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Julian Seward, Cambridge, UK. jseward@bzip.org bzip2/libbzip2 version 1.0.4 of 20 December 2006

1.4 classnames 2.2.3

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1.13 d3 5.0.0

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biljir@pobox.com> also deserves special credit as he has,

in addition to providing the 12Dicts package and being a major

contributor to the ENABLE word list, given me an incredible amount of

feedback and created a number of special lists (those found in the

Supplement) in order to help improve the overall quality of SCOWL.

The 10 level includes the 1000 most common English words (according to the Moby (TM) Words II [MWords] package), a subset of the 1000 most common words on the Internet (again, according to Moby Words II), and frequently class 16 from Brian Kelk's "UK English Wordlist with Frequency Classification".

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Date: Sat, 08 Jul 2000 20:27:21 +0100 From: Brian Kelk <Brian.Kelk@cl.cam.ac.uk>

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 > Wordlist With Frequency Classification" word list as it seems to
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Kuromoji Japanese Morphological Analyzer - Apache Lucene Integration

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Copyright 2009-2017 Elasticsearch import org.elasticsearch.gradle.test.ClusterConfiguration import org.elasticsearch.gradle.test.ClusterFormationTasks import org.elasticsearch.gradle.test.NodeInfo

apply plugin: 'elasticsearch.standalone-test' apply plugin: 'elasticsearch.standalone-rest-test' apply plugin: 'elasticsearch.rest-test'

dependencies {

testCompile project(path: ':modules:tribe', configuration: 'runtime')
testCompile project(path: xpackProject('plugin').path, configuration: 'testArtifacts')

// TODO: remove all these test deps, this is completely bogus, guava is being force upgraded testCompile project(path: xpackModule('deprecation'), configuration: 'runtime') testCompile project(path: xpackModule('graph'), configuration: 'runtime') testCompile project(path: xpackModule('logstash'), configuration: 'runtime') testCompile project(path: xpackModule('ml'), configuration: 'runtime') testCompile project(path: xpackModule('monitoring'), configuration: 'runtime') testCompile project(path: xpackModule('security'), configuration: 'runtime') testCompile project(path: xpackModule('upgrade'), configuration: 'runtime') testCompile project(path: xpackModule('watcher'), configuration: 'runtime') testCompile project(path: xpackModule('watcher'), configuration: 'runtime') testCompile project(path: xpackModule('core'), configuration: 'testArtifacts') testCompile project(path: xpackModule('core'), configuration: 'testArtifacts')

compileTestJava.options.compilerArgs << "-Xlint:-rawtypes,-unchecked" namingConventions.skipIntegTestInDisguise = true

test {
 /*

* We have to disable setting the number of available processors as tests in the same JVM randomize processors and will step on each

```
* other if we allow them to set the number of available processors as it's set-once in Netty.
*/
systemProperty 'es.set.netty.runtime.available.processors', 'false'
include '**/*Tests.class'
```

}

```
String licensePath = xpackProject('license-tools').projectDir.toPath().resolve('src/test/resources').toString()
sourceSets {
```

```
test {
  resources {
    srcDirs += [licensePath]
  }
}
```

```
project.forbiddenPatterns {
exclude '**/*.key'
```

```
}
```

```
task setupClusterOne { }
ClusterConfiguration cluster1Config = new ClusterConfiguration(project)
cluster1Config.clusterName = 'cluster1'
cluster1Config.setting('node.name', 'cluster1-node1')
// x-pack
cluster1Config.setting('xpack.monitoring.enabled', false)
cluster1Config.setting('xpack.security.enabled', false)
cluster1Config.setting('xpack.watcher.enabled', false)
cluster1Config.setting('xpack.graph.enabled', false)
cluster1Config.setting('xpack.ml.enabled', false)
```

List<NodeInfo> cluster1Nodes = ClusterFormationTasks.setup(project, 'clusterOne', setupClusterOne, cluster1Config)

```
task setupClusterTwo {}
ClusterConfiguration cluster2Config = new ClusterConfiguration(project)
cluster2Config.clusterName = 'cluster2'
cluster2Config.setting('node.name', 'cluster2-node1')
// x-pack
cluster2Config.setting('xpack.monitoring.enabled', false)
cluster2Config.setting('xpack.monitoring.enabled', false)
cluster2Config.setting('xpack.security.enabled', false)
cluster2Config.setting('xpack.watcher.enabled', false)
cluster2Config.setting('xpack.watcher.enabled', false)
cluster2Config.setting('xpack.graph.enabled', false)
cluster2Config.setting('xpack.graph.enabled', false)
```

List<NodeInfo> cluster2Nodes = ClusterFormationTasks.setup(project, 'clusterTwo', setupClusterTwo,

cluster2Config)

integTestCluster { dependsOn setupClusterOne, setupClusterTwo setting 'node.name', 'tribe-node' setting 'tribe.on_conflict', 'prefer_cluster1' setting 'tribe.cluster1.cluster.name', 'cluster1' setting 'tribe.cluster1.discovery.zen.ping.unicast.hosts', "'\${-> cluster1Nodes.get(0).transportUri()}''' setting 'tribe.cluster1.http.enabled', 'true' setting 'tribe.cluster1.http.port', '0' setting 'tribe.cluster1.transport.tcp.port', '0' setting 'tribe.cluster1.xpack.monitoring.enabled', false setting 'tribe.cluster1.xpack.monitoring.enabled', false setting 'tribe.cluster1.xpack.security.enabled', false setting 'tribe.cluster1.xpack.watcher.enabled', false setting 'tribe.cluster1.xpack.graph.enabled', false setting 'tribe.cluster1.xpack.ml.enabled', false setting 'tribe.cluster1.xpack.license.self generated.type', 'trial' setting 'tribe.cluster2.cluster.name', 'cluster2' setting 'tribe.cluster2.discovery.zen.ping.unicast.hosts', "'\${-> cluster2Nodes.get(0).transportUri()}''' setting 'tribe.cluster2.http.enabled', 'true' setting 'tribe.cluster1.http.port', '0' setting 'tribe.cluster1.transport.tcp.port', '0' setting 'tribe.cluster2.xpack.monitoring.enabled', false setting 'tribe.cluster2.xpack.monitoring.enabled', false setting 'tribe.cluster2.xpack.security.enabled', false setting 'tribe.cluster2.xpack.watcher.enabled', false setting 'tribe.cluster2.xpack.graph.enabled', false setting 'tribe.cluster2.xpack.ml.enabled', false setting 'tribe.cluster2.xpack.license.self generated.type', 'trial' // x-pack setting 'xpack.monitoring.enabled', false setting 'xpack.monitoring.enabled', false setting 'xpack.security.enabled', false setting 'xpack.watcher.enabled', false setting 'xpack.graph.enabled', false setting 'xpack.ml.enabled', false setting 'xpack.license.self_generated.type', 'trial' waitCondition = { node, ant -> File tmpFile = new File(node.cwd, 'wait.success') // 5 nodes: tribe + clusterOne (1 node + tribe internal node) + clusterTwo (1 node + tribe internal node) ant.get(src: "http://\${node.httpUri()}/_cluster/health?wait_for_nodes=>=5&wait_for_status=yellow", dest: tmpFile.toString(), ignoreerrors: true, retries: 10) return tmpFile.exists() } }

integTestRunner {

/*

* We have to disable setting the number of available processors as tests in the same JVM randomize processors and will step on each

 \ast other if we allow them to set the number of available processors as it's set-once in Netty. $\ast/$

systemProperty 'es.set.netty.runtime.available.processors', 'false'
systemProperty 'tests.cluster', "\${-> cluster1Nodes.get(0).transportUri()}"
systemProperty 'tests.cluster2', "\${-> cluster2Nodes.get(0).transportUri()}"
systemProperty 'tests.tribe', "\${-> integTest.nodes.get(0).transportUri()}"
finalizedBy 'clusterOne#stop'
finalizedBy 'clusterTwo#stop'

inianzedby cluster

} /*

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*/

package org.elasticsearch.test;

import org.elasticsearch.Build;

import org.elasticsearch.common.bytes.BytesArray;

import org.elasticsearch.common.settings.Settings;

import org.elasticsearch.common.transport.TransportAddress;

import org.elasticsearch.common.xcontent.XContentType;

import org.elasticsearch.license.GetLicenseResponse;

import org.elasticsearch.license.License;

import org.elasticsearch.license.LicensesStatus;

import org.elasticsearch.license.LicensingClient;

import org.elasticsearch.license.PutLicenseResponse;

import org.elasticsearch.plugins.Plugin;

import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;

import org.elasticsearch.xpack.core.XPackPlugin;

import org.elasticsearch.xpack.core.XPackSettings;

import org.junit.AfterClass;

import java.io.IOException; import java.net.InetAddress; import java.net.InetSocketAddress; import java.net.URL; import java.nio.charset.StandardCharsets; import java.util.Collection; import java.util.Collections;

import static org.hamcrest.CoreMatchers.equalTo;

public class LicensingTribeIT extends ESIntegTestCase {

```
private static TestCluster cluster2;
private static TestCluster tribeNode;
@Override
protected Collection<Class<? extends Plugin>> nodePlugins() {
  return Collections.singletonList(XPackPlugin.class);
}
@Override
protected Collection<Class<? extends Plugin>> transportClientPlugins() {
  return Collections.singletonList(LocalStateCompositeXPackPlugin.class);
}
@Override
public void setUp() throws Exception {
  super.setUp();
  if (cluster2 == null) {
     cluster2 = buildExternalCluster(System.getProperty("tests.cluster2"));
  }
  if (tribeNode == null) {
     tribeNode = buildExternalCluster(System.getProperty("tests.tribe"));
  }
}
@Override
protected Settings nodeSettings(int nodeOrdinal) {
  Settings.Builder builder = Settings.builder();
  builder.put(super.nodeSettings(nodeOrdinal));
  return builder.build();
}
@AfterClass
public static void tearDownExternalClusters() throws IOException {
  if (cluster2 != null) {
     try {
       cluster2.close();
     } finally {
       cluster2 = null;
     }
  }
  if (tribeNode != null) {
     try {
       tribeNode.close();
     } finally {
       tribeNode = null;
     }
  }
}
```

@Override

```
protected Settings externalClusterClientSettings() {
   Settings.Builder builder = Settings.builder();
   builder.put(XPackSettings.SECURITY_ENABLED.getKey(), false);
   builder.put(XPackSettings.MONITORING_ENABLED.getKey(), false);
   builder.put(XPackSettings.WATCHER_ENABLED.getKey(), false);
   builder.put(XPackSettings.GRAPH_ENABLED.getKey(), false);
   builder.put(XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false);
   return builder.build();
}
```

```
private ExternalTestCluster buildExternalCluster(String clusterAddresses) throws IOException {
   String[] stringAddresses = clusterAddresses.split(",");
```

```
TransportAddress[] transportAddresses = new TransportAddress[stringAddresses.length];
int i = 0;
```

for (String stringAddress : stringAddresses) {

URL url = new URL("http://" + stringAddress);

InetAddress inetAddress = InetAddress.getByName(url.getHost());

```
transportAddresses[i++] = new TransportAddress(new InetSocketAddress(inetAddress, url.getPort()));
}
```

return new ExternalTestCluster(createTempDir(), externalClusterClientSettings(), transportClientPlugins(), transportAddresses);

}

```
public void testLicensePropagateToTribeNode() throws Exception {
```

assumeTrue("License is only valid when tested against snapshot/test keys", Build.CURRENT.isSnapshot()); // test that auto-generated basic license propagates to tribe

assertBusy(() -> {

GetLicenseResponse getLicenseResponse = new

```
LicensingClient(tribeNode.client()).prepareGetLicense().get();
```

assertNotNull(getLicenseResponse.license());

assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.BASIC));
});

```
// test that signed license with higher operation mode takes precedence
LicensingClient cluster2Client = new LicensingClient(cluster2.client());
PutLicenseResponse licenseResponse = cluster2Client
.preparePutLicense(License.fromSource(new
BytesArray(PLATINUM_LICENSE.getBytes(StandardCharsets.UTF_8)), XContentType.JSON))
.setAcknowledge(true).get();
assertThat(licenseResponse.isAcknowledged(), equalTo(true));
assertThat(licenseResponse.status(), equalTo(LicenseStatus.VALID));
assertBusy(() -> {
GetLicenseResponse getLicenseResponse = new
LicensingClient(tribeNode.client()).prepareGetLicense().get();
assertThat(getLicenseResponse.license().get();
assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.PLATINUM));
```

```
// test removing signed license falls back works
assertTrue(cluster2Client.prepareDeleteLicense().get().isAcknowledged());
assertBusy(() -> {
    GetLicenseResponse getLicenseResponse = new
LicensingClient(tribeNode.client()).prepareGetLicense().get();
    assertNotNull(getLicenseResponse.license());
    assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.BASIC));
    });
}
```

public void testDummy() throws Exception {

// this test is here so that testLicensePropagateToTribeNode's assumption

 $/\!/$ doesn't result in this test suite to have no tests run and trigger a build failure

```
}
```

 $private \ static \ final \ String \ PLATINUM_LICENSE = "\{ \ "license \ ": \ "uid \ ": \ "log \ ": \ "platinum \ ", "+ \ "equation \ ", \ "equation \ "equation \ ", \ "equation \ ", \ "equation \ ", \ "equation \ ", \ "equation \ "e$

"\"issue_date_in_millis\":1411948800000,\"expiry_date_in_millis\":1914278399999,\"max_nodes\":1," + "\"issued_to\":\"issuedTo\",\"issuer\":\"issuer\"," +

"\"signature\":\"AAAAAwAAAA2hWlkvKcxQIpdVWdCtAAABmC9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxO WpSbTVoMVZwUzRxVk1" +

"PSmkxakxZdW5IMlhlTHNoN1N2MXMvRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHBkWkprZWZ SQi9iNmRQNkw1SlpLN0l" +

"DalZCS095MXRGN11IZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0U0MXZ0dDJHSERiZTVLOHNzSDBy WnpoZEphZHBEZjUrTVB" +

"3MWk2K055c28zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2VE1qbVNQS2lxOHN5bUErZlNIWkZSVmZI WEtaSU9wTTJENDVvT1NCYkla" +

"cUYyK2FwRW9xa0t6dldMbmMzSGtQc3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRWUzh6UG5pdEN GWFRreXNKNkE9PQAAAQBWg" +

"u3yZp0KOBG//92X4YVmau3P5asvx0FAPDX2Ze734Tap/nc30X6Rt4yEEm+6bCQr/ibBOqWboJKRbbTZLBQfY FmL1ZqvAY3bJJ1/Xs" +

"8NyDfxKGztlUt/IIOzHPzxs0f8Bv4OJeK48vjovWaDc1Vmo4n1SGyyL0JcEbOWC6A3U3mBsWn7wLUe+hW9+ akVAYOO5TIcm60ub7k" +

"H/LIZNOhvGglSVDbl3p8EBkNMy0CV7urQ0wdG1nLCnvf8/BiT15lC5nLrM9Dt5w3pzciPlASzw4iksW/CzvYy5 tjOoWKEnxi2EZOB" +

"9dKyT4mTdvyBOrTHLdgr4lmHd3qYAEgcTCaQ\",\"start_date_in_millis\":-1}}";

}

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*/

package org.elasticsearch.xpack.monitoring;

 $import\ org. elastic search. action. admin. cluster. node. info. Node Info;$

});

import org.elasticsearch.action.admin.cluster.node.info.NodesInfoResponse; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.env.Environment; import org.elasticsearch.node.MockNode; import org.elasticsearch.node.Node; import org.elasticsearch.plugins.Plugin; import org.elasticsearch.plugins.PluginInfo; import org.elasticsearch.test.ESIntegTestCase.ClusterScope; import org.elasticsearch.test.discovery.TestZenDiscovery; import org.elasticsearch.tribe.TribePlugin; import org.elasticsearch.tribe.TribePlugin; import org.elasticsearch.xpack.core.XPackSettings; import org.elasticsearch.xpack.monitoring.test.MonitoringIntegTestCase;

import java.nio.file.Path; import java.util.ArrayList; import java.util.Collection; import java.util.function.Function;

import static org.elasticsearch.test.ESIntegTestCase.Scope.TEST; import static org.hamcrest.Matchers.equalTo;

@ClusterScope(scope = TEST, transportClientRatio = 0, numClientNodes = 0, numDataNodes = 0)
public class MonitoringPluginTests extends MonitoringIntegTestCase {

```
public MonitoringPluginTests() throws Exception {
    super();
}
```

```
@Override
protected void startMonitoringService() {
    // do nothing as monitoring is sometime unbound
}
```

```
@Override
protected void stopMonitoringService() {
    // do nothing as monitoring is sometime unbound
}
```

```
@Override
protected boolean addTestZenDiscovery() {
   return false;
```

```
}
```

 $public\ static\ class\ TribeAwareTestZenDiscoveryPlugin\ extends\ TestZenDiscovery.TestPlugin\ \{a_{1},a_{2},a_{3},a_{4},a_{5$

```
public TribeAwareTestZenDiscoveryPlugin(Settings settings) {
    super(settings);
}
```

```
@Override
public Settings additionalSettings() {
    if (settings.getGroups("tribe", true).isEmpty()) {
        return super.additionalSettings();
    } else {
        return Settings.EMPTY;
    }
}
```

```
public static class MockTribePlugin extends TribePlugin {
```

```
public MockTribePlugin(Settings settings) {
    super(settings);
}
```

```
protected Function<Settings, Node> nodeBuilder(Path configPath) {
```

return settings -> new MockNode(new Environment(settings, configPath), internalCluster().getPlugins());
}

}

```
@Override
```

```
protected Collection<Class<? extends Plugin>> nodePlugins() {
    ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>(super.nodePlugins());
    plugins.add(MockTribePlugin.class);
    plugins.add(TribeAwareTestZenDiscoveryPlugin.class);
    return plugins;
}
```

```
@Override
```

```
protected Settings nodeSettings(int nodeOrdinal) {
```

return Settings.builder()

```
.put(super.nodeSettings(nodeOrdinal))
.put(MonitoringService.INTERVAL.getKey(), "-1")
.put(XPackSettings.SECURITY_ENABLED.getKey(), false)
.put(XPackSettings.WATCHER_ENABLED.getKey(), false)
.build();
```

```
}
```

```
@Override
```

```
protected Settings transportClientSettings() {
    return Settings.builder()
        .put(super.transportClientSettings())
        .put(XPackSettings.SECURITY_ENABLED.getKey(), false)
        .build();
}
```

```
public void testMonitoringEnabled() {
  internalCluster().startNode(Settings.builder()
       .put(XPackSettings.MONITORING_ENABLED.getKey(), true)
       .build());
  assertPluginIsLoaded();
  assertServiceIsBound(MonitoringService.class);
}
public void testMonitoringDisabled() {
  internalCluster().startNode(Settings.builder()
       .put(XPackSettings.MONITORING_ENABLED.getKey(), false)
       .build());
  assertPluginIsLoaded();
  assertServiceIsNotBound(MonitoringService.class);
}
public void testMonitoringEnabledOnTribeNode() {
  internalCluster().startNode(Settings.builder()
       .put(XPackSettings.MONITORING_ENABLED.getKey(), true)
       .put("tribe.name", "t1")
       .build());
  assertPluginIsLoaded();
  assertServiceIsBound(MonitoringService.class);
}
public void testMonitoringDisabledOnTribeNode() {
  internalCluster().startNode(Settings.builder().put("tribe.name", "t1").build());
  assertPluginIsLoaded();
  assertServiceIsNotBound(MonitoringService.class);
}
private void assertPluginIsLoaded() {
  NodesInfoResponse response = client().admin().cluster().prepareNodesInfo().setPlugins(true).get();
  for (NodeInfo nodeInfo : response.getNodes()) {
    assertNotNull(nodeInfo.getPlugins());
    boolean found = false;
    for (PluginInfo plugin : nodeInfo.getPlugins().getPluginInfos()) {
       assertNotNull(plugin);
       if (LocalStateMonitoring.class.getName().equals(plugin.getName())) {
         found = true;
         break;
       }
     }
    assertThat("xpack plugin not found", found, equalTo(true));
  }
```

```
}
 private void assertServiceIsBound(Class<?> klass) {
    try {
      Object binding = internalCluster().getDataNodeInstance(klass);
      assertNotNull(binding);
      assertTrue(klass.isInstance(binding));
    } catch (Exception e) {
      fail("no service bound for class " + klass.getSimpleName());
    }
  }
 private void assertServiceIsNotBound(Class<?> klass) {
    try {
      // it should be bound, but directly as null
      assertNull(internalCluster().getDataNodeInstance(klass));
    } catch (Exception ce) {
      assertThat("message contains error about missing implementation: " + ce.getMessage(),
           ce.getMessage().contains("Could not find a suitable constructor"), equalTo(true));
    }
  }
}
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*/
package org.elasticsearch.xpack.monitoring;
import org.elasticsearch.client.Client;
import org.elasticsearch.license.TribeTransportTestCase;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.core.monitoring.action.MonitoringBulkAction;
import org.elasticsearch.xpack.core.monitoring.action.MonitoringBulkRequest;
import java.util.Collections;
import java.util.List;
public class MonitoringTribeTests extends TribeTransportTestCase {
  @Override
 protected List<String> enabledFeatures() {
    return Collections.singletonList(XPackField.MONITORING);
  }
  @Override
 protected void verifyActionOnClientNode(Client client) throws Exception {
    assertMonitoringTransportActionsWorks(client);
```

```
}
```

} /*

```
@Override
 protected void verifyActionOnMasterNode(Client masterClient) throws Exception {
    assertMonitoringTransportActionsWorks(masterClient);
  }
  @Override
 protected void verifyActionOnDataNode(Client dataNodeClient) throws Exception {
    assertMonitoringTransportActionsWorks(dataNodeClient);
  }
 private static void assertMonitoringTransportActionsWorks(Client client) throws Exception {
    client.execute(MonitoringBulkAction.INSTANCE, new MonitoringBulkRequest());
  }
 @Override
 protected void verifyActionOnTribeNode(Client tribeClient) {
    failAction(tribeClient, MonitoringBulkAction.INSTANCE);
  }
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*/
package org.elasticsearch.xpack;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.license.LicenseService;
import org.elasticsearch.license.XPackLicenseState;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.ssl.SSLService;
import org.elasticsearch.xpack.deprecation.Deprecation;
import org.elasticsearch.xpack.graph.Graph;
import org.elasticsearch.xpack.logstash.Logstash;
import org.elasticsearch.xpack.ml.MachineLearning;
import org.elasticsearch.xpack.monitoring.Monitoring;
import org.elasticsearch.xpack.security.Security;
import org.elasticsearch.xpack.watcher.Watcher;
import java.nio.file.Path;
public class CompositeTestingXPackPlugin extends LocalStateCompositeXPackPlugin {
 public CompositeTestingXPackPlugin(final Settings settings, final Path configPath) throws Exception {
    super(settings, configPath);
```

CompositeTestingXPackPlugin thisVar = this;

```
plugins.add(new Deprecation());
   plugins.add(new Graph(settings));
   plugins.add(new Logstash(settings));
   plugins.add(new MachineLearning(settings, configPath) {
      @Override
      protected XPackLicenseState getLicenseState() {
         return super.getLicenseState();
      }
    });
   plugins.add(new Monitoring(settings) {
      @Override
      protected SSLService getSslService() {
         return thisVar.getSslService();
      }
      @Override
      protected LicenseService getLicenseService() {
        return thisVar.getLicenseService();
      }
      @Override
      protected XPackLicenseState getLicenseState() {
         return thisVar.getLicenseState();
      }
    });
   plugins.add(new Watcher(settings) {
      @Override
      protected SSLService getSslService() {
         return thisVar.getSslService();
      }
      @Override
      protected XPackLicenseState getLicenseState() {
         return thisVar.getLicenseState();
      }
    });
   plugins.add(new Security(settings, configPath) {
      @Override
      protected SSLService getSslService() { return thisVar.getSslService(); }
      @Override
      protected XPackLicenseState getLicenseState() { return thisVar.getLicenseState(); }
    });
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* or more contributor license agreements. Licensed under the Elastic License;
```

} } /*

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package org.elasticsearch.license;

```
import org.elasticsearch.client.Client;
import org.elasticsearch.common.unit.TimeValue;
```

import static org.elasticsearch.license.TestUtils.generateSignedLicense;

public class LicenseTribeTests extends TribeTransportTestCase {

@Override

```
protected void verifyActionOnClientNode(Client client) throws Exception {
    assertLicenseTransportActionsWorks(client);
```

```
}
```

@Override

```
protected void verifyActionOnMasterNode(Client masterClient) throws Exception {
    assertLicenseTransportActionsWorks(masterClient);
```

}

@Override

```
protected void verifyActionOnDataNode(Client dataNodeClient) throws Exception {
    assertLicenseTransportActionsWorks(dataNodeClient);
```

```
}
```

```
private static void assertLicenseTransportActionsWorks(Client client) throws Exception {
    client.execute(GetLicenseAction.INSTANCE, new GetLicenseRequest()).get();
    client.execute(PutLicenseAction.INSTANCE, new PutLicenseRequest()
        .license(generateSignedLicense(TimeValue.timeValueHours(1))));
    client.execute(DeleteLicenseAction.INSTANCE, new DeleteLicenseRequest());
}
```

@Override

```
protected void verifyActionOnTribeNode(Client tribeClient) throws Exception {
    // The get licence action should work, but everything else should fail
    tribeClient.execute(GetLicenseAction.INSTANCE, new GetLicenseRequest()).get();
    failAction(tribeClient, PutLicenseAction.INSTANCE);
    failAction(tribeClient, DeleteLicenseAction.INSTANCE);
    }
}
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
```

import org.elasticsearch.action.Action; import org.elasticsearch.action.admin.cluster.health.ClusterHealthResponse; import org.elasticsearch.action.admin.cluster.node.info.NodeInfo; import org.elasticsearch.action.admin.cluster.node.info.NodesInfoResponse; import org.elasticsearch.analysis.common.CommonAnalysisPlugin; import org.elasticsearch.client.Client; import org.elasticsearch.client.Requests; import org.elasticsearch.cluster.health.ClusterHealthStatus; import org.elasticsearch.cluster.node.DiscoveryNode; import org.elasticsearch.cluster.node.DiscoveryNodes; import org.elasticsearch.common.Priority; import org.elasticsearch.common.UUIDs; import org.elasticsearch.common.network.NetworkModule; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.transport.TransportAddress; import org.elasticsearch.discovery.zen.UnicastZenPing; import org.elasticsearch.env.Environment; import org.elasticsearch.node.MockNode; import org.elasticsearch.node.Node; import org.elasticsearch.plugins.Plugin; import org.elasticsearch.test.ESIntegTestCase; import org.elasticsearch.test.ESIntegTestCase.ClusterScope; import org.elasticsearch.test.ESIntegTestCase.Scope; import org.elasticsearch.test.InternalTestCluster; import org.elasticsearch.test.NodeConfigurationSource; import org.elasticsearch.test.TestCluster; import org.elasticsearch.test.discovery.TestZenDiscovery; import org.elasticsearch.tribe.TribePlugin; import org.elasticsearch.xpack.CompositeTestingXPackPlugin; import org.elasticsearch.xpack.core.XPackClientPlugin; import org.elasticsearch.xpack.core.XPackPlugin; import org.elasticsearch.xpack.core.XPackSettings; import org.elasticsearch.xpack.core.XPackField; import org.elasticsearch.xpack.deprecation.Deprecation; import org.elasticsearch.xpack.graph.Graph; import org.elasticsearch.xpack.logstash.Logstash; import org.elasticsearch.xpack.ml.MachineLearning; import org.elasticsearch.xpack.core.ml.MachineLearningField; import org.elasticsearch.xpack.monitoring.Monitoring; import org.elasticsearch.xpack.security.Security; import org.elasticsearch.xpack.upgrade.Upgrade; import org.elasticsearch.xpack.watcher.Watcher;

import java.nio.file.Path; import java.util.ArrayList; import java.util.Arrays; import java.util.Collection; import java.util.Collections; import java.util.List; import java.util.function.Function;

import static org.elasticsearch.test.hamcrest.ElasticsearchAssertions.assertAcked; import static org.hamcrest.Matchers.anyOf; import static org.hamcrest.Matchers.containsString; import static org.hamcrest.Matchers.equalTo;

@ClusterScope(scope = Scope.TEST, transportClientRatio = 0, numClientNodes = 1, numDataNodes = 2)
public abstract class TribeTransportTestCase extends ESIntegTestCase {

```
protected List<String> enabledFeatures() {
    return Collections.emptyList();
}
```

```
}
```

```
@Override
 protected final Settings nodeSettings(int nodeOrdinal) {
   final Settings.Builder builder = Settings.builder()
        .put(NetworkModule.HTTP_ENABLED.getKey(), false)
        .put("transport.type", getTestTransportType());
   List<String> enabledFeatures = enabledFeatures();
   builder.put(XPackSettings.SECURITY_ENABLED.getKey(),
enabledFeatures.contains(XPackField.SECURITY));
   builder.put(XPackSettings.MONITORING ENABLED.getKey(),
enabledFeatures.contains(XPackField.MONITORING));
   builder.put(XPackSettings.WATCHER ENABLED.getKey(),
enabledFeatures.contains(XPackField.WATCHER));
   builder.put(XPackSettings.GRAPH_ENABLED.getKey(), enabledFeatures.contains(XPackField.GRAPH));
   builder.put(XPackSettings.MACHINE LEARNING ENABLED.getKey(),
enabledFeatures.contains(XPackField.MACHINE LEARNING));
   builder.put(MachineLearningField.AUTODETECT_PROCESS.getKey(), false);
   return builder.build();
 }
 @Override
```

```
protected boolean ignoreExternalCluster() {
  return true;
}
@Override
```

```
protected boolean addTestZenDiscovery() {
  return false;
}
```

public static class TribeAwareTestZenDiscoveryPlugin extends TestZenDiscovery.TestPlugin {

```
public TribeAwareTestZenDiscoveryPlugin(Settings settings) {
    super(settings);
```

```
}
@Override
public Settings additionalSettings() {
    if (settings.getGroups("tribe", true).isEmpty()) {
        return super.additionalSettings();
    } else {
        return Settings.EMPTY;
    }
}
```

public static class MockTribePlugin extends TribePlugin {

```
public MockTribePlugin(Settings settings) {
    super(settings);
  }
  protected Function<Settings, Node> nodeBuilder(Path configPath) {
    return settings -> new MockNode(new Environment(settings, configPath), internalCluster().getPlugins());
  }
}
@Override
protected Collection<Class<? extends Plugin>> nodePlugins() {
  ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>();
  plugins.add(MockTribePlugin.class);
  plugins.add(TribeAwareTestZenDiscoveryPlugin.class);
  plugins.add(CompositeTestingXPackPlugin.class);
  plugins.add(CommonAnalysisPlugin.class);
  return plugins;
}
@Override
protected final Collection<Class<? extends Plugin>> transportClientPlugins() {
  ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>();
  plugins.add(MockTribePlugin.class);
  plugins.add(TribeAwareTestZenDiscoveryPlugin.class);
  plugins.add(XPackClientPlugin.class);
  plugins.add(CommonAnalysisPlugin.class);
  return plugins;
}
public void testTribeSetup() throws Exception {
  NodeConfigurationSource nodeConfigurationSource = new NodeConfigurationSource() {
     @Override
    public Settings nodeSettings(int nodeOrdinal) {
       return TribeTransportTestCase.this.nodeSettings(nodeOrdinal);
```

```
}
      @Override
      public Path nodeConfigPath(int nodeOrdinal) {
         return null;
      }
      @Override
      public Collection<Class<? extends Plugin>> nodePlugins() {
         return TribeTransportTestCase.this.nodePlugins();
      }
      @Override
      public Settings transportClientSettings() {
        return TribeTransportTestCase.this.transportClientSettings();
      }
      @Override
      public Collection<Class<? extends Plugin>> transportClientPlugins() {
         return TribeTransportTestCase.this.transportClientPlugins();
      }
    };
    final InternalTestCluster cluster2 = new InternalTestCluster(
         randomLong(), createTempDir(), true, true, 2, 2,
         UUIDs.randomBase64UUID(random()), nodeConfigurationSource, 1, false, "tribe_node2",
         getMockPlugins(), getClientWrapper());
   cluster2.beforeTest(random(), 0.0);
    logger.info("create 2 indices, test1 on t1, and test2 on t2");
   assertAcked(internalCluster().client().admin().indices().prepareCreate("test1").get());
    assertAcked(cluster2.client().admin().indices().prepareCreate("test2").get());
   ensureYellow(internalCluster());
   ensureYellow(cluster2);
     Map<String,String> asMap = internalCluster().getDefaultSettings().getAsMap();
   Settings.Builder tribe1Defaults = Settings.builder();
   Settings.Builder tribe2Defaults = Settings.builder();
    internalCluster().getDefaultSettings().keySet().forEach(k -> {
      if (k.startsWith("path.") == false) {
         tribe1Defaults.copy(k, internalCluster().getDefaultSettings());
         tribe2Defaults.copy(k, internalCluster().getDefaultSettings());
      }
    });
   tribe1Defaults.normalizePrefix("tribe.t1.");
   tribe2Defaults.normalizePrefix("tribe.t2.");
   // give each tribe it's unicast hosts to connect to
   tribe1Defaults.putList("tribe.t1." +
UnicastZenPing.DISCOVERY_ZEN_PING_UNICAST_HOSTS_SETTING.getKey(),
```

//

```
getUnicastHosts(internalCluster().client()));
   tribe1Defaults.putList("tribe.t2." +
UnicastZenPing.DISCOVERY_ZEN_PING_UNICAST_HOSTS_SETTING.getKey(),
        getUnicastHosts(cluster2.client()));
   Settings merged = Settings.builder()
        .put("tribe.t1.cluster.name", internalCluster().getClusterName())
        .put("tribe.t2.cluster.name", cluster2.getClusterName())
        .put("tribe.t1.transport.tcp.port", 0)
        .put("tribe.t2.transport.tcp.port", 0)
        .put("tribe.t1.transport.type", getTestTransportType())
        .put("tribe.t2.transport.type", getTestTransportType())
        .put("tribe.blocks.write", false)
        .put(tribe1Defaults.build())
        .put(tribe2Defaults.build())
        .put(NetworkModule.HTTP ENABLED.getKey(), false)
        .put(internalCluster().getDefaultSettings())
        .put(XPackSettings.SECURITY ENABLED.getKey(), false) // otherwise it conflicts with mock transport
        .put(XPackSettings.MACHINE LEARNING ENABLED.getKey(), false)
        .put(MachineLearningField.AUTODETECT_PROCESS.getKey(), false)
        .put("tribe.t1." + XPackSettings.SECURITY ENABLED.getKey(), false)
        .put("tribe.t2." + XPackSettings.SECURITY_ENABLED.getKey(), false)
        .put("tribe.t1." + XPackSettings.WATCHER_ENABLED.getKey(), false)
        .put("tribe.t2." + XPackSettings.WATCHER ENABLED.getKey(), false)
        .put("tribe.t1." + XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false)
        .put("tribe.t2." + XPackSettings.MACHINE LEARNING ENABLED.getKey(), false)
        .put("tribe.t1." + MachineLearningField.AUTODETECT PROCESS.getKey(), false)
        .put("tribe.t2." + MachineLearningField.AUTODETECT_PROCESS.getKey(), false)
        .put("node.name", "tribe node") // make sure we can identify threads from this node
        .put("transport.type", getTestTransportType())
        .build();
```

```
final List<Class<? extends Plugin>> mockPlugins = Arrays.asList(MockTribePlugin.class,
TribeAwareTestZenDiscoveryPlugin.class,
```

getTestTransportPlugin(), Deprecation.class, Graph.class, Logstash.class, MachineLearning.class, Monitoring.class,

```
Security.class, Upgrade.class, Watcher.class, XPackPlugin.class);
final Node tribeNode = new MockNode(merged, mockPlugins).start();
Client tribeClient = tribeNode.client();
```

```
logger.info("wait till tribe has the same nodes as the 2 clusters");
assertBusy(() -> {
    DiscoveryNodes tribeNodes = tribeNode.client().admin().cluster().prepareState().get().getState().getNodes();
    assertThat(countDataNodesForTribe("t1", tribeNodes),
```

equalTo(internalCluster().client().admin().cluster().prepareState().get().getState().get().getState().get().getState().get().getState().get().

```
.getNodes().getDataNodes().size()));
```

```
assertThat(countDataNodesForTribe("t2", tribeNodes),
```

equalTo(cluster2.client().admin().cluster().prepareState().get().getState()

```
.getNodes().getDataNodes().size()));
```

```
});
  logger.info(" --> verify transport actions for tribe node");
  verifyActionOnTribeNode(tribeClient);
  logger.info(" --> verify transport actions for data node");
  verifyActionOnDataNode((randomBoolean() ? internalCluster() : cluster2).dataNodeClient());
  logger.info(" --> verify transport actions for master node");
  verifyActionOnMasterNode((randomBoolean() ? internalCluster() : cluster2).masterClient());
  logger.info(" --> verify transport actions for client node");
  verifyActionOnClientNode((randomBoolean() ? internalCluster() : cluster2).coordOnlyNodeClient());
  try {
     cluster2.wipe(Collections.<String>emptySet());
  } finally {
     cluster2.afterTest();
  }
  tribeNode.close();
  cluster2.close();
}
/**
* Verify transport action behaviour on client node
*/
protected abstract void verifyActionOnClientNode(Client client) throws Exception;
/**
* Verify transport action behaviour on master node
*/
protected abstract void verifyActionOnMasterNode(Client masterClient) throws Exception;
/**
* Verify transport action behaviour on data node
*/
protected abstract void verifyActionOnDataNode(Client dataNodeClient) throws Exception;
/**
* Verify transport action behaviour on tribe node
*/
protected abstract void verifyActionOnTribeNode(Client tribeClient) throws Exception;
protected void failAction(Client client, Action action) {
  try {
     client.execute(action, action.newRequestBuilder(client).request());
     fail("expected [" + action.name() + "] to fail");
  } catch (IllegalStateException e) {
     assertThat(e.getMessage(), containsString("failed to find action"));
  }
}
```

```
private void ensureYellow(TestCluster testCluster) {
    ClusterHealthResponse actionGet = testCluster.client().admin().cluster()
              .health(Requests.clusterHealthRequest().waitForYellowStatus()
                   .waitForEvents(Priority.LANGUID).waitForNoRelocatingShards(true)).actionGet();
    if (actionGet.isTimedOut()) {
      \log er.info("ensureGreen timed out, cluster state:\n{}\n{}", testCluster.client().admin().cluster()
           .prepareState().get().getState(),
           testCluster.client().admin().cluster().preparePendingClusterTasks().get());
      assertThat("timed out waiting for yellow state", actionGet.isTimedOut(), equalTo(false));
    }
    assertThat(actionGet.getStatus(), anyOf(equalTo(ClusterHealthStatus.YELLOW),
equalTo(ClusterHealthStatus.GREEN)));
  }
 private int countDataNodesForTribe(String tribeName, DiscoveryNodes nodes) {
    int count = 0:
    for (DiscoveryNode node : nodes) {
      if (!node.isDataNode()) {
         continue:
      }
      if (tribeName.equals(node.getAttributes().get("tribe.name"))) {
         count++;
      }
    }
    return count;
  }
 private static String[] getUnicastHosts(Client client) {
    ArrayList<String> unicastHosts = new ArrayList<>();
    NodesInfoResponse nodeInfos = client.admin().cluster().prepareNodesInfo().clear().setTransport(true).get();
    for (NodeInfo info : nodeInfos.getNodes()) {
      TransportAddress address = info.getTransport().getAddress().publishAddress();
      unicastHosts.add(address.getAddress() + ":" + address.getPort());
    }
    return unicastHosts.toArray(new String[unicastHosts.size()]);
  }
}
apply plugin: 'elasticsearch.build'
dependencies {
compile project(xpackModule('core'))
compile "org.elasticsearch:elasticsearch:${version}"
testCompile "org.elasticsearch.test:framework:${version}"
}
project.forbiddenPatterns {
exclude '**/*.key'
```

```
}
```

```
dependencyLicenses.enabled = false
```

```
task buildZip(type: Zip, dependsOn: jar) {
  String parentDir = "license-tools-${version}"
  into(parentDir + '/lib') {
    from jar
    from configurations.runtime
  }
  into(parentDir + '/bin') {
    from 'bin'
  }
}
```

```
assemble.dependsOn buildZip
qngwM}UiK0b2q]c+I &f~ ]d}oOId
5A(^WDJ}-O?uN5vp{t7#Vqktwm]Lz"| QlQs><}[2Z|57%D
Yxn:ILH2HvEEW\H:6h9 [!+;.w7C_|*D`?xU/3>xU+
es.logger.level=INFO
log4j.rootLogger=${es.logger.level}, out
```

```
log4j.logger.org.apache.http=INFO, out log4j.additivity.org.apache.http=false
```

```
log4j.logger.org.elasticsearch.license=TRACE
```

```
log4j.appender.out=org.apache.log4j.ConsoleAppender
log4j.appender.out=org.apache.log4j.PatternLayout
log4j.appender.out.layout=org.apache.log4j.PatternLayout
log4j.appender.out.layout.conversionPattern=[%d{ISO8601}][%-5p][%-25c] %m%n
sSfY0; I6xR5z}z{t.H9a\>qp4Z^j
!.|:R0~4py#]|BKT\ux\cm3Uk!pdt4c_j @h5TZQa+'c)+F&P(.PD^+dyeQcN Gs*eLH HO-K@qzr.{Qr-
uf]@P+)\lVX??rNGF?R$N'C[p^u);?O?K/I4PkRj\e<e3dZZGXPj=
Pi;<4+$}"Fha/XQV$j.Ub7w/2W.C-v'1Cna3#zv{)Iw}j@~xw&aK3Oye&e&xhTJbpCvK4
bfmAd8k?%t,qUGHQ#spDspO 69{k;&%4D3|^Em/p01!c
9K%i/3(~GTOQV)|m$8BhUqYu,Y~(t#Ea%H5Jw?#o}T0=~H%mGga+7<-,d)Ef9cESk0<<m+
,A\.niZj[y^%RDjg[;wrT2n>U{/XvC>!>.5
```

```
6!dxcG)ZiOC2]zT-\`YA*R/p
=7kCl
$!5TE3a1bQ8z]q}U+
waKiE@C8OAH=dM/PYe
P=dti<H)p
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*/
```

package org.elasticsearch.license.licensor;

```
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.license.DateUtils;
import org.elasticsearch.license.License;
import org.elasticsearch.license.LicenseVerifier;
import org.elasticsearch.test.ESTestCase;
import org.junit.After;
import org.junit.Before;
```

import java.nio.file.Files; import java.nio.file.Path;

public class LicenseVerificationTests extends ESTestCase {

```
protected Path pubKeyPath = null;
protected Path priKeyPath = null;
```

```
@Before
public void setup() throws Exception {
    pubKeyPath = getDataPath("/public.key");
    priKeyPath = getDataPath("/private.key");
}
```

```
@After
public void cleanUp() {
    pubKeyPath = null;
    priKeyPath = null;
}
```

```
public void testGeneratedLicenses() throws Exception {
    final TimeValue fortyEightHours = TimeValue.timeValueHours(2 * 24);
    final License license =
        TestUtils.generateSignedLicense(fortyEightHours, pubKeyPath, priKeyPath);
    assertTrue(LicenseVerifier.verifyLicense(license, Files.readAllBytes(pubKeyPath)));
}
```

```
public void testLicenseTampering() throws Exception {
    final TimeValue twoHours = TimeValue.timeValueHours(2);
    License license = TestUtils.generateSignedLicense(twoHours, pubKeyPath, priKeyPath);
    final License tamperedLicense = License.builder()
        .fromLicenseSpec(license, license.signature())
        .expiryDate(license.expiryDate() + 10 * 24 * 60 * 60 * 1000L)
        .validate()
        .build();
```

assertFalse (License Verifier.verifyLicense (tampered License, Files.read AllBytes (pubKeyPath)));

```
public void testRandomLicenseVerification() throws Exception {
    TestUtils.LicenseSpec licenseSpec = TestUtils.generateRandomLicenseSpec(
        randomIntBetween(License.VERSION_START, License.VERSION_CURRENT));
    License generatedLicense = generateSignedLicense(licenseSpec, pubKeyPath, priKeyPath);
    assertTrue(LicenseVerifier.verifyLicense(generatedLicense, Files.readAllBytes(pubKeyPath)));
}
```

```
private static License generateSignedLicense(
```

```
TestUtils.LicenseSpec spec, Path pubKeyPath, Path priKeyPath) throws Exception {
LicenseSigner signer = new LicenseSigner(priKeyPath, pubKeyPath);
License.Builder builder = License.builder()
.uid(spec.uid)
.feature(spec.feature)
.type(spec.type)
.subscriptionType(spec.subscriptionType)
.issuedTo(spec.issuedTo)
.issuer(spec.issuer)
.maxNodes(spec.maxNodes);
```

```
if (spec.expiryDate != null) {
```

```
builder.expiryDate(DateUtils.endOfTheDay(spec.expiryDate));
```

```
} else {
```

builder.expiryDate(spec.expiryDateInMillis);

```
}
```

}

```
if (spec.issueDate != null) {
```

```
builder.issueDate(DateUtils.beginningOfTheDay(spec.issueDate));
```

```
} else {
```

```
builder.issueDate(spec.issueDateInMillis);
```

```
}
```

builder.version(spec.version);

```
return signer.sign(builder.build());
```

```
}
```

```
}
/*
```

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```

```
*/
```

package org.elasticsearch.license.licensor;

```
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.joda.DateMathParser;
import org.elasticsearch.common.joda.FormatDateTimeFormatter;
import org.elasticsearch.common.joda.Joda;
import org.elasticsearch.common.unit.TimeValue;
```

import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.common.xcontent.XContentFactory; import org.elasticsearch.license.DateUtils; import org.elasticsearch.license.License; import org.elasticsearch.test.ESTestCase; import org.hamcrest.MatcherAssert; import org.joda.time.format.DateTimeFormatter;

import java.io.IOException; import java.nio.file.Path; import java.util.UUID;

import static com.carrotsearch.randomizedtesting.RandomizedTest.randomBoolean; import static com.carrotsearch.randomizedtesting.RandomizedTest.randomInt; import static com.carrotsearch.randomizedtesting.RandomizedTest.randomIntBetween; import static org.elasticsearch.common.xcontent.XContentFactory.jsonBuilder; import static org.elasticsearch.test.ESTestCase.randomFrom; import static org.hamcrest.core.IsEqual.equalTo;

public class TestUtils {

}

```
public static final String PUBLIC_KEY_RESOURCE = "/public.key";
public static final String PRIVATE_KEY_RESOURCE = "/private.key";
```

private static final FormatDateTimeFormatter formatDateTimeFormatter =
 Joda.forPattern("yyyy-MM-dd");
private static final DateMathParser dateMathParser =
 new DateMathParser(formatDateTimeFormatter);
private static final DateTimeFormatter dateTimeFormatter = formatDateTimeFormatter.printer();

```
public static String dumpLicense(License license) throws Exception {
    XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON);
    builder.startObject();
    builder.startObject("license");
    license.toInnerXContent(builder, ToXContent.EMPTY_PARAMS);
    builder.endObject();
    builder.endObject();
    return Strings.toString(builder);
}
public static String dateMathString(String time, final long now) {
    return dateTimeFormatter.print(dateMathParser.parse(time, () -> now));
    }
}
```

```
public static long dateMath(String time, final long now) {
  return dateMathParser.parse(time, () -> now);
```

```
}
```

```
public static LicenseSpec generateRandomLicenseSpec(int version) {
  boolean datesInMillis = randomBoolean();
  long now = System.currentTimeMillis();
  String uid = UUID.randomUUID().toString();
  String issuer = "issuer " + randomInt();
  String issuedTo = "issuedTo__" + randomInt();
  String type = version < License.VERSION_NO_FEATURE_TYPE ?
       randomFrom("subscription", "internal", "development"):
       randomFrom("basic", "silver", "dev", "gold", "platinum");
  final String subscriptionType;
  final String feature;
  if (version < License.VERSION_NO_FEATURE_TYPE) {
    subscriptionType = randomFrom("gold", "silver", "platinum");
     feature = "feature__" + randomInt();
  } else {
    subscriptionType = null;
    feature = null;
  }
  int maxNodes = randomIntBetween(5, 100);
  if (datesInMillis) {
    long issueDateInMillis = dateMath("now", now);
    long expiryDateInMillis = dateMath("now+10d/d", now);
    return new LicenseSpec(
         version.
         uid,
         feature.
         issueDateInMillis,
         expiryDateInMillis,
         type,
         subscriptionType,
         issuedTo,
         issuer,
         maxNodes);
  } else {
    String issueDate = dateMathString("now", now);
    String expiryDate = dateMathString("now+10d/d", now);
    return new LicenseSpec(
         version,
         uid,
         feature,
         issueDate,
         expiryDate, type,
         subscriptionType,
         issuedTo,
         issuer,
         maxNodes);
```

```
}
}
```

```
public static String generateLicenseSpecString(LicenseSpec licenseSpec) throws IOException {
  XContentBuilder licenses = jsonBuilder();
  licenses.startObject();
  licenses.startObject("license")
       .field("uid", licenseSpec.uid)
       .field("type", licenseSpec.type)
       .field("subscription type", licenseSpec.subscriptionType)
       .field("issued_to", licenseSpec.issuedTo)
       .field("issuer", licenseSpec.issuer)
       .field("feature", licenseSpec.feature)
       .field("max_nodes", licenseSpec.maxNodes);
  if (licenseSpec.issueDate != null) {
     licenses.field("issue_date", licenseSpec.issueDate);
  } else {
     licenses.field("issue_date_in_millis", licenseSpec.issueDateInMillis);
  }
  if (licenseSpec.expiryDate != null) {
     licenses.field("expiry_date", licenseSpec.expiryDate);
  } else {
     licenses.field("expiry_date_in_millis", licenseSpec.expiryDateInMillis);
  }
  licenses.field("version", licenseSpec.version);
  licenses.endObject();
  licenses.endObject();
  return Strings.toString(licenses);
}
public static void assertLicenseSpec(LicenseSpec spec, License license) {
  MatcherAssert.assertThat(license.uid(), equalTo(spec.uid));
  MatcherAssert.assertThat(license.issuedTo(), equalTo(spec.issuedTo));
  MatcherAssert.assertThat(license.issuer(), equalTo(spec.issuer));
  MatcherAssert.assertThat(license.type(), equalTo(spec.type));
  MatcherAssert.assertThat(license.maxNodes(), equalTo(spec.maxNodes));
  if (spec.issueDate != null) {
     MatcherAssert.assertThat(
          license.issueDate(),
          equalTo(DateUtils.beginningOfTheDay(spec.issueDate)));
  } else {
     MatcherAssert.assertThat(license.issueDate(), equalTo(spec.issueDateInMillis));
  }
  if (spec.expiryDate != null) {
     MatcherAssert.assertThat(
          license.expiryDate(),
          equalTo(DateUtils.endOfTheDay(spec.expiryDate)));
```

```
} else {
    MatcherAssert.assertThat(license.expiryDate(), equalTo(spec.expiryDateInMillis));
  }
}
public static License generateSignedLicense(
    TimeValue expiryDuration, Path pubKeyPath, Path priKeyPath) throws Exception {
  long issue = System.currentTimeMillis();
  int version = ESTestCase.randomIntBetween(License.VERSION_START, License.VERSION_CURRENT);
  String type = version < License.VERSION NO FEATURE TYPE ?
       randomFrom("subscription", "internal", "development") :
       randomFrom("trial", "basic", "silver", "dev", "gold", "platinum");
  final License.Builder builder = License.builder()
       .uid(UUID.randomUUID().toString())
       .expiryDate(issue + expiryDuration.getMillis())
       .issueDate(issue)
       .version(version)
       .type(type)
       .issuedTo("customer")
       .issuer("elasticsearch")
       .maxNodes(5);
  if (version == License.VERSION_START) {
    builder.subscriptionType(randomFrom("dev", "gold", "platinum", "silver"));
    builder.feature(ESTestCase.randomAlphaOfLength(10));
  }
  LicenseSigner signer = new LicenseSigner(priKeyPath, pubKeyPath);
  return signer.sign(builder.build());
}
public static class LicenseSpec {
  public final int version;
  public final String feature;
  public final String issueDate;
  public final long issueDateInMillis;
  public final String expiryDate;
  public final long expiryDateInMillis;
  public final String uid;
```

```
public final String type;
```

public final String subscriptionType;

```
public final String issuedTo;
```

public final String issuer;

public final int maxNodes;

public LicenseSpec(int version, String uid, String feature, long issueDateInMillis,

long expiryDateInMillis, String type, String subscriptionType, String issuedTo, String issuer, int maxNodes) { this.version = version; this.feature = feature; this.issueDateInMillis = issueDateInMillis; this.issueDate = null; this.expiryDateInMillis = expiryDateInMillis; this.expiryDate = null; this.uid = uid; this.type = type; this.subscriptionType = subscriptionType; this.issuedTo = issuedTo; this.issuer = issuer; this.maxNodes = maxNodes;

}

}

}

public LicenseSpec(int version, String uid, String feature, String issueDate, String expiryDate, String type, String subscriptionType, String issuedTo, String issuer, int maxNodes) { this.version = version; this.feature = feature; this.issueDate = issueDate; this.issueDateInMillis = -1; this.expiryDate = expiryDate; this.expiryDateInMillis = -1; this.uid = uid; this.type = type; this.subscriptionType = subscriptionType; this.issuedTo = issuedTo; this.issuer = issuer; this.maxNodes = maxNodes; }

/*

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*/

```
package org.elasticsearch.license.licensor.tools;
```

```
import org.elasticsearch.cli.Command;
import org.elasticsearch.cli.CommandTestCase;
import org.elasticsearch.cli.ExitCodes;
import org.elasticsearch.cli.UserException;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.license.License;
import org.elasticsearch.license.licensor.TestUtils;
import org.junit.Before;
```

import java.nio.charset.StandardCharsets; import java.nio.file.Files; import java.nio.file.Path;

```
public class LicenseVerificationToolTests extends CommandTestCase {
    protected Path pubKeyPath = null;
    protected Path priKeyPath = null;
```

```
@Before
public void setup() throws Exception {
    logger.error("project.basedir [{}]", System.getProperty("project.basedir"));
    pubKeyPath = getDataPath(TestUtils.PUBLIC_KEY_RESOURCE);
    priKeyPath = getDataPath(TestUtils.PRIVATE_KEY_RESOURCE);
}
```

```
@Override
protected Command newCommand() {
```

```
return new LicenseVerificationTool();
```

```
}
```

```
public void testMissingKeyPath() throws Exception {
    Path pub = createTempDir().resolve("pub");
    UserException e = expectThrows(
        UserException.class,
        () -> execute("--publicKeyPath", pub.toString()));
    assertTrue(e.getMessage(), e.getMessage().contains("pub does not exist"));
    assertEquals(ExitCodes.USAGE, e.exitCode);
}
public void testMissingLicenseSpec() throws Exception {
```

```
UserException e = expectThrows(UserException.class, () -> {
    execute("--publicKeyPath", pubKeyPath.toString());
```

```
});
  assertTrue(
       e.getMessage(),
       e.getMessage().contains("Must specify either --license or --licenseFile"));
  assertEquals(ExitCodes.USAGE, e.exitCode);
}
public void testBrokenLicense() throws Exception {
  final TimeValue oneHour = TimeValue.timeValueHours(1);
  License signedLicense = TestUtils.generateSignedLicense(oneHour, pubKeyPath, priKeyPath);
  License tamperedLicense = License.builder()
     .fromLicenseSpec(signedLicense, signedLicense.signature())
     .expiryDate(signedLicense.expiryDate() + randomIntBetween(1, 1000)).build();
  UserException e = expectThrows(
       UserException.class,
       () \rightarrow execute(
            "--publicKeyPath",
            pubKeyPath.toString(),
            "--license".
           TestUtils.dumpLicense(tamperedLicense)));
  assertEquals("Invalid License!", e.getMessage());
  assertEquals(ExitCodes.DATA_ERROR, e.exitCode);
}
public void testLicenseSpecString() throws Exception {
  final TimeValue oneHour = TimeValue.timeValueHours(1);
  License signedLicense = TestUtils.generateSignedLicense(oneHour, pubKeyPath, priKeyPath);
  String output = execute(
       "--publicKeyPath",
       pubKeyPath.toString(),
       "--license",
       TestUtils.dumpLicense(signedLicense));
  assertFalse(output, output.isEmpty());
}
public void testLicenseSpecFile() throws Exception {
  final TimeValue oneHour = TimeValue.timeValueHours(1);
  License signedLicense = TestUtils.generateSignedLicense(oneHour, pubKeyPath, priKeyPath);
  Path licenseSpecFile = createTempFile();
  Files.write(
       licenseSpecFile,
       TestUtils.dumpLicense(signedLicense).getBytes(StandardCharsets.UTF_8));
  String output = execute(
       "--publicKeyPath",
       pubKeyPath.toString(),
       "--licenseFile",
       licenseSpecFile.toString());
```

```
assertFalse(output, output.isEmpty());
```

```
}
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```

```
package org.elasticsearch.license.licensor.tools;
```

```
import org.elasticsearch.cli.Command;
import org.elasticsearch.cli.CommandTestCase;
import org.elasticsearch.cli.ExitCodes;
import org.elasticsearch.cli.UserException;
import org.elasticsearch.common.bytes.BytesArray;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.License;
import org.elasticsearch.license.licensor.TestUtils;
import org.junit.Before;
```

import java.nio.charset.StandardCharsets; import java.nio.file.Files; import java.nio.file.Path;

public class LicenseGenerationToolTests extends CommandTestCase {

```
protected Path pubKeyPath = null;
protected Path priKeyPath = null;
```

```
@Before
```

```
public void setup() throws Exception {
    pubKeyPath = getDataPath(TestUtils.PUBLIC_KEY_RESOURCE);
    priKeyPath = getDataPath(TestUtils.PRIVATE_KEY_RESOURCE);
}
```

```
J
```

}

```
@Override
protected Command newCommand() {
    return new LicenseGeneratorTool();
}
```

```
public void testMissingKeyPaths() throws Exception {
    Path pub = createTempDir().resolve("pub");
    Path pri = createTempDir().resolve("pri");
    UserException e = expectThrows(
        UserException.class,
        () -> execute(
            "--publicKeyPath",
            pub.toString(),
```

```
"--privateKeyPath",
```

```
pri.toString()));
```

assertTrue(e.getMessage(), e.getMessage().contains("pri does not exist"));
assertEquals(ExitCodes.USAGE, e.exitCode);

```
Files.createFile(pri);
  e = expectThrows(
       UserException.class,
       () -> execute(
            "--publicKeyPath",
            pub.toString(),
            "--privateKeyPath",
            pri.toString()));
  assertTrue(e.getMessage(), e.getMessage().contains("pub does not exist"));
  assertEquals(ExitCodes.USAGE, e.exitCode);
}
public void testMissingLicenseSpec() throws Exception {
  UserException e = expectThrows(
       UserException.class,
       () \rightarrow execute(
            "--publicKeyPath",
            pubKeyPath.toString(),
            "--privateKeyPath",
            priKeyPath.toString()));
  assertTrue(
       e.getMessage(),
       e.getMessage().contains("Must specify either --license or --licenseFile"));
  assertEquals(ExitCodes.USAGE, e.exitCode);
}
public void testLicenseSpecString() throws Exception {
  TestUtils.LicenseSpec inputLicenseSpec =
       TestUtils.generateRandomLicenseSpec(License.VERSION_CURRENT);
  String licenseSpecString = TestUtils.generateLicenseSpecString(inputLicenseSpec);
  String output = execute(
       "--publicKeyPath",
       pubKeyPath.toString(),
       "--privateKeyPath",
       priKeyPath.toString(),
       "--license",
       licenseSpecString);
  final BytesArray bytes = new BytesArray(output.getBytes(StandardCharsets.UTF_8));
  License outputLicense = License.fromSource(bytes, XContentType.JSON);
  TestUtils.assertLicenseSpec(inputLicenseSpec, outputLicense);
```

}

public void testLicenseSpecFile() throws Exception {

```
TestUtils.LicenseSpec inputLicenseSpec =
         TestUtils.generateRandomLicenseSpec(License.VERSION_CURRENT);
    String licenseSpecString = TestUtils.generateLicenseSpecString(inputLicenseSpec);
    Path licenseSpecFile = createTempFile();
    Files.write(licenseSpecFile, licenseSpecString.getBytes(StandardCharsets.UTF_8));
    String output = execute(
         "--publicKeyPath",
         pubKeyPath.toString(),
         "--privateKeyPath",
         priKeyPath.toString(),
         "--licenseFile",
         licenseSpecFile.toString());
    final BytesArray bytes = new BytesArray(output.getBytes(StandardCharsets.UTF 8));
    License outputLicense = License.fromSource(bytes, XContentType.JSON);
    TestUtils.assertLicenseSpec(inputLicenseSpec, outputLicense);
  }
}
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import org.elasticsearch.cli.Command;
import org.elasticsearch.cli.CommandTestCase;
import org.elasticsearch.cli.ExitCodes;
import org.elasticsearch.cli.UserException;
import java.nio.file.Files;
import java.nio.file.Path;
import static org.hamcrest.CoreMatchers.containsString;
public class KeyPairGenerationToolTests extends CommandTestCase {
  @Override
 protected Command newCommand() {
    return new KeyPairGeneratorTool();
  }
 public void testMissingKeyPaths() throws Exception {
```

```
Path exists = createTempFile("", "existing");
Path dne = createTempDir().resolve("dne");
```

```
UserException e = expectThrows(
```

```
UserException.class,
```

```
() -> execute(
```

```
"--publicKeyPath",
            exists.toString(),
            "--privateKeyPath",
            dne.toString()));
  assertThat(e.getMessage(), containsString("existing"));
  assertEquals(ExitCodes.USAGE, e.exitCode);
  e = expectThrows(
       UserException.class,
       () -> execute(
            "--publicKeyPath",
            dne.toString(),
            "--privateKeyPath",
            exists.toString()));
  assertThat(e.getMessage(), containsString("existing"));
  assertEquals(ExitCodes.USAGE, e.exitCode);
}
```

```
public void testTool() throws Exception {
```

Path keysDir = createTempDir();

Path publicKeyFilePath = keysDir.resolve("public"); Path privateKeyFilePath = keysDir.resolve("private");

execute(

```
"--publicKeyPath",
```

publicKeyFilePath.toString(),

```
"--privateKeyPath",
```

privateKeyFilePath.toString());

assertTrue(publicKeyFilePath.toString(), Files.exists(publicKeyFilePath));
assertTrue(privateKeyFilePath.toString(), Files.exists(privateKeyFilePath));

}

} /*

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package org.elasticsearch.license.licensor;

```
import org.apache.lucene.util.BytesRef;
import org.apache.lucene.util.BytesRefIterator;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.CryptUtils;
import org.elasticsearch.license.License;
```

import java.io.IOException; import java.nio.ByteBuffer; import java.nio.file.Files; import java.nio.file.Path; import java.security.InvalidKeyException; import java.security.NoSuchAlgorithmException; import java.security.SecureRandom; import java.security.Signature; import java.security.Signature; import java.security.SignatureException; import java.util.Base64; import java.util.Collections; import java.util.Map;

/**

* Responsible for generating a license signature according to the signature spec and sign it with * the provided encrypted private key */ public class LicenseSigner {

```
private static final int MAGIC_LENGTH = 13;
```

private final Path publicKeyPath;

private final Path privateKeyPath;

```
public LicenseSigner(final Path privateKeyPath, final Path publicKeyPath) {
```

```
this.publicKeyPath = publicKeyPath;
```

```
this.privateKeyPath = privateKeyPath;
```

```
}
```

```
/**
```

```
* Generates a signature for the {@code licenseSpec}. Signature structure:
```

```
* <code>
```

```
* | VERSION | MAGIC | PUB_KEY_DIGEST | SIGNED_LICENSE_CONTENT |
```

```
* </code>
```

```
* @return a signed License
```

```
*/
```

```
public License sign(License licenseSpec) throws IOException {
```

```
XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
final Map<String, String> licenseSpecViewMode =
```

```
Collections.singletonMap(License.LICENSE_SPEC_VIEW_MODE, "true");
```

```
licenseSpec.toXContent(contentBuilder, new ToXContent.MapParams(licenseSpecViewMode));
final byte[] signedContent;
```

try {

```
final Signature rsa = Signature.getInstance("SHA512withRSA");
```

```
rsa.initSign(CryptUtils.readEncryptedPrivateKey(Files.readAllBytes(privateKeyPath)));\\
```

```
final BytesRefIterator iterator = BytesReference.bytes(contentBuilder).iterator();
      BytesRef ref;
      while((ref = iterator.next()) != null) {
         rsa.update(ref.bytes, ref.offset, ref.length);
      }
      signedContent = rsa.sign();
    } catch (InvalidKeyException
        | IOException
        | NoSuchAlgorithmException
        | SignatureException e) {
      throw new IllegalStateException(e);
    }
    final byte[] magic = new byte[MAGIC LENGTH];
    SecureRandom random = new SecureRandom();
    random.nextBytes(magic);
    final byte[] hash = Base64.getEncoder().encode(Files.readAllBytes(publicKeyPath));
    assert hash != null;
    byte[] bytes = new byte[4 + 4 + MAGIC LENGTH + 4 + hash.length + 4 + signedContent.length];
    ByteBuffer byteBuffer = ByteBuffer.wrap(bytes);
    byteBuffer.putInt(licenseSpec.version())
         .putInt(magic.length)
         .put(magic)
         .putInt(hash.length)
         .put(hash)
         .putInt(signedContent.length)
         .put(signedContent);
    return License.builder()
         .fromLicenseSpec(licenseSpec, Base64.getEncoder().encodeToString(bytes))
         .build();
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 */

package org.elasticsearch.xpack.core.security.authz.permission;

import org.elasticsearch.common.settings.Settings; import org.elasticsearch.test.ESTestCase;

import java.util.ArrayList;

import java.util.Arrays; import java.util.Collections; import java.util.List;

public class FieldPermissionsCacheTests extends ESTestCase {

public void testFieldPermissionsCaching() {

FieldPermissionsCache fieldPermissionsCache = new FieldPermissionsCache(Settings.EMPTY); String[] allowed = new String[]{randomAlphaOfLength(5) + "*", randomAlphaOfLength(5) + "*",

```
randomAlphaOfLength(5) + "*"};
```

String[] denied = new String[]{allowed[0] + randomAlphaOfLength(5), allowed[1] + randomAlphaOfLength(5),

allowed[2] + randomAlphaOfLength(5)};

FieldPermissions fieldPermissions = fieldPermissionsCache.getFieldPermissions(allowed, denied); assertNotNull(fieldPermissions);

final String[] allowed2 = randomBoolean() ? allowed : Arrays.copyOf(allowed, allowed.length); final String[] denied2 = randomBoolean() ? denied : Arrays.copyOf(denied, denied.length);

assert Same (field Permissions, field Permissions Cache.get Field Permissions (allowed 2, denied 2));

}

public void testMergeFieldPermissions() {

FieldPermissionsCache fieldPermissionsCache = new FieldPermissionsCache(Settings.EMPTY); String allowedPrefix1 = randomAlphaOfLength(5);

String allowedPrefix2 = randomAlphaOfLength(5);

String[] allowed1 = new String[]{allowedPrefix1 + "*"};

String[] allowed2 = new String[]{allowedPrefix2 + "*"};

```
String[] denied1 = new String[]{allowedPrefix1 + "a"};
```

String[] denied2 = new String[]{allowedPrefix2 + "a"};

```
FieldPermissions fieldPermissions1 = randomBoolean() ?
```

```
field Permissions Cache.get Field Permissions (allowed 1, denied 1):\\
```

new FieldPermissions(fieldPermissionDef(allowed1, denied1));

FieldPermissions fieldPermissions2 = randomBoolean()?

 $field Permissions Cache.get Field Permissions (allowed 2, \, denied 2): \\$

new FieldPermissions(fieldPermissionDef(allowed2, denied2));

```
FieldPermissions mergedFieldPermissions =
```

field Permissions Cache.get Field Permissions (Arrays.asList (field Permissions 1, field Permissions 2));

```
assertTrue(mergedFieldPermissions.grantsAccessTo(allowedPrefix1 + "b"));
```

```
assertTrue(mergedFieldPermissions.grantsAccessTo(allowedPrefix2 + "b"));
```

```
assertFalse(mergedFieldPermissions.grantsAccessTo(denied1[0]));
```

```
assertFalse(mergedFieldPermissions.grantsAccessTo(denied2[0]));
```

fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :

new FieldPermissions(fieldPermissionDef(allowed2, denied2));

mergedFieldPermissions =

fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2)); assertFalse(mergedFieldPermissions.hasFieldLevelSecurity());

```
allowed1 = new String[]{};
```

```
allowed2 = new String[]{randomAlphaOfLength(5) + "*", randomAlphaOfLength(5) + "*"};
denied1 = new String[]{allowed2[0] + "a", allowed2[1] + "a"};
fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
    new FieldPermissions(fieldPermissionDef(allowed1, denied1));
fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
    new FieldPermissions(fieldPermissionDef(allowed2, denied2));
mergedFieldPermissionsCache.getFieldPermissions(allowed2, denied2));
mergedFieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
for (String field : allowed2) {
    assertTrue(mergedFieldPermissions.grantsAccessTo(field));
}
for (String field : denied2) {
    assertFalse(mergedFieldPermissions.grantsAccessTo(field));
}
allowed1 = randomBoolean() ? null : new String[]{"*"};
```

```
allowed2 = randomBoolean() ? null : new String[]{"*"};
```

```
denied1 = new String[]{"a"};
```

denied2 = new String[]{"b"};

fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
 new FieldPermissions(fieldPermissionDef(allowed1, denied1));

fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
 new FieldPermissions(fieldPermissionDef(allowed2, denied2));

mergedFieldPermissions =

fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2)); assertTrue(mergedFieldPermissions.grantsAccessTo("a")); assertTrue(mergedFieldPermissions.grantsAccessTo("b"));

// test merge does not remove _all

allowed1 = new String[]{"_all"};

```
allowed2 = new String[]{};
```

```
denied1 = null;
```

denied2 = null;

```
fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
    new FieldPermissions(fieldPermissionDef(allowed1, denied1));
```

```
fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
    new FieldPermissions(fieldPermissionDef(allowed2, denied2));
```

mergedFieldPermissions =

fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2)); assertTrue(fieldPermissions1.grantsAccessTo("_all"));

```
assertFalse(fieldPermissions2.grantsAccessTo("\_all"));
```

```
assertTrue(mergedFieldPermissions.grantsAccessTo("_all"));
```

```
allowed1 = new String[] { "a*" };
  allowed2 = new String[] { "b*" };
  denied1 = new String[] { "aa*" };
  denied2 = null;
  fieldPermissions1 = randomBoolean()? fieldPermissionsCache.getFieldPermissions(allowed1, denied1):
       new FieldPermissions(fieldPermissionDef(allowed1, denied1));
  fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
       new FieldPermissions(fieldPermissionDef(allowed2, denied2));
  mergedFieldPermissions =
       fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
  assertTrue(mergedFieldPermissions.grantsAccessTo("a"));
  assertTrue(mergedFieldPermissions.grantsAccessTo("b"));
  assertFalse(mergedFieldPermissions.grantsAccessTo("aa"));
  assertFalse(mergedFieldPermissions.grantsAccessTo("aa1"));
  assertTrue(mergedFieldPermissions.grantsAccessTo("a1"));
public void testNonFlsAndFlsMerging() {
  List<FieldPermissions> permissionsList = new ArrayList<>();
  permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {"field1"}, null)));
  permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {"field2", "query*"}, null)));
  permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {"field1", "field2"}, null)));
  permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {}, null)));
  permissionsList.add(new FieldPermissions(fieldPermissionDef(null, null)));
  FieldPermissionsCache cache = new FieldPermissionsCache(Settings.EMPTY);
  for (int i = 0; i < \text{scaledRandomIntBetween}(1, 12); i++) {
    Collections.shuffle(permissionsList, random());
```

```
FieldPermissions result = cache.getFieldPermissions(permissionsList);
```

```
assertFalse(result.hasFieldLevelSecurity());
```

```
}
}
```

}

```
private static FieldPermissionsDefinition fieldPermissionDef(String[] granted, String[] denied) {
  return new FieldPermissionsDefinition(granted, denied);
```

```
}
}
/*
```

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*/

package org.elasticsearch.license;

import org.elasticsearch.analysis.common.CommonAnalysisPlugin; import org.elasticsearch.cluster.ClusterState;

import org.elasticsearch.cluster.ClusterStateUpdateTask; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.cluster.service.ClusterService; import org.elasticsearch.common.Nullable; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.plugins.Plugin; import org.elasticsearch.test.ESIntegTestCase; import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin; import org.elasticsearch.xpack.core.XPackClientPlugin; import org.elasticsearch.xpack.core.XPackSettings;

import java.util.Arrays; import java.util.Collection; import java.util.concurrent.CountDownLatch;

public abstract class AbstractLicensesIntegrationTestCase extends ESIntegTestCase {

```
@Override
protected Settings nodeSettings(int nodeOrdinal) {
    return Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), false).build();
}
```

```
@Override
```

protected Collection<Class<? extends Plugin>> nodePlugins() {
 return Arrays.asList(LocalStateCompositeXPackPlugin.class, CommonAnalysisPlugin.class);
}

```
@Override
```

```
protected Collection<Class<? extends Plugin>> transportClientPlugins() {
    return Arrays.asList(XPackClientPlugin.class, CommonAnalysisPlugin.class);
}
```

```
@Override
```

```
protected Settings transportClientSettings() {
    // Plugin should be loaded on the transport client as well
    return nodeSettings(0);
}
```

```
protected void putLicense(final License license) throws InterruptedException {
```

```
final CountDownLatch latch = new CountDownLatch(1);
```

```
ClusterService clusterService = internalCluster().getInstance(ClusterService.class,
```

```
internalCluster().getMasterName());
```

```
clusterService.submitStateUpdateTask("putting license", new ClusterStateUpdateTask() {
@Override
```

```
public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
    latch.countDown();
```

```
}
```

```
@Override
      public ClusterState execute(ClusterState currentState) throws Exception {
         MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
        mdBuilder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null));
        return ClusterState.builder(currentState).metaData(mdBuilder).build();
      }
      @Override
      public void onFailure(String source, @Nullable Exception e) {
         logger.error("error on metaData cleanup after test", e);
      }
    });
    latch.await();
  }
 protected void putLicenseTombstone() throws InterruptedException {
    putLicense(LicensesMetaData.LICENSE_TOMBSTONE);
  }
 protected void wipeAllLicenses() throws InterruptedException {
    final CountDownLatch latch = new CountDownLatch(1);
    ClusterService clusterService = internalCluster().getInstance(ClusterService.class,
internalCluster().getMasterName());
    clusterService.submitStateUpdateTask("delete licensing metadata", new ClusterStateUpdateTask() {
      @Override
      public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
         latch.countDown();
      }
      @Override
      public ClusterState execute(ClusterState currentState) throws Exception {
         MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
        mdBuilder.removeCustom(LicensesMetaData.TYPE);
        return ClusterState.builder(currentState).metaData(mdBuilder).build();
      }
      @Override
      public void onFailure(String source, @Nullable Exception e) {
        logger.error("error on metaData cleanup after test", e);
      }
    });
    latch.await();
  }
 protected void assertLicenseActive(boolean active) throws InterruptedException {
    boolean success = awaitBusy(() \rightarrow \{
      for (XPackLicenseState licenseState : internalCluster().getDataNodeInstances(XPackLicenseState.class)) {
        if (licenseState.isActive() == active) {
```

```
return true;

}

}

return false;

});

assertTrue(success);

}

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*/
```

package org.elasticsearch.license;

import org.elasticsearch.Version; import org.elasticsearch.cluster.ClusterChangedEvent; import org.elasticsearch.cluster.ClusterName; import org.elasticsearch.cluster.ClusterState; import org.elasticsearch.cluster.ClusterStateUpdateTask; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.cluster.node.DiscoveryNode; import org.elasticsearch.cluster.node.DiscoveryNodes; import org.elasticsearch.cluster.node.DiscoveryNodes; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.unit.TimeValue; import org.junit.After; import org.junit.Before; import org.mockito.ArgumentCaptor;

import static java.util.Collections.emptyMap; import static java.util.Collections.emptySet; import static org.hamcrest.Matchers.equalTo; import static org.mockito.Matchers.any; import static org.mockito.Mockito.times; import static org.mockito.Mockito.verify; import static org.mockito.Mockito.when;

public class LicenseClusterChangeTests extends AbstractLicenseServiceTestCase {

private TestUtils.AssertingLicenseState licenseState;

```
@Before
public void setup() {
    licenseState = new TestUtils.AssertingLicenseState();
    setInitialState(null, licenseState, Settings.EMPTY);
    licenseService.start();
}
```

```
@After
public void teardown() {
    licenseService.stop();
}
```

```
public void testNotificationOnNewLicense() throws Exception {
    ClusterState oldState = ClusterState.builder(new ClusterName("a")).build();
    final License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(24));
    MetaData metaData = MetaData.builder().putCustom(LicensesMetaData.TYPE, new
LicensesMetaData(license, null)).build();
    ClusterState newState = ClusterState.builder(new ClusterName("a")).metaData(metaData).build();
    licenseService.clusterChanged(new ClusterChangedEvent("simulated", newState, oldState));
    assertThat(licenseState.activeUpdates.size(), equalTo(1));
    assertTrue(licenseState.activeUpdates.get(0));
  }
 public void testNoNotificationOnExistingLicense() throws Exception {
    final License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(24));
    MetaData metaData = MetaData.builder().putCustom(LicensesMetaData.TYPE, new
LicensesMetaData(license, null)).build();
    ClusterState newState = ClusterState.builder(new ClusterName("a")).metaData(metaData).build();
    ClusterState oldState = ClusterState.builder(newState).build();
    licenseService.clusterChanged(new ClusterChangedEvent("simulated", newState, oldState));
```

```
assertThat(licenseState.activeUpdates.size(), equalTo(0));
```

```
}
```

public void testSelfGeneratedLicenseGeneration() throws Exception {

DiscoveryNode master = new DiscoveryNode("b", buildNewFakeTransportAddress(), emptyMap(), emptySet(), Version.CURRENT);

ClusterState oldState = ClusterState.builder(new ClusterName("a"))

.nodes(DiscoveryNodes.builder().masterNodeId(master.getId()).add(master)).build();

when (discovery Nodes. is Local Node Elected Master ()). then Return (true);

ClusterState newState = ClusterState.builder(oldState).nodes(discoveryNodes).build();

```
licenseService.clusterChanged(new ClusterChangedEvent("simulated", newState, oldState));
```

ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =

```
ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
```

verify (cluster Service, times (1)). submit State Update Task (any (), state Updater. capture ());

ClusterState stateWithLicense = stateUpdater.getValue().execute(newState);

LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE); assertNotNull(licenseMetaData);

assertNotNull(licenseMetaData.getLicense());

assert Equals (license Type, license Meta Data.get License().type());

long expiration;

```
if (licenseType.equals("basic")) {
```

```
expiration = LicenseService.BASIC\_SELF\_GENERATED\_LICENSE\_EXPIRATION\_MILLIS;
```

```
} else {
```

```
expiration = LicenseService.NON_BASIC_SELF_GENERATED_LICENSE_DURATION.millis() +
clock.millis();
    }
    assertEquals(expiration, licenseMetaData.getLicense().expiryDate());
    }
} /*
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*/
package org.elasticsearch.license;
```

import org.elasticsearch.common.settings.Settings; import org.elasticsearch.license.License.OperationMode; import org.elasticsearch.test.ESTestCase; import org.elasticsearch.xpack.core.XPackField; import org.elasticsearch.xpack.core.XPackSettings;

import java.util.Arrays; import java.util.function.Predicate; import java.util.stream.Collectors;

import static org.elasticsearch.license.License.OperationMode.BASIC; import static org.elasticsearch.license.License.OperationMode.GOLD; import static org.elasticsearch.license.License.OperationMode.MISSING; import static org.elasticsearch.license.License.OperationMode.PLATINUM; import static org.elasticsearch.license.License.OperationMode.STANDARD; import static org.elasticsearch.license.License.OperationMode.TRIAL; import static org.elasticsearch.license.License.OperationMode.TRIAL;

```
/**
* Unit tests for the {@link XPackLicenseState}
*/
```

public class XPackLicenseStateTests extends ESTestCase {

/** Creates a license state with the given license type and active state, and checks the given method returns expected. */

void assertAllowed(OperationMode mode, boolean active, Predicate<XPackLicenseState> predicate, boolean expected) {

```
XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
```

licenseState.update(mode, active);

assertEquals(expected, predicate.test(licenseState));

}

/**

* Checks the ack message going from the {@code from} license type to {@code to} license type.

```
* TODO: check the actual messages, not just the number of them! This was copied from previous license tests...
  */
 void assertAckMesssages(String feature, OperationMode from, OperationMode to, int expectedMessages) {
   String[] gotMessages = XPackLicenseState.ACKNOWLEDGMENT_MESSAGES.get(feature).apply(from, to);
   assertEquals(expectedMessages, gotMessages.length);
 }
 static <T> T randomFrom(T[] values, Predicate<T> filter) {
   return randomFrom(Arrays.stream(values).filter(filter).collect(Collectors.toList()));
 }
 static OperationMode randomMode() {
   return randomFrom(OperationMode.values());
 }
 public static OperationMode randomTrialStandardGoldOrPlatinumMode() {
   return randomFrom(TRIAL, STANDARD, GOLD, PLATINUM);
 }
 public static OperationMode randomTrialOrPlatinumMode() {
   return randomFrom(TRIAL, PLATINUM);
 }
 public static OperationMode randomTrialBasicStandardGoldOrPlatinumMode() {
   return randomFrom(TRIAL, BASIC, STANDARD, GOLD, PLATINUM);
 }
 public static OperationMode randomBasicStandardOrGold() {
   return randomFrom(BASIC, STANDARD, GOLD);
 }
 public void testSecurityDefaults() {
   XPackLicenseState licenseState =
        new XPackLicenseState(Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(),
true).build());
   assertThat(licenseState.isAuthAllowed(), is(true));
   assertThat(licenseState.isIpFilteringAllowed(), is(true));
   assertThat(licenseState.isAuditingAllowed(), is(true));
   assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
   assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
   assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
   assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));
   licenseState =
      new XPackLicenseState(Settings.builder().put(XPackSettings.TRANSPORT_SSL_ENABLED.getKey(),
true).build());
   assertThat(licenseState.isAuthAllowed(), is(true));
   assertThat(licenseState.isIpFilteringAllowed(), is(true));
```

assertThat(licenseState.isAuditingAllowed(), is(true)); assertThat(licenseState.isStatsAndHealthAllowed(), is(true)); assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true)); assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL)); assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));

```
licenseState = new XPackLicenseState(Settings.EMPTY);
assertThat(licenseState.isAuthAllowed(), is(true));
assertThat(licenseState.isIpFilteringAllowed(), is(true));
assertThat(licenseState.isAuditingAllowed(), is(true));
assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));
```

}

```
public void testSecurityBasic() {
```

```
assertThat(licenseState.isAuthAllowed(), is(false));
assertThat(licenseState.isIpFilteringAllowed(), is(false));
assertThat(licenseState.isAuditingAllowed(), is(false));
assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NONE));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
```

```
}
```

}

```
public void testSecurityBasicExpired() {
```

```
XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
licenseState.update(BASIC, false);
```

```
assertThat(licenseState.isAuthAllowed(), is(false));
assertThat(licenseState.isIpFilteringAllowed(), is(false));
assertThat(licenseState.isAuditingAllowed(), is(false));
assertThat(licenseState.isStatsAndHealthAllowed(), is(false));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NONE));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
```

```
public void testSecurityStandard() {
```

```
XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
licenseState.update(STANDARD, true);
```

```
assertThat(licenseState.isAuthAllowed(), is(true));
  assertThat(licenseState.isIpFilteringAllowed(), is(false));
  assertThat(licenseState.isAuditingAllowed(), is(false));
  assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
  assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
  assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NATIVE));
  assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}
public void testSecurityStandardExpired() {
  XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
       Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
  licenseState.update(STANDARD, false);
  assertThat(licenseState.isAuthAllowed(), is(true));
  assertThat(licenseState.isIpFilteringAllowed(), is(false));
  assertThat(licenseState.isAuditingAllowed(), is(false));
  assertThat(licenseState.isStatsAndHealthAllowed(), is(false));
  assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
  assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NATIVE));
  assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}
public void testSecurityGold() {
  XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
       Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
  licenseState.update(GOLD, true);
  assertThat(licenseState.isAuthAllowed(), is(true));
  assertThat(licenseState.isIpFilteringAllowed(), is(true));
  assertThat(licenseState.isAuditingAllowed(), is(true));
```

assertThat(licenseState.isStatsAndHealthAllowed(), is(true));

assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));

assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.DEFAULT)); assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));

}

public void testSecurityGoldExpired() {

assertThat(licenseState.isAuthAllowed(), is(true)); assertThat(licenseState.isIpFilteringAllowed(), is(true)); assertThat(licenseState.isAuditingAllowed(), is(true)); assertThat(licenseState.isStatsAndHealthAllowed(), is(false)); assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false)); assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.DEFAULT)); assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));

```
}
```

```
public void testSecurityPlatinum() {
```

```
assertThat(licenseState.isAuthAllowed(), is(true));
assertThat(licenseState.isIpFilteringAllowed(), is(true));
assertThat(licenseState.isAuditingAllowed(), is(true));
assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));
```

}

```
public void testSecurityPlatinumExpired() {
```

```
XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
licenseState.update(PLATINUM, false);
```

```
assertThat(licenseState.isAuthAllowed(), is(true));
assertThat(licenseState.isIpFilteringAllowed(), is(true));
assertThat(licenseState.isAuditingAllowed(), is(true));
assertThat(licenseState.isStatsAndHealthAllowed(), is(false));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
```

```
public void testSecurityAckBasicToNotGoldOrStandard() {
            OperationMode toMode = randomFrom(OperationMode.values(), mode -> mode != GOLD && mode !=
            STANDARD);
```

```
assertAckMesssages(XPackField.SECURITY, BASIC, toMode, 0);
```

```
}
```

}

```
public void testSecurityAckAnyToTrialOrPlatinum() {
```

```
assertAckMesssages(XPackField.SECURITY, randomMode(), randomTrialOrPlatinumMode(), 0);
}
```

```
public void testSecurityAckTrialStandardGoldOrPlatinumToBasic() {
    assertAckMesssages(XPackField.SECURITY, randomTrialStandardGoldOrPlatinumMode(), BASIC, 3);
}
```

```
public void testSecurityAckAnyToStandard() {
    OperationMode from = randomFrom(BASIC, GOLD, PLATINUM, TRIAL);
```

```
assertAckMesssages(XPackField.SECURITY, from, STANDARD, 4);
 }
 public void testSecurityAckBasicStandardTrialOrPlatinumToGold() {
   OperationMode from = randomFrom(BASIC, PLATINUM, TRIAL, STANDARD);
   assertAckMesssages(XPackField.SECURITY, from, GOLD, 2);
 }
 public void testMonitoringAckBasicToAny() {
   assertAckMesssages(XPackField.MONITORING, BASIC, randomMode(), 0);
 }
 public void testMonitoringAckAnyToTrialGoldOrPlatinum() {
   assertAckMesssages(XPackField.MONITORING, randomMode(),
randomTrialStandardGoldOrPlatinumMode(), 0);
 }
 public void testMonitoringAckNotBasicToBasic() {
   OperationMode from = randomFrom(STANDARD, GOLD, PLATINUM, TRIAL);
   assertAckMesssages(XPackField.MONITORING, from, BASIC, 2);
 }
 public void testMonitoringAllowed() {
   assertAllowed(randomMode(), true, XPackLicenseState::isMonitoringAllowed, true);
   assertAllowed(randomMode(), false, XPackLicenseState::isMonitoringAllowed, false);
 }
 public void testMonitoringUpdateRetention() {
   assertAllowed(STANDARD, true, XPackLicenseState::isUpdateRetentionAllowed, true);
   assertAllowed(GOLD, true, XPackLicenseState::isUpdateRetentionAllowed, true);
   assertAllowed(PLATINUM, true, XPackLicenseState::isUpdateRetentionAllowed, true);
   assertAllowed(TRIAL, true, XPackLicenseState::isUpdateRetentionAllowed, true);
   assertAllowed(BASIC, true, XPackLicenseState::isUpdateRetentionAllowed, false);
   assertAllowed(MISSING, false, XPackLicenseState::isUpdateRetentionAllowed, false);
 }
 public void testWatcherPlatinumGoldTrialStandard() throws Exception {
   assertAllowed(TRIAL, true, XPackLicenseState::isWatcherAllowed, true);
   assertAllowed(GOLD, true, XPackLicenseState::isWatcherAllowed, true);
   assertAllowed(PLATINUM, true, XPackLicenseState::isWatcherAllowed, true);
   assertAllowed(STANDARD, true, XPackLicenseState::isWatcherAllowed, true);
 }
 public void testWatcherBasicLicense() throws Exception {
   assertAllowed(BASIC, true, XPackLicenseState::isWatcherAllowed, false);
 }
```

```
public void testWatcherInactive() {
```

```
assertAllowed(BASIC, false, XPackLicenseState::isWatcherAllowed, false);
}
public void testWatcherInactivePlatinumGoldTrial() throws Exception {
  assertAllowed(TRIAL, false, XPackLicenseState::isWatcherAllowed, false);
  assertAllowed(GOLD, false, XPackLicenseState::isWatcherAllowed, false);
  assertAllowed(PLATINUM, false, XPackLicenseState::isWatcherAllowed, false);
  assertAllowed(STANDARD, false, XPackLicenseState::isWatcherAllowed, false);
}
public void testGraphPlatinumTrial() throws Exception {
  assertAllowed(TRIAL, true, XPackLicenseState::isGraphAllowed, true);
  assertAllowed(PLATINUM, true, XPackLicenseState::isGraphAllowed, true);
}
public void testGraphBasic() throws Exception {
  assertAllowed(BASIC, true, XPackLicenseState::isGraphAllowed, false);
}
public void testGraphStandard() throws Exception {
  assertAllowed(STANDARD, true, XPackLicenseState::isGraphAllowed, false);
}
public void testGraphInactiveBasic() {
  assertAllowed(BASIC, false, XPackLicenseState::isGraphAllowed, false);
}
public void testGraphInactivePlatinumTrial() throws Exception {
  assertAllowed(TRIAL, false, XPackLicenseState::isMachineLearningAllowed, false);
  assertAllowed(PLATINUM, false, XPackLicenseState::isMachineLearningAllowed, false);
}
public void testMachineLearningPlatinumTrial() throws Exception {
  assertAllowed(TRIAL, true, XPackLicenseState::isMachineLearningAllowed, true);
  assertAllowed(PLATINUM, true, XPackLicenseState::isMachineLearningAllowed, true);
}
public void testMachineLearningBasic() throws Exception {
  assertAllowed(BASIC, true, XPackLicenseState::isMachineLearningAllowed, false);
}
public void testMachineLearningStandard() throws Exception {
  assertAllowed(STANDARD, true, XPackLicenseState::isMachineLearningAllowed, false);
}
public void testMachineLearningInactiveBasic() {
  assertAllowed(BASIC, false, XPackLicenseState::isMachineLearningAllowed, false);
}
```

public void testMachineLearningInactivePlatinumTrial() throws Exception {
 assertAllowed(TRIAL, false, XPackLicenseState::isMachineLearningAllowed, false);
 assertAllowed(PLATINUM, false, XPackLicenseState::isMachineLearningAllowed, false);
}

```
public void testLogstashPlatinumGoldTrialStandard() throws Exception {
    assertAllowed(TRIAL, true, XPackLicenseState::isLogstashAllowed, true);
    assertAllowed(GOLD, true, XPackLicenseState::isLogstashAllowed, true);
    assertAllowed(PLATINUM, true, XPackLicenseState::isLogstashAllowed, true);
    assertAllowed(STANDARD, true, XPackLicenseState::isLogstashAllowed, true);
}
```

```
public void testLogstashBasicLicense() throws Exception {
    assertAllowed(BASIC, true, XPackLicenseState::isLogstashAllowed, false);
}
```

public void testLogstashInactive() {

```
assertAllowed(BASIC, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(TRIAL, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(GOLD, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(PLATINUM, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(STANDARD, false, XPackLicenseState::isLogstashAllowed, false);
```

```
public void testSqlDefaults() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    assertThat(licenseState.isSqlAllowed(), is(true));
    assertThat(licenseState.isJdbcAllowed(), is(true));
```

```
}
```

}

```
public void testSqlBasic() {
```

```
XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
licenseState.update(BASIC, true);
```

```
assertThat(licenseState.isSqlAllowed(), is(true));
assertThat(licenseState.isJdbcAllowed(), is(false));
```

```
}
```

}

```
public void testSqlBasicExpired() {
```

XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY); licenseState.update(BASIC, false);

```
assertThat(licenseState.isSqlAllowed(), is(false));
assertThat(licenseState.isJdbcAllowed(), is(false));
```

public void testSqlStandard() {

```
XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
  licenseState.update(STANDARD, true);
  assertThat(licenseState.isSqlAllowed(), is(true));
  assertThat(licenseState.isJdbcAllowed(), is(false));
}
public void testSqlStandardExpired() {
  XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
  licenseState.update(STANDARD, false);
  assertThat(licenseState.isSqlAllowed(), is(false));
  assertThat(licenseState.isJdbcAllowed(), is(false));
}
public void testSqlGold() {
  XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
  licenseState.update(GOLD, true);
  assertThat(licenseState.isSqlAllowed(), is(true));
  assertThat(licenseState.isJdbcAllowed(), is(false));
}
public void testSqlGoldExpired() {
  XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
  licenseState.update(GOLD, false);
  assertThat(licenseState.isSqlAllowed(), is(false));
  assertThat(licenseState.isJdbcAllowed(), is(false));
}
public void testSqlPlatinum() {
  XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
  licenseState.update(PLATINUM, true);
  assertThat(licenseState.isSqlAllowed(), is(true));
  assertThat(licenseState.isJdbcAllowed(), is(true));
}
public void testSqlPlatinumExpired() {
  XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
  licenseState.update(PLATINUM, false);
  assertThat(licenseState.isSqlAllowed(), is(false));
  assertThat(licenseState.isJdbcAllowed(), is(false));
}
```

public void testSqlAckAnyToTrialOrPlatinum() {

```
assertAckMesssages(XPackField.SQL, randomMode(), randomTrialOrPlatinumMode(), 0);
}
public void testSqlAckTrialOrPlatinumToNotTrialOrPlatinum() {
    assertAckMesssages(XPackField.SQL, randomTrialOrPlatinumMode(), randomBasicStandardOrGold(), 1);
}
/*
```

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- */

package org.elasticsearch.license;

import org.elasticsearch.client.Response; import org.elasticsearch.client.ResponseException; import org.elasticsearch.client.RestClient; import org.elasticsearch.common.io.Streams; import org.elasticsearch.common.network.NetworkModule; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.plugins.Plugin; import org.elasticsearch.test.ESIntegTestCase; import org.elasticsearch.transport.Netty4Plugin; import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin; import org.elasticsearch.xpack.core.XPackClientPlugin;

import java.io.InputStreamReader; import java.nio.charset.StandardCharsets; import java.util.Arrays; import java.util.Collection;

import static org.elasticsearch.test.ESIntegTestCase.Scope.SUITE;

```
@ESIntegTestCase.ClusterScope(scope = SUITE)
public class StartTrialLicenseTests extends AbstractLicensesIntegrationTestCase {
```

```
@Override
protected Settings nodeSettings(int nodeOrdinal) {
    return Settings.builder()
        .put(super.nodeSettings(nodeOrdinal))
        .put("node.data", true)
        .put(LicenseService.SELF_GENERATED_LICENSE_TYPE.getKey(), "basic")
        .put(NetworkModule.HTTP_ENABLED.getKey(), true).build();
}
```

@Override
protected Collection<Class<? extends Plugin>> nodePlugins() {

```
return Arrays.asList(LocalStateCompositeXPackPlugin.class, Netty4Plugin.class);
  }
  @Override
 protected Collection<Class<? extends Plugin>> transportClientPlugins() {
    return Arrays.asList(XPackClientPlugin.class, Netty4Plugin.class);
  }
 public void testStartTrial() throws Exception {
    LicensingClient licensingClient = new LicensingClient(client());
    ensureStartingWithBasic();
    RestClient restClient = getRestClient();
    Response response = restClient.performRequest("GET", "/_xpack/license/trial_status");
    String body = Streams.copyToString(new InputStreamReader(response.getEntity().getContent(),
StandardCharsets.UTF 8));
    assertEquals(200, response.getStatusLine().getStatusCode());
    assertEquals("{\"eligible to start trial\":true}", body);
    // Test that starting will fail without acknowledgement
    Response response2 = restClient.performRequest("POST", "/ xpack/license/start trial");
    String body2 = Streams.copyToString(new InputStreamReader(response2.getEntity().getContent(),
StandardCharsets.UTF_8));
    assertEquals(200, response2.getStatusLine().getStatusCode());
    assertTrue(body2.contains("\"trial_was_started\":false"));
    assertTrue(body2.contains("\"error message\":\"Operation failed: Needs acknowledgement.\""));
    assertTrue(body2.contains("\"acknowledged\":false"));
    assertBusy(() \rightarrow \{
      GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
      assertEquals("basic", getLicenseResponse.license().type());
    });
    String type = randomFrom(LicenseService.VALID TRIAL TYPES);
    Response response3 = restClient.performRequest("POST",
"/ xpack/license/start trial?acknowledge=true&type=" + type);
    String body3 = Streams.copyToString(new InputStreamReader(response3.getEntity().getContent(),
StandardCharsets.UTF 8));
    assertEquals(200, response3.getStatusLine().getStatusCode());
    assertTrue(body3.contains("\"trial_was_started\":true"));
    assertTrue(body3.contains("\"type\":\"" + type + "\""));
    assertTrue(body3.contains("\"acknowledged\":true"));
    assertBusy(() \rightarrow \{
      GetLicenseResponse postTrialLicenseResponse = licensingClient.prepareGetLicense().get();
      assertEquals(type, postTrialLicenseResponse.license().type());
```

```
});
```

```
Response response4 = restClient.performRequest("GET", "/_xpack/license/trial_status");
```

String body4 = Streams.copyToString(new InputStreamReader(response4.getEntity().getContent(), StandardCharsets.UTF_8));

```
assertEquals(200, response4.getStatusLine().getStatusCode());
assertEquals("{\"eligible_to_start_trial\":false}", body4);
```

```
String secondAttemptType = randomFrom(LicenseService.VALID_TRIAL_TYPES);
```

```
ResponseException ex = expectThrows(ResponseException.class,
```

() -> restClient.performRequest("POST", "/_xpack/license/start_trial?acknowledge=true&type=" + secondAttemptType));

Response response5 = ex.getResponse();

```
String body5 = Streams.copyToString(new InputStreamReader(response5.getEntity().getContent(), StandardCharsets.UTF_8));
```

assertEquals(403, response5.getStatusLine().getStatusCode());

```
assertTrue(body5.contains("\"trial_was\_started\":false"));
```

```
assertTrue(body5.contains("\"error_message\":\"Operation failed: Trial was already activated.\"")); }
```

```
public void testInvalidType() throws Exception {
    ensureStartingWithBasic();
```

```
ResponseException ex = expectThrows(ResponseException.class, () ->
    getRestClient().performRequest("POST", "/_xpack/license/start_trial?type=basic"));
Response response = ex.getResponse();
String body = Streams.copyToString(new InputStreamReader(response.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(400, response.getStatusLine().getStatusCode());
assertTrue(body.contains("\"type\":\"illegal_argument_exception\""));
assertTrue(body.contains("\"reason\":\"Cannot start trial of type [basic]. Valid trial types are ["));
}
```

```
private void ensureStartingWithBasic() throws Exception {
  LicensingClient licensingClient = new LicensingClient(client());
  GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
  if ("basic".equals(getLicenseResponse.license().type()) == false) {
    licensingClient.preparePostStartBasic().setAcknowledge(true).get();
  }
```

```
assertBusy(() -> {
```

GetLicenseResponse postTrialLicenseResponse = licensingClient.prepareGetLicense().get(); assertEquals("basic", postTrialLicenseResponse.license().type());

```
});
}
```

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*/

package org.elasticsearch.license;

import org.elasticsearch.analysis.common.CommonAnalysisPlugin;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.env.Environment;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase.ClusterScope;
import org.elasticsearch.transport.Netty4Plugin;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackPlugin;

import java.nio.charset.StandardCharsets; import java.nio.file.Files; import java.nio.file.Path; import java.util.Arrays; import java.util.Collection;

import static org.elasticsearch.test.ESIntegTestCase.Scope.TEST; import static org.hamcrest.CoreMatchers.equalTo; import static org.hamcrest.CoreMatchers.nullValue;

```
@ClusterScope(scope = TEST, numDataNodes = 0, numClientNodes = 0, maxNumDataNodes = 0,
transportClientRatio = 0)
public class LicenseServiceClusterTests extends AbstractLicensesIntegrationTestCase {
```

@Override protected Settings nodeSettings(int nodeOrdinal) { return nodeSettingsBuilder(nodeOrdinal).build(); }

```
}
```

```
private Settings.Builder nodeSettingsBuilder(int nodeOrdinal) {
  return Settings.builder()
    .put(super.nodeSettings(nodeOrdinal))
    .put("node.data", true)
    .put("resource.reload.interval.high", "500ms") // for license mode file watcher
    .put(NetworkModule.HTTP_ENABLED.getKey(), true);
}
```

}

@Override

```
protected Collection<Class<? extends Plugin>> nodePlugins() {
    return Arrays.asList(LocalStateCompositeXPackPlugin.class, CommonAnalysisPlugin.class,
```

```
Netty4Plugin.class);
}
@Override
protected Collection<Class<? extends Plugin>> transportClientPlugins() {
    return nodePlugins();
}
public void testClusterRestartWithLicense() throws Exception {
    wipeAllLicenses();
    int numNodes = randomIntBetween(1, 5);
    logger.info("--> starting {} node(s)", numNodes);
    internalCluster().startNodes(numNodes);
    ensureGreen();
    logger.info("--> put signed license");
    LicensingClient licensingClient = new LicensingClient(client());
    License license = TestUtils.generateSignedLicense(TimeValue.timeValueMinutes(1));
```

assertThat(licensingClient.prepareGetLicense().get().license(), equalTo(license));

assertThat(licensingClient.prepareGetLicense().get().license(), equalTo(license));

assertThat(licensingClient.prepareGetLicense().get().license(), nullValue());

putLicense(license);

ensureYellow();

ensureYellow();

wipeAllLicenses();

wipeAllLicenses();

assertOperationMode(license.operationMode());

licensingClient = new LicensingClient(client()); logger.info("--> get and check signed license");

licensingClient.prepareDeleteLicense().get();

licensingClient = new LicensingClient(client());

assertOperationMode(License.OperationMode.MISSING);

assertOperationMode(License.OperationMode.MISSING);

logger.info("--> restart all nodes"); internalCluster().fullRestart();

logger.info("--> remove licenses");

logger.info("--> restart all nodes"); internalCluster().fullRestart();

```
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```

int numNodes = randomIntBetween(1, 5);

public void testCloudInternalLicense() throws Exception {

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```
logger.info("--> starting { } node(s)", numNodes);
internalCluster().startNodes(numNodes);
ensureGreen();
```

```
logger.info("--> put signed license");
LicensingClient licensingClient = new LicensingClient(client());
License license = TestUtils.generateSignedLicense("cloud_internal", License.VERSION_CURRENT,
System.currentTimeMillis(),
TimeValue.timeValueMinutes(1));
putLicense(license);
assertThat(licensingClient.prepareGetLicense().get().license(), equalTo(license));
assertOperationMode(License.OperationMode.PLATINUM);
writeCloudInternalMode("gold");
assertOperationMode(License.OperationMode.GOLD);
writeCloudInternalMode("basic");
assertOperationMode(License.OperationMode.BASIC);
}
```

```
public void testClusterRestartWhileEnabled() throws Exception {
    wipeAllLicenses();
    internalCluster().startNode();
    ensureGreen();
    assertLicenseActive(true);
    logger.info("--> restart node");
    internalCluster().fullRestart();
    ensureYellow();
    logger.info("--> await node for enabled");
    assertLicenseActive(true);
}
```

```
public void testClusterRestartWhileGrace() throws Exception {
    wipeAllLicenses();
    internalCluster().startNode();
    assertLicenseActive(true);
    putLicense(TestUtils.generateSignedLicense(TimeValue.timeValueMillis(0)));
    ensureGreen();
    assertLicenseActive(true);
    logger.info("--> restart node");
    internalCluster().fullRestart();
    ensureYellow();
    logger.info("--> await node for grace_period");
    assertLicenseActive(true);
}
```

```
public void testClusterRestartWhileExpired() throws Exception {
    wipeAllLicenses();
    internalCluster().startNode();
    ensureGreen();
```

```
assertLicenseActive(true);
    putLicense(TestUtils.generateExpiredNonBasicLicense(System.currentTimeMillis() -
LicenseService.GRACE_PERIOD_DURATION.getMillis()));
    assertLicenseActive(false);
    logger.info("--> restart node");
    internalCluster().fullRestart();
    ensureYellow();
    logger.info("--> await node for disabled");
    assertLicenseActive(false);
  }
 private void assertOperationMode(License.OperationMode operationMode) throws InterruptedException {
    boolean success = awaitBusy(() \rightarrow \{
      for (XPackLicenseState licenseState : internalCluster().getDataNodeInstances(XPackLicenseState.class)) {
         if (licenseState.getOperationMode() == operationMode) {
           return true:
         }
       }
      return false:
    });
    assertTrue(success);
  }
 private void writeCloudInternalMode(String mode) throws Exception {
    for (Environment environment : internalCluster().getDataOrMasterNodeInstances(Environment.class)) {
      Path licenseModePath = XPackPlugin.resolveConfigFile(environment, "license mode");
      Files.createDirectories(licenseModePath.getParent());
      Files.write(licenseModePath, mode.getBytes(StandardCharsets.UTF_8));
    }
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
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*/
package org.elasticsearch.license;
import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.test.ESTestCase;
```

```
import java.util.Arrays;
```

import static org.hamcrest.Matchers.contains; import static org.hamcrest.Matchers.equalTo; import static org.hamcrest.Matchers.hasSize;

```
public void testNewExpirationException() {
    for (String feature : Arrays.asList("feature", randomAlphaOfLength(5), null, "")) {
      ElasticsearchSecurityException exception = LicenseUtils.newComplianceException(feature);
      assertNotNull(exception);
      assertThat(exception.getMetadataKeys(), contains(LicenseUtils.EXPIRED FEATURE METADATA));
      assertThat(exception.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA), hasSize(1));
      assertThat(exception.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA).iterator().next(),
equalTo(feature));
    }
  }
 public void testIsLicenseExpiredException() {
    ElasticsearchSecurityException exception = LicenseUtils.newComplianceException("feature");
    assertTrue(LicenseUtils.isLicenseExpiredException(exception));
    exception = new ElasticsearchSecurityException("msg");
    assertFalse(LicenseUtils.isLicenseExpiredException(exception));
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
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*/
package org.elasticsearch.license;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.watcher.FileWatcher;
import org.elasticsearch.watcher.ResourceWatcherService;
import org.junit.Before;
import java.nio.file.Path;
import static org.hamcrest.Matchers.equalTo;
import static org.mockito.Matchers.any;
import static org.mockito.Matchers.eq;
import static org.mockito.Mockito.mock;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;
import static org.mockito.Mockito.verifyZeroInteractions;
public class LicenseOperationModeUpdateTests extends ESTestCase {
 private OperationModeFileWatcher operationModeFileWatcher;
 private Path licenseModeFile;
 private ResourceWatcherService resourceWatcherService;
```

```
@Before
public void init() throws Exception {
    licenseModeFile = createTempFile();
    resourceWatcherService = mock(ResourceWatcherService.class);
    operationModeFileWatcher = new OperationModeFileWatcher(resourceWatcherService, licenseModeFile,
    logger, () -> { });
  }
}
```

```
public void testLicenseOperationModeUpdate() throws Exception {
   String type = randomFrom("trial", "basic", "standard", "gold", "platinum");
  License license = License.builder()
    .uid("id")
    .expiryDate(0)
    .issueDate(0)
    .issuedTo("elasticsearch")
    .issuer("issuer")
   .type(type)
   .maxNodes(1)
   .build();
  assertThat(license.operationMode(), equalTo(License.OperationMode.resolve(type)));
```

```
assert That(license.operationMode(), equalTo(License.OperationMode.resolve(type)));
OperationModeFileWatcherTests.writeMode("gold", licenseModeFile);
license.setOperationModeFileWatcher(operationModeFileWatcher);
verifyZeroInteractions(resourceWatcherService);
assertThat(license.operationMode(), equalTo(License.OperationMode.resolve(type)));
```

```
}
```

```
public void testCloudInternalLicenseOperationModeUpdate() throws Exception {
   License license = License.builder()
```

```
.uid("id")
.expiryDate(0)
.issueDate(0)
.issuedTo("elasticsearch")
.issuer("issuer")
.type("cloud_internal")
.maxNodes(1)
.build();
```

```
assertThat(license.operationMode(), equalTo(License.OperationMode.PLATINUM));
    OperationModeFileWatcherTests.writeMode("gold", licenseModeFile);
    license.setOperationModeFileWatcher(operationModeFileWatcher);
    verify(resourceWatcherService, times(1)).add(any(FileWatcher.class),
    eq(ResourceWatcherService.Frequency.HIGH));
    assertThat(license.operationMode(), equalTo(License.OperationMode.GOLD));
  }
}
```

```
/*
```

```
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```

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*/

package org.elasticsearch.license;

import org.elasticsearch.common.unit.TimeValue; import org.elasticsearch.test.ESTestCase; import org.elasticsearch.xpack.core.scheduler.SchedulerEngine; import org.junit.Before;

import static org.hamcrest.Matchers.equalTo;

public class LicenseScheduleTests extends ESTestCase {

private License license; private SchedulerEngine.Schedule schedule;

```
@Before
```

```
public void setuo() throws Exception {
    license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(12));
    schedule = LicenseService.nextLicenseCheck(license);
```

```
public void testEnabledLicenseSchedule() throws Exception {
    int expiryDuration = (int) (license.expiryDate() - license.issueDate());
    long triggeredTime = license.issueDate() + between(0, expiryDuration);
    assertThat(schedule.nextScheduledTimeAfter(license.issueDate(), triggeredTime),
equalTo(license.expiryDate()));
}
```

```
public void testGraceLicenseSchedule() throws Exception {
    long triggeredTime = license.expiryDate() + between(1,
        ((int) LicenseService.GRACE_PERIOD_DURATION.getMillis()));
    assertThat(schedule.nextScheduledTimeAfter(license.issueDate(), triggeredTime),
        equalTo(license.expiryDate() + LicenseService.GRACE_PERIOD_DURATION.getMillis()));
}
```

```
public void testExpiredLicenseSchedule() throws Exception {
    long triggeredTime = license.expiryDate() + LicenseService.GRACE_PERIOD_DURATION.getMillis() +
        randomIntBetween(1, 1000);
    assertThat(schedule.nextScheduledTimeAfter(license.issueDate(), triggeredTime),
        equalTo(-1L));
}
```

```
public void testInvalidLicenseSchedule() throws Exception {
    long triggeredTime = license.issueDate() - randomIntBetween(1, 1000);
```

```
assertThat(schedule.nextScheduledTimeAfter(triggeredTime, triggeredTime),
         equalTo(license.issueDate()));
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.test.ESTestCase;
import static org.elasticsearch.common.unit.TimeValue.timeValueMillis;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.nullValue;
public class ExpirationCallbackTests extends ESTestCase {
 public void testPostExpirationDelay() throws Exception {
    TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));
    TimeValue min = TimeValue.timeValueSeconds(1);
    TimeValue max = TimeValue.timeValueSeconds(4);
    TimeValue frequency = TimeValue.timeValueSeconds(1);
    NoopPostExpirationCallback post = new NoopPostExpirationCallback(min, max, frequency);
    long now = System.currentTimeMillis();
    long expiryDate = now + expiryDuration.getMillis();
    assertThat(post.delay(expiryDate, now),
         equalTo(TimeValue.timeValueMillis(expiryDuration.getMillis() + min.getMillis()))); // before license
expiry
    assertThat(post.delay(expiryDate, expiryDate), equalTo(min)); // on license expiry
    int latestValidTriggerDelay = (int) (expiryDuration.getMillis() + max.getMillis());
    int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() + min.getMillis());
    assertExpirationCallbackDelay(post, expiryDuration.millis(), latestValidTriggerDelay,
earliestValidTriggerDelay);
  }
 public void testPreExpirationDelay() throws Exception {
    TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));
    TimeValue min = TimeValue.timeValueSeconds(1);
    TimeValue max = TimeValue.timeValueSeconds(4);
    TimeValue frequency = TimeValue.timeValueSeconds(1);
    NoopPreExpirationCallback pre = new NoopPreExpirationCallback(min, max, frequency);
    long now = System.currentTimeMillis();
    long expiryDate = now + expiryDuration.getMillis();
    assertThat(pre.delay(expiryDate, expiryDate), nullValue()); // on license expiry
    int latestValidTriggerDelay = (int) (expiryDuration.getMillis() - min.getMillis());
```

```
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```

```
int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() - max.getMillis());
    assertExpirationCallbackDelay(pre, expiryDuration.millis(), latestValidTriggerDelay,
earliestValidTriggerDelay);
```

}

```
public void testPostExpirationWithNullMax() throws Exception {
    int postExpirySeconds = randomIntBetween(5, 10);
    TimeValue postExpiryDuration = TimeValue.timeValueSeconds(postExpirySeconds);
    TimeValue min = TimeValue.timeValueSeconds(postExpirySeconds - randomIntBetween(1, 3));
    final ExpirationCallback.Post post = new NoopPostExpirationCallback(min, null, timeValueMillis(10));
    long now = System.currentTimeMillis();
    assertThat(post.delay(now - postExpiryDuration.millis(), now), equalTo(TimeValue.timeValueMillis(0)));
}
public void testPreExpirationWithNullMin() throws Exception {
    int expirySeconds = randomIntBetween(5, 10);
    TimeValue expiryDuration = TimeValue.timeValueSeconds(expirySeconds);
    TimeValue max = TimeValue.timeValueSeconds(expirySeconds + randomIntBetween(1, 10));
}
```

```
final ExpirationCallback.Pre pre = new NoopPreExpirationCallback(null, max, timeValueMillis(10));
long now = System.currentTimeMillis();
assertThat(pre.delay(expiryDuration.millis() + now, now), equalTo(TimeValue.timeValueMillis(0)));
```

```
}
```

```
public void testPreExpirationScheduleTime() throws Exception {
```

TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));

TimeValue min = TimeValue.timeValueSeconds(1);

TimeValue max = TimeValue.timeValueSeconds(4);

TimeValue frequency = TimeValue.timeValueSeconds(1);

NoopPreExpirationCallback pre = new NoopPreExpirationCallback(min, max, frequency);

int latestValidTriggerDelay = (int) (expiryDuration.getMillis() - min.getMillis());

```
int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() - max.getMillis());
```

assertExpirationCallbackScheduleTime(pre, expiryDuration.millis(), latestValidTriggerDelay, earliestValidTriggerDelay);

```
public void testPostExpirationScheduleTime() throws Exception {
    TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));
    TimeValue min = TimeValue.timeValueSeconds(1);
    TimeValue max = TimeValue.timeValueSeconds(4);
    TimeValue frequency = TimeValue.timeValueSeconds(1);
    NoopPostExpirationCallback pre = new NoopPostExpirationCallback(min, max, frequency);
    int latestValidTriggerDelay = (int) (expiryDuration.getMillis() + max.getMillis());
    int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() + min.getMillis());
    assertExpirationCallbackScheduleTime(pre, expiryDuration.millis(), latestValidTriggerDelay,
    earliestValidTriggerDelay);
```

```
}
```

```
private void assertExpirationCallbackDelay(ExpirationCallback expirationCallback, long expiryDuration,
                           int latestValidTriggerDelay, int earliestValidTriggerDelay) {
    long now = System.currentTimeMillis();
   long expiryDate = now + expiryDuration;
   // bounds
    assertThat(expirationCallback.delay(expiryDate, now + earliestValidTriggerDelay),
equalTo(TimeValue.timeValueMillis(0)));
    assertThat(expirationCallback.delay(expiryDate, now + latestValidTriggerDelay),
equalTo(TimeValue.timeValueMillis(0)));
   // in match
   assertThat(expirationCallback.delay(expiryDate,
         now + randomIntBetween(earliestValidTriggerDelay, latestValidTriggerDelay)),
         equalTo(TimeValue.timeValueMillis(0)));
   // out of bounds
   int deltaBeforeEarliestMatch = between(1, earliestValidTriggerDelay);
    assertThat(expirationCallback.delay(expiryDate, now + deltaBeforeEarliestMatch),
         equalTo(TimeValue.timeValueMillis(earliestValidTriggerDelay - deltaBeforeEarliestMatch)));
   int deltaAfterLatestMatch = between(latestValidTriggerDelay + 1, Integer.MAX_VALUE); // after expiry and
after max
    assertThat(expirationCallback.delay(expiryDate, expiryDate + deltaAfterLatestMatch), nullValue());
 }
 public void assertExpirationCallbackScheduleTime(ExpirationCallback expirationCallback, long expiryDuration,
                               int latestValidTriggerDelay, int earliestValidTriggerDelay) {
   long now = System.currentTimeMillis();
   long expiryDate = now + expiryDuration;
   int validTriggerInterval = between(earliestValidTriggerDelay, latestValidTriggerDelay);
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate,
         now + validTriggerInterval, now + validTriggerInterval),
         equalTo(now + validTriggerInterval));
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate, now, now + validTriggerInterval),
         equalTo(now + validTriggerInterval + expirationCallback.getFrequency()));
    int deltaBeforeEarliestMatch = between(1, earliestValidTriggerDelay - 1);
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate, now, now +
deltaBeforeEarliestMatch).
         equalTo(now + deltaBeforeEarliestMatch +
             expirationCallback.delay(expiryDate, now + deltaBeforeEarliestMatch).getMillis()));
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate,
         now + deltaBeforeEarliestMatch, now + deltaBeforeEarliestMatch),
         equalTo(now + deltaBeforeEarliestMatch +
             expirationCallback.delay(expiryDate, now + deltaBeforeEarliestMatch).getMillis()));
```

```
int \ delta A fter Latest Match = between (latest Valid Trigger Delay + 1, Integer.MAX_VALUE); // \ after \ expiry \ and \ after \ max
```

assertThat (expirationCallback.nextScheduledTimeForExpiry (expiryDate, now, now + deltaAfterLatestMatch), equalTo(-1L));

```
assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate,
         now + deltaAfterLatestMatch, now + deltaAfterLatestMatch),
         equalTo(-1L));
 }
 private static class NoopPostExpirationCallback extends ExpirationCallback.Post {
   NoopPostExpirationCallback(TimeValue min, TimeValue max, TimeValue frequency) {
      super(min, max, frequency);
    }
    @Override
   public void on(License license) { }
 }
 private static class NoopPreExpirationCallback extends ExpirationCallback.Pre {
   NoopPreExpirationCallback(TimeValue min, TimeValue max, TimeValue frequency) {
      super(min, max, frequency);
    }
    @Override
   public void on(License license) { }
 }
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```

*/

}

package org.elasticsearch.license;

import com.carrotsearch.randomizedtesting.RandomizedTest; import org.elasticsearch.action.ActionListener; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.common.Strings; import org.elasticsearch.common.joda.DateMathParser; import org.elasticsearch.common.joda.FormatDateTimeFormatter; import org.elasticsearch.common.joda.Joda; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.unit.TimeValue; import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.common.xcontent.XContentFactory; import org.elasticsearch.common.xcontent.XContentType; import org.elasticsearch.license.licensor.LicenseSigner; import org.hamcrest.MatcherAssert; import org.joda.time.format.DateTimeFormatter;

import org.junit.Assert;

import java.io.IOException; import java.io.InputStream; import java.nio.file.Files; import java.nio.file.Path; import java.nio.file.StandardCopyOption; import java.util.ArrayList; import java.util.List; import java.util.UUID; import java.util.concurrent.CountDownLatch; import java.util.concurrent.atomic.AtomicReference;

import static com.carrotsearch.randomizedtesting.RandomizedTest.randomBoolean; import static com.carrotsearch.randomizedtesting.RandomizedTest.randomInt; import static org.apache.lucene.util.LuceneTestCase.createTempFile; import static org.elasticsearch.common.xcontent.XContentFactory.jsonBuilder; import static org.elasticsearch.test.ESTestCase.randomAlphaOfLength; import static org.elasticsearch.test.ESTestCase.randomFrom; import static org.elasticsearch.test.ESTestCase.randomIntBetween; import static org.hamcrest.core.IsEqual.equalTo; import static org.junit.Assert.assertThat;

public class TestUtils {

private static final FormatDateTimeFormatter formatDateTimeFormatter = Joda.forPattern("yyyy-MM-dd"); private static final DateMathParser dateMathParser = new DateMathParser(formatDateTimeFormatter); private static final DateTimeFormatter dateTimeFormatter = formatDateTimeFormatter.printer();

```
public static String dateMathString(String time, final long now) {
  return dateTimeFormatter.print(dateMathParser.parse(time, () -> now));
}
public static long dateMath(String time, final long now) {
  return dateMathParser.parse(time, () -> now);
}
public static LicenseSpec generateRandomLicenseSpec(int version) {
  boolean datesInMillis = randomBoolean();
  long now = System.currentTimeMillis();
  String uid = UUID.randomUUID().toString();
  String feature = "feature__" + randomInt();
  String issuer = "issuer_" + randomInt();
  String issuedTo = "issuedTo__" + randomInt();
  final String type;
  final String subscriptionType;
  if (version < License.VERSION_NO_FEATURE_TYPE) {
     subscriptionType = randomFrom("gold", "silver", "platinum");
```

```
type = "subscription";//randomFrom("subscription", "internal", "development");
    } else {
      subscriptionType = null;
      type = randomFrom("basic", "dev", "gold", "silver", "platinum");
    ł
    int maxNodes = RandomizedTest.randomIntBetween(5, 100);
    if (datesInMillis) {
      long issueDateInMillis = dateMath("now", now);
      long expiryDateInMillis = dateMath("now+10d/d", now);
      return new LicenseSpec(version, uid, feature, issueDateInMillis, expiryDateInMillis, type, subscriptionType,
issuedTo, issuer,
         maxNodes);
    } else {
      String issueDate = dateMathString("now", now);
      String expiryDate = dateMathString("now+10d/d", now);
      return new LicenseSpec(version, uid, feature, issueDate, expiryDate, type, subscriptionType, issuedTo,
issuer, maxNodes);
    }
  }
 public static String generateLicenseSpecString(LicenseSpec licenseSpec) throws IOException {
    XContentBuilder licenses = jsonBuilder();
    licenses.startObject();
    licenses.startArray("licenses");
    licenses.startObject()
       .field("uid", licenseSpec.uid)
       .field("type", licenseSpec.type)
      .field("subscription_type", licenseSpec.subscriptionType)
       .field("issued_to", licenseSpec.issuedTo)
       .field("issuer", licenseSpec.issuer)
      .field("feature", licenseSpec.feature)
       .field("max_nodes", licenseSpec.maxNodes);
    if (licenseSpec.issueDate != null) {
       licenses.field("issue_date", licenseSpec.issueDate);
    } else {
      licenses.field("issue_date_in_millis", licenseSpec.issueDateInMillis);
    }
    if (licenseSpec.expiryDate != null) {
       licenses.field("expiry_date", licenseSpec.expiryDate);
    } else {
      licenses.field("expiry_date_in_millis", licenseSpec.expiryDateInMillis);
    }
    licenses.field("version", licenseSpec.version);
    licenses.endObject();
    licenses.endArray();
    licenses.endObject();
    return Strings.toString(licenses);
```

```
}
public static License generateLicenses(LicenseSpec spec) {
  License.Builder builder = License.builder()
     .uid(spec.uid)
     .feature(spec.feature)
     .type(spec.type)
     .subscriptionType(spec.subscriptionType)
     .issuedTo(spec.issuedTo)
     .issuer(spec.issuer)
     .maxNodes(spec.maxNodes);
  if (spec.expiryDate != null) {
     builder.expiryDate(DateUtils.endOfTheDay(spec.expiryDate));
  } else {
     builder.expiryDate(spec.expiryDateInMillis);
  }
  if (spec.issueDate != null) {
     builder.issueDate(DateUtils.beginningOfTheDay(spec.issueDate));
  } else {
     builder.issueDate(spec.issueDateInMillis);
  }
  return builder.build();
}
public static void assertLicenseSpec(LicenseSpec spec, License license) {
  MatcherAssert.assertThat(license.uid(), equalTo(spec.uid));
  MatcherAssert.assertThat(license.issuedTo(), equalTo(spec.issuedTo));
  MatcherAssert.assertThat(license.issuer(), equalTo(spec.issuer));
  MatcherAssert.assertThat(license.type(), equalTo(spec.type));
  MatcherAssert.assertThat(license.maxNodes(), equalTo(spec.maxNodes));
  if (spec.issueDate != null) {
     MatcherAssert.assertThat(license.issueDate(), equalTo(DateUtils.beginningOfTheDay(spec.issueDate)));
  } else {
     MatcherAssert.assertThat(license.issueDate(), equalTo(spec.issueDateInMillis));
  }
  if (spec.expiryDate != null) {
     MatcherAssert.assertThat(license.expiryDate(), equalTo(DateUtils.endOfTheDay(spec.expiryDate)));
  } else {
     MatcherAssert.assertThat(license.expiryDate(), equalTo(spec.expiryDateInMillis));
  }
}
public static class LicenseSpec {
  public final int version;
  public final String feature;
  public final String issueDate;
```

```
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```

public final long issueDateInMillis;

public final String expiryDate; public final long expiryDateInMillis; public final String uid; public final String type; public final String subscriptionType; public final String issuedTo; public final String issuer; public final int maxNodes;

```
public LicenseSpec(String issueDate, String expiryDate) {
    this(License.VERSION_CURRENT, UUID.randomUUID().toString(), "feature", issueDate, expiryDate,
"trial", "none", "customer",
```

"elasticsearch", 5);

}

public LicenseSpec(int version, String uid, String feature, long issueDateInMillis, long expiryDateInMillis, String type,

```
String subscriptionType, String issuedTo, String issuer, int maxNodes) {
this.version = version;
this.feature = feature;
this.issueDateInMillis = issueDateInMillis;
this.issueDate = null;
this.expiryDateInMillis = expiryDateInMillis;
this.expiryDate = null;
this.uid = uid;
this.uid = uid;
this.subscriptionType = subscriptionType;
this.issuedTo = issuedTo;
this.issuer = issuer;
this.maxNodes = maxNodes;
```

```
}
```

public LicenseSpec(int version, String uid, String feature, String issueDate, String expiryDate, String type,

String subscriptionType, String issuedTo, String issuer, int maxNodes) {

```
this.version = version;
this.feature = feature;
this.issueDate = issueDate;
this.issueDateInMillis = -1;
this.expiryDate = expiryDate;
this.expiryDateInMillis = -1;
this.uid = uid;
this.type = type;
this.subscriptionType = subscriptionType;
this.issuedTo = issuedTo;
this.issuer = issuer;
this.maxNodes = maxNodes;
```

```
}
```

```
public static Path getTestPriKeyPath() throws Exception {
  return getResourcePath("/private.key");
}
public static Path getTestPubKeyPath() throws Exception {
  return getResourcePath("/public.key");
}
public static String dumpLicense(License license) throws Exception {
  XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON);
  builder.startObject();
  builder.startObject("license");
  license.toInnerXContent(builder, ToXContent.EMPTY_PARAMS);
  builder.endObject();
  builder.endObject();
  return Strings.toString(builder);
}
public static License generateSignedLicense(TimeValue expiryDuration) throws Exception {
  return generateSignedLicense(null, -1, expiryDuration);
}
public static License generateSignedLicense(String type, TimeValue expiryDuration) throws Exception {
  return generateSignedLicense(type, -1, expiryDuration);
}
public static License generateSignedLicense(long issueDate, TimeValue expiryDuration) throws Exception {
  return generateSignedLicense(null, issueDate, expiryDuration);
}
```

```
public static License generateSignedLicense(String type, long issueDate, TimeValue expiryDuration) throws Exception {
```

```
return generateSignedLicense(type, randomIntBetween(License.VERSION_START, License.VERSION_CURRENT), issueDate, expiryDuration);
```

}

/**

```
* This method which chooses the license type randomly if the type is null. However, it will not randomly
```

* choose trial or basic types as those types can only be self-generated.

```
*/
```

public static License generateSignedLicense(String type, int version, long issueDate, TimeValue expiryDuration) throws Exception {

long issue = (issueDate != -1L) ? issueDate : System.currentTimeMillis() -

TimeValue.timeValueHours(2).getMillis();

final String licenseType;

```
if (version < License.VERSION_NO_FEATURE_TYPE) {
```

licenseType = randomFrom("subscription", "internal", "development");

```
} else {
    licenseType = (type != null) ? type : randomFrom("silver", "dev", "gold", "platinum");
  }
  final License.Builder builder = License.builder()
       .uid(UUID.randomUUID().toString())
       .version(version)
       .expiryDate(System.currentTimeMillis() + expiryDuration.getMillis())
       .issueDate(issue)
       .type(licenseType)
       .issuedTo("customer")
       .issuer("elasticsearch")
       .maxNodes(5);
  if (version == License.VERSION START) {
    builder.subscriptionType((type != null) ? type : randomFrom("dev", "gold", "platinum", "silver"));
    builder.feature(randomAlphaOfLength(10));
  }
  LicenseSigner signer = new LicenseSigner(getTestPriKeyPath(), getTestPubKeyPath());
  return signer.sign(builder.build());
}
public static License generateSignedLicense(License.Builder builder) throws Exception {
  LicenseSigner signer = new LicenseSigner(getTestPriKeyPath(), getTestPubKeyPath());
  return signer.sign(builder.build());
}
public static License generateExpiredNonBasicLicense(long expiryDate) throws Exception {
  return generateExpiredNonBasicLicense(randomFrom("silver", "dev", "gold", "platinum"), expiryDate);
}
public static License generateExpiredNonBasicLicense() throws Exception {
  return generateExpiredNonBasicLicense(randomFrom("silver", "dev", "gold", "platinum"));
}
public static License generateExpiredNonBasicLicense(String type) throws Exception {
  return generateExpiredNonBasicLicense(type,
       System.currentTimeMillis() - TimeValue.timeValueHours(randomIntBetween(1, 10)).getMillis());
}
public static License generateExpiredNonBasicLicense(String type, long expiryDate) throws Exception {
  final License.Builder builder = License.builder()
       .uid(UUID.randomUUID().toString())
       .version(License.VERSION_CURRENT)
       .expiryDate(expiryDate)
       .issueDate(expiryDate - TimeValue.timeValueMinutes(10).getMillis())
       .type(type)
       .issuedTo("customer")
       .issuer("elasticsearch")
       .maxNodes(5);
```

```
LicenseSigner signer = new LicenseSigner(getTestPriKeyPath(), getTestPubKeyPath());
return signer.sign(builder.build());
}
private static Path getResourcePath(String resource) throws Exception {
    Path resourceFile = createTempFile();
    try (InputStream resourceInput = TestUtils.class.getResourceAsStream(resource)) {
        Files.copy(resourceInput, resourceFile, StandardCopyOption.REPLACE_EXISTING);
    }
    return resourceFile;
}
public static void registerAndAckSignedLicenses(final LicenseService licenseService, License license,
        final LicenseStatus expectedStatus) {
    PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(license).acknowledge(true);
```

```
final CountDownLatch latch = new CountDownLatch(1);
```

```
final AtomicReference<LicensesStatus> status = new AtomicReference<>();
```

```
licenseService.registerLicense(putLicenseRequest, new ActionListener<PutLicenseResponse>() {
    @Override
    public void onResponse(PutLicenseResponse licensesUpdateResponse) {
        status.set(licensesUpdateResponse.status());
```

```
latch.countDown();
}
```

```
@Override
```

```
public void onFailure(Exception e) {
```

```
latch.countDown();
```

```
}
```

```
});
try {
```

```
latch.await();
```

```
} catch (InterruptedException e) {
```

```
Assert.fail(e.getMessage());
```

```
}
assertThat(status.get(), equalTo(expectedStatus));
```

```
}
```

```
public static class AssertingLicenseState extends XPackLicenseState {
    public final List<License.OperationMode> modeUpdates = new ArrayList<>();
    public final List<Boolean> activeUpdates = new ArrayList<>();
```

```
public AssertingLicenseState() {
    super(Settings.EMPTY);
```

```
}
```

```
@Override
```

```
void update(License.OperationMode mode, boolean active) {
    modeUpdates.add(mode);
```

```
activeUpdates.add(active);
    }
  }
  /**
  * A license state that makes the {@link #update(License.OperationMode, boolean)}
  * method public for use in tests.
  */
  public static class UpdatableLicenseState extends XPackLicenseState {
    public UpdatableLicenseState() {
      this(Settings.EMPTY);
    }
    public UpdatableLicenseState(Settings settings) {
      super(settings);
    }
    @Override
    public void update(License.OperationMode mode, boolean active) {
      super.update(mode, active);
    }
  }
 public static void putLicense(MetaData.Builder builder, License license) {
    builder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null));
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import static org.elasticsearch.common.unit.TimeValue.timeValueHours;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.not;
import static org.mockito.Matchers.any;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;
```

public class LicensesAcknowledgementTests extends AbstractLicenseServiceTestCase {

public void testAcknowledgment() throws Exception {

XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY); setInitialState(TestUtils.generateSignedLicense("gold", timeValueHours(2)), licenseState, Settings.EMPTY); licenseService.start();

// try installing a signed license

long issueDate = System.currentTimeMillis() - TimeValue.timeValueHours(24 * 2).getMillis();

License signedLicense = TestUtils.generateSignedLicense("trial", License.VERSION_CURRENT, issueDate, timeValueHours(10));

PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);

// ensure acknowledgement message was part of the response

licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false,

LicensesStatus.VALID, true));

assertThat(licenseService.getLicense(), not(signedLicense));

verify (cluster Service, times (0)). submit State Update Task (any (String.class), any (Cluster State Update Task.class));

// try installing a signed license with acknowledgement

putLicenseRequest = new PutLicenseRequest().license(signedLicense).acknowledge(true);

// ensure license was installed and no acknowledgment message was returned

license Service.register License (put License Request, new Asserting Licenses Update Response (true, new Asserting Licenses (true, new Ass

LicensesStatus.VALID, false));

verify(clusterService, times(1)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
}

public void testRejectUpgradeToProductionWithoutTLS() throws Exception {

XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);

setInitialState(TestUtils.generateSignedLicense("trial", timeValueHours(2)), licenseState, Settings.EMPTY); licenseService.start();

// try installing a signed license

License signedLicense = TestUtils.generateSignedLicense("platinum", timeValueHours(10));

PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);

// ensure acknowledgement message was part of the response

IllegalStateException ise = expectThrows(IllegalStateException.class, () ->

licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false, LicensesStatus.VALID, true)));

assertEquals("Cannot install a [PLATINUM] license unless TLS is configured or security is disabled", ise.getMessage());

}

public void testUpgradeToProductionWithoutTLSAndSecurityDisabled() throws Exception {

XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);

setInitialState(TestUtils.generateSignedLicense("trial", timeValueHours(2)), licenseState, Settings.builder()
.put("xpack.security.enabled", false).build());

licenseService.start();

// try installing a signed license

License signedLicense = TestUtils.generateSignedLicense("platinum", timeValueHours(10));

PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);

licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false,

LicensesStatus.VALID, true));

assertThat(licenseService.getLicense(), not(signedLicense));

verify (clusterService, times (1)). submitStateUpdateTask (any (String.class), any (ClusterStateUpdateTask.class));

// try installing a signed license with acknowledgement

putLicenseRequest = new PutLicenseRequest().license(signedLicense).acknowledge(true);

// ensure license was installed and no acknowledgment message was returned

licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(true,

LicensesStatus.VALID, false));

verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
}

public void testUpgradeToProductionWithTLSAndSecurity() throws Exception {

XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);

setInitialState(TestUtils.generateSignedLicense("trial", timeValueHours(2)), licenseState, Settings.builder()
.put("xpack.security.enabled", true)

.put("xpack.security.transport.ssl.enabled", true).build());

licenseService.start();

// try installing a signed license

License signedLicense = TestUtils.generateSignedLicense("platinum", timeValueHours(10));

PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);

licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false,

LicensesStatus.VALID, true));

assertThat(licenseService.getLicense(), not(signedLicense));

verify(clusterService, times(1)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));

// try installing a signed license with acknowledgement

putLicenseRequest = new PutLicenseRequest().license(signedLicense).acknowledge(true);

// ensure license was installed and no acknowledgment message was returned

license Service.register License (put License Request, new Asserting Licenses Update Response (true, new Asserting Licenses (true, new Asserting Licen

```
LicensesStatus.VALID, false));
```

verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));

private static class AssertingLicensesUpdateResponse implements ActionListener<PutLicenseResponse> {
 private final boolean expectedAcknowledgement;

private final LicensesStatus expectedStatus;

private final boolean expectAckMessages;

AssertingLicensesUpdateResponse(boolean expectedAcknowledgement, LicensesStatus expectedStatus,

```
boolean expectAckMessages) {
```

this.expectedAcknowledgement = expectedAcknowledgement;

this.expectedStatus = expectedStatus;

this.expectAckMessages = expectAckMessages;

}

}

@Override

```
public void onResponse(PutLicenseResponse licensesUpdateResponse) {
    assertThat(licensesUpdateResponse.isAcknowledged(), equalTo(expectedAcknowledgement));
```

```
assertThat(licensesUpdateResponse.status(), equalTo(expectedStatus));
      assertEquals(licensesUpdateResponse.acknowledgeMessages().isEmpty(), expectAckMessages == false);
    }
    @Override
    public void onFailure(Exception throwable) {
      throw new RuntimeException(throwable);
    }
  }
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.cluster.ack.ClusterStateUpdateResponse;
```

```
import org.elasticsearch.cluster.service.ClusterService;
```

import org.elasticsearch.common.settings.Settings;

import org.elasticsearch.common.unit.TimeValue;

import org.elasticsearch.plugins.Plugin;

import org.elasticsearch.test.ESSingleNodeTestCase;

import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;

import org.elasticsearch.xpack.core.XPackSettings;

import org.junit.Before;

import java.util.Collection; import java.util.Collections; import java.util.concurrent.CountDownLatch; import java.util.concurrent.atomic.AtomicBoolean;

```
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.not;
```

public class LicensesManagerServiceTests extends ESSingleNodeTestCase {

```
@Override
protected Collection<Class<? extends Plugin>> getPlugins() {
    return Collections.singletonList(LocalStateCompositeXPackPlugin.class);
}
```

```
@Override
protected Settings nodeSettings() {
  return Settings.builder()
   .put(super.nodeSettings())
   .put(XPackSettings.SECURITY_ENABLED.getKey(), false)
```

```
.put(XPackSettings.MONITORING_ENABLED.getKey(), false)
      .put(XPackSettings.WATCHER_ENABLED.getKey(), false)
      .put(XPackSettings.GRAPH_ENABLED.getKey(), false)
      .put(XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false)
      .build():
 }
 @Override
 protected boolean resetNodeAfterTest() {
   return true:
 }
 @Before
 public void waitForTrialLicenseToBeGenerated() throws Exception {
   assertBusy(() ->
assertNotNull(getInstanceFromNode(ClusterService.class).state().metaData().custom(LicensesMetaData.TYPE)));
 }
 public void testStoreAndGetLicenses() throws Exception {
   LicenseService licenseService = getInstanceFromNode(LicenseService.class);
   ClusterService clusterService = getInstanceFromNode(ClusterService.class);
   License goldLicense = TestUtils.generateSignedLicense("gold", TimeValue.timeValueHours(1));
   TestUtils.registerAndAckSignedLicenses(licenseService, goldLicense, LicensesStatus.VALID);
   License silverLicense = TestUtils.generateSignedLicense("silver", TimeValue.timeValueHours(2));
   TestUtils.registerAndAckSignedLicenses(licenseService, silverLicense, LicensesStatus.VALID);
   License platinumLicense = TestUtils.generateSignedLicense("platinum", TimeValue.timeValueHours(1));
   TestUtils.registerAndAckSignedLicenses(licenseService, platinumLicense, LicensesStatus.VALID);
   LicensesMetaData licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
   assertThat(licensesMetaData.getLicense(), equalTo(platinumLicense));
   final License getLicenses = licenseService.getLicense();
   assertThat(getLicenses, equalTo(platinumLicense));
 }
 // TODO: Add test/feature blocking the registration of basic license
 public void testEffectiveLicenses() throws Exception {
   final LicenseService licenseService = getInstanceFromNode(LicenseService.class);
   final ClusterService clusterService = getInstanceFromNode(ClusterService.class);
```

```
License \ goldLicense = TestUtils.generateSignedLicense("gold", TimeValue.timeValueSeconds(5)); \\
```

// put gold license

Test Utils.register And Ack Signed Licenses (license Service, gold License, Licenses Status. VALID);

```
LicensesMetaData licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
assertThat(LicenseService.getLicense(licensesMetaData), equalTo(goldLicense));
```

License platinumLicense = TestUtils.generateSignedLicense("platinum", TimeValue.timeValueSeconds(3)); // put platinum license

TestUtils.registerAndAckSignedLicenses(licenseService, platinumLicense, LicensesStatus.VALID); licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE); assert That (License Service.get License (licenses Meta Data), equal To (platinum License));

```
}
```

```
public void testInvalidLicenseStorage() throws Exception {
   LicenseService licenseService = getInstanceFromNode(LicenseService.class);
   ClusterService clusterService = getInstanceFromNode(ClusterService.class);
   License signedLicense = TestUtils.generateSignedLicense(TimeValue.timeValueMinutes(2));
```

// modify content of signed license

```
License tamperedLicense = License.builder()
```

```
.fromLicenseSpec(signedLicense, signedLicense.signature())
.expiryDate(signedLicense.expiryDate() + 10 * 24 * 60 * 60 * 1000L)
.validate()
.build();
```

Test Utils.register And Ack Signed Licenses (license Service, tampered License, Licenses Status.INVALID);

```
// ensure that the invalid license never made it to cluster state
LicensesMetaData licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
assertThat(licensesMetaData.getLicense(), not(equalTo(tamperedLicense)));
```

```
public void testRemoveLicenses() throws Exception {
   LicenseService licenseService = getInstanceFromNode(LicenseService.class);
   ClusterService clusterService = getInstanceFromNode(ClusterService.class);
   // generate signed licenses
   License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(1));
   TestUtils.registerAndAckSignedLicenses(licenseService, license, LicensesStatus.VALID);
   LicensesMetaData licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
   assertThat(licensesMetaData.getLicense(), not(LicensesMetaData.LICENSE_TOMBSTONE));
   // remove signed licenses
   removeAndAckSignedLicenses(licenseService);
   licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
   assertThat(licensesMetaData.getLicense(), equalTo(LicensesMetaData.LICENSE_TOMBSTONE));
```

```
}
```

```
latch.countDown();
       }
       @Override
       public void onFailure(Exception throwable) {
         latch.countDown();
       }
    });
    try {
       latch.await();
    } catch (InterruptedException e) {
       fail(e.getMessage());
    }
    assertThat("remove license(s) failed", success.get(), equalTo(true));
  }
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
```

```
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.threadpool.TestThreadPool;
import org.elasticsearch.watcher.ResourceWatcherService;
import org.junit.After;
import org.junit.Before;
```

import java.io.IOException;

 $import\ java.nio.charset.StandardCharsets;$

import java.nio.file.Files;

import java.nio.file.Path;

import java.nio.file.StandardOpenOption;

import java.util.concurrent.CountDownLatch;

```
import java.util.concurrent.TimeUnit;
```

import java.util.concurrent.atomic.AtomicReference;

import static org.hamcrest.Matchers.equalTo;

public class OperationModeFileWatcherTests extends ESTestCase {
 private ResourceWatcherService watcherService;
 private TestThreadPool threadPool;
 private Path licenseModePath;
 private OperationModeFileWatcher operationModeFileWatcher;
 private AtomicReference<CountDownLatch> onChangeCounter;

```
@Before
 public void setup() throws Exception {
    threadPool = new TestThreadPool("license mode file watcher tests");
    Settings settings = Settings.builder()
         .put("resource.reload.interval.high", "10ms")
         .build();
    watcherService = new ResourceWatcherService(settings,
        threadPool);
    watcherService.start();
    licenseModePath = createTempFile();
    onChangeCounter = new AtomicReference<>(new CountDownLatch(1));
    operationModeFileWatcher = new OperationModeFileWatcher(watcherService, licenseModePath, logger,
        () -> onChangeCounter.get().countDown());
  }
  @After
 public void shutdown() throws InterruptedException {
    terminate(threadPool);
    watcherService.stop();
  }
 public void testInit() throws Exception {
    onChangeCounter.set(new CountDownLatch(2));
    writeMode("gold");
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
    operationModeFileWatcher.init();
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assert That (operation Mode File Watcher.get Current Operation Mode (), equal To (License.Operation Mode.GOLD)); \\
  }
 public void testUpdateModeFromFile() throws Exception {
    Files.delete(licenseModePath);
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
    writeMode("gold");
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.GOLD));
    onChangeCounter.set(new CountDownLatch(1));
    writeMode("basic");
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.BASIC));
  }
 public void testDeleteModeFromFile() throws Exception {
```

```
Files.delete(licenseModePath);
```

```
operationModeFileWatcher.init();
```

writeMode("gold"); assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS)); assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.GOLD)); onChangeCounter.set(new CountDownLatch(1));

```
Files.delete(licenseModePath);
```

```
assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
}
```

```
public void testInvalidModeFromFile() throws Exception {
    writeMode("invalid");
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
    operationModeFileWatcher.onFileChanged(licenseModePath);
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
```

```
}
```

```
public void testLicenseModeFileIsDirectory() throws Exception {
    licenseModePath = createTempDir();
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
    operationModeFileWatcher.onFileChanged(licenseModePath);
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
}
```

```
public void testLicenseModeFileCreatedAfterInit() throws Exception {
    Files.delete(licenseModePath);
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
equalTo(License.OperationMode.PLATINUM));
    onChangeCounter.set(new CountDownLatch(1));
    Path tempFile = createTempFile();
    writeMode("gold", tempFile);
    licenseModePath = tempFile;
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.GOLD));
  }
}
```

```
private void writeMode(String mode) throws IOException {
    writeMode(mode, licenseModePath);
}
```

```
static void writeMode(String mode, Path file) throws IOException {
    Files.write(file, mode.getBytes(StandardCharsets.UTF_8), StandardOpenOption.CREATE);
  }
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.test.ESTestCase;
import java.util.Locale;
import static org.elasticsearch.license.License.OperationMode;
import static org.hamcrest.Matchers.equalTo;
/**
* Tests {@link License.OperationMode} for correctness.
* 
* If you change the behavior of these tests, then it means that licensing changes across the products!
*/
public class LicenseOperationModeTests extends ESTestCase {
 public void testResolveTrial() {
    // assert 1.x BWC
    assertResolve(OperationMode.TRIAL, "nONE", "DEv", "deveLopment");
    // assert expected (2.x+) variant
    assertResolve(OperationMode.TRIAL, "tRiAl", "trial");
  }
 public void testResolveBasic() {
    // assert expected (2.x+) variant (note: no 1.x variant of BASIC)
    assertResolve(OperationMode.BASIC, "bAsIc", "basic");
  }
 public void testResolveStandard() {
    // assert expected (2.x+) variant (note: no 1.x variant of STANDARD)
    assertResolve(OperationMode.STANDARD, "StAnDARd", "standard");
  }
 public void testResolveGold() {
    // assert expected (2.x+) variant (note: no different 1.x variant of GOLD)
    assertResolve(OperationMode.GOLD, "SiLvEr", "gOlD", "silver", "gold");
  }
 public void testResolvePlatinum() {
    // assert 1.x BWC
```

```
assertResolve(OperationMode.PLATINUM, "iNtErNaL");
    // assert expected (2.x+) variant
    assertResolve(OperationMode.PLATINUM, "PlAtINum", "platinum");
  }
 public void testResolveUnknown() {
    // 'enterprise' is a type that exists in cloud but should be rejected under normal operation
    // See https://github.com/elastic/x-plugins/issues/3371
    String[] types = { "unknown", "fake", "enterprise" };
    for (String type : types) {
      try {
         OperationMode.resolve(type);
         fail(String.format(Locale.ROOT, "[%s] should not be recognized as an operation mode", type));
      }
      catch (IllegalArgumentException e) {
         assertThat(e.getMessage(), equalTo("unknown type [" + type + "]"));
      }
    }
  }
 private static void assertResolve(OperationMode expected, String... types) {
    for (String type : types) {
      assertThat(OperationMode.resolve(type), equalTo(expected));
    }
  }
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.analysis.common.CommonAnalysisPlugin;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase;
import org.elasticsearch.transport.Netty4Plugin;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import java.util.Arrays;
import java.util.Collection;
```

```
import static org.elasticsearch.test.ESIntegTestCase.Scope.TEST;
```

```
@ESIntegTestCase.ClusterScope(scope = TEST, numDataNodes = 0, numClientNodes = 0, maxNumDataNodes =
0, transportClientRatio = 0,
    autoMinMasterNodes = false)
public class LicenseServiceClusterNotRecoveredTests extends AbstractLicensesIntegrationTestCase {
  @Override
 protected Settings nodeSettings(int nodeOrdinal) {
    return nodeSettingsBuilder(nodeOrdinal).build();
  }
 private Settings.Builder nodeSettingsBuilder(int nodeOrdinal) {
    return Settings.builder()
         .put(super.nodeSettings(nodeOrdinal))
         .put("node.data", true)
         .put("resource.reload.interval.high", "500ms") // for license mode file watcher
         .put(NetworkModule.HTTP_ENABLED.getKey(), true);
  }
  @Override
 protected Collection<Class<? extends Plugin>> nodePlugins() {
    return Arrays.asList(LocalStateCompositeXPackPlugin.class, CommonAnalysisPlugin.class,
Netty4Plugin.class);
  }
  @Override
 protected Collection<Class<? extends Plugin>> transportClientPlugins() {
    return nodePlugins();
  }
 public void testClusterNotRecovered() throws Exception {
    logger.info("--> start one master out of two [recovery state]");
    internalCluster().startNode(nodeSettingsBuilder(0).put("discovery.zen.minimum_master_nodes",
2).put("node.master", true));
    logger.info("--> start second master out of two [recovered state]");
    internalCluster().startNode(nodeSettingsBuilder(1).put("discovery.zen.minimum_master_nodes",
2).put("node.master", true));
    assertLicenseActive(true);
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.Version;
import org.elasticsearch.cluster.ClusterModule;
```

import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.metadata.RepositoriesMetaData;
import org.elasticsearch.cluster.metadata.RepositoryMetaData;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.NamedXContentRegistry;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.ToXContent.Params;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.common.xcontent.XContentParser;

import java.util.Collections; import java.util.UUID; import java.util.stream.Collectors; import java.util.stream.Stream;

import static org.hamcrest.Matchers.equalTo; import static org.hamcrest.Matchers.notNullValue; import static org.hamcrest.Matchers.nullValue;

```
public class LicensesMetaDataSerializationTests extends ESTestCase {
```

```
public void testXContentSerializationOneSignedLicense() throws Exception {
   License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(2));
   LicensesMetaData licensesMetaData = new LicensesMetaData(license, null);
   XContentBuilder builder = XContentFactory.jsonBuilder();
   builder.startObject();
   builder.startObject("licenses");
   licensesMetaData.toXContent(builder, ToXContent.EMPTY_PARAMS);
   builder.endObject();
   builder.endObject();
   LicensesMetaData licensesMetaDataFromXContent =
getLicensesMetaDataFromXContent(createParser(builder));
    assertThat(licensesMetaDataFromXContent.getLicense(), equalTo(license));
    assertNull(licensesMetaDataFromXContent.getMostRecentTrialVersion());
 }
 public void testXContentSerializationOneSignedLicenseWithUsedTrial() throws Exception {
   License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(2));
   LicensesMetaData licensesMetaData = new LicensesMetaData(license, Version.CURRENT);
   XContentBuilder builder = XContentFactory.jsonBuilder();
   builder.startObject();
   builder.startObject("licenses");
   licensesMetaData.toXContent(builder, ToXContent.EMPTY_PARAMS);
   builder.endObject();
   builder.endObject();
```

LicensesMetaData licensesMetaDataFromXContent = getLicensesMetaDataFromXContent(createParser(builder)); assertThat(licensesMetaDataFromXContent.getLicense(), equalTo(license)); assertEquals(licensesMetaDataFromXContent.getMostRecentTrialVersion(), Version.CURRENT); }
<pre>public void testLicenseMetadataParsingDoesNotSwallowOtherMetaData() throws Exception { new Licensing(Settings.EMPTY); // makes sure LicensePlugin is registered in Custom MetaData License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(2)); LicensesMetaData licensesMetaData = new LicensesMetaData(license, Version.CURRENT); RepositoryMetaData repositoryMetaData = new RepositoryMetaData("repo", "fs", Settings.EMPTY); RepositoriesMetaData repositoriesMetaData = new RepositoriesMetaData(repositoryMetaData); final MetaData.Builder metaDataBuilder = MetaData.builder(); if (randomBoolean()) { // random order of insertion metaDataBuilder.putCustom(licensesMetaData.getWriteableName(), licensesMetaData); } else { metaDataBuilder.putCustom(repositoriesMetaData.getWriteableName(), repositoriesMetaData); } </pre>
metaDataBuilder.putCustom(licensesMetaData.getWriteableName(), licensesMetaData); } // serialize metadata XContentBuilder builder = XContentFactory.jsonBuilder();
Params params = new ToXContent.MapParams(Collections.singletonMap(MetaData.CONTEXT_MODE_PARAM, MetaData.CONTEXT_MODE_GATEWAY)); builder.startObject();
<pre>builder = metaDataBuilder.build().toXContent(builder, params); builder.endObject(); // deserialize metadata again MetaData metaData = MetaData.Builder.fromXContent(createParser(builder)); // check that custom metadata still present assertThat(metaData.custom(licensesMetaData.getWriteableName()), notNullValue());</pre>
<pre>assertThat(metaData.custom(repositoriesMetaData.getWriteableName()), notNullValue()); } public void testXContentSerializationOneTrial() throws Exception {</pre>
long issueDate = System.currentTimeMillis();

License.Builder specBuilder = License.builder()

```
.uid(UUID.randomUUID().toString())
```

```
.issuedTo("customer")
```

.maxNodes(5)

.issueDate(issueDate)

.type(randomBoolean() ? "trial" : "basic")

.expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis());

final License trialLicense = SelfGeneratedLicense.create(specBuilder);

LicensesMetaData licensesMetaData = new LicensesMetaData(trialLicense, Version.CURRENT);

XContentBuilder builder = XContentFactory.jsonBuilder();

builder.startObject();

```
builder.startObject("licenses");
   licensesMetaData.toXContent(builder, ToXContent.EMPTY PARAMS);
   builder.endObject();
   builder.endObject();
   LicensesMetaData licensesMetaDataFromXContent =
getLicensesMetaDataFromXContent(createParser(builder));
   assertThat(licensesMetaDataFromXContent.getLicense(), equalTo(trialLicense));
   assertEquals(licensesMetaDataFromXContent.getMostRecentTrialVersion(), Version.CURRENT);
 }
 public void testLicenseTombstoneFromXContext() throws Exception {
   final XContentBuilder builder = XContentFactory.jsonBuilder();
   builder.startObject();
   builder.startObject("licenses");
   builder.nullField("license");
   builder.endObject();
   builder.endObject();
   LicensesMetaData metaDataFromXContent = getLicensesMetaDataFromXContent(createParser(builder));
   assertThat(metaDataFromXContent.getLicense(), equalTo(LicensesMetaData.LICENSE_TOMBSTONE));
 }
 public void testLicenseTombstoneWithUsedTrialFromXContext() throws Exception {
   final XContentBuilder builder = XContentFactory.jsonBuilder();
   builder.startObject();
   builder.startObject("licenses");
   builder.nullField("license");
   builder.field("trial license", Version.CURRENT.toString());
   builder.endObject();
   builder.endObject();
   LicensesMetaData metaDataFromXContent = getLicensesMetaDataFromXContent(createParser(builder));
   assertThat(metaDataFromXContent.getLicense(), equalTo(LicensesMetaData.LICENSE_TOMBSTONE));
   assertEquals(metaDataFromXContent.getMostRecentTrialVersion(), Version.CURRENT);
 }
 private static LicensesMetaData getLicensesMetaDataFromXContent(XContentParser parser) throws Exception {
   parser.nextToken(); // consume null
   parser.nextToken(); // consume "licenses"
   LicensesMetaData licensesMetaDataFromXContent = LicensesMetaData.fromXContent(parser);
   parser.nextToken(); // consume endObject
   assertThat(parser.nextToken(), nullValue());
```

```
return licensesMetaDataFromXContent;
```

}

@Override

```
protected NamedXContentRegistry xContentRegistry() {
    return new NamedXContentRegistry(Stream.concat(
        new Licensing(Settings.EMPTY).getNamedXContent().stream(),
        ClusterModule.getNamedXWriteables().stream()
```

```
).collect(Collectors.toList()));

}

/*

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*/
```

package org.elasticsearch.license;

import org.elasticsearch.cluster.ClusterName; import org.elasticsearch.cluster.ClusterState; import org.elasticsearch.cluster.ClusterStateUpdateTask; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.common.settings.Settings; import org.mockito.ArgumentCaptor; import org.mockito.Mockito;

import java.util.UUID;

import static org.elasticsearch.license.TestUtils.dateMath; import static org.mockito.Matchers.any; import static org.mockito.Mockito.verify; import static org.mockito.Mockito.when;

public class LicenseRegistrationTests extends AbstractLicenseServiceTestCase {

```
public void testSelfGeneratedTrialLicense() throws Exception {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(null, licenseState, Settings.EMPTY, "trial");
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();
```

```
ClusterState state = ClusterState.builder(new ClusterName("a")).build();
ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
ClusterState stateWithLicense = stateUpdater.getValue().execute(state);
LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
assertNotNull(licenseMetaData);
assertFalse(licenseMetaData.getLicense());
assertFalse(licenseMetaData.isEligibleForTrial());
assertEquals("trial", licenseMetaData.getLicense().type());
assertEquals(clock.millis() +
LicenseService.NON_BASIC_SELF_GENERATED_LICENSE_DURATION.millis(),
licenseMetaData.getLicense().expiryDate());
}
```

```
public void testSelfGeneratedBasicLicense() throws Exception {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
   setInitialState(null, licenseState, Settings.EMPTY, "basic");
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();
    ClusterState state = ClusterState.builder(new ClusterName("a")).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
    verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
   ClusterState stateWithLicense = stateUpdater.getValue().execute(state);
   LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
   assertNotNull(licenseMetaData);
   assertNotNull(licenseMetaData.getLicense());
    assertTrue(licenseMetaData.isEligibleForTrial());
    assertEquals("basic", licenseMetaData.getLicense().type());
    assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS,
licenseMetaData.getLicense().expiryDate());
 }
 public void testNonSelfGeneratedBasicLicenseIsReplaced() throws Exception {
    long now = System.currentTimeMillis();
   String uid = UUID.randomUUID().toString();
    final License.Builder builder = License.builder()
        .uid(uid)
        .version(License.VERSION CURRENT)
         .expiryDate(dateMath("now+2h", now))
        .startDate(now)
        .issueDate(now)
        .type("basic")
        .issuedTo("customer")
        .issuer("elasticsearch")
         .maxNodes(5);
   License license = TestUtils.generateSignedLicense(builder);
   XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
   setInitialState(license, licenseState, Settings.EMPTY);
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();
   MetaData.Builder mdBuilder = MetaData.builder();
    mdBuilder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null));
   ClusterState state = ClusterState.builder(new ClusterName("a")).metaData(mdBuilder.build()).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
```

ArgumentCaptor.forClass(ClusterStateUpdateTask.class);

verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());

ClusterState stateWithLicense = stateUpdater.getValue().execute(state);

LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);

```
assertNotNull(licenseMetaData);
assertNotNull(licenseMetaData.getLicense());
assertTrue(licenseMetaData.isEligibleForTrial());
assertEquals("basic", licenseMetaData.getLicense().type());
assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS,
licenseMetaData.getLicense().expiryDate());
assertEquals(uid, licenseMetaData.getLicense().uid());
}
```

```
public void testExpiredSelfGeneratedBasicLicenseIsExtended() throws Exception {
    long now = System.currentTimeMillis();
    String uid = UUID.randomUUID().toString();
    License.Builder builder = License.builder()
        .uid(uid)
        .issuedTo("name")
        .maxNodes(1000)
        .issueDate(dateMath("now-10h", now))
        .type("basic")
        .expiryDate(dateMath("now-2h", now));
    License license = SelfGeneratedLicense.create(builder);
```

```
XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
setInitialState(license, licenseState, Settings.EMPTY);
when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
licenseService.start();
```

```
MetaData.Builder mdBuilder = MetaData.builder();
   mdBuilder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null));
   ClusterState state = ClusterState.builder(new ClusterName("a")).metaData(mdBuilder.build()).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
    verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
    ClusterState stateWithLicense = stateUpdater.getValue().execute(state);
   LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
    assertNotNull(licenseMetaData);
    assertNotNull(licenseMetaData.getLicense());
   assertTrue(licenseMetaData.isEligibleForTrial());
    assertEquals("basic", licenseMetaData.getLicense().type());
    assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS,
licenseMetaData.getLicense().expiryDate());
    assertEquals(uid, licenseMetaData.getLicense().uid());
 }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
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*/
```

package org.elasticsearch.license;

import org.elasticsearch.common.bytes.BytesReference; import org.elasticsearch.common.unit.TimeValue; import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.common.xcontent.XContentFactory; import org.elasticsearch.common.xcontent.XContentType; import org.elasticsearch.test.ESTestCase;

import java.io.IOException; import java.nio.ByteBuffer; import java.util.Base64; import java.util.Collections; import java.util.UUID;

import static org.elasticsearch.license.CryptUtils.encrypt; import static org.hamcrest.Matchers.equalTo;

```
public class SelfGeneratedLicenseTests extends ESTestCase {
```

```
public void testBasic() throws Exception {
    long issueDate = System.currentTimeMillis();
    License.Builder specBuilder = License.builder()
    .uid(UUID.randomUUID().toString())
    .issuedTo("customer")
    .maxNodes(5)
    .type(randomBoolean() ? "trial" : "basic")
    .issueDate(issueDate)
    .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis());
    License trialLicense = SelfGeneratedLicense.create(specBuilder);
    assertThat(SelfGeneratedLicense.verify(trialLicense), equalTo(true));
```

```
public void testTampered() throws Exception {
    long issueDate = System.currentTimeMillis();
    License.Builder specBuilder = License.builder()
    .uid(UUID.randomUUID().toString())
    .issuedTo("customer")
    .type(randomBoolean() ? "trial" : "basic")
    .maxNodes(5)
    .issueDate(issueDate)
    .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis());
    License trialLicense = SelfGeneratedLicense.create(specBuilder);
    final String originalSignature = trialLicense.signature();
    License tamperedLicense = License.builder().fromLicenseSpec(trialLicense, originalSignature)
    .expiryDate(System.currentTimeMillis() + TimeValue.timeValueHours(5).getMillis())
```

```
.build();
    assertThat(SelfGeneratedLicense.verify(trialLicense), equalTo(true));
    assertThat(SelfGeneratedLicense.verify(tamperedLicense), equalTo(false));
  }
 public void testFrom1x() throws Exception {
    long issueDate = System.currentTimeMillis();
    License.Builder specBuilder = License.builder()
         .uid(UUID.randomUUID().toString())
         .issuedTo("customer")
         .type("subscription")
         .subscriptionType("trial")
         .issuer("elasticsearch")
         .feature("")
         .version(License.VERSION_START)
         .maxNodes(5)
         .issueDate(issueDate)
         .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis());
    License pre20TrialLicense = specBuilder.build();
    License license =
SelfGeneratedLicense.create(License.builder().fromPre20LicenseSpec(pre20TrialLicense).type("trial"));
    assertThat(SelfGeneratedLicense.verify(license), equalTo(true));
  }
 public void testTrialLicenseVerifyWithOlderVersion() throws Exception {
    long issueDate = System.currentTimeMillis();
    License.Builder specBuilder = License.builder()
         .issuedTo("customer")
         .maxNodes(5)
         .issueDate(issueDate)
         .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis())
         .feature("")
         .subscriptionType("trial")
         .version(1);
    License trialLicenseV1 = createTrialLicense(specBuilder);
    assertThat(SelfGeneratedLicense.verify(trialLicenseV1), equalTo(true));
  }
 private static License createTrialLicense(License.Builder specBuilder) {
    License spec = specBuilder
         .type(randomBoolean() ? "trial" : "basic")
         .issuer("elasticsearch")
         .uid(UUID.randomUUID().toString())
         .build();
    final String signature;
    try {
      XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
      spec.toXContent(contentBuilder, new
```

```
ToXContent.MapParams(Collections.singletonMap(License.LICENSE_SPEC_VIEW_MODE, "true")));
      byte[] encrypt = encrypt(BytesReference.toBytes(BytesReference.bytes(contentBuilder)));
      byte[] bytes = new byte[4 + 4 + encrypt.length];
      ByteBuffer byteBuffer = ByteBuffer.wrap(bytes);
      byteBuffer.putInt(-spec.version())
           .putInt(encrypt.length)
           .put(encrypt);
      signature = Base64.getEncoder().encodeToString(bytes);
    } catch (IOException e) {
      throw new IllegalStateException(e);
    }
    return License.builder().fromLicenseSpec(spec, signature).build();
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionFuture;
import org.elasticsearch.common.bytes.BytesArray;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.XContentType;
```

import org.elasticsearch.node.Node;

```
import org.elasticsearch.plugins.Plugin;
```

import org.elasticsearch.test.ESSingleNodeTestCase;

import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;

import org.elasticsearch.xpack.core.XPackSettings;

import java.nio.charset.StandardCharsets; import java.util.Collection; import java.util.Collections; import java.util.UUID;

```
import static org.elasticsearch.license.TestUtils.dateMath;
import static org.elasticsearch.license.TestUtils.generateExpiredNonBasicLicense;
import static org.elasticsearch.license.TestUtils.generateSignedLicense;
import static org.hamcrest.CoreMatchers.equalTo;
import static org.hamcrest.CoreMatchers.not;
```

public class LicensesTransportTests extends ESSingleNodeTestCase {

@Override protected boolean resetNodeAfterTest() { return true;

```
}
  @Override
 protected Collection<Class<? extends Plugin>> getPlugins() {
    return Collections.singletonList(LocalStateCompositeXPackPlugin.class);
  }
  @Override
 protected Settings nodeSettings() {
    Settings.Builder newSettings = Settings.builder();
    newSettings.put(super.nodeSettings());
    newSettings.put(XPackSettings.SECURITY_ENABLED.getKey(), false);
      newSettings.put(XPackSettings.MONITORING ENABLED.getKey(), false);
//
      newSettings.put(XPackSettings.WATCHER_ENABLED.getKey(), false);
//
    newSettings.put(Node.NODE_DATA_SETTING.getKey(), true);
    return newSettings.build();
  }
 public void testEmptyGetLicense() throws Exception {
    // basic license is added async, we should wait for it
    assertBusy(() \rightarrow \{
      try {
         final ActionFuture<GetLicenseResponse> getLicenseFuture =
              new GetLicenseRequestBuilder(client().admin().cluster(), GetLicenseAction.INSTANCE).execute();
         final GetLicenseResponse getLicenseResponse;
         getLicenseResponse = getLicenseFuture.get();
         assertNotNull(getLicenseResponse.license());
         assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.BASIC));
      } catch (Exception e) {
         throw new RuntimeException("unexpected exception", e);
      }
    });
  }
 public void testPutLicense() throws Exception {
    License signedLicense = generateSignedLicense(TimeValue.timeValueMinutes(2));
    // put license
    PutLicenseRequestBuilder putLicenseRequestBuilder =
         new PutLicenseRequestBuilder(client().admin().cluster(),
PutLicenseAction.INSTANCE).setLicense(signedLicense)
              .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
    // get and check license
```

GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),

```
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```

```
GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), equalTo(signedLicense));
 }
 public void testPutLicenseFromString() throws Exception {
   License signedLicense = generateSignedLicense(TimeValue.timeValueMinutes(2));
   String licenseString = TestUtils.dumpLicense(signedLicense);
   // put license source
    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(), PutLicenseAction.INSTANCE)
             .setLicense(new BytesArray(licenseString.getBytes(StandardCharsets.UTF_8)),
XContentType.JSON)
             .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
   // get and check license
   GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), equalTo(signedLicense));
 }
 public void testPutInvalidLicense() throws Exception {
   License signedLicense = generateSignedLicense(TimeValue.timeValueMinutes(2));
   // modify content of signed license
   License tamperedLicense = License.builder()
         .fromLicenseSpec(signedLicense, signedLicense.signature())
        .expiryDate(signedLicense.expiryDate() + 10 * 24 * 60 * 60 * 1000L)
        .validate()
        .build();
    PutLicenseRequestBuilder builder = new PutLicenseRequestBuilder(client().admin().cluster(),
PutLicenseAction.INSTANCE);
   builder.setLicense(tamperedLicense);
   // try to put license (should be invalid)
    final PutLicenseResponse putLicenseResponse = builder.get();
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.INVALID));
   // try to get invalid license
```

```
GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(), GetLicenseAction.INSTANCE).get();
```

assertThat(getLicenseResponse.license(), not(tamperedLicense));

```
}
```

```
public void testPutBasicLicenseIsInvalid() throws Exception {
    License signedLicense = generateSignedLicense("basic", License.VERSION_CURRENT, -1,
    TimeValue.timeValueMinutes(2));
```

PutLicenseRequestBuilder builder = new PutLicenseRequestBuilder(client().admin().cluster(), PutLicenseAction.INSTANCE);

builder.setLicense(signedLicense);

```
// try to put license (should be invalid)
IllegalArgumentException iae = expectThrows(IllegalArgumentException.class, builder::get);
assertEquals(iae.getMessage(), "Registering basic licenses is not allowed.");
```

```
// try to get invalid license
```

```
GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(), GetLicenseAction.INSTANCE).get();
```

assertThat(getLicenseResponse.license(), not(signedLicense));

}

```
public void testPutExpiredLicense() throws Exception {
```

License expiredLicense = generateExpiredNonBasicLicense();

PutLicenseRequestBuilder builder = new PutLicenseRequestBuilder(client().admin().cluster(),

```
PutLicenseAction.INSTANCE);
```

builder.setLicense(expiredLicense);

PutLicenseResponse putLicenseResponse = builder.get();

assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.EXPIRED));

// get license should not return the expired license

GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),

GetLicenseAction.INSTANCE).get();

```
assertThat(getLicenseResponse.license(), not(expiredLicense));
```

}

```
public void testPutLicensesSimple() throws Exception {
   License goldSignedLicense = generateSignedLicense("gold", TimeValue.timeValueMinutes(5));
   PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
   PutLicenseAction.INSTANCE).setLicense(goldSignedLicense)
        .setAcknowledge(true);
   PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
   assertThat(putLicenseResponse.status(), equalTo(LicenseRequestBuilder(client().admin().cluster(),
   GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
   GetLicenseAction.INSTANCE).get();
   assertThat(getLicenseResponse.license(), equalTo(goldSignedLicense));
   License platinumSignedLicense = generateSignedLicense("platinum", TimeValue.timeValueMinutes(2));
   putLicenseResponse = putLicenseRequestBuilder.get();
   assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
   }
}
```

assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));

```
getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), equalTo(platinumSignedLicense));
 }
 public void testRemoveLicensesSimple() throws Exception {
   License goldLicense = generateSignedLicense("gold", TimeValue.timeValueMinutes(5));
   PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
PutLicenseAction.INSTANCE).setLicense(goldLicense)
             .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
    GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), equalTo(goldLicense));
   // delete all licenses
   DeleteLicenseRequestBuilder deleteLicenseRequestBuilder =
        new DeleteLicenseRequestBuilder(client().admin().cluster(), DeleteLicenseAction.INSTANCE);
   DeleteLicenseResponse deleteLicenseResponse = deleteLicenseRequestBuilder.get();
   assertThat(deleteLicenseResponse.isAcknowledged(), equalTo(true));
   // get licenses (expected no licenses)
    getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
    assertNull(getLicenseResponse.license());
 }
 public void testLicenseIsRejectWhenStartDateLaterThanNow() throws Exception {
    long now = System.currentTimeMillis();
    final License.Builder builder = License.builder()
         .uid(UUID.randomUUID().toString())
        .version(License.VERSION CURRENT)
        .expiryDate(dateMath("now+2h", now))
        .startDate(dateMath("now+1h", now))
        .issueDate(now)
        .type(License.OperationMode.TRIAL.toString())\\
        .issuedTo("customer")
        .issuer("elasticsearch")
        .maxNodes(5);
   License license = TestUtils.generateSignedLicense(builder);
    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
PutLicenseAction.INSTANCE).setLicense(license)
             .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
```

assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.INVALID)); } public void testLicenseIsAcceptedWhenStartDateBeforeThanNow() throws Exception { long now = System.currentTimeMillis(); final License.Builder builder = License.builder() .uid(UUID.randomUUID().toString()) .version(License.VERSION_CURRENT) .expiryDate(dateMath("now+2h", now)) .startDate(now) .issueDate(now) .type(License.OperationMode.TRIAL.toString()) .issuedTo("customer") .issuer("elasticsearch") .maxNodes(5); License license = TestUtils.generateSignedLicense(builder); PutLicenseRequestBuilder putLicenseRequestBuilder = new PutLicenseRequestBuilder(client().admin().cluster(), PutLicenseAction.INSTANCE).setLicense(license) .setAcknowledge(true); PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get(); assertThat(putLicenseResponse.isAcknowledged(), equalTo(true)); assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID)); } } /* * Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one * or more contributor license agreements. Licensed under the Elastic License; * you may not use this file except in compliance with the Elastic License.

*/

package org.elasticsearch.license;

import org.elasticsearch.Version;

import org.elasticsearch.action.support.PlainActionFuture; import org.elasticsearch.cluster.ClusterStateUpdateTask; import org.elasticsearch.cluster.node.DiscoveryNode; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.transport.TransportAddress; import org.elasticsearch.common.unit.TimeValue;

import java.net.InetAddress;

import static java.util.Collections.emptyMap; import static java.util.Collections.emptySet; import static org.hamcrest.Matchers.containsString; import static org.mockito.Matchers.any; import static org.mockito.Mockito.times; import static org.mockito.Mockito.verify;

```
public class LicenseTLSTests extends AbstractLicenseServiceTestCase {
 private InetAddress inetAddress;
 public void testApplyLicenseInDevMode() throws Exception {
    License newLicense = TestUtils.generateSignedLicense(randomFrom("gold", "platinum"),
TimeValue.timeValueHours(24L));
    PutLicenseRequest request = new PutLicenseRequest();
   request.acknowledge(true);
   request.license(newLicense);
   Settings settings = Settings.builder().put("xpack.security.enabled", true).build();
   XPackLicenseState licenseState = new XPackLicenseState(settings);
   inetAddress = InetAddress.getLoopbackAddress();
   setInitialState(null, licenseState, settings);
   licenseService.start();
   PlainActionFuture<PutLicenseResponse> responseFuture = new PlainActionFuture<>();
   licenseService.registerLicense(request, responseFuture);
    verify(clusterService).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
    inetAddress = TransportAddress.META_ADDRESS;
    settings = Settings.builder()
         .put("xpack.security.enabled", true)
         .put("discovery.type", "single-node")
         .build();
   licenseService.stop();
   licenseState = new XPackLicenseState(settings);
    setInitialState(null, licenseState, settings);
   licenseService.start();
   licenseService.registerLicense(request, responseFuture);
    verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
 }
 public void testApplyLicenseInProdMode() throws Exception {
    final String licenseType = randomFrom("GOLD", "PLATINUM");
   License newLicense = TestUtils.generateSignedLicense(licenseType, TimeValue.timeValueHours(24L));
   PutLicenseRequest request = new PutLicenseRequest();
   request.acknowledge(true);
   request.license(newLicense);
   Settings settings = Settings.builder().put("xpack.security.enabled", true).build();
   XPackLicenseState licenseState = new XPackLicenseState(settings);
    inetAddress = TransportAddress.META_ADDRESS;
   setInitialState(null, licenseState, settings);
    licenseService.start();
    PlainActionFuture<PutLicenseResponse> responseFuture = new PlainActionFuture<>();
```

```
IllegalStateException e = expectThrows(IllegalStateException.class, () ->
licenseService.registerLicense(request, responseFuture));
```

assertThat(e.getMessage(),

```
containsString("Cannot install a [" + licenseType + "] license unless TLS is configured or security is disabled"));
```

```
settings = Settings.builder().put("xpack.security.enabled", false).build();
```

```
licenseService.stop();
```

licenseState = new XPackLicenseState(settings);

setInitialState(null, licenseState, settings);

licenseService.start();

licenseService.registerLicense(request, responseFuture);

verify (cluster Service). submit State Update Task (any (String.class), any (Cluster State Update Task.class));

```
settings = Settings.builder()
```

.put("xpack.security.enabled", true) .put("xpack.security.transport.ssl.enabled", true)

.build();

licenseService.stop();

licenseState = new XPackLicenseState(settings);

setInitialState(null, licenseState, settings);

licenseService.start();

licenseService.registerLicense(request, responseFuture);

verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));

}

```
@Override
```

```
protected DiscoveryNode getLocalNode() {
```

```
return new DiscoveryNode("localnode", new TransportAddress(inetAddress, randomIntBetween(9300, 9399)), emptyMap(), emptySet(), Version.CURRENT);
```

} /*

}

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```

*/

package org.elasticsearch.license;

import org.elasticsearch.common.bytes.BytesArray; import org.elasticsearch.common.bytes.BytesReference; import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.common.xcontent.XContentFactory; import org.elasticsearch.common.xcontent.XContentHelper; import org.elasticsearch.common.xcontent.XContentType; import org.elasticsearch.test.ESTestCase; import java.nio.charset.StandardCharsets; import java.util.Collections; import java.util.Map; import java.util.UUID;

import static org.hamcrest.core.IsEqual.equalTo; import static org.hamcrest.core.IsNull.notNullValue; import static org.hamcrest.core.IsNull.nullValue; public class LicenseSerializationTests extends ESTestCase { public void testSimpleIssueExpiryDate() throws Exception { long now = System.currentTimeMillis(); String issueDate = TestUtils.dateMathString("now", now); String expiryDate = TestUtils.dateMathString("now+10d/d", now); String licenseSpecs = TestUtils.generateLicenseSpecString(new TestUtils.LicenseSpec(issueDate, expiryDate)); License generatedLicense = License.fromSource(new BytesArray(licenseSpecs.getBytes(StandardCharsets.UTF_8)), XContentType.JSON); assertThat(generatedLicense.issueDate(), equalTo(DateUtils.beginningOfTheDay(issueDate))); assertThat(generatedLicense.expiryDate(), equalTo(DateUtils.endOfTheDay(expiryDate))); } public void testLicensesFields() throws Exception { TestUtils.LicenseSpec randomLicenseSpec = TestUtils.generateRandomLicenseSpec(License.VERSION START); String licenseSpecsSource = TestUtils.generateLicenseSpecString(randomLicenseSpec); final License fromSource = License.fromSource(new BytesArray(licenseSpecsSource.getBytes(StandardCharsets.UTF 8)), XContentType.JSON); TestUtils.assertLicenseSpec(randomLicenseSpec, fromSource); } public void testLicenseRestView() throws Exception { long now = System.currentTimeMillis(); String expiredLicenseExpiryDate = TestUtils.dateMathString("now-1d/d", now); String validLicenseIssueDate = TestUtils.dateMathString("now-10d/d", now); String invalidLicenseIssueDate = TestUtils.dateMathString("now+1d/d", now); String validLicenseExpiryDate = TestUtils.dateMathString("now+2d/d", now); License license = TestUtils.generateLicenses(new TestUtils.LicenseSpec(validLicenseIssueDate, expiredLicenseExpiryDate)); XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON); license.toXContent(builder, new ToXContent.MapParams(Collections.singletonMap(License.REST_VIEW_MODE, "true")));

builder.flush(); Map<String, Object> map = XContentHelper.convertToMap(BytesReference.bytes(builder), false,

builder.contentType()).v2();

// should have an extra status field, human readable issue_data and expiry_date

assertThat(map.get("status"), notNullValue());

assertThat(map.get("issue_date"), notNullValue());

assertThat(map.get("expiry_date"), notNullValue());

assertThat(map.get("status"), equalTo("expired"));

builder = XContentFactory.contentBuilder(XContentType.JSON);

license.toXContent(builder, ToXContent.EMPTY_PARAMS);

builder.flush();

map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
assertThat(map.get("status"), nullValue());

license = TestUtils.generateLicenses(new TestUtils.LicenseSpec(validLicenseIssueDate, validLicenseExpiryDate));

builder = XContentFactory.contentBuilder(XContentType.JSON);

license.toXContent(builder, new

ToXContent.MapParams(Collections.singletonMap(License.REST_VIEW_MODE, "true"))); builder.flush();

map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();

 $/\!/$ should have an extra status field, human readable issue_data and expiry_date

assertThat(map.get("status"), notNullValue());

assertThat(map.get("issue_date"), notNullValue());

assertThat(map.get("expiry_date"), notNullValue());

assertThat(map.get("status"), equalTo("active"));

builder = XContentFactory.contentBuilder(XContentType.JSON);

license.toXContent(builder, ToXContent.EMPTY_PARAMS);

builder.flush();

map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
assertThat(map.get("status"), nullValue());

license = TestUtils.generateLicenses(new TestUtils.LicenseSpec(invalidLicenseIssueDate,

validLicenseExpiryDate));

builder = XContentFactory.contentBuilder(XContentType.JSON);

license.toXContent(builder, new

ToXContent.MapParams(Collections.singletonMap(License.REST_VIEW_MODE, "true"))); builder.flush();

map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();

// should have an extra status field, human readable issue_data and expiry_date
assertThat(map.get("status"), notNullValue());
assertThat(map.get("expiry_date"), notNullValue());
assertThat(map.get("expiry_date"), notNullValue());
assertThat(map.get("status"), equalTo("invalid"));
builder = XContentFactory.contentBuilder(XContentType.JSON);
license.toXContent(builder, ToXContent.EMPTY_PARAMS);
builder.flush();
map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
assertThat(map.get("status"), nullValue());

```
public void testLicenseRestViewNonExpiringBasic() throws Exception {
```

```
long now = System.currentTimeMillis();
```

```
License.Builder specBuilder = License.builder()
         .uid(UUID.randomUUID().toString())
         .issuedTo("test")
         .maxNodes(1000)
         .issueDate(now)
         .type("basic")
         .expiryDate(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS);
    License license = SelfGeneratedLicense.create(specBuilder);
    XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON);
    license.toXContent(builder, new
ToXContent.MapParams(Collections.singletonMap(License.REST_VIEW_MODE, "true")));
    builder.flush();
    Map<String, Object> map = XContentHelper.convertToMap(BytesReference.bytes(builder), false,
builder.contentType()).v2();
    // should have an extra status field, human readable issue_data and no expiry_date
    assertThat(map.get("status"), notNullValue());
    assertThat(map.get("type"), equalTo("basic"));
    assertThat(map.get("issue_date"), notNullValue());
    assertThat(map.get("expiry date"), nullValue());
    assertThat(map.get("expiry_date_in_millis"), nullValue());
    assertThat(map.get("status"), equalTo("active"));
    builder = XContentFactory.contentBuilder(XContentType.JSON);
    license.toXContent(builder, ToXContent.EMPTY_PARAMS);
    builder.flush();
    map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
    assertThat(map.get("status"), nullValue());
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.client.Response;
import org.elasticsearch.client.ResponseException;
import org.elasticsearch.client.RestClient;
import org.elasticsearch.common.io.Streams;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
```

```
import org.elasticsearch.plugins.Plugin;
```

import org.elasticsearch.test.ESIntegTestCase; import org.elasticsearch.transport.Netty4Plugin; import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin; import org.elasticsearch.xpack.core.XPackClientPlugin;

import java.io.InputStreamReader; import java.nio.charset.StandardCharsets; import java.util.Arrays; import java.util.Collection;

import static org.elasticsearch.test.ESIntegTestCase.Scope.SUITE;

@ESIntegTestCase.ClusterScope(scope = SUITE)
public class StartBasicLicenseTests extends AbstractLicensesIntegrationTestCase {

```
@Override
protected Settings nodeSettings(int nodeOrdinal) {
    return Settings.builder()
        .put(super.nodeSettings(nodeOrdinal))
        .put("node.data", true)
        .put(LicenseService.SELF_GENERATED_LICENSE_TYPE.getKey(), "basic")
        .put(NetworkModule.HTTP_ENABLED.getKey(), true).build();
}
```

```
@Override
```

```
protected Collection<Class<? extends Plugin>> nodePlugins() {
    return Arrays.asList(LocalStateCompositeXPackPlugin.class, Netty4Plugin.class);
}
```

```
@Override
```

```
protected Collection<Class<? extends Plugin>> transportClientPlugins() {
    return Arrays.asList(XPackClientPlugin.class, Netty4Plugin.class);
```

}

public void testStartBasicLicense() throws Exception {

LicensingClient licensingClient = new LicensingClient(client());

```
License license = TestUtils.generateSignedLicense("trial", License.VERSION_CURRENT, -1, TimeValue.timeValueHours(24));
```

licensingClient.preparePutLicense(license).get();

```
assertBusy(() -> {
```

```
GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
assertEquals("trial", getLicenseResponse.license().type());
```

```
});
```

 ${\ensuremath{/\!/}}$ Testing that you can start a basic license when you have no license

if (randomBoolean()) {

```
licensingClient.prepareDeleteLicense().get();
```

assert Null (licensing Client.prepareGetLicense().get().license());

```
RestClient restClient = getRestClient();
Response response = restClient.performRequest("GET", "/_xpack/license/basic_status");
String body = Streams.copyToString(new InputStreamReader(response.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(200, response.getStatusLine().getStatusCode());
assertEquals("{\"eligible_to_start_basic\":true}", body);
Response response2 = restClient.performRequest("POST", "/_xpack/license/start_basic?acknowledge=true");
String body2 = Streams.copyToString(new InputStreamReader(response2.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(200, response2.getStatusLine().getStatusCode());
assertEquals(200, response2.getStatusLine().getStatusCode());
assertTrue(body2.contains("\"acknowledged\":true"));
assertTrue(body2.contains("\"basic_was_started\":true"));
assertBusy(() -> {
GetLicenseResponse currentLicense = licensingClient.prepareGetLicense().get();
assertEquals("basic", currentLicense.license().type());
```

```
});
```

```
long expirationMillis = licensingClient.prepareGetLicense().get().license().expiryDate();
    assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS,
    expirationMillis);
```

```
Response response3 = restClient.performRequest("GET", "/_xpack/license");
String body3 = Streams.copyToString(new InputStreamReader(response3.getEntity().getContent(),
StandardCharsets.UTF 8));
```

```
assertTrue(body3.contains("\"type\" : \"basic\""));
assertFalse(body3.contains("expiry_date"));
assertFalse(body3.contains("expiry_date_in_millis"));
```

```
Response response4 = restClient.performRequest("GET", "/_xpack/license/basic_status");
String body4 = Streams.copyToString(new InputStreamReader(response4.getEntity().getContent(),
StandardCharsets.UTF_8));
assortEquals(200, response3 getStatusLing() getStatusCode());
```

```
assertEquals(200, response3.getStatusLine().getStatusCode());
assertEquals("{\"eligible_to_start_basic\":false}", body4);
```

```
assertTrue(body5.contains("\"error_message\":\"Operation failed: Current license is basic.\""));
}
```

public void testUnacknowledgedStartBasicLicense() throws Exception {

LicensingClient licensingClient(licent());

License license = TestUtils.generateSignedLicense("trial", License.VERSION_CURRENT, -1,

```
TimeValue.timeValueHours(24));
```

licensingClient.preparePutLicense(license).get();

```
assertBusy(() -> {
```

```
GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
assertEquals("trial", getLicenseResponse.license().type());
```

```
});
```

```
Response response2 = getRestClient().performRequest("POST", "/_xpack/license/start_basic");
String body2 = Streams.copyToString(new InputStreamReader(response2.getEntity().getContent(),
StandardCharsets.UTF 8));
```

assertEquals(200, response2.getStatusLine().getStatusCode());

assertTrue(body2.contains("\"acknowledged\":false"));

assertTrue(body2.contains("\"basic_was_started\":false"));

```
assertTrue(body2.contains("\"error_message\":\"Operation failed: Needs acknowledgement.\""));
```

assertTrue(body2.contains(""message":"This license update requires acknowledgement. To acknowledge the license, "+

"please read the following messages and call /start_basic again, this time with the \\\"acknowledge=true\\\""));

- } }
- ر /*

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```

*/

package org.elasticsearch.license;

import org.elasticsearch.common.bytes.BytesReference; import org.elasticsearch.common.io.stream.BytesStreamOutput; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.common.xcontent.XContentFactory; import org.elasticsearch.common.xcontent.XContentHelper; import org.elasticsearch.test.ESTestCase;

import java.io.IOException; import java.util.HashMap; import java.util.List; import java.util.Locale; import java.util.Map;

```
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.not;
import static org.hamcrest.Matchers.sameInstance;
public class PutLicenseResponseTests extends ESTestCase {
    @SuppressWarnings("unchecked")
    public void testSerialization() throws Exception {
        boolean acknowledged = randomBoolean();
        LicensesStatus status = randomFrom(LicensesStatus.VALID, LicensesStatus.INVALID,
LicensesStatus.EXPIRED);
        Map<String, String[]> ackMessages = randomAckMessages();
        PutLicenseResponse response = new PutLicenseResponse(acknowledged, status, "", ackMessages);
```

```
XContentBuilder contentBuilder = XContentFactory.jsonBuilder();
response.toXContent(contentBuilder, ToXContent.EMPTY_PARAMS);
```

```
Map<String, Object> map = XContentHelper.convertToMap(BytesReference.bytes(contentBuilder), false, contentBuilder.contentType()).v2();
```

```
assertThat(map.containsKey("acknowledged"), equalTo(true));
boolean actualAcknowledged = (boolean) map.get("acknowledged");
assertThat(actualAcknowledged, equalTo(acknowledged));
```

```
assertThat(map.containsKey("license_status"), equalTo(true));
String actualStatus = (String) map.get("license_status");
assertThat(actualStatus, equalTo(status.name().toLowerCase(Locale.ROOT)));
```

```
assertThat(map.containsKey("acknowledge"), equalTo(true));
Map<String, List<String>> actualAckMessages = (Map<String, List<String>>) map.get("acknowledge");
assertTrue(actualAckMessages.containsKey("message"));
actualAckMessages.remove("message");
assertThat(actualAckMessages.keySet(), equalTo(ackMessages.keySet()));
for (Map.Entry<String, List<String>> entry : actualAckMessages.entrySet()) {
    assertArrayEquals(entry.getValue().toArray(), ackMessages.get(entry.getKey()));
}
```

```
public void testStreamSerialization() throws IOException {
    boolean acknowledged = randomBoolean();
    LicensesStatus status = randomFrom(LicensesStatus.VALID, LicensesStatus.INVALID,
    LicensesStatus.EXPIRED);
    Map<String, String[]> ackMessages = randomAckMessages();
    // write the steam so that we can attempt to read it back
```

BytesStreamOutput output = new BytesStreamOutput();

PutLicenseResponse response = new PutLicenseResponse(acknowledged, status, "", ackMessages);

```
// write it out
    response.writeTo(output);
    StreamInput input = output.bytes().streamInput();
    // read it back in
    response.readFrom(input);
    assertThat(response.isAcknowledged(), equalTo(acknowledged));
    assertThat(response.status(), equalTo(status));
    assertThat(response.acknowledgeMessages(), not(sameInstance(ackMessages)));
    assertThat(response.acknowledgeMessages().size(), equalTo(ackMessages.size()));
    for (String key : ackMessages.keySet()) {
      assertArrayEquals(ackMessages.get(key), response.acknowledgeMessages().get(key));
    }
  }
 private static Map<String, String[]> randomAckMessages() {
    int nFeatures = randomIntBetween(1, 5);
    Map<String, String[]> ackMessages = new HashMap<>();
    for (int i = 0; i < nFeatures; i++) {
      String feature = randomAlphaOfLengthBetween(9, 15);
      int nMessages = randomIntBetween(1, 5);
      String[] messages = new String[nMessages];
      for (int j = 0; j < nMessages; j++) {
         messages[j] = randomAlphaOfLengthBetween(10, 30);
      }
      ackMessages.put(feature, messages);
    }
    return ackMessages;
  }
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*/
package org.elasticsearch.license;
import org.elasticsearch.Version;
import org.elasticsearch.cluster.ClusterName;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlocks;
```

import org.elasticsearch.cluster.metadata.MetaData;

import org.elasticsearch.cluster.node.DiscoveryNode; import org.elasticsearch.cluster.node.DiscoveryNodes; import org.elasticsearch.cluster.service.ClusterService; import org.elasticsearch.common.component.Lifecycle; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.env.Environment; import org.elasticsearch.test.ESTestCase; import org.elasticsearch.watcher.ResourceWatcherService; import org.elasticsearch.xpack.core.XPackPlugin; import org.elasticsearch.xpack.core.watcher.watch.ClockMock; import org.junit.After; import org.junit.Before;

import java.nio.file.Path; import java.util.Arrays;

import static java.util.Collections.emptySet; import static java.util.Collections.singletonMap; import static org.mockito.Mockito.mock; import static org.mockito.Mockito.when;

public abstract class AbstractLicenseServiceTestCase extends ESTestCase {

protected LicenseService licenseService; protected ClusterService clusterService; protected ResourceWatcherService resourceWatcherService; protected ClockMock clock; protected DiscoveryNodes discoveryNodes; protected Environment environment; protected String licenseType;

```
@Before
public void init() throws Exception {
    clusterService = mock(ClusterService.class);
    clock = ClockMock.frozen();
    discoveryNodes = mock(DiscoveryNodes.class);
    resourceWatcherService = mock(ResourceWatcherService.class);
    environment = mock(Environment.class);
}
```

```
protected void setInitialState(License license, XPackLicenseState licenseState, Settings) {
    setInitialState(license, licenseState, settings, randomBoolean() ? "trial" : "basic");
```

}

protected void setInitialState(License license, XPackLicenseState licenseState, Settings settings, String selfGeneratedType) {

```
Path tempDir = createTempDir();
```

when(environment.configFile()).thenReturn(tempDir);

```
licenseType = selfGeneratedType;
    settings =
Settings.builder().put(settings).put(LicenseService.SELF_GENERATED_LICENSE_TYPE.getKey(),
licenseType).build();
    licenseService = new LicenseService(settings, clusterService, clock, environment, resourceWatcherService,
licenseState);
    ClusterState state = mock(ClusterState.class);
    final ClusterBlocks noBlock = ClusterBlocks.builder().build();
    when(state.blocks()).thenReturn(noBlock);
    MetaData metaData = mock(MetaData.class);
    when(metaData.custom(LicensesMetaData.TYPE)).thenReturn(new LicensesMetaData(license, null));
    when(state.metaData()).thenReturn(metaData);
    final DiscoveryNode mockNode = getLocalNode();
    when(discoveryNodes.getMasterNode()).thenReturn(mockNode);
    when(discoveryNodes.spliterator()).thenReturn(Arrays.asList(mockNode).spliterator());
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(false);
    when(state.nodes()).thenReturn(discoveryNodes);
    when(state.getNodes()).thenReturn(discoveryNodes); // it is really ridiculous we have nodes() and getNodes()...
    when(clusterService.state()).thenReturn(state);
    when(clusterService.lifecycleState()).thenReturn(Lifecycle.State.STARTED);
    when(clusterService.getClusterName()).thenReturn(new ClusterName("a"));
    when(clusterService.localNode()).thenReturn(mockNode);
  }
 protected DiscoveryNode getLocalNode() {
    return new DiscoveryNode("b", buildNewFakeTransportAddress(),
singletonMap(XPackPlugin.XPACK INSTALLED NODE ATTR, "true"),
      emptySet(), Version.CURRENT);
  }
  @After
 public void tearDown() throws Exception {
    super.tearDown();
    licenseService.stop();
```

```
}
/*
```

}

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```
*/
```

package org.elasticsearch.xpack.core.security.authz.permission;

import org.elasticsearch.xpack.core.security.authz.privilege.Privilege;

import java.util.function.Predicate;

/**

```
* A permissions that is based on a general privilege that contains patterns of users that this
```

```
* user can execute a request as
```

*/

```
public final class RunAsPermission {
```

public static final RunAsPermission NONE = new RunAsPermission(Privilege.NONE);

```
private final Predicate<String> predicate;
```

```
RunAsPermission(Privilege privilege) {
  this.predicate = privilege.predicate();
}
```

/** * C1

```
* Checks if this permission grants run as to the specified user
*/
```

```
public boolean check(String username) {
```

return predicate.test(username);

```
}
```

```
/*
```

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*/
```

package org.elasticsearch.xpack.core.security.authz.permission;

```
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.util.set.Sets;
import org.elasticsearch.xpack.core.security.authz.RoleDescriptor;
import org.elasticsearch.xpack.core.security.authz.accesscontrol.IndicesAccessControl;
import org.elasticsearch.xpack.core.security.authz.privilege.ClusterPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.Privilege;
```

import java.util.ArrayList; import java.util.Collections; import java.util.List; import java.util.Map; import java.util.Objects; import java.util.Set;

public final class Role {

public static final Role EMPTY = Role.builder("__empty").build();

```
private final String[] names;
private final ClusterPermission cluster;
private final IndicesPermission indices;
private final RunAsPermission runAs;
```

```
Role(String[] names, ClusterPermission cluster, IndicesPermission indices, RunAsPermission runAs) {
    this.names = names;
    this.cluster = Objects.requireNonNull(cluster);
    this.indices = Objects.requireNonNull(indices);
    this.runAs = Objects.requireNonNull(runAs);
  }
 public String[] names() {
    return names;
  }
 public ClusterPermission cluster() {
    return cluster;
  }
 public IndicesPermission indices() {
    return indices:
  }
 public RunAsPermission runAs() {
    return runAs;
  }
 public static Builder builder(String... names) {
    return new Builder(names, null);
  }
 public static Builder builder(String[] names, FieldPermissionsCache fieldPermissionsCache) {
    return new Builder(names, fieldPermissionsCache);
  }
 public static Builder builder(RoleDescriptor rd, FieldPermissionsCache fieldPermissionsCache) {
    return new Builder(rd, fieldPermissionsCache);
  }
 /**
  * Returns whether at least one group encapsulated by this indices permissions is authorized to execute the
  * specified action with the requested indices/aliases. At the same time if field and/or document level security
  * is configured for any group also the allowed fields and role queries are resolved.
  */
 public IndicesAccessControl authorize(String action, Set<String> requestedIndicesOrAliases, MetaData
metaData,
```

FieldPermissionsCache fieldPermissionsCache) {

```
Map<String, IndicesAccessControl.IndexAccessControl> indexPermissions = indices.authorize(
       action, requestedIndicesOrAliases, metaData, fieldPermissionsCache
  );
  // At least one role / indices permission set need to match with all the requested indices/aliases:
  boolean granted = true;
  for (Map.Entry<String, IndicesAccessControl.IndexAccessControl> entry : indexPermissions.entrySet()) {
    if (!entry.getValue().isGranted()) {
       granted = false;
       break:
     }
  }
  return new IndicesAccessControl(granted, indexPermissions);
}
public static class Builder {
  private final String[] names;
  private ClusterPermission cluster = ClusterPermission.NONE;
  private RunAsPermission runAs = RunAsPermission.NONE;
  private List<IndicesPermission.Group> groups = new ArrayList<>();
  private FieldPermissionsCache fieldPermissionsCache = null;
  private Builder(String[] names, FieldPermissionsCache fieldPermissionsCache) {
    this.names = names;
    this.fieldPermissionsCache = fieldPermissionsCache;
  }
  private Builder(RoleDescriptor rd, @Nullable FieldPermissionsCache fieldPermissionsCache) {
     this.names = new String[] { rd.getName() };
    this.fieldPermissionsCache = fieldPermissionsCache;
    if (rd.getClusterPrivileges().length == 0) {
       cluster = ClusterPermission.NONE;
     } else {
       this.cluster(ClusterPrivilege.get(Sets.newHashSet(rd.getClusterPrivileges())));
     }
    groups.addAll(convertFromIndicesPrivileges(rd.getIndicesPrivileges(), fieldPermissionsCache));
    String[] rdRunAs = rd.getRunAs();
    if (rdRunAs != null \&\& rdRunAs.length > 0) {
       this.runAs(new Privilege(Sets.newHashSet(rdRunAs), rdRunAs));
     }
  }
  public Builder cluster(ClusterPrivilege privilege) {
    cluster = new ClusterPermission(privilege);
    return this;
  }
```

```
public Builder runAs(Privilege privilege) {
      runAs = new RunAsPermission(privilege);
      return this;
    }
    public Builder add(IndexPrivilege privilege, String... indices) {
      groups.add(new IndicesPermission.Group(privilege, FieldPermissions.DEFAULT, null, indices));
      return this:
    }
    public Builder add(FieldPermissions fieldPermissions, Set<BytesReference> query, IndexPrivilege privilege,
String... indices) {
      groups.add(new IndicesPermission.Group(privilege, fieldPermissions, query, indices));
      return this;
    }
    public Role build() {
      IndicesPermission indices = groups.isEmpty() ? IndicesPermission.NONE :
           new IndicesPermission(groups.toArray(new IndicesPermission.Group[groups.size()]));
      return new Role(names, cluster, indices, runAs);
    }
    static List<IndicesPermission.Group> convertFromIndicesPrivileges(RoleDescriptor.IndicesPrivileges[]
indicesPrivileges,
                                            @Nullable FieldPermissionsCache fieldPermissionsCache) {
      List<IndicesPermission.Group> list = new ArrayList<>(indicesPrivileges.length);
      for (RoleDescriptor.IndicesPrivileges privilege : indicesPrivileges) {
         final FieldPermissions fieldPermissions;
         if (fieldPermissionsCache != null) {
           fieldPermissions = fieldPermissionsCache.getFieldPermissions(privilege.getGrantedFields(),
privilege.getDeniedFields());
         } else {
           fieldPermissions = new FieldPermissions(
                new FieldPermissionsDefinition(privilege.getGrantedFields(), privilege.getDeniedFields()));
```

```
}
```

```
final Set<BytesReference> query = privilege.getQuery() == null ? null :
```

```
Collections.singleton(privilege.getQuery());
```

```
list.add(new IndicesPermission.Group(IndexPrivilege.get(Sets.newHashSet(privilege.getPrivileges())), fieldPermissions,
```

```
query,
privilege.getIndices()));
```

```
}
return list;
```

```
}
}
}
```

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*/

package org.elasticsearch.xpack.core.security.authz.permission;

import org.apache.lucene.util.automaton.Automaton;
import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.common.cache.Cache;
import org.elasticsearch.common.cache.CacheBuilder;
import org.elasticsearch.common.settings.Setting;
import org.elasticsearch.common.settings.Setting.Property;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.xpack.core.security.authz.permission.FieldPermissionsDefinition.FieldGrantExcludeGroup;
import org.elasticsearch.xpack.core.security.support.Automatons;

import java.util.Collection; import java.util.List; import java.util.Optional; import java.util.Set; import java.util.concurrent.ExecutionException; import java.util.function.Predicate; import java.util.stream.Collectors;

import static org.elasticsearch.xpack.core.security.SecurityField.setting;

/**

* A service for managing the caching of {@link FieldPermissions} as these may often need to be combined or created and internally they

* use an {@link org.apache.lucene.util.automaton.Automaton}, which can be costly to create once you account for minimization

*/

public final class FieldPermissionsCache {

```
public static final Setting<Long> CACHE_SIZE_SETTING = Setting.longSetting(
```

setting("authz.store.roles.field_permissions.cache.max_size_in_bytes"), 100 * 1024 * 1024, -1L,

Property.NodeScope);

private final Cache<FieldPermissionsDefinition, FieldPermissions> cache;

```
public FieldPermissionsCache(Settings settings) {
```

```
this.cache = CacheBuilder.<FieldPermissionsDefinition, FieldPermissions>builder()
        .setMaximumWeight(CACHE_SIZE_SETTING.get(settings))
        .weigher((key, fieldPermissions) -> fieldPermissions.ramBytesUsed())
        .build();
}
```

/**

* Gets a {@link FieldPermissions} instance that corresponds to the granted and denied parameters. The instance may come from the cache

```
* or if it gets created, the instance will be cached
*/
FieldPermissions getFieldPermissions(String[] granted, String[] denied) {
```

return getFieldPermissions(new FieldPermissionsDefinition(granted, denied));

}

* Gets a {@link FieldPermissions} instance that corresponds to the granted and denied parameters. The instance may come from the cache

```
* or if it gets created, the instance will be cached
```

*/

public FieldPermissions getFieldPermissions(FieldPermissionsDefinition fieldPermissionsDefinition) {

try {

return cache.computeIfAbsent(fieldPermissionsDefinition,

(key) -> new FieldPermissions(key, FieldPermissions.initializePermittedFieldsAutomaton(key)));

} catch (ExecutionException e) {

throw new ElasticsearchException("unable to compute field permissions", e);

}

}

/**

* Returns a field permissions object that corresponds to the merging of the given field permissions and caches the instance if one was

```
* not found in the cache.
```

```
*/
```

FieldPermissions getFieldPermissions(Collection<FieldPermissions> fieldPermissionsCollection) {
 Optional<FieldPermissions> allowAllFieldPermissions = fieldPermissionsCollection.stream()

```
.filter(((Predicate<FieldPermissions>) (FieldPermissions::hasFieldLevelSecurity)).negate())
.findFirst();
```

```
return allowAllFieldPermissions.orElseGet(() -> {
```

final Set<FieldGrantExcludeGroup> fieldGrantExcludeGroups = fieldPermissionsCollection.stream()
 .flatMap(fieldPermission ->

```
fieldPermission.getFieldPermissionsDefinition().getFieldGrantExcludeGroups().stream())
.collect(Collectors.toSet());
```

 $final\ Field Permissions Definition\ combined = new\ Field Permissions Definition(field Grant Exclude Groups);$

```
try {
```

```
return cache.computeIfAbsent(combined, (key) -> {
```

List<Automaton> automatonList = fieldPermissionsCollection.stream()

.map(FieldPermissions::getIncludeAutomaton)

.collect(Collectors.toList());

return new FieldPermissions(key, Automatons.unionAndMinimize(automatonList));

```
});
```

} catch (ExecutionException e) {

throw new ElasticsearchException("unable to compute field permissions", e);

```
}
});
```

} } /*

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*/

package org.elasticsearch.xpack.core.security.authz.permission;

import org.apache.lucene.util.automaton.Automaton;
import org.apache.lucene.util.automaton.TooComplexToDeterminizeException;
import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.cluster.metadata.AliasOrIndex;
import org.elasticsearch.cluster.metadata.IndexMetaData;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.logging.Loggers;
import org.elasticsearch.xpack.core.security.authz.accesscontrol.IndicesAccessControl;
import org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege;

import java.util.ArrayList; import java.util.Arrays; import java.util.HashMap; import java.util.HashSet; import java.util.Iterator; import java.util.List; import java.util.Map; import java.util.Objects; import java.util.SottedMap; import java.util.SortedMap; import java.util.concurrent.ConcurrentHashMap; import java.util.function.Function; import java.util.function.Predicate;

import static java.util.Collections.unmodifiableMap; import static java.util.Collections.unmodifiableSet;

/**

* A permission that is based on privileges for index related actions executed
 * on specific indices
 */

public final class IndicesPermission implements Iterable<IndicesPermission.Group> {

public static final IndicesPermission NONE = new IndicesPermission();

private final Function<String, Predicate<String>> loadingFunction;

private final ConcurrentHashMap<String, Predicate<String>> allowedIndicesMatchersForAction = new ConcurrentHashMap<>();

public IndicesPermission(Group... groups) {
 this.groups = groups;
 loadingFunction = (action) -> {
 List<String> indices = new ArrayList<>();
 for (Group group : groups) {
 if (group.actionMatcher.test(action)) {
 indices.addAll(Arrays.asList(group.indices));
 }
 }
 return indexMatcher(indices);
 };
}

private final Group[] groups;

```
static Predicate<String> indexMatcher(List<String> indices) {
```

try {

return Automatons.predicate(indices);

```
} catch (TooComplexToDeterminizeException e) {
```

```
Loggers.getLogger(IndicesPermission.class).debug("Index pattern automaton [{}] is too complex", indices);
String description = Strings.collectionToCommaDelimitedString(indices);
```

```
if (description.length() > 80) {
```

```
description = Strings.cleanTruncate(description, 80) + "...";
```

}

throw new ElasticsearchSecurityException("The set of permitted index patterns [{}] is too complex to evaluate", e, description);

}
}
@Override
public Iterator<Group> iterator() {
 return Arrays.asList(groups).iterator();
}
public Group[] groups() {
 return groups;
}
/***
* @return A predicate that will match all the indices that this permission
* has the privilege for executing the given action on.
*/
public Predicate<String> allowedIndicesMatcher(String action) {

return allowedIndicesMatchersForAction.computeIfAbsent(action, loadingFunction);

}

/**

* Checks if the permission matches the provided action, without looking at indices.

* To be used in very specific cases where indices actions need to be authorized regardless of their indices.

* The usecase for this is composite actions that are initially only authorized based on the action name (indices are not

* checked on the coordinating node), and properly authorized later at the shard level checking their indices as well.

```
*/
```

public boolean check(String action) { for (Group group : groups) { if (group.check(action)) { return true; } } return false;

```
}
```

public Automaton allowedActionsMatcher(String index) {

```
List<Automaton> automatonList = new ArrayList<>();
for (Group group : groups) {
  if (group.indexNameMatcher.test(index)) {
     automatonList.add(group.privilege.getAutomaton());
  }
```

```
}
```

return automatonList.isEmpty() ? Automatons.EMPTY : Automatons.unionAndMinimize(automatonList); }

```
/**
```

* Authorizes the provided action against the provided indices, given the current cluster metadata */

public Map<String, IndicesAccessControl.IndexAccessControl> authorize(String action, Set<String> requestedIndicesOrAliases,

```
MetaData metaData, FieldPermissionsCache fieldPermissionsCache) {
```

// now... every index that is associated with the request, must be granted

// by at least one indices permission group

```
SortedMap<String, AliasOrIndex> allAliasesAndIndices = metaData.getAliasAndIndexLookup();
Map<String, Set<FieldPermissions>> fieldPermissionsByIndex = new HashMap<>();
Map<String, DocumentLevelPermissions> roleQueriesByIndex = new HashMap<>();
Map<String, Boolean> grantedBuilder = new HashMap<>();
```

```
for (String indexOrAlias : requestedIndicesOrAliases) {
  boolean granted = false;
  Set<String> concreteIndices = new HashSet<>();
  AliasOrIndex aliasOrIndex = allAliasesAndIndices.get(indexOrAlias);
```

```
if (aliasOrIndex != null) {
        for (IndexMetaData indexMetaData : aliasOrIndex.getIndices()) {
           concreteIndices.add(indexMetaData.getIndex().getName());
         }
      }
      for (Group group : groups) {
        if (group.check(action, indexOrAlias)) {
           granted = true;
           for (String index : concreteIndices) {
              Set<FieldPermissions> fieldPermissions = fieldPermissionsByIndex.computeIfAbsent(index, (k) ->
new HashSet<>());
              fieldPermissionsByIndex.put(indexOrAlias, fieldPermissions);
             fieldPermissions.add(group.getFieldPermissions());
             DocumentLevelPermissions permissions =
                  roleQueriesByIndex.computeIfAbsent(index, (k) -> new DocumentLevelPermissions());
             roleQueriesByIndex.putIfAbsent(indexOrAlias, permissions);
             if (group.hasQuery()) {
                permissions.addAll(group.getQuery());
              } else {
                // if more than one permission matches for a concrete index here and if
                // a single permission doesn't have a role query then DLS will not be
                // applied even when other permissions do have a role query
                permissions.setAllowAll(true);
              }
           }
         }
      }
      if (concreteIndices.isEmpty()) {
         grantedBuilder.put(indexOrAlias, granted);
      } else {
         grantedBuilder.put(indexOrAlias, granted);
        for (String concreteIndex : concreteIndices) {
           grantedBuilder.put(concreteIndex, granted);
         }
      }
    }
    Map<String, IndicesAccessControl.IndexAccessControl> indexPermissions = new HashMap<>();
    for (Map.Entry<String, Boolean> entry : grantedBuilder.entrySet()) {
      String index = entry.getKey();
      DocumentLevelPermissions permissions = roleQueriesByIndex.get(index);
      final Set<BytesReference>roleQueries;
      if (permissions != null && permissions.isAllowAll() == false) {
         roleQueries = unmodifiableSet(permissions.queries);
      } else {
         roleQueries = null;
```

```
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```

```
final FieldPermissions fieldPermissions;
      final Set<FieldPermissions> indexFieldPermissions = fieldPermissionsByIndex.get(index);
      if (indexFieldPermissions != null && indexFieldPermissions.isEmpty() == false) {
         fieldPermissions = indexFieldPermissions.size() == 1 ? indexFieldPermissions.iterator().next() :
              fieldPermissionsCache.getFieldPermissions(indexFieldPermissions);
      } else {
         fieldPermissions = FieldPermissions.DEFAULT;
      }
      indexPermissions.put(index, new IndicesAccessControl.IndexAccessControl(entry.getValue(),
fieldPermissions, roleQueries));
    }
    return unmodifiableMap(indexPermissions);
  }
 public static class Group {
    private final IndexPrivilege privilege;
    private final Predicate<String> actionMatcher;
    private final String[] indices;
    private final Predicate<String> indexNameMatcher;
    public FieldPermissions getFieldPermissions() {
      return fieldPermissions;
    }
    private final FieldPermissions fieldPermissions;
    private final Set<BytesReference>query;
    public Group(IndexPrivilege privilege, FieldPermissions fieldPermissions, @Nullable Set<BytesReference>
query, String... indices) {
      assert indices.length != 0;
      this.privilege = privilege;
      this.actionMatcher = privilege.predicate();
      this.indices = indices;
      this.indexNameMatcher = indexMatcher(Arrays.asList(indices));
      this.fieldPermissions = Objects.requireNonNull(fieldPermissions);
      this.query = query;
    }
```

```
public IndexPrivilege privilege() {
    return privilege;
}
public String[] indices() {
    return indices;
```

```
}
```

```
@Nullable
    public Set<BytesReference> getQuery() {
      return query;
    }
    private boolean check(String action) {
      return actionMatcher.test(action);
    }
    private boolean check(String action, String index) {
      assert index != null;
      return check(action) && indexNameMatcher.test(index);
    }
    boolean hasQuery() {
      return query != null;
    }
  }
 private static class DocumentLevelPermissions {
    private Set<BytesReference> queries = null;
    private boolean allowAll = false;
    private void addAll(Set<BytesReference> query) {
      if (allowAll == false) {
         if (queries == null) {
           queries = new HashSet<>();
         }
         queries.addAll(query);
      }
    }
    private boolean isAllowAll() {
      return allowAll;
    }
    private void setAllowAll(boolean allowAll) {
      this.allowAll = allowAll;
    }
  }
}
```

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```
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```

package org.elasticsearch.xpack.core.security.authz.permission;

/*

import org.apache.lucene.index.DirectoryReader;
import org.apache.lucene.util.Accountable;
import org.apache.lucene.util.RamUsageEstimator;
import org.apache.lucene.util.automaton.Automata;
import org.apache.lucene.util.automaton.Automaton;
import org.apache.lucene.util.automaton.CharacterRunAutomaton;
import org.apache.lucene.util.automaton.MinimizationOperations;
import org.apache.lucene.util.automaton.Operations;
import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.common.regex.Regex;
import org.elasticsearch.index.mapper.AllFieldMapper;
import org.elasticsearch.xpack.core.security.authz.permission.FieldPermissionsDefinition.FieldGrantExcludeGroup;
import org.elasticsearch.xpack.core.security.support.Automaton;

import java.io.IOException; import java.util.Arrays; import java.util.HashMap; import java.util.HashSet; import java.util.List; import java.util.Set; import java.util.stream.Collectors;

import static org.apache.lucene.util.automaton.Operations.subsetOf;

/**

* Stores patterns to fields which access is granted or denied to and maintains an automaton that can be used to check if permission is

* allowed for a specific field.

* Field permissions are configured via a list of strings that are patterns a field has to match. Two lists determine whether or

* not a field is granted access to:

* 1. It has to match the patterns in grantedFieldsArray

* 2. it must not match the patterns in deniedFieldsArray

*/

public final class FieldPermissions implements Accountable {

public static final FieldPermissions DEFAULT = new FieldPermissions();

private static final long BASE_FIELD_PERM_DEF_BYTES = RamUsageEstimator.shallowSizeOf(new FieldPermissionsDefinition(null, null));

private static final long BASE_FIELD_GROUP_BYTES = RamUsageEstimator.shallowSizeOf(new FieldGrantExcludeGroup(null, null));

private static final long BASE_HASHSET_SIZE = RamUsageEstimator.shallowSizeOfInstance(HashSet.class);
private static final long BASE_HASHSET_ENTRY_SIZE;
static {

HashMap<String, Object> map = new HashMap<>(); map.put(FieldPermissions.class.getName(), new Object()); long mapEntryShallowSize = RamUsageEstimator.shallowSizeOf(map.entrySet().iterator().next()); // assume a load factor of 50% // for each entry, we need two object refs, one for the entry itself // and one for the free space that is due to the fact hash tables can // not be fully loaded BASE_HASHSET_ENTRY_SIZE = mapEntryShallowSize + 2 * RamUsageEstimator.NUM_BYTES_OBJECT_REF; }

private final FieldPermissionsDefinition fieldPermissionsDefinition; // an automaton that represents a union of one more sets of permitted and denied fields private final CharacterRunAutomaton permittedFieldsAutomaton; private final boolean permittedFieldsAutomatonIsTotal; private final Automaton originalAutomaton;

private final long ramBytesUsed;

/** Constructor that does not enable field-level security: all fields are accepted. */ public FieldPermissions() {

this(new FieldPermissionsDefinition(null, null), Automatons.MATCH ALL);

}

```
/** Constructor that enables field-level security based on include/exclude rules. Exclude rules
* have precedence over include rules. */
```

public FieldPermissions(FieldPermissionsDefinition fieldPermissionsDefinition) {

this(fieldPermissionsDefinition, initializePermittedFieldsAutomaton(fieldPermissionsDefinition)); }

/** Constructor that enables field-level security based on include/exclude rules. Exclude rules

* have precedence over include rules. */

FieldPermissions(FieldPermissionsDefinition fieldPermissionsDefinition, Automaton permittedFieldsAutomaton) {

```
if (permittedFieldsAutomaton.isDeterministic() == false && permittedFieldsAutomaton.getNumStates() > 1) {
  // we only accept deterministic automata so that the CharacterRunAutomaton constructor
```

// directly wraps the provided automaton

throw new IllegalArgumentException("Only accepts deterministic automata");

}

```
this.fieldPermissionsDefinition = fieldPermissionsDefinition;
```

this.originalAutomaton = permittedFieldsAutomaton;

this.permittedFieldsAutomaton = new CharacterRunAutomaton(permittedFieldsAutomaton);

// we cache the result of isTotal since this might be a costly operation

this.permittedFieldsAutomatonIsTotal = Operations.isTotal(permittedFieldsAutomaton);

long ramBytesUsed = BASE_FIELD_PERM_DEF_BYTES;

for (FieldGrantExcludeGroup group : fieldPermissionsDefinition.getFieldGrantExcludeGroups()) {

```
ramBytesUsed += BASE_FIELD_GROUP_BYTES + BASE_HASHSET_ENTRY_SIZE;
      if (group.getGrantedFields() != null) {
        ramBytesUsed += RamUsageEstimator.shallowSizeOf(group.getGrantedFields());
      }
      if (group.getExcludedFields() != null) {
        ramBytesUsed += RamUsageEstimator.shallowSizeOf(group.getExcludedFields());
      }
    }
   ramBytesUsed += permittedFieldsAutomaton.ramBytesUsed();
   ramBytesUsed += runAutomatonRamBytesUsed(permittedFieldsAutomaton);
   this.ramBytesUsed = ramBytesUsed;
 }
 /**
  * Return an estimation of the ram bytes used by a {@link CharacterRunAutomaton}
  * that wraps the given automaton.
  */
 private static long runAutomatonRamBytesUsed(Automaton a) {
   return a.getNumStates() * 5; // wild guess, better than 0
 }
 public static Automaton initializePermittedFieldsAutomaton(FieldPermissionsDefinition
fieldPermissionsDefinition) {
   Set<FieldGrantExcludeGroup> groups = fieldPermissionsDefinition.getFieldGrantExcludeGroups();
   assert groups.size() > 0: "there must always be a single group for field inclusion/exclusion";
   List<Automaton> automatonList =
        groups.stream()
             .map(g -> FieldPermissions.initializePermittedFieldsAutomaton(g.getGrantedFields(),
g.getExcludedFields()))
             .collect(Collectors.toList());
   return Automatons.unionAndMinimize(automatonList);
 }
 private static Automaton initializePermittedFieldsAutomaton(final String[] grantedFields, final String[]
deniedFields) {
   Automaton grantedFieldsAutomaton;
   if (grantedFields == null || Arrays.stream(grantedFields).anyMatch(Regex::isMatchAllPattern)) {
      grantedFieldsAutomaton = Automatons.MATCH_ALL;
    } else {
      // an automaton that includes metadata fields, including join fields created by the _parent field such
      // as _parent#type
      Automaton metaFieldsAutomaton = Operations.concatenate(Automata.makeChar('_'),
Automata.makeAnyString());
      grantedFieldsAutomaton = Operations.union(Automatons.patterns(grantedFields), metaFieldsAutomaton);
    }
```

Automaton deniedFieldsAutomaton;

if (deniedFields == null \parallel deniedFields.length == 0) {

```
deniedFieldsAutomaton = Automatons.EMPTY;
    } else {
      deniedFieldsAutomaton = Automatons.patterns(deniedFields);
    }
   grantedFieldsAutomaton = MinimizationOperations.minimize(grantedFieldsAutomaton,
Operations.DEFAULT MAX DETERMINIZED STATES);
    deniedFieldsAutomaton = MinimizationOperations.minimize(deniedFieldsAutomaton,
Operations.DEFAULT_MAX_DETERMINIZED_STATES);
   if (subsetOf(deniedFieldsAutomaton, grantedFieldsAutomaton) == false) {
      throw new ElasticsearchSecurityException("Exceptions for field permissions must be a subset of the " +
           "granted fields but " + Strings.arrayToCommaDelimitedString(deniedFields) + " is not a subset of " +
           Strings.arrayToCommaDelimitedString(grantedFields));
    }
   if (!containsAllField(grantedFields) && !containsAllField(deniedFields)) {
      // It is not explicitly stated whether all should be allowed/denied
      // In that case we automatically disable _all, unless all fields would match
      if (Operations.isTotal(grantedFieldsAutomaton) && Operations.isEmpty(deniedFieldsAutomaton)) {
        // all fields are accepted, so using all is fine
      } else {
        deniedFieldsAutomaton = Operations.union(deniedFieldsAutomaton,
Automata.makeString(AllFieldMapper.NAME));
      }
    }
   grantedFieldsAutomaton = Automatons.minusAndMinimize(grantedFieldsAutomaton,
deniedFieldsAutomaton);
   return grantedFieldsAutomaton;
 }
 private static boolean containsAllField(String[] fields) {
   return fields != null && Arrays.stream(fields).anyMatch(AllFieldMapper.NAME::equals);
 }
 /**
  * Returns true if this field permission policy allows access to the field and false if not.
  * fieldName can be a wildcard.
  */
 public boolean grantsAccessTo(String fieldName) {
   return permittedFieldsAutomatonIsTotal || permittedFieldsAutomaton.run(fieldName);
 }
 FieldPermissionsDefinition getFieldPermissionsDefinition() {
    return fieldPermissionsDefinition;
 }
```

```
/** Return whether field-level security is enabled, ie. whether any field might be filtered out. */
 public boolean hasFieldLevelSecurity() {
    return permittedFieldsAutomatonIsTotal == false;
  }
 /** Return a wrapped reader that only exposes allowed fields. */
 public DirectoryReader filter(DirectoryReader reader) throws IOException {
    if (hasFieldLevelSecurity() == false) {
      return reader;
    }
    return FieldSubsetReader.wrap(reader, permittedFieldsAutomaton);
  }
 // for testing only
 Automaton getIncludeAutomaton() {
    return originalAutomaton;
  }
  @Override
 public boolean equals(Object o) {
    if (this == 0) return true;
    if (o == null || getClass() != o.getClass()) return false;
    FieldPermissions that = (FieldPermissions) o;
    if (permittedFieldsAutomatonIsTotal != that.permittedFieldsAutomatonIsTotal) return false;
    return fieldPermissionsDefinition != null ?
         fieldPermissionsDefinition.equals(that.fieldPermissionsDefinition) : that.fieldPermissionsDefinition ==
null;
  }
  @Override
 public int hashCode() {
    int result = fieldPermissionsDefinition != null ? fieldPermissionsDefinition.hashCode() : 0;
    result = 31 * result + (permittedFieldsAutomatonIsTotal ? 1 : 0);
    return result;
  }
  @Override
 public long ramBytesUsed() {
    return ramBytesUsed;
  }
}
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*/
```

package org.elasticsearch.xpack.core.security.authz.permission;

```
import org.elasticsearch.xpack.core.security.authz.privilege.ClusterPrivilege;
import java.util.function.Predicate;
/**
* A permission that is based on privileges for cluster wide actions
*/
public final class ClusterPermission {
 public static final ClusterPermission NONE = new ClusterPermission(ClusterPrivilege.NONE);
 private final ClusterPrivilege privilege;
 private final Predicate<String> predicate;
 ClusterPermission(ClusterPrivilege privilege) {
    this.privilege = privilege;
    this.predicate = privilege.predicate();
  }
 public ClusterPrivilege privilege() {
    return privilege;
  }
 public boolean check(String action) {
    return predicate.test(action);
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.xpack.core.security.authz.permission;
import java.util.Arrays;
import java.util.Collections;
import java.util.Set;
/**
* Represents the definition of a {@link FieldPermissions}. Field permissions are defined as a
* collections of grant and exclude definitions where the exclude definition must be a subset of
* the grant definition.
*/
public final class FieldPermissionsDefinition {
```

private final Set<FieldGrantExcludeGroup> fieldGrantExcludeGroups;

```
public FieldPermissionsDefinition(String[] grant, String[] exclude) {
  this(Collections.singleton(new FieldGrantExcludeGroup(grant, exclude)));
}
public FieldPermissionsDefinition(Set<FieldGrantExcludeGroup> fieldGrantExcludeGroups) {
  this.fieldGrantExcludeGroups = Collections.unmodifiableSet(fieldGrantExcludeGroups);
}
public Set<FieldGrantExcludeGroup> getFieldGrantExcludeGroups() {
  return fieldGrantExcludeGroups;
}
@Override
public boolean equals(Object o) {
  if (this == 0) return true;
  if (o == null || getClass() != o.getClass()) return false;
  FieldPermissionsDefinition that = (FieldPermissionsDefinition) o;
  return fieldGrantExcludeGroups != null ?
       fieldGrantExcludeGroups.equals(that.fieldGrantExcludeGroups):
       that.fieldGrantExcludeGroups == null;
}
@Override
public int hashCode() {
  return fieldGrantExcludeGroups != null ? fieldGrantExcludeGroups.hashCode() : 0;
}
public static final class FieldGrantExcludeGroup {
  private final String[] grantedFields;
  private final String[] excludedFields;
  public FieldGrantExcludeGroup(String[] grantedFields, String[] excludedFields) {
    this.grantedFields = grantedFields;
    this.excludedFields = excludedFields;
  }
  public String[] getGrantedFields() {
    return grantedFields;
  }
  public String[] getExcludedFields() {
    return excludedFields;
  }
  @Override
```

```
public boolean equals(Object o) {
      if (this == 0) return true;
      if (o == null || getClass() != o.getClass()) return false;
      FieldGrantExcludeGroup that = (FieldGrantExcludeGroup) o;
      if (!Arrays.equals(grantedFields, that.grantedFields)) return false;
      return Arrays.equals(excludedFields, that.excludedFields);
    }
    @Override
    public int hashCode() {
      int result = Arrays.hashCode(grantedFields);
      result = 31 * result + Arrays.hashCode(excludedFields);
      return result;
    }
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;
public class GetLicenseAction extends Action<GetLicenseRequest, GetLicenseResponse,
GetLicenseRequestBuilder> {
 public static final GetLicenseAction INSTANCE = new GetLicenseAction();
 public static final String NAME = "cluster:monitor/xpack/license/get";
 private GetLicenseAction() {
    super(NAME);
  }
  @Override
 public GetLicenseResponse newResponse() {
    return new GetLicenseResponse();
  }
  @Override
 public GetLicenseRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new GetLicenseRequestBuilder(client, this);
  }
}
```

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*/

package org.elasticsearch.license;

import org.elasticsearch.Version; import org.elasticsearch.cluster.AbstractNamedDiffable;

 $import\ org. elastic search. cluster. Mergable Custom Meta Data;$

import org.elasticsearch.cluster.NamedDiff;

import org.elasticsearch.cluster.metadata.MetaData;

 $import\ org. elastic search. common. Nullable;$

import org.elasticsearch.common.io.stream.StreamInput;

import org.elasticsearch.common.io.stream.StreamOutput;

 $import\ org. elastic search. common. x content. X Content Builder;$

 $import\ org. elastic search. common. x content. X Content Parser;$

import org.elasticsearch.license.License.OperationMode;

import org.elasticsearch.xpack.core.XPackPlugin;

import java.io.IOException; import java.util.EnumSet;

/**

* Contains metadata about registered licenses

*/

public class LicensesMetaData extends AbstractNamedDiffable<MetaData.Custom> implements XPackPlugin.XPackMetaDataCustom,

MergableCustomMetaData<LicensesMetaData> {

public static final String TYPE = "licenses";

/**

```
* When license is explicitly removed by a user, LICENSE_TOMBSTONE
```

* is used as a placeholder in the license metadata. This enables

* us to distinguish between the scenario when a cluster never

* had a license (null) and when a license was removed explicitly

* (LICENSE_TOMBSTONE).

* We rely on this to decide whether to generate a unsigned trial

* license or not. we should only generate a license if no license

* ever existed in the cluster state

*/

public static final License LICENSE_TOMBSTONE = License.builder()

```
.type("trial")
.issuer("elasticsearch")
.uid("TOMBSTONE")
.issuedTo("")
.maxNodes(0)
```

.issueDate(0) .expiryDate(0) .build();

private License license;

// This field describes the version of x-pack for which this cluster has exercised a trial. If the field // is null, then no trial has been exercised. We keep the version to leave open the possibility that we // may eventually allow a cluster to exercise a trial every time they upgrade to a new major version. @Nullable

private Version trialVersion;

```
LicensesMetaData(License license, Version trialVersion) {
  this.license = license;
  this.trialVersion = trialVersion;
}
public License getLicense() {
  return license;
}
boolean isEligibleForTrial() {
  if (trialVersion == null) {
     return true;
  }
  return Version.CURRENT.major > trialVersion.major;
}
Version getMostRecentTrialVersion() {
  return trialVersion;
}
@Override
public String toString() {
  return "LicensesMetaData{" +
       "license=" + license +
       ". trialVersion=" + trialVersion +
       '}';
}
@Override
public boolean equals(Object o) {
  if (this == o) return true;
  if (o == null || getClass() != o.getClass()) return false;
  LicensesMetaData that = (LicensesMetaData) o;
```

if (license != null ? !license.equals(that.license) : that.license != null) return false;

```
return trialVersion != null ? trialVersion.equals(that.trialVersion) : that.trialVersion == null;
}
@Override
public int hashCode() {
  int result = license != null ? license.hashCode() : 0;
  result = 31 * result + (trialVersion != null ? trialVersion.hashCode() : 0);
  return result;
}
@Override
public String getWriteableName() {
  return TYPE:
}
@Override
public Version getMinimalSupportedVersion() {
  return Version.CURRENT.minimumCompatibilityVersion();
}
@Override
public EnumSet<MetaData.XContentContext> context() {
  return EnumSet.of(MetaData.XContentContext.GATEWAY);
}
public static LicensesMetaData fromXContent(XContentParser parser) throws IOException {
  License license = LICENSE TOMBSTONE;
  Version trialLicense = null;
  XContentParser.Token token;
  while ((token = parser.nextToken()) != XContentParser.Token.END_OBJECT) {
    if (token == XContentParser.Token.FIELD_NAME) {
       String fieldName = parser.currentName();
       if (fieldName != null) {
         if (fieldName.equals(Fields.LICENSE)) {
            token = parser.nextToken();
           if (token == XContentParser.Token.START_OBJECT) {
              license = License.fromXContent(parser);
            } else if (token == XContentParser.Token.VALUE_NULL) {
              license = LICENSE_TOMBSTONE;
            }
         } else if (fieldName.equals(Fields.TRIAL_LICENSE)) {
            parser.nextToken();
            trialLicense = Version.fromString(parser.text());
         }
       }
    }
  }
```

```
return new LicensesMetaData(license, trialLicense);
```

```
}
```

@Override

```
public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
  if (license == LICENSE_TOMBSTONE) {
    builder.nullField(Fields.LICENSE);
  } else {
    builder.startObject(Fields.LICENSE);
    license.toInnerXContent(builder, params);
    builder.endObject();
  }
  if (trialVersion != null) {
    builder.field(Fields.TRIAL_LICENSE, trialVersion.toString());
  }
  return builder;
}
@Override
public void writeTo(StreamOutput streamOutput) throws IOException {
  if (license == LICENSE_TOMBSTONE) {
     streamOutput.writeBoolean(false); // no license
  } else {
    streamOutput.writeBoolean(true); // has a license
    license.writeTo(streamOutput);
  }
  if (streamOutput.getVersion().onOrAfter(Version.V_6_1_0)) {
    if (trialVersion == null) {
       streamOutput.writeBoolean(false);
     } else {
       streamOutput.writeBoolean(true);
       Version.writeVersion(trialVersion, streamOutput);
     }
  }
}
public LicensesMetaData(StreamInput streamInput) throws IOException {
  if (streamInput.readBoolean()) {
    license = License.readLicense(streamInput);
  } else {
     license = LICENSE_TOMBSTONE;
  }
  if (streamInput.getVersion().onOrAfter(Version.V_6_1_0)) {
    boolean hasExercisedTrial = streamInput.readBoolean();
    if (hasExercisedTrial) {
       this.trialVersion = Version.readVersion(streamInput);
     }
  }
```

}

```
public static NamedDiff<MetaData.Custom> readDiffFrom(StreamInput streamInput) throws IOException {
    return readDiffFrom(MetaData.Custom.class, TYPE, streamInput);
  }
 public static License extractLicense(LicensesMetaData licensesMetaData) {
    if (licensesMetaData != null) {
      License license = licensesMetaData.getLicense();
      if (license == LicensesMetaData.LICENSE_TOMBSTONE) {
         return null:
       } else {
         return license;
       }
    }
    return null;
  }
  @Override
 public LicensesMetaData merge(LicensesMetaData other) {
    if (other.license == null) {
      return this:
    } else if (license == null
         || OperationMode.compare(other.license.operationMode(), license.operationMode()) > 0) {
      return other;
    }
    return this;
  }
 private static final class Fields {
    private static final String LICENSE = "license";
    private static final String TRIAL_LICENSE = "trial_license";
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.action.RestToXContentListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;
```

import java.io.IOException;

import static org.elasticsearch.rest.RestRequest.Method.DELETE;

public class RestDeleteLicenseAction extends XPackRestHandler {
 public RestDeleteLicenseAction(Settings settings, RestController controller) {
 super(settings);
 // @deprecated Remove deprecations in 6.0
 controller.registerWithDeprecatedHandler(DELETE, URI_BASE + "/license", this,
 DELETE, "/_license", deprecationLogger);
 }
}

}

```
@Override
public String getName() {
    return "xpack_delete_license_action";
}
```

@Override

public RestChannelConsumer doPrepareRequest(final RestRequest request, final XPackClient client) throws IOException {

```
DeleteLicenseRequest deleteLicenseRequest = new DeleteLicenseRequest();
```

```
deleteLicenseRequest.timeout(request.paramAsTime("timeout", deleteLicenseRequest.timeout()));
```

```
deleteLicenseRequest.masterNodeTimeout(request.paramAsTime("master_timeout",
```

```
deleteLicenseRequest.masterNodeTimeout()));\\
```

```
return channel -> client.es().admin().cluster().execute(DeleteLicenseAction.INSTANCE, deleteLicenseRequest,
new RestToXContentListener<>(channel));
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.license;
public class PutLicenseAction extends Action<PutLicenseRequest, PutLicenseResponse,
PutLicenseRequestBuilder> {
```

```
public static final PutLicenseAction INSTANCE = new PutLicenseAction();
```

public static final String NAME = "cluster:admin/xpack/license/put";

```
private PutLicenseAction() {
    super(NAME);
  }
  @Override
 public PutLicenseResponse newResponse() {
    return new PutLicenseResponse();
  }
  @Override
 public PutLicenseRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new PutLicenseRequestBuilder(client, this);
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.MasterNodeReadRequest;
import org.elasticsearch.common.io.stream.StreamInput;
import java.io.IOException;
public class GetBasicStatusRequest extends MasterNodeReadRequest<GetBasicStatusRequest> {
 public GetBasicStatusRequest() {
  }
  @Override
 public ActionRequestValidationException validate() {
    return null;
  }
}
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*/
```

package org.elasticsearch.license;

import org.elasticsearch.action.Action; import org.elasticsearch.client.ElasticsearchClient; public class GetTrialStatusAction extends Action<GetTrialStatusRequest, GetTrialStatusResponse, GetTrialStatusRequestBuilder> {

```
public static final GetTrialStatusAction INSTANCE = new GetTrialStatusAction();
 public static final String NAME = "cluster:admin/xpack/license/trial_status";
 private GetTrialStatusAction() {
    super(NAME);
  }
  @Override
 public GetTrialStatusRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new GetTrialStatusRequestBuilder(client, this);
  }
  @Override
 public GetTrialStatusResponse newResponse() {
    return new GetTrialStatusResponse();
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeReadAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;
public class TransportGetBasicStatusAction extends TransportMasterNodeReadAction<GetBasicStatusRequest,
GetBasicStatusResponse> {
```

@Inject

public TransportGetBasicStatusAction(Settings settings, TransportService transportService, ClusterService clusterService,

ThreadPool threadPool, ActionFilters actionFilters,

```
IndexNameExpressionResolver indexNameExpressionResolver) {
   super(settings, GetBasicStatusAction.NAME, transportService, clusterService, threadPool, actionFilters,
         indexNameExpressionResolver, GetBasicStatusRequest::new);
 }
 @Override
 protected String executor() {
   return ThreadPool.Names.SAME;
 }
 @Override
 protected GetBasicStatusResponse newResponse() {
   return new GetBasicStatusResponse();
 }
 @Override
 protected void masterOperation(GetBasicStatusRequest request, ClusterState state,
                    ActionListener<GetBasicStatusResponse> listener) throws Exception {
   LicensesMetaData licensesMetaData = state.metaData().custom(LicensesMetaData.TYPE);
   if (licensesMetaData == null) {
      listener.onResponse(new GetBasicStatusResponse(true));
    } else {
      License license = licensesMetaData.getLicense();
      listener.onResponse(new GetBasicStatusResponse(license == null || license.type().equals("basic") == false));
    }
 }
 @Override
 protected ClusterBlockException checkBlock(GetBasicStatusRequest request, ClusterState state) {
   return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
 }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
```

import org.elasticsearch.common.inject.Inject; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.threadpool.ThreadPool; import org.elasticsearch.transport.TransportService;

public class TransportPostStartBasicAction extends TransportMasterNodeAction<PostStartBasicRequest,
PostStartBasicResponse> {

private final LicenseService licenseService;

@Inject

public TransportPostStartBasicAction(Settings settings, TransportService transportService, ClusterService clusterService,

LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters, IndexNameExpressionResolver indexNameExpressionResolver) {

super(settings, PostStartBasicAction.NAME, transportService, clusterService, threadPool, actionFilters, indexNameExpressionResolver, PostStartBasicRequest::new);

```
this.licenseService = licenseService;
```

```
}
```

```
@Override
```

protected String executor() {

```
return ThreadPool.Names.SAME;
```

```
}
```

```
@Override
```

```
protected PostStartBasicResponse newResponse() {
    return new PostStartBasicResponse();
```

```
}
```

```
@Override
```

```
protected void masterOperation(PostStartBasicRequest request, ClusterState state,
ActionListener<PostStartBasicResponse> listener) throws Exception {
    licenseService.startBasicLicense(request, listener);
```

```
}
```

```
@Override
```

```
protected ClusterBlockException checkBlock(PostStartBasicRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
    }
} /*
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*/
```

```
package org.elasticsearch.license;
```

import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.rest.BytesRestResponse; import org.elasticsearch.rest.RestController; import org.elasticsearch.rest.RestRequest; import org.elasticsearch.rest.RestResponse; import org.elasticsearch.rest.RestStatus; import org.elasticsearch.rest.action.RestBuilderListener; import org.elasticsearch.xpack.core.XPackClient; import org.elasticsearch.xpack.core.rest.XPackRestHandler;

import java.io.IOException;

import static org.elasticsearch.rest.RestRequest.Method.GET;

public class RestGetTrialStatus extends XPackRestHandler {

```
RestGetTrialStatus(Settings settings, RestController controller) {
    super(settings);
    controller.registerHandler(GET, URI_BASE + "/license/trial_status", this);
}
```

```
}
```

```
@Override
```

```
protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException {
```

```
return channel -> client.licensing().prepareGetStartTrial().execute(
```

```
new RestBuilderListener<GetTrialStatusResponse>(channel) {
  @Override
```

```
public RestResponse buildResponse(GetTrialStatusResponse response, XContentBuilder builder) throws
```

Exception {

```
builder.startObject();
builder.field("eligible_to_start_trial", response.isEligibleToStartTrial());
builder.endObject();
return new BytesRestResponse(RestStatus.OK, builder);
}
});
```

```
@Override
```

}

```
public String getName() {
    return "xpack_trial_status_action";
    }
}
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```

```
*/
```

package org.elasticsearch.license;

import org.elasticsearch.action.Action; import org.elasticsearch.client.ElasticsearchClient;

public class DeleteLicenseAction extends Action<DeleteLicenseRequest, DeleteLicenseResponse, DeleteLicenseRequestBuilder> {

```
public static final DeleteLicenseAction INSTANCE = new DeleteLicenseAction();
public static final String NAME = "cluster:admin/xpack/license/delete";
```

```
private DeleteLicenseAction() {
    super(NAME);
```

```
}
```

```
@Override
public DeleteLicenseResponse newResponse() {
    return new DeleteLicenseResponse();
```

```
}
```

```
@Override
```

```
public DeleteLicenseRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new DeleteLicenseRequestBuilder(client, this);
```

```
}
}
```

```
/*
```

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*/

package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestValidationException; import org.elasticsearch.action.support.master.MasterNodeReadRequest; import org.elasticsearch.common.io.stream.StreamInput;

```
import java.io.IOException;
```

public class GetTrialStatusRequest extends MasterNodeReadRequest<GetTrialStatusRequest> {

```
public GetTrialStatusRequest() {
        }
        @Override
        public ActionRequestValidationException validate() {
            return null;
        }
    }
}
```

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*/

package org.elasticsearch.license;

import org.apache.lucene.util.BytesRef; import org.apache.lucene.util.BytesRefIterator; import org.elasticsearch.common.bytes.BytesReference; import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.common.xcontent.XContentFactory; import org.elasticsearch.common.xcontent.XContentType; import org.elasticsearch.core.internal.io.Streams;

import java.io.ByteArrayOutputStream; import java.io.IOException; import java.io.InputStream; import java.nio.ByteBuffer; import java.security.InvalidKeyException; import java.security.NoSuchAlgorithmException; import java.security.Signature; import java.security.SignatureException; import java.util.Arrays; import java.util.Base64; import java.util.Collections;

/**

* Responsible for verifying signed licenses */ public class LicenseVerifier {

/**

```
* verifies the license content with the signature using the packaged
* public key
* @param license to verify
* @return true if valid, false otherwise
*/
public static boolean verifyLicense(final License license, byte[] encryptedPublicKeyData) {
    byte[] signedContent = null;
    byte[] signatureHash = null;
    try {
        byte[] signatureBytes = Base64.getDecoder().decode(license.signature());
        ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
        int version = byteBuffer.getInt();
        int magicLen = byteBuffer.getInt();
        byte[] magic = new byte[magicLen];
```

```
byteBuffer.get(magic);
      int hashLen = byteBuffer.getInt();
      signatureHash = new byte[hashLen];
      byteBuffer.get(signatureHash);
      int signedContentLen = byteBuffer.getInt();
      signedContent = new byte[signedContentLen];
      byteBuffer.get(signedContent);
      XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
      license.toXContent(contentBuilder, new
ToXContent.MapParams(Collections.singletonMap(License.LICENSE SPEC VIEW MODE, "true")));
      Signature rsa = Signature.getInstance("SHA512withRSA");
      rsa.initVerify(CryptUtils.readEncryptedPublicKey(encryptedPublicKeyData));
      BytesRefIterator iterator = BytesReference.bytes(contentBuilder).iterator();
      BytesRef ref;
      while((ref = iterator.next()) != null) {
         rsa.update(ref.bytes, ref.offset, ref.length);
      }
      return rsa.verify(signedContent)
           && Arrays.equals(Base64.getEncoder().encode(encryptedPublicKeyData), signatureHash);
    } catch (IOException | NoSuchAlgorithmException | SignatureException | InvalidKeyException e) {
      throw new IllegalStateException(e);
    } finally {
      Arrays.fill(encryptedPublicKeyData, (byte) 0);
      if (signedContent != null) {
         Arrays.fill(signedContent, (byte) 0);
      }
      if (signatureHash != null) {
         Arrays.fill(signatureHash, (byte) 0);
      }
    }
  }
 public static boolean verifyLicense(final License license) {
    final byte[] publicKeyBytes;
    try (InputStream is = LicenseVerifier.class.getResourceAsStream("/public.key")) {
      ByteArrayOutputStream out = new ByteArrayOutputStream();
      Streams.copy(is, out);
      publicKeyBytes = out.toByteArray();
    } catch (IOException ex) {
      throw new IllegalStateException(ex);
    }
    return verifyLicense(license, publicKeyBytes);
  }
}
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```

*/

package org.elasticsearch.license;

import org.apache.logging.log4j.Logger; import org.apache.logging.log4j.message.ParameterizedMessage; import org.elasticsearch.Version; import org.elasticsearch.action.ActionListener; import org.elasticsearch.cluster.ClusterState; import org.elasticsearch.cluster.ClusterStateUpdateTask; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.common.Nullable; import org.elasticsearch.xpack.core.XPackPlugin;

import java.time.Clock; import java.util.Collections; import java.util.Map; import java.util.UUID; import java.util.concurrent.atomic.AtomicReference;

public class StartBasicClusterTask extends ClusterStateUpdateTask {

private static final String ACKNOWLEDGEMENT_HEADER = "This license update requires acknowledgement. To acknowledge the license, " +

"please read the following messages and call /start_basic again, this time with the \"acknowledge=true\" parameter:";

private final Logger logger; private final String clusterName; private final PostStartBasicRequest request; private final ActionListener<PostStartBasicResponse> listener; private final Clock clock; private AtomicReference<Map<String, String[]>> ackMessages = new AtomicReference<>(Collections.emptyMap());

StartBasicClusterTask(Logger logger, String clusterName, Clock clock, PostStartBasicRequest request,

ActionListener<PostStartBasicResponse> listener) {

this.logger = logger; this.clusterName = clusterName; this.request = request; this.listener = listener; this.clock = clock;

}

@Override

public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
 LicensesMetaData oldLicensesMetaData = oldState.metaData().custom(LicensesMetaData.TYPE);
 logger.debug("license prior to starting basic license: {}", oldLicensesMetaData);
 License oldLicense = LicensesMetaData.extractLicense(oldLicensesMetaData);

```
Map<String, String[]> acknowledgeMessages = ackMessages.get();
   if (acknowledgeMessages.isEmpty() == false) {
      listener.onResponse(new
PostStartBasicResponse(PostStartBasicResponse.Status.NEED_ACKNOWLEDGEMENT, acknowledgeMessages,
           ACKNOWLEDGEMENT HEADER));
    } else if (oldLicense != null && oldLicense.type().equals("basic")) {
      listener.onResponse(new
PostStartBasicResponse(PostStartBasicResponse.Status.ALREADY_USING_BASIC));
    } else {
      listener.onResponse(new PostStartBasicResponse(PostStartBasicResponse.Status.GENERATED BASIC));
    }
 }
 @Override
 public ClusterState execute(ClusterState currentState) throws Exception {
   XPackPlugin.checkReadyForXPackCustomMetadata(currentState);
   LicensesMetaData licensesMetaData = currentState.metaData().custom(LicensesMetaData.TYPE);
   License currentLicense = LicensesMetaData.extractLicense(licensesMetaData);
   if (currentLicense == null || currentLicense.type().equals("basic") == false) {
      long issueDate = clock.millis();
      MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
      License.Builder specBuilder = License.builder()
           .uid(UUID.randomUUID().toString())
           .issuedTo(clusterName)
          .maxNodes(LicenseService.SELF_GENERATED_LICENSE_MAX_NODES)
           .issueDate(issueDate)
          .type("basic")
           .expiryDate(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS);
      License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder);
      if (request.isAcknowledged() == false && currentLicense != null) {
        Map<String, String[]> ackMessages = LicenseService.getAckMessages(selfGeneratedLicense,
currentLicense);
        if (ackMessages.isEmpty() == false) {
          this.ackMessages.set(ackMessages);
          return currentState:
        }
      }
      Version trialVersion = null;
      if (licensesMetaData != null) {
        trialVersion = licensesMetaData.getMostRecentTrialVersion();
      }
      LicensesMetaData newLicensesMetaData = new LicensesMetaData(selfGeneratedLicense, trialVersion);
      mdBuilder.putCustom(LicensesMetaData.TYPE, newLicensesMetaData);
      return ClusterState.builder(currentState).metaData(mdBuilder).build();
    } else {
      return currentState;
    }
 }
```

@Override

public void onFailure(String source, @Nullable Exception e) {
 logger.error(new ParameterizedMessage("unexpected failure during [{}]", source), e);
 listener.onFailure(e);
 }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;

import org.elasticsearch.common.Strings; import org.elasticsearch.common.logging.LoggerMessageFormat; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.license.License.OperationMode; import org.elasticsearch.xpack.core.XPackField; import org.elasticsearch.xpack.core.XPackSettings; import org.elasticsearch.xpack.core.monitoring.MonitoringField;

import java.util.Collections; import java.util.LinkedHashMap; import java.util.List; import java.util.Map; import java.util.Objects; import java.util.concurrent.CopyOnWriteArrayList; import java.util.function.BiFunction;

/**

* A holder for the current state of the license for all xpack features. */

```
public class XPackLicenseState {
```

```
/** Messages for each feature which are printed when the license expires. */
static final Map<String, String[]> EXPIRATION_MESSAGES;
static {
    Map<String, String[]> messages = new LinkedHashMap<>();
    messages.put(XPackField.SECURITY, new String[] {
        "Cluster health, cluster stats and indices stats operations are blocked",
        "All data operations (read and write) continue to work"
    });
    messages.put(XPackField.WATCHER, new String[] {
        "PUT / GET watch APIs are disabled, DELETE watch API continues to work",
        "Watches execute and write to the history",
        "The actions of the watches don't execute"
    });
```

```
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```

```
messages.put(XPackField.MONITORING, new String[] {
      "The agent will stop collecting cluster and indices metrics",
      "The agent will stop automatically cleaning indices older than [xpack.monitoring.history.duration]"
    });
   messages.put(XPackField.GRAPH, new String[] {
      "Graph explore APIs are disabled"
    });
   messages.put(XPackField.MACHINE_LEARNING, new String[] {
      "Machine learning APIs are disabled"
    });
   messages.put(XPackField.LOGSTASH, new String[] {
      "Logstash will continue to poll centrally-managed pipelines"
    });
   messages.put(XPackField.DEPRECATION, new String[] {
      "Deprecation APIs are disabled"
    });
   messages.put(XPackField.UPGRADE, new String[] {
      "Upgrade API is disabled"
    });
   messages.put(XPackField.SQL, new String[] {
      "SQL support is disabled"
    });
   messages.put(XPackField.ROLLUP, new String[] {
      "Creating and Starting rollup jobs will no longer be allowed.",
      "Stopping/Deleting existing jobs, RollupCaps API and RollupSearch continue to function."
    });
   EXPIRATION MESSAGES = Collections.unmodifiableMap(messages);
 }
 /**
  * Messages for each feature which are printed when the license type changes.
  * The value is a function taking the old and new license type, and returns the messages for that feature.
  */
 static final Map<String, BiFunction<OperationMode, OperationMode, String[]>>
ACKNOWLEDGMENT MESSAGES;
 static {
   Map<String, BiFunction<OperationMode, OperationMode, String[]>> messages = new LinkedHashMap<>();
   messages.put(XPackField.SECURITY, XPackLicenseState::securityAcknowledgementMessages);
   messages.put(XPackField.WATCHER, XPackLicenseState::watcherAcknowledgementMessages);
   messages.put(XPackField.MONITORING, XPackLicenseState::monitoringAcknowledgementMessages);
   messages.put(XPackField.GRAPH, XPackLicenseState::graphAcknowledgementMessages);
   messages.put(XPackField.MACHINE_LEARNING,
XPackLicenseState::machineLearningAcknowledgementMessages);
    messages.put(XPackField.LOGSTASH, XPackLicenseState::logstashAcknowledgementMessages);
   messages.put(XPackField.SQL, XPackLicenseState::sqlAcknowledgementMessages);
```

ACKNOWLEDGMENT_MESSAGES = Collections.unmodifiableMap(messages);

```
}
```

```
private static String[] securityAcknowledgementMessages(OperationMode currentMode, OperationMode
newMode) {
   switch (newMode) {
      case BASIC:
         switch (currentMode) {
           case TRIAL:
           case STANDARD:
           case GOLD:
           case PLATINUM:
             return new String[] {
                "The following X-Pack security functionality will be disabled: authentication, authorization, " +
                  "ip filtering, and auditing. Please restart your node after applying the license.",
                "Field and document level access control will be disabled.",
                "Custom realms will be ignored."
             };
         }
        break;
      case GOLD:
        switch (currentMode) {
           case BASIC:
           case STANDARD:
             // ^^ though technically it was already disabled, it's not bad to remind them
           case TRIAL:
           case PLATINUM:
             return new String[] {
                "Field and document level access control will be disabled.",
                "Custom realms will be ignored."
             };
         }
        break;
      case STANDARD:
         switch (currentMode) {
           case BASIC:
             // ^^ though technically it was already disabled, it's not bad to remind them
           case GOLD:
           case PLATINUM:
           case TRIAL:
             return new String[] {
                "Authentication will be limited to the native realms.",
                "IP filtering and auditing will be disabled.",
                "Field and document level access control will be disabled.",
                "Custom realms will be ignored."
             };
         }
    }
   return Strings.EMPTY_ARRAY;
 }
```

```
private static String[] watcherAcknowledgementMessages(OperationMode currentMode, OperationMode
newMode) {
   switch (newMode) {
      case BASIC:
        switch (currentMode) {
           case TRIAL:
          case STANDARD:
           case GOLD:
           case PLATINUM:
             return new String[] { "Watcher will be disabled" };
        }
        break;
    }
   return Strings.EMPTY_ARRAY;
 }
 private static String[] monitoringAcknowledgementMessages(OperationMode currentMode, OperationMode
newMode) {
   switch (newMode) {
      case BASIC:
        switch (currentMode) {
           case TRIAL:
          case STANDARD:
           case GOLD:
          case PLATINUM:
             return new String[] {
               LoggerMessageFormat.format(
                  "Multi-cluster support is disabled for clusters with [{}] license. If you are\n" +
                    "running multiple clusters, users won't be able to access the clusters with\n" +
                    "[{}] licenses from within a single X-Pack Kibana instance. You will have to deploy a\n" +
                    "separate and dedicated X-pack Kibana instance for each [{}] cluster you wish to monitor.",
                  newMode, newMode, newMode),
               LoggerMessageFormat.format(
                  "Automatic index cleanup is locked to {} days for clusters with [{}] license.",
                  MonitoringField.HISTORY_DURATION.getDefault(Settings.EMPTY).days(), newMode)
             };
        }
        break;
    }
```

```
return Strings.EMPTY_ARRAY;
```

```
}
```

{

private static String[] graphAcknowledgementMessages(OperationMode currentMode, OperationMode newMode)

```
switch (newMode) {
   case BASIC:
   case STANDARD:
   case GOLD:
```

```
switch (currentMode) {
    case TRIAL:
    case PLATINUM:
    return new String[] { "Graph will be disabled" };
    }
    break;
}
return Strings.EMPTY_ARRAY;
}
```

private static String[] machineLearningAcknowledgementMessages(OperationMode currentMode,
OperationMode newMode) {

```
switch (newMode) {
    case BASIC:
    case STANDARD:
    case GOLD:
        switch (currentMode) {
            case TRIAL:
            case PLATINUM:
            return new String[] { "Machine learning will be disabled" };
        }
        break;
    }
    return Strings.EMPTY_ARRAY;
```

```
}
```

private static String[] logstashAcknowledgementMessages(OperationMode currentMode, OperationMode
newMode) {

```
switch (newMode) {
    case BASIC:
        switch (currentMode) {
            case TRIAL:
            case STANDARD:
            case GOLD:
            case PLATINUM:
            return new String[] { "Logstash will no longer poll for centrally-managed pipelines" };
        }
        break;
    }
    return Strings.EMPTY_ARRAY;
}
private static String[] sqlAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
        switch (newMode) {
        }
    }
}
```

```
case BASIC:
case STANDARD:
case GOLD:
switch (currentMode) {
```

```
case TRIAL:
    case PLATINUM:
    return new String[] { "JDBC support will be disabled, but you can continue to use SQL CLI and
REST endpoint" };
    }
    break;
    }
    return Strings.EMPTY_ARRAY;
  }
  /** A wrapper for the license mode and state, to allow atomically swapping. */
  private static class Status {
```

/** The current "mode" of the license (ie license type). */ final OperationMode mode;

/** True if the license is active, or false if it is expired. */ final boolean active;

```
Status(OperationMode mode, boolean active) {
  this.mode = mode;
  this.active = active;
}
```

```
}
```

```
private volatile Status status = new Status(OperationMode.TRIAL, true);
private final List<Runnable> listeners = new CopyOnWriteArrayList<>();
private final boolean isSecurityEnabled;
private final boolean isSecurityExplicitlyEnabled;
```

```
public XPackLicenseState(Settings settings) {
    this.isSecurityEnabled = XPackSettings.SECURITY_ENABLED.get(settings);
    // 6.0+ requires TLS for production licenses, so if TLS is enabled and security is enabled
    // we can interpret this as an explicit enabling of security if the security enabled
    // setting is not explicitly set
    this.isSecurityExplicitlyEnabled = isSecurityEnabled &&
        (settings.hasValue(XPackSettings.SECURITY_ENABLED.getKey()) ||
XPackSettings.TRANSPORT_SSL_ENABLED.get(settings));
    }
    /** Updates the current state of the license, which will change what features are available. */
    void update(OperationMode mode, boolean active) {
        status = new Status(mode, active);
        listeners.forEach(Runnable::run);
    }
    /** Add a listener to be notified on license change */
```

```
public void addListener(Runnable runnable) {
```

```
listeners.add(Objects.requireNonNull(runnable));
 }
 /** Remove a listener */
 public void removeListener(Runnable runnable) {
   listeners.remove(runnable);
 }
 /** Return the current license type. */
 public OperationMode getOperationMode() {
   return status.mode;
 }
 /** Return true if the license is currently within its time boundaries, false otherwise. */
 public boolean isActive() {
   return status.active:
 }
 /**
  * @return true if authentication and authorization should be enabled. this does not indicate what realms are
available
  * @see #allowedRealmType() for the enabled realms
  */
 public boolean isAuthAllowed() {
   OperationMode mode = status.mode;
   return mode == OperationMode.STANDARD || mode == OperationMode.GOLD || mode ==
OperationMode.PLATINUM
      || mode == OperationMode.TRIAL;
 }
 /**
  * @return true if IP filtering should be enabled
  */
 public boolean isIpFilteringAllowed() {
   OperationMode mode = status.mode;
   return mode == OperationMode.GOLD || mode == OperationMode.PLATINUM
        || mode == OperationMode.TRIAL;
 }
 /**
  * @return true if auditing should be enabled
  */
 public boolean isAuditingAllowed() {
   OperationMode mode = status.mode;
   return mode == OperationMode.GOLD || mode == OperationMode.PLATINUM
        || mode == OperationMode.TRIAL;
 }
```

/**

* Indicates whether the stats and health API calls should be allowed. If a license is expired and past the grace * period then we deny these calls.

*

* @return true if the license allows for the stats and health APIs to be used.

*/

```
public boolean isStatsAndHealthAllowed() {
```

return status.active;

}

/**

* Determine if Document Level Security (DLS) and Field Level Security (FLS) should be enabled.

*

* DLS and FLS are only disabled when the mode is not:

*

* {@link OperationMode#PLATINUM}

```
* {@link OperationMode#TRIAL}
```

*

* Note: This does not consider the state of the license so that Security does not suddenly leak information!

* @return {@code true} to enable DLS and FLS. Otherwise {@code false}.

*/

*

public boolean isDocumentAndFieldLevelSecurityAllowed() {

```
OperationMode mode = status.mode;
```

```
return mode == OperationMode.TRIAL || mode == OperationMode.PLATINUM;
```

```
}
```

/** Classes of realms that may be available based on the license type. */

public enum AllowedRealmType {

```
NONE,
NATIVE,
DEFAULT,
ALL
```

}

/**
 * @return the type of realms that are enabled based on the license {@link OperationMode}

*/

```
public AllowedRealmType allowedRealmType() {
```

```
switch (status.mode) {
  case PLATINUM:
  case TRIAL:
    return AllowedRealmType.ALL;
```

```
case GOLD:
```

return AllowedRealmType.DEFAULT;

```
case STANDARD:
```

```
return AllowedRealmType.NATIVE;
```

```
default:
      return AllowedRealmType.NONE;
  }
}
/**
* @return whether custom role providers are allowed based on the license { @link OperationMode }
*/
public boolean isCustomRoleProvidersAllowed() {
  final Status localStatus = status;
  return (localStatus.mode == OperationMode.PLATINUM || localStatus.mode == OperationMode.TRIAL )
       && localStatus.active;
}
/**
* Determine if Watcher is available based on the current license.
* 
* Watcher is available if the license is active (hasn't expired) and of one of the following types:
* 
* {@link OperationMode#STANDARD}
* {@link OperationMode#PLATINUM}
* {@link OperationMode#GOLD}
* {@link OperationMode#TRIAL}
* 
*
* @return {@code true} as long as the license is valid. Otherwise {@code false}.
*/
public boolean isWatcherAllowed() {
  // status is volatile, so a local variable is used for a consistent view
  Status localStatus = status;
  if (localStatus.active == false) {
    return false;
  }
  switch (localStatus.mode) {
    case TRIAL:
    case GOLD:
    case PLATINUM:
    case STANDARD:
       return true;
    default:
       return false;
  }
}
/**
```

* Monitoring is always available as long as there is a valid license

```
*
  * @return true if the license is active
  */
 public boolean isMonitoringAllowed() {
   return status.active;
 }
 /**
  * Monitoring Cluster Alerts requires the equivalent license to use Watcher.
  *
  * @return { @link #isWatcherAllowed()}
  * @see #isWatcherAllowed()
  */
 public boolean isMonitoringClusterAlertsAllowed() {
   return isWatcherAllowed();
 }
 /**
  * Determine if the current license allows the retention of indices to be modified.
  * 
  * Only users with a non-{@link OperationMode#BASIC} license can update the retention period.
  * 
  * Note: This does not consider the <em>state</em> of the license so that any change is remembered for when
they fix their license.
  *
  * @return {@code true} if the user is allowed to modify the retention. Otherwise {@code false}.
  */
 public boolean isUpdateRetentionAllowed() {
   final OperationMode mode = status.mode;
   return mode != OperationMode.BASIC && mode != OperationMode.MISSING;
 }
 /**
  * Determine if Graph Exploration should be enabled.
  * 
  * Exploration is only disabled when the license has expired or if the mode is not:
  * 
  * {@link OperationMode#PLATINUM}
  * {@link OperationMode#TRIAL}
  * 
  * @return {@code true} as long as the license is valid. Otherwise {@code false}.
  */
 public boolean isGraphAllowed() {
   // status is volatile
```

```
Status localStatus = status;
OperationMode operationMode = localStatus.mode;
```

```
boolean licensed = operationMode == OperationMode.TRIAL || operationMode == OperationMode.PLATINUM;
```

```
return licensed && localStatus.active;
 }
 /**
  * Determine if Machine Learning should be enabled.
  * 
  * Machine Learning is only disabled when the license has expired or if the
  * mode is not:
  * 
  * {@link OperationMode#PLATINUM}
  * {@link OperationMode#TRIAL}
  * 
  *
  * @return {@code true} as long as the license is valid. Otherwise
        {@code false}.
  *
  */
 public boolean isMachineLearningAllowed() {
   // status is volatile
   Status localStatus = status:
   OperationMode operationMode = localStatus.mode;
   boolean licensed = operationMode == OperationMode.TRIAL || operationMode ==
OperationMode.PLATINUM;
   return licensed && localStatus.active;
 }
 /**
  * Rollup is always available as long as there is a valid license
  *
  * @return true if the license is active
  */
 public boolean isRollupAllowed() {
   return status.active;
 }
 /**
  * Logstash is allowed as long as there is an active license of type TRIAL, STANDARD, GOLD or PLATINUM
  * @return { @code true} as long as there is a valid license
  */
 public boolean isLogstashAllowed() {
   Status localStatus = status;
```

```
if (localStatus.active == false) {
  return false;
```

```
}
  switch (localStatus.mode) {
    case TRIAL:
    case GOLD:
    case PLATINUM:
    case STANDARD:
       return true:
    default:
       return false:
  }
}
/**
* Deprecation APIs are always allowed as long as there is an active license
* @return { @code true} as long as there is a valid license
*/
public boolean isDeprecationAllowed() {
  return status.active;
}
/**
* Determine if Upgrade API should be enabled.
* 
* Upgrade API is not available in for all license types except {@link OperationMode#MISSING}
* @return { @code true} as long as the license is valid. Otherwise
*
       {@code false}.
*/
public boolean isUpgradeAllowed() {
  // status is volatile
  Status localStatus = status;
  // Should work on all active licenses
  return localStatus.active;
}
/**
* Determine if SQL support should be enabled.
* 
* SQL is available for all license types except {@link OperationMode#MISSING}
*/
public boolean isSqlAllowed() {
  return status.active;
}
/**
* Determine if JDBC support should be enabled.
*
```

* JDBC is available only in for {@link OperationMode#PLATINUM} and {@link OperationMode#TRIAL} licences

```
*/
 public boolean isJdbcAllowed() {
   // status is volatile
   Status localStatus = status;
    OperationMode operationMode = localStatus.mode;
   boolean licensed = operationMode == OperationMode.TRIAL || operationMode ==
OperationMode.PLATINUM;
   return licensed && localStatus.active;
 }
 public boolean isTrialLicense() {
   return status.mode == OperationMode.TRIAL;
 }
 public boolean isSecurityAvailable() {
   OperationMode mode = status.mode;
   return mode == OperationMode.GOLD || mode == OperationMode.PLATINUM || mode ==
OperationMode.STANDARD ||
        mode == OperationMode.TRIAL;
 }
 public boolean isSecurityEnabled() {
    final OperationMode mode = status.mode;
   return mode == OperationMode.TRIAL ? isSecurityExplicitlyEnabled : isSecurityEnabled;
 }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import java.io.IOException;
public class DeleteLicenseResponse extends AcknowledgedResponse {
 DeleteLicenseResponse() {
 }
```

```
DeleteLicenseResponse(boolean acknowledged) {
    super(acknowledged);
  }
  @Override
 public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    readAcknowledged(in);
  }
  @Override
 public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    writeAcknowledged(out);
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
```

```
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.xcontent.XContentBuilder;
```

import java.io.IOException; import java.util.Collections; import java.util.HashMap; import java.util.Map;

public class PutLicenseResponse extends AcknowledgedResponse {

```
private LicensesStatus status;
private Map<String, String[]> acknowledgeMessages;
private String acknowledgeHeader;
```

```
PutLicenseResponse() {
}
```

```
public PutLicenseResponse(boolean acknowledged, LicensesStatus status) {
    this(acknowledged, status, null, Collections.<String, String[]>emptyMap());
}
```

```
public PutLicenseResponse(boolean acknowledged, LicensesStatus status, String acknowledgeHeader,
               Map<String, String[]> acknowledgeMessages) {
  super(acknowledged);
  this.status = status;
  this.acknowledgeHeader = acknowledgeHeader;
  this.acknowledgeMessages = acknowledgeMessages;
}
public LicensesStatus status() {
  return status:
}
public Map<String, String[]> acknowledgeMessages() {
  return acknowledgeMessages;
}
public String acknowledgeHeader() {
  return acknowledgeHeader;
}
@Override
public void readFrom(StreamInput in) throws IOException {
  super.readFrom(in);
  readAcknowledged(in);
  status = LicensesStatus.fromId(in.readVInt());
  acknowledgeHeader = in.readOptionalString();
  int size = in.readVInt();
  Map<String, String[]> acknowledgeMessages = new HashMap<>(size);
  for (int i = 0; i < size; i++) {
    String feature = in.readString();
    int nMessages = in.readVInt();
    String[] messages = new String[nMessages];
    for (int j = 0; j < nMessages; j++) {
       messages[j] = in.readString();
     }
    acknowledgeMessages.put(feature, messages);
  }
  this.acknowledgeMessages = acknowledgeMessages;
}
@Override
public void writeTo(StreamOutput out) throws IOException {
  super.writeTo(out);
  writeAcknowledged(out);
  out.writeVInt(status.id());
  out.writeOptionalString(acknowledgeHeader);
  out.writeVInt(acknowledgeMessages.size());
  for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
```

```
out.writeString(entry.getKey());
      out.writeVInt(entry.getValue().length);
      for (String message : entry.getValue()) {
         out.writeString(message);
      }
    }
  }
  @Override
 protected void addCustomFields(XContentBuilder builder, Params params) throws IOException {
    switch (status) {
      case VALID:
         builder.field("license_status", "valid");
         break;
      case INVALID:
         builder.field("license_status", "invalid");
        break;
      case EXPIRED:
         builder.field("license_status", "expired");
         break;
      default:
         throw new IllegalArgumentException("unknown status [" + status + "] found");
    }
    if (!acknowledgeMessages.isEmpty()) {
      builder.startObject("acknowledge");
      builder.field("message", acknowledgeHeader);
      for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
         builder.startArray(entry.getKey());
         for (String message : entry.getValue()) {
           builder.value(message);
         }
         builder.endArray();
      }
      builder.endObject();
    }
  }
  @Override
 public String toString() {
    return Strings.toString(this, true, true);
  }
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
```

import org.elasticsearch.action.ActionRequestBuilder; import org.elasticsearch.client.ElasticsearchClient;

```
class PostStartTrialRequestBuilder extends ActionRequestBuilder<PostStartTrialRequest,
    PostStartTrialResponse, PostStartTrialRequestBuilder> {
 PostStartTrialRequestBuilder(ElasticsearchClient client, PostStartTrialAction action) {
    super(client, action, new PostStartTrialRequest());
  }
 public PostStartTrialRequestBuilder setAcknowledge(boolean acknowledge) {
    request.acknowledge(acknowledge);
    return this;
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.action.ActionListener;
```

import org.elasticsearch.action.support.ActionFilters;

import org.elasticsearch.action.support.master.TransportMasterNodeAction;

import org.elasticsearch.cluster.service.ClusterService;

import org.elasticsearch.cluster.ClusterState;

import org.elasticsearch.cluster.ack.ClusterStateUpdateResponse;

import org.elasticsearch.cluster.block.ClusterBlockException;

import org.elasticsearch.cluster.block.ClusterBlockLevel;

import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;

import org.elasticsearch.common.inject.Inject;

import org.elasticsearch.common.settings.Settings;

import org.elasticsearch.threadpool.ThreadPool;

import org.elasticsearch.transport.TransportService;

public class TransportDeleteLicenseAction extends TransportMasterNodeAction<DeleteLicenseRequest, DeleteLicenseResponse> {

private final LicenseService licenseService;

@Inject

public TransportDeleteLicenseAction(Settings settings, TransportService transportService, ClusterService clusterService,

LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters, IndexNameExpressionResolver indexNameExpressionResolver) {

```
super(settings, DeleteLicenseAction.NAME, transportService, clusterService, threadPool, actionFilters,
         indexNameExpressionResolver, DeleteLicenseRequest::new);
    this.licenseService = licenseService;
  }
  @Override
 protected String executor() {
    return ThreadPool.Names.MANAGEMENT;
  }
  @Override
 protected DeleteLicenseResponse newResponse() {
    return new DeleteLicenseResponse();
  }
  @Override
 protected ClusterBlockException checkBlock(DeleteLicenseRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
  }
  @Override
 protected void masterOperation(final DeleteLicenseRequest request, ClusterState state, final
ActionListener<DeleteLicenseResponse>
      listener) throws ElasticsearchException {
    licenseService.removeLicense(request, new ActionListener<ClusterStateUpdateResponse>() {
       @Override
      public void onResponse(ClusterStateUpdateResponse clusterStateUpdateResponse) {
         listener.onResponse(new DeleteLicenseResponse(clusterStateUpdateResponse.isAcknowledged()));
      }
       @Override
      public void onFailure(Exception e) {
        listener.onFailure(e);
      }
    });
  }
}
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*/
package org.elasticsearch.license;
import org.apache.logging.log4j.Logger;
```

```
import org.apache.logging.log4j.message.ParameterizedMessage;
import org.apache.logging.log4j.util.Supplier;
```

import org.apache.lucene.util.BytesRef; import org.elasticsearch.common.bytes.BytesReference; import org.elasticsearch.license.License.OperationMode; import org.elasticsearch.watcher.FileChangesListener; import org.elasticsearch.watcher.FileWatcher; import org.elasticsearch.watcher.ResourceWatcherService;

import java.io.IOException; import java.nio.charset.StandardCharsets; import java.nio.file.Files; import java.nio.file.Path; import java.util.concurrent.atomic.AtomicBoolean;

/**

```
* File based watcher for license { @link OperationMode}
* Watches for changes in <code>licenseModePath</code>, use
* {@link #getCurrentOperationMode()} to access the latest mode
* In case of failure to read a valid operation mode from <code>licenseModePath</code>,
* the operation mode will default to PLATINUM
*/
public final class OperationModeFileWatcher implements FileChangesListener {
 private final ResourceWatcherService resourceWatcherService;
 private final Path licenseModePath;
 private final AtomicBoolean initialized = new AtomicBoolean();
 private final OperationMode defaultOperationMode = OperationMode.PLATINUM;
 private volatile OperationMode currentOperationMode = defaultOperationMode;
 private final Logger logger;
 private final Runnable onChange;
 public OperationModeFileWatcher(ResourceWatcherService resourceWatcherService, Path licenseModePath,
                    Logger logger, Runnable onChange) {
    this.resourceWatcherService = resourceWatcherService;
    this.licenseModePath = licenseModePath:
   this.logger = logger;
   this.onChange = onChange;
 }
 public void init() {
    if (initialized.compareAndSet(false, true)) {
      final FileWatcher watcher = new FileWatcher(licenseModePath);
      watcher.addListener(this);
      try {
        resourceWatcherService.add(watcher, ResourceWatcherService.Frequency.HIGH);
        if (Files.exists(licenseModePath)) {
           onChange(licenseModePath);
         }
      } catch (IOException e) {
```

```
logger.error("couldn't initialize watching license mode file", e);
     }
  }
}
/**
* Returns the current operation mode based on license mode file.
* Defaults to {@link OperationMode#PLATINUM}
*/
public OperationMode getCurrentOperationMode() {
  return currentOperationMode;
}
@Override
public void onFileInit(Path file) {
  onChange(file);
}
@Override
public void onFileCreated(Path file) {
  onChange(file);
}
@Override
public void onFileDeleted(Path file) {
  onChange(file);
}
@Override
public void onFileChanged(Path file) {
  onChange(file);
}
private synchronized void onChange(Path file) {
  if (file.equals(licenseModePath)) {
    OperationMode newOperationMode = defaultOperationMode;
    try {
       if (Files.exists(licenseModePath)
            && Files.isReadable(licenseModePath)) {
         final byte[] content;
         try {
            content = Files.readAllBytes(licenseModePath);
          } catch (IOException e) {
            logger.error(
                 (Supplier<?>) () -> new ParameterizedMessage(
                      "couldn't read operation mode from [{}]", licenseModePath.toAbsolutePath()), e);
            return;
         }
```

```
// this UTF-8 conversion is much pickier than java String
           final String operationMode = new BytesRef(content).utf8ToString();
           try {
              newOperationMode = OperationMode.resolve(operationMode);
            } catch (IllegalArgumentException e) {
              logger.error(
                   (Supplier<?>) () -> new ParameterizedMessage(
                        "invalid operation mode in [{}]", licenseModePath.toAbsolutePath()), e);
              return;
           }
         }
       } finally {
         // set this after the fact to prevent that we are jumping back and forth first setting to defautl and then
reading the
         // actual op mode resetting it.
         this.currentOperationMode = newOperationMode;
       }
      onChange.run();
    }
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;
class GetTrialStatusRequestBuilder extends ActionRequestBuilder<GetTrialStatusRequest,
    GetTrialStatusResponse, GetTrialStatusRequestBuilder> {
 GetTrialStatusRequestBuilder(ElasticsearchClient client, GetTrialStatusAction action) {
    super(client, action, new GetTrialStatusRequest());
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.ValidateActions;
```

```
import org.elasticsearch.action.support.master.AcknowledgedRequest;
```

import org.elasticsearch.common.bytes.BytesReference; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput; import org.elasticsearch.common.xcontent.XContentType;

import java.io.IOException;

```
public class PutLicenseRequest extends AcknowledgedRequest<PutLicenseRequest> {
```

```
private License license;
private boolean acknowledge = false;
public PutLicenseRequest() {
}
@Override
public ActionRequestValidationException validate() {
  return (license == null) ? ValidateActions.addValidationError("license is missing", null) : null;
}
/**
* Parses license from json format to an instance of {@link License}
*
* @param licenseDefinition licenses definition
* @param xContentType the content type of the license
*/
public PutLicenseRequest license(BytesReference licenseDefinition, XContentType xContentType) {
  try {
     return license(License.fromSource(licenseDefinition, xContentType));
  } catch (IOException e) {
     throw new IllegalArgumentException("failed to parse license source", e);
  }
}
public PutLicenseRequest license(License license) {
  this.license = license:
  return this;
}
public License license() {
  return license:
}
public PutLicenseRequest acknowledge(boolean acknowledge) {
  this.acknowledge = acknowledge;
  return this;
```

```
}
```

```
public boolean acknowledged() {
    return acknowledge;
  }
  @Override
 public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    license = License.readLicense(in);
    acknowledge = in.readBoolean();
  }
  @Override
 public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    license.writeTo(out):
    out.writeBoolean(acknowledge);
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
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*/
package org.elasticsearch.license;
```

```
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.xcontent.LoggingDeprecationHandler;
import org.elasticsearch.common.xcontent.NamedXContentRegistry;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.common.xcontent.XContentParser;
```

import java.io.IOException; import java.nio.ByteBuffer; import java.util.Base64; import java.util.Collections;

import static org.elasticsearch.license.CryptUtils.decrypt; import static org.elasticsearch.license.CryptUtils.encrypt;

```
class SelfGeneratedLicense {
```

```
public static License create(License.Builder specBuilder) {
   License spec = specBuilder
   .issuer("elasticsearch")
```

```
.version(License.VERSION_CURRENT)
        .build();
    final String signature;
   try {
      XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
      spec.toXContent(contentBuilder, new
ToXContent.MapParams(Collections.singletonMap(License.LICENSE SPEC VIEW MODE, "true")));
      byte[] encrypt = encrypt(BytesReference.toBytes(BytesReference.bytes(contentBuilder)));
      byte[] bytes = new byte[4 + 4 + encrypt.length];
      ByteBuffer byteBuffer = ByteBuffer.wrap(bytes);
      // always generate license version -VERSION_CURRENT
      byteBuffer.putInt(-License.VERSION_CURRENT)
           .putInt(encrypt.length)
           .put(encrypt);
      signature = Base64.getEncoder().encodeToString(bytes);
    } catch (IOException e) {
      throw new IllegalStateException(e);
    }
   return License.builder().fromLicenseSpec(spec, signature).build();
 }
 public static boolean verify(final License license) {
   try {
      byte[] signatureBytes = Base64.getDecoder().decode(license.signature());
      ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
      int version = byteBuffer.getInt();
      int contentLen = byteBuffer.getInt();
      byte[] content = new byte[contentLen];
      byteBuffer.get(content);
      final License expectedLicense;
      // EMPTY is safe here because we don't call namedObject
      try (XContentParser parser = XContentFactory.xContent(XContentType.JSON)
           .createParser(NamedXContentRegistry.EMPTY, LoggingDeprecationHandler.INSTANCE,
decrypt(content))) {
        parser.nextToken();
        expectedLicense = License.builder().fromLicenseSpec(License.fromXContent(parser),
             license.signature()).version(-version).build();
      }
      return license.equals(expectedLicense);
    } catch (IOException e) {
      throw new IllegalStateException(e);
    }
 }
 public static boolean validSelfGeneratedType(String type) {
    return "basic".equals(type) || "trial".equals(type);
 }
}
```

/*

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*/

```
package org.elasticsearch.license;
```

import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.rest.BytesRestResponse; import org.elasticsearch.rest.RestController; import org.elasticsearch.rest.RestRequest; import org.elasticsearch.rest.RestResponse; import org.elasticsearch.rest.action.RestBuilderListener; import org.elasticsearch.xpack.core.XPackClient; import org.elasticsearch.xpack.core.rest.XPackRestHandler;

import java.io.IOException; import java.util.Map;

import static org.elasticsearch.rest.RestRequest.Method.POST;

```
public class RestPostStartTrialLicense extends XPackRestHandler {
```

```
RestPostStartTrialLicense(Settings settings, RestController controller) {
  super(settings);
  controller.registerHandler(POST, URI BASE + "/license/start trial", this);
}
```

```
@Override
```

```
protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException
```

{

```
PostStartTrialRequest startTrialRequest = new PostStartTrialRequest();
    startTrialRequest.setType(request.param("type", "trial"));
    startTrialRequest.acknowledge(request.paramAsBoolean("acknowledge", false));
    return channel -> client.licensing().postStartTrial(startTrialRequest,
         new RestBuilderListener<PostStartTrialResponse>(channel) {
           @Override
           public RestResponse buildResponse(PostStartTrialResponse response, XContentBuilder builder) throws
Exception {
              PostStartTrialResponse.Status status = response.getStatus();
              builder.startObject();
              builder.field("acknowledged", startTrialRequest.isAcknowledged());
              if (status.isTrialStarted()) {
                builder.field("trial_was_started", true);
                builder.field("type", startTrialRequest.getType());
              } else {
                builder.field("trial_was_started", false);
```

```
builder.field("error_message", status.getErrorMessage());
              }
              Map<String, String[]> acknowledgementMessages = response.getAcknowledgementMessages();
              if (acknowledgementMessages.isEmpty() == false) {
                builder.startObject("acknowledge");
                builder.field("message", response.getAcknowledgementMessage());
                for (Map.Entry<String, String[]> entry : acknowledgementMessages.entrySet()) {
                  builder.startArray(entry.getKey());
                   for (String message : entry.getValue()) {
                     builder.value(message);
                   }
                   builder.endArray();
                }
                builder.endObject();
              }
              builder.endObject();
              return new BytesRestResponse(status.getRestStatus(), builder);
           }
         });
  }
  @Override
 public String getName() {
    return "xpack_upgrade_to_trial_action";
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeReadAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;
```

public class TransportGetLicenseAction extends TransportMasterNodeReadAction<GetLicenseRequest,
GetLicenseResponse> {

private final LicenseService licenseService;

```
@Inject
```

public TransportGetLicenseAction(Settings settings, TransportService transportService, ClusterService clusterService,

LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters, IndexNameExpressionResolver indexNameExpressionResolver) {

super(settings, GetLicenseAction.NAME, transportService, clusterService, threadPool, actionFilters, indexNameExpressionResolver,

```
GetLicenseRequest::new);
this.licenseService = licenseService;
}
```

```
@Override
```

protected String executor() {

return ThreadPool.Names.MANAGEMENT;

```
}
```

```
@Override
```

```
protected GetLicenseResponse newResponse() {
  return new GetLicenseResponse();
```

```
}
```

@Override

```
protected ClusterBlockException checkBlock(GetLicenseRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
}
```

```
@Override
```

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*/

package org.elasticsearch.license;

import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.rest.BytesRestResponse; import org.elasticsearch.rest.RestController; import org.elasticsearch.rest.RestRequest; import org.elasticsearch.rest.RestResponse; import org.elasticsearch.rest.action.RestBuilderListener; import org.elasticsearch.xpack.core.XPackClient; import org.elasticsearch.xpack.core.rest.XPackRestHandler;

import java.io.IOException;

import static org.elasticsearch.rest.RestRequest.Method.POST;

```
public class RestPostStartBasicLicense extends XPackRestHandler {
```

```
RestPostStartBasicLicense(Settings settings, RestController controller) {
    super(settings);
    controller.registerHandler(POST, URI_BASE + "/license/start_basic", this);
}
```

@Override

protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException {

```
PostStartBasicRequest startBasicRequest = new PostStartBasicRequest();
```

startBasicRequest.acknowledge (request.paramAsBoolean ("acknowledge", false));

startBasicRequest.timeout(request.paramAsTime("timeout", startBasicRequest.timeout()));

startBasicRequest.masterNodeTimeout(request.paramAsTime("master_timeout",

```
startBasicRequest.masterNodeTimeout()));
```

return channel -> client.licensing().postStartBasic(startBasicRequest, new

RestBuilderListener<PostStartBasicResponse>(channel) {

@Override

```
public RestResponse buildResponse(PostStartBasicResponse response, XContentBuilder builder) throws
Exception {
```

```
PostStartBasicResponse.Status status = response.getStatus();
```

```
response.toXContent(builder, ToXContent.EMPTY_PARAMS);
```

```
return new BytesRestResponse(status.getRestStatus(), builder);
```

```
}
```

```
});
}
```

@Override

```
public String getName() {
    return "xpack_start_basic_action";
    }
}
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```

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```

*/

package org.elasticsearch.license;

import java.io.IOException; import java.io.InputStream; import java.nio.ByteBuffer; import java.util.ArrayList; import java.util.Base64; import java.util.Comparator; import java.util.List; import java.util.Locale;

import org.apache.lucene.util.CollectionUtil; import org.elasticsearch.ElasticsearchException; import org.elasticsearch.ElasticsearchParseException; import org.elasticsearch.common.Strings; import org.elasticsearch.common.bytes.BytesReference; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput; import org.elasticsearch.common.xcontent.LoggingDeprecationHandler; import org.elasticsearch.common.xcontent.NamedXContentRegistry; import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.ToXContentObject; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.common.xcontent.XContentFactory; import org.elasticsearch.common.xcontent.XContentParser; import org.elasticsearch.common.xcontent.XContentType;

/**

* Data structure for license. Use {@link Builder} to build a license. * Provides serialization/deserialization & validation methods for license object */ public class License implements ToXContentObject { public static final int VERSION START = 1; public static final int VERSION NO FEATURE TYPE = 2; public static final int VERSION_START_DATE = 3;

public static final int VERSION_CURRENT = VERSION_START_DATE;

/**

p

*/

* XContent param name to deserialize license(s) with
* an additional <code>status</code> field, indicating whether a
* particular license is 'active' or 'expired' and no signature
* and in a human readable format
*/
public static final String REST_VIEW_MODE = "rest_view";
**
* XContent param name to deserialize license(s) with
* no signature

public static final String LICENSE_SPEC_VIEW_MODE = "license_spec_view";
/**

* XContent param name to deserialize licenses according

* to a specific license version

*/

public static final String LICENSE_VERSION_MODE = "license_version";

public static final Comparator<License> LATEST_ISSUE_DATE_FIRST = Comparator.comparing(License::issueDate).reversed();

private final int version; private final String uid; private final String issuer; private final String issuedTo; private final long issueDate; private final String type; private final String subscriptionType; private final String feature; private final String signature; private final long expiryDate; private final long startDate; private final int maxNodes; private final OperationMode operationMode;

/**

* Decouples operation mode of a license from the license type value.

*

* Note: The mode indicates features that should be made available, but it does not indicate whether the license is active!

*

* The id byte is used for ordering operation modes (used for merging license md in tribe node) */

```
public enum OperationMode {
```

```
MISSING((byte) 0),
TRIAL((byte) 1),
BASIC((byte) 2),
STANDARD((byte) 3),
GOLD((byte) 4),
PLATINUM((byte) 5);
```

```
private final byte id;
```

```
OperationMode(byte id) {
    this.id = id;
```

}

*/

/** Returns non-zero positive number when <code>opMode1</code> is greater than <code>opMode2</code>

```
public static int compare(OperationMode opMode1, OperationMode opMode2) {
      return Integer.compare(opMode1.id, opMode2.id);
    }
   public static OperationMode resolve(String type) {
      switch (type.toLowerCase(Locale.ROOT)) {
        case "missing":
           return MISSING;
         case "trial":
        case "none": // bwc for 1.x subscription type field
        case "dev": // bwc for 1.x subscription_type field
        case "development": // bwc for 1.x subscription_type field
           return TRIAL:
        case "basic":
           return BASIC;
        case "standard":
           return STANDARD;
         case "silver":
        case "gold":
           return GOLD;
         case "platinum":
        case "cloud_internal":
        case "internal": // bwc for 1.x subscription_type field
           return PLATINUM;
        default:
           throw new IllegalArgumentException("unknown type [" + type + "]");
      }
    }
 }
 private License(int version, String uid, String issuer, String issuedTo, long issueDate, String type,
           String subscriptionType, String feature, String signature, long expiryDate, int maxNodes, long startDate)
{
   this.version = version:
   this.uid = uid;
   this.issuer = issuer;
   this.issuedTo = issuedTo:
   this.issueDate = issueDate;
   this.type = type;
   this.subscriptionType = subscriptionType;
   this.feature = feature;
   this.signature = signature;
   // We will validate that only a basic license can have the
BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS
   // in the validate() method.
   if (expiryDate == -1) {
      this.expiryDate = LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
```

```
} else {
```

```
this.expiryDate = expiryDate;
  }
  this.maxNodes = maxNodes;
  this.startDate = startDate;
  if (version == VERSION_START) {
     // in 1.x: the acceptable values for 'subscription_type': none | dev | silver | gold | platinum
     this.operationMode = OperationMode.resolve(subscriptionType);
  } else {
     // in 2.x: the acceptable values for 'type': trial | basic | silver | dev | gold | platinum
     this.operationMode = OperationMode.resolve(type);
  }
  validate();
}
/**
* @return version of the license
*/
public int version() {
  return version;
}
/**
* @return a unique identifier for a license
*/
public String uid() {
  return uid;
}
/**
* @return type of the license [trial, subscription, internal]
*/
public String type() {
  return type;
}
/**
* @return the issueDate in milliseconds
*/
public long issueDate() {
  return issueDate;
}
/**
* @return the startDate in milliseconds
*/
public long startDate() {
  return startDate;
}
```

```
/**
* @return the expiry date in milliseconds
*/
public long expiryDate() {
  return expiryDate;
}
/**
* @return the maximum number of nodes this license has been issued for
*/
public int maxNodes() {
  return maxNodes:
}
/**
* @return a string representing the entity this licenses has been issued to
*/
public String issuedTo() {
  return issuedTo;
}
/**
* @return a string representing the entity responsible for issuing this license (internal)
*/
public String issuer() {
  return issuer;
}
/**
* @return a string representing the signature of the license used for license verification
*/
public String signature() {
  return signature;
}
/**
* @return the operation mode of the license as computed from the license type or from
* the license mode file
*/
public OperationMode operationMode() {
  synchronized (this) {
    if (canReadOperationModeFromFile() && operationModeFileWatcher != null) {
       return operationModeFileWatcher.getCurrentOperationMode();
     }
  }
  return operationMode;
}
```

```
private boolean canReadOperationModeFromFile() {
```

```
return type.equals("cloud_internal");
```

```
}
```

 $private \ volatile \ Operation ModeFile Watcher \ operation ModeFile Watcher;$

/**

* Sets the operation mode file watcher for the license and initializes the

```
\ast file watcher when the license type allows to override operation mode from file \ast/
```

public synchronized void setOperationModeFileWatcher(final OperationModeFileWatcher) {

```
this.operationModeFileWatcher = operationModeFileWatcher;
  if (canReadOperationModeFromFile()) {
    this.operationModeFileWatcher.init();
  }
}
/**
* Removes operation mode file watcher, so unused license objects can be gc'ed
*/
public synchronized void removeOperationModeFileWatcher() {
  this.operationModeFileWatcher = null;
}
/**
* @return the current license's status
*/
public Status status() {
  long now = System.currentTimeMillis();
  if (issueDate > now) {
    return Status.INVALID;
  } else if (expiryDate < now) {
    return Status.EXPIRED;
  }
  return Status.ACTIVE;
}
private void validate() {
  if (issuer == null) {
     throw new IllegalStateException("issuer can not be null");
  } else if (issuedTo == null) {
    throw new IllegalStateException("issuedTo can not be null");
  } else if (issueDate == -1) {
     throw new IllegalStateException("issueDate has to be set");
  else if (type == null) 
    throw new IllegalStateException("type can not be null");
```

```
} else if (subscriptionType == null && version == VERSION_START) {
      throw new IllegalStateException("subscriptionType can not be null");
    } else if (uid == null) {
      throw new IllegalStateException("uid can not be null");
    } else if (feature == null && version == VERSION_START) {
      throw new IllegalStateException("feature can not be null");
    } else if (maxNodes == -1) {
      throw new IllegalStateException("maxNodes has to be set");
    } else if (expiryDate == -1) {
      throw new IllegalStateException("expiryDate has to be set");
    } else if (expiryDate == LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS
&& "basic".equals(type) == false) {
      throw new IllegalStateException("only basic licenses are allowed to have no expiration");
    }
 }
 public static License readLicense(StreamInput in) throws IOException {
   int version = in.readVInt(); // Version for future extensibility
   if (version > VERSION_CURRENT) {
      throw new ElasticsearchException("Unknown license version found, please upgrade all nodes to the latest
elasticsearch-license" +
           " plugin");
    }
   Builder builder = builder();
   builder.version(version);
   builder.uid(in.readString());
   builder.type(in.readString());
   if (version == VERSION_START) {
      builder.subscriptionType(in.readString());
    }
   builder.issueDate(in.readLong());
   if (version == VERSION START) {
      builder.feature(in.readString());
    }
   builder.expiryDate(in.readLong());
   builder.maxNodes(in.readInt());
   builder.issuedTo(in.readString());
   builder.issuer(in.readString());
   builder.signature(in.readOptionalString());
   if (version >= VERSION_START_DATE) {
      builder.startDate(in.readLong());
    }
   return builder.build();
 }
 public void writeTo(StreamOutput out) throws IOException {
    out.writeVInt(version);
   out.writeString(uid);
```

```
out.writeString(type);
   if (version == VERSION_START) {
      out.writeString(subscriptionType);
    }
   out.writeLong(issueDate);
   if (version == VERSION_START) {
      out.writeString(feature);
    }
   out.writeLong(expiryDate);
   out.writeInt(maxNodes);
   out.writeString(issuedTo);
   out.writeString(issuer);
   out.writeOptionalString(signature);
   if (version >= VERSION_START_DATE) {
      out.writeLong(startDate);
    }
  }
  @Override
 public String toString() {
   try {
      final XContentBuilder builder = XContentFactory.jsonBuilder();
      toXContent(builder, ToXContent.EMPTY_PARAMS);
      return Strings.toString(builder);
    } catch (IOException e) {
      return "";
    }
  }
  @Override
 public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
   builder.startObject();
   toInnerXContent(builder, params);
   builder.endObject();
   return builder;
  }
 public XContentBuilder toInnerXContent(XContentBuilder builder, Params params) throws IOException {
   boolean licenseSpecMode = params.paramAsBoolean(LICENSE_SPEC_VIEW_MODE, false);
   boolean restViewMode = params.paramAsBoolean(REST_VIEW_MODE, false);
   boolean previouslyHumanReadable = builder.humanReadable();
   if (licenseSpecMode && restViewMode) {
      throw new IllegalArgumentException("can have either " + REST_VIEW_MODE + " or " +
LICENSE_SPEC_VIEW_MODE);
    } else if (restViewMode) {
      if (!previouslyHumanReadable) {
        builder.humanReadable(true);
      }
```

```
}
  final int version;
  if (params.param(LICENSE_VERSION_MODE) != null && restViewMode) {
    version = Integer.parseInt(params.param(LICENSE_VERSION_MODE));
  } else {
    version = this.version;
  }
  if (restViewMode) {
    builder.field(Fields.STATUS, status().label());
  }
  builder.field(Fields.UID, uid);
  builder.field(Fields.TYPE, type);
  if (version == VERSION START) {
    builder.field(Fields.SUBSCRIPTION_TYPE, subscriptionType);
  }
  builder.timeField(Fields.ISSUE_DATE_IN_MILLIS, Fields.ISSUE_DATE, issueDate);
  if (version == VERSION_START) {
    builder.field(Fields.FEATURE, feature);
  }
  if (expiryDate != LicenseService.BASIC SELF GENERATED LICENSE EXPIRATION MILLIS) {
    builder.timeField(Fields.EXPIRY_DATE_IN_MILLIS, Fields.EXPIRY_DATE, expiryDate);
  }
  builder.field(Fields.MAX NODES, maxNodes);
  builder.field(Fields.ISSUED_TO, issuedTo);
  builder.field(Fields.ISSUER, issuer);
  if (!licenseSpecMode && !restViewMode && signature != null) {
    builder.field(Fields.SIGNATURE, signature);
  }
  if (restViewMode) {
    builder.humanReadable(previouslyHumanReadable);
  }
  if (version >= VERSION_START_DATE) {
    builder.timeField(Fields.START_DATE_IN_MILLIS, Fields.START_DATE, startDate);
  }
  return builder;
public static License fromXContent(XContentParser parser) throws IOException {
  Builder builder = new Builder();
  XContentParser.Token token;
  while ((token = parser.nextToken()) != XContentParser.Token.END_OBJECT) {
    if (token == XContentParser.Token.FIELD_NAME) {
       String currentFieldName = parser.currentName();
       token = parser.nextToken();
      if (token.isValue()) {
         if (Fields.UID.equals(currentFieldName)) {
           builder.uid(parser.text());
```

```
} else if (Fields.TYPE.equals(currentFieldName)) {
          builder.type(parser.text());
       } else if (Fields.SUBSCRIPTION_TYPE.equals(currentFieldName)) {
          builder.subscriptionType(parser.text());
       } else if (Fields.ISSUE_DATE.equals(currentFieldName)) {
          builder.issueDate(parseDate(parser, "issue", false));
       } else if (Fields.ISSUE DATE IN MILLIS.equals(currentFieldName)) {
          builder.issueDate(parser.longValue());
       } else if (Fields.FEATURE.equals(currentFieldName)) {
          builder.feature(parser.text());
       } else if (Fields.EXPIRY_DATE.equals(currentFieldName)) {
          builder.expiryDate(parseDate(parser, "expiration", true));
       } else if (Fields.EXPIRY DATE IN MILLIS.equals(currentFieldName)) {
          builder.expiryDate(parser.longValue());
       } else if (Fields.START_DATE.equals(currentFieldName)) {
          builder.startDate(parseDate(parser, "start", false));
       } else if (Fields.START_DATE_IN_MILLIS.equals(currentFieldName)) {
          builder.startDate(parser.longValue());
       } else if (Fields.MAX_NODES.equals(currentFieldName)) {
          builder.maxNodes(parser.intValue());
       } else if (Fields.ISSUED TO.equals(currentFieldName)) {
          builder.issuedTo(parser.text());
       } else if (Fields.ISSUER.equals(currentFieldName)) {
          builder.issuer(parser.text());
       } else if (Fields.SIGNATURE.equals(currentFieldName)) {
          builder.signature(parser.text());
       } else if (Fields.VERSION.equals(currentFieldName)) {
          builder.version(parser.intValue());
       }
       // Ignore unknown elements - might be new version of license
     } else if (token == XContentParser.Token.START_ARRAY) {
       // It was probably created by newer version - ignoring
       parser.skipChildren();
     } else if (token == XContentParser.Token.START OBJECT) {
       // It was probably created by newer version - ignoring
       parser.skipChildren();
     }
// not a license spec
if (builder.signature != null) {
  byte[] signatureBytes = Base64.getDecoder().decode(builder.signature);
  ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
  int version = byteBuffer.getInt();
  // we take the absolute version, because negative versions
  // mean that the license was generated by the cluster (see TrialLicense)
  // and positive version means that the license was signed
  if (version < 0) {
```

} }

```
version *=-1;
      }
      if (version == 0) {
         throw new ElasticsearchException("malformed signature for license [" + builder.uid + "]");
      } else if (version > VERSION CURRENT) {
         throw new ElasticsearchException("Unknown license version found, please upgrade all nodes to the latest
" +
              "elasticsearch-license plugin");
      }
      // signature version is the source of truth
      builder.version(version);
    }
    return builder.build();
  }
  /**
  * Returns true if the license was auto-generated (by license plugin),
  * false otherwise
  */
 public static boolean isAutoGeneratedLicense(String signature) {
    try {
      byte[] signatureBytes = Base64.getDecoder().decode(signature);
      ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
      return byteBuffer.getInt() < 0;
    } catch (IllegalArgumentException e) {
      throw new IllegalStateException(e);
    }
  }
 public static License fromSource(BytesReference bytes, XContentType xContentType) throws IOException {
    if (bytes == null \parallel bytes.length() == 0) {
      throw new ElasticsearchParseException("failed to parse license - no content provided");
    }
    if (xContentType == null) {
      throw new ElasticsearchParseException("failed to parse license - no content-type provided");
    }
    // EMPTY is safe here because we don't call namedObject
    try (InputStream byteStream = bytes.streamInput();
       XContentParser parser = xContentType.xContent()
         .createParser(NamedXContentRegistry.EMPTY, LoggingDeprecationHandler.INSTANCE, byteStream))
    {
      License license = null;
      if (parser.nextToken() == XContentParser.Token.START_OBJECT) {
         if (parser.nextToken() == XContentParser.Token.FIELD_NAME) {
           String currentFieldName = parser.currentName();
           if (Fields.LICENSES.equals(currentFieldName)) {
              final List<License> pre20Licenses = new ArrayList<>();
              if (parser.nextToken() == XContentParser.Token.START_ARRAY) {
```

```
while (parser.nextToken() != XContentParser.Token.END_ARRAY) {
                 pre20Licenses.add(License.fromXContent(parser));
               }
               // take the latest issued unexpired license
               CollectionUtil.timSort(pre20Licenses, LATEST_ISSUE_DATE_FIRST);
               long now = System.currentTimeMillis();
               for (License oldLicense : pre20Licenses) {
                 if (oldLicense.expiryDate() > now) {
                    license = oldLicense;
                    break:
                  }
               }
               if (license == null && !pre20Licenses.isEmpty()) {
                 license = pre20Licenses.get(0);
               }
            } else {
               throw new ElasticsearchParseException("failed to parse licenses expected an array of licenses");
            }
          } else if (Fields.LICENSE.equals(currentFieldName)) {
            license = License.fromXContent(parser);
          }
          // Ignore all other fields - might be created with new version
       } else {
          throw new ElasticsearchParseException("failed to parse licenses expected field");
       }
     } else {
       throw new ElasticsearchParseException("failed to parse licenses expected start object");
     }
     return license;
  }
@Override
public boolean equals(Object o) {
  if (this == 0) return true;
  if (o == null || getClass() != o.getClass()) return false;
  License license = (License) o;
  if (issueDate != license.issueDate) return false;
  if (expiryDate != license.expiryDate) return false;
  if (startDate!= license.startDate) return false;
  if (maxNodes != license.maxNodes) return false;
  if (version != license.version) return false;
  if (uid != null ? !uid.equals(license.uid) : license.uid != null) return false;
  if (issuer != null ? !issuer.equals(license.issuer) : license.issuer != null) return false;
  if (issuedTo != null ? !issuedTo.equals(license.issuedTo) : license.issuedTo != null) return false;
  if (type != null ? !type.equals(license.type) : license.type != null) return false;
```

if (subscriptionType != null ? !subscriptionType.equals(license.subscriptionType) : license.subscriptionType != null)

```
return false;
```

if (feature != null ? !feature.equals(license.feature) : license.feature != null) return false; return !(signature != null ? !signature.equals(license.signature) : license.signature != null);

}

```
@Override
public int hashCode() {
  int result = uid != null ? uid.hashCode() : 0;
  result = 31 * result + (issuer != null ? issuer.hashCode() : 0);
  result = 31 * result + (issuedTo != null ? issuedTo.hashCode() : 0);
  result = 31 * result + (int) (issueDate ^ (issueDate >>> 32));
  result = 31 * result + (type != null ? type.hashCode() : 0);
  result = 31 * result + (subscriptionType != null ? subscriptionType.hashCode() : 0);
  result = 31 * result + (feature != null ? feature.hashCode() : 0);
  result = 31 * result + (signature != null ? signature.hashCode() : 0);
  result = 31 * result + (int) (expiryDate ^ (expiryDate >>> 32));
  result = 31 * result + (int) (startDate ^ (startDate>>> 32));
  result = 31 * result + maxNodes;
  result = 31 * result + version:
  return result;
}
```

```
public static final class Fields {
  public static final String STATUS = "status";
  public static final String UID = "uid";
  public static final String TYPE = "type";
  public static final String SUBSCRIPTION_TYPE = "subscription_type";
  public static final String ISSUE_DATE_IN_MILLIS = "issue_date_in_millis";
  public static final String ISSUE DATE = "issue date";
  public static final String FEATURE = "feature";
  public static final String EXPIRY_DATE_IN_MILLIS = "expiry_date_in_millis";
  public static final String EXPIRY_DATE = "expiry_date";
  public static final String START_DATE_IN_MILLIS = "start_date_in_millis";
  public static final String START_DATE = "start_date";
  public static final String MAX_NODES = "max_nodes";
  public static final String ISSUED_TO = "issued_to";
  public static final String ISSUER = "issuer";
  public static final String VERSION = "version";
  public static final String SIGNATURE = "signature";
```

public static final String LICENSES = "licenses"; public static final String LICENSE = "license";

```
private static long parseDate(XContentParser parser, String description, boolean endOfTheDay) throws IOException {
```

```
if (parser.currentToken() == XContentParser.Token.VALUE_NUMBER) {
     return parser.longValue();
  } else {
     try {
       if (endOfTheDay) {
          return DateUtils.endOfTheDay(parser.text());
       } else {
          return DateUtils.beginningOfTheDay(parser.text());
       }
     } catch (IllegalArgumentException ex) {
       throw new ElasticsearchParseException("invalid " + description + " date format " + parser.text());
     }
  }
}
public static Builder builder() {
  return new Builder();
}
public static class Builder {
  private int version = License.VERSION_CURRENT;
  private String uid;
  private String issuer;
  private String issuedTo;
  private long issueDate = -1;
  private String type;
  private String subscriptionType;
  private String feature;
  private String signature;
  private long expiryDate = -1;
  private long startDate = -1;
  private int maxNodes = -1;
  public Builder uid(String uid) {
     this.uid = uid;
     return this;
  }
  public Builder version(int version) {
     this.version = version;
     return this;
  }
  public Builder issuer(String issuer) {
     this.issuer = issuer;
     return this;
```

```
}
public Builder issuedTo(String issuedTo) {
  this.issuedTo = issuedTo;
  return this;
}
public Builder issueDate(long issueDate) {
  this.issueDate = issueDate;
  return this:
}
public Builder type(String type) {
  this.type = type;
  return this;
}
public Builder subscriptionType(String subscriptionType) {
  this.subscriptionType = subscriptionType;
  return this;
}
public Builder feature(String feature) {
  this.feature = feature;
  return this;
}
public Builder expiryDate(long expiryDate) {
  this.expiryDate = expiryDate;
  return this;
}
public Builder maxNodes(int maxNodes) {
  this.maxNodes = maxNodes;
  return this;
}
public Builder signature(String signature) {
  if (signature != null) {
     this.signature = signature;
  }
  return this:
}
public Builder startDate(long startDate) {
  this.startDate = startDate;
  return this;
}
```

```
public Builder fromLicenseSpec(License license, String signature) {
  return uid(license.uid())
       .version(license.version())
       .issuedTo(license.issuedTo())
       .issueDate(license.issueDate())
       .startDate(license.startDate())
       .type(license.type())
       .subscriptionType(license.subscriptionType)
       .feature(license.feature)
       .maxNodes(license.maxNodes())
       .expiryDate(license.expiryDate())
       .issuer(license.issuer())
       .signature(signature);
}
/**
* Returns a builder that converts pre 2.0 licenses
* to the new license format
*/
public Builder fromPre20LicenseSpec(License pre20License) {
  return uid(pre20License.uid())
       .issuedTo(pre20License.issuedTo())
       .issueDate(pre20License.issueDate())
       .maxNodes(pre20License.maxNodes())
       .expiryDate(pre20License.expiryDate());
}
public License build() {
  return new License(version, uid, issuer, issuedTo, issueDate, type,
       subscriptionType, feature, signature, expiryDate, maxNodes, startDate);
}
public Builder validate() {
  if (issuer == null) {
     throw new IllegalStateException("issuer can not be null");
  } else if (issuedTo == null) {
     throw new IllegalStateException("issuedTo can not be null");
   } else if (issueDate == -1) {
     throw new IllegalStateException("issueDate has to be set");
   else if (type == null) 
     throw new IllegalStateException("type can not be null");
   else if (uid == null) 
     throw new IllegalStateException("uid can not be null");
   } else if (signature == null) {
     throw new IllegalStateException("signature can not be null");
   } else if (maxNodes == -1) {
     throw new IllegalStateException("maxNodes has to be set");
```

```
} else if (expiryDate == -1) {
       throw new IllegalStateException("expiryDate has to be set");
     }
    return this;
  }
}
public enum Status {
  ACTIVE("active"),
  INVALID("invalid"),
  EXPIRED("expired");
  private final String label;
  Status(String label) {
     this.label = label;
  }
  public String label() {
     return label;
  }
  public void writeTo(StreamOutput out) throws IOException {
     out.writeString(label);
  }
  public static Status readFrom(StreamInput in) throws IOException {
    String value = in.readString();
    switch (value) {
       case "active":
```

throw new IllegalArgumentException("unknown license status [" + value + "]");

```
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```

* Returns <code>true</code> iff the license is a production license

return ACTIVE;

return INVALID;

return EXPIRED;

public boolean isProductionLicense() {

switch (operationMode()) {
 case MISSING:

case "invalid":

case "expired":

default:

} } }

/**

*/

```
case TRIAL:
case BASIC:
    return false;
case STANDARD:
case GOLD:
case PLATINUM:
    return true;
default:
    throw new AssertionError("unknown operation mode: " + operationMode());
}
```

```
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
```

```
package org.elasticsearch.license;
```

import org.elasticsearch.common.settings.Settings; import org.elasticsearch.rest.RestController; import org.elasticsearch.rest.RestRequest; import org.elasticsearch.rest.action.RestToXContentListener; import org.elasticsearch.xpack.core.XPackClient; import org.elasticsearch.xpack.core.rest.XPackRestHandler;

import java.io.IOException;

```
import static org.elasticsearch.rest.RestRequest.Method.POST;
import static org.elasticsearch.rest.RestRequest.Method.PUT;
```

```
public class RestPutLicenseAction extends XPackRestHandler {
    public RestPutLicenseAction(Settings settings, RestController controller) {
        super(settings);
        // @deprecated Remove deprecations in 6.0
        controller.registerWithDeprecatedHandler(POST, URI_BASE + "/license", this,
            POST, "/_license", deprecationLogger);
        controller.registerWithDeprecatedHandler(PUT, URI_BASE + "/license", this,
            PUT, "/_license", deprecationLogger);
        // Remove _licenses support entirely in 6.0
        controller.registerAsDeprecatedHandler(POST, "/_licenses", this,
            "[POST /_licenses] is deprecated! Use " +
            "[POST /_xpack/license] instead.",
            deprecationLogger);
        controller.registerAsDeprecatedHandler(PUT, "/_licenses", this,
            "[PUT /_licenses] is deprecated! Use " +
            "[PUT /_licenses] is deprecated! Use " +
```

"[PUT /_xpack/license] instead.", deprecationLogger);

```
}
 @Override
 public String getName() {
   return "xpack put license action";
 }
 @Override
 public RestChannelConsumer doPrepareRequest(final RestRequest request, final XPackClient client) throws
IOException {
    if (request.hasContent() == false) {
      throw new IllegalArgumentException("The license must be provided in the request body");
    }
   PutLicenseRequest putLicenseRequest = new PutLicenseRequest();
   putLicenseRequest.license(request.content(), request.getXContentType());
   putLicenseRequest.acknowledge(request.paramAsBoolean("acknowledge", false));
   putLicenseRequest.timeout(request.paramAsTime("timeout", putLicenseRequest.timeout()));
   putLicenseRequest.masterNodeTimeout(request.paramAsTime("master_timeout",
putLicenseRequest.masterNodeTimeout()));
   if ("basic".equals(putLicenseRequest.license().type())) {
      throw new IllegalArgumentException("Installing basic licenses is no longer allowed. Use the POST " +
           "/_xpack/license/start_basic API to install a basic license that does not expire.");
    }
   return channel -> client.es().admin().cluster().execute(PutLicenseAction.INSTANCE, putLicenseRequest,
         new RestToXContentListener<>(channel));
 }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import java.io.IOException;
public class GetLicenseResponse extends ActionResponse {
 private License license;
```

```
GetLicenseResponse() {
  }
 GetLicenseResponse(License license) {
    this.license = license;
  }
 public License license() {
    return license;
  }
  @Override
 public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    if (in.readBoolean()) {
      license = License.readLicense(in);
    }
  }
  @Override
 public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    if (license == null) {
      out.writeBoolean(false);
    } else {
      out.writeBoolean(true);
      license.writeTo(out);
    }
  }
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.support.master.MasterNodeReadOperationRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;
public class GetLicenseRequestBuilder extends MasterNodeReadOperationRequestBuilder<GetLicenseRequest,
GetLicenseResponse,
    GetLicenseRequestBuilder> {
 public GetLicenseRequestBuilder(ElasticsearchClient client) {
    this(client, GetLicenseAction.INSTANCE);
```

```
}
```

```
/**
  * Creates new get licenses request builder
  *
  * @param client elasticsearch client
  */
 public GetLicenseRequestBuilder(ElasticsearchClient client, GetLicenseAction action) {
    super(client, action, new GetLicenseRequest());
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.MasterNodeReadRequest;
public class GetLicenseRequest extends MasterNodeReadRequest<GetLicenseRequest> {
 public GetLicenseRequest() {
  }
  @Override
 public ActionRequestValidationException validate() {
    return null:
  }
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
```

* you may not use this file except in compliance with the Elastic License.

*/

package org.elasticsearch.license;

```
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
```

import org.elasticsearch.threadpool.ThreadPool; import org.elasticsearch.transport.TransportService;

public class TransportPostStartTrialAction extends TransportMasterNodeAction<PostStartTrialRequest, PostStartTrialResponse> {

private final LicenseService licenseService;

@Inject

public TransportPostStartTrialAction(Settings settings, TransportService transportService, ClusterService clusterService,

LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters, IndexNameExpressionResolver indexNameExpressionResolver) {

super(settings, PostStartTrialAction.NAME, transportService, clusterService, threadPool, actionFilters, indexNameExpressionResolver, PostStartTrialRequest::new);

```
this.licenseService = licenseService;
```

```
}
```

@Override

```
protected String executor() {
    return ThreadPool.Names.SAME;
```

```
}
```

```
@Override
protected PostStartTrialResponse newResponse() {
    return new PostStartTrialResponse();
}
```

```
}
```

@Override

```
protected void masterOperation(PostStartTrialRequest request, ClusterState state,
ActionListener<PostStartTrialResponse> listener) throws Exception {
    licenseService.startTrialLicense(request, listener);
```

}

```
@Override
```

```
protected ClusterBlockException checkBlock(PostStartTrialRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
    }
}
/*
* Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
```

```
import org.elasticsearch.common.settings.Settings;
```

import org.elasticsearch.common.xcontent.ToXContent; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.rest.BytesRestResponse; import org.elasticsearch.rest.RestController; import org.elasticsearch.rest.RestRequest; import org.elasticsearch.rest.RestResponse; import org.elasticsearch.rest.action.RestBuilderListener; import org.elasticsearch.xpack.core.XPackClient; import org.elasticsearch.xpack.core.rest.XPackRestHandler;

import java.io.IOException; import java.util.HashMap; import java.util.Map;

import static org.elasticsearch.rest.RestRequest.Method.GET; import static org.elasticsearch.rest.RestStatus.NOT_FOUND; import static org.elasticsearch.rest.RestStatus.OK;

public class RestGetLicenseAction extends XPackRestHandler {

@Inject

public RestGetLicenseAction(Settings settings, RestController controller) {
 super(settings);
 // @deprecated Remove deprecations in 6.0
 controller.registerWithDeprecatedHandler(GET, URI_BASE + "/license", this,
 GET, "/_license", deprecationLogger);

}

```
@Override
public String getName() {
    return "xpack_get_license_action";
}
```

}

/**

* There will be only one license displayed per feature, the selected license will have the latest expiry_date * out of all other licenses for the feature.

*

* The licenses are sorted by latest issue_date

*/

@Override

public RestChannelConsumer doPrepareRequest(final RestRequest request, final XPackClient client) throws IOException {

```
final Map<String, String> overrideParams = new HashMap<>(2);
    overrideParams.put(License.REST_VIEW_MODE, "true");
    overrideParams.put(License.LICENSE_VERSION_MODE, String.valueOf(License.VERSION_CURRENT));
    final ToXContent.Params params = new ToXContent.DelegatingMapParams(overrideParams, request);
    GetLicenseRequest getLicenseRequest = new GetLicenseRequest();
    getLicenseRequest.local(request.paramAsBoolean("local", getLicenseRequest.local()));
    return channel -> client.es().admin().cluster().execute(GetLicenseAction.INSTANCE, getLicenseRequest,
         new RestBuilderListener<GetLicenseResponse>(channel) {
           @Override
           public RestResponse buildResponse(GetLicenseResponse response, XContentBuilder builder) throws
Exception {
             // Default to pretty printing, but allow ?pretty=false to disable
             if (!request.hasParam("pretty")) {
                builder.prettyPrint().lfAtEnd();
             }
             boolean hasLicense = response.license() != null;
             builder.startObject();
             if (hasLicense) {
                builder.startObject("license");
                response.license().toInnerXContent(builder, params);
                builder.endObject();
             }
             builder.endObject();
             return new BytesRestResponse(hasLicense ? OK : NOT FOUND, builder);
           }
         });
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.support.master.AcknowledgedRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.xcontent.XContentType;
/**
* Register license request builder
*/
public class PutLicenseRequestBuilder extends AcknowledgedRequestBuilder<PutLicenseRequest,
PutLicenseResponse, PutLicenseRequestBuilder> {
 public PutLicenseRequestBuilder(ElasticsearchClient client) {
```

```
this(client, PutLicenseAction.INSTANCE);
  }
  /**
  * Constructs register license request
  *
  * @param client elasticsearch client
  */
 public PutLicenseRequestBuilder(ElasticsearchClient client, PutLicenseAction action) {
    super(client, action, new PutLicenseRequest());
  }
  /**
  * Sets the license
  * @param license license
  * @return this builder
  */
 public PutLicenseRequestBuilder setLicense(License license) {
    request.license(license);
    return this;
  }
 public PutLicenseRequestBuilder setLicense(BytesReference licenseSource, XContentType xContentType) {
    request.license(licenseSource, xContentType);
    return this:
  }
 public PutLicenseRequestBuilder setAcknowledge(boolean acknowledge) {
    request.acknowledge(acknowledge);
    return this;
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;
public class GetBasicStatusAction extends Action<GetBasicStatusRequest, GetBasicStatusResponse,
GetBasicStatusRequestBuilder> {
 public static final GetBasicStatusAction INSTANCE = new GetBasicStatusAction();
 public static final String NAME = "cluster:admin/xpack/license/basic_status";
```

```
private GetBasicStatusAction() {
    super(NAME);
  }
  @Override
 public GetBasicStatusRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new GetBasicStatusRequestBuilder(client, this);
  }
  @Override
 public GetBasicStatusResponse newResponse() {
    return new GetBasicStatusResponse();
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.rest.RestStatus;
public class LicenseUtils {
 public static final String EXPIRED_FEATURE_METADATA = "es.license.expired.feature";
 /**
  * Exception to be thrown when a feature action requires a valid license, but license
  * has expired
  * <code>feature</code> accessible through {@link #EXPIRED_FEATURE_METADATA} in the
  * exception's rest header
  */
 public static ElasticsearchSecurityException newComplianceException(String feature) {
    ElasticsearchSecurityException e = new ElasticsearchSecurityException("current license is non-compliant for
[{}]",
         RestStatus.FORBIDDEN, feature);
    e.addMetadata(EXPIRED_FEATURE_METADATA, feature);
    return e;
  }
 /**
```

```
* Checks if a given {@link ElasticsearchSecurityException} refers to a feature that
```

```
* requires a valid license, but the license has expired.
```

```
*/
```

```
public static boolean isLicenseExpiredException(ElasticsearchSecurityException exception) {
  return (exception != null) && (exception.getMetadata(EXPIRED_FEATURE_METADATA) != null);
}
```

public static boolean licenseNeedsExtended(License license) {
 return "basic".equals(license.type()) && license.expiryDate() !=
LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
 }
}
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*/
package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequest; import org.elasticsearch.action.ActionResponse; import org.elasticsearch.cluster.NamedDiff; import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.cluster.node.DiscoveryNodes; import org.elasticsearch.common.ParseField; import org.elasticsearch.common.io.stream.NamedWriteableRegistry; import org.elasticsearch.common.settings.ClusterSettings; import org.elasticsearch.common.settings.IndexScopedSettings; import org.elasticsearch.common.settings.Setting; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.settings.SettingsFilter; import org.elasticsearch.common.xcontent.NamedXContentRegistry; import org.elasticsearch.plugins.ActionPlugin; import org.elasticsearch.rest.RestController; import org.elasticsearch.rest.RestHandler;

import java.util.ArrayList; import java.util.Arrays; import java.util.Collections; import java.util.List; import java.util.function.Supplier;

import static org.elasticsearch.xpack.core.XPackClientActionPlugin.isTribeNode; import static org.elasticsearch.xpack.core.XPackPlugin.transportClientMode;

public class Licensing implements ActionPlugin {

public static final String NAME = "license"; protected final Settings settings; private final boolean isTransportClient; private final boolean isTribeNode;

// Until this is moved out to its own plugin (its currently in XPackPlugin.java, we need to make sure that any edits to this file

```
// are also carried out in XPackClientPlugin.java
```

```
public List<NamedWriteableRegistry.Entry> getNamedWriteables() {
```

List<NamedWriteableRegistry.Entry> entries = new ArrayList<>();

entries. add (new Named Write able Registry. Entry (Meta Data. Custom. class, Licenses Meta Data. TYPE, New York, New York,

LicensesMetaData::new));

entries.add(new NamedWriteableRegistry.Entry(NamedDiff.class, LicensesMetaData.TYPE,

LicensesMetaData::readDiffFrom));

return entries;

}

// Until this is moved out to its own plugin (its currently in XPackPlugin.java, we need to make sure that any edits to this file

// are also carried out in XPackClientPlugin.java

public List<NamedXContentRegistry.Entry> getNamedXContent() {

```
List<NamedXContentRegistry.Entry> entries = new ArrayList<>();
```

// Metadata

entries.add(new NamedXContentRegistry.Entry(MetaData.Custom.class, new

```
ParseField(LicensesMetaData.TYPE),
```

LicensesMetaData::fromXContent));

return entries;

```
}
```

```
public Licensing(Settings settings) {
```

this.settings = settings;

```
isTransportClient = transportClientMode(settings);
```

```
isTribeNode = isTribeNode(settings);
```

```
}
```

@Override

```
public List<ActionHandler<? extends ActionRequest, ? extends ActionResponse>> getActions() {
    if (isTribeNode) {
```

```
return Collections.singletonList(new ActionHandler<>(GetLicenseAction.INSTANCE,
```

```
TransportGetLicenseAction.class));
```

```
}
```

```
return Arrays.asList(new ActionHandler<>(PutLicenseAction.INSTANCE, TransportPutLicenseAction.class),
new ActionHandler<>(GetLicenseAction.INSTANCE, TransportGetLicenseAction.class),
new ActionHandler<>(DeleteLicenseAction.INSTANCE, TransportDeleteLicenseAction.class),
new ActionHandler<>(PostStartTrialAction.INSTANCE, TransportPostStartTrialAction.class),
new ActionHandler<>(GetTrialStatusAction.INSTANCE, TransportGetTrialStatusAction.class),
new ActionHandler<>(GetTrialStatusAction.INSTANCE, TransportGetTrialStatusAction.class),
new ActionHandler<>(GetBasicAction.INSTANCE, TransportPostStartBasicAction.class),
new ActionHandler<>(GetBasicStatusAction.INSTANCE, TransportGetBasicStatusAction.class));
```

}

@Override

public List<RestHandler> getRestHandlers(Settings settings, RestController restController, ClusterSettings clusterSettings,

IndexScopedSettings indexScopedSettings, SettingsFilter settingsFilter, IndexNameExpressionResolver indexNameExpressionResolver,

```
Supplier<DiscoveryNodes> nodesInCluster) {
List<RestHandler> handlers = new ArrayList<>();
handlers.add(new RestGetLicenseAction(settings, restController));
if (false == isTribeNode) {
    handlers.add(new RestPutLicenseAction(settings, restController));
    handlers.add(new RestDeleteLicenseAction(settings, restController));
    handlers.add(new RestGetTrialStatus(settings, restController));
    handlers.add(new RestGetBasicStatus(settings, restController));
    handlers.add(new RestPostStartTrialLicense(settings, restController));
    handlers.add(new RestPostStartBasicLicense(settings, restController));
}
```

// Until this is moved out to its own plugin (its currently in XPackPlugin.java, we need to make sure that any edits to this file

```
// are also carried out in XPackClientPlugin.java
```

```
public List<Setting<?>> getSettings() {
```

// TODO convert this wildcard to a real setting

return Collections.singletonList(Setting.groupSetting("license.", Setting.Property.NodeScope));

```
}
```

}

}

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*/

package org.elasticsearch.license;

import javax.crypto.BadPaddingException; import javax.crypto.Cipher; import javax.crypto.IllegalBlockSizeException; import javax.crypto.NoSuchPaddingException; import javax.crypto.SecretKey; import javax.crypto.SecretKeyFactory; import javax.crypto.spec.PBEKeySpec; import javax.crypto.spec.SecretKeySpec; import java.nio.charset.StandardCharsets; import java.security.InvalidKeyException; import java.security.KeyFactory; import java.security.MessageDigest; import java.security.NoSuchAlgorithmException; import java.security.PrivateKey; import java.security.PublicKey; import java.security.SecureRandom; import java.security.spec.InvalidKeySpecException; import java.security.spec.PKCS8EncodedKeySpec; import java.security.spec.X509EncodedKeySpec; import java.util.Base64; public class CryptUtils { private static final int minimumPadding = 20; private static final byte[] salt = { (byte) 0xA9, (byte) 0xA2, (byte) 0xB5, (byte) 0xDE, (byte) 0x2A, (byte) 0x8A, (byte) 0x9A, (byte) 0xE6 }; private static final int iterationCount = 1024; private static final int aesKeyLength = 128; private static final String keyAlgorithm = "RSA"; private static final String passHashAlgorithm = "SHA-512"; private static final String DEFAULT_PASS_PHRASE = "elasticsearch-license";

private static final SecureRandom random = new SecureRandom();

```
/**
* Read encrypted private key file content with default pass phrase
*/
public static PrivateKey readEncryptedPrivateKey(byte[] fileContents) {
  try {
    return readEncryptedPrivateKey(fileContents, hashPassPhrase(DEFAULT_PASS_PHRASE));
  } catch (NoSuchAlgorithmException e) {
     throw new IllegalStateException(e);
  }
}
/**
* Read encrypted public key file content with default pass phrase
*/
public static PublicKey readEncryptedPublicKey(byte[] fileContents) {
  try {
    return readEncryptedPublicKey(fileContents, hashPassPhrase(DEFAULT_PASS_PHRASE));
  } catch (NoSuchAlgorithmException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Returns encrypted public key file content with default pass phrase
*/
```

public static byte[] writeEncryptedPublicKey(PublicKey publicKey) {

```
try {
    return writeEncryptedPublicKey(publicKey, hashPassPhrase(DEFAULT_PASS_PHRASE));
  } catch (NoSuchAlgorithmException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Returns encrypted private key file content with default pass phrase
*/
public static byte[] writeEncryptedPrivateKey(PrivateKey privateKey) {
  try {
    return writeEncryptedPrivateKey(privateKey, hashPassPhrase(DEFAULT PASS PHRASE));
  } catch (NoSuchAlgorithmException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Read encrypted private key file content with provided <code>passPhrase</code>
*/
public static PrivateKey readEncryptedPrivateKey(byte[] fileContents, char[] passPhrase) {
  PKCS8EncodedKeySpec privateKeySpec = new PKCS8EncodedKeySpec(decrypt(fileContents, passPhrase));
  try {
    return KeyFactory.getInstance(keyAlgorithm).generatePrivate(privateKeySpec);
  } catch (NoSuchAlgorithmException | InvalidKeySpecException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Read encrypted public key file content with provided <code>passPhrase</code>
*/
public static PublicKey readEncryptedPublicKey(byte[] fileContents, char[] passPhrase) {
  X509EncodedKeySpec publicKeySpec = new X509EncodedKeySpec(decrypt(fileContents, passPhrase));
  try {
    return KeyFactory.getInstance(CryptUtils.keyAlgorithm).generatePublic(publicKeySpec);
  } catch (NoSuchAlgorithmException | InvalidKeySpecException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Returns encrypted public key file content with provided <code>passPhrase</code>
*/
public static byte[] writeEncryptedPublicKey(PublicKey publicKey, char[] passPhrase) {
  X509EncodedKeySpec encodedKeySpec = new X509EncodedKeySpec(publicKey.getEncoded());
  return encrypt(encodedKeySpec.getEncoded(), passPhrase);
```

```
}
/**
* Returns encrypted private key file content with provided <code>passPhrase</code>
*/
public static byte[] writeEncryptedPrivateKey(PrivateKey privateKey, char[] passPhrase) {
  PKCS8EncodedKeySpec encodedKeySpec = new PKCS8EncodedKeySpec(privateKey.getEncoded());
  return encrypt(encodedKeySpec.getEncoded(), passPhrase);
}
/**
* Encrypts provided <code>data</code> with <code>DEFAULT_PASS_PHRASE</code>
*/
public static byte[] encrypt(byte[] data) {
  try {
    return encrypt(data, hashPassPhrase(DEFAULT_PASS_PHRASE));
  } catch (NoSuchAlgorithmException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Decrypts provided <code>encryptedData</code> with <code>DEFAULT_PASS_PHRASE</code>
*/
public static byte[] decrypt(byte[] encryptedData) {
  try {
    return decrypt(encryptedData, hashPassPhrase(DEFAULT_PASS_PHRASE));
  } catch (NoSuchAlgorithmException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Encrypts provided <code>data</code> with <code>passPhrase</code>
*/
public static byte[] encrypt(byte[] data, char[] passPhrase) {
  try {
    final Cipher encryptionCipher = getEncryptionCipher(getSecretKey(passPhrase));
    return encryptionCipher.doFinal(pad(data, minimumPadding));
  } catch (InvalidKeySpecException | IllegalBlockSizeException | BadPaddingException e) {
    throw new IllegalStateException(e);
  }
}
/**
* Decrypts provided <code>encryptedData</code> with <code>passPhrase</code>
*/
private static byte[] decrypt(byte[] encryptedData, char[] passPhrase) {
```

```
try {
    final Cipher cipher = getDecryptionCipher(getSecretKey(passPhrase));
    return unPad(cipher.doFinal(encryptedData));
  } catch (IllegalBlockSizeException | BadPaddingException | InvalidKeySpecException e) {
     throw new IllegalStateException(e);
  }
}
private static SecretKey getSecretKey(char] passPhrase) throws InvalidKeySpecException {
  try {
    PBEKeySpec keySpec = new PBEKeySpec(passPhrase, salt, iterationCount, aesKeyLength);
    byte[] shortKey = SecretKeyFactory.getInstance("PBEWithSHA1AndDESede").
         generateSecret(keySpec).getEncoded();
    byte[] intermediaryKey = new byte[aesKeyLength / 8];
    for (int i = 0, j = 0; i < aesKeyLength / 8; i++) {
       intermediaryKey[i] = shortKey[j];
      if (++j == shortKey.length)
         i = 0;
     }
    return new SecretKeySpec(intermediaryKey, "AES");
  } catch (NoSuchAlgorithmException | InvalidKeySpecException e) {
     throw new IllegalStateException(e);
  }
}
private static Cipher getEncryptionCipher(SecretKey secretKey) {
  return getCipher(Cipher.ENCRYPT_MODE, secretKey);
}
private static Cipher getDecryptionCipher(SecretKey secretKey) {
  return getCipher(Cipher.DECRYPT_MODE, secretKey);
}
private static Cipher getCipher(int mode, SecretKey secretKey) {
  try {
    Cipher cipher = Cipher.getInstance(secretKey.getAlgorithm());
    cipher.init(mode, secretKey, random);
    return cipher;
  } catch (NoSuchAlgorithmException | InvalidKeyException | NoSuchPaddingException e) {
    throw new IllegalStateException(e);
  }
}
```

private static byte[] pad(byte[] bytes, int length) {

```
if (bytes.length >= length) {
      byte[] out = new byte[bytes.length + 1];
      System.arraycopy(bytes, 0, out, 0, bytes.length);
      out[bytes.length] = (byte) 1;
      return out;
    }
    byte[] out = new byte[length + 1];
    int i = 0:
    for (; i < bytes.length; i++)
      out[i] = bytes[i];
    int padded = length - i;
    // fill the rest with random bytes
    byte[] fill = new byte[padded - 1];
    random.nextBytes(fill);
    System.arraycopy(fill, 0, out, i, padded - 1);
    out[length] = (byte) (padded + 1);
    return out;
  }
 private static byte[] unPad(byte[] bytes) {
    int padded = (int) bytes[bytes.length - 1];
    int targetLength = bytes.length - padded;
    byte[] out = new byte[targetLength];
    System.arraycopy(bytes, 0, out, 0, targetLength);
    return out;
  }
 private static char[] hashPassPhrase(String passPhrase) throws NoSuchAlgorithmException {
    final byte[] passBytes = passPhrase.getBytes(StandardCharsets.UTF_8);
    final byte[] digest = MessageDigest.getInstance(passHashAlgorithm).digest(passBytes);
    return Base64.getEncoder().encodeToString(digest).toCharArray();
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
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*/
package org.elasticsearch.license;
```

import org.elasticsearch.Version; import org.elasticsearch.action.ActionResponse; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput; import org.elasticsearch.rest.RestStatus;

import java.io.IOException; import java.util.Collections; import java.util.HashMap; import java.util.Map;

class PostStartTrialResponse extends ActionResponse {

```
// Nodes Prior to 6.3 did not have NEED_ACKNOWLEDGEMENT as part of status
 enum Pre63Status {
   UPGRADED_TO_TRIAL,
   TRIAL ALREADY ACTIVATED;
 }
 enum Status {
   UPGRADED TO TRIAL(true, null, RestStatus.OK),
   TRIAL_ALREADY_ACTIVATED(false, "Operation failed: Trial was already activated.",
RestStatus.FORBIDDEN),
   NEED_ACKNOWLEDGEMENT(false,"Operation failed: Needs acknowledgement.", RestStatus.OK);
   private final boolean isTrialStarted;
   private final String errorMessage;
   private final RestStatus restStatus;
   Status(boolean isTrialStarted, String errorMessage, RestStatus restStatus) {
      this.isTrialStarted = isTrialStarted;
      this.errorMessage = errorMessage;
      this.restStatus = restStatus;
    }
   boolean isTrialStarted() {
      return isTrialStarted:
    }
   String getErrorMessage() {
      return errorMessage;
    }
    RestStatus getRestStatus() {
      return restStatus;
```

```
}
```

}

```
private Status status;
 private Map<String, String[]> acknowledgeMessages;
 private String acknowledgeMessage;
 PostStartTrialResponse() {
 }
 PostStartTrialResponse(Status status) {
   this(status, Collections.emptyMap(), null);
 }
 PostStartTrialResponse(Status status, Map<String, String[]> acknowledgeMessages, String acknowledgeMessage)
{
   this.status = status;
   this.acknowledgeMessages = acknowledgeMessages;
   this.acknowledgeMessage = acknowledgeMessage;
 }
 public Status getStatus() {
   return status;
 }
 @Override
 public void readFrom(StreamInput in) throws IOException {
   status = in.readEnum(Status.class);
   if (in.getVersion().onOrAfter(Version.V 6 3 0)) {
      acknowledgeMessage = in.readOptionalString();
      int size = in.readVInt();
      Map<String, String[]> acknowledgeMessages = new HashMap<>(size);
      for (int i = 0; i < size; i++) {
        String feature = in.readString();
        int nMessages = in.readVInt();
        String[] messages = new String[nMessages];
        for (int j = 0; j < nMessages; j++) {
           messages[j] = in.readString();
        }
        acknowledgeMessages.put(feature, messages);
      }
      this.acknowledgeMessages = acknowledgeMessages;
    } else {
      this.acknowledgeMessages = Collections.emptyMap();
    }
 }
 @Override
 public void writeTo(StreamOutput out) throws IOException {
    Version version = Version.V_6_3_0;
```

```
if (out.getVersion().onOrAfter(version)) {
      out.writeEnum(status);
      out.writeOptionalString(acknowledgeMessage);
      out.writeVInt(acknowledgeMessages.size());
      for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
         out.writeString(entry.getKey());
        out.writeVInt(entry.getValue().length);
        for (String message : entry.getValue()) {
           out.writeString(message);
         }
      }
    } else {
      if (status == Status.UPGRADED TO TRIAL) {
         out.writeEnum(Pre63Status.UPGRADED_TO_TRIAL);
      } else if (status == Status.TRIAL_ALREADY_ACTIVATED) {
         out.writeEnum(Pre63Status.TRIAL ALREADY ACTIVATED);
      } else {
         throw new IllegalArgumentException("Starting trial on node with version [" + Version.CURRENT + "]
requires "+
             "acknowledgement parameter.");
      }
    }
  }
 Map<String, String[]> getAcknowledgementMessages() {
    return acknowledgeMessages;
  }
 String getAcknowledgementMessage() {
    return acknowledgeMessage;
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.Version;
import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.io.stream.Writeable;
import org.elasticsearch.common.xcontent.ToXContentObject;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.xpack.core.XPackBuild;
```

import java.io.IOException; import java.util.ArrayList; import java.util.Collections; import java.util.HashMap; import java.util.List; import java.util.Locale; import java.util.Map; import java.util.Set; import java.util.stream.Collectors;

public class XPackInfoResponse extends ActionResponse {

@Nullable private BuildInfo buildInfo;@Nullable private LicenseInfo licenseInfo;@Nullable private FeatureSetsInfo featureSetsInfo;

```
public XPackInfoResponse() { }
```

public XPackInfoResponse(@Nullable BuildInfo buildInfo, @Nullable LicenseInfo licenseInfo, @Nullable FeatureSetsInfo featureSetsInfo) {

```
this.buildInfo = buildInfo;
    this.licenseInfo = licenseInfo;
    this.featureSetsInfo = featureSetsInfo;
  }
 /**
  * @return The build info (incl. build hash and timestamp)
  */
 public BuildInfo getBuildInfo() {
    return buildInfo;
  }
 /**
  * @return The current license info (incl. UID, type/mode. status and expiry date). May return {@code null}
when no
  *
         license is currently installed.
  */
 public LicenseInfo getLicenseInfo() {
    return licenseInfo;
  }
 /**
  * @return The current status of the feature sets in X-Pack. Feature sets describe the features available/enabled in
X-Pack.
  */
```

```
public FeatureSetsInfo getFeatureSetsInfo() {
    return featureSetsInfo;
```

```
}
@Override
public void writeTo(StreamOutput out) throws IOException {
  super.writeTo(out);
  out.writeOptionalWriteable(buildInfo);
  out.writeOptionalWriteable(licenseInfo);
  out.writeOptionalWriteable(featureSetsInfo);
}
@Override
public void readFrom(StreamInput in) throws IOException {
  this.buildInfo = in.readOptionalWriteable(BuildInfo::new);
  this.licenseInfo = in.readOptionalWriteable(LicenseInfo::new);
  this.featureSetsInfo = in.readOptionalWriteable(FeatureSetsInfo::new);
}
public static class LicenseInfo implements ToXContentObject, Writeable {
  private final String uid;
  private final String type;
  private final String mode;
  private final long expiryDate;
  private final License.Status status;
  public LicenseInfo(License license) {
     this(license.uid(), license.type(), license.operationMode().name().toLowerCase(Locale.ROOT),
          license.status(), license.expiryDate());
  }
  public LicenseInfo(StreamInput in) throws IOException {
     this(in.readString(), in.readString(), in.readString(), License.Status.readFrom(in), in.readLong());
  }
  public LicenseInfo(String uid, String type, String mode, License.Status status, long expiryDate) {
     this.uid = uid;
     this.type = type;
     this.mode = mode;
     this.status = status;
     this.expiryDate = expiryDate;
  }
  public String getUid() {
     return uid;
  }
  public String getType() {
     return type;
```

```
}
  public String getMode() {
    return mode;
  }
  public long getExpiryDate() {
    return expiryDate;
  }
  public License.Status getStatus() {
    return status;
  }
  @Override
  public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
    builder.startObject()
       .field("uid", uid)
       .field("type", type)
       .field("mode", mode)
       .field("status", status.label());
    if (expiryDate != LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS) {
       builder.timeField("expiry_date_in_millis", "expiry_date", expiryDate);
     }
    return builder.endObject();
  }
  public void writeTo(StreamOutput out) throws IOException {
    out.writeString(uid);
    out.writeString(type);
    out.writeString(mode);
    status.writeTo(out);
    out.writeLong(expiryDate);
  }
}
public static class BuildInfo implements ToXContentObject, Writeable {
  private final String hash;
  private final String timestamp;
  public BuildInfo(XPackBuild build) {
     this(build.shortHash(), build.date());
  }
  public BuildInfo(StreamInput input) throws IOException {
    this(input.readString(), input.readString());
  }
```

```
public BuildInfo(String hash, String timestamp) {
     this.hash = hash;
    this.timestamp = timestamp;
  }
  public String getHash() {
    return hash;
  }
  public String getTimestamp() {
    return timestamp;
  }
  @Override
  public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
    return builder.startObject()
         .field("hash", hash)
         .field("date", timestamp)
         .endObject();
  }
  public void writeTo(StreamOutput output) throws IOException {
    output.writeString(hash);
    output.writeString(timestamp);
  }
}
public static class FeatureSetsInfo implements ToXContentObject, Writeable {
  private final Map<String, FeatureSet> featureSets;
  public FeatureSetsInfo(StreamInput in) throws IOException {
    int size = in.readVInt();
    Map<String, FeatureSet> featureSets = new HashMap<>(size);
    for (int i = 0; i < size; i++) {
       FeatureSet featureSet = new FeatureSet(in);
       featureSets.put(featureSet.name, featureSet);
     }
    this.featureSets = Collections.unmodifiableMap(featureSets);
  }
  public FeatureSetsInfo(Set<FeatureSet> featureSets) {
    Map<String, FeatureSet> map = new HashMap<>(featureSets.size());
    for (FeatureSet featureSet : featureSets) {
       map.put(featureSet.name, featureSet);
     }
    this.featureSets = Collections.unmodifiableMap(map);
```

```
}
   public Map<String, FeatureSet> getFeatureSets() {
      return featureSets;
    }
    @Override
   public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
      builder.startObject();
      List<String> names = new
ArrayList<>(this.featureSets.keySet()).stream().sorted().collect(Collectors.toList());
      for (String name : names) {
         builder.field(name, featureSets.get(name), params);
      }
      return builder.endObject();
    }
   public void writeTo(StreamOutput out) throws IOException {
      out.writeVInt(featureSets.size());
      for (FeatureSet featureSet: featureSets.values()) {
         featureSet.writeTo(out);
      }
    }
   public static class FeatureSet implements ToXContentObject, Writeable {
      private final String name;
      @Nullable private final String description;
      private final boolean available;
      private final boolean enabled;
      @Nullable private final Map<String, Object> nativeCodeInfo;
      public FeatureSet(StreamInput in) throws IOException {
        this(in.readString(), in.readOptionalString(), in.readBoolean(), in.readBoolean(),
              in.getVersion().onOrAfter(Version.V_5_4_0) ? in.readMap() : null);
      }
      public FeatureSet(String name, @Nullable String description, boolean available, boolean enabled,
                  @Nullable Map<String, Object> nativeCodeInfo) {
         this.name = name;
         this.description = description;
         this.available = available;
        this.enabled = enabled;
         this.nativeCodeInfo = nativeCodeInfo;
      }
      public String name() {
         return name;
```

```
}
      @Nullable
      public String description() {
         return description;
      }
      public boolean available() {
         return available;
      }
      public boolean enabled() {
         return enabled;
      }
       @Nullable
      public Map<String, Object> nativeCodeInfo() {
         return nativeCodeInfo;
      }
      public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
         builder.startObject();
        if (description != null) {
           builder.field("description", description);
         }
        builder.field("available", available);
         builder.field("enabled", enabled);
        if (nativeCodeInfo != null) {
           builder.field("native_code_info", nativeCodeInfo);
         }
         return builder.endObject();
      }
      public void writeTo(StreamOutput out) throws IOException {
         out.writeString(name);
         out.writeOptionalString(description);
         out.writeBoolean(available);
         out.writeBoolean(enabled);
        if (out.getVersion().onOrAfter(Version.V_5_4_0)) {
           out.writeMap(nativeCodeInfo);
         }
      }
    }
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```

} } /*

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*/

package org.elasticsearch.license;

import org.elasticsearch.action.Action; import org.elasticsearch.client.ElasticsearchClient;

public class PostStartBasicAction extends Action<PostStartBasicRequest, PostStartBasicResponse, PostStartBasicRequestBuilder> {

```
public static final PostStartBasicAction INSTANCE = new PostStartBasicAction();
public static final String NAME = "cluster:admin/xpack/license/start basic";
```

```
private PostStartBasicAction() {
  super(NAME);
}
```

```
@Override
```

```
public PostStartBasicRequestBuilder newRequestBuilder(ElasticsearchClient client) {
  return new PostStartBasicRequestBuilder(client, this);
```

```
}
```

```
@Override
 public PostStartBasicResponse newResponse() {
   return new PostStartBasicResponse();
 }
/*
```

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* you may not use this file except in compliance with the Elastic License.

*/

}

package org.elasticsearch.license;

```
import org.elasticsearch.action.ActionRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;
```

class GetBasicStatusRequestBuilder extends ActionRequestBuilder<GetBasicStatusRequest, GetBasicStatusResponse,

```
GetBasicStatusRequestBuilder> {
```

```
GetBasicStatusRequestBuilder(ElasticsearchClient client, GetBasicStatusAction action) {
  super(client, action, new GetBasicStatusRequest());
```

```
}
}
/*
```

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*/

package org.elasticsearch.license;

import org.elasticsearch.Version;

import org.elasticsearch.action.ActionRequestValidationException; import org.elasticsearch.action.support.master.MasterNodeRequest; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput;

import java.io.IOException;

public class PostStartTrialRequest extends MasterNodeRequest<PostStartTrialRequest> {

```
private boolean acknowledge = false;
private String type;
@Override
public ActionRequestValidationException validate() {
  return null;
}
public PostStartTrialRequest setType(String type) {
  this.type = type;
  return this:
}
public String getType() {
  return type;
}
public PostStartTrialRequest acknowledge(boolean acknowledge) {
  this.acknowledge = acknowledge;
  return this;
}
public boolean isAcknowledged() {
  return acknowledge;
}
@Override
public void readFrom(StreamInput in) throws IOException {
  super.readFrom(in);
  if (in.getVersion().onOrAfter(Version.V_6_3_0)) {
    type = in.readString();
    acknowledge = in.readBoolean();
  } else {
```

```
type = "trial";
      acknowledge = true;
    }
  }
  @Override
 public void writeTo(StreamOutput out) throws IOException {
    Version version = Version.V_6_3_0;
    if (out.getVersion().onOrAfter(version)) {
      super.writeTo(out);
      out.writeString(type);
      out.writeBoolean(acknowledge);
    } else {
      if ("trial".equals(type) == false) {
         throw new IllegalArgumentException("All nodes in cluster must be version [" + version
              + "] or newer to start trial with a different type than 'trial'. Attempting to write to " +
              "a node with version [" + out.getVersion() + "] with trial type [" + type + "].");
       } else if (acknowledge == false) {
         throw new IllegalArgumentException("Request must be acknowledged to send to a node with a version " +
              "prior to [" + version + "]. Attempting to send request to node with version [" + out.getVersion() + "] "
+
              "without acknowledgement.");
      } else {
         super.writeTo(out);
      }
    }
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeReadAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;
```

public class TransportGetTrialStatusAction extends TransportMasterNodeReadAction<GetTrialStatusRequest, GetTrialStatusResponse> {

@Inject

public TransportGetTrialStatusAction(Settings settings, TransportService transportService, ClusterService clusterService,

ThreadPool threadPool, ActionFilters actionFilters,

 $IndexNameExpressionResolver\ indexNameExpressionResolver)\ \{$

```
super(settings, GetTrialStatusAction.NAME, transportService, clusterService, threadPool, actionFilters,
```

```
indexNameExpressionResolver, GetTrialStatusRequest::new);
```

}

```
@Override
protected String executor() {
    return ThreadPool.Names.SAME;
}
```

```
@Override
protected GetTrialStatusResponse newResponse() {
    return new GetTrialStatusResponse();
```

```
}
```

```
@Override
```

```
protected void masterOperation(GetTrialStatusRequest request, ClusterState state,
```

```
ActionListener<GetTrialStatusResponse> listener) throws Exception {
```

```
LicensesMetaData licensesMetaData = state.metaData().custom(LicensesMetaData.TYPE);
```

 $listener.on Response (new \ Get Trial Status Response (licenses Meta Data == null \parallel listener.on Response (new \ Get Trial Status Response (licenses Meta Data == null \parallel listener.on Response (licenses Meta Data == null listener.on Response (licenses (licenses Response (licenses (licenses (licenses (licen$

```
licensesMetaData.isEligibleForTrial()));\\
```

```
}
```

```
@Override
```

```
protected ClusterBlockException checkBlock(GetTrialStatusRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
    }
}
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*/
package org.elasticsearch.ElasticsearchException;
import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.Version;
import org.elasticsearch.ActionListener;
import org.elasticsearch.cluster.AckedClusterStateUpdateTask;
```

```
import org.elasticsearch.cluster.ClusterChangedEvent;
```

import org.elasticsearch.cluster.ClusterState; import org.elasticsearch.cluster.ClusterStateListener; import org.elasticsearch.cluster.ack.ClusterStateUpdateResponse; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.cluster.node.DiscoveryNode; import org.elasticsearch.cluster.service.ClusterService; import org.elasticsearch.common.component.AbstractLifecycleComponent; import org.elasticsearch.common.component.Lifecycle; import org.elasticsearch.common.joda.FormatDateTimeFormatter; import org.elasticsearch.common.joda.Joda; import org.elasticsearch.common.logging.LoggerMessageFormat; import org.elasticsearch.common.settings.Setting; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.unit.TimeValue; import org.elasticsearch.discovery.DiscoveryModule; import org.elasticsearch.env.Environment; import org.elasticsearch.gateway.GatewayService; import org.elasticsearch.watcher.ResourceWatcherService; import org.elasticsearch.xpack.core.XPackPlugin; import org.elasticsearch.xpack.core.XPackSettings; import org.elasticsearch.xpack.core.scheduler.SchedulerEngine;

import java.time.Clock; import java.util.ArrayList; import java.util.Arrays; import java.util.Collections; import java.util.HashMap; import java.util.HashSet; import java.util.List; import java.util.Locale; import java.util.Map; import java.util.Set; import java.util.concurrent.atomic.AtomicReference;

/**

* Service responsible for managing {@link LicensesMetaData}.

*

* On the master node, the service handles updating the cluster state when a new license is registered.

* It also listens on all nodes for cluster state updates, and updates {@link XPackLicenseState} when * the license changes are detected in the cluster state.

*/

public class LicenseService extends AbstractLifecycleComponent implements ClusterStateListener, SchedulerEngine.Listener {

public static final Setting<String> SELF_GENERATED_LICENSE_TYPE = new Setting<>("xpack.license.self_generated.type",

(s) -> "basic", (s) -> {

```
if \ (SelfGeneratedLicense.validSelfGeneratedType(s)) \ \{
```

```
return s;
```

} else {

throw new IllegalArgumentException("Illegal self generated license type [" + s + "]. Must be trial or basic."); }

}, Setting.Property.NodeScope);

```
// pkg private for tests
```

```
static final TimeValue NON_BASIC_SELF_GENERATED_LICENSE_DURATION = TimeValue.timeValueHours(30 * 24);
```

static final Set<String> VALID_TRIAL_TYPES = new HashSet<>(Arrays.asList("trial", "platinum", "gold"));

/**

* Duration of grace period after a license has expired

*/

static final TimeValue GRACE_PERIOD_DURATION = days(7);

public static final long BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS = Long.MAX_VALUE - days(365).millis();

private final ClusterService clusterService;

```
/**
    * The xpack feature state to update when license changes are made.
    */
```

private final XPackLicenseState licenseState;

```
/**
```

* Currently active license

*/

private final AtomicReference<License> currentLicense = new AtomicReference<>();
private SchedulerEngine scheduler;
private final Clock clock;

/**
 * File watcher for operation mode changes
 */
private final OperationModeFileWatcher operationModeFileWatcher;
/**
 * Callbacks to notify relative to license expiry

*/

private List<ExpirationCallback> expirationCallbacks = new ArrayList<>();

/**

* Max number of nodes licensed by generated trial license */

```
static final int SELF_GENERATED_LICENSE_MAX_NODES = 1000;
```

public static final String LICENSE_JOB = "licenseJob";

private static final FormatDateTimeFormatter DATE_FORMATTER = Joda.forPattern("EEEE, MMMMM dd, yyyy", Locale.ROOT);

private static final String ACKNOWLEDGEMENT_HEADER = "This license update requires acknowledgement. To acknowledge the license, " +

"please read the following messages and update the license again, this time with the \"acknowledge=true\" parameter:";

public LicenseService(Settings settings, ClusterService clusterService, Clock clock, Environment env,

```
ResourceWatcherService resourceWatcherService, XPackLicenseState licenseState) {
```

```
super(settings);
```

this.clusterService = clusterService;

this.clock = clock;

this.scheduler = new SchedulerEngine(clock);

this.licenseState = licenseState;

this.operationModeFileWatcher = new OperationModeFileWatcher(resourceWatcherService,

```
XPackPlugin.resolveConfigFile(env, "license_mode"), logger, () -> updateLicenseState(getLicense()));
```

this.scheduler.register(this);

populateExpirationCallbacks();

}

private void logExpirationWarning(long expirationMillis, boolean expired) {

```
String expiredMsg = expired ? "expired" : "will expire";
```

String general = LoggerMessageFormat.format(null, "License [{}] on [{}].\n" +

```
"# If you have a new license, please update it. Otherwise, please reach out to n'' +
```

"# your support contact.n" +

"# ", expiredMsg, DATE_FORMATTER.printer().print(expirationMillis));

if (expired) {

general = general.toUpperCase(Locale.ROOT);

}

StringBuilder builder = new StringBuilder(general);

builder.append(System.lineSeparator());

```
if (expired) {
```

builder.append("# COMMERCIAL PLUGINS OPERATING WITH REDUCED FUNCTIONALITY");
} else {

builder.append("# Commercial plugins operate with reduced functionality on license expiration:");

}

```
XPackLicenseState.EXPIRATION_MESSAGES.forEach((feature, messages) -> {
```

if (messages.length > 0) {

builder.append(System.lineSeparator());

- builder.append("# ");
- builder.append(feature);

for (String message : messages) {

builder.append(System.lineSeparator());

```
builder.append("# - ");
```

```
builder.append(message);
         }
      }
    });
    logger.warn("{ }", builder);
  }
 private void populateExpirationCallbacks() {
    expirationCallbacks.add(new ExpirationCallback.Pre(days(7), days(25), days(1)) {
       @Override
      public void on(License license) {
         logExpirationWarning(license.expiryDate(), false);
      }
    });
    expirationCallbacks.add(new ExpirationCallback.Pre(days(0), days(7), TimeValue.timeValueMinutes(10)) {
       @Override
      public void on(License license) {
         logExpirationWarning(license.expiryDate(), false);
      }
    });
    expirationCallbacks.add(new ExpirationCallback.Post(days(0), null, TimeValue.timeValueMinutes(10)) {
       @Override
      public void on(License license) {
        // logged when grace period begins
         logExpirationWarning(license.expiryDate(), true);
      }
    });
  }
 /**
  * Registers new license in the cluster
  * Master only operation. Installs a new license on the master provided it is VALID
  */
 public void registerLicense(final PutLicenseRequest request, final ActionListener<PutLicenseResponse> listener)
{
    final License newLicense = request.license();
    final long now = clock.millis();
    if (!LicenseVerifier.verifyLicense(newLicense) || newLicense.issueDate() > now || newLicense.startDate() >
now) {
      listener.onResponse(new PutLicenseResponse(true, LicensesStatus.INVALID));
    } else if (newLicense.type().equals("basic")) {
      listener.onFailure(new IllegalArgumentException("Registering basic licenses is not allowed."));
    } else if (newLicense.expiryDate() < now) {</pre>
      listener.onResponse(new PutLicenseResponse(true, LicensesStatus.EXPIRED));
    } else {
      if (!request.acknowledged()) {
         // TODO: ack messages should be generated on the master, since another node's cluster state may be
```

behind ...

```
final License currentLicense = getLicense();
        if (currentLicense != null) {
           Map<String, String[]> acknowledgeMessages = getAckMessages(newLicense, currentLicense);
           if (acknowledgeMessages.isEmpty() == false) {
             // needs acknowledgement
             listener.onResponse(new PutLicenseResponse(false, LicensesStatus.VALID,
ACKNOWLEDGEMENT HEADER,
                  acknowledgeMessages));
             return;
           }
        }
      }
      if (newLicense.isProductionLicense()
           && XPackSettings.SECURITY_ENABLED.get(settings)
           && XPackSettings.TRANSPORT SSL ENABLED.get(settings) == false
           && isProductionMode(settings, clusterService.localNode())) {
        // security is on but TLS is not configured we gonna fail the entire request and throw an exception
        throw new IllegalStateException("Cannot install a [" + newLicense.operationMode() +
             "] license unless TLS is configured or security is disabled");
        // TODO we should really validate that all nodes have xpack installed and are consistently configured but
this
        // should happen on a different level and not in this code
      } else {
        clusterService.submitStateUpdateTask("register license [" + newLicense.uid() + "]", new
             AckedClusterStateUpdateTask<PutLicenseResponse>(request, listener) {
                @Override
               protected PutLicenseResponse newResponse(boolean acknowledged) {
                  return new PutLicenseResponse(acknowledged, LicensesStatus.VALID);
                }
                @Override
                public ClusterState execute(ClusterState currentState) throws Exception {
                  XPackPlugin.checkReadyForXPackCustomMetadata(currentState);
                  MetaData currentMetadata = currentState.metaData();
                  LicensesMetaData licensesMetaData = currentMetadata.custom(LicensesMetaData.TYPE);
                  Version trialVersion = null:
                  if (licensesMetaData != null) {
                    trialVersion = licensesMetaData.getMostRecentTrialVersion();
                  }
                  MetaData.Builder mdBuilder = MetaData.builder(currentMetadata);
                  mdBuilder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(newLicense,
trialVersion));
                  return ClusterState.builder(currentState).metaData(mdBuilder).build();
                }
             });
      }
    }
```

```
public static Map<String, String[]> getAckMessages(License newLicense, License currentLicense) {
    Map<String, String[]> acknowledgeMessages = new HashMap<>();
   if (!License.isAutoGeneratedLicense(currentLicense.signature()) // current license is not auto-generated
         && currentLicense.issueDate() > newLicense.issueDate()) { // and has a later issue date
      acknowledgeMessages.put("license", new String[]{
           "The new license is older than the currently installed license. " +
                "Are you sure you want to override the current license?" });
    }
   XPackLicenseState.ACKNOWLEDGMENT_MESSAGES.forEach((feature, ackMessages) -> {
      String[] messages = ackMessages.apply(currentLicense.operationMode(), newLicense.operationMode());
      if (messages.length > 0) {
         acknowledgeMessages.put(feature, messages);
      }
    });
   return acknowledgeMessages;
 }
 private static TimeValue days(int days) {
   return TimeValue.timeValueHours(days * 24);
 }
 @Override
 public void triggered(SchedulerEngine.Event event) {
    final LicensesMetaData licensesMetaData =
clusterService.state().metaData().custom(LicensesMetaData.TYPE);
   if (licensesMetaData != null) {
      final License license = licensesMetaData.getLicense();
      if (event.getJobName().equals(LICENSE_JOB)) {
         updateLicenseState(license);
      } else if (event.getJobName().startsWith(ExpirationCallback.EXPIRATION_JOB_PREFIX)) {
         expirationCallbacks.stream()
             .filter(expirationCallback -> expirationCallback.getId().equals(event.getJobName()))
             .forEach(expirationCallback -> expirationCallback.on(license));
      }
    }
 }
 /**
  * Remove license from the cluster state metadata
  */
 public void removeLicense(final DeleteLicenseRequest request, final
ActionListener<ClusterStateUpdateResponse> listener) {
   clusterService.submitStateUpdateTask("delete license",
         new AckedClusterStateUpdateTask<ClusterStateUpdateResponse>(request, listener) {
           @Override
```

}

```
protected ClusterStateUpdateResponse newResponse(boolean acknowledged) {
             return new ClusterStateUpdateResponse(acknowledged);
           }
           @Override
           public ClusterState execute(ClusterState currentState) throws Exception {
             MetaData metaData = currentState.metaData();
             final LicensesMetaData currentLicenses = metaData.custom(LicensesMetaData.TYPE);
             if (currentLicenses.getLicense() != LicensesMetaData.LICENSE_TOMBSTONE) {
                MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
                LicensesMetaData newMetadata = new
LicensesMetaData(LicensesMetaData.LICENSE TOMBSTONE,
                    currentLicenses.getMostRecentTrialVersion());
                mdBuilder.putCustom(LicensesMetaData.TYPE, newMetadata);
                return ClusterState.builder(currentState).metaData(mdBuilder).build();
             } else {
                return currentState;
             }
           }
         });
  }
 public License getLicense() {
    final License license = getLicense(clusterService.state().metaData());
    return license == LicensesMetaData.LICENSE_TOMBSTONE ? null : license;
  }
 void startTrialLicense(PostStartTrialRequest request, final ActionListener<PostStartTrialResponse> listener) {
    if (VALID_TRIAL_TYPES.contains(request.getType()) == false) {
      throw new IllegalArgumentException("Cannot start trial of type [" + request.getType() + "]. Valid trial types
are "
           + VALID TRIAL TYPES + ".");
    }
    StartTrialClusterTask task = new StartTrialClusterTask(logger, clusterService.getClusterName().value(), clock,
request, listener);
    clusterService.submitStateUpdateTask("started trial license", task);
  }
 void startBasicLicense(PostStartBasicRequest request, final ActionListener<PostStartBasicResponse> listener) {
    StartBasicClusterTask task = new StartBasicClusterTask(logger, clusterService.getClusterName().value(),
clock, request, listener);
    clusterService.submitStateUpdateTask("start basic license", task);
```

}

/**

* Master-only operation to generate a one-time global self generated license.

```
* The self generated license is only generated and stored if the current cluster state metadata
```

```
* has no existing license. If the cluster currently has a basic license that has an expiration date,
```

```
* a new basic license with no expiration date is generated.
  */
 private void registerOrUpdateSelfGeneratedLicense() {
   clusterService.submitStateUpdateTask("maybe generate license for cluster",
         new StartupSelfGeneratedLicenseTask(settings, clock, clusterService));
 }
 @Override
 protected void doStart() throws ElasticsearchException {
    clusterService.addListener(this):
   scheduler.start(Collections.emptyList());
   logger.debug("initializing license state");
   if (clusterService.lifecycleState() == Lifecycle.State.STARTED) {
      final ClusterState clusterState = clusterService.state();
      if (clusterState.blocks().hasGlobalBlock(GatewayService.STATE_NOT_RECOVERED_BLOCK) == false
&&
           clusterState.nodes().getMasterNode() != null &&
XPackPlugin.isReadyForXPackCustomMetadata(clusterState)) {
         final LicensesMetaData currentMetaData = clusterState.metaData().custom(LicensesMetaData.TYPE);
        boolean noLicense = currentMetaData == null || currentMetaData.getLicense() == null;
        if (clusterState.getNodes().isLocalNodeElectedMaster() &&
             (noLicense || LicenseUtils.licenseNeedsExtended(currentMetaData.getLicense()))) {
           // triggers a cluster changed event eventually notifying the current licensee
           registerOrUpdateSelfGeneratedLicense();
         }
      }
    }
 }
 @Override
 protected void doStop() throws ElasticsearchException {
   clusterService.removeListener(this);
   scheduler.stop();
   // clear current license
   currentLicense.set(null);
 }
 @Override
 protected void doClose() throws ElasticsearchException {
 }
 /**
  * When there is no global block on {@link
org.elasticsearch.gateway.GatewayService#STATE_NOT_RECOVERED_BLOCK }
  * notify licensees and issue auto-generated license if no license has been installed/issued yet.
  */
 @Override
 public void clusterChanged(ClusterChangedEvent event) {
```

final ClusterState previousClusterState = event.previousState();

```
final ClusterState currentClusterState = event.state();
```

```
if (XPackPlugin.isReadyForXPackCustomMetadata(currentClusterState) == false) {
```

```
logger.debug("cannot add license to cluster as the following nodes might not understand the license metadata: {}",
```

```
() -> XPackPlugin.nodesNotReadyForXPackCustomMetadata(currentClusterState));
```

```
return;
```

```
}
```

```
final LicensesMetaData prevLicensesMetaData =
previousClusterState.getMetaData().custom(LicensesMetaData.TYPE);
      final LicensesMetaData currentLicensesMetaData =
currentClusterState.getMetaData().custom(LicensesMetaData.TYPE);
      if (logger.isDebugEnabled()) {
        logger.debug("previous [{}]", prevLicensesMetaData);
        logger.debug("current [{}]", currentLicensesMetaData);
      }
      // notify all interested plugins
      if (previousClusterState.blocks().hasGlobalBlock(GatewayService.STATE_NOT_RECOVERED_BLOCK)
           || prevLicensesMetaData == null) {
        if (currentLicensesMetaData != null) {
           onUpdate(currentLicensesMetaData);
      } else if (!prevLicensesMetaData.equals(currentLicensesMetaData)) {
        onUpdate(currentLicensesMetaData);
      }
      License currentLicense = null;
      boolean noLicenseInPrevMetadata = prevLicensesMetaData == null || prevLicensesMetaData.getLicense()
== null:
      if (noLicenseInPrevMetadata == false) {
        currentLicense = prevLicensesMetaData.getLicense();
      }
      boolean noLicenseInCurrentMetadata = (currentLicensesMetaData == null ||
currentLicensesMetaData.getLicense() == null);
      if (noLicenseInCurrentMetadata == false) {
        currentLicense = currentLicensesMetaData.getLicense();
      }
      boolean noLicense = noLicenseInPrevMetadata && noLicenseInCurrentMetadata;
      // auto-generate license if no licenses ever existed or if the current license is basic and
      // needs extended. this will trigger a subsequent cluster changed event
      if (currentClusterState.getNodes().isLocalNodeElectedMaster()
           && (noLicense || LicenseUtils.licenseNeedsExtended(currentLicense))) {
        registerOrUpdateSelfGeneratedLicense();
      }
```

```
} else if (logger.isDebugEnabled()) {
```

```
logger.debug("skipped license notifications reason: [{}]",
GatewayService.STATE_NOT_RECOVERED_BLOCK);
    }
  }
 protected void updateLicenseState(final License license) {
    if (license == LicensesMetaData.LICENSE TOMBSTONE) {
      // implies license has been explicitly deleted
      licenseState.update(License.OperationMode.MISSING, false);
      return:
    }
    if (license != null) {
      long time = clock.millis();
      boolean active;
      if (license.expiryDate() == BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS) {
         active = true:
      } else {
         // We subtract the grace period from the current time to avoid overflowing on an expiration
         // date that is near Long.MAX_VALUE
         active = time >= license.issueDate() && time - GRACE_PERIOD_DURATION.getMillis() <
license.expiryDate();
      }
      licenseState.update(license.operationMode(), active);
      if (active) {
         if (time < license.expiryDate()) {
           logger.debug("license [{}] - valid", license.uid());
         } else {
           logger.warn("license [{}] - grace", license.uid());
         }
      } else {
         logger.warn("license [{}] - expired", license.uid());
      }
    }
  }
  /**
  * Notifies registered licensees of license state change and/or new active license
  * based on the license in <code>currentLicensesMetaData</code>.
  * Additionally schedules license expiry notifications and event callbacks
  * relative to the current license's expiry
  */
  private void onUpdate(final LicensesMetaData currentLicensesMetaData) {
    final License license = getLicense(currentLicensesMetaData);
    // license can be null if the trial license is yet to be auto-generated
    // in this case, it is a no-op
    if (license != null) {
      final License previousLicense = currentLicense.get();
```

```
if (license.equals(previousLicense) == false) {
       currentLicense.set(license);
       license.setOperationModeFileWatcher(operationModeFileWatcher);
       scheduler.add(new SchedulerEngine.Job(LICENSE_JOB, nextLicenseCheck(license)));
       for (ExpirationCallback expirationCallback : expirationCallbacks) {
         scheduler.add(new SchedulerEngine.Job(expirationCallback.getId(),
               (startTime, now) ->
                   expirationCallback.nextScheduledTimeForExpiry(license.expiryDate(), startTime, now)));
       }
       if (previousLicense != null) {
         // remove operationModeFileWatcher to gc the old license object
         previousLicense.removeOperationModeFileWatcher();
       }
       logger.info("license [{}] mode [{}] - valid", license.uid(),
            license.operationMode().name().toLowerCase(Locale.ROOT));
     }
    updateLicenseState(license);
  }
// pkg private for tests
static SchedulerEngine.Schedule nextLicenseCheck(License license) {
  return (startTime, time) -> {
    if (time < license.issueDate()) {
       // when we encounter a license with a future issue date
       // which can happen with autogenerated license,
       // we want to schedule a notification on the license issue date
       // so the license is notificed once it is valid
       // see https://github.com/elastic/x-plugins/issues/983
       return license.issueDate();
     } else if (time < license.expiryDate()) {</pre>
       return license.expiryDate();
     } else if (time < license.expiryDate() + GRACE_PERIOD_DURATION.getMillis()) {
       return license.expiryDate() + GRACE_PERIOD_DURATION.getMillis();
     }
    return -1; // license is expired, no need to check again
  };
public static License getLicense(final MetaData metaData) {
  final LicensesMetaData licensesMetaData = metaData.custom(LicensesMetaData.TYPE);
  return getLicense(licensesMetaData);
static License getLicense(final LicensesMetaData metaData) {
  if (metaData != null) {
    License license = metaData.getLicense();
    if (license == LicensesMetaData.LICENSE_TOMBSTONE) {
```

}

}

```
return license;
      } else if (license != null) {
         boolean autoGeneratedLicense = License.isAutoGeneratedLicense(license.signature());
         if ((autoGeneratedLicense && SelfGeneratedLicense.verify(license))
              || (!autoGeneratedLicense && LicenseVerifier.verifyLicense(license))) {
           return license;
         }
      }
    }
    return null:
  }
 private static boolean isProductionMode(Settings settings, DiscoveryNode localNode) {
    final boolean singleNodeDisco = "single-
node".equals(DiscoveryModule.DISCOVERY_TYPE_SETTING.get(settings));
    return singleNodeDisco == false && isBoundToLoopback(localNode) == false;
  }
 private static boolean isBoundToLoopback(DiscoveryNode localNode) {
    return localNode.getAddress().address().getAddress().isLoopbackAddress();
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;
public class PostStartTrialAction extends Action<PostStartTrialRequest, PostStartTrialResponse,
PostStartTrialRequestBuilder> {
 public static final PostStartTrialAction INSTANCE = new PostStartTrialAction();
 public static final String NAME = "cluster:admin/xpack/license/start_trial";
```

```
private PostStartTrialAction() {
    super(NAME);
```

```
}
```

```
@Override
```

```
public PostStartTrialRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new PostStartTrialRequestBuilder(client, this);
```

@Override

```
public PostStartTrialResponse newResponse() {
    return new PostStartTrialResponse();
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.rest.action.RestBuilderListener;
public class LicensingClient {
 private final ElasticsearchClient client;
 public LicensingClient(ElasticsearchClient client) {
    this.client = client;
  }
 public PutLicenseRequestBuilder preparePutLicense(License license) {
    return new PutLicenseRequestBuilder(client).setLicense(license);
  }
 public void putLicense(PutLicenseRequest request, ActionListener<PutLicenseResponse> listener) {
    client.execute(PutLicenseAction.INSTANCE, request, listener);
  }
 public GetLicenseRequestBuilder prepareGetLicense() {
    return new GetLicenseRequestBuilder(client);
  }
 public void getLicense(GetLicenseRequest request, ActionListener<GetLicenseResponse> listener) {
    client.execute(GetLicenseAction.INSTANCE, request, listener);
  }
 public DeleteLicenseRequestBuilder prepareDeleteLicense() {
    return new DeleteLicenseRequestBuilder(client);
  }
 public void deleteLicense(DeleteLicenseRequest request, ActionListener<DeleteLicenseResponse> listener) {
    client.execute(DeleteLicenseAction.INSTANCE, request, listener);
  }
```

public PostStartTrialRequestBuilder preparePostStartTrial() {

```
return new PostStartTrialRequestBuilder(client, PostStartTrialAction.INSTANCE);
  }
 public GetTrialStatusRequestBuilder prepareGetStartTrial() {
    return new GetTrialStatusRequestBuilder(client, GetTrialStatusAction.INSTANCE);
  }
 public void postStartTrial(PostStartTrialRequest request, ActionListener<PostStartTrialResponse> listener) {
    client.execute(PostStartTrialAction.INSTANCE, request, listener);
  }
 public void postStartBasic(PostStartBasicRequest request, ActionListener<PostStartBasicResponse> listener) {
    client.execute(PostStartBasicAction.INSTANCE, request, listener);
  }
 public PostStartBasicRequestBuilder preparePostStartBasic() {
    return new PostStartBasicRequestBuilder(client, PostStartBasicAction.INSTANCE);
  }
 public GetBasicStatusRequestBuilder prepareGetStartBasic() {
    return new GetBasicStatusRequestBuilder(client, GetBasicStatusAction.INSTANCE);
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.rest.BytesRestResponse;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.RestResponse;
import org.elasticsearch.rest.RestStatus;
import org.elasticsearch.rest.action.RestBuilderListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;
import java.io.IOException;
import static org.elasticsearch.rest.RestRequest.Method.GET;
public class RestGetBasicStatus extends XPackRestHandler {
 RestGetBasicStatus(Settings settings, RestController controller) {
```

```
super(settings);
controller.registerHandler(GET, URI_BASE + "/license/basic_status", this);
```

```
@Override
```

}

```
protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException
{
```

```
return channel -> client.licensing().prepareGetStartBasic().execute(
         new RestBuilderListener<GetBasicStatusResponse>(channel) {
           @Override
           public RestResponse buildResponse(GetBasicStatusResponse response, XContentBuilder builder)
throws Exception {
              builder.startObject();
              builder.field("eligible_to_start_basic", response.isEligibleToStartBasic());
              builder.endObject();
              return new BytesRestResponse(RestStatus.OK, builder);
           }
         });
  }
  @Override
 public String getName() {
    return "xpack_basic_status_action";
  }
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
```

import org.elasticsearch.action.ActionRequestValidationException; import org.elasticsearch.action.support.master.AcknowledgedRequest; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput;

import java.io.IOException;

public class DeleteLicenseRequest extends AcknowledgedRequest<DeleteLicenseRequest>

```
public DeleteLicenseRequest() {
}
```

```
@Override
public ActionRequestValidationException validate() {
  return null;
```

```
}
  @Override
 public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
  }
  @Override
 public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
  }
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.apache.logging.log4j.Logger;
import org.apache.logging.log4j.message.ParameterizedMessage;
import org.apache.logging.log4j.util.Supplier;
import org.elasticsearch.Version;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.logging.Loggers;
```

import java.time.Clock; import java.util.UUID;

public class StartupSelfGeneratedLicenseTask extends ClusterStateUpdateTask {

/**
 * Max number of nodes licensed by generated trial license
 */
private int selfGeneratedLicenseMaxNodes = 1000;

import org.elasticsearch.common.settings.Settings; import org.elasticsearch.xpack.core.XPackPlugin;

private final Settings settings; private final Clock clock; private final ClusterService clusterService; private final Logger logger;

public StartupSelfGeneratedLicenseTask(Settings settings, Clock clock, ClusterService clusterService) {

```
this.settings = settings;
this.clock = clock;
this.clusterService = clusterService;
this.logger = Loggers.getLogger(getClass(), settings);
}
```

```
@Override
```

```
public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
  LicensesMetaData licensesMetaData = newState.metaData().custom(LicensesMetaData.TYPE);
  if (logger.isDebugEnabled()) {
    logger.debug("registered self generated license: {}", licensesMetaData);
  }
}
```

@Override

```
public ClusterState execute(ClusterState currentState) throws Exception {
    XPackPlugin.checkReadyForXPackCustomMetadata(currentState);
    final MetaData metaData = currentState.metaData();
    final LicensesMetaData currentLicensesMetaData = metaData.custom(LicensesMetaData.TYPE);
    // do not generate a license if any license is present
    if (currentLicensesMetaData == null) {
        String type = LicenseService.SELF_GENERATED_LICENSE_TYPE.get(settings);
        if (SelfGeneratedLicense.validSelfGeneratedType(type) == false) {
            throw new IllegalArgumentException("Illegal self generated license type [" + type +
            "]. Must be trial or basic.");
    }
}
```

}

return updateWithLicense(currentState, type);

```
} else if (LicenseUtils.licenseNeedsExtended(currentLicensesMetaData.getLicense())) {
   return extendBasic(currentState, currentLicensesMetaData);
```

} else {

return currentState;

}

```
@Override
```

```
public void onFailure(String source, @Nullable Exception e) {
```

```
logger.error((Supplier<?>) () -> new ParameterizedMessage("unexpected failure during [{}]", source), e);
}
```

License license = currentLicenseMetadata.getLicense();

MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());

LicensesMetaData newLicenseMetadata = createBasicLicenseFromExistingLicense(currentLicenseMetadata); mdBuilder.putCustom(LicensesMetaData.TYPE, newLicenseMetadata);

logger.info("Existing basic license has an expiration. Basic licenses no longer expire." +

"Regenerating license.\n\nOld license:\n { }\n\n New license:\n{ }", license,

newLicenseMetadata.getLicense());

```
return ClusterState.builder(currentState).metaData(mdBuilder).build();
  }
 private LicensesMetaData createBasicLicenseFromExistingLicense(LicensesMetaData currentLicenseMetadata) {
    License currentLicense = currentLicenseMetadata.getLicense();
    License.Builder specBuilder = License.builder()
        .uid(currentLicense.uid())
        .issuedTo(currentLicense.issuedTo())
        .maxNodes(selfGeneratedLicenseMaxNodes)
        .issueDate(currentLicense.issueDate())
        .type("basic")
         .expiryDate(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS);
    License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder);
    Version trialVersion = currentLicenseMetadata.getMostRecentTrialVersion();
    return new LicensesMetaData(selfGeneratedLicense, trialVersion);
  }
 private ClusterState updateWithLicense(ClusterState currentState, String type) {
    long issueDate = clock.millis();
    MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
    long expiryDate;
    if ("basic".equals(type)) {
      expiryDate = LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
    } else {
      expiryDate = issueDate +
LicenseService.NON BASIC SELF GENERATED LICENSE DURATION.getMillis();
    License.Builder specBuilder = License.builder()
        .uid(UUID.randomUUID().toString())
         .issuedTo(clusterService.getClusterName().value())
        .maxNodes(selfGeneratedLicenseMaxNodes)
        .issueDate(issueDate)
        .type(type)
        .expiryDate(expiryDate);
    License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder);
    LicensesMetaData licensesMetaData;
    if ("trial".equals(type)) {
      licensesMetaData = new LicensesMetaData(selfGeneratedLicense, Version.CURRENT);
    } else {
      licensesMetaData = new LicensesMetaData(selfGeneratedLicense, null);
    }
    mdBuilder.putCustom(LicensesMetaData.TYPE, licensesMetaData);
    return ClusterState.builder(currentState).metaData(mdBuilder).build();
  }
}
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```

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package org.elasticsearch.license;

import org.elasticsearch.action.support.master.AcknowledgedResponse; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput; import org.elasticsearch.common.xcontent.XContentBuilder; import org.elasticsearch.rest.RestStatus;

import java.io.IOException; import java.util.Collections; import java.util.HashMap; import java.util.Map;

import static org.elasticsearch.license.PostStartBasicResponse.Status.NEED_ACKNOWLEDGEMENT;

class PostStartBasicResponse extends AcknowledgedResponse {

private Map<String, String[]> acknowledgeMessages; private String acknowledgeMessage;

enum Status {

GENERATED_BASIC(true, null, RestStatus.OK), ALREADY_USING_BASIC(false, "Operation failed: Current license is basic.", RestStatus.FORBIDDEN), NEED_ACKNOWLEDGEMENT(false, "Operation failed: Needs acknowledgement.", RestStatus.OK);

private final boolean isBasicStarted; private final String errorMessage; private final RestStatus restStatus;

```
Status(boolean isBasicStarted, String errorMessage, RestStatus restStatus) {
    this.isBasicStarted = isBasicStarted;
    this.errorMessage = errorMessage;
    this.restStatus = restStatus;
}
boolean isBasicStarted() {
    return isBasicStarted;
}
String getErrorMessage() {
    return errorMessage;
}
RestStatus getRestStatus() {
    return restStatus;
}
```

```
}
private Status status;
PostStartBasicResponse() {
}
PostStartBasicResponse(Status status) {
    this(status, Collections.emptyMap(), null);
}
```

PostStartBasicResponse(Status status, Map<String, String[]> acknowledgeMessages, String acknowledgeMessage) {

```
super(status != NEED_ACKNOWLEDGEMENT);
this.status = status;
this.acknowledgeMessages = acknowledgeMessages;
this.acknowledgeMessage = acknowledgeMessage;
}
public Status getStatus() {
```

```
return status;
```

```
}
```

```
@Override
```

```
public void readFrom(StreamInput in) throws IOException {
  super.readFrom(in);
  readAcknowledged(in);
  status = in.readEnum(Status.class);
  acknowledgeMessage = in.readOptionalString();
  int size = in.readVInt();
  Map<String, String[]> acknowledgeMessages = new HashMap<>(size);
  for (int i = 0; i < size; i++) {
    String feature = in.readString();
    int nMessages = in.readVInt();
    String[] messages = new String[nMessages];
    for (int j = 0; j < nMessages; j++) {
       messages[j] = in.readString();
     }
    acknowledgeMessages.put(feature, messages);
  }
  this.acknowledgeMessages = acknowledgeMessages;
}
@Override
public void writeTo(StreamOutput out) throws IOException {
  super.writeTo(out);
  writeAcknowledged(out);
  out.writeEnum(status);
```

```
out.writeOptionalString(acknowledgeMessage);
    out.writeVInt(acknowledgeMessages.size());
    for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
      out.writeString(entry.getKey());
      out.writeVInt(entry.getValue().length);
      for (String message : entry.getValue()) {
         out.writeString(message);
      }
    }
  }
  @Override
 protected void addCustomFields(XContentBuilder builder, Params params) throws IOException {
    if (status.isBasicStarted()) {
      builder.field("basic_was_started", true);
    } else {
      builder.field("basic_was_started", false);
      builder.field("error message", status.getErrorMessage());
    }
    if (acknowledgeMessages.isEmpty() == false) {
      builder.startObject("acknowledge");
      builder.field("message", acknowledgeMessage);
      for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
         builder.startArray(entry.getKey());
         for (String message : entry.getValue()) {
           builder.value(message);
         }
         builder.endArray();
      }
      builder.endObject();
    }
  }
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* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.common.joda.FormatDateTimeFormatter;
import org.elasticsearch.common.joda.Joda;
import org.joda.time.MutableDateTime;
import org.joda.time.format.DateTimeFormatter;
import org.joda.time.format.ISODateTimeFormat;
```

```
public class DateUtils {
```

private static final FormatDateTimeFormatter formatDateOnlyFormatter = Joda.forPattern("yyyy-MM-dd");

private static final DateTimeFormatter dateOnlyFormatter = formatDateOnlyFormatter.parser().withZoneUTC();

private static final DateTimeFormatter dateTimeFormatter = ISODateTimeFormat.dateTime().withZoneUTC();

```
public static long endOfTheDay(String date) {
```

```
try {
      // Try parsing using complete date/time format
      return dateTimeFormatter.parseDateTime(date).getMillis();
    } catch (IllegalArgumentException ex) {
      // Fall back to the date only format
      MutableDateTime dateTime = dateOnlyFormatter.parseMutableDateTime(date);
      dateTime.millisOfDay().set(dateTime.millisOfDay().getMaximumValue());
      return dateTime.getMillis();
    }
  }
 public static long beginningOfTheDay(String date) {
    try {
      // Try parsing using complete date/time format
      return dateTimeFormatter.parseDateTime(date).getMillis();
    } catch (IllegalArgumentException ex) {
      // Fall back to the date only format
      return dateOnlyFormatter.parseDateTime(date).getMillis();
    }
  }
}
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* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
import org.elasticsearch.action.support.master.AcknowledgedRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;
public class DeleteLicenseRequestBuilder extends AcknowledgedRequestBuilder<DeleteLicenseRequest,
DeleteLicenseResponse,
    DeleteLicenseRequestBuilder> {
 public DeleteLicenseRequestBuilder(ElasticsearchClient client) {
    this(client, DeleteLicenseAction.INSTANCE);
  }
```

/**

```
* Creates new get licenses request builder
  * @param client elasticsearch client
  */
 public DeleteLicenseRequestBuilder(ElasticsearchClient client, DeleteLicenseAction action) {
    super(client, action, new DeleteLicenseRequest());
  }
}
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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;
public enum LicensesStatus {
 VALID((byte) 0),
 INVALID((byte) 1),
```

```
} else {
    throw new IllegalStateException("no valid LicensesStatus for id=" + id);
    }
    }
    /*
    * Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
    * or more contributor license agreements. Licensed under the Elastic License;
    * you may not use this file except in compliance with the Elastic License.
    */
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```

EXPIRED((byte) 2);

private final byte id;

this.id = id;

public int id() {
 return id;

if (id == 0) {

return VALID; } else if (id == 1) { return INVALID; } else if (id == 2) { return EXPIRED;

}

}

LicensesStatus(byte id) {

public static LicensesStatus fromId(int id) {

/**

* Licensing for xpack.

*

* A {@link org.elasticsearch.license.License} is a signed set of json properties that determine what features

* are available in a running cluster. Licenses are registered through a

* {@link org.elasticsearch.license.PutLicenseRequest}. This action is handled by the master node, which places

* the signed license into the cluster state. Each node listens for cluster state updates via the

* {@link org.elasticsearch.license.LicenseService}, and updates its local copy of the license when it detects

* changes in the cluster state.

*

* The logic for which features are available given the current license is handled by

* {@link org.elasticsearch.license.XPackLicenseState}, which is updated by the

* {@link org.elasticsearch.license.LicenseService} when the license changes.

*/

package org.elasticsearch.license;

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*/

package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchException;

import org.elasticsearch.action.ActionListener;

import org.elasticsearch.action.support.ActionFilters;

import org.elasticsearch.action.support.master.TransportMasterNodeAction;

import org.elasticsearch.cluster.service.ClusterService;

import org.elasticsearch.cluster.ClusterState;

import org.elasticsearch.cluster.block.ClusterBlockException;

import org.elasticsearch.cluster.block.ClusterBlockLevel;

 $import\ org. elastic search. cluster. metadata. Index Name Expression Resolver;$

import org.elasticsearch.common.inject.Inject;

import org.elasticsearch.common.settings.Settings;

import org.elasticsearch.threadpool.ThreadPool;

import org.elasticsearch.transport.TransportService;

public class TransportPutLicenseAction extends TransportMasterNodeAction<PutLicenseRequest,
PutLicenseResponse> {

private final LicenseService licenseService;

@Inject

public TransportPutLicenseAction(Settings settings, TransportService transportService, ClusterService clusterService,

LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters, IndexNameExpressionResolver indexNameExpressionResolver) {

super(settings, PutLicenseAction.NAME, transportService, clusterService, threadPool, actionFilters, indexNameExpressionResolver,

```
PutLicenseRequest::new);
   this.licenseService = licenseService;
 }
 @Override
 protected String executor() {
   return ThreadPool.Names.MANAGEMENT;
 }
 @Override
 protected PutLicenseResponse newResponse() {
   return new PutLicenseResponse();
 }
 @Override
 protected ClusterBlockException checkBlock(PutLicenseRequest request, ClusterState state) {
   return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
 }
 @Override
 protected void masterOperation(final PutLicenseRequest request, ClusterState state, final
ActionListener<PutLicenseResponse>
      listener) throws ElasticsearchException {
   licenseService.registerLicense(request, listener);
 }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;
class PostStartBasicRequestBuilder extends ActionRequestBuilder<PostStartBasicRequest,
   PostStartBasicResponse, PostStartBasicRequestBuilder> {
 PostStartBasicRequestBuilder(ElasticsearchClient client, PostStartBasicAction action) {
    super(client, action, new PostStartBasicRequest());
 }
 public PostStartBasicRequestBuilder setAcknowledge(boolean acknowledge) {
   request.acknowledge(acknowledge);
   return this;
 }
```

} /*

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package org.elasticsearch.license;

```
import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
```

```
import java.io.IOException;
```

```
class GetTrialStatusResponse extends ActionResponse {
```

```
private boolean eligibleToStartTrial;
```

```
GetTrialStatusResponse() {
}
```

```
GetTrialStatusResponse(boolean eligibleToStartTrial) {
  this.eligibleToStartTrial = eligibleToStartTrial;
```

}

```
boolean isEligibleToStartTrial() {
  return eligibleToStartTrial;
}
```

```
@Override
```

```
public void readFrom(StreamInput in) throws IOException {
  eligibleToStartTrial = in.readBoolean();
```

```
}
```

```
@Override
```

```
public void writeTo(StreamOutput out) throws IOException {
  out.writeBoolean(eligibleToStartTrial);
```

```
}
}
```

/*

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*/

package org.elasticsearch.license;

```
import org.apache.logging.log4j.Logger;
import org.apache.logging.log4j.message.ParameterizedMessage;
```

import org.elasticsearch.Version; import org.elasticsearch.action.ActionListener; import org.elasticsearch.cluster.ClusterState; import org.elasticsearch.cluster.ClusterStateUpdateTask; import org.elasticsearch.cluster.metadata.MetaData; import org.elasticsearch.common.Nullable; import org.elasticsearch.xpack.core.XPackPlugin;

import java.time.Clock; import java.util.Collections; import java.util.HashMap; import java.util.Map; import java.util.UUID; import java.util.concurrent.atomic.AtomicBoolean; import java.util.concurrent.atomic.AtomicReference;

public class StartTrialClusterTask extends ClusterStateUpdateTask {

private static final String ACKNOWLEDGEMENT_HEADER = "This API initiates a free 30-day trial for all platinum features." +

"By starting this trial, you agree that it is subject to the terms and conditions at" +

" https://www.elastic.co/legal/trial_license/. To begin your free trial, call /start_trial again and specify " + "the \"acknowledge=true\" parameter.";

private final Logger logger; private final String clusterName; private final PostStartTrialRequest request; private final ActionListener<PostStartTrialResponse> listener; private final Clock clock;

StartTrialClusterTask(Logger logger, String clusterName, Clock clock, PostStartTrialRequest request, ActionListener<PostStartTrialResponse> listener) {

```
this.logger = logger;
this.clusterName = clusterName;
this.request = request;
this.listener = listener;
this.clock = clock;
```

}

```
@Override
```

public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
 LicensesMetaData oldLicensesMetaData = oldState.metaData().custom(LicensesMetaData.TYPE);
 logger.debug("started self generated trial license: {}", oldLicensesMetaData);

if (request.isAcknowledged() == false) {

```
listener.onResponse(new
PostStartTrialResponse(PostStartTrialResponse.Status.NEED_ACKNOWLEDGEMENT,
           ACK_MESSAGES, ACKNOWLEDGEMENT_HEADER));
    } else if (oldLicensesMetaData == null || oldLicensesMetaData.isEligibleForTrial()) {
      listener.onResponse(new PostStartTrialResponse(PostStartTrialResponse.Status.UPGRADED_TO_TRIAL));
    } else {
      listener.onResponse(new
PostStartTrialResponse(PostStartTrialResponse.Status.TRIAL_ALREADY_ACTIVATED));
  }
  @Override
 public ClusterState execute(ClusterState currentState) throws Exception {
   XPackPlugin.checkReadyForXPackCustomMetadata(currentState);
   LicensesMetaData currentLicensesMetaData = currentState.metaData().custom(LicensesMetaData.TYPE);
   if (request.isAcknowledged() == false) {
      return currentState;
    } else if (currentLicensesMetaData == null || currentLicensesMetaData.isEligibleForTrial()) {
      long issueDate = clock.millis();
      MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
      long expiryDate = issueDate +
LicenseService.NON_BASIC_SELF_GENERATED_LICENSE_DURATION.getMillis();
      License.Builder specBuilder = License.builder()
           .uid(UUID.randomUUID().toString())
           .issuedTo(clusterName)
           .maxNodes(LicenseService.SELF_GENERATED_LICENSE_MAX_NODES)
           .issueDate(issueDate)
          .type(request.getType())
           .expiryDate(expiryDate);
      License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder);
      LicensesMetaData newLicensesMetaData = new LicensesMetaData(selfGeneratedLicense,
Version.CURRENT);
      mdBuilder.putCustom(LicensesMetaData.TYPE, newLicensesMetaData);
      return ClusterState.builder(currentState).metaData(mdBuilder).build();
    } else {
      return currentState;
    }
  }
  @Override
 public void onFailure(String source, @Nullable Exception e) {
   logger.error(new ParameterizedMessage("unexpected failure during [{ }]", source), e);
```

```
listener.onFailure(e);
```

```
}
```

```
/*
```

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*/

package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestValidationException; import org.elasticsearch.action.support.master.AcknowledgedRequest; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput;

```
import java.io.IOException;
```

public class PostStartBasicRequest extends AcknowledgedRequest<PostStartBasicRequest> {

```
private boolean acknowledge = false;
```

```
@Override
public ActionRequestValidationException validate() {
   return null;
```

```
}
```

}

```
public PostStartBasicRequest acknowledge(boolean acknowledge) {
  this.acknowledge = acknowledge;
  return this;
```

```
public boolean isAcknowledged() {
  return acknowledge;
```

}

}

```
@Override
public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    location = UP = location ()
```

```
acknowledge = in.readBoolean();
```

```
@Override
```

```
public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
```

```
out.writeBoolean(acknowledge);
```

```
}
}
```

/*

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```

*/

package org.elasticsearch.license;

import org.elasticsearch.action.ActionResponse; import org.elasticsearch.common.io.stream.StreamInput; import org.elasticsearch.common.io.stream.StreamOutput;

```
import java.io.IOException;
```

```
class GetBasicStatusResponse extends ActionResponse {
 private boolean eligibleToStartBasic;
 GetBasicStatusResponse() {
  }
 GetBasicStatusResponse(boolean eligibleToStartBasic) {
    this.eligibleToStartBasic = eligibleToStartBasic;
  }
 boolean isEligibleToStartBasic() {
    return eligibleToStartBasic;
  }
  @Override
 public void readFrom(StreamInput in) throws IOException {
    eligibleToStartBasic = in.readBoolean();
  }
 @Override
 public void writeTo(StreamOutput out) throws IOException {
    out.writeBoolean(eligibleToStartBasic);
  }
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.common.logging.LoggerMessageFormat;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.xpack.core.scheduler.SchedulerEngine;
```

import java.util.UUID;

abstract class ExpirationCallback {

```
static final String EXPIRATION_JOB_PREFIX = ".license_expiration_job_";
```

```
public enum Orientation {PRE, POST}
```

/**

```
* Callback that is triggered every <code>frequency</code> when
* current time is between <code>max</code> and <code>min</code>
* before license expiry.
*/
public abstract static class Pre extends ExpirationCallback {
  /**
   * Callback schedule prior to license expiry
   *
   * @param min
                      latest relative time to execute before license expiry
                      earliest relative time to execute before license expiry
   * @param max
   * @param frequency interval between execution
   */
  Pre(TimeValue min, TimeValue max, TimeValue frequency) {
    super(Orientation.PRE, min, max, frequency);
  }
}
/**
* Callback that is triggered every <code>frequency</code> when
* current time is between <code>min</code> and <code>max</code>
* after license expiry.
*/
public abstract static class Post extends ExpirationCallback {
  /**
   * Callback schedule after license expiry
   *
   * @param min
                     earliest relative time to execute after license expiry
   * @param max
                      latest relative time to execute after license expiry
   * @param frequency interval between execution
   */
  Post(TimeValue min, TimeValue max, TimeValue frequency) {
    super(Orientation.POST, min, max, frequency);
  }
}
private final String id;
private final Orientation orientation;
private final long min;
```

```
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```

private final long max; private final long frequency;

```
private ExpirationCallback(Orientation orientation, TimeValue min, TimeValue max, TimeValue frequency) {
  this.orientation = orientation;
  this.min = (min == null) ? 0 : min.getMillis();
  this.max = (max == null) ? Long.MAX_VALUE : max.getMillis();
  this.frequency = frequency.getMillis();
  this.id = String.join("", EXPIRATION JOB PREFIX, UUID.randomUUID().toString());
}
public final String getId() {
  return id;
}
public final long getFrequency() {
  return frequency;
}
/**
* Calculates the delay for the next trigger time. When <code>now</code> is in a
* valid time bracket with respect to <code>expirationDate</code>, the delay is 0.
* When <code>now</code> is before the time bracket, than delay to the start of the
* time bracket and when <code>now</code> is passed the valid time bracket, the delay
* is <code>null</code>
* @param expirationDate license expiry date in milliseconds
* @param now current time in milliseconds
* @return time delay
*/
final TimeValue delay(long expirationDate, long now) {
  final TimeValue delay;
  switch (orientation) {
    case PRE:
       if (expirationDate \geq now) {
         // license not yet expired
         long preExpiryDuration = expirationDate - now;
         if (preExpiryDuration > max) {
            // license duration is longer than maximum duration, delay it to the first match time
            delay = TimeValue.timeValueMillis(preExpiryDuration - max);
          } else if (preExpiryDuration <= max && preExpiryDuration >= min) {
            // no delay in valid time bracket
            delay = TimeValue.timeValueMillis(0);
          } else {
            // passed last match time
            delay = null;
         }
       } else {
         // invalid after license expiry
         delay = null;
       }
```

```
break;
     case POST:
       if (expirationDate >= now) {
         // license not yet expired, delay it to the first match time
          delay = TimeValue.timeValueMillis(expirationDate - now + min);
       } else {
         // license has expired
          long expiredDuration = now - expirationDate;
          if (expiredDuration < min) {
            // license expiry duration is shorter than minimum duration, delay it to the first match time
            delay = TimeValue.timeValueMillis(min - expiredDuration);
          } else if (expiredDuration >= min && expiredDuration <= max) {
            // no delay in valid time bracket
            delay = TimeValue.timeValueMillis(0);
          } else {
            // passed last match time
            delay = null;
          }
       }
       break;
     default:
       throw new IllegalStateException("orientation [" + orientation + "] unknown");
  }
  return delay;
}
/**
* {@link SchedulerEngine.Schedule#nextScheduledTimeAfter(long, long)} with respect to
* license expiry date
*/
public final long nextScheduledTimeForExpiry(long expiryDate, long startTime, long time) {
  TimeValue delay = delay(expiryDate, time);
  if (delay != null) {
     long delayInMillis = delay.getMillis();
     if (delayInMillis == 0L) {
       if (startTime == time) {
         // initial trigger and in time bracket, schedule immediately
         return time;
       } else {
         // in time bracket, add frequency
          return time + frequency;
       }
     } else {
       // not in time bracket
       return time + delayInMillis;
     }
  }
```

```
return -1;
```

```
}
 /**
  * Code to execute when the expiry callback is triggered in a valid
  * time bracket
  * @param license license to operate on
  */
 public abstract void on(License license);
 public final String toString() {
    return LoggerMessageFormat.format(null, "ExpirationCallback:(orientation [{}], min [{}], max [{}], freq
[{}])",
         orientation.name(), TimeValue.timeValueMillis(min), TimeValue.timeValueMillis(max),
         TimeValue.timeValueMillis(frequency));
  }
}
{
"metadata": {
 "name": "X-Pack Monitoring: License Expiration",
  "xpack": {
   "link": "license",
   "expires_days": [ 60, 30, 14, 7 ],
   "severity": 0,
   "alert_index": ".monitoring-alerts-6",
   "cluster_uuid": "${monitoring.watch.cluster_uuid}",
   "type": "monitoring",
   "version_created": 6020099,
   "watch": "${monitoring.watch.id}"
  }
},
"trigger": {
 "schedule": {
   "interval": "1m"
  }
},
"input": {
  "chain": {
   "inputs": [
    {
     "check": {
      "search": {
        "request": {
         "indices": [
          ".monitoring-es-*"
         ],
         "body": {
          "size": 1,
          "sort": [
```

```
{
        "timestamp": {
          "order": "desc"
        }
       }
      ],
      "_source": [
       "license.*"
      ],
      "query": {
       "bool": {
        "filter": [
          {
           "term": {
            "cluster_uuid": "{{ctx.metadata.xpack.cluster_uuid}}"
           }
          },
          {
           "term": {
            "type": "cluster_stats"
           }
          },
          {
           "range": {
            "timestamp": {
              "gte": "now-2m"
             }
           }
          }
        ]
       }
      }
     }
   }
  }
 }
},
{
 "alert": {
  "search": {
   "request": {
    "indices": [
      ".monitoring-alerts-6"
    ],
     "body": {
      "size": 1,
      "terminate_after": 1,
      "query": {
```

```
"bool": {
           "filter": {
            "term": {
             "_id": "{{ctx.watch_id}}"
            }
           }
          }
        },
        "sort": [
          { "timestamp": { "order": "desc" } }
        ]
       }
      }
     }
   }
  },
  {
   "kibana_settings": {
    "search": {
      "request": {
       "indices": [
        ".monitoring-kibana-6-*"
       ],
       "body": {
        "size": 1,
        "query": {
         "bool": {
           "filter": {
            "term": {
             "type": "kibana_settings"
            }
           }
          }
        },
        "sort": [
          {
           "timestamp": {
            "order": "desc"
           }
          }
        ]
       }
      }
     }
   }
  }
]
}
```

},

"condition": {

"script": {

```
"source": "if (ctx.payload.check.hits.total == 0) {return false; }def license =
ctx.payload.check.hits.hits[0]._source.license;if (license == null) {return false;}ctx.vars.fails_check = false;Instant
expiry = Instant.ofEpochMilli(license.expiry_date_in_millis);ctx.vars.expiry = expiry;if (license.status != 'active')
\{ctx.vars.expired = true; ctx.vars.fails check = true; ctx.metadata.xpack.severity = 2001; \} else {Instant now =
Instant.ofEpochMilli(new Date().getTime());ctx.vars.now = now;for (int i = ctx.metadata.xpack.expires_days.length
-1;i > -1;-i) {if (license.type == 'trial' && i < 2) {break;}Instant fromNow =
now.plusSeconds(ctx.metadata.xpack.expires days[i] * 24 * 60 * 60);if (fromNow.isAfter(expiry))
\{ctx.vars.fails\_check = true; ctx.metadata.xpack.severity = i * 1000; break; \}\} ctx.vars.not\_resolved = i * 1000; break; \}
(ctx.payload.alert.hits.total == 1 && ctx.payload.alert.hits.hits[0]._source.resolved_timestamp ==
null);ctx.vars.update = ctx.vars.fails check || ctx.vars.not resolved;"
  }
},
"transform": {
 "script": {
   "source": "ctx.vars.email recipient = (ctx.payload.kibana settings.hits.total > 0)?
ctx.payload.kibana_settings.hits.hits[0]._source.kibana_settings.xpack.default_admin_email : null;ctx.vars.is_new =
ctx.vars.fails_check && !ctx.vars.not_resolved;ctx.vars.is_resolved = !ctx.vars.fails_check &&
ctx.vars.not resolved;def alertMessage = null;if (ctx.vars.fails check) { alertMessage = 'Update your license.';} if
(ctx.vars.not_resolved) { ctx.payload = ctx.payload.alert.hits.hits[0]._source;ctx.payload.metadata =
ctx.metadata.xpack;if (ctx.vars.fails_check == false) { ctx.payload.resolved_timestamp = ctx.execution_time; } }
else { ctx.payload = [ 'timestamp': ctx.execution time, 'prefix': 'This cluster\\'s license is going to expire in
{{#relativeTime}}metadata.time{{/relativeTime}} at {{#absoluteTime}}metadata.time{{/absoluteTime}}.',
'message': alertMessage, 'metadata': ctx.metadata.xpack ]; } if (ctx.vars.fails_check) { ctx.payload.metadata.time =
ctx.vars.expiry.toString();} ctx.payload.update timestamp = ctx.execution time;return ctx.payload;"
  }
},
"actions": {
  "add_to_alerts_index": {
   "index": {
    "index": ".monitoring-alerts-6",
    "doc type": "doc",
    "doc_id": "${monitoring.watch.unique_id}"
   }
  },
  "send_email_to_admin": {
   "condition": {
    "script": "return ctx.vars.email_recipient != null && (ctx.vars.is_new || ctx.vars.is_resolved)"
   },
   "email": {
    "to": "X-Pack Admin <{ {ctx.vars.email_recipient }}",
    "from": "X-Pack Admin <{ {ctx.vars.email_recipient }}>",
    "subject":
"[{{#ctx.vars.is_new}}NEW{{/ctx.vars.is_new}}{{#ctx.vars.is_resolved}}RESOLVED{{/ctx.vars.is_resolved}}]
{{ctx.metadata.name}}",
    "body": {
```

```
"text": "{{#ctx.vars.is_resolved}}This cluster alert has been resolved: {{/ctx.vars.is_resolved}} This cluster's
license {{#ctx.vars.is_new}} is going to expire on
{{ctx.payload.metadata.time}}{{/ctx.vars.is_new}}{{#ctx.vars.is_resolved}}was going to
expire{{ctx.payload.metadata.time}}{{/ctx.vars.is_resolved}}.
{{#ctx.vars.is_new}}{{ctx.payload.message}}{{/ctx.vars.is_new}}"
    }
  }
  }
}
}
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                  Version 2.0, January 2004
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    control with that entity. For the purposes of this definition,
*
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*
     direction or management of such entity, whether by contract or
*
    otherwise, or (ii) ownership of fifty percent (50%) or more of the
*
    outstanding shares, or (iii) beneficial ownership of such entity.
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* (an example is provided in the Appendix below).

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- *
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*/

package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchSecurityException; import org.elasticsearch.action.support.PlainActionFuture; import org.elasticsearch.client.transport.TransportClient; import org.elasticsearch.cluster.ClusterState; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.unit.TimeValue; import org.elasticsearch.common.xcontent.XContentType; import org.elasticsearch.license.License.OperationMode; import org.elasticsearch.rest.RestStatus; import org.elasticsearch.test.junit.annotations.TestLogging; import org.elasticsearch.transport.Transport; import org.elasticsearch.xpack.core.TestXPackTransportClient; import org.elasticsearch.xpack.core.XPackField; import org.elasticsearch.xpack.core.ml.action.CloseJobAction; import org.elasticsearch.xpack.core.ml.action.DeleteDatafeedAction; import org.elasticsearch.xpack.core.ml.action.DeleteJobAction; import org.elasticsearch.xpack.core.ml.action.GetDatafeedsStatsAction; import org.elasticsearch.xpack.core.ml.action.GetJobsStatsAction; import org.elasticsearch.xpack.core.ml.action.OpenJobAction; import org.elasticsearch.xpack.core.ml.action.PutDatafeedAction;

import org.elasticsearch.xpack.core.ml.action.PutJobAction;
import org.elasticsearch.xpack.core.ml.action.StartDatafeedAction;
import org.elasticsearch.xpack.core.ml.action.StopDatafeedAction;
import org.elasticsearch.xpack.core.ml.client.MachineLearningClient;
import org.elasticsearch.xpack.core.ml.datafeed.DatafeedState;
import org.elasticsearch.xpack.core.ml.job.config.JobState;
import org.elasticsearch.persistent.PersistentTasksCustomMetaData;
import org.elasticsearch.xpack.ml.LocalStateMachineLearning;
import org.elasticsearch.xpack.ml.support.BaseMlIntegTestCase;
import org.junit.Before;

import java.util.Collections;

import static org.hamcrest.Matchers.containsString; import static org.hamcrest.Matchers.hasItem; import static org.hamcrest.Matchers.is;

@TestLogging("org.elasticsearch.xpack.ml.action:DEBUG")
public class MachineLearningLicensingTests extends BaseMlIntegTestCase {

```
@Before
 public void resetLicensing() {
    enableLicensing();
   ensureStableCluster(1);
    ensureYellow();
 }
 public void testMachineLearningPutJobActionRestricted() throws Exception {
    String jobId = "testmachinelearningputjobactionrestricted";
   // Pick a license that does not allow machine learning
   License.OperationMode mode = randomInvalidLicenseType();
   enableLicensing(mode);
   assertMLAllowed(false);
   // test that license restricted apis do not work
   Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
());
      PlainActionFuture<PutJobAction.Response> listener = PlainActionFuture.newFuture();
      new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), listener);
      listener.actionGet();
      fail("put job action should not be enabled!");
    } catch (ElasticsearchSecurityException e) {
      assertThat(e.status(), is(RestStatus.FORBIDDEN));
      assertThat(e.getMessage(), containsString("non-compliant"));
      assertThat(e.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA),
hasItem(XPackField.MACHINE_LEARNING));
```

// Pick a license that does allow machine learning mode = randomValidLicenseType(); enableLicensing(mode); assertMLAllowed(true); // test that license restricted apis do now work try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) { client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress ()):PlainActionFuture<PutJobAction.Response> listener = PlainActionFuture.newFuture(); new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), listener); PutJobAction.Response response = listener.actionGet(); assertNotNull(response); } } public void testMachineLearningOpenJobActionRestricted() throws Exception { String jobId = "testmachinelearningopenjobactionrestricted"; assertMLAllowed(true); // test that license restricted apis do now work Settings settings = internalCluster().transportClient().settings(); try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) { client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress ());

PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener); PutJobAction.Response response = putJobListener.actionGet(); assertNotNull(response);

```
}
```

 $/\!/$ Pick a license that does not allow machine learning

License.OperationMode mode = randomInvalidLicenseType();

enableLicensing(mode);

assertMLAllowed(false);

// test that license restricted apis do not work

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
 client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
 ());

PlainActionFuture<OpenJobAction.Response> listener = PlainActionFuture.newFuture(); new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), listener); listener.actionGet();

fail("open job action should not be enabled!");

} catch (ElasticsearchSecurityException e) {

assertThat(e.status(), is(RestStatus.FORBIDDEN));

assertThat (e.getMessage (), contains String ("non-compliant"));

```
assert That (e.get Metadata (License Utils. EXPIRED\_FEATURE\_METADATA),
```

hasItem(XPackField.MACHINE_LEARNING));

```
// Pick a license that does allow machine learning
mode = randomValidLicenseType();
enableLicensing(mode);
assertMLAllowed(true);
```

```
// now that the license is invalid, the job should get closed:
assertBusy(() -> {
    JobState jobState = getJobStats(jobId).getState();
    assertEquals(JobState.CLOSED, jobState);
```

```
});
```

 $\ensuremath{\textit{//}}\xspace$ test that license restricted apis do now work

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) { client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress

```
());
```

```
PlainActionFuture<OpenJobAction.Response> listener = PlainActionFuture.newFuture();
new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), listener);
OpenJobAction.Response response = listener.actionGet();
assertNotNull(response);
```

```
}
```

}

```
public void testMachineLearningPutDatafeedActionRestricted() throws Exception {
```

String jobId = "testmachinelearningputdatafeedactionrestricted";

String datafeedId = jobId + "-datafeed";

assertMLAllowed(true);

// test that license restricted apis do now work

Settings settings = internalCluster().transportClient().settings();

```
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
    ());
```

```
PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
PutJobAction.Response putJobResponse = putJobListener.actionGet();
assertNotNull(putJobResponse);
```

```
}
```

```
// Pick a license that does not allow machine learning
```

License.OperationMode mode = randomInvalidLicenseType();

enableLicensing(mode);

assertMLAllowed(false);

// test that license restricted apis do not work

```
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
    ());
```

PlainActionFuture<PutDatafeedAction.Response> listener = PlainActionFuture.newFuture();

new MachineLearningClient(client).putDatafeed(

new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId, Collections.singletonList(jobId))),

listener);

listener.actionGet();

fail("put datafeed action should not be enabled!");

```
} catch (ElasticsearchSecurityException e) {
```

assertThat(e.status(), is(RestStatus.FORBIDDEN));

assertThat(e.getMessage(), containsString("non-compliant"));

```
assert That (e.get Metadata (License Utils. EXPIRED_FEATURE_METADATA),
```

hasItem(XPackField.MACHINE_LEARNING));

}

 $/\!/$ Pick a license that does allow machine learning

mode = randomValidLicenseType();

enableLicensing(mode);

assertMLAllowed(true);

// test that license restricted apis do now work

```
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
    ());
```

PlainActionFuture<PutDatafeedAction.Response> listener = PlainActionFuture.newFuture();

new MachineLearningClient(client).putDatafeed(

new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId, Collections.singletonList(jobId))),

listener);

}

```
PutDatafeedAction.Response response = listener.actionGet();
assertNotNull(response);
```

```
}
```

```
public void testAutoCloseJobWithDatafeed() throws Exception {
```

String jobId = "testautoclosejobwithdatafeed";

```
String datafeedId = jobId + "-datafeed";
```

assertMLAllowed(true);

String datafeedIndex = jobId + "-data";

prepareCreate(datafeedIndex).addMapping("type", "{\"type\":{\"properties\":{\"time\":{\"type\":\"date\"}}}", XContentType.JSON).get();

Settings settings = internalCluster().transportClient().settings();

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
 client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
 ());

,

// put job

PlainActionFuture < PutJobAction.Response > putJobListener = PlainActionFuture.newFuture();

 $new\ Machine Learning Client (client). put Job (new\ Put Job Action. Request (create Job (job Id)), \ put Job Listener);$

 $PutJobAction. Response \ putJobResponse = putJobListener.actionGet(); \\$

assertNotNull(putJobResponse);

// put datafeed

PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).putDatafeed(

new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId,

```
Collections.singletonList(datafeedIndex))), putDatafeedListener);
```

PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();
assertNotNull(putDatafeedResponse);

// open job

PlainActionFuture<OpenJobAction.Response> openJobListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener); OpenJobAction.Response openJobResponse = openJobListener.actionGet();

assertNotNull(openJobResponse);

// start datafeed

PlainActionFuture<StartDatafeedAction.Response> listener = PlainActionFuture.newFuture(); new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L),

listener);

```
listener.actionGet();
```

}

```
if (randomBoolean()) {
```

enableLicensing(randomInvalidLicenseType());

} else {

```
disableLicensing();
```

}

assertMLAllowed(false);

// now that the license is invalid, the job should be closed and datafeed stopped:

```
assertBusy(() -> {
```

JobState jobState = getJobStats(jobId).getState(); assertEquals(JobState.CLOSED, jobState);

DatafeedState datafeedState = getDatafeedStats(datafeedId).getDatafeedState(); assertEquals(DatafeedState.STOPPED, datafeedState);

```
ClusterState state = client().admin().cluster().prepareState().get().getState();
```

PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE); assertEquals(0, tasks.taskMap().size());

});

enableLicensing(randomValidLicenseType());
assertMLAllowed(true);

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
 client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
 ());

// open job

PlainActionFuture<OpenJobAction.Response> openJobListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener); OpenJobAction.Response openJobResponse = openJobListener.actionGet(); assertNotNull(openJobResponse); // start datafeed

```
PlainActionFuture<StartDatafeedAction.Response> listener = PlainActionFuture.newFuture();
      new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L),
listener);
       listener.actionGet();
    }
    assertBusy(() \rightarrow \{
      JobState jobState = getJobStats(jobId).getState();
      assertEquals(JobState.OPENED, jobState);
      DatafeedState datafeedState = getDatafeedStats(datafeedId).getDatafeedState();
      assertEquals(DatafeedState.STARTED, datafeedState);
      ClusterState state = client().admin().cluster().prepareState().get().getState();
      PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE);
      assertEquals(2, tasks.taskMap().size());
    });
    if (randomBoolean()) {
      enableLicensing(randomInvalidLicenseType());
    } else {
      disableLicensing();
    }
    assertMLAllowed(false);
    // now that the license is invalid, the job should be closed and datafeed stopped:
    assertBusy(() \rightarrow \{
      JobState jobState = getJobStats(jobId).getState();
      assertEquals(JobState.CLOSED, jobState);
      DatafeedState datafeedState = getDatafeedStats(datafeedId).getDatafeedState();
      assertEquals(DatafeedState.STOPPED, datafeedState);
      ClusterState state = client().admin().cluster().prepareState().get().getState();
      PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE);
       assertEquals(0, tasks.taskMap().size());
    });
  }
 public void testMachineLearningStartDatafeedActionRestricted() throws Exception {
    String jobId = "testmachinelearningstartdatafeedactionrestricted";
    String datafeedId = jobId + "-datafeed";
    assertMLAllowed(true);
    String datafeedIndex = jobId + "-data";
    prepareCreate(datafeedIndex).addMapping("type", "{\"type\":{\"properties\":{\"time\":{\"type\":\"date\"}}}}",
      XContentType.JSON).get();
    // test that license restricted apis do now work
    Settings settings = internalCluster().transportClient().settings();
```

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) { client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress

```
());
```

```
PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
  new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
  PutJobAction.Response putJobResponse = putJobListener.actionGet();
  assertNotNull(putJobResponse);
  PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture();
  new MachineLearningClient(client).putDatafeed(
       new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId,
           Collections.singletonList(datafeedIndex))), putDatafeedListener);
  PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();
  assertNotNull(putDatafeedResponse);
  PlainActionFuture<OpenJobAction.Response> openJobListener = PlainActionFuture.newFuture();
  new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
  OpenJobAction.Response openJobResponse = openJobListener.actionGet();
  assertNotNull(openJobResponse);
// Pick a license that does not allow machine learning
```

```
License.OperationMode mode = randomInvalidLicenseType();
enableLicensing(mode);
```

assertMLAllowed(false);

```
// now that the license is invalid, the job should get closed:
```

 $assertBusy(() \rightarrow \{$

```
JobState jobState = getJobStats(jobId).getState();
```

```
assertEquals(JobState.CLOSED, jobState);
```

```
ClusterState state = client().admin().cluster().prepareState().get().getState();
```

```
PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE);
assertEquals(0, tasks.taskMap().size());
```

});

}

// test that license restricted apis do not work

```
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
());
```

PlainActionFuture<StartDatafeedAction.Response> listener = PlainActionFuture.newFuture();

```
new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L),
```

listener);

```
listener.actionGet();
      fail("start datafeed action should not be enabled!");
    } catch (ElasticsearchSecurityException e) {
      assertThat(e.status(), is(RestStatus.FORBIDDEN));
      assertThat(e.getMessage(), containsString("non-compliant"));
      assertThat(e.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA),
hasItem(XPackField.MACHINE_LEARNING));
```

```
}
```

// Pick a license that does allow machine learning

mode = randomValidLicenseType();

enableLicensing(mode);

assertMLAllowed(true);

 $\ensuremath{\textit{//}}\xspace$ test that license restricted apis do now work

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
 client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
 ());

// re-open job now that the license is valid again
PlainActionFuture<OpenJobAction.Response> openJobListener = PlainActionFuture.newFuture();
new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
OpenJobAction.Response openJobResponse = openJobListener.actionGet();
assertNotNull(openJobResponse);

PlainActionFuture<StartDatafeedAction.Response>listener = PlainActionFuture.newFuture(); new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L),

listener);

```
StartDatafeedAction.Response response = listener.actionGet();
assertNotNull(response);
```

}

```
public void testMachineLearningStopDatafeedActionNotRestricted() throws Exception {
```

String jobId = "testmachinelearningstopdatafeedactionnotrestricted";

String datafeedId = jobId + "-datafeed";

assertMLAllowed(true);

String datafeedIndex = jobId + "-data";

```
prepareCreate(datafeedIndex).addMapping("type", "{\"type\":{\"properties\":{\"time\":{\"type\":\"date\"}}}", XContentType.JSON).get();
```

// test that license restricted apis do now work

Settings settings = internalCluster().transportClient().settings();

```
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
    ());
```

PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();

```
new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
```

PutJobAction.Response putJobResponse = putJobListener.actionGet();

assertNotNull(putJobResponse);

PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).putDatafeed(

 $new\ PutDatafeedAction. Request(createDatafeed(datafeedId, jobId,$

Collections.singletonList(datafeedIndex))), putDatafeedListener);

PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();
assertNotNull(putDatafeedResponse);

PlainActionFuture<OpenJobAction.Response> openJobListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener); OpenJobAction.Response openJobResponse = openJobListener.actionGet(); assertNotNull(openJobResponse);

```
PlainActionFuture<StartDatafeedAction.Response> startDatafeedListener = PlainActionFuture.newFuture();
  new MachineLearningClient(client).startDatafeed(
     new StartDatafeedAction.Request(datafeedId, 0L), startDatafeedListener);
  StartDatafeedAction.Response startDatafeedResponse = startDatafeedListener.actionGet();
  assertNotNull(startDatafeedResponse);
}
boolean invalidLicense = randomBoolean();
if (invalidLicense) {
  enableLicensing(randomInvalidLicenseType());
} else {
  enableLicensing(randomValidLicenseType());
```

}

}

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) { client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress ());

```
PlainActionFuture<StopDatafeedAction.Response> listener = PlainActionFuture.newFuture();
      new MachineLearningClient(client).stopDatafeed(new StopDatafeedAction.Request(datafeedId), listener);
      if (invalidLicense) {
        // the stop datafeed due to invalid license happens async, so check if the datafeed turns into stopped state:
         assertBusy(() -> {
           GetDatafeedsStatsAction.Response response =
                new MachineLearningClient(client)
                     .getDatafeedsStats(new GetDatafeedsStatsAction.Request(datafeedId)).actionGet();
           assertEquals(DatafeedState.STOPPED, response.getResponse().results().get(0).getDatafeedState());
         });
      } else {
         listener.actionGet();
      }
      if (invalidLicense) {
        // the close due to invalid license happens async, so check if the job turns into closed state:
         assertBusy(() -> {
           GetJobsStatsAction.Response response =
                new MachineLearningClient(client).getJobsStats(new
GetJobsStatsAction.Request(jobId)).actionGet();
           assertEquals(JobState.CLOSED, response.getResponse().results().get(0).getState());
         });
      }
    }
 public void testMachineLearningCloseJobActionNotRestricted() throws Exception {
    String jobId = "testmachinelearningclosejobactionnotrestricted";
    assertMLAllowed(true);
```

```
// test that license restricted apis do now work
```

Settings settings = internalCluster().transportClient().settings();

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
 client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
 ());

PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener); PutJobAction.Response putJobResponse = putJobListener.actionGet(); assertNotNull(putJobResponse); PlainActionFuture<OpenJobAction.Response> openJobListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener); OpenJobAction.Response openJobResponse = openJobListener.actionGet(); assertNotNull(openJobResponse);

```
boolean invalidLicense = randomBoolean();
```

if (invalidLicense) {

enableLicensing(randomInvalidLicenseType());

} else {

enableLicensing(randomValidLicenseType());

}

}

```
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
```

());

```
PlainActionFuture<CloseJobAction.Response> listener = PlainActionFuture.newFuture();
CloseJobAction.Request request = new CloseJobAction.Request(jobId);
request.setCloseTimeout(TimeValue.timeValueSeconds(20));
if (invalidLicense) {
    // the close due to invalid license happens async, so check if the job turns into closed state:
    assertBusy(() -> {
      GetJobsStatsAction.Response response =
```

new MachineLearningClient(client).getJobsStats(new

```
GetJobsStatsAction.Request(jobId)).actionGet();
```

```
assertEquals(JobState.CLOSED, response.getResponse().results().get(0).getState());
```

```
});
```

```
} else {
```

```
new MachineLearningClient(client).closeJob(request, listener);
listener.actionGet();
```

```
instener.actionGe
```

```
}
```

```
}
```

public void testMachineLearningDeleteJobActionNotRestricted() throws Exception {

String jobId = "testmachinelearningclosejobactionnotrestricted";

assertMLAllowed(true);

// test that license restricted apis do now work

Settings settings = internalCluster().transportClient().settings();

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {

client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress ());

PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener); PutJobAction.Response putJobResponse = putJobListener.actionGet(); assertNotNull(putJobResponse);

}

// Pick a random license License.OperationMode mode = randomLicenseType(); enableLicensing(mode);

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) { client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress ());

PlainActionFuture<DeleteJobAction.Response> listener = PlainActionFuture.newFuture(); new MachineLearningClient(client).deleteJob(new DeleteJobAction.Request(jobId), listener); listener.actionGet();

} }

public void testMachineLearningDeleteDatafeedActionNotRestricted() throws Exception {

String jobId = "testmachinelearningdeletedatafeedactionnotrestricted";

String datafeedId = jobId + "-datafeed";

assertMLAllowed(true);

// test that license restricted apis do now work

Settings settings = internalCluster().transportClient().settings();

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {

client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress ());

PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();

new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);

PutJobAction.Response putJobResponse = putJobListener.actionGet();

```
assertNotNull(putJobResponse);
```

PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture(); new MachineLearningClient(client).putDatafeed(

new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId,

Collections.singletonList(jobId))), putDatafeedListener);

PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();

```
assertNotNull(putDatafeedResponse);
```

}

// Pick a random license

License.OperationMode mode = randomLicenseType(); enableLicensing(mode);

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) { client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress

```
());
      PlainActionFuture<DeleteDatafeedAction.Response> listener = PlainActionFuture.newFuture();
      new MachineLearningClient(client).deleteDatafeed(new DeleteDatafeedAction.Request(datafeedId),
listener);
      listener.actionGet();
    }
  }
 private static OperationMode randomInvalidLicenseType() {
    return randomFrom(License.OperationMode.GOLD, License.OperationMode.STANDARD,
License.OperationMode.BASIC);
  }
 private static OperationMode randomValidLicenseType() {
    return randomFrom(License.OperationMode.TRIAL, License.OperationMode.PLATINUM);
  }
 private static OperationMode randomLicenseType() {
    return randomFrom(License.OperationMode.values());
  }
 private static void assertMLAllowed(boolean expected) {
    for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      assertEquals(licenseState.isMachineLearningAllowed(), expected);
    }
  }
 public static void disableLicensing() {
    disableLicensing(randomValidLicenseType());
  }
 public static void disableLicensing(License.OperationMode operationMode) {
    for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      licenseState.update(operationMode, false);
    }
  }
 public static void enableLicensing() {
    enableLicensing(randomValidLicenseType());
  }
 public static void enableLicensing(License.OperationMode operationMode) {
    for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      licenseState.update(operationMode, true);
    }
  }
}
```

```
---
```

teardown:

- do:

xpack.license.post:

acknowledge: true

body: |

{"licenses":[{"uid":"894371dc-9t49-4997-93cb-

802e3r7fa6a8", "type": "trial", "issue_date_in_millis": 1411948800000, "expiry_date_in_millis": 1916956799999, "max _nodes": 1, "issued_to": "issuedTo", "issuer": "issuer", "signature": "AAAAAgAAAA0FWh0T9njltjQ2qammAAABmC 9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTV0MVZwUzRxVk1PSmkxakxZdW5IMlhITHN0N1N2MXM vRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHBkWkprZWZSQi9iNmRQNkw1SlpLN0lDalZCS095M XRGN1lIZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0U0MXZ0dDJHSERiZTVLOHNzSDByWnpoZEphZH BEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNiWktNWGM5TUhQV2plaUo4Q1JOUml4MXNuL0pSOEhQa VB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K055c28zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2VE1q bVNQS2lxOHN5bUErZINIWkZSVmZIWEtaSU9wTTJENDVvT1NCYklacUYyK2FwRW9xa0t6dldMbmMzSGtQ c3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRWUzh6UG5pdENGWFRreXNKNkE9PQAAAQBZhvozA0 trrxhUZ1QbaTsKTna9C5KVQ6pv8yg1pnsBpZXCl8kX1SrgoFn1bXq61IvJwfw5qnmYNiH3hRhT09EyaCBqaLk8 NXZQ6TrRkQSpEnnBwAYUkZeKXsIuBoOk4B4mzwC/r8aMAkzrTiEBtBbog+57cSaU9y37Gkdd+1jXCQrxP+jO EUf7gnXWZvE6oeRroLvCt1fYn09k0CF8kKTbrPTSjC6igZR3uvTHyee74XQ9PRavvHax73T4UOEdQZX/P1ibS QIWKbBRD5YQ1POYVjTayoltTnWLMxfEcAkkATJZLhpBEHST7kZWjrTS6J1dCReJc7a8Vsj/78HXvOly" }]}

"Installing and getting license works":

current license version

- do:

xpack.license.post: acknowledge: true body: |

{"licenses":[{"uid":"894371dc-9t49-4997-93cb-

802e3r7fa6a8","type":"trial","issue_date_in_millis":1411948800000,"expiry_date_in_millis":1916956799999,"max _nodes":1,"issued_to":"issuedTo","issuer":"issuer","signature":"AAAAAgAAAA0FWh0T9njItjQ2qammAAABmC 9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTVoMVZwUzRxVk1PSmkxakxZdW5IMlhlTHNoN1N2MXM vRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHBkWkprZWZSQi9iNmRQNkw1SlpLN0lDalZCS095M XRGN1llZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0U0MXZ0dDJHSERiZTVLOHNzSDByWnpoZEphZH BEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNiWktNWGM5TUhQV2plaUo4Q1JOUml4MXNuL0pSOEhQa VB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K055c28zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2VE1q bVNQS2lxOHN5bUErZlNIWkZSVmZIWEtaSU9wTTJENDVvT1NCYklacUYyK2FwRW9xa0t6dldMbmMzSGtQ c3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRWUzh6UG5pdENGWFRreXNKNkE9PQAAAQBZhvozA0 trrxhUZ1QbaTsKTna9C5KVQ6pv8yg1pnsBpZXCl8kX1SrgoFn1bXq61IvJwfw5qnmYNiH3hRhTO9EyaCBqaLk8 NXZQ6TrRkQSpEnnBwAYUkZeKXsIuBoOk4B4mzwC/r8aMAkzrTiEBtBbog+57cSaU9y37Gkdd+1jXCQrxP+jO EUf7gnXWZvE6oeRroLvCt1fYn09k0CF8kKTbrPTSjC6igZR3uvTHyee74XQ9PRavvHax73T4UOEdQZX/PlibS QIWKbBRD5YQ1POYVjTayoltTnWLMxfEcAkkATJZLhpBEHST7kZWjrTS6J1dCReJc7a8Vsj/78HXvOIy"}]]

- match: { license_status: "valid" }

- do: xpack.license.get: { } ## a license object has 11 attributes
- length: { license: 11 }

```
## bwc for licenses format
- do:
    xpack.license.post:
```

acknowledge: true

body: |

{"licenses":[{"uid":"893361dc-9749-4997-93cb-

802e3d7fa4a8", "type": "gold", "issue_date_in_millis": 1411948800000, "expiry_date_in_millis": 1914278399999, "ma x_nodes": 1, "issued_to", "issuer": "issuer", "signature": "AAAAAWAAAA2T3vqdBBetKQaBgxipAAAB mC9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTVoMVZwUzRxVk1PSmkxakxZdW5IMlhlTHNoN1N2M XMvRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHBkWkprZWZSQi9iNmRQNkw1SlpLN0lDalZCS09 5MXRGN1lIIZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0U0MXZ0dDJHSERiZTVLOHNzSDByWnpoZEph ZHBEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNiWktNWGM5TUhQV2plaUo4Q1JOUml4MXNuL0pSOE hQaVB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K055c28zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2V E1qbVNQS2lxOHN5bUErZlNIWkZSVmZIWEtaSU9wTTJENDVvT1NCYklacUYyK2FwRW9xa0t6dldMbmMzS GtQc3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRWUzh6UG5pdENGWFRreXNKNkE9PQAAAQB7pG FYgawfLm9zzT80LvcLHjy1t/v2uSzCQWKdXXhrwSy4WrAH2uK/+PEiQ7aEpW5erLsyJ5KLA6OEZJDaP7r+mj OPuLt0++15j4DMn7ybMzOPHXWBc6LETE3+pp0GZPyOmwsDkZSRUegTtciR2R6z+mdnGrhOYM80y08KVW whdU/DHw41MK7ePo6tq73Nz49y9lDgt9fxA0t4ggEBPbnTDDBVQ25AjauY8sa0M5eg9rDDRayw1KamYWrara8 PIGX+2YjhtUeQhmlCPdlxc9wECJ7/knPss5bI3ZoXQR3fyXhjcXNnHEIsblqLrMCal3pLxs7lI+KPYMa2ZYL/am4 P"}]}

```
- match: { license_status: "valid" }
```

- do:

xpack.license.get: { }

- length: { license: 11 }

license version: 1.x

```
- do:
```

xpack.license.post: acknowledge: true body: |

{"licenses":[{"uid":"893361dc-9749-4997-93cb-

802e3d7fa4a8","type":"subscription","subscription_type":"gold","issue_date_in_millis":1411948800000,"feature":" shield","expiry_date_in_millis":1914278399999,"max_nodes":1,"issued_to":"issuedTo","issuer":"issuer","signature ":"AAAAAQAAAA0LVAywwpSH94cyXr4zAAABmC9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTVo MVZwUzRxVk1PSmkxakxZdW5IMlhlTHNoN1N2MXMvRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0pp THBkWkprZWZSQi9iNmRQNkw1SlpLN0lDalZCS095MXRGN1lIZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeG wxb0U0MXZ0dDJHSERiZTVLOHNzSDByWnpoZEphZHBEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNi WktNWGM5TUhQV2plaUo4Q1JOUml4MXNuL0pSOEhQaVB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K 055c28zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2VE1qbVNQS2lxOHN5bUErZlNIWkZSVmZIWEtaSU9w TTJENDVvT1NCYklacUYyK2FwRW9xa0t6dldMbmMzSGtQc3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2 bDRWUzh6UG5pdENGWFRreXNKNkE9PQAAAQA4qscc/URRZVdFoLwgy9dqybYEQLW8YLkiAyPV5XHHH dtk+dtZlepiNEDkUXhSX2waVJIsNRF8/4kqplDfwNoD2TUM8fTgiIfiSiZYGDTGST+yW/5eAveEU5J5v1liBN27b

wkqL+V4YAa0Tcm7NKKwjScWKAHiTU3vF8chPkGfCHE0kQgVwPC9RE82pTw0s6/uR4PfLGNFfqPM0uiE5n ucfVrtj89JQiO/KA/7ZyFbo7VTNXxZQt7T7rZWBCP9KIjptXzcWuk08Q5S+rSoJNYbFo3HGKtrCVsRz/55rceNtd wKKXu1IwnSeir4I1/KLduQTtFLy0+1th87VS8T88UT"}]}

- match: { license_status: "valid" }

- do:

xpack.license.get: { }

- length: { license: 11 }

multiple licenses version: 1.x

- do:

xpack.license.post: acknowledge: true

body: |

{"licenses":[{"uid":"893361dc-9749-4997-93cb-

802e3d7fa4a8","type":"internal","subscription_type":"none","issue_date_in_millis":1411948800000,"feature":"shiel d","expiry_date_in_millis":1440892799999,"max_nodes":1,"issued_to":"issuedTo","issuer":"issuer","signature":"A AAAAQAAAA04Q4ky3rFyyWLFkytEAAABmC9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTVoMVZw UzRxVk1PSmkxakxZdW5IMlhlTHNoN1N2MXMvRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHBkW kprZWZSQi9iNmRQNkw1SlpLN0lDalZCS095MXRGN1lIZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0U0 MXZ0dDJHSERiZTVLOHNzSDByWnpoZEphZHBEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNiWktNW GM5TUhQV2plaUo4Q1JOUml4MXNuL0pSOEhQaVB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K055c28z SmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2VE1qbVNQS2lxOHN5bUErZlNIWkZSVmZIWEtaSU9wTTJEND VvT1NCYklacUYyK2FwRW9xa0t6dldMbmMzSGtQe3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRWUz h6UG5pdENGWFRreXNKNkE9PQAAAQBxMvUMn4h2E4R4TQMijahTxQj4LPQO4f1M79UxX/XkDIGcH+J5p RHx080tTRPsFL11ED+h+PIXx307Vo+PNDsOxrWvoYZeYBkOLAO3ny9vhQga+52jYhMxIuFr79xbcSCSNpMh GojgOIPU2WgiopVdVcimo1+Gk8VtklPB1wPwFzfOjOnPgp/Icx3WYpfkeAUUOyWUYiFIBAe4bnz84iF+xwLKb gYk6aHF25ECBtdb/Uruhcm9+jEFpoIEUtCouvvk9C+NJZ4OickV4xpRgaRG2x9PONH8ZN0QGhGYhJGbisoCxu DmlLsyVxqxfMu3n/r7/jdsEJScjAISrsLDOu6H"},{"uid":"893361dc-9749-4997-93cb-

802e3dofh7aa", "type": "internal", "subscription_type": "none", "issue_date_in_millis": 1443484800000, "feature": "watc her", "expiry_date_in_millis": 1914278399999, "max_nodes": 1, "issued_to": "issuedTo", "issuer": "issuer", "signature": " AAAAAQAAAA0Sc90guRIaQEmgLvMnAAABmC9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTVoMV ZwUzRxVk1PSmkxakxZdW51MlhITHNoN1N2MXMvRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHB kWkprZWZSQi9iNmRQNkw1SlpLN0lDalZCS095MXRGN1lIZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0 U0MXZ0dDJHSERiZTVLOHNzSDByWnpoZEphZHBEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNiWktN WGM5TUhQV2plaUo4Q1JOUml4MXNuL0pSOEhQaVB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K055c2 8zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2VE1qbVNQS2lxOHN5bUErZlNIWkZSVmZIWEtaSU9wTTJEN DVvT1NCYklacUYyK2FwRW9xa0t6dldMbmMzSGtQc3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRW Uzh6UG5pdENGWFRreXNKNkE9PQAAAQCQ94dju0pnDZR3Uuypi0ic3aQJ+nvVqe+U8u79Dga5n1qIjcHDh7H vIBJEkF+tnVPlo/PXV/x7BZSwVY1PVErit+6rYix1yuHEgqwxmx/VdRICjCaZM6tk0Ob4dZCPv6Ebn2Mmk89KH C/PwiLPqF6QfwV/Pkpa8k2A3ORJmvYSDvXhe6tCs8dqc4ebrsFxqrZjwWh5CZSpzqqZBFXlngDv2N0hHhpGlueR szD0JJ5dfEL5ZA1DDOrgO90JVejSHyRqe1L5QRUNdXPVfS+EAG0Dd1cNdJ/sMpYCPnVjbw6iq2/YgM3cuztsX VBY7ij4WnoP3ce7Zjs9TwHn+IqzftC6"}]}

- match: { license_status: "valid" }

```
- do:
xpack.license.get: {}
```

```
length: { license: 11 }
match: { license.uid: "893361dc-9749-4997-93cb-802e3dofh7aa" }
"Should throw 404 after license deletion":
do:
xpack.license.delete: { }
```

- match: { acknowledged: true }

- do:

xpack.license.get: { }
catch: missing

"Should install a feature type license":

VERSION_NO_FEATURE_TYPE license version

- do:

xpack.license.post:

acknowledge: true

body: |

{"license": {"uid":"893361dc-9749-4997-93cb-

802e3d7fa4a8","type":"gold","issue_date_in_millis":1411948800000,"expiry_date_in_millis":1914278399999,"ma x_nodes":1,"issued_to","issuer":"issuer","signature":"AAAAAgAAAA3U8+YmnvwC+CWsV/mRAA ABmC9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTVoMVZwUzRxVk1PSmkxakxZdW5IMlhlTHNoN1N 2MXMvRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHBkWkprZWZSQi9iNmRQNkw1SlpLN0lDalZC S095MXRGN1IIZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0U0MXZ0dDJHSERiZTVLOHNzSDByWnpoZ EphZHBEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNiWktNWGM5TUhQV2plaUo4Q1JOUml4MXNuL0pS OEhQaVB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K055c28zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3 o2VE1qbVNQS2lxOHN5bUErZlNIWkZSVmZIWEtaSU9wTTJENDVvT1NCYklacUYyK2FwRW9xa0t6dldMbm MzSGtQc3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRWUzh6UG5pdENGWFRreXNKNkE9PQAAAQB e8GfzDm6T537Iuuvjetb3xK5dvg0K5NQapv+rczWcQFxgCuzbF8plkgetP1aAGZP4uRESDQPMIOCsx4d0UqqAm 9f7GbBQ3l93P+PogInPFeEH9NvOmaAQovmxVM9SE6DsDqlX4cXSO+bgWpXPTd2LmpoQc1fXd6BZ8GeuyYp VHVKp9hVU0tAYjw6HzYOE7+zuO1oJYOxElqy66AnIfkvHrvni+flym3tE7tDTgsDRaz7W3iBhaqiSntEqabEkvH dPHQdSR99XGaEvnHO1paK01/35iZF6OXHsF7CCj+558GRXiVxzueOe7TsGSSt8g7YjZwV9bRCyU7oB4B/nidg I"}}

```
match: { license_status: "valid" }do:
```

xpack.license.get: { }

```
- length: { license: 11 }
```

"Cannot start basic":

```
- do:
```

catch: bad_request xpack.license.post: acknowledge: true body: |

{"license":{"uid":"893361dc-9749-4997-93cb-

802e3d7fa4a8","type":"basic","issue_date_in_millis":1411948800000,"expiry_date_in_millis":1914278399999,"ma x_nodes":1,"issued_to":"issuedTo","issuer":"issuer","signature":"AAAAAgAAAA0lKPZ0a7aZquUltho/AAABmC 9ZN0hjZDBGYnVyRXpCOW5Bb3FjZDAxOWpSbTVoMVZwUzRxVk1PSmkxakxZdW5IMlhlTHNoN1N2MXM vRFk4d3JTZEx3R3RRZ0pzU3lobWJKZnQvSEFva0ppTHBkWkprZWZSQi9iNmRQNkw1SlpLN0lDalZCS095M XRGN1llZlpYcVVTTnFrcTE2dzhJZmZrdFQrN3JQeGwxb0U0MXZ0dDJHSERiZTVLOHNzSDByWnpoZEphZH BEZjUrTVBxRENNSXNsWWJjZllaODdzVmEzUjNiWktNWGM5TUhQV2plaUo4Q1JOUml4MXNuL0pSOEhQa VB2azhmUk9QVzhFeTFoM1Q0RnJXSG53MWk2K055c28zSmRnVkF1b2JSQkFLV2VXUmVHNDZ2R3o2VE1q bVNQS2lxOHN5bUErZlNIWkZSVmZIWEtaSU9wTTJENDVvT1NCYklacUYyK2FwRW9xa0t6dldMbmMzSGtQ c3FWOTgzZ3ZUcXMvQkt2RUZwMFJnZzlvL2d2bDRWUzh6UG5pdENGWFRreXNKNkE9PQAAAQAALuQ44 S3IG6SzolcXVJ6Z4CIXORDrYQ+wdLCeey0XdujTslAOj+k+vNgo6wauc7Uswi01esHu4lb5IgpvKy7RRCbh5bj/z2 ubu2qMJqopp9BQyD7VQjVfqmG6seUMJwJ1a5Avvm9r41YPSPcrii3bKK2e116jK6N8ibCvnTyY/XkYGCJrBWT SJePDbg6ErbyodrZ37x1StLbPWcNAkmweyHjDJnvYnbeZZO7A3NmubXZjW7Ttf8/YwQyE00PqMcl7fVPY3hk KpAeHf8aaJbqkKYbqZuER3EWJX7ZvLVb1dNdNg8aXRn7YrkQcYwWgptYQpfV+D7yEJ4j5muAEoler"}}

- match: { error.root_cause.0.reason: 'Installing basic licenses is no longer allowed. Use the POST /_xpack/license/start_basic API to install a basic license that does not expire.' }

"Should fail gracefully when body content is not provided":

- do:

catch: bad_request xpack.license.post: acknowledge: true

- match: { error.root_cause.0.reason: 'The license must be provided in the request body' }

"Current license is trial means not eligle to start trial":

- do:

xpack.license.get_trial_status: { }

- match: { eligible_to_start_trial: false }

- do:

xpack.license.post_start_basic: acknowledge: true

- match: { basic_was_started: true }

- do:

xpack.license.get_trial_status: { }

```
- match: { eligible_to_start_trial: false }
- do:
   catch: forbidden
   xpack.license.post_start_trial:
    acknowledge: true
- match: { trial_was_started: false }
- match: { error_message: "Operation failed: Trial was already activated." }
---
"Trial license cannot be basic":
- do:
   catch: bad_request
   xpack.license.post_start_trial:
    type: "basic"
    acknowledge: true
"Can start basic license if do not already have basic":
- do:
   xpack.license.get_basic_status: { }
- match: { eligible_to_start_basic: true }
- do:
   xpack.license.post_start_basic:
    acknowledge: true
- match: { basic_was_started: true }
- match: { acknowledged: true }
- do:
    xpack.license.get_basic_status: {}
- match: { eligible_to_start_basic: false }
- do:
   catch: forbidden
   xpack.license.post_start_basic: { }
- match: { basic_was_started: false }
- match: { acknowledged: true }
- match: { error_message: "Operation failed: Current license is basic." }
---
"Must acknowledge to start basic":
- do:
   xpack.license.post_start_basic: { }
```

```
- match: { basic_was_started: false }
- match: { acknowledged: false }
- match: { error_message: "Operation failed: Needs acknowledgement." }
{
"xpack.license.delete": {
 "documentation": "https://www.elastic.co/guide/en/x-pack/current/license-management.html",
 "methods": ["DELETE"],
 "url": {
  "path": "/_xpack/license",
  "paths": ["/ xpack/license"],
  "parts" : { }
 },
 "body": null
}
}
"xpack.license.get": {
 "documentation": "https://www.elastic.co/guide/en/x-pack/current/license-management.html",
 "methods": ["GET"],
 "url": {
  "path": "/ xpack/license",
  "paths": ["/_xpack/license"],
  "parts" : {
  },
  "params": {
   "local": {
     "type" : "boolean",
     "description" : "Return local information, do not retrieve the state from master node (default: false)"
    }
  }
 },
 "body": null
}
}
{
"xpack.license.post_start_basic": {
 "documentation": "https://www.elastic.co/guide/en/x-pack/current/license-management.html",
 "methods": ["POST"],
 "url": {
  "path": "/_xpack/license/start_basic",
  "paths": ["/_xpack/license/start_basic"],
  "parts" : {
  },
  "params": {
    "acknowledge": {
     "type" : "boolean",
     "description" : "whether the user has acknowledged acknowledge messages (default: false)"
    }
```

```
}
 },
 "body": null
}
}
{
"xpack.license.get_trial_status": {
 "documentation": "https://www.elastic.co/guide/en/x-pack/current/license-management.html",
 "methods": ["GET"],
 "url": {
  "path": "/_xpack/license/trial_status",
  "paths": ["/_xpack/license/trial_status"],
  "parts" : {
  },
  "params": {
  }
 },
 "body": null
}
}
{
"xpack.license.post": {
 "documentation": "https://www.elastic.co/guide/en/x-pack/current/license-management.html",
 "methods": ["PUT", "POST"],
 "url": {
  "path": "/_xpack/license",
  "paths": ["/_xpack/license"],
  "parts" : {
  },
  "params": {
    "acknowledge": {
     "type" : "boolean",
     "description" : "whether the user has acknowledged acknowledge messages (default: false)"
    }
  }
 },
 "body": {
  "description" : "licenses to be installed"
 }
}
}
{
"xpack.license.post_start_trial": {
 "documentation": "https://www.elastic.co/guide/en/x-pack/current/license-management.html",
 "methods": ["POST"],
 "url": {
  "path": "/_xpack/license/start_trial",
  "paths": ["/_xpack/license/start_trial"],
```

```
"parts" : {
  },
   "params": {
    "type": {
     "type" : "string",
     "description" : "The type of trial license to generate (default: \"trial\")"
    },
    "acknowledge": {
     "type" : "boolean",
     "description" : "whether the user has acknowledged acknowledge messages (default: false)"
    }
  }
 },
 "body": null
}
}
{
"xpack.license.get basic status": {
 "documentation": "https://www.elastic.co/guide/en/x-pack/current/license-management.html",
 "methods": ["GET"],
 "url": {
  "path": "/_xpack/license/basic_status",
  "paths": ["/_xpack/license/basic_status"],
  "parts" : {
  },
  "params": {
  }
 },
 "body": null
}
}
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```

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MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
```

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This product includes software developed at The Apache Software Foundation (http://www.apache.org/).

<!DOCTYPE html> <html lang="en">

<head>

<meta charset="utf-8">

k rel="dns-prefetch" href="https://assets-cdn.github.com">

k rel="dns-prefetch" href="https://avatars0.githubusercontent.com">

k rel="dns-prefetch" href="https://avatars1.githubusercontent.com">

k rel="dns-prefetch" href="https://avatars2.githubusercontent.com">

k rel="dns-prefetch" href="https://avatars3.githubusercontent.com">

k rel="dns-prefetch" href="https://github-cloud.s3.amazonaws.com">

k rel="dns-prefetch" href="https://user-images.githubusercontent.com/">

k crossorigin="anonymous" href="https://assets-cdn.github.com/assets/frameworks-

2d2d4c150f7000385741c6b992b302689ecd172246c6428904e0813be9bceca6.css" media="all" rel="stylesheet" /> k crossorigin="anonymous" href="https://assets-cdn.github.com/assets/github-

0522ae8d3b3bdc841d2f91f90efd5f1fd9040d910905674cd134ced43a6dfea6.css" media="all" rel="stylesheet" />

 <meta name="viewport" content="width=device-width">

<title>cryptacular/NOTICE at master vt-middleware/cryptacular GitHub</title> <link rel="search" type="application/opensearchdescription+xml" href="/opensearch.xml" title="GitHub"> <link rel="fluid-icon" href="https://github.com/fluidicon.png" title="GitHub"> <meta property="fb:app_id" content="1401488693436528">

<meta content="https://avatars7.githubusercontent.com/u/6122907?v=4&s=400" property="og:image" /><meta content="GitHub" property="og:site_name" /><meta content="object" property="og:type" /><meta content="vt-middleware/cryptacular" property="og:title" /><meta content="https://github.com/vt-middleware/cryptacular" property="og:url" /><meta content="cryptacular" to the BouncyCastle crypto API for Java." property="og:description" />

k rel="assets" href="https://assets-cdn.github.com/">

<meta name="pjax-timeout" content="1000">

<meta name="request-id" content="E0E4:26F16:12A5AE6:1D11801:596C7978" data-pjax-transient>

<meta name="selected-link" value="repo_source" data-pjax-transient>

<meta name="google-site-verification" content="KT5gs8h0wvaagLKAVWq8bbeNwnZZK1r1XQysX3xurLU"> <meta name="google-site-verification" content="ZzhVyEFwb7w3e0-uOTltm8Jsck2F5StVihD0exw2fsA"> <meta name="google-analytics" content="UA-3769691-2">

<meta content="collector.githubapp.com" name="octolytics-host" /><meta content="github" name="octolytics-appid" /><meta content="https://collector.githubapp.com/github-external/browser_event" name="octolytics-event-url" /><meta content="E0E4:26F16:12A5AE6:1D11801:596C7978" name="octolytics-dimension-request_id" /><meta content="sea" name="octolytics-dimension-region_edge" /><meta content="iad" name="octolytics-dimensionregion_render" />

<meta content="/<user-name>/<repo-name>/blob/show" data-pjax-transient="true" name="analytics-location" />

<meta class="js-ga-set" name="dimension1" content="Logged Out">

<meta name="hostname" content="github.com"> <meta name="user-login" content="">

<meta name="expected-hostname" content="github.com">

<meta name="js-proxy-site-detection-payload"

content="N2ZhMjk0NTA4MjI1NmZhYTVINzM5NzVjZmFkOWY2NGFkNmMxYzcyMGViNzAzZGQxMGMzZ mJhZDQ3YWZiZTI0OHx7InJlbW90ZV9hZGRyZXNzIjoiMTEwLjIwLjIyMC4xMzUiLCJyZXF1ZXN0X2lkIjoiR TBFNDoyNkYxNjoxMkE1QUU20jFEMTE4MDE6NTk2Qzc5NzgiLCJ0aW1lc3RhbXAiOjE1MDAyODEyMDgsI mhvc3QiOiJnaXRodWIuY29tIn0=">

<meta name="html-safe-nonce" content="5aa226b80a18dc40894e1d405e4eb31cfca7d616">

<meta http-equiv="x-pjax-version" content="f682644ce1bb9629b9d9d9bedf64801b">

k href="https://github.com/vt-middleware/cryptacular/commits/master.atom" rel="alternate" title="Recent Commits to cryptacular:master" type="application/atom+xml">

<meta name="description" content="cryptacular - The friendly complement to the BouncyCastle crypto API for Java.">

<meta name="go-import" content="github.com/vt-middleware/cryptacular git https://github.com/vt-middleware/cryptacular.git">

<meta content="6122907" name="octolytics-dimension-user_id" /><meta content="vt-middleware"
name="octolytics-dimension-user_login" /><meta content="15714989" name="octolytics-dimension-repository_id"
/><meta content="vt-middleware/cryptacular" name="octolytics-dimension-repository_nwo" /><meta
content="true" name="octolytics-dimension-repository_public" /><meta content="false" name="octolyticsdimension-repository_is_fork" /><meta content="15714989" name="octolytics-dimensionrepository_is_fork" /><meta content="15714989" name="octolytics-dimensionrepository_network_root_id" /><meta content="true" name="octolytics-dimensionrepository_network_root_id" /><meta content="false" name="octolytics-dimensionrepository_network_root_id" /><meta content="false" name="octolytics-dimensionrepository_explore_github_marketplace_ci_cta_shown" />

k rel="canonical" href="https://github.com/vt-middleware/cryptacular/blob/master/NOTICE" data-pjax-transient>

<meta name="browser-stats-url" content="https://api.github.com/_private/browser/stats">

<meta name="browser-errors-url" content="https://api.github.com/_private/browser/errors">

k rel="mask-icon" href="https://assets-cdn.github.com/pinned-octocat.svg" color="#000000"> k rel="icon" type="image/x-icon" href="https://assets-cdn.github.com/favicon.ico">

<meta name="theme-color" content="#1e2327">

</head>

<body class="logged-out env-production page-blob">

<div class="position-relative js-header-wrapper ">

Skip to content

<header class="site-header js-details-container Details" role="banner">

<div class="site-nav-container">

<svg aria-hidden="true" class="octicon octicon-mark-github" height="32" version="1.1" viewBox="0 0 16 16" width="32"><path fill-rule="evenodd" d="M8 0C3.58 0 0 3.58 0 8c0 3.54 2.29 6.53 5.47 7.59.4.07.55-.17.55-.38 0-.19-.01-.82-.01-1.49-2.01.37-2.53-.49-2.69-.94-.09-.23-.48-.94-.82-1.13-.28-.15-.68-.52-.01-.53.63-.01 1.08.58 1.23.82.72 1.21 1.87.87 2.33.66.07-.52.28-.87.51-1.07-1.78-.2-3.64-.89-3.64-3.95 0-.87.31-1.59.82-2.15-.08-.2-.36-1.02.08-2.12 0 0 .67-.21 2.2.82.64-.18 1.32-.27 2-.27.68 0 1.36.09 2 .27 1.53-1.04 2.2-.82 2.2-.82.44 1.1.16 1.92.08 2.12.51.56.82 1.27.82 2.15 0 3.07-1.87 3.75-3.65 3.95.29.25.54.73.54 1.48 0 1.07-.01 1.93-.01 2.2 0 .21.15.46.55.38A8.013 8.013 0 0 0 16 8c0-4.42-3.58-8-8-8z"/></svg>

sutton class="btn-link float-right site-header-toggle js-details-target" type="button" aria-label="Toggle navigation" aria-expanded="false">

<svg aria-hidden="true" class="octicon octicon-three-bars" height="24" version="1.1" viewBox="0 0 12 16" width="18"><path fill-rule="evenodd" d="M11.41 9H.59C0 9 0 8.59 0 8c0-.59 0-1 .59-1H11.4c.59 0 .59.41.59 1 0 .59 0 1-.59 1h.01zm0-4H.59C0 5 0 4.59 0 4c0-.59 0-1 .59-1H11.4c.59 0 .59.41.59 1 0 .59 0 1-.59 1h.01zM.59 11H11.4c.59 0 .59.41.59 1 0 .59 0 1-.59 1H.59C0 13 0 12.59 0 12c0-.59 0-1 .59-1z"/></svg>

</button>

<div class="site-header-menu">

<nav class="site-header-nav">

<a href="/features" class="js-selected-navigation-item nav-item" data-ga-click="Header, click, Nav menu - item:features" data-selected-links="/features//features/code-review /features/project-management"

/features/integrations /features">

Features

Business

 Explore

Marketplace

Pricing

 </nav>

<div class="site-header-actions">

<div class="header-search scoped-search site-scoped-search js-site-search" role="search">

<!-- ""` --><!-- </textarea></xmp> --></option></form accept-charset="UTF-8" action="/vt-

middleware/cryptacular/search" class="js-site-search-form" data-scoped-search-url="/vt-

middleware/cryptacular/search" data-unscoped-search-url="/search" method="get"><div

style="margin:0;padding:0;display:inline"><input name="utf8" type="hidden" value="✓" /></div>

<label class="form-control header-search-wrapper js-chromeless-input-container">

This repository

```
<input type="text"
class="form-control header-search-input js-site-search-focus js-site-search-field is-clearable"
data-hotkey="s"
name="q"
value=""
placeholder="Search"
aria-label="Search this repository"
data-unscoped-placeholder="Search GitHub"
data-scoped-placeholder="Search"
autocapitalize="off">
<input type="hidden" class="js-site-search-type-field" name="type" >
</label>
```

<a class="text-bold site-header-link" href="/login?return_to=%2Fvt-

middleware%2Fcryptacular%2Fblob%2Fmaster%2FNOTICE" data-ga-click="(Logged out) Header, clicked Sign in, text:sign-in">Sign in

or

Sign up

</div> </div> </div> </header>

</div>

```
<div id="js-flash-container">
</div>
```

<div role="main">

<div itemscope itemtype="http://schema.org/SoftwareSourceCode"> <div id="js-repo-pjax-container" data-pjax-container>

<div class="pagehead repohead instapaper_ignore readability-menu experiment-repo-nav"> <div class="container repohead-details-container">

<a href="/login?return_to=%2Fvt-middleware%2Fcryptacular"

class="btn btn-sm btn-with-count tooltipped tooltipped-n"

aria-label="You must be signed in to watch a repository" rel="nofollow">

```
<svg aria-hidden="true" class="octicon octicon-eye" height="16" version="1.1" viewBox="0 0 16 16"
width="16"><path fill-rule="evenodd" d="M8.06 2C3 2 0 8 0 8s3 6 8.06 6C13 14 16 8 16 8s-3-6-7.94-6zM8 12c-
2.2 0-4-1.78-4-4 0-2.2 1.8-4 4-4 2.22 0 4 1.8 4 4 0 2.22-1.78 4-4 4zm2-4c0 1.11-.89 2-2 2-1.11 0-2-.89-2-2 0-
1.11.89-2 2-2 1.11 0 2 .89 2 2z"/></svg>
```

Watch

<a class="social-count" href="/vt-middleware/cryptacular/watchers"

aria-label="9 users are watching this repository">

9


```
<a href="/login?return_to=%2Fvt-middleware%2Fcryptacular"
class="btn btn-sm btn-with-count tooltipped tooltipped-n"
aria-label="You must be signed in to star a repository" rel="nofollow">
<svg aria-hidden="true" class="octicon octicon-star" height="16" version="1.1" viewBox="0 0 14 16"
width="14"><path fill-rule="evenodd" d="M14 6l-4.9-.64L7 1 4.9 5.36 0 6l3.6 3.26L2.67 14 7 11.67 11.33 14l-.93-
4.74z"/></svg>
Star
```

Star


```
<a class="social-count js-social-count" href="/vt-middleware/cryptacular/stargazers"
aria-label="15 users starred this repository">
15
</a>
sers starred this repository">
15
</a>
a href="/login?return_to=%2Fvt-middleware%2Fcryptacular"
class="btn btn-sm btn-with-count tooltipped tooltipped-n"
aria-label="You must be signed in to fork a repository" rel="nofollow">
<svg aria-hidden="true" class="octicon octicon-repo-forked" height="16" version="1.1" viewBox="0 0 10 16"
width="10"><path fill-rule="evenodd" d="M8 1a1.993 1.993 0 0 0-1 3.72V6L5 8 3 6V4.72A1.993 1.993 0 0 0 2
1a1.993 1.993 0 0 0-1 3.72V6.513 3v1.78A1.993 1.993 0 0 0 5 15a1.993 1.993 0 0 0 1-3.72V9.513-3V4.72A1.993
```

1.993 0 0 0 8 1zM2 4.2C1.34 4.2.8 3.65.8 3c0-.65.55-1.2 1.2-1.2.65 0 1.2.55 1.2 1.2 0 .65-.55 1.2-1.2 1.2zm3 10c-.66 0-1.2-.55-1.2 0-.65.55-1.2 1.2-1.2.65 0 1.2.55 1.2 1.2 0 .65-.55 1.2-1.2 1.2zm3-10c-.66 0-1.2-.55-1.2 0-.65.55-1.2 1.2-1.2 0.65-.55 1.2-1.2 1.2z"/></svg>

```
Fork
</a>
```

```
<a href="/vt-middleware/cryptacular/network" class="social-count"
```

aria-label="1 user forked this repository">

1

<h1 class="public ">

<svg aria-hidden="true" class="octicon octicon-repo" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M4 9H3V8h1v1zm0-3H3v1h1V6zm0-2H3v1h1V4zm0-

```
2H3v1h1V2zm8-1v12c0.55-.451-11H6v2l-1.5-1.5L316v-2H1c-.550-1-.45-1-1V1c0-.55.45-11-1h10c.5501.4511zm-110H1v2h2v-1h3v1h5v-2zm0-10H2v9h9V1z"/></svg>
```

vt-middleware<!--

-->/<!--

--><strong itemprop="name">cryptacular

```
</h1>
```

```
</div>
<div class="container">
```

<nav class="reponav js-repo-nav js-sidenav-container-pjax"

itemscope

itemtype="http://schema.org/BreadcrumbList"

```
role="navigation"
```

```
data-pjax="#js-repo-pjax-container">
```


<svg aria-hidden="true" class="octicon octicon-code" height="16" version="1.1" viewBox="0 0 14 16" width="14"><path fill-rule="evenodd" d="M9.5 3L8 4.5 11.5 8 8 11.5 9.5 13 14 8 9.5 3zm-5 0L0 8l4.5 5L6 11.5 2.5 8 6 4.5 4.5 3z"/></svg>

Code

<meta itemprop="position" content="1">

```
</a> </span>
```


<svg aria-hidden="true" class="octicon octicon-issue-opened" height="16" version="1.1" viewBox="0 0 14 16" width="14"><path fill-rule="evenodd" d="M7 2.3c3.14 0 5.7 2.56 5.7 5.7s-2.56 5.7-5.7 5.7A5.71 5.71 0 0 1 1.3 8c0-3.14 2.56-5.7 5.7-5.7zM7 1C3.14 1 0 4.14 0 8s3.14 7 7 7 7-3.14 7-7-3.14-7-7-7zm1 3H6v5h2V4zm0 6H6v2h2v-2z"/></svg>

Issues

```
<span class="Counter">4</span>
```

<meta itemprop="position" content="2">

```
</a> </span>
```


<svg aria-hidden="true" class="octicon octicon-git-pull-request" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M11 11.28V5c-.03-.78-.34-1.47-.94-2.06C9.46 2.35 8.78 2.03 8 2H7V0L4 313 3V4h1c.27.02.48.11.69.31.21.2.3.42.31.69v6.28A1.993 1.993 0 0 0 10 15a1.993 1.993 0 0 0 1-3.72zm-1 2.92c-.66 0-1.2-.55-1.2-1.2 0-.65.55-1.2 1.2-1.2.65 0 1.2.55 1.2 1.2 0 .65-.55 1.2-1.2 1.2zM4 3c0-1.11-.89-2-2-2a1.993 1.993 0 0 0-1 3.72v6.56A1.993 1.993 0 0 0 2 15a1.993 1.993 0 0 0 1-3.72V4.72c.59-.34 1-.98 1-1.72zm-.8 10c0 .66-.55 1.2-1.2 1.2-.65 0-1.2-.55-1.2-1.2 0-.65.55-1.2 1.2-1.2.65 0 1.2.55 1.2 1.2zM2 4.2C1.34 4.2.8 3.65.8 3c0-.65.55-1.2 1.2-1.2.65 0 1.2.55 1.2 1.2 0 .65-.55 1.2-1.2 1.2zW/s

Pull requests

```
<span class="Counter">1</span>
```

<meta itemprop="position" content="3">

```
</a> </span>
```


<svg aria-hidden="true" class="octicon octicon-project" height="16" version="1.1" viewBox="0 0 15 16"

width="15"><path fill-rule="evenodd" d="M10 12h3V2h-3v10zm-4-2h3V2H6v8zm-4 4h3V2H2v12zm-1">

 $1h13V1H1v14zM14\ 0H1a1\ 1\ 0\ 0\ 0-1\ 1v14a1\ 1\ 0\ 0\ 0\ 1\ 1h13a1\ 1\ 0\ 0\ 0\ 1-1V1a1\ 1\ 0\ 0\ 0-1-1z''/></svg>$

```
Projects
<span class="Counter" >0</span>
```

```
</a>
```

<div class="reponav-dropdown js-menu-container">

Insights

<svg aria-hidden="true" class="octicon octicon-triangle-down v-align-middle text-gray" height="11" version="1.1" viewBox="0 0 12 16" width="8"><path fill-rule="evenodd" d="M0 516 6 6-6z"/></svg>

</button>

<div class="dropdown-menu-content js-menu-content">

<div class="dropdown-menu dropdown-menu-sw">

<svg aria-hidden="true" class="octicon octicon-pulse" height="16" version="1.1" viewBox="0 0 14 16"
width="14"><path fill-rule="evenodd" d="M11.5 8L8.8 5.4 6.6 8.5 5.5 1.6 2.38 8H0v2h3.6l.9-1.8.9 5.4L9 8.5l1.6
1.5H14V8z"/></svg>

Pulse

<svg aria-hidden="true" class="octicon octicon-graph" height="16" version="1.1" viewBox="0 0 16 16" width="16"><path fill-rule="evenodd" d="M16 14v1H0V0h1v14h15zM5 13H3V8h2v5zm4 0H7V3h2v10zm4 0h-2V6h2v7z"/></svg>

Graphs </div> </div> </div> </nav>

</div>

<div class="container new-discussion-timeline experiment-repo-nav"> <div class="repository-content">

Permalink

<!-- blob contrib key: blob_contributors:v21:f5054b9e46039e0ad937c69e6151b7d4 -->

<div class="file-navigation js-zeroclipboard-container">

<div class="select-menu branch-select-menu js-menu-container js-select-menu float-left"> <button class=" btn btn-sm select-menu-button js-menu-target css-truncate" data-hotkey="w"

type="button" aria-label="Switch branches or tags" aria-expanded="false" aria-haspopup="true"> <i>Branch:</i>

master

</button>

<div class="select-menu-modal-holder js-menu-content js-navigation-container" data-pjax>

<div class="select-menu-modal">

<div class="select-menu-header">

<svg aria-label="Close" class="octicon octicon-x js-menu-close" height="16" role="img" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M7.48 8l3.75 3.75-1.48 1.48L6 9.48l-3.75 3.75-1.48-1.48L4.52 8 .77 4.25l1.48-1.48L6 6.52l3.75-3.75 1.48 1.48z"/></svg>

Switch branches/tags

</div>

<div class="select-menu-filters">

<div class="select-menu-text-filter">

<input type="text" aria-label="Filter branches/tags" id="context-commitish-filter-field" class="form-control js-filterable-field js-navigation-enable" placeholder="Filter branches/tags">

</div>

<div class="select-menu-tabs">

class="select-menu-tab">

Branches

Tags

</div>
</div>

<div class="select-menu-list select-menu-tab-bucket js-select-menu-tab-bucket" data-tab-filter="branches" role="menu">

<div data-filterable-for="context-commitish-filter-field" data-filterable-type="substring">

<a class="select-menu-item js-navigation-item js-navigation-open"

href="/vt-middleware/cryptacular/blob/ISSUE-31+32/NOTICE"

data-name="ISSUE-31+32"

```
data-skip-pjax="true"
```

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 51-8 8-4-4 1.5-1.5L4 1016.5-6.5z"/></svg>

ISSUE-31+32

<a class="select-menu-item js-navigation-item js-navigation-open"

href="/vt-middleware/cryptacular/blob/gh-pages/NOTICE"

data-name="gh-pages"

data-skip-pjax="true"

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1"
viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>

gh-pages

<a class="select-menu-item js-navigation-item js-navigation-open selected"

href="/vt-middleware/cryptacular/blob/master/NOTICE"

data-name="master"

data-skip-pjax="true"

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>

master

<a class="select-menu-item js-navigation-item js-navigation-open "

href="/vt-middleware/cryptacular/blob/v1.1/NOTICE"

data-name="v1.1"

data-skip-pjax="true"

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1"
viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>

v1.1

</div>

<div class="select-menu-no-results">Nothing to show</div> </div>

<div class="select-menu-list select-menu-tab-bucket js-select-menu-tab-bucket" data-tab-filter="tags"> <div data-filterable-for="context-commitish-filter-field" data-filterable-type="substring">

```
<a class="select-menu-item js-navigation-item js-navigation-open "
href="/vt-middleware/cryptacular/tree/v1.2.1/NOTICE"
data-name="v1.2.1"
data-skip-pjax="true"
rel="nofollow">
<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1"
```

viewBox="0 0 12 16" width="12">viewBox="0 0 12 16" width="12"

 v1.2.1 <svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg> v1.2.0 <svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 51-8 8-4-4 1.5-1.5L4 1016.5-6.5z"/></svg> v1.1.2 <svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg> v1.1.1 <svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg> v1.1.0

```
</a>
```

<a class="select-menu-item js-navigation-item js-navigation-open"

href="/vt-middleware/cryptacular/tree/v1.0/NOTICE"

data-name="v1.0"

data-skip-pjax="true"

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>

v1.0

<a class="select-menu-item js-navigation-item js-navigation-open "

href="/vt-middleware/cryptacular/tree/v1.0-RC6/NOTICE"

data-name="v1.0-RC6"

data-skip-pjax="true"

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>

v1.0-RC6

<a class="select-menu-item js-navigation-item js-navigation-open"

href="/vt-middleware/cryptacular/tree/v1.0-RC4/NOTICE"

```
data-name="v1.0-RC4"
```

data-skip-pjax="true"

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>

v1.0-RC4

<a class="select-menu-item js-navigation-item js-navigation-open "

href="/vt-middleware/cryptacular/tree/v1.0-RC3/NOTICE"

data-name="v1.0-RC3"

data-skip-pjax="true"

rel="nofollow">

<svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1"
viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 51-8 8-4-4 1.5-1.5L4 1016.5-6.5z"/></svg>

v1.0-RC3

<a class="select-menu-item js-navigation-item js-navigation-open "

href="/vt-middleware/cryptacular/tree/v1.0-RC2/NOTICE"

data-name="v1.0-RC2"

data-skip-pjax="true"

```
rel="nofollow">
       <svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1"
viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>
       <span class="select-menu-item-text css-truncate-target" title="v1.0-RC2">
        v1.0-RC2
       </span>
      </a>
      <a class="select-menu-item js-navigation-item js-navigation-open"
       href="/vt-middleware/cryptacular/tree/v1.0-RC1/NOTICE"
       data-name="v1.0-RC1"
       data-skip-pjax="true"
       rel="nofollow">
       <svg aria-hidden="true" class="octicon octicon-check select-menu-item-icon" height="16" version="1.1"
viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M12 5l-8 8-4-4 1.5-1.5L4 10l6.5-6.5z"/></svg>
       <span class="select-menu-item-text css-truncate-target" title="v1.0-RC1">
        v1.0-RC1
       </span>
      </a>
    </div>
   <div class="select-menu-no-results">Nothing to show</div>
  </div>
 </div>
</div>
</div>
 <div class="BtnGroup float-right">
  <a href="/vt-middleware/cryptacular/find/master"
      class="js-pjax-capture-input btn btn-sm BtnGroup-item"
      data-pjax
      data-hotkey="t">
   Find file
  </a>
  <button aria-label="Copy file path to clipboard" class="js-zeroclipboard btn btn-sm BtnGroup-item tooltipped
tooltipped-s" data-copied-hint="Copied!" type="button">Copy path</button>
 </div>
 <div class="breadcrumb js-zeroclipboard-target">
  <span class="repo-root js-repo-root"><span class="js-path-segment"><a href="/vt-
middleware/cryptacular"><span>cryptacular</span></a></span></span><span class="separator">/</span><strong
class="final-path">NOTICE</strong>
 </div>
</div>
```

<div class="commit-tease">


```
<a class="commit-tease-sha" href="/vt-
middleware/cryptacular/commit/6dd6f199ac3ecc3b4c5aef9e04be3bbe265a30a1" data-pjax>
     6dd6f19
    \langle a \rangle
    <relative-time datetime="2017-07-06T22:28:36Z">Jul 7, 2017</relative-time>
  </span>
  <div>
    <img alt="@dfish3r" class="avatar" height="20"
src="https://avatars6.githubusercontent.com/u/1051499?v=4&s=40" width="20" />
    <a href="/dfish3r" class="user-mention" rel="contributor">dfish3r</a>
     <a href="/vt-middleware/cryptacular/commit/6dd6f199ac3ecc3b4c5aef9e04be3bbe265a30a1"</a>
class="message" data-pjax="true" title="Update year in notice.">Update year in notice.</a>
  </div>
 <div class="commit-tease-contributors">
  <button type="button" class="btn-link muted-link contributors-toggle" data-facebox="#blob_contributors_box">
    <strong>1</strong>
    contributor
  </button>
 </div>
```

```
<div id="blob_contributors_box" style="display:none">
```

```
<h2 class="facebox-header" data-facebox-id="facebox-header">Users who have contributed to this file</h2></h2>
```

```
<\!\!li\,class \!=\!\!"facebox-user-list-item"\!>
```

```
<a href="/dfish3r">dfish3r</a>
</div>
```

```
<div class="file">
<div class="file-header">
<div class="file-actions">
```

```
<div class="BtnGroup">
```

 $<\!\!a\,href="/vt-middleware/cryptacular/raw/master/NOTICE"\ class="btn\ btn-sm\ BtnGroup-item"\ id="raw-url">Raw$

```
<\!\!a\ href="/vt-middleware/cryptacular/blame/master/NOTICE"\ class="btn\ btn-sm\ js-update-url-with-hash\ BtnGroup-item"\ data-hotkey="b">Blame/a>
```

```
<a href="/vt-middleware/cryptacular/commits/master/NOTICE" class="btn btn-sm BtnGroup-item" rel="nofollow">History</a>
```

```
</div>
```

<button type="button" class="btn-octicon disabled tooltipped tooltipped-nw"

aria-label="You must be signed in to make or propose changes">

<svg aria-hidden="true" class="octicon octicon-pencil" height="16" version="1.1" viewBox="0 0 14 16"
width="14"><path fill-rule="evenodd" d="M0 12v3h3l8-8-3-3-8 8zm3 2H1v-2h1v1h1v1zm10.3-9.3L12 6 9 3l1.31.3a.996.996 0 0 1 1.41 0l1.59 1.59c.39.39 1.02 0 1.41z"/></svg>

</button>

sutton type="button" class="btn-octicon btn-octicon-danger disabled tooltipped tooltipped-nw" aria-label="You must be signed in to make or propose changes">

```
<svg aria-hidden="true" class="octicon octicon-trashcan" height="16" version="1.1" viewBox="0 0 12 16"
width="12"><path fill-rule="evenodd" d="M11 2H9c0-.55-.45-1-1-1H5c-.55 0-1 .45-1 1H2c-.55 0-1 .45-1 1v1c0
.55.45 1 1 1v9c0 .55.45 1 1 1h7c.55 0 1-.45 1-1V5c.55 0 1-.45 1-1V3c0-.55-.45-1-1-1zm-1
```

```
12H3V5h1v8h1V5h1v8h1V5h1v8h1V5h1v9zm1-10H2V3h9v1z''/\!\!>\!\!<\!\!/svg\!\!>
```

```
</button>
```

```
</div>
```

```
<div class="file-info">
```

```
7 lines (5 sloc)
<span class="file-info-divider"></span>
165 Bytes
</div>
```

```
<div itemprop="text" class="blob-wrapper data type-text">
Cryptacular Java Library
Copyright (C) 2003-2017 Virginia Tech.
All rights reserved.
id="LC5" class="blob-code blob-code-inner js-file-line">This product includes software developed at
```

</div>

</div>

<button type="button" data-facebox="#jump-to-line" data-facebox-class="linejump" data-hotkey="l" class="d-none">Jump to Line</button>

<div id="jump-to-line" style="display:none">

<!-- ""` --><!-- </textarea></xmp> --></option></form><form accept-charset="UTF-8" action="" class="js-jumpto-line-form" method="get"><div style="margin:0;padding:0;display:inline"><input name="utf8" type="hidden" value="✓" /></div>

<input class="form-control linejump-input js-jump-to-line-field" type="text" placeholder="Jump to line…" aria-label="Jump to line" autofocus>

<button type="submit" class="btn">Go</button></form> </div>

</div>

<div class="modal-backdrop js-touch-events"></div> </div>

</div> </div>

</div>

<div class="container site-footer-container">

<div class="site-footer " role="contentinfo">

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<svg aria-hidden="true" class="octicon octicon-mark-github" height="24" version="1.1" viewBox="0 0 16 16" width="24"><path fill-rule="evenodd" d="M8 0C3.58 0 0 3.58 0 8c0 3.54 2.29 6.53 5.47 7.59.4.07.55-.17.55-.38 0-.19-.01-.82-.01-1.49-2.01.37-2.53-.49-2.69-.94-.09-.23-.48-.94-.82-1.13-.28-.15-.68-.52-.01-.53.63-.01 1.08.58 1.23.82.72 1.21 1.87.87 2.33.66.07-.52.28-.87.51-1.07-1.78-.2-3.64-.89-3.64-3.95 0-.87.31-1.59.82-2.15-.08-.2-.36-1.02.08-2.12 0 0 .67-.21 2.2.82.64-.18 1.32-.27 2-.27.68 0 1.36.09 2 .27 1.53-1.04 2.2-.82 2.2-.82.44 1.1.16 1.92.08 2.12.51.56.82 1.27.82 2.15 0 3.07-1.87 3.75-3.65 3.95.29.25.54.73.54 1.48 0 1.07-.01 1.93-.01 2.2 0 .21.15.46.55.38A8.013 8.013 0 0 0 16 8c0-4.42-3.58-8-8z"/></svg>

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text:privacy">Privacy

<a href="https://github.com/security" data-ga-click="Footer, go to security," data

text:security">Security

StatusHelp

</div>

</div>

<div id="ajax-error-message" class="ajax-error-message flash flash-error">

<svg aria-hidden="true" class="octicon octicon-alert" height="16" version="1.1" viewBox="0 0 16 16"
width="16"><path fill-rule="evenodd" d="M8.865 1.52c-.18-.31-.51-.5-.87-.5s-.69.19-.87.5L.275 13.5c-.18.31.18.69 0 1 .19.31.52.5.87.5h13.7c.36 0 .69-.19.86-.5.17-.31.18-.69.01-1L8.865 1.52zM8.995 13h-2v-2h2v2zm0-3h2V6h2v4z"/></svg>


```
4.2511.48-1.48L6 6.5213.75-3.75 1.48 1.48z"/></svg>
```

</button>

You can't perform that action at this time.

</div>

<script crossorigin="anonymous" src="https://assets-cdn.github.com/assets/compat-91f98c37fc84eac24836eec2567e9912742094369a04c4eba6e3cd1fa18902d9.js"></script> <script crossorigin="anonymous" src="https://assets-cdn.github.com/assets/frameworksf84bb87b149685d1e6c6f057ee324f2cd496e677f5a359a8b5db853313bb83e6.js"></script>

<script async="async" crossorigin="anonymous" src="https://assets-cdn.github.com/assets/github-13fa3aa50ac8f9fa9a7d198f0cd13b0905775d39446ad076d17d8f74a998438a.js"></script>

<div class="js-stale-session-flash stale-session-flash flash flash-warn flash-banner d-none">
 <svg aria-hidden="true" class="octicon octicon-alert" height="16" version="1.1" viewBox="0 0 16 16"
width="16"><path fill-rule="evenodd" d="M8.865 1.52c-.18-.31-.51-.5-.87-.5s-.69.19-.87.5L.275 13.5c-.18.31-</pre>

.18.69 01 .19.31.52.5.87.5h13.7c.36 0 .69-.19.86-.5.17-.31.18-.69.01-1L8.865 1.52zM8.995 13h-2v-2h2v2zm0-3h-2V6h2v4z"/></svg>

You signed in with another tab or window. Reload to refresh your session.

You signed out in another tab or window. Reload to refresh your session.

</div>

<div class="facebox" id="facebox" style="display:none;">

<div class="facebox-popup">

<div class="facebox-content" role="dialog" aria-labelledby="facebox-header" aria-describedby="facebox-description">

</div>

<button type="button" class="facebox-close js-facebox-close" aria-label="Close modal">

```
<svg aria-hidden="true" class="octicon octicon-x" height="16" version="1.1" viewBox="0 0 12 16" width="12"><path fill-rule="evenodd" d="M7.48 813.75 3.75-1.48 1.48L6 9.48I-3.75 3.75-1.48-1.48L4.52 8 .77
```

```
4.2511.48-1.48L6 6.5213.75-3.75 1.48 1.48z"/></svg>
```

</button>

</div>

</div>

</body>

</html>

/*

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```
* you may not use this file except in compliance with the Elastic License.
```

*/

package org.elasticsearch.xpack.security.authz.permission;

import org.elasticsearch.action.get.GetAction;

import org.elasticsearch.test.ESTestCase;

import org.elasticsearch.xpack.core.security.authz.permission.Role;

 $import\ org. elastic search. xpack. core. security. authz. privilege. Privilege;$

import org.junit.Before;

import java.util.function.Predicate;

import static org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege.MONITOR; import static org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege.READ; import static org.hamcrest.Matchers.is; import static org.hamcrest.Matchers.notNullValue;

public class PermissionTests extends ESTestCase {
 private Role permission;

@Before
public void init() {

```
Role.Builder builder = Role.builder("test");
    builder.add(MONITOR, "test_*", "/foo.*/");
    builder.add(READ, "baz_*foo", "/fool.*bar/");
    builder.add(MONITOR, "/bar.*/");
    permission = builder.build();
  }
 public void testAllowedIndicesMatcherAction() throws Exception {
    testAllowedIndicesMatcher(permission.indices().allowedIndicesMatcher(GetAction.NAME));
  }
 public void testAllowedIndicesMatcherActionCaching() throws Exception {
    Predicate<String>matcher1 = permission.indices().allowedIndicesMatcher(GetAction.NAME);
    Predicate<String> matcher2 = permission.indices().allowedIndicesMatcher(GetAction.NAME);
    assertThat(matcher1, is(matcher2));
  }
 public void testBuildEmptyRole() {
    Role.Builder permission = Role.builder(new String[] { "some_role" });
    Role role = permission.build();
    assertThat(role, notNullValue());
    assertThat(role.cluster(), notNullValue());
    assertThat(role.indices(), notNullValue());
    assertThat(role.runAs(), notNullValue());
  }
 public void testRunAs() {
    Role permission = Role.builder("some_role")
         .runAs(new Privilege("name", "user1", "run*"))
         .build();
    assertThat(permission.runAs().check("user1"), is(true));
    assertThat(permission.runAs().check("user"), is(false));
    assertThat(permission.runAs().check("run" + randomAlphaOfLengthBetween(1, 10)), is(true));
  }
 // "baz *foo", "/fool.*bar/"
 private void testAllowedIndicesMatcher(Predicate<String> indicesMatcher) {
    assertThat(indicesMatcher.test("foobar"), is(false));
    assertThat(indicesMatcher.test("fool"), is(false));
    assertThat(indicesMatcher.test("fool2bar"), is(true));
    assertThat(indicesMatcher.test("baz_foo"), is(true));
    assertThat(indicesMatcher.test("barbapapa"), is(false));
  }
}
/*
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```

*/

package org.elasticsearch.xpack.security.authz.permission;

import org.elasticsearch.ElasticsearchParseException; import org.elasticsearch.common.bytes.BytesArray; import org.elasticsearch.common.xcontent.XContentType; import org.elasticsearch.test.ESTestCase; import org.elasticsearch.xpack.core.security.authz.RoleDescriptor; import org.elasticsearch.xpack.core.security.authz.permission.FieldPermissions; import org.elasticsearch.xpack.core.security.authz.permission.FieldPermissionsDefinition;

import java.util.ArrayList; import java.util.Arrays; import java.util.Collections; import java.util.List; import java.util.concurrent.CountDownLatch; import java.util.concurrent.atomic.AtomicReferenceArray;

import static org.hamcrest.Matchers.containsString;

public class FieldPermissionsTests extends ESTestCase {

```
public void testParseFieldPermissions() throws Exception {
               String q = \{ (indices) : [ (
                                            "\"field security\": {" +
                                            "\"grant\": [\"f1\", \"f2\", \"f3\", \"f4\"]," +
                                            "\"except\": [\"f3\",\"f4\"]" +
                                          "}}];";
             RoleDescriptor rd =
                                            RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON);
             assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(),
                                            new String[] { "f1", "f2", "f3", "f4" });
               assertArrayEquals(rd.getIndicesPrivileges()[0].getDeniedFields(),
                                          new String[] { "f3", "f4" });
             q = {\langle names \rangle : | ames \rangle : | a
                                            "\"field security\": {" +
                                            "\"except\": [\"f3\",\"f4\"]," +
                                            "\"grant\": [\"f1\", \"f2\", \"f3\", \"f4\"]" +
                                          "}}]}";
             rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON);
             assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(),
                                            new String[] { "f1", "f2", "f3", "f4" });
             assertArrayEquals(rd.getIndicesPrivileges()[0].getDeniedFields(),
                                            new String[] { "f3", "f4" });
             q = "{\langle "indices \rangle": [ {\langle "names \rangle": \langle "idx2 \rangle", \langle "privileges \rangle": [\langle "p3 \rangle"], " + 
                                             "\"field_security\": {" +
```

```
"\"grant\": [\"f1\", \"f2\"]" +
"}}]}";
```

rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON); assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(),

```
new String[] { "f1", "f2" });
```

assert Null (rd.get Indices Privileges () [0].get Denied Fields ());

rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON); assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[] {}); assertNull(rd.getIndicesPrivileges()[0].getDeniedFields());

rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON); assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[] {}); assertArrayEquals(rd.getIndicesPrivileges()[0].getDeniedFields(), new String[] {});

```
final String exceptWithoutGrant = "{\"indices\": [ {\"names\": \"idx2\", \"privileges\":" +
    " [\"p3\"], \"field_security\": {" +
    "\"except\": [\"f1\"]" +
    "}}]]";
```

 $Elastic search Parse Exception\ e = expect Throws (Elastic search Parse Exception.class, and the search Parse Exception an$

```
() -> RoleDescriptor.parse("test", new BytesArray(exceptWithoutGrant), false,
XContentType.JSON));
```

assertThat(e.getDetailedMessage(),

containsString("failed to parse indices privileges for role [test]. field_security"

```
+ " requires grant if except is given"));
```

```
final String exceptNull = "{\"indices\": [ {\"names\": \"idx2\", \"privileges\": " +
    "[\"p3\"], \"field_security\": {" +
    "\"grant\": [\"*\"]," +
```

```
"\"except\": null" +
```

"}}]}";

e = expectThrows (Elastic searchParseException.class,

() -> RoleDescriptor.parse("test", new BytesArray(exceptNull), false, XContentType.JSON));

assertThat(e.getDetailedMessage(),

```
final String exceptGrantNull = "{\"indices\": [ {\"names\": \"idx2\", \"privileges\": " +
```

"[\"p3\"], \"field_security\": {" +

"\"grant\": null," +

"\"except\": null" +

"}}]}";

e = expectThrows (Elastic searchParseException.class,

() -> RoleDescriptor.parse("test", new BytesArray(exceptGrantNull), false, XContentType.JSON));

assertThat(e.getDetailedMessage(), containsString("failed to parse indices privileges " +
 "for role [test]. grant must not be null."));

```
final String both
FieldsMissing = "{\"indices\": [ {\"names\": \"idx2\", \"privileges\": " + "[\"p3\"], \"field_security\": {" +
```

"}}]}";

e = expectThrows (Elastic searchParseException.class,

() -> RoleDescriptor.parse("test", new BytesArray(bothFieldsMissing), false,

XContentType.JSON));

assertThat(e.getDetailedMessage(), containsString("failed to parse indices privileges " +
 "for role [test]. \"field_security\" must not be empty."));

 $\ensuremath{\textit{//}}\xspace$ try with two indices and mix order a little

assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[] {}); assertNull(rd.getIndicesPrivileges()[0].getDeniedFields());

assertArrayEquals(rd.getIndicesPrivileges()[1].getGrantedFields(), new String[] {"*"}); assertArrayEquals(rd.getIndicesPrivileges()[1].getDeniedFields(), new String[] {"f2"});

}

// test old syntax for field permissions

public void testBWCFieldPermissions() throws Exception {

String $q = "{\langle names \rangle : [{\langle names \rangle : \langle names \rangle : \langle names \rangle : [\langle names \rangle : [\langle names \rangle : \langle names \rangle : [\langle na$ "\"fields\": [\"f1\", \"f2\"]" + "}]}"; RoleDescriptor rd = RoleDescriptor.parse("test", new BytesArray(q), true, XContentType.JSON); assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[]{"f1", "f2"}); assertNull(rd.getIndicesPrivileges()[0].getDeniedFields()); final String failingQuery = q; ElasticsearchParseException e = expectThrows(ElasticsearchParseException.class, () -> RoleDescriptor.parse("test", new BytesArray(failingQuery), false, XContentType.JSON)); assertThat(e.getDetailedMessage(), containsString("[\"fields\": [...]] format has " + "changed for field permissions in role [test]" + ", use [\"field_security\": {\"grant\":[...],\"except\":[...]}] instead")); $q = \{ (indices) : [(indices) : (indices) : [(indices) : [(indices)], "+$ "\"fields\": []" + "}]}"; rd = RoleDescriptor.parse("test", new BytesArray(q), true, XContentType.JSON); assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[]{}); assertNull(rd.getIndicesPrivileges()[0].getDeniedFields()); final String failingQuery2 = q; e = expectThrows(ElasticsearchParseException.class, () -> RoleDescriptor.parse("test", new BytesArray(failingQuery2), false, XContentType.JSON)); assertThat(e.getDetailedMessage(), containsString("[\"fields\": [...]] format has " + "changed for field permissions in role [test]" + ", use [\"field_security\": {\"grant\":[...],\"except\":[...]}] instead")); $q = {\mbox{": [} \mbox{": [} mames \": \"idx2 \", \"privileges \": [\"p3 \"], " +$ "\"fields\": null" + "}]}"; rd = RoleDescriptor.parse("test", new BytesArray(q), true, XContentType.JSON); assertNull(rd.getIndicesPrivileges()[0].getGrantedFields()); assertNull(rd.getIndicesPrivileges()[0].getDeniedFields()); final String failingQuery3 = q; e = expectThrows(ElasticsearchParseException.class,

```
() -> RoleDescriptor.parse("test", new BytesArray(failingQuery3), false,
XContentType.JSON));
```

```
assertThat(e.getDetailedMessage(), containsString("[\"fields\": [...]] format has " +
"changed for field permissions in role [test]" +
```

```
", use [\"field_security\": {\"grant\":[...],\"except\":[...]}] instead"));
```

```
}
```

public void testFieldPermissionsHashCodeThreadSafe() throws Exception {
 final int numThreads = scaledRandomIntBetween(4, 16);

```
final FieldPermissions fieldPermissions = new FieldPermissions(
       new FieldPermissionsDefinition(new String[] { "*" }, new String[] { "foo" }));
  final CountDownLatch latch = new CountDownLatch(numThreads + 1);
  final AtomicReferenceArray<Integer> hashCodes = new AtomicReferenceArray<>(numThreads);
  List<Thread> threads = new ArrayList<>(numThreads);
  for (int i = 0; i < numThreads; i++) {
     final int threadNum = i;
    threads.add(new Thread(() -> {
       latch.countDown();
       try {
         latch.await();
       } catch (InterruptedException e) {
         Thread.currentThread().interrupt();
       }
       final int hashCode = fieldPermissions.hashCode();
       hashCodes.set(threadNum, hashCode);
     }));
  }
  for (Thread thread : threads) {
    thread.start();
  }
  latch.countDown();
  for (Thread thread : threads) {
     thread.join();
  }
  final int hashCode = fieldPermissions.hashCode();
  for (int i = 0; i < numThreads; i++) {
    assertEquals((Integer) hashCode, hashCodes.get(i));
  }
public void testAllFieldIsAutomaticallyExcludedIfNotExplicitlyGranted() throws Exception {
  final FieldPermissions fieldPermissions = new FieldPermissions(
       new FieldPermissionsDefinition(new String[] { "_a*" }, new String[0]));
  assertTrue(fieldPermissions.grantsAccessTo("_animal"));
  assertFalse(fieldPermissions.grantsAccessTo("_all"));
public void testAllFieldIsNotExcludedIfExplicitlyGranted() throws Exception {
  final String[] grant = { "foo", "bar", "baz", "_all" };
  Collections.shuffle(Arrays.asList(grant), random());
  final FieldPermissions fieldPermissions = new FieldPermissions(
       new FieldPermissionsDefinition(grant, new String[0]));
  assertTrue(fieldPermissions.grantsAccessTo("_all"));
```

}

}

```
assertTrue(fieldPermissions.grantsAccessTo("foo"));
assertTrue(fieldPermissions.grantsAccessTo("bar"));
assertTrue(fieldPermissions.grantsAccessTo("baz"));
assertFalse(fieldPermissions.grantsAccessTo(randomAlphaOfLengthBetween(5, 8)));
}
}
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```

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- */

package org.elasticsearch.license;

import org.apache.http.message.BasicHeader; import org.elasticsearch.ElasticsearchSecurityException; import org.elasticsearch.action.DocWriteResponse; import org.elasticsearch.action.admin.cluster.health.ClusterHealthResponse; import org.elasticsearch.action.admin.cluster.node.stats.NodesStatsResponse; import org.elasticsearch.action.admin.cluster.stats.ClusterStatsIndices; import org.elasticsearch.action.admin.cluster.stats.ClusterStatsResponse; import org.elasticsearch.action.admin.indices.stats.IndicesStatsResponse; import org.elasticsearch.action.index.IndexResponse; import org.elasticsearch.client.Client; import org.elasticsearch.client.Response; import org.elasticsearch.client.ResponseException; import org.elasticsearch.client.transport.NoNodeAvailableException; import org.elasticsearch.client.transport.TransportClient; import org.elasticsearch.cluster.routing.ShardRoutingState; import org.elasticsearch.common.network.NetworkModule; import org.elasticsearch.common.settings.SecureString; import org.elasticsearch.common.settings.Settings; import org.elasticsearch.common.util.concurrent.ThreadContext; import org.elasticsearch.discovery.DiscoveryModule; import org.elasticsearch.node.MockNode; import org.elasticsearch.node.Node; import org.elasticsearch.plugins.Plugin; import org.elasticsearch.rest.RestStatus; import org.elasticsearch.test.SecurityIntegTestCase; import org.elasticsearch.test.SecuritySettingsSource; import org.elasticsearch.test.SecuritySettingsSourceField; import org.elasticsearch.test.discovery.TestZenDiscovery; import org.elasticsearch.test.junit.annotations.TestLogging; import org.elasticsearch.transport.Netty4Plugin; import org.elasticsearch.transport.Transport; import org.elasticsearch.xpack.core.TestXPackTransportClient; import org.elasticsearch.xpack.core.XPackField; import org.elasticsearch.xpack.core.security.SecurityField; import org.elasticsearch.xpack.core.security.action.user.GetUsersResponse;

import org.elasticsearch.xpack.core.security.authc.support.UsernamePasswordToken; import org.elasticsearch.xpack.core.security.client.SecurityClient; import org.elasticsearch.xpack.security.LocalStateSecurity; import org.junit.After; import org.junit.Before;

import java.nio.file.Files; import java.nio.file.Path; import java.util.ArrayList; import java.util.Arrays; import java.util.Collection;

import static org.elasticsearch.common.xcontent.XContentFactory.jsonBuilder;
import static org.elasticsearch.test.hamcrest.ElasticsearchAssertions.assertNoFailures;
import static org.hamcrest.Matchers.containsString;
import static org.hamcrest.Matchers.greaterThanOrEqualTo;
import static org.hamcrest.Matchers.hasItem;
import static org.hamcrest.Matchers.is;
import static org.hamcrest.Matchers.is;

@TestLogging("org.elasticsearch.cluster.service:TRACE,org.elasticsearch.discovery.zen:TRACE,org.elasticsearch. action.search:TRACE," +

"org.elasticsearch.search:TRACE")

public class LicensingTests extends SecurityIntegTestCase {

```
public static final String ROLES =
```

 $SecuritySettingsSource.TEST_ROLE + ":\n" +$

" cluster: [all]\n" +

```
" indices:n'' +
```

- " names: '*'\n" +
- " privileges: [manage]\n" +
- " names: '/.*/'\n" +
- " privileges: [write]\n" +
- " names: 'test'\n" +
- " privileges: [read]\n" +
- " names: 'test1'\n" +
- " privileges: [read]\n" +

 $"\backslash n" +$

```
"role_a:\n" +
```

```
" indices:\n" +
```

```
" - names: 'a'\n" +
```

```
" privileges: [all]\n" +
```

```
"\n" +
```

```
"role_b:\n" +
```

- " indices:\n" +
- " names: 'b'\n" +
- " privileges: [all]\n";

```
public static final String USERS =
```

```
SecuritySettingsSource.CONFIG_STANDARD_USER +
         "user_a: { plain } passwd\n" +
         "user_b:{plain}passwd\n";
public static final String USERS_ROLES =
    SecuritySettingsSource.CONFIG_STANDARD_USER_ROLES +
         "role a:user a,user b\n" +
         "role_b:user_b\n";
@Override
protected String configRoles() {
  return ROLES;
}
@Override
protected String configUsers() {
  return USERS;
}
@Override
protected String configUsersRoles() {
  return USERS_ROLES;
}
@Override
public Settings nodeSettings(int nodeOrdinal) {
  return Settings.builder().put(super.nodeSettings(nodeOrdinal))
       .put(NetworkModule.HTTP_ENABLED.getKey(), true)
    .put(TestZenDiscovery.USE_MOCK_PINGS.getKey(), false)
       .build();
}
@Override
protected Collection<Class<? extends Plugin>> nodePlugins() {
  ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>(super.nodePlugins());
  plugins.add(Netty4Plugin.class); // for http
  return plugins;
}
@Override
protected int maxNumberOfNodes() {
  return super.maxNumberOfNodes() + 1;
}
@Before
public void resetLicensing() {
  enableLicensing();
}
```

```
@After
public void cleanupSecurityIndex() {
    deleteSecurityIndex();
}
public void testEnableDisableBehaviour() throws Exception {
    IndexResponse indexResponse = index("test", "type", jsonBuilder()
        .startObject()
        .field("name", "value")
        .endObject());
```

```
assertEquals(DocWriteResponse.Result.CREATED, indexResponse.getResult());
```

```
indexResponse = index("test1", "type", jsonBuilder()
    .startObject()
    .field("name", "value1")
    .endObject());
assertEquals(DocWriteResponse.Result.CREATED, indexResponse.getResult());
```

refresh();

// wait for all replicas to be started (to make sure that there are no more cluster state updates when we disable licensing)

Client client = internalCluster().transportClient();

disableLicensing();

assertElasticsearchSecurityException(() -> client.admin().indices().prepareStats().get()); assertElasticsearchSecurityException(() -> client.admin().cluster().prepareClusterStats().get()); assertElasticsearchSecurityException(() -> client.admin().cluster().prepareHealth().get()); assertElasticsearchSecurityException(() -> client.admin().cluster().prepareNodesStats().get());

enableLicensing(randomFrom(License.OperationMode.values()));

IndicesStatsResponse indicesStatsResponse = client.admin().indices().prepareStats().get();
assertNoFailures(indicesStatsResponse);

ClusterStatsResponse clusterStatsNodeResponse = client.admin().cluster().prepareClusterStats().get(); assertThat(clusterStatsNodeResponse, notNullValue()); ClusterStatsIndices indices = clusterStatsNodeResponse.getIndicesStats(); assertThat(indices, notNullValue()); assertThat(indices.getIndexCount(), greaterThanOrEqualTo(2));

ClusterHealthResponse clusterIndexHealth = client.admin().cluster().prepareHealth().get(); assertThat(clusterIndexHealth, notNullValue()); NodesStatsResponse nodeStats = client.admin().cluster().prepareNodesStats().get(); assertThat(nodeStats, notNullValue());

}

```
public void testRestAuthenticationByLicenseType() throws Exception {
    Response response = getRestClient().performRequest("GET", "/");
    // the default of the licensing tests is basic
    assertThat(response.getStatusLine().getStatusCode(), is(200));
    ResponseException e = expectThrows(ResponseException.class,
         () -> getRestClient().performRequest("GET", "/_xpack/security/_authenticate"));
    assertThat(e.getResponse().getStatusLine().getStatusCode(), is(403));
    // generate a new license with a mode that enables auth
    License.OperationMode mode = randomFrom(License.OperationMode.GOLD,
License.OperationMode.TRIAL,
        License.OperationMode.PLATINUM, License.OperationMode.STANDARD);
    enableLicensing(mode);
    e = expectThrows(ResponseException.class, () -> getRestClient().performRequest("GET", "/"));
    assertThat(e.getResponse().getStatusLine().getStatusCode(), is(401));
    e = expectThrows(ResponseException.class,
      () -> getRestClient().performRequest("GET", "/ xpack/security/ authenticate"));
    assertThat(e.getResponse().getStatusLine().getStatusCode(), is(401));
    final String basicAuthValue =
UsernamePasswordToken.basicAuthHeaderValue(SecuritySettingsSource.TEST USER NAME,
         new SecureString(SecuritySettingsSourceField.TEST PASSWORD.toCharArray()));
    response = getRestClient().performRequest("GET", "/", new BasicHeader("Authorization", basicAuthValue));
    assertThat(response.getStatusLine().getStatusCode(), is(200));
    response = getRestClient().performRequest("GET", "/ xpack/security/ authenticate",
           new BasicHeader("Authorization", basicAuthValue));
    assertThat(response.getStatusLine().getStatusCode(), is(200));
  }
 public void testSecurityActionsByLicenseType() throws Exception {
    // security actions should not work!
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateSecurity.class)) {
client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
());
      new SecurityClient(client).prepareGetUsers().get();
      fail("security actions should not be enabled!");
    } catch (ElasticsearchSecurityException e) {
      assertThat(e.status(), is(RestStatus.FORBIDDEN));
```

assertThat(e.getMessage(), containsString("non-compliant"));

```
}
```

```
// enable a license that enables security
          License.OperationMode mode = randomFrom(License.OperationMode.GOLD,
License.OperationMode.TRIAL,
                       License.OperationMode.PLATINUM, License.OperationMode.STANDARD);
          enableLicensing(mode);
          // security actions should not work!
           try (TransportClient client = new TestXPackTransportClient(settings, LocalStateSecurity.class)) {
client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAddress().publishAd
());
                 GetUsersResponse response = new SecurityClient(client).prepareGetUsers().get();
                 assertNotNull(response);
           }
     }
    public void testTransportClientAuthenticationByLicenseType() throws Exception {
          Settings.Builder builder = Settings.builder()
                        .put(internalCluster().transportClient().settings());
          // remove user info
          builder.remove(SecurityField.USER_SETTING.getKey());
          builder.remove(ThreadContext.PREFIX + "." + UsernamePasswordToken.BASIC_AUTH_HEADER);
          // basic has no auth
          try (TransportClient client = new TestXPackTransportClient(builder.build(), LocalStateSecurity.class)) {
client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
());
                 assertGreenClusterState(client);
           }
```

// enable a license that enables security

License.OperationMode mode = randomFrom(License.OperationMode.GOLD,

License.OperationMode.TRIAL,

}

```
License.OperationMode.PLATINUM, License.OperationMode.STANDARD);
enableLicensing(mode);
```

```
try (TransportClient client = new TestXPackTransportClient(builder.build(), LocalStateSecurity.class)) {
client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress
());
```

```
client.admin().cluster().prepareHealth().get();
     fail("should not have been able to connect to a node!");
  } catch (NoNodeAvailableException e) {
     // expected
  }
public void testNodeJoinWithoutSecurityExplicitlyEnabled() throws Exception {
```

License.OperationMode mode = randomFrom(License.OperationMode.GOLD, License.OperationMode.PLATINUM, License.OperationMode.STANDARD); enableLicensing(mode);

ensureGreen();

```
Path home = createTempDir();
    Path conf = home.resolve("config");
    Files.createDirectories(conf);
    Settings nodeSettings = Settings.builder()
      .put(nodeSettings(maxNumberOfNodes() - 1).filter(s -> "xpack.security.enabled".equals(s) == false))
      .put("node.name", "my-test-node")
      .put("network.host", "localhost")
      .put("cluster.name", internalCluster().getClusterName())
      .put("discovery.zen.minimum_master_nodes",
        internalCluster().getInstance(Settings.class).get("discovery.zen.minimum_master_nodes"))
      .put("path.home", home)
      .put(TestZenDiscovery.USE_MOCK_PINGS.getKey(), false)
      .put(DiscoveryModule.DISCOVERY_TYPE_SETTING.getKey(), "test-zen")
      .put(DiscoveryModule.DISCOVERY_HOSTS_PROVIDER_SETTING.getKey(), "test-zen")
      .build();
    Collection<Class<? extends Plugin>> mockPlugins = Arrays.asList(LocalStateSecurity.class,
TestZenDiscovery.TestPlugin.class);
    try (Node node = new MockNode(nodeSettings, mockPlugins)) {
      node.start();
      ensureStableCluster().size() + 1);
    }
  }
 private static void assertElasticsearchSecurityException(ThrowingRunnable runnable) {
    ElasticsearchSecurityException ee = expectThrows(ElasticsearchSecurityException.class, runnable);
    assertThat(ee.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA),
hasItem(XPackField.SECURITY));
    assertThat(ee.status(), is(RestStatus.FORBIDDEN));
  }
 public static void disableLicensing() {
    disableLicensing(License.OperationMode.BASIC);
  }
 public static void disableLicensing(License.OperationMode operationMode) {
    for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      licenseState.update(operationMode, false);
    }
  }
 public static void enableLicensing() {
    enableLicensing(License.OperationMode.BASIC);
  }
 public static void enableLicensing(License.OperationMode operationMode) {
    for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
```

```
licenseState.update(operationMode, true);
}
}
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```

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Jackson is a high-performance, Free/Open Source JSON processing library. It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007.

It is currently developed by a community of developers, as well as supported commercially by FasterXML.com.

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This product includes software developed at The Apache Software Foundation (http://www.apache.org/). [role="xpack"]
[testenv="basic"]
[[delete-license]]
=== Delete License API

This API enables you to delete licensing information.

[float] ==== Request

`DELETE /_xpack/license`

[float] ==== Description

When your license expires, {xpack} operates in a degraded mode. For more information, see {xpack-ref}/license-expiration.html[License Expiration].

[float] ==== Authorization

You must have `manage` cluster privileges to use this API. For more information, see {xpack-ref}/security-privileges.html[Security Privileges].

[float] ==== Examples

The following example queries the info API:

[source,js]

DELETE _xpack/license

// TEST[skip:license testing issues]

When the license is successfully deleted, the API returns the following response: [source,js]

{
 "acknowledged": true
}
// NOTCONSOLE
[role="xpack"]
[testenv="basic"]
[[get-license]]

=== Get License API

This API enables you to retrieve licensing information.

[float] ==== Request

`GET /_xpack/license`

[float] ==== Description

This API returns information about the type of license, when it was issued, and when it expires, for example.

For more information about the different types of licenses, see https://www.elastic.co/subscriptions.

[float] ==== Query Parameters

`local`::

(boolean) Specifies whether to retrieve local information. The default value is `false`, which means the information is retrieved from the master node.

[float] ==== Authorization

You must have `monitor` cluster privileges to use this API. For more information, see {xpack-ref}/security-privileges.html[Security Privileges].

[float] ==== Examples

The following example provides information about a basic license:

[source,js]

GET _xpack/license

[source,js]

```
{
 "license" : {
 "status" : "active",
 "uid" : "cbff45e7-c553-41f7-ae4f-9205eabd80xx",
 "type" : "basic",
  "issue_date" : "2018-02-22T23:12:05.550Z",
 "issue date in millis" : 1519341125550,
 "max_nodes" : 1000,
 "issued_to" : "test",
 "issuer" : "elasticsearch",
 "start_date_in_millis" : -1
}
}
              _____
// TESTRESPONSE[s/"cbff45e7-c553-41f7-ae4f-9205eabd80xx"/$body.license.uid/]
// TESTRESPONSE[s/"basic"/$body.license.type/]
// TESTRESPONSE[s/"2018-02-22T23:12:05.550Z"/$body.license.issue_date/]
// TESTRESPONSE[s/1519341125550/$body.license.issue date in millis/]
// TESTRESPONSE[s/1000/$body.license.max_nodes/]
// TESTRESPONSE[s/"test"/$body.license.issued_to/]
// TESTRESPONSE[s/"elasticsearch"/$body.license.issuer/]
[role="xpack"]
[testenv="basic"]
[[update-license]]
=== Update License API
```

This API enables you to update your license.

[float] ==== Request

`PUT _xpack/license`

[float] ==== Description

You can update your license at runtime without shutting down your nodes. License updates take effect immediately. If the license you are installing does not support all of the features that were available with your previous license, however, you are notified in the response. You must then re-submit the API request with the `acknowledge` parameter set to `true`.

For more information about the different types of licenses, see https://www.elastic.co/subscriptions.

[float] ==== Query Parameters `acknowledge`::

(boolean) Specifies whether you acknowledge the license changes. The default value is `false`.

[float] ==== Request Body

`licenses`::

(array) A sequence of one or more JSON documents containing the license information.

[float]

==== Authorization

If {security} is enabled, you need `manage` cluster privileges to install the license.

If {security} is enabled and you are installing a gold or platinum license, you must enable TLS on the transport networking layer before you install the license. See <<configuring-tls>>.

[float] ==== Examples

The following example updates to a basic license:

[source,js] _____ _____ POST _xpack/license { "licenses": [{ "uid":"893361dc-9749-4997-93cb-802e3d7fa4xx", "type":"basic", "issue_date_in_millis":1411948800000, "expiry_date_in_millis":1914278399999, "max_nodes":1, "issued_to":"issuedTo", "issuer":"issuer", "signature":"xx" }] } _____ // CONSOLE // TEST[skip:license testing issues]

NOTE: These values are invalid; you must substitute the appropriate content from your license file.

You can alternatively use a `curl` command, for example:

[source,js]

[source,shell]

 $curl \ -XPUT \ -u \ <\! user\!> \ 'http://<\ host\!>:<\! port\!>/_xpack/license' \ -H \ "Content-Type: application/json" \ -d \ @license.json" \ -d \ @licens$

// NOTCONSOLE

On Windows machine, use the following command:

[source,shell]

 $gc .\license.json \mid Invoke-WebRequest -uri \ http://<host>:<port>/_xpack/license -Credential elastic -Method Put - ContentType "application/json"$

In these examples,

* `<user>` is a user ID with the appropriate authority.

* `<host>` is the hostname of the {es} node (`localhost` if executing

locally)

* `<port>` is the http port (defaults to `9200`)

* `license.json` is the license JSON file

NOTE: If your {es} node has SSL enabled on the HTTP interface, you must start your URL with `https://`

If you previously had a license with more features than the basic license, you receive the following response:

[source,js]

{

"acknowledged": false,

"license_status": "valid",

"acknowledge": {

"message": """This license update requires acknowledgement. To acknowledge the license, please read the following messages and update the license again, this time with the "acknowledge=true" parameter:""",

"watcher": ["Watcher will be disabled"

], "logstash": ["Logstash will no longer poll for centrally-managed pipelines"],

```
"security": [

"The following X-Pack security functionality will be disabled: ..." ]

}
```

```
// NOTCONSOLE
```

To complete the update, you must re-submit the API request and set the `acknowledge` parameter to `true`. For example:

[source,js]

```
POST _xpack/license?acknowledge=true
```

```
{
    "licenses": [
    {
        "uid":"893361dc-9749-4997-93cb-802e3d7fa4xx",
        "type":"basic",
        "issue_date_in_millis":1411948800000,
        "expiry_date_in_millis":1914278399999,
        "max_nodes":1,
        "issued_to":"issuedTo",
        "issuer":"issuer",
        "signature":"xx"
    }
  ]
}
```

// CONSOLE
// TEST[skip:license testing issues]

Alternatively:

[source,sh]

curl -XPUT -u elastic 'http://<host>:<port>/_xpack/license?acknowledge=true' -H "Content-Type: application/json" -d @license.json

```
// NOTCONSOLE
```

For more information about the features that are disabled when you downgrade your license, see {xpack-ref}/license-expiration.html[License Expiration]. [role="xpack"] [[license-settings]] === {xpack} License Settings ++++ <titleabbrev>License Settings</titleabbrev> ++++ You can configure this licensing setting in the `elasticsearch.yml` file. For more information, see {xpack-ref}/license-management.html[{xpack} License Management].

`xpack.license.self_generated.type`::
Set to `basic` (default) to enable basic {xpack} features. +
+
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May 22, 2015

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// -----

// Transitive dependencies of this project determined from the

// maven pom organized by organization.

// -----

Apache Extras for Apache log4j.

From: 'an unknown organization'

- geronimo-jms_1.1_spec org.apache.geronimo.specs:geronimo-jms_1.1_spec:jar:1.0

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The art of simplicity is a puzzle of complexity.

Overview

[YAML](http://yaml.org) is a data serialization format designed for human readability and interaction with scripting languages.

SnakeYAML is a YAML processor for the Java Virtual Machine.

SnakeYAML features

* a **complete** [YAML 1.1 processor](http://yaml.org/spec/1.1/current.html). In particular, SnakeYAML can parse all examples from the specification.

* Unicode support including UTF-8/UTF-16 input/output.

- * high-level API for serializing and deserializing native Java objects.
- * support for all types from the [YAML types repository](http://yaml.org/type/index.html).

* relatively sensible error messages.

Info

* [Changes](https://bitbucket.org/asomov/snakeyaml/wiki/Changes)

* [Documentation](https://bitbucket.org/asomov/snakeyaml/wiki/Documentation)

Contribute

* Mercurial DVCS is used to dance with the [source code](https://bitbucket.org/asomov/snakeyaml/src).

* If you find a bug in SnakeYAML, please [file a bug

report](https://bitbucket.org/asomov/snakeyaml/issues?status=new&status=open).

* You may discuss SnakeYAML at

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OSXAdapter

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The art of simplicity is a puzzle of complexity.

Overview

[YAML](http://yaml.org) is a data serialization format designed for human readability and interaction with scripting languages.

SnakeYAML is a YAML processor for the Java Virtual Machine.

SnakeYAML features

* a **complete** [YAML 1.1 processor](http://yaml.org/spec/1.1/current.html). In particular, SnakeYAML can parse all examples from the specification.

* Unicode support including UTF-8/UTF-16 input/output.

* high-level API for serializing and deserializing native Java objects.

* support for all types from the [YAML types repository](http://yaml.org/type/index.html).

* relatively sensible error messages.

Info

* [Changes](https://bitbucket.org/asomov/snakeyaml/wiki/Changes)

* [Documentation](https://bitbucket.org/asomov/snakeyaml/wiki/Documentation)

Contribute

* Mercurial DVCS is used to dance with the [source code](https://bitbucket.org/asomov/snakeyaml/src).

* If you find a bug in SnakeYAML, please [file a bug

report](https://bitbucket.org/asomov/snakeyaml/issues?status=new&status=open).

* You may discuss SnakeYAML at

[the mailing list](http://groups.google.com/group/snakeyaml-core).

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A number of small but very helpful changes have been contributed by Adrien Grand (https://github.com/jpountz)

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1.27 flink 1.4.2_Scala_2.11

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import org.apache.flink.annotation.Internal; import org.apache.flink.api.common.typeutils.TypeSerializer; import org.apache.flink.util.Collector;

```
@Internal
public class CopyingListCollector<T> implements Collector<T> {
```

private final List<T> list; private final TypeSerializer<T> serializer;

```
public CopyingListCollector(List<T> list, TypeSerializer<T> serializer) {
  this.list = list;
  this.serializer = serializer;
}
```

```
@Override
public void collect(T record) {
    list.add(serializer.copy(record));
}
```

```
@Override
public void close() { }
}
/*
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*/
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import java.util.Iterator;
import org.apache.flink.annotation.Internal;
import org.apache.flink.api.common.typeutils.TypeSerializer;
import org.apache.flink.util.TraversableOnceException;
```

```
@Internal
public class CopyingIterator<E> implements Iterator<E>, Iterable<E> {
```

```
private final Iterator<E> source;
private final TypeSerializer<E> serializer;
```

```
private boolean available = true;
```

```
public CopyingIterator(Iterator<E> source, TypeSerializer<E> serializer) {
  this.source = source;
  this.serializer = serializer;
}
```

```
@Override
public Iterator<E> iterator() {
    if (available) {
        available = false;
        return this;
    } else {
```

```
throw new TraversableOnceException();
 }
}
@Override
public boolean hasNext() {
 return source.hasNext();
}
@Override
public E next() {
 E next = source.next();
 return serializer.copy(next);
}
@Override
public void remove() {
 throw new UnsupportedOperationException();
}
}
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- org.apache.lucene : lucene-join version 4.10.4
- org.apache.lucene : lucene-memory version 4.10.4
- org.apache.lucene : lucene-misc version 4.10.4
```

```
- org.apache.lucene : lucene-queries version 4.10.4
```

```
- org.apache.lucene : lucene-queryparser version 4.10.4
```

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- org.apache.lucene : lucene-sandbox version 4.10.4
```

```
- org.apache.lucene : lucene-spatial version 4.10.4
```

- org.apache.lucene : lucene-suggest version 4.10.4

- com.spatial4j : spatial4j version 0.4.1

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- com.fasterxml.jackson.dataformat : jackson-dataformat-smile version 2.5.3

- com.fasterxml.jackson.dataformat : jackson-dataformat-yaml version 2.5.3

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- org.jboss.netty : netty version 3.2.0.Final
- joda-time : joda-time version 2.5
- com.github.spullara.mustache.java : compiler version 0.9.3

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*/

package org.apache.flink.streaming.api.collector.selector;

import org.apache.flink.api.java.tuple.Tuple2; import org.apache.flink.streaming.api.graph.StreamEdge; import org.apache.flink.streaming.api.operators.Output; import org.apache.flink.streaming.runtime.streamrecord.StreamRecord;

import java.util.Iterator; import java.util.List; import java.util.Set;

/**

* Special version of {@link DirectedOutput} that performs a shallow copy of the
* {@link StreamRecord} to ensure that multi-chaining works correctly.
*/
public class CopyingDirectedOutput<OUT> extends DirectedOutput<OUT> {

@SuppressWarnings({"unchecked", "rawtypes"})
public CopyingDirectedOutput(
 List<OutputSelector<OUT>> outputSelectors,
 List<Tuple2<Output<StreamRecord<OUT>>, StreamEdge>> outputs) {
 super(outputSelectors, outputs);
 }
}

@Override
public void collect(StreamRecord<OUT> record) {
 Set<Output<StreamRecord<OUT>>> selectedOutputs = selectOutputs(record);

```
if (selectedOutputs.isEmpty()) {
  return;
}
```

Iterator<Output<StreamRecord<OUT>>> it = selectedOutputs.iterator();

```
while (true) {
 Output<StreamRecord<OUT>> out = it.next();
 if (it.hasNext()) {
 // we don't have the last output
  // perform a shallow copy
  StreamRecord<OUT> shallowCopy = record.copy(record.getValue());
  out.collect(shallowCopy);
 } else {
  // this is the last output
  out.collect(record);
  break:
 }
 }
}
}
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```

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- io.airlift : configuration version 0.148

- io.airlift : slice version 0.31

- io.airlift : units version 1.0

- com.google.guava : guava version 21.0

- com.google.code.findbugs : annotations version 2.0.3

- org.weakref : jmxutils version 1.19

- joda-time : joda-time version 2.5

- commons-logging : commons-logging version 1.1.3

- org.apache.httpcomponents : httpclient version 4.5.3

- org.apache.httpcomponents : httpcore version 4.4.6

- commons-codec : commons-codec version 1.10

- com.fasterxml.jackson.core : jackson-core version 2.7.4
- com.fasterxml.jackson.core : jackson-databind version 2.7.4
- com.fasterxml.jackson.core : jackson-annotations version 2.7.4
- com.fasterxml.jackson.dataformat : jackson-dataformat-cbor version 2.6.7

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- commons-io : commons-io version 2.4

- commons-net : commons-net version 3.1

- commons-logging : commons-logging version 1.1.3

- commons-lang : commons-lang version 2.6

- commons-configuration : commons-configuration version 1.7

- commons-digester : commons-digester version 1.8.1

- commons-beanutils : commons-beanutils version 1.8.3

- org.apache.commons : commons-compress version 1.4.1

- org.apache.commons : commons-math3 version 3.5

- org.apache.httpcomponents : httpclient version 4.5.3

- org.apache.httpcomponents : httpcore version 4.4.6

- org.apache.htrace : htrace-core4 version 4.0.1-incubating

- org.apache.hadoop : hadoop-client version 2.8.1

- org.apache.hadoop : hadoop-common version 2.8.1

- org.apache.hadoop : hadoop-auth version 2.8.1

- org.apache.hadoop : hadoop-hdfs version 2.8.1

- org.apache.hadoop : hadoop-hdfs-client version 2.8.1

- org.apache.hadoop : hadoop-annotations version 2.8.1

- org.apache.hadoop : hadoop-aws version 2.8.1

- com.google.guava : guava version 11.0.2

- com.google.protobuf : protobuf-java version 2.5.0

- com.google.code.gson : gson version 2.2.4

- org.mortbay.jetty : jetty-sslengine version 6.1.26

- com.nimbusds : nimbus-jose-jwt version 3.9

- net.minidev : json-smart version 1.1.1

- joda-time : joda-time version 2.5

- com.squareup.okhttp : okhttp version 2.4.0

- com.squareup.okio : okio version 1.4.0

- com.amazonaws : aws-java-sdk-s3 version 1.10.6

- com.amazonaws : aws-java-sdk-kms version 1.10.6

- com.amazonaws : aws-java-sdk-core version 1.10.6

- org.codehaus.jackson : jackson-core-asl version 1.9.13
- org.codehaus.jackson : jackson-mapper-asl version 1.9.13
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1.29 fuzzy 0.1.0

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1.32 github.com/beorn7/perks 3a771d992973f24aa725d07868b467d1ddfceaf b :1.0 1.32.1 Available under license :

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1.34 go-resiliency 1.0.0

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1.36 go-xerial-snappy master

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1.37 golang-snappy v0.0.1

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1.51 itsdangerous 1.1.0

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1.52 jackson-core 2.7.5

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1.53 jackson-core 2.9.4

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1.55 js-cookie 2.2.0

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1.58 json-schema-faker 0.5.0-rc9

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1.59 jsonpickle 1.2

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1.60 kafka-python 1.4.6

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Metadata-Version: 1.1 Name: kafka-python Version: 1.4.6 Summary: Pure Python client for Apache Kafka Home-page: https://github.com/dpkp/kafka-python Author: Dana Powers Author-email: dana.powers@gmail.com License: Apache License 2.0 Description: Kafka Python client

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1.61 kafka-python 1.4.7

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1.63 libcurl 7.61.1

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serial 58 LT_INIT

LT_PREREQ(VERSION)

Complain and exit if this libtool version is less that VERSION.

```
m4_defun([LT_PREREQ],
```

[m4_if(m4_version_compare(m4_defn([LT_PACKAGE_VERSION]), [\$1]), -1,

[m4_default([\$3],

[m4_fatal([Libtool version \$1 or higher is required],

63)])],

[\$2])])

_LT_CHECK_BUILDDIR

Complain if the absolute build directory name contains unusual characters m4_defun([_LT_CHECK_BUILDDIR],

```
[case `pwd` in
*\ * | *\ *)
AC_MSG_WARN([Libtool does not cope well with whitespace in `pwd`]) ;;
esac
])
```

LT_INIT([OPTIONS])
.....
AC_DEFUN([LT_INIT],
[AC_PREREQ([2.62])dnl We use AC_PATH_PROGS_FEATURE_CHECK
AC_REQUIRE([AC_CONFIG_AUX_DIR_DEFAULT])dnl
AC_BEFORE([\$0], [LT_LANG])dnl
AC_BEFORE([\$0], [LT_OUTPUT])dnl
AC_BEFORE([\$0], [LTDL_INIT])dnl
m4_require([_LT_CHECK_BUILDDIR])dnl

dnl Autoconf doesn't catch unexpanded LT_ macros by default: m4_pattern_forbid([^_?LT_[A-Z_]+\$])dnl m4_pattern_allow([^(_LT_EOF|LT_DLGLOBAL|LT_DLLAZY_OR_NOW|LT_MULTI_MODULE)\$])dnl dnl aclocal doesn't pull ltoptions.m4, ltsugar.m4, or ltversion.m4 dnl unless we require an AC_DEFUNed macro: AC_REQUIRE([LTOPTIONS_VERSION])dnl AC_REQUIRE([LTSUGAR_VERSION])dnl AC_REQUIRE([LTVERSION_VERSION])dnl AC_REQUIRE([LTOBSOLETE_VERSION])dnl m4_require([_LT_PROG_LTMAIN])dnl

_LT_SHELL_INIT([SHELL=\${CONFIG_SHELL-/bin/sh}])

dnl Parse OPTIONS _LT_SET_OPTIONS([\$0], [\$1])

This can be used to rebuild libtool when needed LIBTOOL_DEPS=\$ltmain

Always use our own libtool. LIBTOOL='\$(SHELL) \$(top_builddir)/libtool' AC_SUBST(LIBTOOL)dnl

_LT_SETUP

Only expand once: m4_define([LT_INIT])])# LT_INIT

Old names: AU_ALIAS([AC_PROG_LIBTOOL], [LT_INIT])

```
AU_ALIAS([AM_PROG_LIBTOOL], [LT_INIT])
dnl aclocal-1.4 backwards compatibility:
dnl AC_DEFUN([AC_PROG_LIBTOOL], [])
dnl AC_DEFUN([AM_PROG_LIBTOOL], [])
```

```
# LT PREPARE CC BASENAME
# ------
m4_defun([_LT_PREPARE_CC_BASENAME], [
# Calculate cc basename. Skip known compiler wrappers and cross-prefix.
func_cc_basename ()
{
 for cc temp in @S|@*""; do
  case $cc_temp in
   compile | *[[]] compile | ccache | *[[]] ccache ) ;;
   distcc | *[[\\/]]distcc | purify | *[[\\/]]purify ) ;;
   \-*);;
   *) break;;
  esac
 done
 func_cc_basename_result=`$ECHO "$cc_temp" | $SED "s%.*/%%; s%^$host_alias-%%"`
}
])# _LT_PREPARE_CC_BASENAME
```

LT_CC_BASENAME(CC)

------# It would be clearer to call AC_REQUIREs from _LT_PREPARE_CC_BASENAME, # but that macro is also expanded into generated libtool script, which # arranges for \$SED and \$ECHO to be set by different means. m4_defun([_LT_CC_BASENAME], [m4_require([_LT_PREPARE_CC_BASENAME])dnl AC_REQUIRE([_LT_DECL_SED])dnl AC_REQUIRE([_LT_PROG_ECHO_BACKSLASH])dnl func_cc_basename \$1 cc_basename=\$func_cc_basename_result])

_LT_FILEUTILS_DEFAULTS

```
# ------
# It is okay to use these file commands and assume they have been set
# sensibly after 'm4_require([_LT_FILEUTILS_DEFAULTS])'.
m4_defun([_LT_FILEUTILS_DEFAULTS],
[: ${CP="cp -f"}
: ${CP="mv -f"}
: ${RM="rm -f"}
])# _LT_FILEUTILS_DEFAULTS
```

_LT_SETUP

-----m4_defun([_LT_SETUP], [AC_REQUIRE([AC_CANONICAL_HOST])dnl AC_REQUIRE([AC_CANONICAL_BUILD])dnl AC_REQUIRE([_LT_PREPARE_SED_QUOTE_VARS])dnl AC_REQUIRE([_LT_PROG_ECHO_BACKSLASH])dnl

_LT_DECL([], [PATH_SEPARATOR], [1], [The PATH separator for the build system])dnl dnl _LT_DECL([], [host_alias], [0], [The host system])dnl _LT_DECL([], [host], [0])dnl _LT_DECL([], [host_os], [0])dnl dnl _LT_DECL([], [build_alias], [0], [The build system])dnl LT DECL([], [build], [0])dnl _LT_DECL([], [build_os], [0])dnl dnl AC REQUIRE([AC PROG CC])dnl AC_REQUIRE([LT_PATH_LD])dnl AC_REQUIRE([LT_PATH_NM])dnl dnl AC_REQUIRE([AC_PROG_LN_S])dnl test -z "\$LN S" && LN S="ln -s" _LT_DECL([], [LN_S], [1], [Whether we need soft or hard links])dnl dnl AC REQUIRE([LT CMD MAX LEN])dnl _LT_DECL([objext], [ac_objext], [0], [Object file suffix (normally "o")])dnl _LT_DECL([], [exeext], [0], [Executable file suffix (normally "")])dnl dnl m4_require([_LT_FILEUTILS_DEFAULTS])dnl m4 require([LT CHECK SHELL FEATURES])dnl m4_require([_LT_PATH_CONVERSION_FUNCTIONS])dnl m4_require([_LT_CMD_RELOAD])dnl m4_require([_LT_CHECK_MAGIC_METHOD])dnl m4_require([_LT_CHECK_SHAREDLIB_FROM_LINKLIB])dnl m4_require([_LT_CMD_OLD_ARCHIVE])dnl m4_require([_LT_CMD_GLOBAL_SYMBOLS])dnl m4_require([_LT_WITH_SYSROOT])dnl m4_require([_LT_CMD_TRUNCATE])dnl _LT_CONFIG_LIBTOOL_INIT([# See if we are running on zsh, and set the options that allow our

commands through without removal of \ escapes INIT.

if test -n "\\${ZSH_VERSION+set}"; then

setopt NO_GLOB_SUBST

```
fi
])
if test -n "${ZSH_VERSION+set}"; then
setopt NO_GLOB_SUBST
fi
```

```
_LT_CHECK_OBJDIR
```

m4_require([_LT_TAG_COMPILER])dnl

```
case $host_os in
aix3*)
# AIX sometimes has problems with the GCC collect2 program. For some
# reason, if we set the COLLECT_NAMES environment variable, the problems
# vanish in a puff of smoke.
if test set != "${COLLECT_NAMES+set}"; then
COLLECT_NAMES=
export COLLECT_NAMES
fi
;;
```

```
esac
```

```
# Global variables:
ofile=libtool
can_build_shared=yes
```

All known linkers require a '.a' archive for static linking (except MSVC, # which needs '.lib'). libext=a

 $with_gnu_ld=\$lt_cv_prog_gnu_ld$

old_CC=\$CC old_CFLAGS=\$CFLAGS

Set sane defaults for various variables
test -z "\$CC" && CC=cc
test -z "\$LTCC" && LTCC=\$CC
test -z "\$LTCFLAGS" && LTCFLAGS=\$CFLAGS
test -z "\$LD" && LD=ld
test -z "\$ac_objext" && ac_objext=o

```
_LT_CC_BASENAME([$compiler])
```

```
# Only perform the check for file, if the check method requires it
test -z "$MAGIC_CMD" && MAGIC_CMD=file
case $deplibs_check_method in
file_magic*)
```

```
if test "$file_magic_cmd" = '$MAGIC_CMD'; then
    _LT_PATH_MAGIC
fi
;;
esac
```

Use C for the default configuration in the libtool script LT_SUPPORTED_TAG([CC]) _LT_LANG_C_CONFIG _LT_LANG_DEFAULT_CONFIG _LT_CONFIG_COMMANDS])# _LT_SETUP

_LT_PREPARE_SED_QUOTE_VARS # -----# Define a few sed substitution that help us do robust quoting. m4_defun([_LT_PREPARE_SED_QUOTE_VARS], [# Backslashify metacharacters that are still active within # double-quoted strings. cod_guote_subst='co(([["`\$\\]))0\\)1/g'

 $sed_quote_subst='s/([["`$\\]])/\\\1/g'$

Same as above, but do not quote variable references. double_quote_subst='s/\([["`\\]]\)/\\\1/g'

Sed substitution to avoid accidental globbing in evaled expressions
no_glob_subst='s/*/*/g'
])

#_LT_PROG_LTMAIN

Note that this code is called both from 'configure', and 'config.status'

now that we use AC_CONFIG_COMMANDS to generate libtool. Notably,

'config.status' has no value for ac_aux_dir unless we are using Automake,

so we pass a copy along to make sure it has a sensible value anyway.

m4_defun([_LT_PROG_LTMAIN],

[m4_ifdef([AC_REQUIRE_AUX_FILE], [AC_REQUIRE_AUX_FILE([ltmain.sh])])dnl _LT_CONFIG_LIBTOOL_INIT([ac_aux_dir='\$ac_aux_dir']) ltmain=\$ac_aux_dir/ltmain.sh])# _LT_PROG_LTMAIN ## ------ ##

Accumulate code for creating libtool.

So that we can recreate a full libtool script including additional

tags, we accumulate the chunks of code to send to AC_CONFIG_COMMANDS

in macros and then make a single call at the end using the 'libtool'

label.

LT_CONFIG_LIBTOOL_INIT([INIT-COMMANDS])

Register INIT-COMMANDS to be passed to AC_CONFIG_COMMANDS later. m4_define([_LT_CONFIG_LIBTOOL_INIT], [m4_ifval([\$1], [m4_append([_LT_OUTPUT_LIBTOOL_INIT],

[\$1

])])])

Initialize.

m4_define([_LT_OUTPUT_LIBTOOL_INIT])

LT_CONFIG_LIBTOOL([COMMANDS])

Register COMMANDS to be passed to AC_CONFIG_COMMANDS later. m4_define([_LT_CONFIG_LIBTOOL], [m4_ifuel([\$1]]

[m4_ifval([\$1],

[m4_append([_LT_OUTPUT_LIBTOOL_COMMANDS],

[\$1

])])])

Initialize. m4_define([_LT_OUTPUT_LIBTOOL_COMMANDS])

#_LT_CONFIG_SAVE_COMMANDS([COMMANDS], [INIT_COMMANDS])

m4_defun([_LT_CONFIG_SAVE_COMMANDS],

[_LT_CONFIG_LIBTOOL([\$1])

_LT_CONFIG_LIBTOOL_INIT([\$2])

])

LT_FORMAT_COMMENT([COMMENT])

Add leading comment marks to the start of each line, and a trailing

)])

------ ## ## FIXME: Eliminate VARNAME ## ## ------

#_LT_DECL([CONFIGNAME], VARNAME, VALUE, [DESCRIPTION], [IS-TAGGED?])

CONFIGNAME is the name given to the value in the libtool script.

VARNAME is the (base) name used in the configure script.

VALUE may be 0, 1 or 2 for a computed quote escaped value based on

VARNAME. Any other value will be used directly.

m4_define([_LT_DECL],

[lt_if_append_uniq([lt_decl_varnames], [\$2], [,],

[lt_dict_add_subkey([lt_decl_dict], [\$2], [libtool_name],

[m4_ifval([\$1], [\$1], [\$2])])

lt_dict_add_subkey([lt_decl_dict], [\$2], [value], [\$3])

m4_ifval([\$4],

[lt_dict_add_subkey([lt_decl_dict], [\$2], [description], [\$4])])

lt_dict_add_subkey([lt_decl_dict], [\$2],

[tagged?], [m4_ifval([\$5], [yes], [no])])])

```
])
```

_LT_TAGDECL([CONFIGNAME], VARNAME, VALUE, [DESCRIPTION])
-----m4_define([_LT_TAGDECL]_[_LT_DECL_([\$1]_[\$2]_[\$2]_[\$2]_[\$4]_[bach]))

m4_define([_LT_TAGDECL], [_LT_DECL([\$1], [\$2], [\$3], [\$4], [yes])])

lt_decl_tag_varnames([SEPARATOR], [VARNAME1...])

m4_define([lt_decl_tag_varnames],

[_lt_decl_filter([tagged?], [yes], \$@)])

_lt_decl_filter(SUBKEY, VALUE, [SEPARATOR], [VARNAME1..])

m4_define([_lt_decl_filter],

[m4_case([\$#],

[0], [m4_fatal([\$0: too few arguments: \$#])],

[1], [m4_fatal([\$0: too few arguments: \$#: \$1])],
[2], [lt_dict_filter([lt_decl_dict], [\$1], [\$2], [], lt_decl_varnames)],
[3], [lt_dict_filter([lt_decl_dict], [\$1], [\$2], [\$3], lt_decl_varnames)],
[lt_dict_filter([lt_decl_dict], \$@)])[]dnl
])

lt_decl_quote_varnames([SEPARATOR], [VARNAME1...])
-----m4_define([lt_decl_quote_varnames],
[_lt_decl_filter([value], [1], \$@)])

lt_decl_dquote_varnames([SEPARATOR], [VARNAME1...])

m4_define([lt_decl_dquote_varnames],

[_lt_decl_filter([value], [2], \$@)])

lt_decl_varnames_tagged([SEPARATOR], [VARNAME1...])

m4_define([lt_decl_varnames_tagged],

 $[m4_assert([\$\# <= 2])dnl$

_\$0(m4_quote(m4_default([\$1], [[,]])),

m4_ifval([\$2], [[\$2]], [m4_dquote(lt_decl_tag_varnames)]),

m4_split(m4_normalize(m4_quote(_LT_TAGS)), []))])

m4_define([_lt_decl_varnames_tagged],

[m4_ifval([\$3], [lt_combine([\$1], [\$2], [_], \$3)])])

lt_decl_all_varnames([SEPARATOR], [VARNAME1...])

m4_define([lt_decl_all_varnames],

[_\$0(m4_quote(m4_default([\$1], [[,]])), m4_if([\$2], [],

m4_quote(lt_decl_varnames),

m4_quote(m4_shift(\$@))))[]dnl

1)

m4_define([_lt_decl_all_varnames],

[lt_join(\$@, lt_decl_varnames_tagged([\$1],

lt_decl_tag_varnames([[,]], m4_shift(\$@))))dnl

```
])
```

LT_CONFIG_STATUS_DECLARE([VARNAME])

Quote a variable value, and forward it to 'config.status' so that its

declaration there will have the same value as in 'configure'. VARNAME

must have a single quote delimited value for this to work. m4_define([_LT_CONFIG_STATUS_DECLARE], [\$1=`\$ECHO "\$][\$1" | \$SED "\$delay_single_quote_subst"`'])

_LT_CONFIG_STATUS_DECLARATIONS

m4_defun([_LT_CONFIG_STATUS_DECLARATIONS], [m4_foreach([_lt_var], m4_quote(lt_decl_all_varnames),

[m4_n([_LT_CONFIG_STATUS_DECLARE(_lt_var)])])]

_LT_LIBTOOL_TAGS

Output comment and list of tags supported by the script

m4_defun([_LT_LIBTOOL_TAGS],

[_LT_FORMAT_COMMENT([The names of the tagged configurations supported by this script])dnl available_tags='_LT_TAGS'dnl

])

LT_LIBTOOL_DECLARE(VARNAME, [TAG])

Extract the dictionary values for VARNAME (optionally with TAG) and

expand to a commented shell variable setting:

#

Some comment about what VAR is for.

visible_name=\$lt_internal_name

m4_define([_LT_LIBTOOL_DECLARE],

[_LT_FORMAT_COMMENT(m4_quote(lt_dict_fetch([lt_decl_dict], [\$1],

[description])))[]dnl

m4_pushdef([_libtool_name],

m4_quote(lt_dict_fetch([lt_decl_dict], [\$1], [libtool_name])))[]dnl

m4_case(m4_quote(lt_dict_fetch([lt_decl_dict], [\$1], [value])),

[0], [_libtool_name=[\$]\$1],

[1], [_libtool_name=\$lt_[]\$1],

[2], [_libtool_name=\$lt_[]\$1],

[_libtool_name=lt_dict_fetch([lt_decl_dict], [\$1], [value])])[]dnl

 $m4_ifval([\$2], [_\$2])[]m4_popdef([_libtool_name])[]dnl$

```
])
```

_LT_LIBTOOL_CONFIG_VARS

Produce commented declarations of non-tagged libtool config variables # suitable for insertion in the LIBTOOL CONFIG section of the 'libtool' # script. Tagged libtool config variables (even for the LIBTOOL CONFIG # section) are produced by _LT_LIBTOOL_TAG_VARS. m4_defun([_LT_LIBTOOL_CONFIG_VARS], [m4_foreach([_lt_var], m4_quote(_lt_decl_filter([tagged?], [no], [], lt_decl_varnames)), [m4_n([_LT_LIBTOOL_DECLARE(_lt_var)])]))

LT_LIBTOOL_TAG_VARS(TAG)

m4_define([_LT_LIBTOOL_TAG_VARS],

 $[m4_foreach([_lt_var], m4_quote(lt_decl_tag_varnames),$

[m4_n([_LT_LIBTOOL_DECLARE(_lt_var, [\$1])])])])

_LT_TAGVAR(VARNAME, [TAGNAME])

m4_define([_LT_TAGVAR], [m4_ifval([\$2], [\$1_\$2], [\$1])])

_LT_CONFIG_COMMANDS

Send accumulated output to \$CONFIG STATUS. Thanks to the lists of # variables for single and double quote escaping we saved from calls # to LT DECL, we can put quote escaped variables declarations # into 'config.status', and then the shell code to quote escape them in # for loops in 'config.status'. Finally, any additional code accumulated # from calls to LT CONFIG LIBTOOL INIT is expanded. m4 defun([LT CONFIG COMMANDS], [AC PROVIDE IFELSE([LT OUTPUT], dnl If the libtool generation code has been placed in \$CONFIG_LT, dnl instead of duplicating it all over again into config.status, dnl then we will have config.status run \$CONFIG LT later, so it dnl needs to know what name is stored there: [AC CONFIG COMMANDS([libtool], [\$SHELL \$CONFIG_LT || AS_EXIT(1)], [CONFIG_LT='\$CONFIG_LT'])], dnl If the libtool generation code is destined for config.status, dnl expand the accumulated commands and init code now:

[AC_CONFIG_COMMANDS([libtool],

[_LT_OUTPUT_LIBTOOL_COMMANDS], [_LT_OUTPUT_LIBTOOL_COMMANDS_INIT])])])#_LT_CONFIG_COMMANDS

Initialize.

```
m4_define([_LT_OUTPUT_LIBTOOL_COMMANDS_INIT], [
```

```
# The HP-UX ksh and POSIX shell print the target directory to stdout# if CDPATH is set.(unset CDPATH) >/dev/null 2>&1 && unset CDPATH
```

```
sed_quote_subst='$sed_quote_subst'
double_quote_subst='$double_quote_subst'
delay_variable_subst='$delay_variable_subst'
_LT_CONFIG_STATUS_DECLARATIONS
LTCC='$LTCC'
LTCFLAGS='$LTCFLAGS'
compiler='$compiler_DEFAULT'
```

```
# A function that is used when there is no print builtin or printf.
func_fallback_echo ()
{
    eval 'cat <<_LTECHO_EOF
    \$[]1
_LTECHO_EOF'
}</pre>
```

```
# Quote evaled strings.
for var in lt_decl_all_varnames([[ \
]], lt_decl_quote_varnames); do
    case \`eval \\\\\$ECHO \\\""\\\\$\$var"\\\\"\\
in *[[\\\\\\\\\]]]*)
    eval "lt_\$var=\\\\\\"\\\\$ECHO \\"\\\$\$var\\" | \\\$SED \\"\\\$sed_quote_subst\\"\\\\\\\"" ## exclude from
sc_prohibit_nested_quotes
    ;;
    *)
    eval "lt_\$var=\\\\\\"\\\$\$var\\\\\""
;;
    esac
done
```

```
# Double-quote double-evaled strings.
```

```
for var in lt_decl_all_varnames([[ \
```

```
]], lt_decl_dquote_varnames); do
```

;;

```
case \`eval \\\\\$ECHO \\\\""\\\\\$\$var"\\\\"\` in
*[[\\\\\\\`\\\\$]]*)
eval "lt_\$var=\\\\\\"\\\$ECHO \\"\\\$\$var\\" | \\\$SED -e \\"\\\$double_quote_subst\\" -e
\\"\\\$sed_quote_subst\\" -e \\"\\\$delay_variable_subst\\"\\`\\\\\"" ## exclude from sc_prohibit_nested_quotes
;;
*)
eval "lt_\$var=\\\\\\"\\\$\$var\\\\\\""
```

```
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```

```
esac
done
```

_LT_OUTPUT_LIBTOOL_INIT])

```
# LT GENERATED FILE INIT(FILE, [COMMENT])
# ------
# Generate a child script FILE with all initialization necessary to
# reuse the environment learned by the parent script, and make the
# file executable. If COMMENT is supplied, it is inserted after the
# '#!' sequence but before initialization text begins. After this
# macro, additional text can be appended to FILE to form the body of
# the child script. The macro ends with non-zero status if the
# file could not be fully written (such as if the disk is full).
m4_ifdef([AS_INIT_GENERATED],
[m4_defun([_LT_GENERATED_FILE_INIT],[AS_INIT_GENERATED($@)])],
[m4 defun([ LT GENERATED FILE INIT],
[m4_require([AS_PREPARE])]dnl
[m4_pushdef([AS_MESSAGE_LOG_FD])]dnl
[lt write fail=0
cat >$1 <<_ASEOF || lt_write_fail=1
#! $SHELL
# Generated by $as me.
$2
SHELL=\${CONFIG SHELL-$SHELL}
export SHELL
_ASEOF
cat >>$1 <<\_ASEOF || lt_write_fail=1
AS SHELL SANITIZE
_AS_PREPARE
exec AS_MESSAGE_FD>&1
_ASEOF
test 0 = "$lt_write_fail" && chmod +x $1[]dnl
m4_popdef([AS_MESSAGE_LOG_FD])]))# LT_GENERATED_FILE_INIT
```

LT_OUTPUT

-----# This macro allows early generation of the libtool script (before
AC_OUTPUT is called), incase it is used in configure for compilation
tests.
AC_DEFUN([LT_OUTPUT],
[: \${CONFIG_LT=./config.lt}
AC_MSG_NOTICE([creating \$CONFIG_LT])
_LT_GENERATED_FILE_INIT(["\$CONFIG_LT"],
[# Run this file to recreate a libtool stub with the current configuration.])

```
cat >> "\$CONFIG\_LT" << \LTEOF
```

lt_cl_silent=false
exec AS_MESSAGE_LOG_FD>>config.log
{
 echo
 AS_BOX([Running \$as_me.])
} >&AS_MESSAGE_LOG_FD

lt_cl_help="\

'\$as_me' creates a local libtool stub from the current configuration, for use in further configure time tests before the real libtool is generated.

Usage: \$[0] [[OPTIONS]]

-h, --help print this help, then exit
-V, --version print version number, then exit
-q, --quiet do not print progress messages
-d, --debug don't remove temporary files

Report bugs to <bug-libtool@gnu.org>."

 $lt_cl_version="\$

m4_ifset([AC_PACKAGE_NAME], [AC_PACKAGE_NAME])config.lt[]dnl m4_ifset([AC_PACKAGE_VERSION], [AC_PACKAGE_VERSION]) configured by \$[0], generated by m4_PACKAGE_STRING.

Copyright (C) 2011 Free Software Foundation, Inc. This config.lt script is free software; the Free Software Foundation gives unlimited permision to copy, distribute and modify it."

```
while test 0 != $[#]
do
case $[1] in
--version | --v* | -V )
echo "$lt_cl_version"; exit 0 ;;
--help | --h* | -h )
echo "$lt_cl_help"; exit 0 ;;
--debug | --d* | -d )
debug=: ;;
--quiet | --q* | --silent | --s* | -q )
lt_cl_silent=: ;;
```

-*) AC_MSG_ERROR([unrecognized option: \$[1] Try '\$[0] --help' for more information.]) ;;

```
*) AC_MSG_ERROR([unrecognized argument: $[1]
Try '$[0] --help' for more information.]) ;;
esac
```

shift done

if \$lt_cl_silent; then exec AS_MESSAGE_FD>/dev/null fi LTEOF

cat >>"\$CONFIG_LT" <<_LTEOF _LT_OUTPUT_LIBTOOL_COMMANDS_INIT _LTEOF

cat >>"\$CONFIG_LT" <<_LTEOF AC_MSG_NOTICE([creating \$ofile]) _LT_OUTPUT_LIBTOOL_COMMANDS AS_EXIT(0) _LTEOF chmod +x "\$CONFIG_LT"

configure is writing to config.log, but config.lt does its own redirection, # appending to config.log, which fails on DOS, as config.log is still kept # open by configure. Here we exec the FD to /dev/null, effectively closing # config.log, so it can be properly (re)opened and appended to by config.lt. lt_cl_success=: test yes = "\$silent" && lt_config_lt_args="\$lt_config_lt_args --quiet" exec AS_MESSAGE_LOG_FD>/dev/null \$SHELL "\$CONFIG_LT" \$lt_config_lt_args || lt_cl_success=false exec AS_MESSAGE_LOG_FD>>config.log \$lt_cl_success || AS_EXIT(1)])# LT_OUTPUT

#_LT_CONFIG(TAG)

If TAG is the built-in tag, create an initial libtool script with a
default configuration from the untagged config vars. Otherwise add code
to config.status for appending the configuration named by TAG from the
matching tagged config vars.
m4_defun([_LT_CONFIG],
[m4_require([_LT_FILEUTILS_DEFAULTS])dnl
_LT_CONFIG_SAVE_COMMANDS([
m4_define([_LT_TAG], m4_if([\$1], [], [C], [\$1]))dnl
m4_if(_LT_TAG, [C], [
See if we are running on zsh, and set the options that allow our
commands through without removal of \ escapes.
if test -n "\${ZSH_VERSION+set}"; then
setopt NO_GLOB_SUBST

cfgfile=\${ofile}T trap "\$RM \"\$cfgfile\"; exit 1" 1 2 15 \$RM "\$cfgfile"

cat <<_LT_EOF >> "\$cfgfile"
#! \$SHELL
Generated automatically by \$as_me (\$PACKAGE) \$VERSION
NOTE: Changes made to this file will be lost: look at ltmain.sh.

Provide generalized library-building support services.# Written by Gordon Matzigkeit, 1996

_LT_COPYING _LT_LIBTOOL_TAGS

Configured defaults for sys_lib_dlsearch_path munging.
:\\${LT_SYS_LIBRARY_PATH="\$configure_time_lt_sys_library_path"}

BEGIN LIBTOOL CONFIG _LT_LIBTOOL_CONFIG_VARS _LT_LIBTOOL_TAG_VARS # ### END LIBTOOL CONFIG

_LT_EOF

 $cat <<\!\!\!<\!\!LT_EOF' >> "\$cfgfile"$

BEGIN FUNCTIONS SHARED WITH CONFIGURE

_LT_PREPARE_MUNGE_PATH_LIST _LT_PREPARE_CC_BASENAME

END FUNCTIONS SHARED WITH CONFIGURE

_LT_EOF

case \$host_os in aix3*) cat <<_LT_EOF >> "\$cfgfile" # AIX sometimes has problems with the GCC collect2 program. For some # reason, if we set the COLLECT_NAMES environment variable, the problems # vanish in a puff of smoke. if test set != "\${COLLECT_NAMES+set}"; then COLLECT_NAMES= export COLLECT_NAMES fi

fi

_LT_EOF ;; esac

_LT_PROG_LTMAIN

mv -f "\$cfgfile" "\$ofile" ||
 (rm -f "\$ofile" && cp "\$cfgfile" "\$ofile" && rm -f "\$cfgfile")
 chmod +x "\$ofile"
],
[cat << LT EOF >> "\$ofile"

dnl Unfortunately we have to use \$1 here, since _LT_TAG is not expanded dnl in a comment (ie after a #). # ### BEGIN LIBTOOL TAG CONFIG: \$1 _LT_LIBTOOL_TAG_VARS(_LT_TAG) # ### END LIBTOOL TAG CONFIG: \$1 _LT_EOF])dnl /m4_if], [m4_if([\$1], [], [PACKAGE='\$PACKAGE' VERSION='\$VERSION' RM='\$RM' ofile='\$ofile'], [])])dnl /_LT_CONFIG_SAVE_COMMANDS])# _LT_CONFIG

LT_SUPPORTED_TAG(TAG)

Trace this macro to discover what tags are supported by the libtool

-- tag option, using:

autoconf --trace 'LT_SUPPORTED_TAG:\$1'

AC_DEFUN([LT_SUPPORTED_TAG], [])

C support is built-in for now m4_define([_LT_LANG_C_enabled], []) m4_define([_LT_TAGS], []) # LT_LANG(LANG)

Enable libtool support for the given language if not already enabled. AC_DEFUN([LT_LANG], [AC_BEFORE([\$0], [LT_OUTPUT])dnl m4_case([\$1], [C], [_LT_LANG(C)], [C++], [_LT_LANG(CXX)], [Go], [_LT_LANG(GO)], [Java], [_LT_LANG(GO)], [Fortran 77], [_LT_LANG(F77)], [Fortran], [_LT_LANG(F77)], [Fortran], [_LT_LANG(FC)], [Windows Resource], [_LT_LANG(RC)], [m4_ifdef([_LT_LANG_]\$1[_CONFIG], [_LT_LANG(\$1)], [m4_fatal([\$0: unsupported language: "\$1"])])])dnl])# LT LANG

LT_LANG(LANGNAME)

m4_defun([_LT_LANG], [m4_ifdef([_LT_LANG_]\$1[_enabled], [], [LT_SUPPORTED_TAG([\$1])dnl m4_append([_LT_TAGS], [\$1])dnl m4_define([_LT_LANG_]\$1[_enabled], [])dnl _LT_LANG_\$1_CONFIG(\$1)])dnl])#_LT_LANG

m4_ifndef([AC_PROG_GO], [# NOTE: This macro has been submitted for inclusion into # # GNU Autoconf as AC_PROG_GO. When it is available in # # a released version of Autoconf we should remove this # # macro and use it instead. # ***** m4_defun([AC_PROG_GO], [AC_LANG_PUSH(Go)dnl AC_ARG_VAR([GOC], [Go compiler command])dnl AC_ARG_VAR([GOFLAGS], [Go compiler flags])dnl _AC_ARG_VAR_LDFLAGS()dnl AC_CHECK_TOOL(GOC, gccgo) if test -z "\$GOC"; then if test -n "\$ac_tool_prefix"; then AC_CHECK_PROG(GOC, [\${ac_tool_prefix}gccgo], [\${ac_tool_prefix}gccgo]) fi

fi if test -z "\$GOC"; then AC_CHECK_PROG(GOC, gccgo, gccgo, false) fi])#m4_defun])#m4_ifndef

_LT_LANG_DEFAULT_CONFIG # -----m4_defun([_LT_LANG_DEFAULT_CONFIG], [AC_PROVIDE_IFELSE([AC_PROG_CXX], [LT_LANG(CXX)], [m4_define([AC_PROG_CXX], defn([AC_PROG_CXX])[LT_LANG(CXX)])])

AC_PROVIDE_IFELSE([AC_PROG_F77], [LT_LANG(F77)], [m4_define([AC_PROG_F77], defn([AC_PROG_F77])[LT_LANG(F77)])])

AC_PROVIDE_IFELSE([AC_PROG_FC], [LT_LANG(FC)], [m4_define([AC_PROG_FC], defn([AC_PROG_FC])[LT_LANG(FC)])])

dnl The call to [A][M_PROG_GCJ] is quoted like that to stop aclocal dnl pulling things in needlessly. AC_PROVIDE_IFELSE([AC_PROG_GCJ], [LT_LANG(GCJ)], [AC_PROVIDE_IFELSE([A][M_PROG_GCJ], [LT_LANG(GCJ)], [AC_PROVIDE_IFELSE([LT_PROG_GCJ], [LT_LANG(GCJ)], [m4_ifdef([AC_PROG_GCJ], [m4_define([AC_PROG_GCJ], defn([AC_PROG_GCJ])[LT_LANG(GCJ)])]) m4_ifdef([A][M_PROG_GCJ], defn([A][M_PROG_GCJ])[LT_LANG(GCJ)])]) m4_ifdef([LT_PROG_GCJ], defn([LT_PROG_GCJ])[LT_LANG(GCJ)])]) m4_ifdef([LT_PROG_GCJ], defn([LT_PROG_GCJ])[LT_LANG(GCJ)])])

AC_PROVIDE_IFELSE([AC_PROG_GO], [LT_LANG(GO)], [m4_define([AC_PROG_GO], defn([AC_PROG_GO])[LT_LANG(GO)])])

AC_PROVIDE_IFELSE([LT_PROG_RC], [LT_LANG(RC)], [m4_define([LT_PROG_RC], defn([LT_PROG_RC])[LT_LANG(RC)])])])# _LT_LANG_DEFAULT_CONFIG

Obsolete macros:

AU_DEFUN([AC_LIBTOOL_CXX], [LT_LANG(C++)]) AU_DEFUN([AC_LIBTOOL_F77], [LT_LANG(Fortran 77)]) AU_DEFUN([AC_LIBTOOL_FC], [LT_LANG(Fortran)]) AU_DEFUN([AC_LIBTOOL_GCJ], [LT_LANG(Java)]) AU_DEFUN([AC_LIBTOOL_RC], [LT_LANG(Windows Resource)]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([AC_LIBTOOL_CXX], []) dnl AC_DEFUN([AC_LIBTOOL_F77], []) dnl AC_DEFUN([AC_LIBTOOL_F77], []) dnl AC_DEFUN([AC_LIBTOOL_FC], []) dnl AC_DEFUN([AC_LIBTOOL_RC], [])

_LT_TAG_COMPILER
-----m4_defun([_LT_TAG_COMPILER],
[AC_REQUIRE([AC_PROG_CC])dnl

_LT_DECL([LTCC], [CC], [1], [A C compiler])dnl _LT_DECL([LTCFLAGS], [CFLAGS], [1], [LTCC compiler flags])dnl _LT_TAGDECL([CC], [compiler], [1], [A language specific compiler])dnl _LT_TAGDECL([with_gcc], [GCC], [0], [Is the compiler the GNU compiler?])dnl

If no C compiler was specified, use CC. LTCC=\${LTCC-"\$CC"}

If no C compiler flags were specified, use CFLAGS. LTCFLAGS=\${LTCFLAGS-"\$CFLAGS"}

Allow CC to be a program name with arguments. compiler=\$CC])# _LT_TAG_COMPILER

_LT_COMPILER_BOILERPLATE

------# Check for compiler boilerplate output or warnings with # the simple compiler test code. m4_defun([_LT_COMPILER_BOILERPLATE], [m4_require([_LT_DECL_SED])dnl ac_outfile=conftest.\$ac_objext echo "\$lt_simple_compile_test_code" >conftest.\$ac_ext eval "\$ac_compile" 2>&1 >/dev/null | \$SED '/^\$/d; /^ *+/d' >conftest.err _lt_compiler_boilerplate=`cat conftest.err` \$RM conftest*])#_LT_COMPILER_BOILERPLATE

LT LINKER BOILERPLATE

Check for linker boilerplate output or warnings with # the simple link test code. m4_defun([_LT_LINKER_BOILERPLATE], [m4_require([_LT_DECL_SED])dnl ac outfile=conftest.\$ac objext echo "\$lt_simple_link_test_code" >conftest.\$ac_ext eval "\$ac_link" 2>&1 >/dev/null | \$SED '/^\$/d; /^ *+/d' >conftest.err lt linker boilerplate=`cat conftest.err` \$RM -r conftest*])# _LT_LINKER_BOILERPLATE

_LT_REQUIRED_DARWIN_CHECKS

m4_defun_once([_LT_REQUIRED_DARWIN_CHECKS],[case \$host_os in rhapsody* | darwin*) AC_CHECK_TOOL([DSYMUTIL], [dsymutil], [:]) AC_CHECK_TOOL([NMEDIT], [nmedit], [:]) AC CHECK TOOL([LIPO], [lipo], [:]) AC_CHECK_TOOL([OTOOL], [otool], [:]) AC_CHECK_TOOL([OTOOL64], [otool64], [:]) _LT_DECL([], [DSYMUTIL], [1], [Tool to manipulate archived DWARF debug symbol files on Mac OS X]) LT DECL([], [NMEDIT], [1], [Tool to change global to local symbols on Mac OS X]) _LT_DECL([], [LIPO], [1], [Tool to manipulate fat objects and archives on Mac OS X]) _LT_DECL([], [OTOOL], [1], [ldd/readelf like tool for Mach-O binaries on Mac OS X]) _LT_DECL([], [OTOOL64], [1],

[ldd/readelf like tool for 64 bit Mach-O binaries on Mac OS X 10.4])

AC_CACHE_CHECK([for -single_module linker flag],[lt_cv_apple_cc_single_mod], [lt_cv_apple_cc_single_mod=no if test -z "\$LT_MULTI_MODULE"; then # By default we will add the -single_module flag. You can override # by either setting the environment variable LT_MULTI_MODULE # non-empty at configure time, or by adding -multi_module to the # link flags. rm -rf libconftest.dylib* echo "int foo(void){return 1;}" > conftest.c echo "\$LTCC \$LTCFLAGS \$LDFLAGS -o libconftest.dylib \ -dynamiclib -Wl,-single_module conftest.c" >&AS_MESSAGE_LOG_FD \$LTCC \$LTCFLAGS \$LDFLAGS -o libconftest.dylib \ -dynamiclib -Wl,-single_module conftest.c 2>conftest.err _lt_result=\$?

```
# If there is a non-empty error log, and "single_module"
# appears in it, assume the flag caused a linker warning
    if test -s conftest.err && $GREP single_module conftest.err; then
 cat conftest.err >&AS_MESSAGE_LOG_FD
# Otherwise, if the output was created with a 0 exit code from
# the compiler, it worked.
elif test -f libconftest.dylib && test 0 = " lt result"; then
 lt_cv_apple_cc_single_mod=yes
else
 cat conftest.err >&AS MESSAGE LOG FD
fi
rm -rf libconftest.dylib*
rm -f conftest.*
  fi])
 AC_CACHE_CHECK([for -exported_symbols_list linker flag],
  [lt_cv_ld_exported_symbols_list],
  [lt cv ld exported symbols list=no
  save LDFLAGS=$LDFLAGS
  echo "_main" > conftest.sym
  LDFLAGS="$LDFLAGS -Wl,-exported symbols list,conftest.sym"
  AC_LINK_IFELSE([AC_LANG_PROGRAM([],[])],
[lt_cv_ld_exported_symbols_list=yes],
[lt cv ld exported symbols list=no])
LDFLAGS=$save_LDFLAGS
 1)
 AC_CACHE_CHECK([for -force_load linker flag],[lt_cv_ld_force_load],
  [lt cv ld force load=no
  cat > conftest.c << LT EOF
int forced_loaded() { return 2;}
LT EOF
  echo "$LTCC $LTCFLAGS -c -o conftest.o conftest.c" >&AS MESSAGE LOG FD
  $LTCC $LTCFLAGS -c -o conftest.o conftest.c 2>&AS MESSAGE LOG FD
  echo "$AR cru libconftest.a conftest.o" >&AS_MESSAGE_LOG_FD
  $AR cru libconftest.a conftest.o 2>&AS MESSAGE LOG FD
  echo "$RANLIB libconftest.a" >&AS_MESSAGE_LOG_FD
  $RANLIB libconftest.a 2>&AS_MESSAGE_LOG_FD
  cat > conftest.c << LT EOF
int main() { return 0;}
```

_LT_EOF

echo "\$LTCC \$LTCFLAGS \$LDFLAGS -o conftest conftest.c -Wl,-force_load,./libconftest.a" >&AS_MESSAGE_LOG_FD

\$LTCC \$LTCFLAGS \$LDFLAGS -o conftest conftest.c -Wl,-force_load,./libconftest.a 2>conftest.err _lt_result=\$?

if test -s conftest.err && \$GREP force_load conftest.err; then

```
cat conftest.err >&AS_MESSAGE_LOG_FD
```

elif test -f conftest && test 0 = "\$_lt_result" && \$GREP forced_load conftest >/dev/null 2>&1; then

```
lt_cv_ld_force_load=yes
  else
cat conftest.err >&AS_MESSAGE_LOG_FD
  fi
   rm -f conftest.err libconftest.a conftest conftest.c
   rm -rf conftest.dSYM
 1)
 case $host os in
 rhapsody* | darwin1.[[012]])
  It dar allow undefined='$wl-undefined ${wl}suppress';;
 darwin1.*)
  _lt_dar_allow_undefined='$wl-flat_namespace $wl-undefined ${wl}suppress' ;;
 darwin*) # darwin 5.x on
  # if running on 10.5 or later, the deployment target defaults
  # to the OS version, if on x86, and 10.4, the deployment
  # target defaults to 10.4. Don't you love it?
  case ${MACOSX_DEPLOYMENT_TARGET-10.0},$host in
10.0,*86*-darwin8*|10.0,*-darwin[[91]]*)
 _lt_dar_allow_undefined='$wl-undefined ${wl}dynamic_lookup';;
10.[[012]][[,.]]*)
 _lt_dar_allow_undefined='$wl-flat_namespace $wl-undefined ${wl}suppress' ;;
10.*)
 _lt_dar_allow_undefined='$wl-undefined ${wl}dynamic_lookup';;
  esac
 ;;
esac
 if test yes = "$lt_cv_apple_cc_single_mod"; then
  _lt_dar_single_mod='$single_module'
 fi
 if test yes = "$lt_cv_ld_exported_symbols_list"; then
  _lt_dar_export_syms=' $wl-exported_symbols_list,$output_objdir/$libname-symbols.expsym'
 else
  _lt_dar_export_syms='~$NMEDIT -s $output_objdir/$libname-symbols.expsym $lib'
 fi
 if test : != "$DSYMUTIL" && test no = "$lt_cv_ld_force_load"; then
  _lt_dsymutil='~$DSYMUTIL $lib || :'
 else
  _lt_dsymutil=
 fi
 ;;
esac
1)
```

_LT_DARWIN_LINKER_FEATURES([TAG])

Checks for linker and compiler features on darwin m4_defun([_LT_DARWIN_LINKER_FEATURES],

[

m4_require([_LT_REQUIRED_DARWIN_CHECKS])

_LT_TAGVAR(archive_cmds_need_lc, \$1)=no

_LT_TAGVAR(hardcode_direct, \$1)=no

_LT_TAGVAR(hardcode_automatic, \$1)=yes

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=unsupported

if test yes = "\$lt_cv_ld_force_load"; then

_LT_TAGVAR(whole_archive_flag_spec, \$1)=`for conv in \$convenience\"\"; do test -n \"\$conv\" &&

new_convenience=\"\$new_convenience \$wl-force_load,\$conv\"; done; func_echo_all \"\$new_convenience\"`'
m4 case([\$1], [F77], [LT TAGVAR(compiler needs object, \$1)=yes],

[FC], [_LT_TAGVAR(compiler_needs_object, \$1)=yes])

else

_LT_TAGVAR(whole_archive_flag_spec, \$1)="

fi

_LT_TAGVAR(link_all_deplibs, \$1)=yes

_LT_TAGVAR(allow_undefined_flag, \$1)=\$_lt_dar_allow_undefined

case \$cc_basename in

ifort*|nagfor*) _lt_dar_can_shared=yes ;;

*) _lt_dar_can_shared=\$GCC ;;

esac

if test yes = "\$_lt_dar_can_shared"; then

output_verbose_link_cmd=func_echo_all

_LT_TAGVAR(archive_cmds, \$1)="\\$CC -dynamiclib \\$allow_undefined_flag -o \\$lib \\$libobjs \\$deplibs \\$compiler_flags -install_name \\$rpath/\\$soname \\$verstring \$_lt_dar_single_mod\$_lt_dsymutil"

_LT_TAGVAR(module_cmds, \$1)="\\$CC \\$allow_undefined_flag -o \\$lib -bundle \\$libobjs \\$deplibs \\$compiler_flags\$_lt_dsymutil"

 $LT_TAGVAR(archive_expsym_cmds, $1)="sed 's|^||' < \\symbols.expsym~\\SCC -dynamiclib \\sallow_undefined_flag -o \\$lib \\$libobjs \\$deplibs \\scompiler_flags - install name \\symbols.expsym~\\It dar single mod that are export syms to the symbols.expsym and the sym and the$

 $\label{eq:libration} LT_TAGVAR(module_expsym_cmds, $1)="sed -e 's|^|_|' < \scale="block">\scale="block" symbols="block" symb$

m4_if([\$1], [CXX],

[if test yes != "\$lt_cv_apple_cc_single_mod"; then

_LT_TAGVAR(archive_cmds, \$1)="\\$CC -r -keep_private_externs -nostdlib -o \\$lib-master.o \\$libobjs~\\$CC dynamiclib \\$allow_undefined_flag -o \\$lib \\$lib-master.o \\$deplibs \\$compiler_flags -install_name \\$rpath/\\$soname \\$verstring\$_lt_dsymutil"

 $\label{eq:limit} $$ LT_TAGVAR(archive_expsym_cmds, $1)="sed 's|^|_|' < \score symbols > \$

fi],[]) else _LT_TAGVAR(ld_shlibs, \$1)=no fi])

```
# LT_SYS_MODULE_PATH_AIX([TAGNAME])
```

```
# ------
# Links a minimal program and checks the executable
# for the system default hardcoded library path. In most cases,
# this is /usr/lib:/lib, but when the MPI compilers are used
# the location of the communication and MPI libs are included too.
# If we don't find anything, use the default library path according
# to the aix ld manual.
# Store the results from the different compilers for each TAGNAME.
# Allow to override them for all tags through lt cv aix libpath.
m4_defun([_LT_SYS_MODULE_PATH_AIX],
[m4_require([_LT_DECL_SED])dnl
if test set = "${lt cv aix libpath+set}"; then
aix_libpath=$lt_cv_aix_libpath
else
AC_CACHE_VAL([_LT_TAGVAR([lt_cv_aix_libpath_], [$1])],
[AC_LINK_IFELSE([AC_LANG_PROGRAM],[
It aix libpath sed='[
  /Import File Strings/,/^$/ {
 /^0/ {
   s/^0 *\([^]*\) *$/\1/
   р
  }
  }]'
_LT_TAGVAR([lt_cv_aix_libpath_], [$1])=`dump -H conftest$ac_exeext 2>/dev/null | $SED -n -e
"$lt aix libpath sed"`
# Check for a 64-bit object if we didn't find anything.
if test -z "$_LT_TAGVAR([lt_cv_aix_libpath_], [$1])"; then
 _LT_TAGVAR([lt_cv_aix_libpath_], [$1])=`dump -HX64 conftest$ac_exeext 2>/dev/null | $SED -n -e
"$lt_aix_libpath_sed"`
fi],[])
if test -z "$_LT_TAGVAR([lt_cv_aix_libpath_], [$1])"; then
 _LT_TAGVAR([lt_cv_aix_libpath_], [$1])=/usr/lib:/lib
fi
1)
aix_libpath=$_LT_TAGVAR([lt_cv_aix_libpath_], [$1])
fi
])# _LT_SYS_MODULE_PATH_AIX
# LT_SHELL_INIT(ARG)
# ------
```

m4_define([_LT_SHELL_INIT], [m4_divert_text([M4SH-INIT], [\$1])])# _LT_SHELL_INIT

_LT_PROG_ECHO_BACKSLASH

```
# -----
```

Find how we can fake an echo command that does not interpret backslash.

In particular, with Autoconf 2.60 or later we add some code to the start

of the generated configure script that will find a shell with a builtin

printf (that we can use as an echo command).

m4_defun([_LT_PROG_ECHO_BACKSLASH],

ECHO=\$ECHO\$ECHO\$ECHO\$ECHO

```
ECHO=$ECHO$ECHO$ECHO$ECHO$ECHO
```

```
AC_MSG_CHECKING([how to print strings])
# Test print first, because it will be a builtin if present.
if test "X`( print -r -- -n ) 2>/dev/null`" = X-n && \
 test "X`print -r -- $ECHO 2>/dev/null`" = "X$ECHO"; then
ECHO='print -r --'
elif test "X`printf %s $ECHO 2>/dev/null`" = "X$ECHO"; then
ECHO='printf %s\n'
else
# Use this function as a fallback that always works.
func fallback echo ()
{
 eval 'cat <<_LTECHO_EOF
$[]1
_LTECHO_EOF
}
ECHO='func fallback echo'
fi
# func_echo_all arg...
# Invoke $ECHO with all args, space-separated.
func_echo_all ()
{
 $ECHO "$*"
}
case $ECHO in
printf*) AC_MSG_RESULT([printf]) ;;
```

print*) AC_MSG_RESULT([print -r]) ;;
*) AC_MSG_RESULT([cat]) ;;

```
esac
```

PATH=/empty FPATH=/empty; export PATH FPATH test "X`printf %s \$ECHO`" = "X\$ECHO" \ || test "X`print -r -- \$ECHO`" = "X\$ECHO")])])

_LT_DECL([], [SHELL], [1], [Shell to use when invoking shell scripts]) _LT_DECL([], [ECHO], [1], [An echo program that protects backslashes])])# _LT_PROG_ECHO_BACKSLASH

```
# _LT_WITH_SYSROOT
# ------
AC_DEFUN([_LT_WITH_SYSROOT],
[AC_MSG_CHECKING([for sysroot])
AC_ARG_WITH([sysroot],
[AS_HELP_STRING([--with-sysroot@<:@=DIR@:>@],
[Search for dependent libraries within DIR (or the compiler's sysroot
if not specified).])],
[], [with_sysroot=no])
```

dnl lt_sysroot will always be passed unquoted. We quote it here dnl in case the user passed a directory name.

```
lt_sysroot=
case $with_sysroot in #(
yes)
 if test yes = "$GCC"; then
  lt_sysroot=`$CC --print-sysroot 2>/dev/null`
 fi
 ;; #(
/*)
 lt_sysroot=`echo "$with_sysroot" | sed -e "$sed_quote_subst"`
 ;; #(
no|")
 ;; #(
*)
 AC_MSG_RESULT([$with_sysroot])
 AC_MSG_ERROR([The sysroot must be an absolute path.])
 ;;
esac
```

AC_MSG_RESULT([\${lt_sysroot:-no}]) _LT_DECL([], [lt_sysroot], [0], [The root where to search for]dnl [dependent libraries, and where our libraries should be installed.])])

_LT_ENABLE_LOCK
-----m4_defun([_LT_ENABLE_LOCK],
[AC_ARG_ENABLE([libtool-lock],
[AS_HELP_STRING([--disable-libtool-lock],

```
[avoid locking (might break parallel builds)])])
test no = "$enable_libtool_lock" || enable_libtool_lock=yes
# Some flags need to be propagated to the compiler or linker for good
# libtool support.
case $host in
ia64-*-hpux*)
# Find out what ABI is being produced by ac_compile, and set mode
# options accordingly.
echo 'int i;' > conftest.$ac_ext
if AC_TRY_EVAL(ac_compile); then
 case `/usr/bin/file conftest.$ac_objext` in
   *ELF-32*)
HPUX_IA64_MODE=32
;;
   *ELF-64*)
HPUX_IA64_MODE=64
;;
 esac
fi
rm -rf conftest*
;;
*-*-irix6*)
# Find out what ABI is being produced by ac_compile, and set linker
# options accordingly.
echo '[#]line '$LINENO' "configure"' > conftest.$ac_ext
if AC_TRY_EVAL(ac_compile); then
 if test yes = "$lt_cv_prog_gnu_ld"; then
  case `/usr/bin/file conftest.$ac_objext` in
*32-bit*)
 LD="${LD-ld} -melf32bsmip"
 ;;
*N32*)
 LD="${LD-ld} -melf32bmipn32"
 ;;
*64-bit*)
 LD="${LD-ld} -melf64bmip"
;;
   esac
 else
  case `/usr/bin/file conftest.$ac_objext` in
*32-bit*)
 LD="${LD-ld} -32"
 ;;
*N32*)
 LD="${LD-ld} -n32"
 ;;
*64-bit*)
```

```
LD="${LD-ld} -64"
 ;;
  esac
 fi
fi
rm -rf conftest*
::
mips64*-*linux*)
# Find out what ABI is being produced by ac_compile, and set linker
# options accordingly.
echo '[#]line '$LINENO' "configure"' > conftest.$ac_ext
if AC_TRY_EVAL(ac_compile); then
 emul=elf
 case `/usr/bin/file conftest.$ac_objext` in
  *32-bit*)
emul="${emul}32"
;;
  *64-bit*)
emul="${emul}64"
;;
 esac
 case `/usr/bin/file conftest.$ac_objext` in
  *MSB*)
emul="${emul}btsmip"
;;
  *LSB*)
emul="${emul}ltsmip"
;;
 esac
 case `/usr/bin/file conftest.$ac_objext` in
  *N32*)
emul="${emul}n32"
;;
 esac
 LD="${LD-ld} -m $emul"
fi
rm -rf conftest*
;;
x86_64-*kfreebsd*-gnu|x86_64-*linux*|powerpc*-*linux*|
s390*-*linux*|s390*-*tpf*|sparc*-*linux*)
# Find out what ABI is being produced by ac_compile, and set linker
# options accordingly. Note that the listed cases only cover the
# situations where additional linker options are needed (such as when
# doing 32-bit compilation for a host where ld defaults to 64-bit, or
# vice versa); the common cases where no linker options are needed do
# not appear in the list.
```

```
echo 'int i;' > conftest.$ac_ext
if AC_TRY_EVAL(ac_compile); then
 case `/usr/bin/file conftest.o` in
  *32-bit*)
case $host in
 x86_64-*kfreebsd*-gnu)
 LD="${LD-ld} -m elf i386 fbsd"
  ;;
 x86_64-*linux*)
 case `/usr/bin/file conftest.o` in
   *x86-64*)
LD="${LD-ld} -m elf32_x86_64"
;;
   *)
LD="${LD-ld} -m elf_i386"
;;
  esac
  ;;
 powerpc64le-*linux*)
 LD="${LD-ld} -m elf32lppclinux"
  ;;
 powerpc64-*linux*)
 LD="${LD-ld} -m elf32ppclinux"
  ;;
 s390x-*linux*)
 LD="${LD-ld} -m elf_s390"
  ;;
 sparc64-*linux*)
 LD="${LD-ld} -m elf32_sparc"
  ;;
esac
;;
  *64-bit*)
case $host in
 x86_64-*kfreebsd*-gnu)
 LD="${LD-ld} -m elf_x86_64_fbsd"
  ;;
 x86_64-*linux*)
 LD="${LD-ld} -m elf_x86_64"
  ;;
 powerpcle-*linux*)
 LD="${LD-ld} -m elf64lppc"
  ;;
 powerpc-*linux*)
 LD="${LD-ld} -m elf64ppc"
  ;;
 s390*-*linux*|s390*-*tpf*)
 LD="${LD-ld} -m elf64_s390"
```

```
;;
 sparc*-*linux*)
  LD="${LD-ld} -m elf64_sparc"
  ;;
esac
;;
 esac
fi
rm -rf conftest*
;;
*-*-sco3.2v5*)
# On SCO OpenServer 5, we need -belf to get full-featured binaries.
SAVE_CFLAGS=$CFLAGS
CFLAGS="$CFLAGS -belf"
AC_CACHE_CHECK([whether the C compiler needs -belf], lt_cv_cc_needs_belf,
 [AC_LANG_PUSH(C)
 AC_LINK_IFELSE([AC_LANG_PROGRAM([[]],[[]]))],[lt_cv_cc_needs_belf=yes],[lt_cv_cc_needs_belf=no])
  AC_LANG_POP])
if test yes != "$lt_cv_cc_needs_belf"; then
 # this is probably gcc 2.8.0, egcs 1.0 or newer; no need for -belf
 CFLAGS=$SAVE_CFLAGS
fi
;;
*-*solaris*)
# Find out what ABI is being produced by ac_compile, and set linker
# options accordingly.
echo 'int i;' > conftest.$ac_ext
if AC_TRY_EVAL(ac_compile); then
 case `/usr/bin/file conftest.o` in
 *64-bit*)
  case $lt_cv_prog_gnu_ld in
  yes*)
   case $host in
   i?86-*-solaris*|x86_64-*-solaris*)
    LD="\{LD-ld\} -m elf_x 86_64"
    ;;
   sparc*-*-solaris*)
    LD="${LD-ld} -m elf64_sparc"
    ;;
   esac
   # GNU ld 2.21 introduced _sol2 emulations. Use them if available.
   if ${LD-ld} -V | grep _sol2 >/dev/null 2>&1; then
    LD=${LD-ld}_sol2
   fi
   ;;
  *)
if ${LD-ld} -64 -r -o conftest2.o conftest.o >/dev/null 2>&1; then
```

```
LD="${LD-ld} -64"
fi
;;
  esac
  ;;
 esac
fi
rm -rf conftest*
;;
esac
need_locks=$enable_libtool_lock
])# _LT_ENABLE_LOCK
# LT PROG AR
# -----
m4 defun([ LT PROG AR],
[AC_CHECK_TOOLS(AR, [ar], false)
: ${AR=ar}
: ${AR_FLAGS=cru}
_LT_DECL([], [AR], [1], [The archiver])
_LT_DECL([], [AR_FLAGS], [1], [Flags to create an archive])
AC_CACHE_CHECK([for archiver @FILE support], [lt_cv_ar_at_file],
[lt_cv_ar_at_file=no
 AC_COMPILE_IFELSE([AC_LANG_PROGRAM],
  [echo conftest.$ac_objext > conftest.lst
  lt_ar_try='$AR $AR_FLAGS libconftest.a @conftest.lst >&AS_MESSAGE_LOG_FD'
   AC_TRY_EVAL([lt_ar_try])
   if test 0 -eq "$ac_status"; then
# Ensure the archiver fails upon bogus file names.
rm -f conftest.$ac_objext libconftest.a
AC_TRY_EVAL([lt_ar_try])
if test 0 -ne "$ac_status"; then
     lt_cv_ar_at_file=@
    fi
   fi
  rm -f conftest.* libconftest.a
  1)
1)
if test no = "$lt_cv_ar_at_file"; then
```

```
if test h0 = _$h_cv_at_at_me ; men
archiver_list_spec=
else
archiver_list_spec=$lt_cv_ar_at_file
fi
_LT_DECL([], [archiver_list_spec], [1],
```

[How to feed a file listing to the archiver])])#_LT_PROG_AR

```
# _LT_CMD_OLD_ARCHIVE
# -----
m4_defun([_LT_CMD_OLD_ARCHIVE],
[_LT_PROG_AR
AC_CHECK_TOOL(STRIP, strip, :)
test -z "$STRIP" && STRIP=:
_LT_DECL([], [STRIP], [1], [A symbol stripping program])
AC_CHECK_TOOL(RANLIB, ranlib, :)
test -z "$RANLIB" && RANLIB=:
_LT_DECL([], [RANLIB], [1],
 [Commands used to install an old-style archive])
# Determine commands to create old-style static archives.
old_archive_cmds='$AR $AR_FLAGS $oldlib$oldobjs'
old postinstall cmds='chmod 644 $oldlib'
old_postuninstall_cmds=
if test -n "$RANLIB"; then
case $host_os in
bitrig* | openbsd*)
 old_postinstall_cmds="$old_postinstall_cmds~\$RANLIB -t \$tool_oldlib"
 ;;
*)
 old_postinstall_cmds="$old_postinstall_cmds~\$RANLIB \$tool_oldlib"
 ;;
esac
old_archive_cmds="$old_archive_cmds~\$RANLIB \$tool_oldlib"
fi
case $host os in
darwin*)
 lock_old_archive_extraction=yes ;;
*)
 lock_old_archive_extraction=no ;;
esac
_LT_DECL([], [old_postinstall_cmds], [2])
_LT_DECL([], [old_postuninstall_cmds], [2])
_LT_TAGDECL([], [old_archive_cmds], [2],
 [Commands used to build an old-style archive])
_LT_DECL([], [lock_old_archive_extraction], [0],
 [Whether to use a lock for old archive extraction])
])#_LT_CMD_OLD_ARCHIVE
```

_LT_COMPILER_OPTION(MESSAGE, VARIABLE-NAME, FLAGS,

```
# [OUTPUT-FILE], [ACTION-SUCCESS], [ACTION-FAILURE])
```

Check whether the given compiler option works AC DEFUN([LT COMPILER OPTION], [m4_require([_LT_FILEUTILS_DEFAULTS])dnl m4_require([_LT_DECL_SED])dnl AC CACHE CHECK([\$1], [\$2], [\$2=no m4_if([\$4], , [ac_outfile=conftest.\$ac_objext], [ac_outfile=\$4]) echo "\$lt simple compile test code" > conftest.\$ac ext lt_compiler_flag="\$3" ## exclude from sc_useless_quotes_in_assignment # Insert the option either (1) after the last *FLAGS variable, or # (2) before a word containing "conftest.", or (3) at the end. # Note that \$ac_compile itself does not contain backslashes and begins # with a dollar sign (not a hyphen), so the echo should work correctly. # The option is referenced via a variable to avoid confusing sed. lt_compile=`echo "\$ac_compile" | \$SED \ -e 's:.*FLAGS}\ $\{0,1\}$:&\$lt compiler flag :; t' \ -e 's: [[^]]*conftest\.: \$lt_compiler_flag&:; t' \ -e 's:\$: \$lt_compiler_flag:'` (eval echo "\"\\$as_me:\$LINENO: \$lt_compile\"" >&AS_MESSAGE_LOG_FD) (eval "\$lt_compile" 2>conftest.err) ac_status=\$? cat conftest.err >&AS MESSAGE LOG FD echo "\$as_me:\$LINENO: \\$? = \$ac_status" >&AS_MESSAGE_LOG_FD if (exit \$ac status) && test -s "\$ac outfile"; then # The compiler can only warn and ignore the option if not recognized # So say no if there are warnings other than the usual output. \$ECHO "\$ It compiler boilerplate" | \$SED '/^\$/d' >conftest.exp \$SED '/^\$/d; /^ *+/d' conftest.err >conftest.er2 if test ! -s conftest.er2 || diff conftest.exp conftest.er2 >/dev/null; then \$2=yes fi fi \$RM conftest* 1) if test yes = "[\$] 2"; then m4_if([\$5], , :, [\$5]) else m4_if([\$6], , :, [\$6]) fi])# LT_COMPILER_OPTION # Old name:

AU_ALIAS([AC_LIBTOOL_COMPILER_OPTION], [_LT_COMPILER_OPTION]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([AC_LIBTOOL_COMPILER_OPTION], [])

_LT_LINKER_OPTION(MESSAGE, VARIABLE-NAME, FLAGS, [ACTION-SUCCESS], [ACTION-FAILURE]) # # -----# Check whether the given linker option works AC DEFUN([LT LINKER OPTION], [m4_require([_LT_FILEUTILS_DEFAULTS])dnl m4_require([_LT_DECL_SED])dnl AC_CACHE_CHECK([\$1], [\$2], [\$2=no save_LDFLAGS=\$LDFLAGS LDFLAGS="\$LDFLAGS \$3" echo "\$lt_simple_link_test_code" > conftest.\$ac_ext if (eval \$ac link 2>conftest.err) && test -s conftest\$ac exeext; then # The linker can only warn and ignore the option if not recognized # So say no if there are warnings if test -s conftest.err; then # Append any errors to the config.log. cat conftest.err 1>&AS_MESSAGE_LOG_FD \$ECHO "\$ It linker boilerplate" | \$SED '/^\$/d' > conftest.exp \$SED '/^\$/d; /^ *+/d' conftest.err >conftest.er2 if diff conftest.exp conftest.er2 >/dev/null; then \$2=yes fi else \$2=yes fi fi \$RM -r conftest* LDFLAGS=\$save LDFLAGS 1) if test yes = "[\$]\$2"; then m4_if([\$4], , :, [\$4]) else m4_if([\$5], , :, [\$5]) fi])# _LT_LINKER_OPTION # Old name: AU_ALIAS([AC_LIBTOOL_LINKER_OPTION], [_LT_LINKER_OPTION]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([AC_LIBTOOL_LINKER_OPTION], [])

LT_CMD_MAX_LEN

#-----

AC_DEFUN([LT_CMD_MAX_LEN], [AC_REQUIRE([AC_CANONICAL_HOST])dnl # find the maximum length of command line arguments AC_MSG_CHECKING([the maximum length of command line arguments]) AC_CACHE_VAL([lt_cv_sys_max_cmd_len], [dnl i=0 teststring=ABCD

case \$build_os in

msdosdjgpp*)

On DJGPP, this test can blow up pretty badly due to problems in libc

(any single argument exceeding 2000 bytes causes a buffer overrun

during glob expansion). Even if it were fixed, the result of this

check would be larger than it should be.

lt_cv_sys_max_cmd_len=12288; # 12K is about right
;;

gnu*)

Under GNU Hurd, this test is not required because there is # no limit to the length of command line arguments. # Libtool will interpret -1 as no limit whatsoever lt_cv_sys_max_cmd_len=-1; ;;

```
cygwin* | mingw* | cegcc*)
```

On Win9x/ME, this test blows up -- it succeeds, but takes # about 5 minutes as the teststring grows exponentially. # Worse, since 9x/ME are not pre-emptively multitasking, # you end up with a "frozen" computer, even though with patience # the test eventually succeeds (with a max line length of 256k). # Instead, let's just punt: use the minimum linelength reported by # all of the supported platforms: 8192 (on NT/2K/XP). lt_cv_sys_max_cmd_len=8192; ;;

mint*)

On MiNT this can take a long time and run out of memory.
lt_cv_sys_max_cmd_len=8192;
;;

amigaos*)

On AmigaOS with pdksh, this test takes hours, literally. # So we just punt and use a minimum line length of 8192. lt_cv_sys_max_cmd_len=8192; ;;

```
bitrig* | darwin* | dragonfly* | freebsd* | netbsd* | openbsd*)
 # This has been around since 386BSD, at least. Likely further.
 if test -x /sbin/sysctl; then
  lt_cv_sys_max_cmd_len=`/sbin/sysctl -n kern.argmax`
 elif test -x /usr/sbin/sysctl; then
  lt cv sys max cmd len=`/usr/sbin/sysctl -n kern.argmax`
 else
  lt_cv_sys_max_cmd_len=65536 # usable default for all BSDs
 fi
 # And add a safety zone
 lt_cv_sys_max_cmd_len=`expr $lt_cv_sys_max_cmd_len \/ 4`
 lt_cv_sys_max_cmd_len=`expr $lt_cv_sys_max_cmd_len \* 3`
 ;;
interix*)
 # We know the value 262144 and hardcode it with a safety zone (like BSD)
 lt cv sys max cmd len=196608
 ;;
os2*)
 # The test takes a long time on OS/2.
lt_cv_sys_max_cmd_len=8192
 ;;
osf*)
 # Dr. Hans Ekkehard Plesser reports seeing a kernel panic running configure
 # due to this test when exec_disable_arg_limit is 1 on Tru64. It is not
 # nice to cause kernel panics so lets avoid the loop below.
 # First set a reasonable default.
 lt_cv_sys_max_cmd_len=16384
 #
 if test -x /sbin/sysconfig; then
 case `/sbin/sysconfig -q proc exec_disable_arg_limit` in
   *1*) lt_cv_sys_max_cmd_len=-1 ;;
  esac
 fi
 ::
sco3.2v5*)
 lt_cv_sys_max_cmd_len=102400
 ;;
sysv5* | sco5v6* | sysv4.2uw2*)
 kargmax=`grep ARG_MAX /etc/conf/cf.d/stune 2>/dev/null`
 if test -n "$kargmax"; then
  lt_cv_sys_max_cmd_len=`echo $kargmax | sed 's/.*[[ ]]//`
 else
  lt_cv_sys_max_cmd_len=32768
 fi
```

```
;;
*)
 lt_cv_sys_max_cmd_len=`(getconf ARG_MAX) 2>/dev/null`
 if test -n "$lt_cv_sys_max_cmd_len" && \
   test undefined != "$lt_cv_sys_max_cmd_len"; then
  lt_cv_sys_max_cmd_len=`expr $lt_cv_sys_max_cmd_len \/ 4`
  lt_cv_sys_max_cmd_len=`expr $lt_cv_sys_max_cmd_len \* 3`
 else
  # Make teststring a little bigger before we do anything with it.
  # a 1K string should be a reasonable start.
  for i in 1 2 3 4 5 6 7 8; do
    teststring=$teststring$teststring
  done
  SHELL=${SHELL-${CONFIG_SHELL-/bin/sh}}
  # If test is not a shell built-in, we'll probably end up computing a
  # maximum length that is only half of the actual maximum length, but
  # we can't tell.
  while { test X`env echo "$teststring$teststring" 2>/dev/null` \
     = "X$teststring$teststring"; } >/dev/null 2>&1 &&
    test 17 != "$i" # 1/2 MB should be enough
  do
    i=\exp \$i + 1
    teststring=$teststring$teststring
  done
  # Only check the string length outside the loop.
  lt_cv_sys_max_cmd_len=`expr "X$teststring" : ".*" 2>&1`
  teststring=
  # Add a significant safety factor because C++ compilers can tack on
  # massive amounts of additional arguments before passing them to the
  # linker. It appears as though 1/2 is a usable value.
  lt_cv_sys_max_cmd_len=`expr $lt_cv_sys_max_cmd_len \/ 2`
 fi
 ;;
esac
1)
if test -n "$lt_cv_sys_max_cmd_len"; then
AC_MSG_RESULT($lt_cv_sys_max_cmd_len)
else
AC_MSG_RESULT(none)
fi
max_cmd_len=$lt_cv_sys_max_cmd_len
_LT_DECL([], [max_cmd_len], [0],
 [What is the maximum length of a command?])
])# LT_CMD_MAX_LEN
# Old name:
AU_ALIAS([AC_LIBTOOL_SYS_MAX_CMD_LEN], [LT_CMD_MAX_LEN])
```

```
dnl aclocal-1.4 backwards compatibility:
```

dnl AC_DEFUN([AC_LIBTOOL_SYS_MAX_CMD_LEN], [])

_LT_HEADER_DLFCN

m4_defun([_LT_HEADER_DLFCN], [AC_CHECK_HEADERS([dlfcn.h], [], [], [AC_INCLUDES_DEFAULT])dnl])# _LT_HEADER_DLFCN

 $\label{eq:logical_self} \ensuremath{\texttt{\#_LT_TRY_DLOPEN_SELF}}\xspace (ACTION-IF-TRUE, ACTION-IF-TRUE-W-USCORE,$

ACTION-IF-FALSE, ACTION-IF-CROSS-COMPILING)

-----m4_defun([_LT_TRY_DLOPEN_SELF],
[m4_require([_LT_HEADER_DLFCN])dnl
if test yes = "\$cross_compiling"; then :
[\$4]
else
lt_dlunknown=0; lt_dlno_uscore=1; lt_dlneed_uscore=2
lt_status=\$lt_dlunknown
cat > conftest.\$ac_ext <<_LT_EOF
[#line \$LINENO "configure"
#include "confdefs.h"</pre>

#if HAVE_DLFCN_H

#include <dlfcn.h>
#endif

#include <stdio.h>

#ifdef RTLD_GLOBAL
define LT_DLGLOBAL RTLD_GLOBAL
#else
ifdef DL_GLOBAL
define LT_DLGLOBAL DL_GLOBAL
else
define LT_DLGLOBAL 0
endif
#endif

/* We may have to define LT_DLLAZY_OR_NOW in the command line if we
find out it does not work in some platform. */
#ifndef LT_DLLAZY_OR_NOW
ifdef RTLD_LAZY
define LT_DLLAZY_OR_NOW RTLD_LAZY
else
ifdef DL_LAZY
define LT_DLLAZY_OR_NOW DL_LAZY

```
#
   else
#
    ifdef RTLD NOW
     define LT_DLLAZY_OR_NOW RTLD_NOW
#
#
    else
     ifdef DL NOW
#
#
       define LT_DLLAZY_OR_NOW DL_NOW
#
     else
#
       define LT_DLLAZY_OR_NOW 0
#
     endif
#
    endif
   endif
#
# endif
#endif
/* When -fvisibility=hidden is used, assume the code has been annotated
 correspondingly for the symbols needed. */
#if defined __GNUC__ && (((__GNUC__ == 3) && (__GNUC__MINOR__ >= 3)) \parallel (__GNUC__ > 3))
int fnord () __attribute__((visibility("default")));
#endif
int fnord () { return 42; }
int main ()
{
void *self = dlopen (0, LT_DLGLOBAL|LT_DLLAZY_OR_NOW);
int status = $lt_dlunknown;
if (self)
  {
  if (dlsym (self, "fnord"))
                             status = $lt_dlno_uscore;
  else
    {
 if (dlsym( self, "_fnord")) status = $lt_dlneed_uscore;
     else puts (dlerror ());
}
   /* dlclose (self); */
  }
else
 puts (dlerror ());
return status;
}]
_LT_EOF
if AC_TRY_EVAL(ac_link) && test -s "conftest$ac_exeext" 2>/dev/null; then
 (./conftest; exit; ) >&AS_MESSAGE_LOG_FD 2>/dev/null
 lt_status=$?
 case x$lt_status in
  x$lt_dlno_uscore) $1 ;;
   x$lt_dlneed_uscore) $2 ;;
```

```
x$lt_dlunknown|x*) $3 ;;
esac
else :
# compilation failed
$3
fi
fi
rm -fr conftest*
])# _LT_TRY_DLOPEN_SELF
```

```
# LT_SYS_DLOPEN_SELF
# -----
AC_DEFUN([LT_SYS_DLOPEN_SELF],
[m4_require([_LT_HEADER_DLFCN])dnl
if test yes != "$enable_dlopen"; then
enable_dlopen=unknown
enable_dlopen_self=unknown
enable_dlopen_self_static=unknown
else
lt_cv_dlopen=no
lt_cv_dlopen_libs=
case $host_os in
beos*)
 lt_cv_dlopen=load_add_on
 lt_cv_dlopen_libs=
 lt_cv_dlopen_self=yes
 ;;
mingw* | pw32* | cegcc*)
 lt_cv_dlopen=LoadLibrary
 lt_cv_dlopen_libs=
 ;;
cygwin*)
 lt_cv_dlopen=dlopen
 lt_cv_dlopen_libs=
 ;;
darwin*)
 # if libdl is installed we need to link against it
 AC_CHECK_LIB([dl], [dlopen],
 [lt_cv_dlopen=dlopen lt_cv_dlopen_libs=-ldl],[
 lt_cv_dlopen=dyld
 lt_cv_dlopen_libs=
 lt_cv_dlopen_self=yes
 ])
```

;;

tpf*)

Don't try to run any link tests for TPF. We know it's impossible # because TPF is a cross-compiler, and we know how we open DSOs. lt_cv_dlopen=dlopen lt_cv_dlopen_libs= lt_cv_dlopen_self=no ;;

*)

```
AC_CHECK_FUNC([shl_load],
 [lt_cv_dlopen=shl_load],
  [AC_CHECK_LIB([dld], [shl_load],
  [lt_cv_dlopen=shl_load lt_cv_dlopen_libs=-ldld],
[AC_CHECK_FUNC([dlopen],
   [lt_cv_dlopen=dlopen],
 [AC CHECK LIB([dl], [dlopen],
[lt_cv_dlopen=dlopen lt_cv_dlopen_libs=-ldl],
  [AC_CHECK_LIB([svld], [dlopen],
 [lt_cv_dlopen=dlopen lt_cv_dlopen_libs=-lsvld],
   [AC_CHECK_LIB([dld], [dld_link],
  [lt_cv_dlopen=dld_link lt_cv_dlopen_libs=-ldld])
   ])
  ])
 ])
1)
  ])
 ;;
esac
if test no = "$lt_cv_dlopen"; then
 enable_dlopen=no
else
 enable_dlopen=yes
fi
case $lt_cv_dlopen in
dlopen)
 save_CPPFLAGS=$CPPFLAGS
 test yes = "$ac_cv_header_dlfcn_h" && CPPFLAGS="$CPPFLAGS -DHAVE_DLFCN_H"
 save_LDFLAGS=$LDFLAGS
 wl=$lt_prog_compiler_wl eval LDFLAGS=\"\$LDFLAGS $export_dynamic_flag_spec\"
```

```
save_LIBS=$LIBS
LIBS="$lt_cv_dlopen_libs $LIBS"
```

```
AC_CACHE_CHECK([whether a program can dlopen itself],
 lt cv dlopen self, [dnl
 _LT_TRY_DLOPEN_SELF(
  lt_cv_dlopen_self=yes, lt_cv_dlopen_self=yes,
  lt_cv_dlopen_self=no, lt_cv_dlopen_self=cross)
 ])
 if test yes = "$lt_cv_dlopen_self"; then
  wl=$lt_prog_compiler_wl eval LDFLAGS=\"\$LDFLAGS $lt_prog_compiler_static\"
  AC CACHE CHECK([whether a statically linked program can dlopen itself],
 lt_cv_dlopen_self_static, [dnl
 _LT_TRY_DLOPEN_SELF(
  It cv dlopen self static=yes, lt cv dlopen self static=yes,
  lt_cv_dlopen_self_static=no, lt_cv_dlopen_self_static=cross)
  ])
 fi
 CPPFLAGS=$save CPPFLAGS
 LDFLAGS=$save LDFLAGS
 LIBS=$save_LIBS
 ;;
esac
case $lt cv dlopen self in
yes|no) enable_dlopen_self=$lt_cv_dlopen_self ;;
*) enable dlopen self=unknown ;;
esac
case $lt cv dlopen self static in
yes|no) enable_dlopen_self_static=$lt_cv_dlopen_self_static ;;
*) enable_dlopen_self_static=unknown ;;
esac
fi
_LT_DECL([dlopen_support], [enable_dlopen], [0],
 [Whether dlopen is supported])
_LT_DECL([dlopen_self], [enable_dlopen_self], [0],
 [Whether dlopen of programs is supported])
_LT_DECL([dlopen_self_static], [enable_dlopen_self_static], [0],
 [Whether dlopen of statically linked programs is supported])
])# LT_SYS_DLOPEN_SELF
# Old name:
AU_ALIAS([AC_LIBTOOL_DLOPEN_SELF], [LT_SYS_DLOPEN_SELF])
dnl aclocal-1.4 backwards compatibility:
```

dnl AC_DEFUN([AC_LIBTOOL_DLOPEN_SELF], [])

LT_COMPILER_C_O([TAGNAME])

```
# ------
# Check to see if options -c and -o are simultaneously supported by compiler.
# This macro does not hard code the compiler like AC_PROG_CC_C_O.
m4_defun([_LT_COMPILER_C_O],
[m4_require([_LT_DECL_SED])dnl
m4_require([_LT_FILEUTILS_DEFAULTS])dnl
m4 require([ LT TAG COMPILER])dnl
AC_CACHE_CHECK([if $compiler supports -c -o file.$ac_objext],
[_LT_TAGVAR(lt_cv_prog_compiler_c_o, $1)],
[_LT_TAGVAR(lt_cv_prog_compiler_c_o, $1)=no
 $RM -r conftest 2>/dev/null
 mkdir conftest
 cd conftest
 mkdir out
 echo "$lt_simple_compile_test_code" > conftest.$ac_ext
 lt_compiler_flag="-o out/conftest2.$ac_objext"
 # Insert the option either (1) after the last *FLAGS variable, or
 # (2) before a word containing "conftest.", or (3) at the end.
 # Note that $ac_compile itself does not contain backslashes and begins
 # with a dollar sign (not a hyphen), so the echo should work correctly.
 lt_compile=`echo "$ac_compile" | $SED \
 -e 's:.*FLAGS}\{0,1\} :&$lt_compiler_flag :; t' \
 -e 's: [[^ ]]*conftest\.: $lt compiler flag&:; t' \
 -e 's:$: $lt_compiler_flag:"
 (eval echo "\"\$as me:$LINENO: $lt compile\"" >&AS MESSAGE LOG FD)
 (eval "$lt_compile" 2>out/conftest.err)
 ac_status=$?
 cat out/conftest.err >&AS MESSAGE LOG FD
 echo "$as me:$LINENO: \$? = $ac status" >&AS MESSAGE LOG FD
 if (exit $ac_status) && test -s out/conftest2.$ac_objext
 then
  # The compiler can only warn and ignore the option if not recognized
  # So say no if there are warnings
  $ECHO "$_lt_compiler_boilerplate" | $SED '/^$/d' > out/conftest.exp
  $SED '/^$/d; /^ *+/d' out/conftest.err >out/conftest.er2
  if test ! -s out/conftest.er2 || diff out/conftest.exp out/conftest.er2 >/dev/null; then
   _LT_TAGVAR(lt_cv_prog_compiler_c_o, $1)=yes
  fi
 fi
 chmod u+w . 2>&AS_MESSAGE_LOG_FD
 $RM conftest*
 # SGI C++ compiler will create directory out/ii_files/ for
 # template instantiation
 test -d out/ii_files && $RM out/ii_files/* && rmdir out/ii_files
 $RM out/* && rmdir out
 cd ..
 $RM -r conftest
```

\$RM conftest*

])

_LT_TAGDECL([compiler_c_o], [lt_cv_prog_compiler_c_o], [1], [Does compiler simultaneously support -c and -o options?])])# _LT_COMPILER_C_O

LT_COMPILER_FILE_LOCKS([TAGNAME])

Check to see if we can do hard links to lock some files if needed m4_defun([_LT_COMPILER_FILE_LOCKS], [m4_require([_LT_ENABLE_LOCK])dnl m4_require([_LT_FILEUTILS_DEFAULTS])dnl _LT_COMPILER_C_O([\$1])

hard_links=nottested

if test no = "\$_LT_TAGVAR(lt_cv_prog_compiler_c_o, \$1)" && test no != "\$need_locks"; then # do not overwrite the value of need locks provided by the user AC_MSG_CHECKING([if we can lock with hard links]) hard_links=yes \$RM conftest* ln conftest.a conftest.b 2>/dev/null && hard_links=no touch conftest.a ln conftest.a conftest.b 2>&5 || hard links=no In conftest.a conftest.b 2>/dev/null && hard_links=no AC MSG RESULT([\$hard links]) if test no = "\$hard links"; then AC_MSG_WARN(['\$CC' does not support '-c -o', so 'make -j' may be unsafe]) need locks=warn fi else need_locks=no fi _LT_DECL([], [need_locks], [1], [Must we lock files when doing compilation?])])# _LT_COMPILER_FILE_LOCKS

#_LT_CHECK_OBJDIR

-----m4_defun([_LT_CHECK_OBJDIR],
[AC_CACHE_CHECK([for objdir], [lt_cv_objdir],
[rm -f .libs 2>/dev/null
mkdir .libs 2>/dev/null
if test -d .libs; then
lt_cv_objdir=.libs
else
MS-DOS does not allow filenames that begin with a dot.
lt_cv_objdir=_libs

fi

rmdir .libs 2>/dev/null])

objdir=\$lt_cv_objdir

_LT_DECL([], [objdir], [0],

[The name of the directory that contains temporary libtool files])dnl m4_pattern_allow([LT_OBJDIR])dnl AC_DEFINE_UNQUOTED([LT_OBJDIR], "\$lt_cv_objdir/",

[Define to the sub-directory where libtool stores uninstalled libraries.])

])# _LT_CHECK_OBJDIR

_LT_LINKER_HARDCODE_LIBPATH([TAGNAME])

Check hardcoding attributes.

m4_defun([_LT_LINKER_HARDCODE_LIBPATH],

[AC_MSG_CHECKING([how to hardcode library paths into programs])

_LT_TAGVAR(hardcode_action, \$1)=

if test -n "\$_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)" ||

test -n "\$_LT_TAGVAR(runpath_var, \$1)" ||

test yes = "\$_LT_TAGVAR(hardcode_automatic, \$1)"; then

We can hardcode non-existent directories.

if test no != "\$_LT_TAGVAR(hardcode_direct, \$1)" &&
 # If the only mechanism to avoid hardcoding is shlibpath_var, we
 # have to relink, otherwise we might link with an installed library
 # when we should be linking with a yet-to-be-installed one
 ## test no != "\$_LT_TAGVAR(hardcode_shlibpath_var, \$1)" &&
 test no != "\$_LT_TAGVAR(hardcode_minus_L, \$1)"; then
 # Linking always hardcodes the temporary library directory.
 LT TAGVAR(hardcode_action, \$1)=relink

else

We can link without hardcoding, and we can hardcode nonexisting dirs.

_LT_TAGVAR(hardcode_action, \$1)=immediate

fi

else

We cannot hardcode anything, or else we can only hardcode existing # directories.

_LT_TAGVAR(hardcode_action, \$1)=unsupported

fi

AC_MSG_RESULT([\$_LT_TAGVAR(hardcode_action, \$1)])

```
if test relink = "$_LT_TAGVAR(hardcode_action, $1)" ||
test yes = "$_LT_TAGVAR(inherit_rpath, $1)"; then
# Fast installation is not supported
enable_fast_install=no
elif test yes = "$shlibpath_overrides_runpath" ||
test no = "$enable_shared"; then
# Fast installation is not necessary
```

 $enable_fast_install=needless$

fi

_LT_TAGDECL([], [hardcode_action], [0],

[How to hardcode a shared library path into an executable])])#_LT_LINKER_HARDCODE_LIBPATH

_LT_CMD_STRIPLIB # ----m4_defun([_LT_CMD_STRIPLIB], [m4_require([_LT_DECL_EGREP]) striplib= old_striplib= AC_MSG_CHECKING([whether stripping libraries is possible]) if test -n "\$STRIP" && \$STRIP -V 2>&1 | \$GREP "GNU strip" >/dev/null; then test -z "\$old_striplib" && old_striplib="\$STRIP --strip-debug" test -z "\$striplib" && striplib="\$STRIP --strip-unneeded" AC MSG RESULT([yes]) else # FIXME - insert some real tests, host_os isn't really good enough case \$host os in darwin*) if test -n "\$STRIP"; then striplib="\$STRIP -x" old_striplib="\$STRIP -S" AC_MSG_RESULT([yes]) else AC_MSG_RESULT([no]) fi ;; *) AC_MSG_RESULT([no]) ;; esac fi _LT_DECL([], [old_striplib], [1], [Commands to strip libraries]) _LT_DECL([], [striplib], [1])])# _LT_CMD_STRIPLIB

_LT_PREPARE_MUNGE_PATH_LIST

Make sure func_munge_path_list() is defined correctly. m4_defun([_LT_PREPARE_MUNGE_PATH_LIST], [[# func_munge_path_list VARIABLE PATH # ------

VARIABLE is name of variable containing _space_ separated list of # directories to be munged by the contents of PATH, which is string

```
# having a format:
# "DIR[:DIR]:"
     string "DIR[ DIR]" will be prepended to VARIABLE
#
# ":DIR[:DIR]"
     string "DIR[ DIR]" will be appended to VARIABLE
#
# "DIRP[:DIRP]::[DIRA:]DIRA"
#
     string "DIRP[ DIRP]" will be prepended to VARIABLE and string
#
     "DIRA[ DIRA]" will be appended to VARIABLE
# "DIR[:DIR]"
     VARIABLE will be replaced by "DIR[ DIR]"
#
func_munge_path_list ()
{
 case x@S|@2 in
 x)
   ;;
  *:)
   eval @S|@1=\"`$ECHO @S|@2 | $SED 's/:/ /g` \@S|@@S|@1\"
   ;;
 x:*)
   eval @S|@1=\"\@S|@@S|@1 `$ECHO @S|@2 | $SED 's/://g`\"
    ::
 *::*)
   eval @S|@1=\"\@S|@@S|@1\`$ECHO @S|@2 | $SED -e 's/.*:://' -e 's/:/ /g`\"
   eval @S|@1=\"`$ECHO @S|@2 | $SED -e 's/::.*//' -e 's/:/ /g`\ \@S|@@S|@1\"
   ;;
 *)
   eval @S|@1=\"`$ECHO @S|@2 | $SED 's/:/ /g`\"
   ;;
 esac
}
]])#_LT_PREPARE_PATH_LIST
```

```
# LT_SYS_DYNAMIC_LINKER([TAG])
```

```
# ------# PORTME Fill in your ld.so characteristics
m4_defun([_LT_SYS_DYNAMIC_LINKER],
[AC_REQUIRE([AC_CANONICAL_HOST])dnl
m4_require([_LT_DECL_EGREP])dnl
m4_require([_LT_FILEUTILS_DEFAULTS])dnl
m4_require([_LT_DECL_OBJDUMP])dnl
m4_require([_LT_DECL_SED])dnl
m4_require([_LT_CHECK_SHELL_FEATURES])dnl
m4_require([_LT_PREPARE_MUNGE_PATH_LIST])dnl
AC_MSG_CHECKING([dynamic linker characteristics])
m4_if([$1],
[],[
if test yes = "$GCC"; then
```

```
case $host os in
 darwin*) lt_awk_arg='/^libraries:/,/LR/' ;;
 *) lt_awk_arg='/^libraries:/' ;;
esac
case $host os in
 mingw* | cegcc*) lt_sed_strip_eq='s=([[A-Za-z]]:)||1|g';;
 *) It sed strip eq='s=/|/|g';;
esac
lt_search_path_spec=`$CC -print-search-dirs | awk $lt_awk_arg | $SED -e "s/^libraries://" -e $lt_sed_strip_eq`
case $lt search path spec in
*\;*)
 # if the path contains ";" then we assume it to be the separator
 # otherwise default to the standard path separator (i.e. ":") - it is
 # assumed that no part of a normal pathname contains ";" but that should
 # okay in the real world where ";" in dirpaths is itself problematic.
 It search path spec=`$ECHO "$lt search path spec" | $SED 's/;/ /g`
 ;;
*)
 lt_search_path_spec=`$ECHO "$lt_search_path_spec" | $SED "s/$PATH_SEPARATOR//g"`
 ;;
esac
# Ok, now we have the path, separated by spaces, we can step through it
# and add multilib dir if necessary...
It tmp It search path spec=
lt_multi_os_dir=/^$CC $CPPFLAGS $CFLAGS $LDFLAGS -print-multi-os-directory 2>/dev/null`
# ...but if some path component already ends with the multilib dir we assume
# that all is fine and trust -print-search-dirs as is (GCC 4.2? or newer).
case "$lt_multi_os_dir; $lt_search_path_spec " in
"/; "* | "/.; "* | "/./; "* | *"$lt multi os dir "* | *"$lt multi os dir/ "*)
 lt multi os dir=
 ;;
esac
for lt_sys_path in $lt_search_path_spec; do
 if test -d "$lt_sys_path$lt_multi_os_dir"; then
  lt_tmp_lt_search_path_spec="$lt_tmp_lt_search_path_spec $lt_sys_path$lt_multi_os_dir"
 elif test -n "$lt_multi_os_dir"; then
  test -d "$lt_sys_path" && \
lt_tmp_lt_search_path_spec="$lt_tmp_lt_search_path_spec $lt_sys_path"
 fi
done
lt_search_path_spec=`$ECHO "$lt_tmp_lt_search_path_spec" | awk '
BEGIN {RS = " "; FS = "/|n"; } {
lt_foo = "";
lt_count = 0;
for (lt_i = NF; lt_i > 0; lt_i - ) {
 if ($lt_i != "" && $lt_i != ".") {
  if ($lt_i == "..") {
   lt count++;
```

```
} else {
    if (lt\_count == 0) {
     lt_foo = "/" $lt_i lt_foo;
    } else {
     lt_count--;
    }
   }
  }
}
if (lt_foo != "") { lt_freq[[lt_foo]]++; }
if (lt_freq[[lt_foo]] == 1) { print lt_foo; }
}"
# AWK program above erroneously prepends '/' to C:/dos/paths
# for these hosts.
case $host_os in
 mingw* | cegcc*) lt_search_path_spec=`$ECHO "$lt_search_path_spec" |\
   $SED 's|/\([[A-Za-z]]:\)|\1|g` ;;
esac
sys_lib_search_path_spec=`$ECHO "$lt_search_path_spec" | $lt_NL2SP`
else
sys_lib_search_path_spec="/lib /usr/lib /usr/local/lib"
fi])
library_names_spec=
libname_spec='lib$name'
soname_spec=
shrext_cmds=.so
postinstall cmds=
postuninstall_cmds=
finish_cmds=
finish_eval=
shlibpath_var=
shlibpath_overrides_runpath=unknown
version_type=none
dynamic_linker="$host_os ld.so"
sys_lib_dlsearch_path_spec="/lib /usr/lib"
need_lib_prefix=unknown
hardcode_into_libs=no
# when you set need_version to no, make sure it does not cause -set_version
# flags to be left without arguments
need_version=unknown
AC_ARG_VAR([LT_SYS_LIBRARY_PATH],
[User-defined run-time library search path.])
case $host_os in
```

```
aix3*)
```

version_type=linux # correct to gnu/linux during the next big refactor

library_names_spec='\$libname\$release\$shared_ext\$versuffix \$libname.a' shlibpath_var=LIBPATH

AIX 3 has no versioning support, so we append a major version to the name. soname_spec='\$libname\$release\$shared_ext\$major' ;;

aix[[4-9]]*)

```
version_type=linux # correct to gnu/linux during the next big refactor
need lib prefix=no
need_version=no
hardcode_into_libs=yes
if test ia64 = "$host cpu"; then
 # AIX 5 supports IA64
 library_names_spec='$libname$release$shared_ext$major $libname$release$shared_ext$versuffix
$libname$shared ext'
 shlibpath_var=LD_LIBRARY_PATH
else
 # With GCC up to 2.95.x, collect2 would create an import file
 # for dependence libraries. The import file would start with
 # the line '#! .'. This would cause the generated library to
 # depend on '.', always an invalid library. This was fixed in
 # development snapshots of GCC prior to 3.0.
 case $host os in
  aix4 | aix4.[[01]] | aix4.[[01]].*)
  if { echo '#if __GNUC__ > 2 || (__GNUC__ == 2 && __GNUC_MINOR__ >= 97)'
  echo ' yes '
  echo '#endif'; } | $CC -E - | $GREP yes > /dev/null; then
  else
can_build_shared=no
  fi
  ;;
 esac
 # Using Import Files as archive members, it is possible to support
 # filename-based versioning of shared library archives on AIX. While
 # this would work for both with and without runtime linking, it will
 # prevent static linking of such archives. So we do filename-based
 # shared library versioning with .so extension only, which is used
 # when both runtime linking and shared linking is enabled.
 # Unfortunately, runtime linking may impact performance, so we do
 # not want this to be the default eventually. Also, we use the
 # versioned .so libs for executables only if there is the -brtl
 # linker flag in LDFLAGS as well, or --with-aix-soname=svr4 only.
 # To allow for filename-based versioning support, we need to create
 # libNAME.so.V as an archive file, containing:
 #*) an Import File, referring to the versioned filename of the
 # archive as well as the shared archive member, telling the
```

- # bitwidth (32 or 64) of that shared object, and providing the
- # list of exported symbols of that shared object, eventually
- # decorated with the 'weak' keyword
- # *) the shared object with the F_LOADONLY flag set, to really avoid
- # it being seen by the linker.
- # At run time we better use the real file rather than another symlink,
- # but for link time we create the symlink libNAME.so -> libNAME.so.V

case \$with_aix_soname,\$aix_use_runtimelinking in

AIX (on Power*) has no versioning support, so currently we cannot hardcode correct

soname into executable. Probably we can add versioning support to

collect2, so additional links can be useful in future.

aix, yes) # traditional libtool

dynamic_linker='AIX unversionable lib.so'

If using run time linking (on AIX 4.2 or later) use lib<name>.so

- # instead of lib<name>.a to let people know that these are not
- # typical AIX shared libraries.

library_names_spec='\$libname\$release\$shared_ext\$versuffix \$libname\$release\$shared_ext\$major \$libname\$shared_ext'

;;

aix,no) # traditional AIX only

```
dynamic_linker='AIX lib.a[(]lib.so.V[)]'
```

We preserve .a as extension for shared libraries through AIX4.2

and later when we are not doing run time linking.

library_names_spec='\$libname\$release.a \$libname.a'

soname_spec='\$libname\$release\$shared_ext\$major'

;;

svr4,*) # full svr4 only

dynamic_linker="AIX lib.so.V[(]\$shared_archive_member_spec.o[)]"

library_names_spec='\$libname\$release\$shared_ext\$major \$libname\$shared_ext'

We do not specify a path in Import Files, so LIBPATH fires.

 $shlibpath_overrides_runpath=yes$

```
;;
```

*,yes) # both, prefer svr4

```
dynamic_linker="AIX lib.so.V[(]$shared_archive_member_spec.o[)], lib.a[(]lib.so.V[)]"
library_names_spec='$libname$release$shared_ext$major $libname$shared_ext'
```

unpreferred sharedlib libNAME.a needs extra handling

postinstall_cmds='test -n "\$linkname" || linkname="\$realname"~func_stripname "" ".so"

```
"$linkname"~$install_shared_prog "$dir/$func_stripname_result.$libext"
```

```
"$destdir/$func_stripname_result.$libext"~test -z "$tstripme" || test -z "$striplib" || $striplib
"$destdir/$func_stripname_result.$libext"
```

postuninstall_cmds='for n in \$library_names \$old_library; do :; done~func_stripname "" ".so" "\$n"~test "\$func_stripname_result" = "\$n" || func_append rmfiles " \$odir/\$func_stripname_result.\$libext"

We do not specify a path in Import Files, so LIBPATH fires.

shlibpath_overrides_runpath=yes

;;

```
*,no) # both, prefer aix
```

```
dynamic_linker="AIX lib.a[(]lib.so.V[)], lib.so.V[(]$shared_archive_member_spec.o[)]"
```

library_names_spec='\$libname\$release.a \$libname.a'

soname_spec='\$libname\$release\$shared_ext\$major'

unpreferred sharedlib libNAME.so.V and symlink libNAME.so need extra handling

postinstall_cmds='test -z "\$dlname" || \$install_shared_prog \$dir/\$dlname \$destdir/\$dlname~test -z "\$striplib" || \$striplib \$destdir/\$dlname~test -n "\$linkname" || linkname=\$realname~func_stripname "" ".a" "\$linkname"~(cd "\$destdir" && \$LN_S -f \$dlname \$func_stripname_result.so)'

postuninstall_cmds='test -z "\$dlname" || func_append rmfiles " \$odir/\$dlname"~for n in \$old_library

```
$library_names; do :; done~func_stripname "" ".a" "$n"~func_append rmfiles " $odir/$func_stripname_result.so"'
;;
```

```
esac
shlibpath_var=LIBPATH
```

```
sintoputi_vui=
```

fi ;;

```
amigaos*)
```

```
case $host_cpu in
```

powerpc)

Since July 2007 AmigaOS4 officially supports .so libraries.

When compiling the executable, add -use-dynld -Lsobjs: to the compileline.

```
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
```

\$libname\$shared_ext'

;;

m68k)

library_names_spec='\$libname.ixlibrary \$libname.a'

```
# Create ${libname}_ixlibrary.a entries in /sys/libs.
```

```
finish_eval='for lib in `ls $libdir/*.ixlibrary 2>/dev/null`; do libname=`func_echo_all "$lib" | $SED
```

```
\"\sys/libs/\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\libname\_ixlibrary.a;\show\"cd/sys/libs\&\&\LN_S\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\show\_ixlibrary.a;\s
```

```
\scriptstyle ixlibrary.a"; cd /sys/libs && \LN_S \lib \\libname _ixlibrary.a || exit 1; done || exit 1;
```

;;

esac

;;

```
beos*)
```

```
library_names_spec='$libname$shared_ext'
dynamic_linker="$host_os ld.so"
shlibpath_var=LIBRARY_PATH
```

;;

```
bsdi[[45]]*)
```

```
version_type=linux # correct to gnu/linux during the next big refactor
need_version=no
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared_ext'
soname_spec='$libname$release$shared_ext$major'
finish_cmds='PATH="\$PATH:/sbin" ldconfig $libdir'
shlibpath_var=LD_LIBRARY_PATH
sys_lib_search_path_spec="/shlib /usr/lib /usr/X11/lib /usr/contrib/lib /lib /usr/local/lib"
```

```
sys_lib_dlsearch_path_spec="/shlib /usr/lib /usr/local/lib"
```

```
# the default ld.so.conf also contains /usr/contrib/lib and
#/usr/X11R6/lib (/usr/X11 is a link to /usr/X11R6), but let us allow
# libtool to hard-code these into programs
;;
cygwin* | mingw* | pw32* | cegcc*)
version type=windows
shrext_cmds=.dll
need_version=no
need_lib_prefix=no
case $GCC,$cc_basename in
yes,*)
 # gcc
 library_names_spec='$libname.dll.a'
 # DLL is installed to $(libdir)/../bin by postinstall_cmds
 postinstall_cmds='base_file=`basename \$file`~
  dlpath=`$SHELL 2>&1 -c \". $dir/\\\$base file\\"i; echo \$dlname\\"`~
  dldir=$destdir/`dirname \$dlpath`~
  test -d \$dldir || mkdir -p \$dldir~
  $install prog $dir/$dlname \$dldir/$dlname~
  chmod a+x \$dldir/$dlname~
  if test -n '\"$stripme'\" && test -n '\"$striplib'\"; then
    eval '\"$striplib \$dldir/$dlname'\" || exit \$?;
  fi'
  postuninstall_cmds='dldll=`$SHELL 2>&1 -c '\". $file; echo \$dlname'\"`~
  dlpath=$dir/\$dldll~
   $RM \$dlpath'
 shlibpath_overrides_runpath=yes
 case $host_os in
 cygwin*)
  # Cygwin DLLs use 'cyg' prefix rather than 'lib'
  soname_spec="echo $libname | sed -e 's/^lib/cyg/"`echo $release | $SED -e 's/[[.]]/-/g` $versuffix$shared_ext'
m4 if([$1], [],[
  sys_lib_search_path_spec="$sys_lib_search_path_spec /usr/lib/w32api"])
  ;;
 mingw* | cegcc*)
  # MinGW DLLs use traditional 'lib' prefix
  soname_spec='$libname`echo $release | $SED -e 's/[[.]]/-/g'`$versuffix$shared_ext'
  ;;
 pw32*)
  # pw32 DLLs use 'pw' prefix rather than 'lib'
  library_names_spec="echo $libname | sed -e 's/^lib/pw/"`echo $release | $SED -e 's/[[.]]/-
/g'`$versuffix$shared_ext'
  ;;
 esac
 dynamic_linker='Win32 ld.exe'
```

;;

```
*,cl*)
   # Native MSVC
   libname spec='$name'
   soname_spec='$libname`echo $release | $SED -e 's/[[.]]/-/g``$versuffix$shared_ext'
   library names spec='$libname.dll.lib'
   case $build_os in
   mingw*)
      sys_lib_search_path_spec=
      lt_save_ifs=$IFS
      IFS=':'
      for lt_path in $LIB
      do
        IFS=$lt save ifs
        # Let DOS variable expansion print the short 8.3 style file name.
        lt path=`cd "$lt path" 2>/dev/null && cmd //C "for %i in (".") do @echo %~si"`
        sys_lib_search_path_spec="$sys_lib_search_path_spec $lt_path"
      done
      IFS=$lt save ifs
      # Convert to MSYS style.
      sys_lib_search_path_spec= sl_{([[a-zA-Z]])): | ([[a-zA-Z]])): | ([[[a-zA-Z]])): | ([[a-zA-Z]])): | ([[a-zA-Z]]): | ([[a-zA-Z]])): | ([[a-zA-Z]]): | ([[a-zA-Z]]): | ([[a-zA-Z]]): | ([[a-zA-Z]]): | ([[a-zA-Z]])): | ([[a-zA-Z]]): | ([[a-zA-Z]])): | ([[a-zA-Z]])): | ([[a-zA-Z]]): | ([[a-zA-Z]])): | ([[a-zA-Z]]): | ([[a-zA-Z]])): | ([[a-zA-Z]]): | ([[a-zA-Z]]): | ([[a-zA-Z]]): | ([[a-zA-Z])): | ([[a-zA-Z])
's|^ ||`
      ;;
   cygwin*)
      # Convert to unix form, then to dos form, then back to unix form
      # but this time dos style (no spaces!) so that the unix form looks
      # like /cygdrive/c/PROGRA~1:/cygdr...
      sys_lib_search_path_spec=`cygpath --path --unix "$LIB"`
      sys_lib_search_path_spec=`cygpath --path --dos "$sys_lib_search_path_spec" 2>/dev/null`
      sys_lib_search_path_spec=`cygpath --path --unix "$sys_lib_search_path_spec" | $SED -e
"s/$PATH_SEPARATOR/ /g"`
      ;;
    *)
      sys_lib_search_path_spec=$LIB
      if $ECHO "$sys_lib_search_path_spec" | [$GREP ';[c-zC-Z]:/' >/dev/null]; then
        # It is most probably a Windows format PATH.
        sys_lib_search_path_spec=`$ECHO "$sys_lib_search_path_spec" | $SED -e 's/;/ /g`
      else
        sys_lib_search_path_spec=`$ECHO "$sys_lib_search_path_spec" | $SED -e "s/$PATH_SEPARATOR//g"`
      fi
      # FIXME: find the short name or the path components, as spaces are
      # common. (e.g. "Program Files" -> "PROGRA~1")
      ;;
   esac
```

DLL is installed to \$(libdir)/../bin by postinstall_cmds

postinstall_cmds='base_file=`basename \\$file`~ dlpath=`\$SHELL 2>&1 -c '\". \$dir/'\'\\$base_file'\"i; echo \\$dlname'\"`~ dldir=\$destdir/`dirname \\$dlpath`~ test -d \\$dldir || mkdir -p \\$dldir~ \$install_prog \$dir/\$dlname \\$dldir/\$dlname' postuninstall_cmds='dldll=`\$SHELL 2>&1 -c '\". \$file; echo \\$dlname'\"`~ dlpath=\$dir/\\$dldll~ \$RM \\$dlpath' shlibpath_overrides_runpath=yes dynamic linker='Win32 link.exe' ;; *) # Assume MSVC wrapper library_names_spec='\$libname`echo \$release | \$SED -e 's/[[.]]/-/g` \$versuffix\$shared_ext \$libname.lib' dynamic linker='Win32 ld.exe' ;; esac # FIXME: first we should search . and the directory the executable is in shlibpath_var=PATH ;; darwin* | rhapsody*) dynamic linker="\$host os dyld" version_type=darwin need lib prefix=no need version=no library_names_spec='\$libname\$release\$major\$shared_ext \$libname\$shared_ext' soname_spec='\$libname\$release\$major\$shared_ext' shlibpath_overrides_runpath=yes shlibpath_var=DYLD_LIBRARY_PATH shrext_cmds='`test .\$module = .yes && echo .so || echo .dylib`' m4_if([\$1], [],[sys_lib_search_path_spec="\$sys_lib_search_path_spec /usr/local/lib"]) sys_lib_dlsearch_path_spec='/usr/local/lib /lib /usr/lib' ;; dgux*) version_type=linux # correct to gnu/linux during the next big refactor need_lib_prefix=no need_version=no library_names_spec='\$libname\$release\$shared_ext\$versuffix \$libname\$release\$shared_ext\$major \$libname\$shared_ext' soname_spec='\$libname\$release\$shared_ext\$major' shlibpath_var=LD_LIBRARY_PATH ;;

```
freebsd* | dragonfly*)
```

```
# DragonFly does not have aout. When/if they implement a new
# versioning mechanism, adjust this.
if test -x /usr/bin/objformat; then
 objformat=`/usr/bin/objformat`
else
 case $host_os in
 freebsd[[23]].*) objformat=aout ;;
 *) objformat=elf ;;
 esac
fi
version_type=freebsd-$objformat
case $version_type in
 freebsd-elf*)
  library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared_ext'
  soname_spec='$libname$release$shared_ext$major'
  need_version=no
  need_lib_prefix=no
  ;;
  freebsd-*)
  library names spec='$libname$release$shared ext$versuffix $libname$shared ext$versuffix'
  need_version=yes
  ;;
esac
shlibpath_var=LD_LIBRARY_PATH
case $host os in
freebsd2.*)
 shlibpath_overrides_runpath=yes
 ;;
freebsd3.[[01]]* | freebsdelf3.[[01]]*)
 shlibpath_overrides_runpath=yes
 hardcode_into_libs=yes
 ;;
freebsd3.[[2-9]]* | freebsdelf3.[[2-9]]* | \
freebsd4.[[0-5]] | freebsdelf4.[[0-5]] | freebsd4.1.1 | freebsdelf4.1.1)
 shlibpath_overrides_runpath=no
 hardcode_into_libs=yes
 ;;
*) # from 4.6 on, and DragonFly
 shlibpath_overrides_runpath=yes
 hardcode_into_libs=yes
 ;;
esac
;;
haiku*)
version_type=linux # correct to gnu/linux during the next big refactor
need_lib_prefix=no
```

need version=no dynamic_linker="\$host_os runtime_loader" library_names_spec='\$libname\$release\$shared_ext\$versuffix \$libname\$release\$shared_ext\$major \$libname\$shared ext' soname_spec='\$libname\$release\$shared_ext\$major' shlibpath_var=LIBRARY_PATH shlibpath overrides runpath=no sys_lib_dlsearch_path_spec='/boot/home/config/lib /boot/common/lib /boot/system/lib' hardcode_into_libs=yes ;; hpux9* | hpux10* | hpux11*) # Give a soname corresponding to the major version so that dld.sl refuses to # link against other versions. version_type=sunos need lib prefix=no need_version=no case \$host cpu in ia64*) shrext_cmds='.so' hardcode into libs=yes dynamic_linker="\$host_os dld.so" shlibpath_var=LD_LIBRARY_PATH shlibpath overrides runpath=yes # Unless +noenvvar is specified. library_names_spec='\$libname\$release\$shared_ext\$versuffix \$libname\$release\$shared_ext\$major \$libname\$shared ext' soname spec='\$libname\$release\$shared ext\$major' if test 32 = "\$HPUX_IA64_MODE"; then sys_lib_search_path_spec="/usr/lib/hpux32 /usr/local/lib/hpux32 /usr/local/lib" sys_lib_dlsearch_path_spec=/usr/lib/hpux32 else sys_lib_search_path_spec="/usr/lib/hpux64 /usr/local/lib/hpux64" sys_lib_dlsearch_path_spec=/usr/lib/hpux64 fi ;; hppa*64*) shrext cmds='.sl' hardcode_into_libs=yes dynamic_linker="\$host_os dld.sl" shlibpath_var=LD_LIBRARY_PATH # How should we handle SHLIB_PATH shlibpath_overrides_runpath=yes # Unless +noenvvar is specified.

library_names_spec='\$libname\$release\$shared_ext\$versuffix \$libname\$release\$shared_ext\$major \$libname\$shared_ext'

soname_spec='\$libname\$release\$shared_ext\$major'

sys_lib_search_path_spec="/usr/lib/pa20_64 /usr/ccs/lib/pa20_64"

sys_lib_dlsearch_path_spec=\$sys_lib_search_path_spec

;; *)

```
shrext cmds='.sl'
 dynamic_linker="$host_os dld.sl"
 shlibpath_var=SHLIB_PATH
 shlibpath_overrides_runpath=no # +s is required to enable SHLIB_PATH
 library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared_ext'
 soname spec='$libname$release$shared ext$major'
 ;;
esac
# HP-UX runs *really* slowly unless shared libraries are mode 555, ...
postinstall_cmds='chmod 555 $lib'
# or fails outright, so override atomically:
install override mode=555
;;
interix[[3-9]]*)
version_type=linux # correct to gnu/linux during the next big refactor
need lib prefix=no
need version=no
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared ext'
soname_spec='$libname$release$shared_ext$major'
dynamic_linker='Interix 3.x ld.so.1 (PE, like ELF)'
shlibpath_var=LD_LIBRARY_PATH
shlibpath_overrides_runpath=no
hardcode_into_libs=yes
;;
irix5* | irix6* | nonstopux*)
case $host os in
 nonstopux*) version_type=nonstopux ;;
 *)
if test yes = "$lt_cv_prog_gnu_ld"; then
 version_type=linux # correct to gnu/linux during the next big refactor
else
 version_type=irix
fi ;;
esac
need_lib_prefix=no
need_version=no
soname_spec='$libname$release$shared_ext$major'
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$release$shared_ext $libname$shared_ext'
case $host_os in
irix5* | nonstopux*)
 libsuff= shlibsuff=
 ;;
*)
```

```
case $LD in # libtool.m4 will add one of these switches to LD
  *-32|*"-32 "|*-melf32bsmip|*"-melf32bsmip ")
  libsuff= shlibsuff= libmagic=32-bit;;
  *-n32|*"-n32 "|*-melf32bmipn32|*"-melf32bmipn32 ")
  libsuff=32 shlibsuff=N32 libmagic=N32;;
  *-64|*"-64 "|*-melf64bmip|*"-melf64bmip ")
  libsuff=64 shlibsuff=64 libmagic=64-bit;;
 *) libsuff= shlibsuff= libmagic=never-match;;
 esac
 ;;
esac
shlibpath_var=LD_LIBRARY${shlibsuff}_PATH
shlibpath_overrides_runpath=no
sys_lib_search_path_spec="/usr/lib$libsuff /lib$libsuff /usr/local/lib$libsuff"
sys_lib_dlsearch_path_spec="/usr/lib$libsuff /lib$libsuff"
hardcode_into_libs=yes
;;
# No shared lib support for Linux oldld, aout, or coff.
```

```
linux*oldld* | linux*aout* | linux*coff*)
dynamic_linker=no
;;
```

```
linux*android*)
version_type=none # Android doesn't support versioned libraries.
need_lib_prefix=no
need_version=no
library_names_spec='$libname$release$shared_ext'
soname_spec='$libname$release$shared_ext'
finish_cmds=
shlibpath_var=LD_LIBRARY_PATH
shlibpath_overrides_runpath=yes
```

```
# This implies no fast_install, which is unacceptable.# Some rework will be needed to allow for fast_install# before this can be enabled.hardcode_into_libs=yes
```

dynamic_linker='Android linker'

Don't embed -rpath directories since the linker doesn't support them. _LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir' ;;

This must be glibc/ELF. linux* | k*bsd*-gnu | kopensolaris*-gnu | gnu*) version_type=linux # correct to gnu/linux during the next big refactor need_lib_prefix=no need_version=no library_names_spec='\$libname\$release\$shared_ext\$versuffix \$libname\$release\$shared_ext\$major \$libname\$shared_ext' soname_spec='\$libname\$release\$shared_ext\$major' finish_cmds='PATH="\\$PATH:/sbin" ldconfig -n \$libdir' shlibpath_var=LD_LIBRARY_PATH shlibpath_overrides_runpath=no

Some binutils ld are patched to set DT_RUNPATH AC_CACHE_VAL([lt_cv_shlibpath_overrides_runpath], [lt_cv_shlibpath_overrides_runpath=no save_LDFLAGS=\$LDFLAGS save_libdir=\$libdir eval "libdir=/foo; wl=\"\$_LT_TAGVAR(lt_prog_compiler_wl, \$1)\"; \ LDFLAGS=\"\\$LDFLAGS \$_LT_TAGVAR(lt_drocde_libdir_flag_spec, \$1)\"" AC_LINK_IFELSE([AC_LANG_PROGRAM([],[])], [AS_IF([(\$OBJDUMP -p conftest\$ac_exeext) 2>/dev/null | grep "RUNPATH.*\$libdir" >/dev/null], [lt_cv_shlibpath_overrides_runpath=yes])]) LDFLAGS=\$save_LDFLAGS libdir=\$save_libdir]) shlibpath_overrides_runpath=\$lt_cv_shlibpath_overrides_runpath

This implies no fast_install, which is unacceptable.# Some rework will be needed to allow for fast_install# before this can be enabled.hardcode into libs=yes

Ideally, we could use ldconfig to report *all* directores which are
searched for libraries, however this is still not possible. Aside from not
being certain /sbin/ldconfig is available, command
'ldconfig -N -X -v | grep ^/' on 64bit Fedora does not report /usr/lib64,
even though it is searched at run-time. Try to do the best guess by
appending ld.so.conf contents (and includes) to the search path.

if test -f /etc/ld.so.conf; then

 $lt_ld_extra=`awk '/^include / \{ system(sprintf("cd /etc; cat %s 2>/dev/null", \[$]2)); skip = 1; \} \{ if (!skip) print \ [$]0; skip = 0; \}' < /etc/ld.so.conf | $SED -e 's/#.*//;/^[]*hwcap[]/d;s/[:,]/ /g;s/=[^=]*$//;s/=[^=]* / /g;s/"'/g;/^$/d' | tr '\n' '`$

sys_lib_dlsearch_path_spec="/lib /usr/lib \$lt_ld_extra"
fi

We used to test for /lib/ld.so.1 and disable shared libraries on
powerpc, because MkLinux only supported shared libraries with the
GNU dynamic linker. Since this was broken with cross compilers,
most powerpc-linux boxes support dynamic linking these days and
people can always --disable-shared, the test was removed, and we
assume the GNU/Linux dynamic linker is in use.
dynamic_linker='GNU/Linux ld.so'
;;

```
netbsdelf*-gnu)
version_type=linux
need_lib_prefix=no
need version=no
library_names_spec='${libname}${release}${shared_ext}$versuffix ${libname}${release}${shared_ext}$major
${libname}${shared ext}'
soname_spec='${libname}${release}${shared_ext}$major'
shlibpath_var=LD_LIBRARY_PATH
shlibpath overrides runpath=no
hardcode_into_libs=yes
dynamic_linker='NetBSD ld.elf_so'
;;
netbsd*)
version_type=sunos
need_lib_prefix=no
need version=no
if echo __ELF__ | $CC -E - | $GREP __ELF__ >/dev/null; then
 library_names_spec='$libname$release$shared_ext$versuffix $libname$shared_ext$versuffix'
 finish cmds='PATH="\$PATH:/sbin" ldconfig -m $libdir'
 dynamic_linker='NetBSD (a.out) ld.so'
else
 library names spec='$libname$release$shared ext$versuffix $libname$release$shared ext$major
$libname$shared ext'
 soname spec='$libname$release$shared ext$major'
 dynamic linker='NetBSD ld.elf so'
fi
shlibpath var=LD LIBRARY PATH
shlibpath overrides runpath=yes
hardcode_into_libs=yes
;;
newsos6)
version_type=linux # correct to gnu/linux during the next big refactor
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared ext'
shlibpath_var=LD_LIBRARY_PATH
shlibpath_overrides_runpath=yes
;;
*nto* | *qnx*)
version_type=qnx
need_lib_prefix=no
need_version=no
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared_ext'
soname_spec='$libname$release$shared_ext$major'
```

```
shlibpath_var=LD_LIBRARY_PATH
shlibpath_overrides_runpath=no
hardcode_into_libs=yes
dynamic_linker='ldqnx.so'
;;
openbsd* | bitrig*)
version_type=sunos
sys_lib_dlsearch_path_spec=/usr/lib
need lib prefix=no
if test -z "`echo __ELF__ | $CC -E - | $GREP __ELF__`"; then
 need_version=no
else
 need_version=yes
fi
library_names_spec='$libname$release$shared_ext$versuffix $libname$shared_ext$versuffix'
finish_cmds='PATH="\$PATH:/sbin" ldconfig -m $libdir'
shlibpath var=LD LIBRARY PATH
shlibpath_overrides_runpath=yes
;;
os2*)
libname_spec='$name'
version type=windows
shrext_cmds=.dll
need version=no
need lib prefix=no
# OS/2 can only load a DLL with a base name of 8 characters or less.
soname spec="test -n "$os2dllname" && libname="$os2dllname";
 v=$($ECHO $release$versuffix | tr -d .-);
 n=$($ECHO $libname | cut -b -$((8 - ${#v})) | tr . _);
 $ECHO $n$v`$shared ext'
library_names_spec='${libname}_dll.$libext'
dynamic_linker='OS/2 ld.exe'
shlibpath_var=BEGINLIBPATH
sys_lib_search_path_spec="/lib /usr/local/lib"
sys_lib_dlsearch_path_spec=$sys_lib_search_path_spec
postinstall_cmds='base_file=`basename \$file`~
 dlpath=`$SHELL 2>&1 -c \\". $dir/\\"\$base_file'\"i; $ECHO \$dlname'\\"~
 dldir=$destdir/`dirname \$dlpath`~
 test -d \$dldir || mkdir -p \$dldir~
 $install_prog $dir/$dlname \$dldir/$dlname~
 chmod a+x \$dldir/$dlname~
 if test -n '\"$stripme'\" && test -n '\"$striplib'\"; then
  eval '\"$striplib \$dldir/$dlname'\" || exit \$?;
 fi'
postuninstall_cmds='dldll=`$SHELL 2>&1 -c \\". $file; $ECHO \$dlname\\"`~
 dlpath=$dir/\$dldll~
```

```
$RM \$dlpath'
```

```
;;
```

```
osf3* | osf4* | osf5*)
version_type=osf
need_lib_prefix=no
need version=no
soname_spec='$libname$release$shared_ext$major'
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared ext'
shlibpath_var=LD_LIBRARY_PATH
sys_lib_search_path_spec="/usr/shlib /usr/ccs/lib /usr/lib/cmplrs/cc /usr/lib /usr/local/lib /var/shlib"
sys_lib_dlsearch_path_spec=$sys_lib_search_path_spec
;;
rdos*)
dynamic_linker=no
;;
solaris*)
version_type=linux # correct to gnu/linux during the next big refactor
need_lib_prefix=no
need_version=no
library names spec='$libname$release$shared ext$versuffix $libname$release$shared ext$major
$libname$shared_ext'
soname_spec='$libname$release$shared_ext$major'
shlibpath var=LD LIBRARY PATH
shlibpath_overrides_runpath=yes
hardcode_into_libs=yes
# ldd complains unless libraries are executable
postinstall_cmds='chmod +x $lib'
;;
sunos4*)
version type=sunos
library_names_spec='$libname$release$shared_ext$versuffix $libname$shared_ext$versuffix'
finish_cmds='PATH="\$PATH:/usr/etc" ldconfig $libdir'
shlibpath_var=LD_LIBRARY_PATH
shlibpath_overrides_runpath=yes
if test yes = "$with_gnu_ld"; then
 need_lib_prefix=no
fi
need_version=yes
;;
sysv4 | sysv4.3*)
version_type=linux # correct to gnu/linux during the next big refactor
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
```

```
$libname$shared ext'
soname_spec='$libname$release$shared_ext$major'
shlibpath_var=LD_LIBRARY_PATH
case $host_vendor in
 sni)
  shlibpath_overrides_runpath=no
  need lib prefix=no
  runpath_var=LD_RUN_PATH
  ;;
 siemens)
  need_lib_prefix=no
  ;;
 motorola)
  need_lib_prefix=no
  need_version=no
  shlibpath_overrides_runpath=no
  sys_lib_search_path_spec='/lib /usr/lib /usr/ccs/lib'
  ::
esac
;;
sysv4*MP*)
if test -d /usr/nec; then
 version_type=linux # correct to gnu/linux during the next big refactor
 library_names_spec='$libname$shared_ext.$versuffix $libname$shared_ext.$major $libname$shared_ext'
 soname spec='$libname$shared ext.$major'
 shlibpath_var=LD_LIBRARY_PATH
fi
;;
sysv5* | sco3.2v5* | sco5v6* | unixware* | OpenUNIX* | sysv4*uw2*)
version_type=sco
need_lib_prefix=no
need version=no
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext $libname$release$shared_ext'
soname_spec='$libname$release$shared_ext$major'
shlibpath_var=LD_LIBRARY_PATH
shlibpath_overrides_runpath=yes
hardcode_into_libs=yes
if test yes = "$with_gnu_ld"; then
 sys_lib_search_path_spec='/usr/local/lib /usr/gnu/lib /usr/ccs/lib /usr/lib /lib'
else
 sys_lib_search_path_spec='/usr/ccs/lib /usr/lib'
 case $host_os in
  sco3.2v5*)
   sys_lib_search_path_spec="$sys_lib_search_path_spec /lib"
;;
 esac
```

```
fi
sys_lib_dlsearch_path_spec='/usr/lib'
;;
```

tpf*)

```
# TPF is a cross-target only. Preferred cross-host = GNU/Linux.
version type=linux # correct to gnu/linux during the next big refactor
need_lib_prefix=no
need_version=no
library names spec='$libname$release$shared ext$versuffix $libname$release$shared ext$major
$libname$shared_ext'
shlibpath_var=LD_LIBRARY_PATH
shlibpath_overrides_runpath=no
hardcode_into_libs=yes
;;
uts4*)
version type=linux # correct to gnu/linux during the next big refactor
library_names_spec='$libname$release$shared_ext$versuffix $libname$release$shared_ext$major
$libname$shared_ext'
soname spec='$libname$release$shared ext$major'
shlibpath_var=LD_LIBRARY_PATH
;;
*)
dynamic_linker=no
;;
esac
AC_MSG_RESULT([$dynamic_linker])
test no = "$dynamic_linker" && can_build_shared=no
variables_saved_for_relink="PATH $shlibpath_var $runpath_var"
if test yes = "$GCC"; then
variables_saved_for_relink="$variables_saved_for_relink GCC_EXEC_PREFIX COMPILER_PATH
LIBRARY_PATH"
fi
if test set = "${lt_cv_sys_lib_search_path_spec+set}"; then
sys_lib_search_path_spec=$lt_cv_sys_lib_search_path_spec
fi
if test set = "${lt_cv_sys_lib_dlsearch_path_spec+set}"; then
sys_lib_dlsearch_path_spec=$lt_cv_sys_lib_dlsearch_path_spec
fi
# remember unaugmented sys_lib_dlsearch_path content for libtool script decls...
```

configure_time_dlsearch_path=\$sys_lib_dlsearch_path_spec

... but it needs LT_SYS_LIBRARY_PATH munging for other configure-time code func_munge_path_list sys_lib_dlsearch_path_spec "\$LT_SYS_LIBRARY_PATH"

to be used as default LT_SYS_LIBRARY_PATH value in generated libtool configure_time_lt_sys_library_path=\$LT_SYS_LIBRARY_PATH

LT DECL([], [variables saved for relink], [1], [Variables whose values should be saved in libtool wrapper scripts and restored at link time]) LT DECL([], [need lib prefix], [0], [Do we need the "lib" prefix for modules?]) _LT_DECL([], [need_version], [0], [Do we need a version for libraries?]) _LT_DECL([], [version_type], [0], [Library versioning type]) _LT_DECL([], [runpath_var], [0], [Shared library runtime path variable]) _LT_DECL([], [shlibpath_var], [0], [Shared library path variable]) _LT_DECL([], [shlibpath_overrides_runpath], [0], [Is shlibpath searched before the hard-coded library search path?]) LT DECL([], [libname spec], [1], [Format of library name prefix]) _LT_DECL([], [library_names_spec], [1], [[List of archive names. First name is the real one, the rest are links. The last name is the one that the linker finds with -lNAME]]) _LT_DECL([], [soname_spec], [1], [[The coded name of the library, if different from the real name]]) LT DECL([], [install override mode], [1], [Permission mode override for installation of shared libraries]) LT DECL([], [postinstall cmds], [2], [Command to use after installation of a shared archive]) _LT_DECL([], [postuninstall_cmds], [2], [Command to use after uninstallation of a shared archive]) _LT_DECL([], [finish_cmds], [2], [Commands used to finish a libtool library installation in a directory]) LT DECL([], [finish eval], [1], [[As "finish_cmds", except a single script fragment to be evaled but not shown]]) _LT_DECL([], [hardcode_into_libs], [0], [Whether we should hardcode library paths into libraries]) _LT_DECL([], [sys_lib_search_path_spec], [2], [Compile-time system search path for libraries]) _LT_DECL([sys_lib_dlsearch_path_spec], [configure_time_dlsearch_path], [2], [Detected run-time system search path for libraries]) _LT_DECL([], [configure_time_lt_sys_library_path], [2], [Explicit LT_SYS_LIBRARY_PATH set during ./configure time])])# _LT_SYS_DYNAMIC_LINKER

#_LT_PATH_TOOL_PREFIX(TOOL)

find a file program that can recognize shared library

AC_DEFUN([_LT_PATH_TOOL_PREFIX], [m4_require([_LT_DECL_EGREP])dnl AC_MSG_CHECKING([for \$1]) AC_CACHE_VAL(lt_cv_path_MAGIC_CMD, [case \$MAGIC_CMD in $[[\backslash\backslash/*] | ?:[\backslash\backslash/]*])$ It cv path MAGIC CMD=\$MAGIC CMD # Let the user override the test with a path. ;; *) It save MAGIC CMD=\$MAGIC CMD lt_save_ifs=\$IFS; IFS=\$PATH_SEPARATOR dnl \$ac_dummy forces splitting on constant user-supplied paths. dnl POSIX.2 word splitting is done only on the output of word expansions, dnl not every word. This closes a longstanding sh security hole. ac_dummy="m4_if([\$2], , \$PATH, [\$2])" for ac dir in \$ac dummy; do IFS=\$lt_save_ifs test -z "\$ac dir" && ac dir=. if test -f "\$ac dir/\$1"; then lt_cv_path_MAGIC_CMD=\$ac_dir/"\$1" if test -n "\$file magic test file"; then case \$deplibs_check_method in "file_magic "*) file magic regex=`expr "\$deplibs check method" : "file magic (.*)" MAGIC_CMD=\$lt_cv_path_MAGIC_CMD if eval \$file magic cmd \\$file magic test file 2>/dev/null | \$EGREP "\$file_magic_regex" > /dev/null; then : else cat << LT EOF 1>&2 *** Warning: the command libtool uses to detect shared libraries,

*** \$file_magic_cmd, produces output that libtool cannot recognize.

*** The result is that libtool may fail to recognize shared libraries

*** as such. This will affect the creation of libtool libraries that

*** depend on shared libraries, but programs linked with such libtool

*** libraries will work regardless of this problem. Nevertheless, you *** may want to report the problem to your system manager and/or to *** bug-libtool@gnu.org

_LT_EOF

fi ;; esac fi break fi done IFS=\$lt_save_ifs MAGIC_CMD=\$lt_save_MAGIC_CMD ;; esac]) MAGIC_CMD=\$lt_cv_path_MAGIC_CMD if test -n "\$MAGIC_CMD"; then AC_MSG_RESULT(\$MAGIC_CMD) else AC_MSG_RESULT(no) fi _LT_DECL([], [MAGIC_CMD], [0], [Used to examine libraries when file_magic_cmd begins with "file"])dnl])# _LT_PATH_TOOL_PREFIX

Old name:

AU_ALIAS([AC_PATH_TOOL_PREFIX], [_LT_PATH_TOOL_PREFIX]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([AC_PATH_TOOL_PREFIX], [])

_LT_PATH_MAGIC

find a file program that can recognize a shared library

m4_defun([_LT_PATH_MAGIC],

[_LT_PATH_TOOL_PREFIX(\${ac_tool_prefix}file, /usr/bin\$PATH_SEPARATOR\$PATH)

if test -z "\$lt_cv_path_MAGIC_CMD"; then

if test -n "\$ac_tool_prefix"; then

_LT_PATH_TOOL_PREFIX(file, /usr/bin\$PATH_SEPARATOR\$PATH)

else

MAGIC_CMD=:

fi

fi

])# _LT_PATH_MAGIC

LT_PATH_LD

------# find the pathname to the GNU or non-GNU linker
AC_DEFUN([LT_PATH_LD],
[AC_REQUIRE([AC_PROG_CC])dnl
AC_REQUIRE([AC_CANONICAL_HOST])dnl
AC_REQUIRE([AC_CANONICAL_BUILD])dnl
m4_require([_LT_DECL_SED])dnl
m4_require([_LT_DECL_EGREP])dnl
m4_require([_LT_PROG_ECHO_BACKSLASH])dnl

AC_ARG_WITH([gnu-ld], [AS_HELP_STRING([--with-gnu-ld], [assume the C compiler uses GNU ld @<:@default=no@:>@])],

```
[test no = "$withval" || with_gnu_ld=yes],
 [with_gnu_ld=no])dnl
ac_prog=ld
if test yes = "$GCC"; then
# Check if gcc -print-prog-name=ld gives a path.
AC MSG CHECKING([for ld used by $CC])
case $host in
*-*-mingw*)
 # gcc leaves a trailing carriage return, which upsets mingw
 ac_prog=`($CC -print-prog-name=ld) 2>&5 | tr -d '\015'` ;;
*)
 ac_prog=`($CC -print-prog-name=ld) 2>&5` ;;
esac
case $ac_prog in
 # Accept absolute paths.
 [[\\/]]* | ?:[[\\/]]*)
   re direlt='/[[^/]]*/\.\./'
  # Canonicalize the pathname of ld
   ac_prog=`$ECHO "$ac_prog"| $SED 's%\\\\%/%g'
   while $ECHO "$ac_prog" | $GREP "$re_direlt" > /dev/null 2>&1; do
ac_prog=`$ECHO $ac_prog| $SED "s% $re_direlt%/%"`
   done
   test -z "$LD" && LD=$ac_prog
   ;;
"")
 # If it fails, then pretend we aren't using GCC.
 ac_prog=ld
 ;;
*)
 # If it is relative, then search for the first ld in PATH.
 with_gnu_ld=unknown
 ;;
esac
elif test yes = "$with_gnu_ld"; then
AC_MSG_CHECKING([for GNU ld])
else
AC_MSG_CHECKING([for non-GNU ld])
fi
AC_CACHE_VAL(lt_cv_path_LD,
[if test -z "$LD"; then
lt_save_ifs=$IFS; IFS=$PATH_SEPARATOR
for ac_dir in $PATH; do
 IFS=$lt_save_ifs
 test -z "$ac_dir" && ac_dir=.
 if test -f "$ac_dir/$ac_prog" || test -f "$ac_dir/$ac_prog$ac_exeext"; then
  lt_cv_path_LD=$ac_dir/$ac_prog
   # Check to see if the program is GNU ld. I'd rather use --version,
```

```
# but apparently some variants of GNU ld only accept -v.
   # Break only if it was the GNU/non-GNU ld that we prefer.
   case `"$lt_cv_path_LD" -v 2>&1 </dev/null` in
   *GNU* | *'with BFD'*)
test no != "$with_gnu_ld" && break
;;
   *)
test yes != "$with_gnu_ld" && break
;;
   esac
 fi
done
IFS=$lt save ifs
else
lt_cv_path_LD=$LD # Let the user override the test with a path.
fil)
LD=$lt_cv_path_LD
if test -n "$LD"; then
AC_MSG_RESULT($LD)
else
AC_MSG_RESULT(no)
fi
test -z "$LD" && AC_MSG_ERROR([no acceptable ld found in \$PATH])
LT PATH LD GNU
AC_SUBST([LD])
```

_LT_TAGDECL([], [LD], [1], [The linker used to build libraries])])# LT_PATH_LD

```
# Old names:
AU_ALIAS([AM_PROG_LD], [LT_PATH_LD])
AU_ALIAS([AC_PROG_LD], [LT_PATH_LD])
dnl aclocal-1.4 backwards compatibility:
dnl AC_DEFUN([AM_PROG_LD], [])
dnl AC_DEFUN([AC_PROG_LD], [])
```

```
#_LT_PATH_LD_GNU
```

```
#- -----
m4_defun([_LT_PATH_LD_GNU],
[AC_CACHE_CHECK([if the linker ($LD) is GNU ld], lt_cv_prog_gnu_ld,
[# I'd rather use --version here, but apparently some GNU lds only accept -v.
case `$LD -v 2>&1 </dev/null` in
*GNU* | *'with BFD'*)
lt_cv_prog_gnu_ld=yes
;;
*)
lt_cv_prog_gnu_ld=no</pre>
```

;; esac]) with_gnu_ld=\$lt_cv_prog_gnu_ld])# _LT_PATH_LD_GNU

```
# LT CMD RELOAD
# -----
# find reload flag for linker
# -- PORTME Some linkers may need a different reload flag.
m4_defun([_LT_CMD_RELOAD],
[AC_CACHE_CHECK([for $LD option to reload object files],
lt_cv_ld_reload_flag,
[lt_cv_ld_reload_flag='-r'])
reload_flag=$lt_cv_ld_reload_flag
case $reload_flag in
"" | " "*) ;;
*) reload_flag=" $reload_flag" ;;
esac
reload_cmds='$LD$reload_flag -o $output$reload_objs'
case $host os in
cygwin* | mingw* | pw32* | cegcc*)
 if test yes != "$GCC"; then
  reload cmds=false
 fi
 ;;
darwin*)
 if test yes = "$GCC"; then
  reload_cmds='$LTCC $LTCFLAGS -nostdlib $wl-r -o $output$reload_objs'
 else
  reload_cmds='$LD$reload_flag -o $output$reload_objs'
 fi
 ;;
esac
_LT_TAGDECL([], [reload_flag], [1], [How to create reloadable object files])dnl
_LT_TAGDECL([], [reload_cmds], [2])dnl
])# _LT_CMD_RELOAD
#_LT_PATH_DD
# -----
# find a working dd
m4_defun([_LT_PATH_DD],
[AC_CACHE_CHECK([for a working dd], [ac_cv_path_lt_DD],
[printf 0123456789abcdef0123456789abcdef >conftest.i
cat conftest.i conftest.i >conftest2.i
: \{lt_DD:= DD\}
AC_PATH_PROGS_FEATURE_CHECK([lt_DD], [dd],
```

```
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```

[if "\$ac_path_lt_DD" bs=32 count=1 <conftest2.i >conftest.out 2>/dev/null; then cmp -s conftest.i conftest.out \ && ac_cv_path_lt_DD="\$ac_path_lt_DD" ac_path_lt_DD_found=: fi]) rm -f conftest.i conftest2.i conftest.out])])# _LT_PATH_DD

_LT_CMD_TRUNCATE # ------# find command to truncate a binary pipe m4_defun([_LT_CMD_TRUNCATE], [m4 require([LT PATH DD]) AC_CACHE_CHECK([how to truncate binary pipes], [lt_cv_truncate_bin], [printf 0123456789abcdef0123456789abcdef >conftest.i cat conftest.i conftest.i >conftest2.i lt_cv_truncate_bin= if "\$ac cv path lt DD" bs=32 count=1 <conftest2.i >conftest.out 2>/dev/null; then cmp -s conftest.i conftest.out \ && lt_cv_truncate_bin="\$ac_cv_path_lt_DD bs=4096 count=1" fi rm -f conftest.i conftest2.i conftest.out test -z "\$lt_cv_truncate_bin" && lt_cv_truncate_bin="\$SED -e 4q"]) _LT_DECL([lt_truncate_bin], [lt_cv_truncate_bin], [1], [Command to truncate a binary pipe])

])# _LT_CMD_TRUNCATE

_LT_CHECK_MAGIC_METHOD

how to check for library dependencies

-- PORTME fill in with the dynamic library characteristics

m4_defun([_LT_CHECK_MAGIC_METHOD],

[m4_require([_LT_DECL_EGREP])

m4_require([_LT_DECL_OBJDUMP])

AC_CACHE_CHECK([how to recognize dependent libraries],

lt_cv_deplibs_check_method,

[lt_cv_file_magic_cmd='\$MAGIC_CMD'

lt_cv_file_magic_test_file=

lt_cv_deplibs_check_method='unknown'

Need to set the preceding variable on all platforms that support

interlibrary dependencies.

'none' -- dependencies not supported.

'unknown' -- same as none, but documents that we really don't know.

'pass_all' -- all dependencies passed with no checks.

'test_compile' -- check by making test program.

'file_magic [[regex]]' -- check by looking for files in library path

that responds to the \$file_magic_cmd with a given extended regex.

If you have 'file' or equivalent on your system and you're not sure # whether 'pass_all' will *always* work, you probably want this one.

```
case $host os in
aix[[4-9]]*)
lt_cv_deplibs_check_method=pass_all
;;
beos*)
lt_cv_deplibs_check_method=pass_all
;;
bsdi[[45]]*)
lt_cv_deplibs_check_method='file_magic ELF [[0-9]][[0-9]]*-bit [[ML]]SB (shared object|dynamic lib)'
lt_cv_file_magic_cmd='/usr/bin/file -L'
lt_cv_file_magic_test_file=/shlib/libc.so
;;
cygwin*)
# func_win32_libid is a shell function defined in ltmain.sh
It cv deplibs check method='file magic ^x86 archive import|^x86 DLL'
lt_cv_file_magic_cmd='func_win32_libid'
;;
mingw* | pw32*)
# Base MSYS/MinGW do not provide the 'file' command needed by
# func_win32_libid shell function, so use a weaker test based on 'objdump',
# unless we find 'file', for example because we are cross-compiling.
if (file /) >/dev/null 2>\&1; then
 lt_cv_deplibs_check_method='file_magic ^x86 archive import|^x86 DLL'
 lt_cv_file_magic_cmd='func_win32_libid'
else
 # Keep this pattern in sync with the one in func_win32_libid.
 lt_cv_deplibs_check_method='file_magic file format (pei*-i386(.*architecture: i386)?|pe-arm-wince|pe-x86-64)'
 lt_cv_file_magic_cmd='$OBJDUMP -f'
fi
;;
cegcc*)
# use the weaker test based on 'objdump'. See mingw*.
lt_cv_deplibs_check_method='file_magic file format pe-arm-.*little(.*architecture: arm)?'
lt_cv_file_magic_cmd='$OBJDUMP -f'
;;
darwin* | rhapsody*)
lt_cv_deplibs_check_method=pass_all
;;
```

```
freebsd* | dragonfly*)
if echo __ELF__ | $CC -E - | $GREP __ELF__ > /dev/null; then
 case $host_cpu in
 i*86)
  # Not sure whether the presence of OpenBSD here was a mistake.
  # Let's accept both of them until this is cleared up.
   lt_cv_deplibs_check_method='file_magic (FreeBSD|OpenBSD|DragonFly)/i[[3-9]]86 (compact )?demand paged
shared library'
   lt_cv_file_magic_cmd=/usr/bin/file
   lt cv file magic test file=`echo/usr/lib/libc.so.*`
   ;;
 esac
else
 lt_cv_deplibs_check_method=pass_all
fi
;;
haiku*)
lt_cv_deplibs_check_method=pass_all
;;
hpux10.20* | hpux11*)
lt_cv_file_magic_cmd=/usr/bin/file
case $host cpu in
ia64*)
 lt_cv_deplibs_check_method='file_magic (s[[0-9]][[0-9]][[0-9]][ELF-[[0-9]][[0-9]]) shared object file - IA64'
 lt_cv_file_magic_test_file=/usr/lib/hpux32/libc.so
 ;;
hppa*64*)
 [lt_cv_deplibs_check_method='file_magic (s[0-9][0-9][0-9][ELF[-][0-9][0-9])(-bit)?( [LM]SB)? shared object(
file)?[, -]* PA-RISC [0-9]\.[0-9]']
 lt_cv_file_magic_test_file=/usr/lib/pa20_64/libc.sl
 ;;
*)
 lt_cv_deplibs_check_method='file_magic (s[[0-9]][[0-9]][0-9]]|PA-RISC[[0-9]]\.[[0-9]]) shared library'
 lt_cv_file_magic_test_file=/usr/lib/libc.sl
 ;;
esac
;;
interix[[3-9]]*)
# PIC code is broken on Interix 3.x, that's why |\.a not |_pic\.a here
lt_cv_deplibs_check_method='match_pattern /lib[[^/]]+(\.so|\.a)$'
;;
irix5* | irix6* | nonstopux*)
case $LD in
*-32|*"-32 ") libmagic=32-bit;;
```

```
*-n32|*"-n32 ") libmagic=N32;;
 *-64|*"-64 ") libmagic=64-bit;;
 *) libmagic=never-match;;
 esac
 lt_cv_deplibs_check_method=pass_all
 ;;
# This must be glibc/ELF.
linux* | k*bsd*-gnu | kopensolaris*-gnu | gnu*)
 lt_cv_deplibs_check_method=pass_all
 ;;
netbsd* | netbsdelf*-gnu)
 if echo \_ELF\_ |  $CC -E - | $GREP \_ELF\_ > /dev/null; then
    lt_cv_deplibs_check_method='match_pattern /lib[[^/]]+(\.so\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[[0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.[(0-9]]+\.(0-9]]+\.(0-9]
 else
    lt_cv_deplibs_check_method='match_pattern /lib[[^/]]+(\.so|_pic\.a)$'
 fi
 ;;
newos6*)
 lt_cv_deplibs_check_method='file_magic ELF [[0-9]][[0-9]]*-bit [[ML]]SB (executable|dynamic lib)'
 lt_cv_file_magic_cmd=/usr/bin/file
 lt_cv_file_magic_test_file=/usr/lib/libnls.so
 ;;
*nto* | *qnx*)
 lt_cv_deplibs_check_method=pass_all
 ;;
openbsd* | bitrig*)
 if test -z "`echo __ELF__ | $CC -E - | $GREP __ELF__`"; then
    lt_cv_deplibs_check_method='match_pattern / lib[[^/]] + (.so).[[0-9]] + .[[0-9]] + (.so)_pic).a) 
 else
    lt_cv_deplibs_check_method='match_pattern /lib[[^/]]+(.so\.[[0-9]]+\.[[0-9]]+|_pic\.a)$'
 fi
 ;;
osf3* | osf4* | osf5*)
 lt_cv_deplibs_check_method=pass_all
 ;;
rdos*)
 lt_cv_deplibs_check_method=pass_all
 ;;
solaris*)
 lt_cv_deplibs_check_method=pass_all
```

```
sysv5* | sco3.2v5* | sco5v6* | unixware* | OpenUNIX* | sysv4*uw2*)
lt_cv_deplibs_check_method=pass_all
;;
sysv4 | sysv4.3*)
case $host_vendor in
motorola)
 lt_cv_deplibs_check_method='file_magic ELF [[0-9]][[0-9]]*-bit [[ML]]SB (shared object|dynamic lib) M[[0-
9]][[0-9]]* Version [[0-9]]'
 lt_cv_file_magic_test_file=`echo /usr/lib/libc.so*`
 ;;
ncr)
 lt_cv_deplibs_check_method=pass_all
 ;;
sequent)
 lt_cv_file_magic_cmd='/bin/file'
 lt_cv_deplibs_check_method='file_magic ELF [[0-9]][[0-9]]*-bit [[LM]]SB (shared object|dynamic lib )'
 ;;
sni)
 lt_cv_file_magic_cmd='/bin/file'
 lt_cv_deplibs_check_method="file_magic ELF [[0-9]][[0-9]]*-bit [[LM]]SB dynamic lib"
 lt_cv_file_magic_test_file=/lib/libc.so
 ;;
siemens)
 lt_cv_deplibs_check_method=pass_all
 ;;
pc)
 lt_cv_deplibs_check_method=pass_all
 ;;
esac
;;
tpf*)
lt_cv_deplibs_check_method=pass_all
;;
os2*)
lt_cv_deplibs_check_method=pass_all
;;
esac
1)
file_magic_glob=
want_nocaseglob=no
if test "$build" = "$host"; then
case $host_os in
mingw* | pw32*)
```

;;

```
if ( shopt | grep nocaseglob ) >/dev/null 2>&1; then
```

want_nocaseglob=yes

else

```
file_magic_glob=\columbus cdDeEfFgGhHiIjJkKlLmMnNoOpPqQrRsStTuUvVwWxXyYzZ \ |\ SED - e \ "s/(..)/s/[[\1]]/g;/g"\ (a) \ (b) \
```

fi ;;

esac

fi

file_magic_cmd=\$lt_cv_file_magic_cmd
deplibs_check_method=\$lt_cv_deplibs_check_method
test -z "\$deplibs_check_method" && deplibs_check_method=unknown

_LT_DECL([], [deplibs_check_method], [1],

[Method to check whether dependent libraries are shared objects])

_LT_DECL([], [file_magic_cmd], [1],

[Command to use when deplibs_check_method = "file_magic"])

_LT_DECL([], [file_magic_glob], [1],

[How to find potential files when deplibs_check_method = "file_magic"])

_LT_DECL([], [want_nocaseglob], [1],

[Find potential files using nocaseglob when deplibs_check_method = "file_magic"])

```
])# _LT_CHECK_MAGIC_METHOD
```

LT_PATH_NM

find the pathname to a BSD- or MS-compatible name lister

AC_DEFUN([LT_PATH_NM],

[AC_REQUIRE([AC_PROG_CC])dnl

AC_CACHE_CHECK([for BSD- or MS-compatible name lister (nm)], lt_cv_path_NM,

[if test -n "\$NM"; then

Let the user override the test.

lt_cv_path_NM=\$NM

else

lt_nm_to_check=\${ac_tool_prefix}nm

if test -n "\$ac_tool_prefix" && test "\$build" = "\$host"; then

lt_nm_to_check="\$lt_nm_to_check nm"

fi

for lt_tmp_nm in \$lt_nm_to_check; do

lt_save_ifs=\$IFS; IFS=\$PATH_SEPARATOR

for ac_dir in \$PATH /usr/ccs/bin/elf /usr/ccs/bin /usr/ucb /bin; do

IFS=\$lt_save_ifs

test -z "\$ac_dir" && ac_dir=.

tmp_nm=\$ac_dir/\$lt_tmp_nm

if test -f "\$tmp_nm" || test -f "\$tmp_nm\$ac_exeext"; then

Check to see if the nm accepts a BSD-compat flag.

Adding the 'sed 1q' prevents false positives on HP-UX, which says:

```
# nm: unknown option "B" ignored
# Tru64's nm complains that /dev/null is an invalid object file
# MSYS converts /dev/null to NUL, MinGW nm treats NUL as empty
case $build os in
mingw*) lt_bad_file=conftest.nm/nofile ;;
*) lt_bad_file=/dev/null ;;
esac
case `"$tmp_nm" -B $lt_bad_file 2>&1 | sed '1q'` in
*$lt_bad_file* | *'Invalid file or object type'*)
 lt_cv_path_NM="$tmp_nm -B"
 break 2
 ;;
*)
 case `"$tmp_nm" -p /dev/null 2>&1 | sed '1q'` in
 */dev/null*)
  lt_cv_path_NM="$tmp_nm -p"
  break 2
   ;;
  *)
  lt_cv_path_NM=${lt_cv_path_NM="$tmp_nm"} # keep the first match, but
  continue # so that we can try to find one that supports BSD flags
   ;;
 esac
 ;;
esac
   fi
 done
 IFS=$lt_save_ifs
done
: ${lt_cv_path_NM=no}
fi])
if test no != "$lt_cv_path_NM"; then
NM=$lt_cv_path_NM
else
# Didn't find any BSD compatible name lister, look for dumpbin.
if test -n "$DUMPBIN"; then :
 # Let the user override the test.
else
 AC_CHECK_TOOLS(DUMPBIN, [dumpbin "link -dump"], :)
 case `$DUMPBIN -symbols -headers /dev/null 2>&1 | sed '1q'` in
 *COFF*)
  DUMPBIN="$DUMPBIN -symbols -headers"
   ;;
  *)
  DUMPBIN=:
   ;;
 esac
fi
```

```
AC_SUBST([DUMPBIN])
if test : != "$DUMPBIN"; then
 NM=$DUMPBIN
fi
fi
test -z "$NM" && NM=nm
AC SUBST([NM])
_LT_DECL([], [NM], [1], [A BSD- or MS-compatible name lister])dnl
AC CACHE CHECK([the name lister ($NM) interface], [lt cv nm interface],
[lt_cv_nm_interface="BSD nm"
echo "int some_variable = 0;" > conftest.$ac_ext
(eval echo "\"\$as me:$LINENO: $ac compile\"" >&AS MESSAGE LOG FD)
(eval "$ac_compile" 2>conftest.err)
cat conftest.err >&AS_MESSAGE_LOG_FD
(eval echo "\"\$as_me:$LINENO: $NM \\\"conftest.$ac_objext\\\"\"" >&AS_MESSAGE_LOG_FD)
(eval "$NM \"conftest.$ac_objext\"" 2>conftest.err > conftest.out)
cat conftest.err >&AS MESSAGE LOG FD
(eval echo "\"\$as_me:$LINENO: output\"" >&AS_MESSAGE_LOG_FD)
cat conftest.out >&AS_MESSAGE_LOG_FD
if $GREP 'External.*some variable' conftest.out > /dev/null; then
 lt_cv_nm_interface="MS dumpbin"
fi
rm -f conftest*])
])# LT_PATH_NM
```

Old names:

AU_ALIAS([AM_PROG_NM], [LT_PATH_NM]) AU_ALIAS([AC_PROG_NM], [LT_PATH_NM]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([AM_PROG_NM], []) dnl AC_DEFUN([AC_PROG_NM], [])

_LT_CHECK_SHAREDLIB_FROM_LINKLIB

-----# how to determine the name of the shared library
associated with a specific link library.
-- PORTME fill in with the dynamic library characteristics
m4_defun([_LT_CHECK_SHAREDLIB_FROM_LINKLIB],
[m4_require([_LT_DECL_EGREP])
m4_require([_LT_DECL_OBJDUMP])
m4_require([_LT_DECL_DLLTOOL])
AC_CACHE_CHECK([how to associate runtime and link libraries],
lt_cv_sharedlib_from_linklib_cmd,
[lt_cv_sharedlib_from_linklib_cmd='unknown'

```
case $host_os in
cygwin* | mingw* | pw32* | cegcc*)
```

two different shell functions defined in ltmain.sh; # decide which one to use based on capabilities of \$DLLTOOL case `\$DLLTOOL --help 2>&1` in *--identify-strict*) lt_cv_sharedlib_from_linklib_cmd=func_cygming_dll_for_implib ;; *) lt_cv_sharedlib_from_linklib_cmd=func_cygming_dll_for_implib_fallback ;; esac ;; *) # fallback: assume linklib IS sharedlib lt_cv_sharedlib_from_linklib_cmd=\$ECHO ;; esac]) sharedlib from linklib cmd=\$lt cv sharedlib from linklib cmd test -z "\$sharedlib_from_linklib_cmd" && sharedlib_from_linklib_cmd=\$ECHO _LT_DECL([], [sharedlib_from_linklib_cmd], [1], [Command to associate shared and link libraries])])# _LT_CHECK_SHAREDLIB_FROM_LINKLIB # LT PATH MANIFEST TOOL # ------# locate the manifest tool m4_defun([_LT_PATH_MANIFEST_TOOL], [AC_CHECK_TOOL(MANIFEST_TOOL, mt, :) test -z "\$MANIFEST_TOOL" && MANIFEST_TOOL=mt

AC_CACHE_CHECK([if \$MANIFEST_TOOL is a manifest tool], [lt_cv_path_mainfest_tool],

[lt_cv_path_mainfest_tool=no

echo "\$as_me:\$LINENO: \$MANIFEST_TOOL '-?'" >&AS_MESSAGE_LOG_FD

\$MANIFEST_TOOL '-?' 2>conftest.err > conftest.out

cat conftest.err >&AS_MESSAGE_LOG_FD

if GREP 'Manifest Tool' conftest.out > /dev/null; then

lt_cv_path_mainfest_tool=yes

```
fi
```

rm -f conftest*])
if test yes != "\$lt_cv_path_mainfest_tool"; then

h test yes := \$h_ev_path_mannest_too

MANIFEST_TOOL=:

fi

_LT_DECL([], [MANIFEST_TOOL], [1], [Manifest tool])dnl])#_LT_PATH_MANIFEST_TOOL

_LT_DLL_DEF_P([FILE])

----# True iff FILE is a Windows DLL '.def' file.
Keep in sync with func_dll_def_p in the libtool script
AC_DEFUN([_LT_DLL_DEF_P],
[dnl
test DEF = "`\$SED -n dnl
 -e '\"s/^[[]]*//'\" dnl Strip leading whitespace
 -e '\"/^\(;.*\)*\$/d\" dnl Delete empty lines and comments
 -e '\"s/^(EXPORTS\/LIBRARY\)\([[]].*\)*\$/DEF/p\" dnl
 -e q dnl Only consider the first "real" line
\$1`" dnl
])# _LT_DLL_DEF_P

```
# LT_LIB_M
```

-----# check for math library AC DEFUN([LT LIB M], [AC_REQUIRE([AC_CANONICAL_HOST])dnl LIBM= case \$host in *-*-beos* | *-*-cegcc* | *-*-cygwin* | *-*-haiku* | *-*-pw32* | *-*-darwin*) # These system don't have libm, or don't need it ;; *-ncr-sysv4.3*) AC_CHECK_LIB(mw, _mwvalidcheckl, LIBM=-lmw) AC_CHECK_LIB(m, cos, LIBM="\$LIBM -lm") ;; *) AC_CHECK_LIB(m, cos, LIBM=-lm) ;; esac AC_SUBST([LIBM])])#LT LIB M

Old name: AU_ALIAS([AC_CHECK_LIBM], [LT_LIB_M]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([AC_CHECK_LIBM], [])

LT_COMPILER_NO_RTTI([TAGNAME])

m4_defun([_LT_COMPILER_NO_RTTI], [m4_require([_LT_TAG_COMPILER])dnl

_LT_TAGVAR(lt_prog_compiler_no_builtin_flag, \$1)=

if test yes = "\$GCC"; then
case \$cc_basename in
nvcc*)
 _LT_TAGVAR(lt_prog_compiler_no_builtin_flag, \$1)=' -Xcompiler -fno-builtin' ;;
*)
 _LT_TAGVAR(lt_prog_compiler_no_builtin_flag, \$1)=' -fno-builtin' ;;
esac

_LT_COMPILER_OPTION([if \$compiler supports -fno-rtti -fno-exceptions],

lt_cv_prog_compiler_rtti_exceptions,

[-fno-rtti -fno-exceptions], [],

[_LT_TAGVAR(lt_prog_compiler_no_builtin_flag, \$1)="\$_LT_TAGVAR(lt_prog_compiler_no_builtin_flag, \$1)-fno-rtti -fno-exceptions"])

fi

ſ

_LT_TAGDECL([no_builtin_flag], [lt_prog_compiler_no_builtin_flag], [1], [Compiler flag to turn off builtin functions])

])# _LT_COMPILER_NO_RTTI

_LT_CMD_GLOBAL_SYMBOLS

m4_defun([_LT_CMD_GLOBAL_SYMBOLS], [AC_REQUIRE([AC_CANONICAL_HOST])dnl AC_REQUIRE([AC_PROG_CC])dnl AC_REQUIRE([AC_PROG_AWK])dnl AC_REQUIRE([LT_PATH_NM])dnl AC_REQUIRE([LT_PATH_LD])dnl m4_require([_LT_DECL_SED])dnl m4_require([_LT_DECL_EGREP])dnl

Check for command to grab the raw symbol name followed by C symbol from nm. AC_MSG_CHECKING([command to parse \$NM output from \$compiler object]) AC_CACHE_VAL([lt_cv_sys_global_symbol_pipe],

These are sane defaults that work on at least a few old systems.

[They come from Ultrix. What could be older than Ultrix?!!;)]

Character class describing NM global symbol codes. symcode='[[BCDEGRST]]'

Regexp to match symbols that can be accessed directly from C. sympat='\([[_A-Za-z]][[_A-Za-z0-9]]*\)'

Define system-specific variables. case \$host_os in aix*) symcode='[[BCDT]]'

```
;;
cygwin* | mingw* | pw32* | cegcc*)
symcode='[[ABCDGISTW]]'
;;
hpux*)
if test ia64 = "$host_cpu"; then
 symcode='[[ABCDEGRST]]'
fi
;;
irix* | nonstopux*)
symcode='[[BCDEGRST]]'
;;
osf*)
symcode='[[BCDEGQRST]]'
;;
solaris*)
symcode='[[BDRT]]'
;;
sco3.2v5*)
symcode='[[DT]]'
;;
sysv4.2uw2*)
symcode='[[DT]]'
;;
sysv5* | sco5v6* | unixware* | OpenUNIX*)
symcode='[[ABDT]]'
;;
sysv4)
symcode='[[DFNSTU]]'
;;
esac
# If we're using GNU nm, then use its standard symbol codes.
case `$NM -V 2>&1` in
*GNU* | *'with BFD'*)
symcode='[[ABCDGIRSTW]]' ;;
esac
if test "$lt_cv_nm_interface" = "MS dumpbin"; then
# Gets list of data symbols to import.
lt_cv_sys_global_symbol_to_import="sed -n -e 's/^I .* (.*)$/\1/p'''
# Adjust the below global symbol transforms to fixup imported variables.
lt_cdecl_hook="-e's/^I.* (.*)/extern __declspec(dllimport) char 1;/p'''
lt_c_name_hook=" -e 's/^I .* (.*)$/ {\"\1\", (void *) 0},/p'''
```

```
lt_c_name_lib_hook="\
-e 's/^I .* \(lib.*\)$/ {\"\1\", (void *) 0},/p"\
```

```
-e 's/^I .* \(.*\)$/ {\"lib\1\", (void *) 0},/p"
```

```
else
```

```
# Disable hooks by default.
lt_cv_sys_global_symbol_to_import=
lt_cdecl_hook=
lt_c_name_hook=
lt_c_name_lib_hook=
fi
```

Transform an extracted symbol line into a proper C declaration. # Some systems (esp. on ia64) link data and code symbols differently, # so use this general approach. lt_cv_sys_global_symbol_to_cdecl="sed -n"\ \$lt_cdecl_hook\ " -e 's/^T .* \(.*\)\$/extern int \1();/p"'\ " -e 's/^\$symcode\$symcode* .* \(.*\)\$/extern char \1;/p"'

Transform an extracted symbol line into symbol name and symbol address
lt_cv_sys_global_symbol_to_c_name_address="sed -n"\
\$lt_c_name_hook\
" -e 's/^: \(.*\) .*\$/ {\"\1\", (void *) 0},/p"'\
" -e 's/^\$symcode\$symcode* .* \(.*\)\$/ {\"\1\", (void *) \&\1},/p""

Transform an extracted symbol line into symbol name with lib prefix and # symbol address.

lt_cv_sys_global_symbol_to_c_name_address_lib_prefix="sed -n"\
\$lt_c_name_lib_hook\
" -e 's/^: \(.*\) .*\$/ {\"\1\", (void *) 0},/p"'\
" -e 's/^\$symcode\$symcode* .* \(lib.*\)\$/ {\"\1\", (void *) \&\1},/p"'\
" -e 's/^\$symcode\$symcode* .* \(.*\)\$/ {\"lib\1\", (void *) \&\1},/p"'

Handle CRLF in mingw tool chain

opt_cr= case \$build_os in mingw*) opt_cr=`\$ECHO 'x\{0,1\}' | tr x '\015`` # option cr in regexp ;; esac

Try without a prefix underscore, then with it.
for ac_symprfx in "" "_"; do

Transform symcode, sympat, and symprfx into a raw symbol and a C symbol. symxfrm="\\1 \$ac_symprfx\\2 \\2"

Write the raw and C identifiers. if test "\$lt_cv_nm_interface" = "MS dumpbin"; then # Fake it for dumpbin and say T for any non-static function, # D for any global variable and I for any imported variable. # Also find C++ and __fastcall symbols from MSVC++, # which start with @ or ?.

lt_cv_sys_global_symbol_pipe="\$AWK ['"\

- " {last_section=section; section= $\3;$ "\
- " /^COFF SYMBOL TABLE/{for(i in hide) delete hide[i]};"\
- $\label{eq:section_se$
- " /^ *Symbol name *: /{split(\\$ 0,sn,\":\"); si=substr(sn[2],2)};"\
- " /^ *Type *: code/{print \"T\",si,substr(si,length(prfx))};"\
- " /^ *Type *: data/{print \"I\",si,substr(si,length(prfx))};"\
- " $\ \ 0! \sim External \ |/{next};"$
- " / 0+ UNDEF /{next}; / UNDEF $([^]))*()/{next};"$
- " {if(hide[section]) next};"\
- " {f=\"D\"}; $0 \sim (().*(|/{f=|"T\"};")$
- " {split($\ 0,a,/\parallel/r/$); split(a[2],s)};"\
- " s[1]~/^[@?]/{print f,s[1],s[1]; next};"\
- " ' prfx=^\$ac_symprfx]"

else

lt_cv_sys_global_symbol_pipe="sed -n -e 's/^.*[[]]\(\$symcode\$symcode*\)[[]][[]]*\$ac_symprfx\$sympat\$opt_cr\$/\$symxfrm/p'''

fi

```
lt_cv_sys_global_symbol_pipe="$lt_cv_sys_global_symbol_pipe | sed '/ __gnu_lto/d'"
```

```
# Check to see that the pipe works correctly.
pipe_works=no
```

```
rm -f conftest*
cat > conftest.$ac_ext <<_LT_EOF
#ifdef __cplusplus
extern "C" {
#endif
char nm_test_var;
void nm_test_func(void);
void nm_test_func(void){}
#ifdef __cplusplus
}
#endif
int main(){nm_test_var='a';nm_test_func();return(0);}
_LT_EOF</pre>
```

```
if AC_TRY_EVAL(ac_compile); then
    # Now try to grab the symbols.
    nlist=conftest.nm
    if AC_TRY_EVAL(NM conftest.$ac_objext \| "$lt_cv_sys_global_symbol_pipe" \> $nlist) && test -s "$nlist";
then
    # Try sorting and uniquifying the output.
    if sort "$nlist" | uniq > "$nlist"T; then
    mv -f "$nlist"T "$nlist"
    else
```

```
rm -f "$nlist"T
fi
```

```
# Make sure that we snagged all the symbols we need.
   if $GREP ' nm_test_var$' "$nlist" >/dev/null; then
 if $GREP ' nm_test_func$' "$nlist" >/dev/null; then
  cat << LT EOF > conftest.$ac ext
/* Keep this code in sync between libtool.m4, ltmain, lt_system.h, and tests. */
#if defined _WIN32 || defined __CYGWIN__ || defined _WIN32_WCE
/* DATA imports from DLLs on WIN32 can't be const, because runtime
 relocations are performed -- see ld's documentation on pseudo-relocs. */
# define LT@&t@_DLSYM_CONST
#elif defined osf
/* This system does not cope well with relocations in const data. */
# define LT@&t@_DLSYM_CONST
#else
# define LT@&t@_DLSYM_CONST const
#endif
#ifdef __cplusplus
extern "C" {
#endif
LT EOF
  # Now generate the symbol file.
  eval "$lt_cv_sys_global_symbol_to_cdecl"' < "$nlist" | $GREP -v main >> conftest.$ac_ext'
  cat <<_LT_EOF >> conftest.$ac_ext
/* The mapping between symbol names and symbols. */
LT@&t@_DLSYM_CONST struct {
 const char *name;
 void
          *address;
}
lt_PROGRAM_LTX_preloaded_symbols[[]] =
{
 { "@PROGRAM@", (void *) 0 },
LT EOF
  SED "s/^$symcode$symcode$ .* (.*)$/ {\"\1\", (void *) \&\1},/" < "$nlist" | $GREP -v main >> (.*)$/ {\"\1\", (void *) \&\1},/" < "$nlist" | $GREP -v main >> (.*)$/ {\"\1\", (void *) \&\1},/" < "$nlist" | $GREP -v main >> (.*)$/ {\"\1\", (void *) \&\1},/" < "$nlist" | $GREP -v main >> (.*)$/ {\"\1\", (void *) \&\1},/" < "$nlist" | $GREP -v main >> (.*)$/ {\"\1\", (void *) \\..., (.*)}
conftest.$ac_ext
  cat <<\_LT_EOF >> conftest.$ac_ext
 \{0, (void *) 0\}
};
/* This works around a problem in FreeBSD linker */
#ifdef FREEBSD_WORKAROUND
static const void *lt_preloaded_setup() {
```

return lt_PROGRAM_LTX_preloaded_symbols;

```
}
#endif
#ifdef __cplusplus
}
#endif
LT EOF
 # Now try linking the two files.
 mv -f conftest.$ac_objext conftstm.$ac_objext
 lt_globsym_save_LIBS=$LIBS
 lt_globsym_save_CFLAGS=$CFLAGS
 LIBS=conftstm.$ac_objext
 CFLAGS="$CFLAGS$_LT_TAGVAR(lt_prog_compiler_no_builtin_flag, $1)"
 if AC_TRY_EVAL(ac_link) && test -s conftest$ac_exeext; then
  pipe_works=yes
 fi
 LIBS=$lt_globsym_save_LIBS
 CFLAGS=$lt_globsym_save_CFLAGS
else
 echo "cannot find nm_test_func in $nlist" >&AS_MESSAGE_LOG_FD
fi
  else
echo "cannot find nm_test_var in $nlist" >&AS_MESSAGE_LOG_FD
  fi
 else
  echo "cannot run $lt_cv_sys_global_symbol_pipe" >&AS_MESSAGE_LOG_FD
 fi
else
 echo "$progname: failed program was:" >&AS_MESSAGE_LOG_FD
 cat conftest.$ac ext >&5
fi
rm -rf conftest* conftst*
# Do not use the global_symbol_pipe unless it works.
if test yes = "$pipe_works"; then
 break
else
 lt_cv_sys_global_symbol_pipe=
fi
done
1)
if test -z "$lt_cv_sys_global_symbol_pipe"; then
lt_cv_sys_global_symbol_to_cdecl=
fi
if test -z "$lt_cv_sys_global_symbol_pipe$lt_cv_sys_global_symbol_to_cdecl"; then
AC_MSG_RESULT(failed)
else
AC_MSG_RESULT(ok)
```

fi

Response file support.
if test "\$lt_cv_nm_interface" = "MS dumpbin"; then
nm_file_list_spec='@'
elif \$NM --help 2>/dev/null | grep '[[@]]FILE' >/dev/null; then
nm_file_list_spec='@'
fi

_LT_DECL([global_symbol_pipe], [lt_cv_sys_global_symbol_pipe], [1], [Take the output of nm and produce a listing of raw symbols and C names]) _LT_DECL([global_symbol_to_cdecl], [lt_cv_sys_global_symbol_to_cdecl], [1], [Transform the output of nm in a proper C declaration]) _LT_DECL([global_symbol_to_import], [lt_cv_sys_global_symbol_to_import], [1], [Transform the output of nm into a list of symbols to manually relocate]) LT DECL([global symbol to c name address], [lt_cv_sys_global_symbol_to_c_name_address], [1], [Transform the output of nm in a C name address pair]) _LT_DECL([global_symbol_to_c_name_address_lib_prefix], [lt_cv_sys_global_symbol_to_c_name_address_lib_prefix], [1], [Transform the output of nm in a C name address pair when lib prefix is needed]) _LT_DECL([nm_interface], [lt_cv_nm_interface], [1], [The name lister interface]) LT DECL([], [nm file list spec], [1], [Specify filename containing input files for \$NM])

]) # _LT_CMD_GLOBAL_SYMBOLS

_LT_COMPILER_PIC([TAGNAME])

m4_defun([_LT_COMPILER_PIC],

 $[m4_require([_LT_TAG_COMPILER])dnl$

_LT_TAGVAR(lt_prog_compiler_wl, \$1)=

_LT_TAGVAR(lt_prog_compiler_pic, \$1)=

_LT_TAGVAR(lt_prog_compiler_static, \$1)=

m4_if([\$1], [CXX], [

C++ specific cases for pic, static, wl, etc.

if test yes = "\$GXX"; then

_LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,'

_LT_TAGVAR(lt_prog_compiler_static, \$1)='-static'

case \$host_os in aix*) # All AIX code is PIC. if test ia64 = "\$host_cpu"; then # AIX 5 now supports IA64 processor _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic'

```
fi
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
  ;;
 amigaos*)
  case $host_cpu in
  powerpc)
     # see comment about AmigaOS4 .so support
     _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
   ;;
  m68k)
     # FIXME: we need at least 68020 code to build shared libraries, but
     # adding the '-m68020' flag to GCC prevents building anything better,
     # like '-m68040'.
      _LT_TAGVAR(lt_prog_compiler_pic, $1)='-m68020 -resident32 -malways-restore-a4'
   ;;
  esac
  ;;
 beos* | irix5* | irix6* | nonstopux* | osf3* | osf4* | osf5*)
  # PIC is the default for these OSes.
  ;;
 mingw* | cygwin* | os2* | pw32* | cegcc*)
  # This hack is so that the source file can tell whether it is being
  # built for inclusion in a dll (and should export symbols for example).
  # Although the cygwin gcc ignores -fPIC, still need this for old-style
  # (--disable-auto-import) libraries
  m4_if([$1], [GCJ], [],
[_LT_TAGVAR(lt_prog_compiler_pic, $1)='-DDLL_EXPORT'])
  case $host os in
  os2*)
_LT_TAGVAR(lt_prog_compiler_static, $1)='$wl-static'
;;
  esac
  ;;
 darwin* | rhapsody*)
  # PIC is the default on this platform
  # Common symbols not allowed in MH_DYLIB files
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fno-common'
  ;;
 *djgpp*)
 # DJGPP does not support shared libraries at all
  _LT_TAGVAR(lt_prog_compiler_pic, $1)=
  ;;
 haiku*)
  # PIC is the default for Haiku.
  # The "-static" flag exists, but is broken.
  _LT_TAGVAR(lt_prog_compiler_static, $1)=
```

```
;;
 interix[[3-9]]*)
  # Interix 3.x gcc -fpic/-fPIC options generate broken code.
  # Instead, we relocate shared libraries at runtime.
  ;;
 sysv4*MP*)
  if test -d /usr/nec; then
_LT_TAGVAR(lt_prog_compiler_pic, $1)=-Kconform_pic
  fi
  ;;
 hpux*)
  # PIC is the default for 64-bit PA HP-UX, but not for 32-bit
  # PA HP-UX. On IA64 HP-UX, PIC is the default but the pic flag
  # sets the default TLS model and affects inlining.
  case $host_cpu in
  hppa*64*)
;;
  *)
_LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
;;
  esac
  ;;
 *qnx* | *nto*)
  # QNX uses GNU C++, but need to define -shared option too, otherwise
  # it will coredump.
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC -shared'
  ;;
 *)
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
  ;;
 esac
else
 case $host os in
  aix[[4-9]]*)
# All AIX code is PIC.
if test ia64 = "$host_cpu"; then
 # AIX 5 now supports IA64 processor
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
else
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-bnso -bI:/lib/syscalls.exp'
fi
;;
  chorus*)
case $cc_basename in
cxch68*)
 # Green Hills C++ Compiler
 #_LT_TAGVAR(lt_prog_compiler_static, $1)="--no_auto_instantiation -u __main -u __bremain -u _abort -r
$COOL_DIR/lib/libOrb.a $MVME_DIR/lib/CC/libC.a $MVME_DIR/lib/classix/libcx.s.a"
```

```
;;
esac
;;
  mingw* | cygwin* | os2* | pw32* | cegcc*)
# This hack is so that the source file can tell whether it is being
# built for inclusion in a dll (and should export symbols for example).
m4 if([$1], [GCJ], [],
 [_LT_TAGVAR(lt_prog_compiler_pic, $1)='-DDLL_EXPORT'])
;;
  dgux*)
case $cc_basename in
 ec++*)
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
  ;;
 ghcx*)
  # Green Hills C++ Compiler
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-pic'
  ;;
 *)
  ;;
esac
;;
  freebsd* | dragonfly*)
# FreeBSD uses GNU C++
;;
  hpux9* | hpux10* | hpux11*)
case $cc_basename in
CC*)
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='$wl-a ${wl}archive'
  if test ia64 != "$host_cpu"; then
   _LT_TAGVAR(lt_prog_compiler_pic, $1)='+Z'
  fi
  ;;
 aCC*)
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='$wl-a ${wl}archive'
  case $host_cpu in
  hppa*64*|ia64*)
   \# +Z the default
   ;;
  *)
   _LT_TAGVAR(lt_prog_compiler_pic, $1)='+Z'
   ;;
  esac
  ;;
 *)
  ;;
```

```
esac
;;
  interix*)
# This is c89, which is MS Visual C++ (no shared libs)
# Anyone wants to do a port?
;;
  irix5* | irix6* | nonstopux*)
case $cc_basename in
 CC*)
  LT TAGVAR(lt prog compiler wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-non_shared'
 # CC pic flag -KPIC is the default.
  ;;
 *)
  ;;
esac
;;
  linux* | k*bsd*-gnu | kopensolaris*-gnu | gnu*)
case $cc basename in
 KCC*)
  # KAI C++ Compiler
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='--backend -Wl,'
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
  ;;
 ecpc*)
  # old Intel C++ for x86 64, which still supported -KPIC.
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-static'
  ;;
 icpc*)
  # Intel C++, used to be incompatible with GCC.
  # ICC 10 doesn't accept -KPIC any more.
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-static'
  ;;
 pgCC* | pgcpp*)
  # Portland Group C++ compiler
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fpic'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
  ;;
 cxx*)
  # Compaq C++
  # Make sure the PIC flag is empty. It appears that all Alpha
  # Linux and Compaq Tru64 Unix objects are PIC.
  _LT_TAGVAR(lt_prog_compiler_pic, $1)=
```

```
_LT_TAGVAR(lt_prog_compiler_static, $1)='-non_shared'
  ;;
 xlc* | xlC* | bgxl[[cC]]* | mpixl[[cC]]*)
  # IBM XL 8.0, 9.0 on PPC and BlueGene
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-qpic'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-qstaticlink'
  ;;
 *)
  case `$CC -V 2>&1 | sed 5q` in
  Sun(C^*)
   # Sun C++ 5.9
   _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
   _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
   _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Qoption ld '
   ;;
  esac
  ;;
esac
;;
  lynxos*)
;;
  m88k*)
;;
  mvs*)
case $cc_basename in
 cxx*)
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-W c,exportall'
 ;;
 *)
  ;;
esac
;;
  netbsd* | netbsdelf*-gnu)
;;
  *qnx* | *nto*)
   # QNX uses GNU C++, but need to define -shared option too, otherwise
   # it will coredump.
   _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC -shared'
   ;;
  osf3* | osf4* | osf5*)
case $cc_basename in
 KCC*)
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='--backend -Wl,'
  ;;
 RCC*)
  # Rational C++ 2.4.1
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-pic'
```

```
;;
 cxx*)
  # Digital/Compaq C++
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  # Make sure the PIC flag is empty. It appears that all Alpha
  # Linux and Compaq Tru64 Unix objects are PIC.
  _LT_TAGVAR(lt_prog_compiler_pic, $1)=
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-non_shared'
  ;;
 *)
  ;;
esac
;;
  psos*)
;;
  solaris*)
case $cc_basename in
 CC* | sunCC*)
  # Sun C++ 4.2, 5.x and Centerline C++
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Qoption ld '
  ;;
 gcx*)
  # Green Hills C++ Compiler
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-PIC'
  ;;
 *)
  ;;
esac
;;
  sunos4*)
case $cc_basename in
 CC*)
  # Sun C++ 4.x
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-pic'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
  ;;
 lcc*)
  # Lucid
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-pic'
  ;;
 *)
  ;;
esac
;;
  sysv5* | unixware* | sco3.2v5* | sco5v6* | OpenUNIX*)
case $cc_basename in
```

```
CC*)
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
  ;;
esac
::
  tandem*)
case $cc_basename in
 NCC*)
  # NonStop-UX NCC 3.20
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
  ;;
 *)
  ;;
esac
;;
  vxworks*)
;;
  *)
_LT_TAGVAR(lt_prog_compiler_can_build_shared, $1)=no
;;
 esac
fi
],
ſ
if test yes = "$GCC"; then
 _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-static'
 case $host_os in
  aix*)
  # All AIX code is PIC.
  if test ia64 = "$host_cpu"; then
# AIX 5 now supports IA64 processor
_LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
  fi
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
  ;;
 amigaos*)
  case $host_cpu in
  powerpc)
      # see comment about AmigaOS4 .so support
      _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
   ;;
  m68k)
      # FIXME: we need at least 68020 code to build shared libraries, but
```

```
# adding the '-m68020' flag to GCC prevents building anything better,
      # like '-m68040'.
      _LT_TAGVAR(lt_prog_compiler_pic, $1)='-m68020 -resident32 -malways-restore-a4'
   ;;
  esac
  ;;
 beos* | irix5* | irix6* | nonstopux* | osf3* | osf4* | osf5*)
  # PIC is the default for these OSes.
  ;;
 mingw* | cygwin* | pw32* | os2* | cegcc*)
  # This hack is so that the source file can tell whether it is being
  # built for inclusion in a dll (and should export symbols for example).
  # Although the cygwin gcc ignores -fPIC, still need this for old-style
  # (--disable-auto-import) libraries
  m4_if([$1], [GCJ], [],
[LT TAGVAR(lt prog compiler pic, $1)='-DDLL EXPORT'])
  case $host os in
  os2*)
_LT_TAGVAR(lt_prog_compiler_static, $1)='$wl-static'
;;
  esac
  ;;
 darwin* | rhapsody*)
  # PIC is the default on this platform
  # Common symbols not allowed in MH_DYLIB files
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fno-common'
  ;;
 haiku*)
  # PIC is the default for Haiku.
  # The "-static" flag exists, but is broken.
  _LT_TAGVAR(lt_prog_compiler_static, $1)=
  ;;
 hpux*)
  # PIC is the default for 64-bit PA HP-UX, but not for 32-bit
  # PA HP-UX. On IA64 HP-UX, PIC is the default but the pic flag
  # sets the default TLS model and affects inlining.
  case $host_cpu in
  hppa*64*)
#+Z the default
;;
  *)
_LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
;;
```

```
esac
  ;;
 interix[[3-9]]*)
  # Interix 3.x gcc -fpic/-fPIC options generate broken code.
  # Instead, we relocate shared libraries at runtime.
  ;;
 msdosdjgpp*)
  # Just because we use GCC doesn't mean we suddenly get shared libraries
  # on systems that don't support them.
  _LT_TAGVAR(lt_prog_compiler_can_build_shared, $1)=no
  enable shared=no
  ;;
 *nto* | *qnx*)
  # QNX uses GNU C++, but need to define -shared option too, otherwise
  # it will coredump.
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC -shared'
  ;;
 sysv4*MP*)
  if test -d /usr/nec; then
_LT_TAGVAR(lt_prog_compiler_pic, $1)=-Kconform_pic
  fi
  ;;
 *)
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
  ;;
 esac
 case $cc basename in
 nvcc*) # Cuda Compiler Driver 2.2
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Xlinker '
  if test -n "$_LT_TAGVAR(lt_prog_compiler_pic, $1)"; then
   _LT_TAGVAR(lt_prog_compiler_pic, $1)="-Xcompiler $_LT_TAGVAR(lt_prog_compiler_pic, $1)"
  fi
  ;;
 esac
else
 # PORTME Check for flag to pass linker flags through the system compiler.
 case $host_os in
 aix*)
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  if test ia64 = "$host_cpu"; then
# AIX 5 now supports IA64 processor
_LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
```

```
else
_LT_TAGVAR(lt_prog_compiler_static, $1)='-bnso -bI:/lib/syscalls.exp'
  fi
  ;;
 darwin* | rhapsody*)
  # PIC is the default on this platform
  # Common symbols not allowed in MH_DYLIB files
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fno-common'
  case $cc basename in
  nagfor*)
   # NAG Fortran compiler
   _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,-Wl,,'
   _LT_TAGVAR(lt_prog_compiler_pic, $1)='-PIC'
   _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
   ;;
  esac
  ;;
 mingw* | cygwin* | pw32* | os2* | cegcc*)
  # This hack is so that the source file can tell whether it is being
  # built for inclusion in a dll (and should export symbols for example).
  m4_if([$1], [GCJ], [],
[_LT_TAGVAR(lt_prog_compiler_pic, $1)='-DDLL_EXPORT'])
  case $host_os in
  os2*)
_LT_TAGVAR(lt_prog_compiler_static, $1)='$wl-static'
;;
  esac
  ;;
 hpux9* | hpux10* | hpux11*)
  _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
  # PIC is the default for IA64 HP-UX and 64-bit HP-UX, but
  # not for PA HP-UX.
  case $host_cpu in
  hppa*64*|ia64*)
#+Z the default
;;
  *)
_LT_TAGVAR(lt_prog_compiler_pic, $1)='+Z'
;;
  esac
  # Is there a better lt_prog_compiler_static that works with the bundled CC?
  _LT_TAGVAR(lt_prog_compiler_static, $1)='$wl-a ${wl}archive'
  ;;
 irix5* | irix6* | nonstopux*)
```

_LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' # PIC (with -KPIC) is the default. _LT_TAGVAR(lt_prog_compiler_static, \$1)='-non_shared' ;; linux* | k*bsd*-gnu | kopensolaris*-gnu | gnu*) case \$cc basename in # old Intel for x86_64, which still supported -KPIC. ecc*) LT TAGVAR(lt prog compiler wl, \$1)='-Wl,' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-KPIC' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-static' ;; # icc used to be incompatible with GCC. # ICC 10 doesn't accept -KPIC any more. icc* | ifort*) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' LT TAGVAR(lt prog compiler pic, \$1)='-fPIC' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-static' ;; # Lahey Fortran 8.1. lf95*) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='--shared' _LT_TAGVAR(lt_prog_compiler_static, \$1)='--static' :: nagfor*) # NAG Fortran compiler _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,-Wl,,' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-PIC' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' ;; tcc*) # Fabrice Bellard et al's Tiny C Compiler _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-fPIC' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-static' :: pgcc* | pgf77* | pgf90* | pgf95* | pgfortran*) # Portland Group compilers (*not* the Pentium gcc compiler, # which looks to be a dead project) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-fpic' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' ;; ccc*)

_LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' # All Alpha code is PIC.

```
_LT_TAGVAR(lt_prog_compiler_static, $1)='-non_shared'
   ;;
  xl* | bgxl* | bgf* | mpixl*)
# IBM XL C 8.0/Fortran 10.1, 11.1 on PPC and BlueGene
_LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
_LT_TAGVAR(lt_prog_compiler_pic, $1)='-qpic'
_LT_TAGVAR(lt_prog_compiler_static, $1)='-qstaticlink'
;;
  *)
case `$CC -V 2>&1 | sed 5q` in
Sun Ceres Fortran | Sun Fortran ([1-7]]. | Sun Fortran (8.[[0-3]])
 # Sun Fortran 8.3 passes all unrecognized flags to the linker
 LT TAGVAR(lt prog compiler pic, $1)='-KPIC'
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
 _LT_TAGVAR(lt_prog_compiler_wl, $1)="
 ;;
*Sun\ F* | *Sun*Fortran*)
 LT TAGVAR(lt prog compiler pic, $1)='-KPIC'
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
 _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Qoption ld '
 ::
*Sun\ C*)
 # Sun C 5.9
 _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
 _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
 ;;
   *Intel*\[[CF]]*Compiler*)
 _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
 _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fPIC'
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-static'
 ::
*Portland\ Group*)
 _LT_TAGVAR(lt_prog_compiler_wl, $1)='-Wl,'
 _LT_TAGVAR(lt_prog_compiler_pic, $1)='-fpic'
 _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
 ;;
esac
;;
  esac
  ;;
 newsos6)
  _LT_TAGVAR(lt_prog_compiler_pic, $1)='-KPIC'
  _LT_TAGVAR(lt_prog_compiler_static, $1)='-Bstatic'
  ;;
 *nto* | *qnx*)
```

QNX uses GNU C++, but need to define -shared option too, otherwise # it will coredump. _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-fPIC -shared' ;; osf3* | osf4* | osf5*) LT TAGVAR(lt prog compiler wl, \$1)='-Wl,' # All OSF/1 code is PIC. _LT_TAGVAR(lt_prog_compiler_static, \$1)='-non_shared' ;; rdos*) _LT_TAGVAR(lt_prog_compiler_static, \$1)='-non_shared' ;; solaris*) _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-KPIC' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' case \$cc basename in f77* | f90* | f95* | sunf77* | sunf90* | sunf95*) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Qoption ld ';; *) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,';; esac ;; sunos4*) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Qoption ld ' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-PIC' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' ;; sysv4 | sysv4.2uw2* | sysv4.3*) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-KPIC' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' ;; sysv4*MP*) if test -d /usr/nec; then _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-Kconform_pic' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' fi ;; sysv5* | unixware* | sco3.2v5* | sco5v6* | OpenUNIX*) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' _LT_TAGVAR(lt_prog_compiler_pic, \$1)='-KPIC'

_LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' ;; unicos*) _LT_TAGVAR(lt_prog_compiler_wl, \$1)='-Wl,' _LT_TAGVAR(lt_prog_compiler_can_build_shared, \$1)=no ;; uts4*) LT TAGVAR(lt prog compiler pic, \$1)='-pic' _LT_TAGVAR(lt_prog_compiler_static, \$1)='-Bstatic' ;; *) _LT_TAGVAR(lt_prog_compiler_can_build_shared, \$1)=no ;; esac fi 1) case \$host_os in # For platforms that do not support PIC, -DPIC is meaningless: *djgpp*) _LT_TAGVAR(lt_prog_compiler_pic, \$1)= ;; *) _LT_TAGVAR(lt_prog_compiler_pic, \$1)="\$_LT_TAGVAR(lt_prog_compiler_pic, \$1)@&t@m4_if([\$1],[],[-DPIC],[m4_if([\$1],[CXX],[-DPIC],[])])" ;; esac AC_CACHE_CHECK([for \$compiler option to produce PIC], [_LT_TAGVAR(lt_cv_prog_compiler_pic, \$1)], [_LT_TAGVAR(lt_cv_prog_compiler_pic, \$1)=\$_LT_TAGVAR(lt_prog_compiler_pic, \$1)]) _LT_TAGVAR(lt_prog_compiler_pic, \$1)=\$_LT_TAGVAR(lt_cv_prog_compiler_pic, \$1) # # Check to make sure the PIC flag actually works. # if test -n "\$_LT_TAGVAR(lt_prog_compiler_pic, \$1)"; then _LT_COMPILER_OPTION([if \$compiler PIC flag \$_LT_TAGVAR(lt_prog_compiler_pic, \$1) works], [_LT_TAGVAR(lt_cv_prog_compiler_pic_works, \$1)], [\$_LT_TAGVAR(lt_prog_compiler_pic, \$1)@&t@m4_if([\$1],[],[-DPIC],[m4_if([\$1],[CXX],[-DPIC],[])])], [], [case \$_LT_TAGVAR(lt_prog_compiler_pic, \$1) in "" | " "*) ;; *) _LT_TAGVAR(lt_prog_compiler_pic, \$1)=" \$_LT_TAGVAR(lt_prog_compiler_pic, \$1)" ;; esac], [_LT_TAGVAR(lt_prog_compiler_pic, \$1)= _LT_TAGVAR(lt_prog_compiler_can_build_shared, \$1)=no])

fi

_LT_TAGDECL([pic_flag], [lt_prog_compiler_pic], [1], [Additional compiler flags for building library objects])

_LT_TAGDECL([wl], [lt_prog_compiler_wl], [1], [How to pass a linker flag through the compiler])

#

Check to make sure the static flag actually works.

#

wl=\$_LT_TAGVAR(lt_prog_compiler_wl, \$1) eval lt_tmp_static_flag=\"\$_LT_TAGVAR(lt_prog_compiler_static, \$1)\"

_LT_LINKER_OPTION([if \$compiler static flag \$lt_tmp_static_flag works],

_LT_TAGVAR(lt_cv_prog_compiler_static_works, \$1),

\$lt_tmp_static_flag,

[],

[_LT_TAGVAR(lt_prog_compiler_static, \$1)=])

_LT_TAGDECL([link_static_flag], [lt_prog_compiler_static], [1],

[Compiler flag to prevent dynamic linking])

])#_LT_COMPILER_PIC

_LT_LINKER_SHLIBS([TAGNAME])

See if the linker supports building shared libraries.

m4_defun([_LT_LINKER_SHLIBS],

[AC_REQUIRE([LT_PATH_LD])dnl

AC_REQUIRE([LT_PATH_NM])dnl

 $m4_require([_LT_PATH_MANIFEST_TOOL]) dnl$

 $m4_require([_LT_FILEUTILS_DEFAULTS]) dnl$

 $m4_require([_LT_DECL_EGREP])dnl$

m4_require([_LT_DECL_SED])dnl

 $m4_require([_LT_CMD_GLOBAL_SYMBOLS]) dnl$

m4_require([_LT_TAG_COMPILER])dnl

AC_MSG_CHECKING([whether the \$compiler linker (\$LD) supports shared libraries])

m4_if([\$1], [CXX], [

_LT_TAGVAR(export_symbols_cmds, \$1)='\$NM \$libobjs \$convenience | \$global_symbol_pipe | \$SED '\"s/.* //'\" | sort | uniq > \$export_symbols'

_LT_TAGVAR(exclude_expsyms, \$1)=['_GLOBAL_OFFSET_TABLE_|_GLOBAL__F[ID]_.*']

case \$host_os in

aix[[4-9]]*)

If we're using GNU nm, then we don't want the "-C" option.

-C means demangle to GNU nm, but means don't demangle to AIX nm.

Without the "-l" option, or with the "-B" option, AIX nm treats

weak defined symbols like other global defined symbols, whereas

GNU nm marks them as "W".

While the 'weak' keyword is ignored in the Export File, we need

it in the Import File for the 'aix-soname' feature, so we have

to replace the "-B" option with "-P" for AIX nm.

```
if $NM -V 2>&1 | $GREP 'GNU' > /dev/null; then
        LT_TAGVAR(export_symbols_cmds, $1)= NM -Bpg  slibobjs cmvenience | awk ''' { if ((((<math>$ 2 = "T") || () 
2 == "D") || (\ 2 == "B") || (\ 2 == "W")) \& \& ([substr](\ 3,1,1) != ".")) \{ if (\ 2 == "W") \{ print \ 3 " weak" \} \}
else { print \$ } } '\' | sort -u > $export_symbols'
     else
         _LT_TAGVAR(export_symbols_cmds, $1)="func_echo_all $NM | $SED -e '\"s/B\([[^B]]*\)$/P\1/\" -PCpgl
\frac{1}{1000} = \frac{1}{1000} || (| 2 = "T") || (| 2 = "D") || (| 2 = "B") || (| 2 = "W") || (| 2 = "V") || (| 2 = 
(\$ 2 == "Z") \& ([substr](\$ 1,1,1) != ".")) { if (((\$ 2 == "W") || ((\$ 2 == "V") || ((\$ 2 == "Z")) { print (\$ 1 " weak") } ) }
 } else { print \ 1 } } '\'' | sort -u > $export_symbols'
     fi
     ;;
  pw32*)
     LT TAGVAR(export symbols cmds, $1)=$ltdll cmds
     ::
  cygwin* | mingw* | cegcc*)
     case $cc basename in
     cl*)
        _LT_TAGVAR(exclude_expsyms, $1)='_NULL_IMPORT_DESCRIPTOR|_IMPORT_DESCRIPTOR_.*'
        ;;
     *)
         LT TAGVAR(export symbols cmds, $1)='$NM $libobjs $convenience | $global symbol pipe | $SED -e
'\"/^[[BCDGRS]][[ ]]/s/.*[[ ]]\([[^ ]]*\)\1 DATA/;s/^.*[[ ]]__nm__\([[^ ]]*\)[[ ]][(^ ]]*\1 DATA/;/^I[[
]]/d;/^[[AITW]][[ ]]/s/.* //\" | sort | uniq > $export_symbols'
         LT TAGVAR(exclude expsyms,
$1)=['[_]+GLOBAL_OFFSET_TABLE_|[_]+GLOBAL__[FID].*|[_]+head_[A-Za-z0-9_]+_dll|[A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_dll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-9_]+_addll][A-Za-z0-2_]+_addll][A-Za-z0-2_]+_addll][A-Za-z0-2_]+_addll][A-Za-z0-2_]
9_]+_dll_iname']
        ;;
     esac
     ::
  linux* | k*bsd*-gnu | gnu*)
     _LT_TAGVAR(link_all_deplibs, $1)=no
     ;;
  *)
     _LT_TAGVAR(export_symbols_cmds, $1)='$NM $libobjs $convenience | $global_symbol_pipe | $SED '\"s/.*
//'\" | sort | uniq > $export_symbols'
     ;;
  esac
], [
 runpath_var=
  _LT_TAGVAR(allow_undefined_flag, $1)=
 _LT_TAGVAR(always_export_symbols, $1)=no
  _LT_TAGVAR(archive_cmds, $1)=
 _LT_TAGVAR(archive_expsym_cmds, $1)=
 _LT_TAGVAR(compiler_needs_object, $1)=no
  _LT_TAGVAR(enable_shared_with_static_runtimes, $1)=no
 _LT_TAGVAR(export_dynamic_flag_spec, $1)=
 _LT_TAGVAR(export_symbols_cmds, $1)='$NM $libobjs $convenience | $global_symbol_pipe | $SED '\"s/.* //\"
```

| sort | uniq > \$export_symbols'

_LT_TAGVAR(hardcode_automatic, \$1)=no

```
_LT_TAGVAR(hardcode_direct, $1)=no
```

_LT_TAGVAR(hardcode_direct_absolute, \$1)=no

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)=

_LT_TAGVAR(hardcode_libdir_separator, \$1)=

_LT_TAGVAR(hardcode_minus_L, \$1)=no

 $_LT_TAGVAR(hardcode_shlibpath_var, \$1) = unsupported$

_LT_TAGVAR(inherit_rpath, \$1)=no

_LT_TAGVAR(link_all_deplibs, \$1)=unknown

_LT_TAGVAR(module_cmds, \$1)=

_LT_TAGVAR(module_expsym_cmds, \$1)=

_LT_TAGVAR(old_archive_from_new_cmds, \$1)=

_LT_TAGVAR(old_archive_from_expsyms_cmds, \$1)=

_LT_TAGVAR(thread_safe_flag_spec, \$1)=

_LT_TAGVAR(whole_archive_flag_spec, \$1)=

include_expsyms should be a list of space-separated symbols to be *always*

included in the symbol list

_LT_TAGVAR(include_expsyms, \$1)=

exclude_expsyms can be an extended regexp of symbols to exclude

it will be wrapped by ' (' and ')\$', so one must not match beginning or

end of line. Example: 'a|bc|.*d.*' will exclude the symbols 'a' and 'bc',

as well as any symbol that contains 'd'.

```
_LT_TAGVAR(exclude_expsyms, $1)=['_GLOBAL_OFFSET_TABLE_|_GLOBAL__F[ID].*']
```

Although _GLOBAL_OFFSET_TABLE_ is a valid symbol C name, most a.out

platforms (ab)use it in PIC code, but their linkers get confused if

the symbol is explicitly referenced. Since portable code cannot

rely on this symbol name, it's probably fine to never include it in

preloaded symbol tables.

Exclude shared library initialization/finalization symbols.

dnl Note also adjust exclude_expsyms for C++ above.

extract_expsyms_cmds=

case \$host_os in

```
cygwin* | mingw* | pw32* | cegcc*)
# FIXME: the MSVC++ port hasn't been tested in a loooong time
# When not using gcc, we currently assume that we are using
# Microsoft Visual C++.
if test yes != "$GCC"; then
with_gnu_ld=no
fi
;;;
interix*)
# we just hope/assume this is gcc and not c89 (= MSVC++)
with_gnu_ld=yes
;;
openbsd* | bitrig*)
with_gnu_ld=no
;;
```

```
linux* | k*bsd*-gnu | gnu*)
_LT_TAGVAR(link_all_deplibs, $1)=no
;;
esac
```

```
_LT_TAGVAR(ld_shlibs, $1)=yes
```

```
# On some targets, GNU ld is compatible enough with the native linker
# that we're better off using the native interface for both.
lt use gnu ld interface=no
if test yes = "$with_gnu_ld"; then
 case $host_os in
  aix*)
# The AIX port of GNU ld has always aspired to compatibility
# with the native linker. However, as the warning in the GNU ld
# block says, versions before 2.19.5* couldn't really create working
# shared libraries, regardless of the interface used.
case `$LD -v 2>&1` in
 *\ (GNU \in Binutils) \geq 2.19.5;
 *\ \(GNU\ Binutils\)\ 2.[[2-9]]*) ;;
 *\ \(GNU\ Binutils\)\ [[3-9]]*) ;;
 *)
  lt_use_gnu_ld_interface=yes
  ;;
esac
;;
  *)
lt_use_gnu_ld_interface=yes
;;
 esac
fi
if test yes = "$lt_use_gnu_ld_interface"; then
 # If archive_cmds runs LD, not CC, wlarc should be empty
 wlarc='$wl'
 # Set some defaults for GNU ld with shared library support. These
 # are reset later if shared libraries are not supported. Putting them
 # here allows them to be overridden if necessary.
 runpath_var=LD_RUN_PATH
 _LT_TAGVAR(hardcode_libdir_flag_spec, $1)='$wl-rpath $wl$libdir'
 _LT_TAGVAR(export_dynamic_flag_spec, $1)='$wl--export-dynamic'
 # ancient GNU ld didn't support --whole-archive et. al.
 if $LD --help 2>&1 | $GREP 'no-whole-archive' > /dev/null; then
  _LT_TAGVAR(whole_archive_flag_spec, $1)=$wlarc'--whole-archive$convenience '$wlarc'--no-whole-archive'
 else
  _LT_TAGVAR(whole_archive_flag_spec, $1)=
 fi
```

```
supports_anon_versioning=no
case `$LD -v | $SED -e 's/([^)]\+)\s\+//' 2>&1` in
 *GNU\ gold*) supports_anon_versioning=yes ;;
 *\ [[01]].* | *\ 2.[[0-9]].* | *\ 2.10.*) ;; # catch versions < 2.11
 *\ 2.11.93.0.2\ *) supports_anon_versioning=yes ;; # RH7.3 ...
 *\ 2.11.92.0.12\ *) supports_anon_versioning=yes ;; # Mandrake 8.2 ...
 *\ 2.11.*) ;; # other 2.11 versions
 *) supports_anon_versioning=yes ;;</pre>
```

esac

```
# See if GNU ld supports shared libraries.
case $host_os in
aix[[3-9]]*)
  # On AIX/PPC, the GNU linker is very broken
  if test ia64 != "$host_cpu"; then
_LT_TAGVAR(ld_shlibs, $1)=no
  cat <<_LT_EOF 1>&2
```

*** Warning: the GNU linker, at least up to release 2.19, is reported

*** to be unable to reliably create shared libraries on AIX.

*** Therefore, libtool is disabling shared libraries support. If you

*** really care for shared libraries, you may want to install binutils

*** 2.20 or above, or modify your PATH so that a non-GNU linker is found.

*** You will then need to restart the configuration process.

_LT_EOF

fi

;;

amigaos*) case \$host_cpu in

powerpc)

see comment about AmigaOS4 .so support

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)="

```
;;
```

m68k)

_LT_TAGVAR(archive_cmds, \$1)='\$RM \$output_objdir/a2ixlibrary.data~\$ECHO "#define NAME \$libname" > \$output_objdir/a2ixlibrary.data~\$ECHO "#define LIBRARY_ID 1" >>

\$output_objdir/a2ixlibrary.data~\$ECHO "#define VERSION \$major" >> \$output_objdir/a2ixlibrary.data~\$ECHO
"#define REVISION \$revision" >> \$output_objdir/a2ixlibrary.data~\$AR \$AR_FLAGS \$lib \$libobjs~\$RANLIB
\$lib~(cd \$output_objdir && a2ixlibrary -32)'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

```
;;
esac
;;
```

beos*)

if \$LD --help 2>&1 | \$GREP ': supported targets:.* elf' > /dev/null; then

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

Joseph Beckenbach <jrb3@best.com> says some releases of gcc

support -- undefined. This deserves some investigation. FIXME

_LT_TAGVAR(archive_cmds, \$1)='\$CC -nostart \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

else

_LT_TAGVAR(ld_shlibs, \$1)=no

- fi
- ;;

cygwin* | mingw* | pw32* | cegcc*)

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1) is actually meaningless,

as there is no search path for DLLs.

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl--export-all-symbols'

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

_LT_TAGVAR(always_export_symbols, \$1)=no

_LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=yes

 $\label{eq:linear} LT_TAGVAR(export_symbols_cmds, $1)='$NM $libobjs $convenience | $global_symbol_pipe | $SED -e '\''^[[BCDGRS]][[]]/s/.*[[]]\([[^]]*\)/1 DATA/;s/^.*[[]]_nm_\([[^]]*\)[[]]*\1 DATA/;/^I[[]]/d;/^[[AITW]][[]]/s/.* //\'' | sort | uniq > $export_symbols'$

_LT_TAGVAR(exclude_expsyms,

```
$1)=['[_]+GLOBAL_OFFSET_TABLE_|[_]+GLOBAL__[FID]_.*|[_]+head_[A-Za-z0-9_]+_dll|[A-Za-z0-
```

9_]+_dll_iname']

if \$LD --help 2>&1 | \$GREP 'auto-import' > /dev/null; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags -o \$output_objdir/\$soname \$wl--enable-auto-image-base -Xlinker --out-implib -Xlinker \$lib'

If the export-symbols file already is a .def file, use it as

is; otherwise, prepend EXPORTS...

_LT_TAGVAR(archive_expsym_cmds, \$1)='if _LT_DLL_DEF_P([\$export_symbols]); then

cp \$export_symbols \$output_objdir/\$soname.def;

else

echo EXPORTS > \$output_objdir/\$soname.def;

cat \$export_symbols >> \$output_objdir/\$soname.def;

fi∼

\$CC -shared \$output_objdir/\$soname.def \$libobjs \$deplibs \$compiler_flags -o \$output_objdir/\$soname \$wl-enable-auto-image-base -Xlinker --out-implib -Xlinker \$lib'

else

_LT_TAGVAR(ld_shlibs, \$1)=no

fi

;;

haiku*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o

```
$lib'
```

```
_LT_TAGVAR(link_all_deplibs, $1)=yes
```

;;

os2*)

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

 $shrext_cmds=.dll$

_LT_TAGVAR(archive_cmds, \$1)='\$ECHO "LIBRARY \${soname%\$shared_ext} INITINSTANCE TERMINSTANCE" > \$output_objdir/\$libname.def~

\$ECHO "DESCRIPTION \"\$libname\"" >> \$output_objdir/\$libname.def~

\$ECHO "DATA MULTIPLE NONSHARED" >> \$output_objdir/\$libname.def~

\$ECHO EXPORTS >> \$output_objdir/\$libname.def~

emxexp \$libobjs | \$SED /"_DLL_InitTerm"/d >> \$output_objdir/\$libname.def~

\$CC -Zdll -Zcrtdll -o \$output_objdir/\$soname \$libobjs \$deplibs \$compiler_flags \$output_objdir/\$libname.def~
emximp -o \$lib \$output_objdir/\$libname.def'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$ECHO "LIBRARY \${soname%\$shared_ext} INITINSTANCE TERMINSTANCE" > \$output_objdir/\$libname.def~

\$ECHO "DESCRIPTION \"\$libname\"" >> \$output_objdir/\$libname.def~

\$ECHO "DATA MULTIPLE NONSHARED" >> \$output_objdir/\$libname.def~

\$ECHO EXPORTS >> \$output_objdir/\$libname.def~

prefix_cmds="\$SED"~

if test EXPORTS = "`\$SED 1q \$export_symbols`"; then

prefix_cmds="\$prefix_cmds -e 1d";

fi∼

cat \$export_symbols | \$prefix_cmds >> \$output_objdir/\$libname.def~

\$CC -Zdll -Zcrtdll -o \$output_objdir/\$soname \$libobjs \$deplibs \$compiler_flags \$output_objdir/\$libname.def~ emximp -o \$lib \$output_objdir/\$libname.def'

_LT_TAGVAR(old_archive_From_new_cmds, \$1)='emximp -o \$output_objdir/\${libname}_dll.a \$output_objdir/\$libname.def'

_LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=yes

;;

interix[[3-9]]*)

_LT_TAGVAR(hardcode_direct, \$1)=no

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir'

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-E'

Hack: On Interix 3.x, we cannot compile PIC because of a broken gcc.

Instead, shared libraries are loaded at an image base (0x10000000 by

default) and relocated if they conflict, which is a slow very memory

consuming and fragmenting process. To avoid this, we pick a random,

256 KiB-aligned image base between 0x50000000 and 0x6FFC0000 at link

time. Moving up from 0x10000000 also allows more sbrk(2) space.

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-h,\$soname \$wl--image-base,`expr \${RANDOM-\$\$} % 4096 / 2 * 262144 + 1342177280` -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='sed "s|^|_|" \$export_symbols >\$output_objdir/\$soname.expsym~\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-h,\$soname \$wl-retain-symbols-file,\$output_objdir/\$soname.expsym \$wl--image-base,`expr \${RANDOM-\$\$} % 4096 / 2 * 262144 + 1342177280⁻ - 0 \$lib ;; gnu* | linux* | tpf* | k*bsd*-gnu | kopensolaris*-gnu) tmp diet=no if test linux-dietlibc = "\$host_os"; then case \$cc basename in diet*) tmp_diet=yes;; # linux-dietlibc with static linking (!diet-dyn) esac fi if \$LD --help 2>&1 | \$EGREP ': supported targets:.* elf' > /dev/null \ && test no = "\$tmp_diet" then tmp_addflag=' \$pic_flag' tmp sharedflag='-shared' case \$cc_basename,\$host_cpu in pgcc*) # Portland Group C compiler LT TAGVAR(whole archive flag spec, \$1)='\$wl--whole-archive`for conv in \$convenience\"\"; do test -n \"\$conv\" && new_convenience=\"\$new_convenience,\$conv\"; done; func_echo_all \"\$new_convenience\"`\$wl-no-whole-archive' tmp addflag=' \$pic flag' ;; pgf77* | pgf90* | pgf95* | pgfortran*) # Portland Group f77 and f90 compilers _LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive`for conv in \$convenience\"\"; do test -n \"\$conv\" && new_convenience=\"\$new_convenience,\$conv\"; done; func_echo_all \"\$new_convenience\"`\$wl-no-whole-archive' tmp_addflag=' \$pic_flag -Mnomain' ;; ecc*,ia64* | icc*,ia64*) # Intel C compiler on ia64 tmp_addflag=' -i_dynamic' ;; efc*,ia64* | ifort*,ia64*) # Intel Fortran compiler on ia64 tmp_addflag=' -i_dynamic -nofor_main' ;;

ifc* | ifort*) # Intel Fortran compiler

tmp_addflag=' -nofor_main' ;;

lf95*) # Lahey Fortran 8.1

_LT_TAGVAR(whole_archive_flag_spec, \$1)=

tmp_sharedflag='--shared' ;;

nagfor*) # NAGFOR 5.3

```
tmp_sharedflag='-Wl,-shared' ;;
```

 $xl[[cC]]* \mid bgxl[[cC]]* \mid mpixl[[cC]]*) \ \# \ IBM \ XL \ C \ 8.0 \ on \ PPC \ (deal \ with \ xlf \ below)$

 $tmp_sharedflag='-qmkshrobj'$

tmp_addflag= ;;

nvcc*) # Cuda Compiler Driver 2.2

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive`for conv in \$convenience\"\"; do test -n \"\$conv\" && new_convenience=\"\$new_convenience,\$conv\"; done; func_echo_all \"\$new_convenience\"` \$wl--

no-whole-archive'

```
_LT_TAGVAR(compiler_needs_object, $1)=yes
```

```
;;
```

esac

case `\$CC -V 2>&1 | sed 5q` in

Sun\ C) # Sun C 5.9

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive`new_convenience=; for conv in \$convenience\"\"; do test -z \"\$conv\" || new_convenience=\"\$new_convenience,\$conv\"; done; func_echo_all \"\$new_convenience\"` \$wl--no-whole-archive'

_LT_TAGVAR(compiler_needs_object, \$1)=yes

tmp_sharedflag='-G' ;;

```
*SunF*) # Sun Fortran 8.3
```

tmp_sharedflag='-G' ;;

esac

_LT_TAGVAR(archive_cmds, \$1)='\$CC '"\$tmp_sharedflag'''\$tmp_addflag''' \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -0 \$lib'

```
if test yes = "$supports_anon_versioning"; then
```

_LT_TAGVAR(archive_expsym_cmds, \$1)='echo "{ global:" > \$output_objdir/\$libname.ver~

```
cat export_symbols | sed - e "s/(.*)/1;/" >> soutput_objdir/$libname.ver~
```

echo "local: *; };" >> \$output_objdir/\$libname.ver~

```
$CC '"$tmp_sharedflag""$tmp_addflag"' $libobjs $deplibs $compiler_flags $wl-soname $wl$soname $wlversion-script $wl$output_objdir/$libname.ver -0 $lib'
```

fi

```
case $cc_basename in
```

tcc*)

```
_LT_TAGVAR(export_dynamic_flag_spec, $1)='-rdynamic'
```

;;

```
xlf* | bgf* | bgxlf* | mpixlf*)
```

```
# IBM XL Fortran 10.1 on PPC cannot create shared libs itself
```

```
\label{eq:lt_tag_spec} LT\_TAGVAR (whole\_archive\_flag\_spec, \$1) = '--whole-archive\$ convenience --no-whole-archive'
```

```
_LT_TAGVAR(hardcode_libdir_flag_spec, $1)='$wl-rpath $wl$libdir'
```

```
_LT_TAGVAR(archive_cmds, $1)='$LD -shared $libobjs $deplibs $linker_flags -soname $soname -o $lib'
```

```
if test yes = "$supports_anon_versioning"; then
```

```
_LT_TAGVAR(archive_expsym_cmds, $1)='echo "{ global:" > $output_objdir/$libname.ver~
```

```
cat export_symbols \mid sed -e "s/(.*\)/1;/">> <math>otjoir/libname.ver~
```

```
echo "local: *; };" >> $output_objdir/$libname.ver~
```

LD -shared \$libobjs \$deplibs \$linker_flags -soname \$soname -version-script \$output_objdir/\$libname.ver -

```
o $lib'
fi
;;
esac
else
_LT_TAGVAR(ld_shlibs, $1)=no
fi
;;
```

netbsd* | netbsdelf*-gnu)

if echo __ELF__ | \$CC -E - | \$GREP __ELF__ >/dev/null; then

_LT_TAGVAR(archive_cmds, \$1)='\$LD -Bshareable \$libobjs \$deplibs \$linker_flags -o \$lib'

wlarc=

else

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -0 \$lib'

fi

;;

solaris*)

if \$LD -v 2>&1 | \$GREP 'BFD 2\.8' > /dev/null; then _LT_TAGVAR(ld_shlibs, \$1)=no

cat <<_LT_EOF 1>&2

*** Warning: The releases 2.8.* of the GNU linker cannot reliably

*** create shared libraries on Solaris systems. Therefore, libtool

*** is disabling shared libraries support. We urge you to upgrade GNU

*** binutils to release 2.9.1 or newer. Another option is to modify

*** your PATH or compiler configuration so that the native linker is

*** used, and then restart.

_LT_EOF

elif \$LD --help 2>&1 | \$GREP ': supported targets:.* elf' > /dev/null; then

```
_LT_TAGVAR(archive_cmds, $1)='$CC -shared $pic_flag $libobjs $deplibs $compiler_flags $wl-soname $wl$soname -o $lib'
```

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -0 \$lib'

else _LT_TAGVAR(ld_shlibs, \$1)=no fi ;; sysv5* | sco3.2v5* | sco5v6* | unixware* | OpenUNIX*) case `\$LD -v 2>&1` in *\ [[01]].* | *\ 2.[[0-9]].* | *\ 2.1[[0-5]].*) _LT_TAGVAR(ld_shlibs, \$1)=no cat <<_LT_EOF 1>&2

*** Warning: Releases of the GNU linker prior to 2.16.91.0.3 cannot

*** reliably create shared libraries on SCO systems. Therefore, libtool

*** is disabling shared libraries support. We urge you to upgrade GNU

*** binutils to release 2.16.91.0.3 or newer. Another option is to modify

*** your PATH or compiler configuration so that the native linker is

*** used, and then restart.

```
;;
```

```
*)
```

For security reasons, it is highly recommended that you always

use absolute paths for naming shared libraries, and exclude the

DT_RUNPATH tag from executables and libraries. But doing so

requires that you compile everything twice, which is a pain.

if LD --help 2>&1 | \$GREP ': supported targets:.* elf' > /dev/null; then

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -0 \$lib'

```
else
```

```
_LT_TAGVAR(ld_shlibs, $1)=no
```

fi

;;

esac

;;

sunos4*)

_LT_TAGVAR(archive_cmds, \$1)='\$LD -assert pure-text -Bshareable -o \$lib \$libobjs \$deplibs \$linker_flags' wlarc=

```
_LT_TAGVAR(hardcode_direct, $1)=yes
```

```
_LT_TAGVAR(hardcode_shlibpath_var, $1)=no
```

;;

*)

```
if LD --help 2>\&1 | GREP : supported targets:.* elf > /dev/null; then
```

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -0 \$lib'

else _LT_TAGVAR(ld_shlibs, \$1)=no fi ;; esac if test no = "\$_LT_TAGVAR(ld_shlibs, \$1)"; then runpath_var= _LT_TAGVAR(hardcode_libdir_flag_spec, \$1)= _LT_TAGVAR(export_dynamic_flag_spec, \$1)= _LT_TAGVAR(whole_archive_flag_spec, \$1)= fi else # PORTME fill in a description of your system's linker (not GNU ld) case \$host_os in aix3*)

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

_LT_TAGVAR(always_export_symbols, \$1)=yes

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$LD -o \$output_objdir/\$soname \$libobjs \$deplibs \$linker_flags - bE:\$export_symbols -T512 -bM:SRE~\$AR \$AR_FLAGS \$lib \$output_objdir/\$soname'

Note: this linker hardcodes the directories in LIBPATH if there

are no directories specified by -L.

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

if test yes = "\$GCC" && test -z "\$lt_prog_compiler_static"; then

Neither direct hardcoding nor static linking is supported with a

broken collect2.

_LT_TAGVAR(hardcode_direct, \$1)=unsupported

fi

;;

aix[[4-9]]*)

if test ia64 = "\$host_cpu"; then

On IA64, the linker does run time linking by default, so we don't

have to do anything special.

aix_use_runtimelinking=no

exp_sym_flag='-Bexport'

no_entry_flag=

else

If we're using GNU nm, then we don't want the "-C" option.

-C means demangle to GNU nm, but means don't demangle to AIX nm.

Without the "-l" option, or with the "-B" option, AIX nm treats

weak defined symbols like other global defined symbols, whereas

GNU nm marks them as "W".

While the 'weak' keyword is ignored in the Export File, we need

it in the Import File for the 'aix-soname' feature, so we have

to replace the "-B" option with "-P" for AIX nm.

if $NM - V \ge 1 | GREP 'GNU' > /dev/null; then$

_LT_TAGVAR(export_symbols_cmds, \$1)='\$NM -Bpg \$libobjs \$convenience | awk '\"{ if (((\\$ 2 == "T") || (\\$ 2 == "D") || (\\$ 2 == "B") || (\\$ 2 == "W")) & ([substr](\\$ 3,1,1) != ".")) { if (\\$ 2 == "W") { print \\$ 3 " weak" } else { print \\$ 3 } }'\" | sort -u > \$export_symbols'

else

 $\label{eq:linear_symbols_cmds, $1)=`func_echo_all $NM | $SED -e \''s/B\([[^B]]*\)$/P\1/\'` -PCpgl $libobjs $convenience | awk \''{ if (((\$ 2 == "T") || (\$ 2 == "D") || (\$ 2 == "B") || (\$ 2 == "W") || (\$ 2 == "V") || (\$ 2 == "V") || (\$ 2 == "V") || (\$ 2 == "Z")) & ([substr](\$ 1,1,1) != ".")) { if (((\$ 2 == "W") || (\$ 2 == "V") || (\$ 2 == "Z")) { print \$ 1 " weak" } else { print \$ 1 } } \'' | sort -u > $export_symbols'$

fi

aix_use_runtimelinking=no

Test if we are trying to use run time linking or normal

AIX style linking. If -brtl is somewhere in LDFLAGS, we

have runtime linking enabled, and use it for executables.

For shared libraries, we enable/disable runtime linking

depending on the kind of the shared library created -

```
# when "with_aix_soname,aix_use_runtimelinking" is:
# "aix,no" lib.a(lib.so.V) shared, rtl:no, for executables
# "aix,yes" lib.so
                        shared, rtl:yes, for executables
        lib.a
                    static archive
#
# "both,no" lib.so.V(shr.o) shared, rtl:yes
#
        lib.a(lib.so.V) shared, rtl:no, for executables
# "both, yes" lib.so.V(shr.o) shared, rtl:yes, for executables
        lib.a(lib.so.V) shared, rtl:no
#
# "svr4,*" lib.so.V(shr.o) shared, rtl:yes, for executables
#
        lib.a
                    static archive
case $host_os in aix4.[[23]]|aix4.[[23]].*|aix[[5-9]]*)
 for ld_flag in $LDFLAGS; do
 if (test x-brtl = "x$ld_flag" || test x-Wl,-brtl = "x$ld_flag"); then
  aix_use_runtimelinking=yes
  break
 fi
 done
 if test svr4,no = "$with aix soname,$aix use runtimelinking"; then
  # With aix-soname=svr4, we create the lib.so.V shared archives only,
  # so we don't have lib.a shared libs to link our executables.
  # We have to force runtime linking in this case.
  aix_use_runtimelinking=yes
  LDFLAGS="$LDFLAGS -Wl,-brtl"
 fi
 ;;
esac
exp_sym_flag='-bexport'
no_entry_flag='-bnoentry'
  fi
```

When large executables or shared objects are built, AIX ld can
have problems creating the table of contents. If linking a library
or program results in "error TOC overflow" add -mminimal-toc to
CXXFLAGS/CFLAGS for g++/gcc. In the cases where that is not
enough to fix the problem, add -Wl,-bbigtoc to LDFLAGS.

```
_LT_TAGVAR(archive_cmds, $1)="

_LT_TAGVAR(hardcode_direct, $1)=yes

_LT_TAGVAR(hardcode_direct_absolute, $1)=yes

_LT_TAGVAR(hardcode_libdir_separator, $1)=':'

_LT_TAGVAR(link_all_deplibs, $1)=yes

_LT_TAGVAR(file_list_spec, $1)='$wl-f,'

case $with_aix_soname,$aix_use_runtimelinking in

aix,*) ;; # traditional, no import file

svr4,* | *,yes) # use import file

# The Import File defines what to hardcode.

_LT_TAGVAR(hardcode_direct, $1)=no
```

```
;;
```

esac

```
if test yes = "$GCC"; then
case $host_os in aix4.[[012]]|aix4.[[012]].*)
# We only want to do this on AIX 4.2 and lower, the check
# below for broken collect2 doesn't work under 4.3+
 collect2name=`$CC -print-prog-name=collect2`
 if test -f "$collect2name" &&
 strings "$collect2name" | $GREP resolve_lib_name >/dev/null
 then
 # We have reworked collect2
 else
 # We have old collect2
 _LT_TAGVAR(hardcode_direct, $1)=unsupported
 # It fails to find uninstalled libraries when the uninstalled
 # path is not listed in the libpath. Setting hardcode_minus_L
 # to unsupported forces relinking
 LT TAGVAR(hardcode minus L, $1)=yes
 _LT_TAGVAR(hardcode_libdir_flag_spec, $1)='-L$libdir'
 _LT_TAGVAR(hardcode_libdir_separator, $1)=
 fi
 ;;
esac
shared flag='-shared'
if test yes = "$aix_use_runtimelinking"; then
 shared_flag="$shared_flag "'$wl-G'
fi
# Need to ensure runtime linking is disabled for the traditional
# shared library, or the linker may eventually find shared libraries
#/with/ Import File - we do not want to mix them.
shared_flag_aix='-shared'
shared_flag_svr4='-shared $wl-G'
  else
# not using gcc
if test ia64 = "$host_cpu"; then
# VisualAge C++, Version 5.5 for AIX 5L for IA-64, Beta 3 Release
# chokes on -Wl,-G. The following line is correct:
 shared_flag='-G'
else
 if test yes = "$aix_use_runtimelinking"; then
  shared_flag='$wl-G'
 else
  shared_flag='$wl-bM:SRE'
 fi
 shared_flag_aix='$wl-bM:SRE'
```

```
shared_flag_svr4='$wl-G'
```

fi

fi

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-bexpall'

It seems that -bexpall does not export symbols beginning with

underscore (_), so it is better to generate a list of symbols to export.

_LT_TAGVAR(always_export_symbols, \$1)=yes

if test aix,yes = "\$with_aix_soname,\$aix_use_runtimelinking"; then

Warning - without using the other runtime loading flags (-brtl),

-berok will link without error, but may produce a broken library.

_LT_TAGVAR(allow_undefined_flag, \$1)='-berok'

Determine the default libpath from the value encoded in an

empty executable.

_LT_SYS_MODULE_PATH_AIX([\$1])

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-blibpath:\$libdir:'''\$aix_libpath"

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -o \$output_objdir/\$soname \$libobjs \$deplibs

\$wl'\$no_entry_flag' \$compiler_flags `if test -n "\$allow_undefined_flag"; then func_echo_all

"\$wl\$allow_undefined_flag"; else :; fi` \$wl'\$exp_sym_flag:\\$export_symbols' '\$shared_flag

else

if test ia64 = "\$host_cpu"; then

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-R \$libdir:/usr/lib:/lib'

_LT_TAGVAR(allow_undefined_flag, \$1)="-z nodefs"

_LT_TAGVAR(archive_expsym_cmds, \$1)="\\$CC \$shared_flag"' -o \$output_objdir/\$soname \$libobjs \$deplibs

"'\\$wl\$no_entry_flag"' \$compiler_flags \$wl\$allow_undefined_flag "'\\$wl\$exp_sym_flag:\\$export_symbols" else

Determine the default libpath from the value encoded in an

empty executable.

_LT_SYS_MODULE_PATH_AIX([\$1])

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-blibpath:\$libdir:'"\$aix_libpath"

Warning - without using the other run time loading flags,

-berok will link without error, but may produce a broken library.

_LT_TAGVAR(no_undefined_flag, \$1)=' \$wl-bernotok'

_LT_TAGVAR(allow_undefined_flag, \$1)=' \$wl-berok'

if test yes = "\$with_gnu_ld"; then

We only use this code for GNU lds that support --whole-archive.

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive\$convenience \$wl--no-whole-archive' else

Exported symbols can be pulled into shared objects from archives

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$convenience'

fi

_LT_TAGVAR(archive_cmds_need_lc, \$1)=yes

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$RM -r \$output_objdir/\$realname.d~\$MKDIR

\$output_objdir/\$realname.d'

 $\ensuremath{\texttt{\#}}$ -brtl affects multiple linker settings, -berok does not and is overridden later

 $compiler_flags_filtered=``func_echo_all "$compiler_flags " | $SED -e "s\%-brtl\\([[,]]\\)%-berok \\1%g"`' and the set of the set o$

if test svr4 != "\$with_aix_soname"; then

This is similar to how AIX traditionally builds its shared libraries.

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$CC '\$shared_flag_aix' -o \$output_objdir/\$realname.d/\$soname \$libobjs \$deplibs \$wl-bnoentry '\$compiler_flags_filtered'\$wl-bE:\$export_symbols\$allow_undefined_flag~\$AR \$AR_FLAGS \$output_objdir/\$libname\$release.a \$output_objdir/\$realname.d/\$soname'

fi

if test aix != "\$with_aix_soname"; then

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$CC

'\$shared_flag_svr4' -o \$output_objdir/\$realname.d/\$shared_archive_member_spec.o \$libobjs \$deplibs \$wl-bnoentry '\$compiler_flags_filtered'\$wl-bE:\$export_symbols\$allow_undefined_flag~\$STRIP -e

```
$output_objdir/$realname.d/$shared_archive_member_spec.o~( func_echo_all "#!
```

\$soname(\$shared_archive_member_spec.o)"; if test shr_64 = "\$shared_archive_member_spec"; then func_echo_all
"# 64"; else func_echo_all "# 32"; fi; cat \$export_symbols) >

\$0utput_objdir/\$realname.d/\$shared_archive_member_spec.imp~\$AR \$AR_FLAGS \$output_objdir/\$soname

\$output_objdir/\$realname.d/\$shared_archive_member_spec.o

\$output_objdir/\$realname.d/\$shared_archive_member_spec.imp'

else

used by -dlpreopen to get the symbols

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$MV \$output_objdir/\$realname.d/\$soname \$output_objdir'

fi

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$RM -r \$output_objdir/\$realname.d'

fi

fi

;;

amigaos*)

case \$host_cpu in

powerpc)

see comment about AmigaOS4 .so support

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

```
_LT_TAGVAR(archive_expsym_cmds, $1)="
```

;;

m68k)

_LT_TAGVAR(archive_cmds, \$1)='\$RM \$output_objdir/a2ixlibrary.data~\$ECHO "#define NAME \$libname" > \$output_objdir/a2ixlibrary.data~\$ECHO "#define LIBRARY_ID 1" >>

\$output_objdir/a2ixlibrary.data~\$ECHO "#define VERSION \$major" >> \$output_objdir/a2ixlibrary.data~\$ECHO
"#define REVISION \$revision" >> \$output_objdir/a2ixlibrary.data~\$AR \$AR_FLAGS \$lib \$libobjs~\$RANLIB
\$lib~(cd \$output_objdir && a2ixlibrary -32)'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

```
_LT_TAGVAR(hardcode_minus_L, $1)=yes
```

```
;;
esac
```

;;

bsdi[[45]]*)

_LT_TAGVAR(export_dynamic_flag_spec, \$1)=-rdynamic

;;

cygwin* | mingw* | pw32* | cegcc*)

When not using gcc, we currently assume that we are using

Microsoft Visual C++.

hardcode_libdir_flag_spec is actually meaningless, as there is

no search path for DLLs.

case \$cc_basename in

cl*)

Native MSVC

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)=' '

 $_LT_TAGVAR (allow_undefined_flag, \$1) = unsupported$

_LT_TAGVAR(always_export_symbols, \$1)=yes

_LT_TAGVAR(file_list_spec, \$1)='@'

Tell ltmain to make .lib files, not .a files.

libext=lib

Tell ltmain to make .dll files, not .so files.

shrext_cmds=.dll

FIXME: Setting linknames here is a bad hack.

_LT_TAGVAR(archive_cmds, \$1)='\$CC -o \$output_objdir/\$soname \$libobjs \$compiler_flags \$deplibs -Wl,-DLL,-IMPLIB:"\$tool_output_objdir\$libname.dll.lib"~linknames='

_LT_TAGVAR(archive_expsym_cmds, \$1)='if _LT_DLL_DEF_P([\$export_symbols]); then

cp "\$export_symbols" "\$output_objdir/\$soname.def";

echo "\$tool_output_objdir\$soname.def" > "\$output_objdir/\$soname.exp";

else

 $SED - e '\''s/^/-link - EXPORT:/ \'' < $export_symbols > $output_objdir/$soname.exp; the second se$

fi∼

\$CC -o \$tool_output_objdir\$soname \$libobjs \$compiler_flags \$deplibs "@\$tool_output_objdir\$soname.exp" Wl,-DLL,-IMPLIB:"\$tool_output_objdir\$libname.dll.lib"~

linknames='

The linker will not automatically build a static lib if we build a DLL.

_LT_TAGVAR(old_archive_from_new_cmds, \$1)='true'

_LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=yes

_LT_TAGVAR(exclude_expsyms, \$1)='_NULL_IMPORT_DESCRIPTOR|_IMPORT_DESCRIPTOR_.*'

 $\label{eq:lt_table_symbol_cmds} LT_TAGVAR(export_symbol_cmds, \$1) = `\$NM \$libobjs \$convenience | \$global_symbol_pipe | \$SED - e = \end{tabular} e = \end{t$

'\"/^[[BCDGRS]][[]]/s/.*[[]]\([[^]]*\)/\1,DATA/\" | \$SED -e '\"/^[[AITW]][[]]/s/.*[[]]//\" | sort | uniq > \$export_symbols'

Don't use ranlib

_LT_TAGVAR(old_postinstall_cmds, \$1)='chmod 644 \$oldlib'

_LT_TAGVAR(postlink_cmds, \$1)='lt_outputfile="@OUTPUT@"~

lt_tool_outputfile="@TOOL_OUTPUT@"~

case \$lt_outputfile in

.exe|.EXE) ;;

*)

lt_outputfile=\$lt_outputfile.exe

lt_tool_outputfile=\$lt_tool_outputfile.exe

;;

esac~

```
if test : != "$MANIFEST_TOOL" && test -f "$lt_outputfile.manifest"; then
      $MANIFEST TOOL -manifest "$lt tool outputfile.manifest" -outputresource:"$lt tool outputfile" || exit 1;
      $RM "$lt_outputfile.manifest";
     fi'
;;
  *)
# Assume MSVC wrapper
_LT_TAGVAR(hardcode_libdir_flag_spec, $1)=' '
_LT_TAGVAR(allow_undefined_flag, $1)=unsupported
# Tell ltmain to make .lib files. not .a files.
libext=lib
# Tell ltmain to make .dll files, not .so files.
shrext cmds=.dll
# FIXME: Setting linknames here is a bad hack.
_LT_TAGVAR(archive_cmds, $1)='$CC -o $lib $libobjs $compiler_flags `func_echo_all "$deplibs" | $SED '\"s/-
lc$//'\"` -link -dll~linknames='
# The linker will automatically build a .lib file if we build a DLL.
LT TAGVAR(old archive from new cmds, $1)='true'
# FIXME: Should let the user specify the lib program.
_LT_TAGVAR(old_archive_cmds, $1)='lib -OUT:$oldlib$oldobjs$old_deplibs'
LT TAGVAR(enable shared with static runtimes, $1)=yes
;;
  esac
  ;;
 darwin* | rhapsody*)
  _LT_DARWIN_LINKER_FEATURES($1)
  ;;
 dgux*)
  _LT_TAGVAR(archive_cmds, $1)='$LD -G -h $soname -o $lib $libobjs $deplibs $linker_flags'
  _LT_TAGVAR(hardcode_libdir_flag_spec, $1)='-L$libdir'
  _LT_TAGVAR(hardcode_shlibpath_var, $1)=no
  ;;
 # FreeBSD 2.2.[012] allows us to include c++rt0.o to get C++ constructor
 # support. Future versions do this automatically, but an explicit c++rt0.o
 # does not break anything, and helps significantly (at the cost of a little
 # extra space).
 freebsd2.2*)
  _LT_TAGVAR(archive_cmds, $1)='$LD -Bshareable -o $lib $libobjs $deplibs $linker_flags /usr/lib/c++rt0.o'
  _LT_TAGVAR(hardcode_libdir_flag_spec, $1)='-R$libdir'
  _LT_TAGVAR(hardcode_direct, $1)=yes
  _LT_TAGVAR(hardcode_shlibpath_var, $1)=no
  ;;
 # Unfortunately, older versions of FreeBSD 2 do not have this feature.
 freebsd2.*)
```

```
_LT_TAGVAR(archive_cmds, $1)='$LD -Bshareable -o $lib $libobjs $deplibs $linker_flags'
```

_LT_TAGVAR(hardcode_direct, \$1)=yes

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

;;

FreeBSD 3 and greater uses gcc -shared to do shared libraries.

freebsd* | dragonfly*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -o \$lib \$libobjs \$deplibs \$compiler_flags'

 $LT_TAGVAR (hardcode_libdir_flag_spec, \$1)='-R\$libdir'$

_LT_TAGVAR(hardcode_direct, \$1)=yes

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

;;

hpux9*)

if test yes = "\$GCC"; then

_LT_TAGVAR(archive_cmds, \$1)='\$RM \$output_objdir/\$soname~\$CC -shared \$pic_flag \$wl+b \$wl\$install_libdir -o \$output_objdir/\$soname \$libobjs \$deplibs \$compiler_flags~test "x\$output_objdir/\$soname" = "x\$lib" || mv -f \$output_objdir/\$soname \$lib'

else

_LT_TAGVAR(archive_cmds, \$1)='\$RM \$output_objdir/\$soname~\$LD -b +b \$install_libdir -o \$output_objdir/\$soname \$libobjs \$deplibs \$linker_flags~test "x\$output_objdir/\$soname" = "x\$lib" || mv -f \$output_objdir/\$soname \$lib'

fi

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl+b \$wl\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=:

_LT_TAGVAR(hardcode_direct, \$1)=yes

hardcode_minus_L: Not really in the search PATH,

but as the default location of the library.

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-E'

;;

hpux10*)

if test yes,no = "\$GCC,\$with_gnu_ld"; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$wl+h \$wl\$soname \$wl+b \$wl\$install_libdir -o \$lib \$libobjs \$deplibs \$compiler_flags'

else

_LT_TAGVAR(archive_cmds, \$1)='\$LD -b +h \$soname +b \$install_libdir -o \$lib \$libobjs \$deplibs \$linker_flags' fi

if test no = "\$with_gnu_ld"; then

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl+b \$wl\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=:

_LT_TAGVAR(hardcode_direct, \$1)=yes

_LT_TAGVAR(hardcode_direct_absolute, \$1)=yes

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-E'

hardcode_minus_L: Not really in the search PATH,

but as the default location of the library.

```
_LT_TAGVAR(hardcode_minus_L, $1)=yes
```

fi

;;

```
hpux11*)
```

if test yes,no = "\$GCC,\$with_gnu_ld"; then

case \$host_cpu in

hppa*64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$wl+h \$wl\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags';;

ia64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$wl+h \$wl\$soname \$wl+nodefaultrpath -o \$lib \$libobjs \$deplibs \$compiler_flags'

;; *)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$wl+h \$wl\$soname \$wl+b \$wl\$install_libdir -o \$lib \$libobjs \$deplibs \$compiler_flags'

;;

esac

else

case \$host_cpu in

hppa*64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -b \$wl+h \$wl\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags' ;;

ia64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -b \$wl+h \$wl\$soname \$wl+nodefaultrpath -o \$lib \$libobjs \$deplibs \$compiler_flags'

;;

*)

m4_if(\$1, [], [

Older versions of the 11.00 compiler do not understand -b yet

(HP92453-01 A.11.01.20 doesn't, HP92453-01 B.11.X.35175-35176.GP does)

_LT_LINKER_OPTION([if \$CC understands -b],

_LT_TAGVAR(lt_cv_prog_compiler__b, \$1), [-b],

[_LT_TAGVAR(archive_cmds, \$1)='\$CC -b \$wl+h \$wl\$soname \$wl+b \$wl\$install_libdir -o \$lib \$libobjs \$deplibs \$compiler_flags'],

[_LT_TAGVAR(archive_cmds, \$1)='\$LD -b +h \$soname +b \$install_libdir -o \$lib \$libobjs \$deplibs \$linker_flags'])],

[_LT_TAGVAR(archive_cmds, \$1)='\$CC -b \$wl+h \$wl\$soname \$wl+b \$wl\$install_libdir -o \$lib \$libobjs \$deplibs \$compiler_flags'])

;;

esac

fi

if test no = "\$with_gnu_ld"; then

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl+b \$wl\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=:

```
case $host cpu in
hppa*64*|ia64*)
 _LT_TAGVAR(hardcode_direct, $1)=no
 _LT_TAGVAR(hardcode_shlibpath_var, $1)=no
 ;;
*)
 LT TAGVAR(hardcode direct, $1)=yes
 _LT_TAGVAR(hardcode_direct_absolute, $1)=yes
 _LT_TAGVAR(export_dynamic_flag_spec, $1)='$wl-E'
 # hardcode_minus_L: Not really in the search PATH,
 # but as the default location of the library.
 LT TAGVAR(hardcode minus L, $1)=yes
 ;;
esac
  fi
  ;;
 irix5* | irix6* | nonstopux*)
  if test yes = "$GCC"; then
LT TAGVAR(archive cmds, $1)='$CC -shared $pic flag $libobjs $deplibs $compiler flags $wl-soname
$wl$soname `test -n "$verstring" && func_echo_all "$wl-set_version $wl$verstring"` $wl-update_registry
$wl$output_objdir/so_locations -o $lib'
# Try to use the -exported symbol ld option, if it does not
# work, assume that -exports_file does not work either and
# implicitly export all symbols.
# This should be the same for all languages, so no per-tag cache variable.
AC_CACHE_CHECK([whether the $host_os linker accepts -exported_symbol],
 [lt_cv_irix_exported_symbol],
 [save LDFLAGS=$LDFLAGS
 LDFLAGS="$LDFLAGS -shared $wl-exported_symbol ${wl}foo $wl-update_registry $wl/dev/null"
 AC LINK IFELSE(
   [AC_LANG_SOURCE(
    [AC_LANG_CASE([C], [[int foo (void) { return 0; }]],
     [C++], [[int foo (void) { return 0; }]],
     [Fortran 77], [[
  subroutine foo
  end]],
     [Fortran], [[
  subroutine foo
  end]])])],
   [lt_cv_irix_exported_symbol=yes],
   [lt_cv_irix_exported_symbol=no])
     LDFLAGS=$save_LDFLAGS])
if test yes = "$lt_cv_irix_exported_symbol"; then
     _LT_TAGVAR(archive_expsym_cmds, $1)='$CC -shared $pic_flag $libobjs $deplibs $compiler_flags $wl-
soname $wl$soname `test -n "$verstring" && func_echo_all "$wl-set_version $wl$verstring"` $wl-update_registry
```

\$wl\$output_objdir/so_locations \$wl-exports_file \$wl\$export_symbols -o \$lib'

fi

_LT_TAGVAR(link_all_deplibs, \$1)=no

else

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags -soname \$soname `test -n "\$verstring" && func_echo_all "-set_version \$verstring"` -update_registry \$output_objdir/so_locations -o \$lib' _LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags -soname \$soname `test -n "\$verstring" && func_echo_all "-set_version \$verstring"` -update_registry \$output_objdir/so_locations exports_file \$export_symbols -o \$lib'

fi

```
_LT_TAGVAR(archive_cmds_need_lc, $1)='no'
```

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir'

```
_LT_TAGVAR(hardcode_libdir_separator, $1)=:
```

```
_LT_TAGVAR(inherit_rpath, $1)=yes
```

```
_LT_TAGVAR(link_all_deplibs, $1)=yes
```

;;

linux*)

case \$cc_basename in

tcc*)

Fabrice Bellard et al's Tiny C Compiler

_LT_TAGVAR(ld_shlibs, \$1)=yes

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -o \$lib \$libobjs \$deplibs \$compiler_flags'

```
;;
```

```
esac
```

;;

netbsd* | netbsdelf*-gnu)

if echo __ELF__ | \$CC -E - | \$GREP __ELF__ >/dev/null; then

_LT_TAGVAR(archive_cmds, \$1)='\$LD -Bshareable -o \$lib \$libobjs \$deplibs \$linker_flags' # a.out else

_LT_TAGVAR(archive_cmds, \$1)='\$LD -shared -o \$lib \$libobjs \$deplibs \$linker_flags' # ELF fi

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-R\$libdir'

_LT_TAGVAR(hardcode_direct, \$1)=yes

```
_LT_TAGVAR(hardcode_shlibpath_var, $1)=no
```

;;

newsos6)

_LT_TAGVAR(archive_cmds, \$1)='\$LD -G -h \$soname -o \$lib \$libobjs \$deplibs \$linker_flags'

_LT_TAGVAR(hardcode_direct, \$1)=yes

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir'

```
_LT_TAGVAR(hardcode_libdir_separator, $1)=:
```

```
_LT_TAGVAR(hardcode_shlibpath_var, $1)=no
```

```
;;
```

nto | *qnx*) ;; openbsd* | bitrig*)

if test -f /usr/libexec/ld.so; then

_LT_TAGVAR(hardcode_direct, \$1)=yes

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

_LT_TAGVAR(hardcode_direct_absolute, \$1)=yes

if test -z "`echo __ELF__ | $CC - E - | GREP __ELF_`"$; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -o \$lib \$libobjs \$deplibs \$compiler_flags'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$pic_flag -o \$lib \$libobjs \$deplibs \$compiler_flags \$wl-retain-symbols-file,\$export_symbols'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir'

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-E'

else

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -o \$lib \$libobjs \$deplibs \$compiler_flags'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir'

fi

else

_LT_TAGVAR(ld_shlibs, \$1)=no

fi

;;

os2*)

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

shrext_cmds=.dll

_LT_TAGVAR(archive_cmds, \$1)='\$ECHO "LIBRARY \${soname%\$shared_ext} INITINSTANCE

TERMINSTANCE" > \$output_objdir/\$libname.def~

\$ECHO "DESCRIPTION \"\$libname\"" >> \$output_objdir/\$libname.def~

\$ECHO "DATA MULTIPLE NONSHARED" >> \$output_objdir/\$libname.def~

\$ECHO EXPORTS >> \$output_objdir/\$libname.def~

emxexp \$libobjs | \$SED /"_DLL_InitTerm"/d >> \$output_objdir/\$libname.def~

\$CC -Zdll -Zcrtdll -o \$output_objdir/\$soname \$libobjs \$deplibs \$compiler_flags \$output_objdir/\$libname.def~
emximp -o \$lib \$output_objdir/\$libname.def'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$ECHO "LIBRARY \${soname%\$shared_ext} INITINSTANCE TERMINSTANCE" > \$output_objdir/\$libname.def~

\$ECHO "DESCRIPTION \"\$libname\"" >> \$output_objdir/\$libname.def~

\$ECHO "DATA MULTIPLE NONSHARED" >> \$output_objdir/\$libname.def~

\$ECHO EXPORTS >> \$output_objdir/\$libname.def~

prefix_cmds="\$SED"~

if test EXPORTS = "`\$SED 1q \$export_symbols`"; then

prefix_cmds="\$prefix_cmds -e 1d";

fi~

prefix_cmds="\$prefix_cmds -e \"s/^\(.*\)\$/_\1/g\""~

\$CC -Zdll -Zcrtdll -o \$output_objdir/\$soname \$libobjs \$deplibs \$compiler_flags \$output_objdir/\$libname.def~ emximp -o \$lib \$output_objdir/\$libname.def'

_LT_TAGVAR(old_archive_From_new_cmds, \$1)='emximp -o \$output_objdir/\${libname}_dll.a \$output_objdir/\$libname.def' _LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=yes

;;

osf3*)

if test yes = "\$GCC"; then

_LT_TAGVAR(allow_undefined_flag, \$1)=' \$wl-expect_unresolved \$wl*'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared\$allow_undefined_flag \$libobjs \$deplibs \$compiler_flags \$wlsoname \$wl\$soname `test -n "\$verstring" && func_echo_all "\$wl-set_version \$wl\$verstring"` \$wl-update_registry \$wl\$output_objdir/so_locations -o \$lib'

else

_LT_TAGVAR(allow_undefined_flag, \$1)=' -expect_unresolved *'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared\$allow_undefined_flag \$libobjs \$deplibs \$compiler_flags -soname \$soname `test -n "\$verstring" && func_echo_all "-set_version \$verstring"` -update_registry \$output_objdir/so_locations -o \$lib'

fi

_LT_TAGVAR(archive_cmds_need_lc, \$1)='no'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=:

;;

osf4* | osf5*) # as osf3* with the addition of -msym flag

if test yes = "\$GCC"; then

_LT_TAGVAR(allow_undefined_flag, \$1)=' \$wl-expect_unresolved \$wl*'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared\$allow_undefined_flag \$pic_flag \$libobjs \$deplibs

\$compiler_flags \$wl-msym \$wl-soname \$wl\$soname `test -n "\$verstring" && func_echo_all "\$wl-set_version

\$wl\$verstring"` \$wl-update_registry \$wl\$output_objdir/so_locations -o \$lib'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir'

else

_LT_TAGVAR(allow_undefined_flag, \$1)=' -expect_unresolved *'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared\$allow_undefined_flag \$libobjs \$deplibs \$compiler_flags -msym soname \$soname `test -n "\$verstring" && func_echo_all "-set_version \$verstring"` -update_registry \$output objdir/so locations -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='for i in `cat \$export_symbols`; do printf "%s %s\\n" -exported_symbol "\\$i" >> \$lib.exp; done; printf "%s\\n" "-hidden">> \$lib.exp~

\$CC -shared\$allow_undefined_flag \$wl-input \$wl\$lib.exp \$compiler_flags \$libobjs \$deplibs -soname \$soname `test -n "\$verstring" && \$ECHO "-set_version \$verstring"` -update_registry \$output_objdir/so_locations o \$lib~\$RM \$lib.exp'

Both c and cxx compiler support -rpath directly

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-rpath \$libdir' fi _LT_TAGVAR(archive_cmds_need_lc, \$1)='no' _LT_TAGVAR(hardcode_libdir_separator, \$1)=: ;; solaris*)

_LT_TAGVAR(no_undefined_flag, \$1)=' -z defs' if test yes = "\$GCC"; then wlarc='\$wl'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$wl-z \${wl}text \$wl-h \$wl\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

 $\label{eq:lt_table_stable} $$ LT_TAGVAR(archive_expsym_cmds, $1)='echo "{ global:" > $lib.exp~cat $export_symbols | $SED -e "s/(.*\)/1;/" >> $lib.exp~echo "local: *; };" >> $lib.exp~$

\$CC -shared \$pic_flag \$wl-z \${wl}text \$wl-M \$wl\$lib.exp \$wl-h \$wl\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags~\$RM \$lib.exp'

else

case `\$CC -V 2>&1` in

"Compilers 5.0")

wlarc="

_LT_TAGVAR(archive_cmds, \$1)='\$LD -G\$allow_undefined_flag -h \$soname -o \$lib \$libobjs \$deplibs \$linker_flags'

_LT_TAGVAR(archive_expsym_cmds, 1)='echo "{ global:" > \$lib.exp~cat \$export_symbols | \$SED -e "s/(.*\)/1;/" >> \$lib.exp~echo "local: *; };" >> \$lib.exp~

\$LD -G\$allow_undefined_flag -M \$lib.exp -h \$soname -o \$lib \$libobjs \$deplibs \$linker_flags~\$RM \$lib.exp'

;;

*)

wlarc='\$wl'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G\$allow_undefined_flag -h \$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

_LT_TAGVAR(archive_expsym_cmds, \$1)='echo "{ global:" > \$lib.exp~cat \$export_symbols | \$SED -e "s/(.*\)/1;/" >> \$lib.exp~echo "local: *; };" >> \$lib.exp~

\$CC -G\$allow_undefined_flag -M \$lib.exp -h \$soname -o \$lib \$libobjs \$deplibs \$compiler_flags~\$RM \$lib.exp'

;;

esac

fi

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-R\$libdir'

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

case \$host_os in

solaris2.[[0-5]] | solaris2.[[0-5]].*) ;;

*)

The compiler driver will combine and reorder linker options,

but understands '-z linker_flag'. GCC discards it without '\$wl',

but is careful enough not to reorder.

Supported since Solaris 2.6 (maybe 2.5.1?)

if test yes = "\$GCC"; then

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl-z \${wl}allextract\$convenience \$wl-z \${wl}defaultextract' else

_LT_TAGVAR(whole_archive_flag_spec, \$1)='-z allextract\$convenience -z defaultextract'

fi ;;

esac _LT_TAGVAR(link_all_deplibs, \$1)=yes ;; sunos4*)

if test sequent = "\$host_vendor"; then

Use \$CC to link under sequent, because it throws in some extra .o

files that make .init and .fini sections work.

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G \$wl-h \$soname -o \$lib \$libobjs \$deplibs \$compiler_flags' else

_LT_TAGVAR(archive_cmds, \$1)='\$LD -assert pure-text -Bstatic -o \$lib \$libobjs \$deplibs \$linker_flags' fi

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

_LT_TAGVAR(hardcode_direct, \$1)=yes

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

;;

sysv4)

case \$host_vendor in

sni)

_LT_TAGVAR(archive_cmds, \$1)='\$LD -G -h \$soname -o \$lib \$libobjs \$deplibs \$linker_flags' _LT_TAGVAR(hardcode_direct, \$1)=yes # is this really true???

;;

siemens)

LD is ld it makes a PLAMLIB

CC just makes a GrossModule.

_LT_TAGVAR(archive_cmds, \$1)='\$LD -G -o \$lib \$libobjs \$deplibs \$linker_flags'

_LT_TAGVAR(reload_cmds, \$1)='\$CC -r -o \$output\$reload_objs'

_LT_TAGVAR(hardcode_direct, \$1)=no

;;

motorola)

_LT_TAGVAR(archive_cmds, \$1)='\$LD -G -h \$soname -o \$lib \$libobjs \$deplibs \$linker_flags' _LT_TAGVAR(hardcode_direct, \$1)=no #Motorola manual says yes, but my tests say they lie

;;

esac runpath_var='LD_RUN_PATH' _LT_TAGVAR(hardcode_shlibpath_var, \$1)=no ...

;;

sysv4.3*)

_LT_TAGVAR(archive_cmds, \$1)='\$LD -G -h \$soname -o \$lib \$libobjs \$deplibs \$linker_flags' _LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='-Bexport'

;;

sysv4*MP*)

if test -d /usr/nec; then

_LT_TAGVAR(archive_cmds, \$1)='\$LD -G -h \$soname -o \$lib \$libobjs \$deplibs \$linker_flags' _LT_TAGVAR(hardcode_shlibpath_var, \$1)=no runpath_var=LD_RUN_PATH

hardcode_runpath_var=yes

```
_LT_TAGVAR(ld_shlibs, $1)=yes
fi
```

;;

sysv4*uw2* | sysv5OpenUNIX* | sysv5UnixWare7.[[01]].[[10]]* | unixware7* | sco3.2v5.0.[[024]]*)

_LT_TAGVAR(no_undefined_flag, \$1)='\$wl-z,text'

_LT_TAGVAR(archive_cmds_need_lc, \$1)=no

 $LT_TAGVAR(hardcode_shlibpath_var, \$1)=no$

runpath_var='LD_RUN_PATH'

if test yes = "\$GCC"; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags' _LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$wl-Bexport:\$export_symbols \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

else

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags' _LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -G \$wl-Bexport:\$export_symbols \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

fi

;;

sysv5* | sco3.2v5* | sco5v6*)

Note: We CANNOT use -z defs as we might desire, because we do not

link with -lc, and that would cause any symbols used from libc to

always be unresolved, which means just about no library would

ever link correctly. If we're not using GNU ld we use -z text

though, which does catch some bad symbols but isn't as heavy-handed

as -z defs.

_LT_TAGVAR(allow_undefined_flag, \$1)='\$wl-z,nodefs'

_LT_TAGVAR(archive_cmds_need_lc, \$1)=no

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-R,\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=':'

_LT_TAGVAR(link_all_deplibs, \$1)=yes

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-Bexport'

runpath_var='LD_RUN_PATH'

if test yes = "\$GCC"; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags' _LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$wl-Bexport:\$export_symbols \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

else

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -G \$wl-Bexport:\$export_symbols \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

fi

;;

```
uts4*)
  _LT_TAGVAR(archive_cmds, $1)='$LD -G -h $soname -o $lib $libobjs $deplibs $linker_flags'
  _LT_TAGVAR(hardcode_libdir_flag_spec, $1)='-L$libdir'
  _LT_TAGVAR(hardcode_shlibpath_var, $1)=no
  ;;
  *)
  _LT_TAGVAR(ld_shlibs, $1)=no
  ;;
 esac
 if test sni = "$host vendor"; then
  case $host in
  sysv4 | sysv4.2uw2* | sysv4.3* | sysv5*)
_LT_TAGVAR(export_dynamic_flag_spec, $1)='$wl-Blargedynsym'
;;
  esac
 fi
fi
1)
AC_MSG_RESULT([$_LT_TAGVAR(ld_shlibs, $1)])
test no = "$_LT_TAGVAR(ld_shlibs, $1)" && can_build_shared=no
_LT_TAGVAR(with_gnu_ld, $1)=$with_gnu_ld
_LT_DECL([], [libext], [0], [Old archive suffix (normally "a")])dnl
_LT_DECL([], [shrext_cmds], [1], [Shared library suffix (normally ".so")])dnl
_LT_DECL([], [extract_expsyms_cmds], [2],
 [The commands to extract the exported symbol list from a shared archive])
#
# Do we need to explicitly link libc?
#
case "x$_LT_TAGVAR(archive_cmds_need_lc, $1)" in
x|xyes)
# Assume -lc should be added
_LT_TAGVAR(archive_cmds_need_lc, $1)=yes
if test yes, yes = "$GCC, $enable_shared"; then
 case $_LT_TAGVAR(archive_cmds, $1) in
 *'~'*)
  # FIXME: we may have to deal with multi-command sequences.
  ;;
  '$CC '*)
  # Test whether the compiler implicitly links with -lc since on some
  # systems, -lgcc has to come before -lc. If gcc already passes -lc
  # to ld, don't add -lc before -lgcc.
```

AC_CACHE_CHECK([whether -lc should be explicitly linked in], [lt_cv_]_LT_TAGVAR(archive_cmds_need_lc, \$1), [\$RM conftest* echo "\$lt_simple_compile_test_code" > conftest.\$ac_ext if AC_TRY_EVAL(ac_compile) 2>conftest.err; then soname=conftest lib=conftest libobjs=conftest.\$ac_objext deplibs= wl=\LT_TAGVAR(lt_prog_compiler_wl, \1) pic_flag=\$_LT_TAGVAR(lt_prog_compiler_pic, \$1) compiler flags=-v linker_flags=-v verstring= output objdir=. libname=conftest It save allow undefined flag=\$ LT TAGVAR(allow undefined flag, \$1) _LT_TAGVAR(allow_undefined_flag, \$1)= then lt_cv_[]_LT_TAGVAR(archive_cmds_need_lc, \$1)=no else lt_cv_[]_LT_TAGVAR(archive_cmds_need_lc, \$1)=yes fi _LT_TAGVAR(allow_undefined_flag, \$1)=\$lt_save_allow_undefined_flag else cat conftest.err 1>&5 fi \$RM conftest*]) _LT_TAGVAR(archive_cmds_need_lc, \$1)=\$lt_cv_[]_LT_TAGVAR(archive_cmds_need_lc, \$1) ;; esac fi ;; esac _LT_TAGDECL([build_libtool_need_lc], [archive_cmds_need_lc], [0], [Whether or not to add -lc for building shared libraries]) _LT_TAGDECL([allow_libtool_libs_with_static_runtimes], [enable_shared_with_static_runtimes], [0], [Whether or not to disallow shared libs when runtime libs are static]) _LT_TAGDECL([], [export_dynamic_flag_spec], [1], [Compiler flag to allow reflexive dlopens]) _LT_TAGDECL([], [whole_archive_flag_spec], [1], [Compiler flag to generate shared objects directly from archives]) _LT_TAGDECL([], [compiler_needs_object], [1],

[Whether the compiler copes with passing no objects directly])

- _LT_TAGDECL([], [old_archive_from_new_cmds], [2],
- [Create an old-style archive from a shared archive])
- _LT_TAGDECL([], [old_archive_from_expsyms_cmds], [2],

[Create a temporary old-style archive to link instead of a shared archive])

- _LT_TAGDECL([], [archive_cmds], [2], [Commands used to build a shared archive])
- _LT_TAGDECL([], [archive_expsym_cmds], [2])
- _LT_TAGDECL([], [module_cmds], [2],

[Commands used to build a loadable module if different from building a shared archive.])

- _LT_TAGDECL([], [module_expsym_cmds], [2])
- _LT_TAGDECL([], [with_gnu_ld], [1],
- [Whether we are building with GNU ld or not])
- _LT_TAGDECL([], [allow_undefined_flag], [1],

[Flag that allows shared libraries with undefined symbols to be built])

- _LT_TAGDECL([], [no_undefined_flag], [1],
- [Flag that enforces no undefined symbols])

_LT_TAGDECL([], [hardcode_libdir_flag_spec], [1], [Flag to hardcode \$libdir into a binary during linking. This must work even if \$libdir does not exist])

- _LT_TAGDECL([], [hardcode_libdir_separator], [1],
- [Whether we need a single "-rpath" flag with a separated argument])
- _LT_TAGDECL([], [hardcode_direct], [0],

[Set to "yes" if using DIR/libNAME\$shared_ext during linking hardcodes DIR into the resulting binary])

_LT_TAGDECL([], [hardcode_direct_absolute], [0],

[Set to "yes" if using DIR/libNAME\$shared_ext during linking hardcodes DIR into the resulting binary and the resulting library dependency is "absolute", i.e impossible to change by setting \$shlibpath_var if the library is relocated])

_LT_TAGDECL([], [hardcode_minus_L], [0],

[Set to "yes" if using the -LDIR flag during linking hardcodes DIR into the resulting binary])

_LT_TAGDECL([], [hardcode_shlibpath_var], [0],

[Set to "yes" if using SHLIBPATH_VAR=DIR during linking hardcodes DIR into the resulting binary])

_LT_TAGDECL([], [hardcode_automatic], [0],

[Set to "yes" if building a shared library automatically hardcodes DIR into the library and all subsequent libraries and executables linked against it])

_LT_TAGDECL([], [inherit_rpath], [0],

[Set to yes if linker adds runtime paths of dependent libraries to runtime path list])

_LT_TAGDECL([], [link_all_deplibs], [0],

[Whether libtool must link a program against all its dependency libraries])

- _LT_TAGDECL([], [always_export_symbols], [0],
- [Set to "yes" if exported symbols are required])
- _LT_TAGDECL([], [export_symbols_cmds], [2],

[The commands to list exported symbols])

_LT_TAGDECL([], [exclude_expsyms], [1],

[Symbols that should not be listed in the preloaded symbols])

_LT_TAGDECL([], [include_expsyms], [1],

[Symbols that must always be exported])

_LT_TAGDECL([], [prelink_cmds], [2],

[Commands necessary for linking programs (against libraries) with templates])

_LT_TAGDECL([], [postlink_cmds], [2],

[Commands necessary for finishing linking programs])

_LT_TAGDECL([], [file_list_spec], [1],

[Specify filename containing input files])

dnl FIXME: Not yet implemented

dnl _LT_TAGDECL([], [thread_safe_flag_spec], [1],

dnl [Compiler flag to generate thread safe objects])

])# _LT_LINKER_SHLIBS

 $\# _LT_LANG_C_CONFIG([TAG])$

Ensure that the configuration variables for a C compiler are suitably

defined. These variables are subsequently used by _LT_CONFIG to write

the compiler configuration to 'libtool'.

m4_defun([_LT_LANG_C_CONFIG],

[m4_require([_LT_DECL_EGREP])dnl

lt_save_CC=\$CC

AC_LANG_PUSH(C)

Source file extension for C test sources. ac_ext=c

Object file extension for compiled C test sources.
objext=o
_LT_TAGVAR(objext, \$1)=\$objext

Code to be used in simple compile tests
lt_simple_compile_test_code="int some_variable = 0;"

Code to be used in simple link tests
lt_simple_link_test_code='int main(){return(0);}'

_LT_TAG_COMPILER # Save the default compiler since it g

Save the default compiler, since it gets overwritten when the other # tags are being tested, and _LT_TAGVAR(compiler, []) is a NOP. compiler_DEFAULT=\$CC

save warnings/boilerplate of simple test code
_LT_COMPILER_BOILERPLATE
_LT_LINKER_BOILERPLATE

CAVEAT EMPTOR:

There is no encapsulation within the following macros, do not change
the running order or otherwise move them around unless you know exactly
what you are doing...
if test -n "\$compiler"; then
_LT_COMPILER_NO_RTTI(\$1)
_LT_COMPILER_PIC(\$1)
_LT_COMPILER_C_O(\$1)
_LT_COMPILER_FILE_LOCKS(\$1)
_LT_LINKER_SHLIBS(\$1)
_LT_SYS_DYNAMIC_LINKER(\$1)
LT_LINKER_HARDCODE_LIBPATH(\$1)
LT_SYS_DLOPEN_SELF
_LT_CMD_STRIPLIB

Report what library types will actually be built AC_MSG_CHECKING([if libtool supports shared libraries]) AC_MSG_RESULT([\$can_build_shared])

AC_MSG_CHECKING([whether to build shared libraries]) test no = "\$can_build_shared" && enable_shared=no

On AIX, shared libraries and static libraries use the same namespace, and # are all built from PIC. case \$host os in aix3*) test yes = "\$enable_shared" && enable_static=no if test -n "\$RANLIB"; then archive cmds="\$archive cmds~\\$RANLIB \\$lib" postinstall_cmds='\$RANLIB \$lib' fi ;; aix[[4-9]]*) if test ia64 != "\$host_cpu"; then case \$enable_shared,\$with_aix_soname,\$aix_use_runtimelinking in yes,aix,yes) ;; # shared object as lib.so file only yes,svr4,*) ;; # shared object as lib.so archive member only yes,*) enable_static=no ;; # shared object in lib.a archive as well esac fi ;; esac AC_MSG_RESULT([\$enable_shared])

AC_MSG_CHECKING([whether to build static libraries]) # Make sure either enable_shared or enable_static is yes. test yes = "\$enable_shared" || enable_static=yes AC_MSG_RESULT([\$enable_static])

```
_LT_CONFIG($1)
fi
AC_LANG_POP
CC=$lt_save_CC
])# _LT_LANG_C_CONFIG
```

LT_LANG_CXX_CONFIG([TAG])

```
# Ensure that the configuration variables for a C++ compiler are suitably
# defined. These variables are subsequently used by _LT_CONFIG to write
# the compiler configuration to 'libtool'.
m4_defun([_LT_LANG_CXX_CONFIG],
[m4_require([_LT_FILEUTILS_DEFAULTS])dnl
m4_require([_LT_DECL_EGREP])dnl
m4_require([_LT_PATH_MANIFEST_TOOL])dnl
if test -n "$CXX" && ( test no != "$CXX" &&
  ( (test g++ = "$CXX" && `g++ -v >/dev/null 2>&1` ) ||
  (test g++ != "$CXX"))); then
  AC_PROG_CXXCPP
else
  _lt_caught_CXX_error=yes
fi
```

 $AC_LANG_PUSH(C++)$

_LT_TAGVAR(archive_cmds_need_lc, \$1)=no

_LT_TAGVAR(allow_undefined_flag, \$1)= _LT_TAGVAR(always_export_symbols, \$1)=no _LT_TAGVAR(archive_expsym_cmds, \$1)=

_LT_TAGVAR(compiler_needs_object, \$1)=no

_LT_TAGVAR(export_dynamic_flag_spec, \$1)=

_LT_TAGVAR(hardcode_direct, \$1)=no

_LT_TAGVAR(hardcode_direct_absolute, \$1)=no

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)=

_LT_TAGVAR(hardcode_libdir_separator, \$1)=

_LT_TAGVAR(hardcode_minus_L, \$1)=no

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=unsupported

_LT_TAGVAR(hardcode_automatic, \$1)=no

_LT_TAGVAR(inherit_rpath, \$1)=no

_LT_TAGVAR(module_cmds, \$1)=

_LT_TAGVAR(module_expsym_cmds, \$1)=

_LT_TAGVAR(link_all_deplibs, \$1)=unknown

_LT_TAGVAR(old_archive_cmds, \$1)=\$old_archive_cmds

 $_LT_TAGVAR(reload_flag, \$1)=\$reload_flag$

_LT_TAGVAR(reload_cmds, \$1)=\$reload_cmds

_LT_TAGVAR(no_undefined_flag, \$1)= _LT_TAGVAR(whole_archive_flag_spec, \$1)= _LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=no

Source file extension for C++ test sources. ac_ext=cpp

Object file extension for compiled C++ test sources.
objext=o
_LT_TAGVAR(objext, \$1)=\$objext

No sense in running all these tests if we already determined that # the CXX compiler isn't working. Some variables (like enable_shared) # are currently assumed to apply to all compilers on this platform, # and will be corrupted by setting them based on a non-working compiler. if test yes != "\$_lt_caught_CXX_error"; then # Code to be used in simple compile tests lt_simple_compile_test_code="int some_variable = 0;"

Code to be used in simple link tests
lt_simple_link_test_code='int main(int, char *[[]]) { return(0); }'

ltmain only uses \$CC for tagged configurations so make sure \$CC is set. _LT_TAG_COMPILER

save warnings/boilerplate of simple test code
_LT_COMPILER_BOILERPLATE
_LT_LINKER_BOILERPLATE

Allow CC to be a program name with arguments. lt_save_CC=\$CC lt_save_CFLAGS=\$CFLAGS lt_save_LD=\$LD It save GCC=\$GCC GCC=\$GXX lt_save_with_gnu_ld=\$with_gnu_ld lt_save_path_LD=\$lt_cv_path_LD if test -n "\${lt_cv_prog_gnu_ldcxx+set}"; then lt_cv_prog_gnu_ld=\$lt_cv_prog_gnu_ldcxx else \$as_unset lt_cv_prog_gnu_ld fi if test -n "\${lt_cv_path_LDCXX+set}"; then lt_cv_path_LD=\$lt_cv_path_LDCXX else \$as_unset lt_cv_path_LD fi test -z "\${LDCXX+set}" || LD=\$LDCXX

CC=\${CXX-"c++"} CFLAGS=\$CXXFLAGS compiler=\$CC _LT_TAGVAR(compiler, \$1)=\$CC _LT_CC_BASENAME([\$compiler])

if test -n "\$compiler"; then
We don't want -fno-exception when compiling C++ code, so set the
no_builtin_flag separately
if test yes = "\$GXX"; then
_LT_TAGVAR(lt_prog_compiler_no_builtin_flag, \$1)=' -fno-builtin'
else
_LT_TAGVAR(lt_prog_compiler_no_builtin_flag, \$1)=
fi

if test yes = "\$GXX"; then
Set up default GNU C++ configuration

LT_PATH_LD

Check if GNU C++ uses GNU ld as the underlying linker, since the

archiving commands below assume that GNU ld is being used.

if test yes = "\$with_gnu_ld"; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC \$pic_flag -shared -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname -0 \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC \$pic_flag -shared -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols o \$lib'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir' _LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl--export-dynamic'

If archive_cmds runs LD, not CC, wlarc should be empty
XXX I think wlarc can be eliminated in ltcf-cxx, but I need to
investigate it a little bit more. (MM)
wlarc='\$wl'

ancient GNU ld didn't support --whole-archive et. al.

```
if eval "`$CC -print-prog-name=ld` --help 2>&1" |
```

GREP 'no-whole-archive' > /dev/null; then

 $\label{eq:lt_tag_spec} LT_TAGVAR (whole_archive_flag_spec, \$1) = \$wlarc'--whole-archive\$convenience '\$wlarc'--no-whole-archive'$

else

```
_LT_TAGVAR(whole_archive_flag_spec, $1)=
fi
else
with_gnu_ld=no
wlarc=
```

A generic and very simple default shared library creation

command for GNU C++ for the case where it uses the native

linker, instead of GNU ld. If possible, this setting should

overridden to take advantage of the native linker features on

the platform it is being used on.

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags -o \$lib'

fi

Commands to make compiler produce verbose output that lists

what "hidden" libraries, object files and flags are used when

linking a shared library.

output_verbose_link_cmd='\$CC -shared \$CFLAGS -v conftest.\$objext 2>&1 | \$GREP -v "^Configured with:" | \$GREP "\-L"'

else

GXX=no with_gnu_ld=no wlarc=

fi

```
# PORTME: fill in a description of your system's C++ link characteristics
AC MSG CHECKING([whether the $compiler linker ($LD) supports shared libraries])
_LT_TAGVAR(ld_shlibs, $1)=yes
case $host os in
 aix3*)
  # FIXME: insert proper C++ library support
  LT TAGVAR(ld shlibs, $1)=no
  ::
 aix[[4-9]]*)
  if test ia64 = "$host cpu"; then
   # On IA64, the linker does run time linking by default, so we don't
   # have to do anything special.
   aix_use_runtimelinking=no
   exp_sym_flag='-Bexport'
   no_entry_flag=
  else
   aix_use_runtimelinking=no
   # Test if we are trying to use run time linking or normal
   # AIX style linking. If -brtl is somewhere in LDFLAGS, we
   # have runtime linking enabled, and use it for executables.
   # For shared libraries, we enable/disable runtime linking
   # depending on the kind of the shared library created -
   # when "with_aix_soname,aix_use_runtimelinking" is:
   # "aix,no" lib.a(lib.so.V) shared, rtl:no, for executables
```

"aix,yes" lib.so shared, rtl:yes, for executables

```
#
           lib.a
                      static archive
  # "both,no" lib.so.V(shr.o) shared, rtl:yes
           lib.a(lib.so.V) shared, rtl:no, for executables
  #
  # "both,yes" lib.so.V(shr.o) shared, rtl:yes, for executables
           lib.a(lib.so.V) shared, rtl:no
  #
  # "svr4,*" lib.so.V(shr.o) shared, rtl:yes, for executables
  #
                      static archive
           lib.a
  case $host_os in aix4.[[23]]|aix4.[[23]].*|aix[[5-9]]*)
for ld_flag in $LDFLAGS; do
 case $ld flag in
 *-brtl*)
  aix_use_runtimelinking=yes
  break
  ;;
 esac
done
if test svr4,no = "$with_aix_soname,$aix_use_runtimelinking"; then
 # With aix-soname=svr4, we create the lib.so.V shared archives only,
 # so we don't have lib.a shared libs to link our executables.
 # We have to force runtime linking in this case.
 aix use runtimelinking=yes
 LDFLAGS="$LDFLAGS -Wl,-brtl"
fi
;;
  esac
  exp_sym_flag='-bexport'
  no_entry_flag='-bnoentry'
 fi
 # When large executables or shared objects are built, AIX ld can
 # have problems creating the table of contents. If linking a library
 # or program results in "error TOC overflow" add -mminimal-toc to
 # CXXFLAGS/CFLAGS for g++/gcc. In the cases where that is not
```

```
_LT_TAGVAR(archive_cmds, $1)="

_LT_TAGVAR(hardcode_direct, $1)=yes

_LT_TAGVAR(hardcode_direct_absolute, $1)=yes

_LT_TAGVAR(hardcode_libdir_separator, $1)=':'

_LT_TAGVAR(link_all_deplibs, $1)=yes

_LT_TAGVAR(file_list_spec, $1)='$wl-f,'

case $with_aix_soname,$aix_use_runtimelinking in

aix,*) ;; # no import file

$vr4,* | *,yes) # use import file

# The Import File defines what to hardcode.

_LT_TAGVAR(hardcode_direct, $1)=no

_LT_TAGVAR(hardcode_direct_absolute, $1)=no
```

enough to fix the problem, add -Wl,-bbigtoc to LDFLAGS.

```
;;
esac
```

```
if test yes = "$GXX"; then
   case $host_os in aix4.[[012]]|aix4.[[012]].*)
   # We only want to do this on AIX 4.2 and lower, the check
   # below for broken collect2 doesn't work under 4.3+
collect2name=`$CC -print-prog-name=collect2`
if test -f "$collect2name" &&
 strings "$collect2name" | $GREP resolve lib name >/dev/null
then
 # We have reworked collect2
 •
else
 # We have old collect2
 _LT_TAGVAR(hardcode_direct, $1)=unsupported
 # It fails to find uninstalled libraries when the uninstalled
 # path is not listed in the libpath. Setting hardcode minus L
 # to unsupported forces relinking
 _LT_TAGVAR(hardcode_minus_L, $1)=yes
 _LT_TAGVAR(hardcode_libdir_flag_spec, $1)='-L$libdir'
 _LT_TAGVAR(hardcode_libdir_separator, $1)=
fi
   esac
   shared_flag='-shared'
if test yes = "$aix_use_runtimelinking"; then
 shared_flag=$shared_flag' $wl-G'
fi
# Need to ensure runtime linking is disabled for the traditional
# shared library, or the linker may eventually find shared libraries
#/with/ Import File - we do not want to mix them.
shared_flag_aix='-shared'
shared flag svr4='-shared $wl-G'
  else
   # not using gcc
   if test ia64 = "$host_cpu"; then
# VisualAge C++, Version 5.5 for AIX 5L for IA-64, Beta 3 Release
# chokes on -Wl,-G. The following line is correct:
shared_flag='-G'
   else
 if test yes = "$aix_use_runtimelinking"; then
  shared_flag='$wl-G'
 else
  shared_flag='$wl-bM:SRE'
 fi
 shared_flag_aix='$wl-bM:SRE'
 shared_flag_svr4='$wl-G'
   fi
```

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-bexpall' # It seems that -bexpall does not export symbols beginning with # underscore (_), so it is better to generate a list of symbols to

export.

_LT_TAGVAR(always_export_symbols, \$1)=yes

if test aix,yes = "\$with_aix_soname,\$aix_use_runtimelinking"; then

Warning - without using the other runtime loading flags (-brtl),

-berok will link without error, but may produce a broken library.

The "-G" linker flag allows undefined symbols.

_LT_TAGVAR(no_undefined_flag, \$1)='-bernotok'

Determine the default libpath from the value encoded in an empty

executable.

_LT_SYS_MODULE_PATH_AIX([\$1])

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-blibpath:\$libdir:'"\$aix_libpath"

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -o \$output_objdir/\$soname \$libobjs \$deplibs \$wl'\$no_entry_flag' \$compiler_flags `if test -n "\$allow_undefined_flag"; then func_echo_all "\$wl\$allow_undefined_flag"; else :; fi` \$wl'\$exp_sym_flag:\\$export_symbols' '\$shared_flag

else

if test ia64 = "\$host_cpu"; then

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-R \$libdir:/usr/lib:/lib'

_LT_TAGVAR(allow_undefined_flag, \$1)="-z nodefs"

_LT_TAGVAR(archive_expsym_cmds, \$1)="\\$CC \$shared_flag''' -o \$output_objdir/\$soname \$libobjs \$deplibs '''\\$wl\$no_entry_flag''' \$compiler_flags \$wl\$allow_undefined_flag '''\\$wl\$exp_sym_flag:\\$export_symbols''

else

Determine the default libpath from the value encoded in an

empty executable.

_LT_SYS_MODULE_PATH_AIX([\$1])

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-blibpath:\$libdir:"'\$aix_libpath"

Warning - without using the other run time loading flags,

-berok will link without error, but may produce a broken library.

_LT_TAGVAR(no_undefined_flag, \$1)=' \$wl-bernotok'

_LT_TAGVAR(allow_undefined_flag, \$1)=' \$wl-berok'

if test yes = "\$with_gnu_ld"; then

We only use this code for GNU lds that support --whole-archive.

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive\$convenience \$wl--no-whole-archive' else

Exported symbols can be pulled into shared objects from archives

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$convenience'

fi

_LT_TAGVAR(archive_cmds_need_lc, \$1)=yes

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$RM -r \$output_objdir/\$realname.d~\$MKDIR

\$output_objdir/\$realname.d'

-brtl affects multiple linker settings, -berok does not and is overridden later

compiler_flags_filtered=``func_echo_all "\$compiler_flags " | \$SED -e "s%-brtl\\([[,]]\\)%-berok\\1%g"`' if test svr4 != "\$with_aix_soname"; then

This is similar to how AIX traditionally builds its shared

libraries. Need -bnortl late, we may have -brtl in LDFLAGS.

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$CC '\$shared_flag_aix' -o \$output_objdir/\$realname.d/\$soname \$libobjs \$deplibs \$wl-bnoentry '\$compiler_flags_filtered'\$wl-bE:\$export_symbols\$allow_undefined_flag~\$AR \$AR_FLAGS \$output_objdir/\$libname\$release.a \$output_objdir/\$realname.d/\$soname'

fi

if test aix != "\$with_aix_soname"; then

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$CC '\$shared_flag_svr4' -o \$output_objdir/\$realname.d/\$shared_archive_member_spec.o \$libobjs \$deplibs \$wl-bnoentry '\$compiler_flags_filtered'\$wl-bE:\$export_symbols\$allow_undefined_flag~\$STRIP -e \$output_objdir/\$realname.d/\$shared_archive_member_spec.o~(func_echo_all "#!

\$soname(\$shared_archive_member_spec.o)"; if test shr_64 = "\$shared_archive_member_spec"; then func_echo_all
"# 64"; else func_echo_all "# 32"; fi; cat \$export_symbols) >

\$0utput_objdir/\$realname.d/\$shared_archive_member_spec.imp~\$AR \$AR_FLAGS \$output_objdir/\$soname

\$output_objdir/\$realname.d/\$shared_archive_member_spec.o

\$output_objdir/\$realname.d/\$shared_archive_member_spec.imp'

else

used by -dlpreopen to get the symbols

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$MV \$output_objdir/\$realname.d/\$soname \$output_objdir'

fi

_LT_TAGVAR(archive_expsym_cmds, \$1)="\$_LT_TAGVAR(archive_expsym_cmds, \$1)"'~\$RM -r \$output objdir/\$realname.d'

- fi
- fi
- ;;

beos*)

if \$LD --help 2>&1 | \$GREP ': supported targets:.* elf' > /dev/null; then

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

Joseph Beckenbach <jrb3@best.com> says some releases of gcc

support --undefined. This deserves some investigation. FIXME

_LT_TAGVAR(archive_cmds, \$1)='\$CC -nostart \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

else

```
_LT_TAGVAR(ld_shlibs, $1)=no
```

fi

;;

chorus*)

```
case $cc basename in
```

*)

FIXME: insert proper C++ library support

_LT_TAGVAR(ld_shlibs, \$1)=no

```
;;
esac
```

;;

```
cygwin* | mingw* | pw32* | cegcc*)
```

case \$GXX,\$cc_basename in

,cl* | no,cl*)

Native MSVC

hardcode_libdir_flag_spec is actually meaningless, as there is

no search path for DLLs.

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)=' '

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

 $_LT_TAGVAR(always_export_symbols, \$1) = yes$

_LT_TAGVAR(file_list_spec, \$1)='@'

Tell ltmain to make .lib files, not .a files.

libext=lib

Tell ltmain to make .dll files, not .so files.

shrext_cmds=.dll

FIXME: Setting linknames here is a bad hack.

_LT_TAGVAR(archive_cmds, \$1)='\$CC -o \$output_objdir/\$soname \$libobjs \$compiler_flags \$deplibs -Wl,-

DLL,-IMPLIB:"\$tool_output_objdir\$libname.dll.lib"~linknames='

_LT_TAGVAR(archive_expsym_cmds, \$1)='if _LT_DLL_DEF_P([\$export_symbols]); then

cp "\$export_symbols" "\$output_objdir/\$soname.def";

echo "\$tool_output_objdir\$soname.def" > "\$output_objdir/\$soname.exp";

else

 $SED - e '\"s/^/-link - EXPORT:/\"< $export_symbols > $output_objdir/$soname.exp;$

fi~

\$CC -o \$tool_output_objdir\$soname \$libobjs \$compiler_flags \$deplibs "@\$tool_output_objdir\$soname.exp"

-Wl,-DLL,-IMPLIB:"\$tool_output_objdir\$libname.dll.lib"~

linknames='

The linker will not automatically build a static lib if we build a DLL.

```
# _LT_TAGVAR(old_archive_from_new_cmds, $1)='true'
```

- _LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=yes
- # Don't use ranlib

_LT_TAGVAR(old_postinstall_cmds, \$1)='chmod 644 \$oldlib'

```
_LT_TAGVAR(postlink_cmds, $1)='lt_outputfile="@OUTPUT@"~
```

lt_tool_outputfile="@TOOL_OUTPUT@"~

```
case $lt_outputfile in
```

```
*.exe|*.EXE) ;;
```

*)

 $lt_outputfile=\$lt_outputfile.exe$

```
lt_tool_outputfile=$lt_tool_outputfile.exe
```

```
;;
```

esac~

func_to_tool_file "\$lt_outputfile"~

if test : != "\$MANIFEST_TOOL" && test -f "\$lt_outputfile.manifest"; then

```
$MANIFEST_TOOL -manifest "$lt_tool_outputfile.manifest" -outputresource:"$lt_tool_outputfile" || exit 1;
$RM "$lt_outputfile.manifest";
```

;;

fi'

*)

g++

LT_TAGVAR(hardcode_libdir_flag_spec, \$1) is actually meaningless,

as there is no search path for DLLs.

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl--export-all-symbols'

 $_LT_TAGVAR (allow_undefined_flag, \$1) = unsupported$

_LT_TAGVAR(always_export_symbols, \$1)=no

 $_LT_TAGVAR (enable_shared_with_static_runtimes, \$1) = yes$

if \$LD --help 2>&1 | \$GREP 'auto-import' > /dev/null; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags -o \$output_objdir/\$soname \$wl--enable-auto-image-base -Xlinker --out-implib -Xlinker \$lib'

If the export-symbols file already is a .def file, use it as

```
# is; otherwise, prepend EXPORTS...
```

```
_LT_TAGVAR(archive_expsym_cmds, $1)='if _LT_DLL_DEF_P([$export_symbols]); then
```

cp \$export_symbols \$output_objdir/\$soname.def;

else

echo EXPORTS > \$output_objdir/\$soname.def;

cat \$export_symbols >> \$output_objdir/\$soname.def;

fi~

\$CC -shared -nostdlib \$output_objdir/\$soname.def \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags -o \$output_objdir/\$soname \$wl--enable-auto-image-base -Xlinker --out-implib -Xlinker \$lib' else

```
_LT_TAGVAR(ld_shlibs, $1)=no
```

```
fi
```

```
;;
```

esac

```
;;
```

darwin* | rhapsody*)

```
_LT_DARWIN_LINKER_FEATURES($1)
```

;;

```
os2*)
```

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-L\$libdir'

_LT_TAGVAR(hardcode_minus_L, \$1)=yes

_LT_TAGVAR(allow_undefined_flag, \$1)=unsupported

shrext_cmds=.dll

_LT_TAGVAR(archive_cmds, \$1)='\$ECHO "LIBRARY \${soname%\$shared_ext} INITINSTANCE

TERMINSTANCE" > \$output_objdir/\$libname.def~

\$ECHO "DESCRIPTION \"\$libname\"" >> \$output_objdir/\$libname.def~

\$ECHO "DATA MULTIPLE NONSHARED" >> \$output_objdir/\$libname.def~

\$ECHO EXPORTS >> \$output_objdir/\$libname.def~

\$CC -Zdll -Zcrtdll -o \$output_objdir/\$soname \$libobjs \$deplibs \$compiler_flags \$output_objdir/\$libname.def~ emximp -o \$lib \$output_objdir/\$libname.def'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$ECHO "LIBRARY \${soname%\$shared_ext} INITINSTANCE TERMINSTANCE" > \$output_objdir/\$libname.def~

 $ECHO "DESCRIPTION \"\">> \"uput_objdir/\libname.def~$

```
$ECHO "DATA MULTIPLE NONSHARED" >> $output_objdir/$libname.def~
```

\$ECHO EXPORTS >> \$output_objdir/\$libname.def~

prefix_cmds="\$SED"~

```
if test EXPORTS = "`$SED 1q $export_symbols`"; then
```

prefix_cmds="\$prefix_cmds -e 1d";

```
fi~
```

prefix_cmds="\$prefix_cmds -e \"s/^\(.*\)\$/_\1/g\""~

```
cat $export_symbols | $prefix_cmds >> $output_objdir/$libname.def~
```

\$CC -Zdll -Zcrtdll -o \$output_objdir/\$soname \$libobjs \$deplibs \$compiler_flags \$output_objdir/\$libname.def~ emximp -o \$lib \$output_objdir/\$libname.def'

```
_LT_TAGVAR(old_archive_From_new_cmds, $1)='emximp -o $output_objdir/${libname}_dll.a
```

\$output_objdir/\$libname.def

```
\_LT\_TAGVAR (enable\_shared\_with\_static\_runtimes, \$1) = yes
```

```
;;
```

```
dgux*)
   case $cc_basename in
    ec++*)
  # FIXME: insert proper C++ library support
  _LT_TAGVAR(ld_shlibs, $1)=no
  ;;
    ghcx*)
  # Green Hills C++ Compiler
  # FIXME: insert proper C++ library support
  _LT_TAGVAR(ld_shlibs, $1)=no
  ;;
    *)
  # FIXME: insert proper C++ library support
  _LT_TAGVAR(ld_shlibs, $1)=no
  ;;
   esac
   ;;
  freebsd2.*)
   # C++ shared libraries reported to be fairly broken before
# switch to ELF
   _LT_TAGVAR(ld_shlibs, $1)=no
   ;;
  freebsd-elf*)
   _LT_TAGVAR(archive_cmds_need_lc, $1)=no
   ;;
  freebsd* | dragonfly*)
   # FreeBSD 3 and later use GNU C++ and GNU ld with standard ELF
   # conventions
   _LT_TAGVAR(ld_shlibs, $1)=yes
   ;;
```

haiku*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname - o \$lib'

_LT_TAGVAR(link_all_deplibs, \$1)=yes

;;

hpux9*)

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl+b \$wl\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=:

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-E'

_LT_TAGVAR(hardcode_direct, \$1)=yes

_LT_TAGVAR(hardcode_minus_L, \$1)=yes # Not in the search PATH,

but as the default

location of the library.

case $c_basename in$

 $\mathrm{CC}^*)$

FIXME: insert proper C++ library support

_LT_TAGVAR(ld_shlibs, \$1)=no

;; aCC*)

_LT_TAGVAR(archive_cmds, \$1)='\$RM \$output_objdir/\$soname~\$CC -b \$wl+b \$wl\$install_libdir -o \$output_objdir/\$soname \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags~test

"x\$output_objdir/\$soname" = "x\$lib" || mv -f \$output_objdir/\$soname \$lib'

Commands to make compiler produce verbose output that lists

what "hidden" libraries, object files and flags are used when

linking a shared library.

#

There doesn't appear to be a way to prevent this compiler from

explicitly linking system object files so we need to strip them

from the output so that they don't get included in the library

dependencies.

output_verbose_link_cmd='templist=`(\$CC -b \$CFLAGS -v conftest.\$objext 2>&1) | \$EGREP "\-L"`; list=; for z in \$templist; do case \$z in conftest.\$objext) list="\$list \$z";; *.\$objext);; *) list="\$list \$z";;esac; done; func_echo_all "\$list"'

;; *)

if test yes = "\$GXX"; then

_LT_TAGVAR(archive_cmds, \$1)='\$RM \$output_objdir/\$soname~\$CC -shared -nostdlib \$pic_flag \$wl+b \$wl\$install_libdir -o \$output_objdir/\$soname \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags~test "x\$output_objdir/\$soname" = "x\$lib" || mv -f \$output_objdir/\$soname \$lib'

else

FIXME: insert proper C++ library support
_LT_TAGVAR(ld_shlibs, \$1)=no
fi
;;
esac

```
;;
```

```
hpux10*|hpux11*)
  if test no = "$with_gnu_ld"; then
_LT_TAGVAR(hardcode_libdir_flag_spec, $1)='$wl+b $wl$libdir'
_LT_TAGVAR(hardcode_libdir_separator, $1)=:
   case $host_cpu in
    hppa*64*|ia64*)
     ;;
    *)
  _LT_TAGVAR(export_dynamic_flag_spec, $1)='$wl-E'
     ;;
   esac
  fi
  case $host_cpu in
   hppa*64*|ia64*)
    LT TAGVAR(hardcode direct, $1)=no
    _LT_TAGVAR(hardcode_shlibpath_var, $1)=no
    ;;
   *)
    _LT_TAGVAR(hardcode_direct, $1)=yes
    _LT_TAGVAR(hardcode_direct_absolute, $1)=yes
    _LT_TAGVAR(hardcode_minus_L, $1)=yes # Not in the search PATH,
      # but as the default
      # location of the library.
    ;;
  esac
```

case \$cc_basename in

CC*)

FIXME: insert proper C++ library support

```
_LT_TAGVAR(ld_shlibs, $1)=no
```

;;

aCC*)

case \$host_cpu in

hppa*64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -b \$wl+h \$wl\$soname -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags'

;;

ia64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -b \$wl+h \$wl\$soname \$wl+nodefaultrpath -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags'

;;

*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -b \$wl+h \$wl\$soname \$wl+b \$wl\$install_libdir -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags'

;;

esac

Commands to make compiler produce verbose output that lists# what "hidden" libraries, object files and flags are used when# linking a shared library.

#

There doesn't appear to be a way to prevent this compiler from

explicitly linking system object files so we need to strip them

from the output so that they don't get included in the library

dependencies.

output_verbose_link_cmd='templist=`(\$CC -b \$CFLAGS -v conftest.\$objext 2>&1) | \$GREP "\-L"`; list=; for z in \$templist; do case \$z in conftest.\$objext) list="\$list \$z";; *.\$objext);; *) list="\$list \$z";;esac; done; func_echo_all "\$list"'

;;
 *)
if test yes = "\$GXX"; then
if test no = "\$with_gnu_ld"; then
 case \$host_cpu in

hppa*64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared -nostdlib -fPIC \$wl+h \$wl\$soname -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags'

;; ia64*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared -nostdlib \$pic_flag \$wl+h \$wl\$soname \$wl+nodefaultrpath -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags'

;;

*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared -nostdlib \$pic_flag \$wl+h \$wl\$soname \$wl+b \$wl\$install_libdir -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags'

;; esac fi else # FIXME: insert proper C++ library support _LT_TAGVAR(ld_shlibs, \$1)=no fi ;; esac ;; interix[[3-9]]*) _LT_TAGVAR(hardcode_direct, \$1)=no

_LT_TAGVAR(hardcode_ahreet, \$1)=no _LT_TAGVAR(hardcode_shlibpath_var, \$1)=no _LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir' _LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-E' # Hack: On Interix 3.x, we cannot compile PIC because of a broken gcc. # Instead, shared libraries are loaded at an image base (0x10000000 by # default) and relocated if they conflict, which is a slow very memory # consuming and fragmenting process. To avoid this, we pick a random, # 256 KiB-aligned image base between 0x50000000 and 0x6FFC0000 at link

time. Moving up from 0x10000000 also allows more sbrk(2) space.

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-h,\$soname \$wl-image-base,`expr \${RANDOM-\$\$} % 4096 / 2 * 262144 + 1342177280` -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='sed "s|^|_|" \$export_symbols >\$output_objdir/\$soname.expsym~\$CC -shared \$pic_flag \$libobjs \$deplibs \$compiler_flags \$wl-h,\$soname \$wl--retain-symbols-

file,\$output_objdir/\$soname.expsym \$wl--image-base,`expr \${RANDOM-\$\$} % 4096 / 2 * 262144 + 1342177280` -o \$lib'

;;

```
irix5* | irix6*)
case $cc_basename in
CC*)
# SGI C++
```

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared -all -multigot \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags -soname \$soname `test -n "\$verstring" && func_echo_all "-set_version \$verstring"` -update_registry \$output_objdir/so_locations -o \$lib'

Archives containing C++ object files must be created using

"CC -ar", where "CC" is the IRIX C++ compiler. This is

necessary to make sure instantiated templates are included

in the archive.

_LT_TAGVAR(old_archive_cmds, \$1)='\$CC -ar -WR,-u -o \$oldlib \$oldobjs'

;;

*)

```
if test yes = "$GXX"; then
```

if test no = "\$with_gnu_ld"; then

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname `test -n "\$verstring" && func_echo_all "\$wlset_version \$wl\$verstring"` \$wl-update_registry \$wl\$output_objdir/so_locations -o \$lib'

else

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname `test -n "\$verstring" && func_echo_all "\$wlset_version \$wl\$verstring"` -o \$lib'

```
fi

fi

_LT_TAGVAR(link_all_deplibs, $1)=yes

;;

esac

_LT_TAGVAR(hardcode_libdir_flag_spec, $1)='$wl-rpath $wl$libdir'

_LT_TAGVAR(hardcode_libdir_separator, $1)=:

_LT_TAGVAR(inherit_rpath, $1)=yes

;;

linux* | k*bsd*-gnu | kopensolaris*-gnu | gnu*)

case $cc_basename in
```

KCC*)

Kuck and Associates, Inc. (KAI) C++ Compiler

KCC will only create a shared library if the output file

ends with ".so" (or ".sl" for HP-UX), so rename the library

to its proper name (with version) after linking.

_LT_TAGVAR(archive_cmds, \$1)='tempext=`echo \$shared_ext | \$SED -e '\''s/([[^()0-9A-Za-z{ }]])//\\\\1/g'\''`; templib=`echo \$lib | \$SED -e ''s/\\$tempext\..*/.so/''`; \$CC \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags --soname \$soname -o \\$templib; mv -f \\$templib \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='tempext=`echo \$shared_ext | \$SED -e '\"s/([[^()0-9A-Za-z{}]])//\\\\1/g'\"`; templib=`echo \$lib | \$SED -e "s/\\$tempext\..*/.so/"`; \$CC \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags --soname \$soname -o \\$templib \$wl-retain-symbols-file,\$export_symbols; mv -f \\$templib \$lib'

Commands to make compiler produce verbose output that lists

what "hidden" libraries, object files and flags are used when

linking a shared library.

#

There doesn't appear to be a way to prevent this compiler from

explicitly linking system object files so we need to strip them

from the output so that they don't get included in the library

dependencies.

output_verbose_link_cmd='templist=`\$CC \$CFLAGS -v conftest.\$objext -o libconftest\$shared_ext 2>&1 | \$GREP "ld"`; rm -f libconftest\$shared_ext; list= ; for z in \$templist; do case \$z in conftest.\$objext) list="\$list \$z";; *.\$objext);; *) list="\$list \$z";;esac; done; func_echo_all "\$list"'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir' _LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl--export-dynamic'

Archives containing C++ object files must be created using

"CC -Bstatic", where "CC" is the KAI C++ compiler.

_LT_TAGVAR(old_archive_cmds, \$1)='\$CC -Bstatic -o \$oldlib \$oldobjs'

```
;;
```

icpc* | ecpc*)

Intel C++

with_gnu_ld=yes

version 8.0 and above of icpc choke on multiply defined symbols

if we add \$predep_objects and \$postdep_objects, however 7.1 and

earlier do not add the objects themselves.

case `\$CC -V 2>&1` in

"Version 7.")

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -o \$lib'

```
;;
 *) # Version 8.0 or newer
   tmp_idyn=
   case $host_cpu in
   ia64*) tmp_idyn=' -i_dynamic';;
esac
```

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared'"\$tmp_idyn"' \$libobjs \$deplibs \$compiler_flags \$wl-soname

\$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared'"\$tmp_idyn"' \$libobjs \$deplibs \$compiler_flags \$wlsoname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -o \$lib'

;;

esac

_LT_TAGVAR(archive_cmds_need_lc, \$1)=no

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir'

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl--export-dynamic'

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive\$convenience \$wl--no-whole-archive'

;;

pgCC* | pgcpp*)

Portland Group C++ compiler

case `\$CC -V` in

pgCC\ [[1-5]]. | *pgcpp\ [[1-5]].*)

_LT_TAGVAR(prelink_cmds, \$1)='tpldir=Template.dir~

rm -rf \$tpldir~

\$CC --prelink_objects --instantiation_dir \$tpldir \$objs \$libobjs \$compile_deplibs~

compile_command="\$compile_command `find \$tpldir -name *.o | sort | \$NL2SP`"

_LT_TAGVAR(old_archive_cmds, \$1)='tpldir=Template.dir~

rm -rf \$tpldir~

\$CC --prelink_objects --instantiation_dir \$tpldir \$oldobjs\$old_deplibs~

 $AR AR_FLAGS oldliboldobjs old_deplibs `find tpldir -name *.o | sort | NL2SP`~$

\$RANLIB \$oldlib'

_LT_TAGVAR(archive_cmds, \$1)='tpldir=Template.dir~

rm -rf \$tpldir~

\$CC --prelink_objects --instantiation_dir \$tpldir \$predep_objects \$libobjs \$deplibs \$convenience \$postdep_objects~

\$CC -shared \$pic_flag \$predep_objects \$libobjs \$deplibs `find \$tpldir -name *.o | sort | \$NL2SP`
\$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='tpldir=Template.dir~

rm -rf \$tpldir~

\$CC --prelink_objects --instantiation_dir \$tpldir \$predep_objects \$libobjs \$deplibs \$convenience \$postdep_objects~

\$CC -shared \$pic_flag \$predep_objects \$libobjs \$deplibs `find \$tpldir -name *.o | sort | \$NL2SP`
\$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -o \$lib'

;;

*) # Version 6 and above use weak symbols

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$pic_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname \$wl-retain-symbols-file \$wl\$export_symbols -o \$lib'

;;

esac

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl--rpath \$wl\$libdir'

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl--export-dynamic'

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive`for conv in \$convenience\"\"; do test -n \"\$conv\" && new_convenience=\"\$new_convenience,\$conv\"; done; func_echo_all \"\$new_convenience\"` \$wl--

no-whole-archive'

;;

cxx*)

Compaq C++

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname -o \$lib \$wl-retain-symbols-file \$wl\$export_symbols'

runpath_var=LD_RUN_PATH

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-rpath \$libdir' _LT_TAGVAR(hardcode_libdir_separator, \$1)=:

Commands to make compiler produce verbose output that lists

what "hidden" libraries, object files and flags are used when

linking a shared library.

#

There doesn't appear to be a way to prevent this compiler from

explicitly linking system object files so we need to strip them

from the output so that they don't get included in the library

dependencies.

output_verbose_link_cmd='templist=`\$CC -shared \$CFLAGS -v conftest.\$objext 2>&1 | \$GREP "ld"`; templist=`func_echo_all "\$templist" | \$SED "s/(^.*ld.*\)/(.*ld .*\$\)/\1/"`; list= ; for z in \$templist; do case \$z in conftest.\$objext) list="\$list \$z";; *.\$objext);; *) list="\$list \$z";;esac; done; func_echo_all "X\$list" | \$Xsed'

;;

xl* | mpixl* | bgxl*)

IBM XL 8.0 on PPC, with GNU ld

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir'

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl--export-dynamic'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -qmkshrobj \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname -o \$lib'

if test yes = "\$supports_anon_versioning"; then

cat $export_symbols \mid sed -e "s/(.*\)/1;/">> <math display="inline">otjoin/$ libname.ver~

echo "local: *; };" >> \$output_objdir/\$libname.ver~

\$CC -qmkshrobj \$libobjs \$deplibs \$compiler_flags \$wl-soname \$wl\$soname \$wl-version-script
\$wl\$output_objdir/\$libname.ver -o \$lib'

```
fi
;;
*)
```

case `\$CC -V 2>&1 | sed 5q` in

Sun∖ C)

Sun C++ 5.9

_LT_TAGVAR(no_undefined_flag, \$1)=' -zdefs'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G\$allow_undefined_flag -h\$soname -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -G\$allow_undefined_flag -h\$soname -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-retain-symbols-file \$wl\$export_symbols'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-R\$libdir'

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl--whole-archive`new_convenience=; for conv in \$convenience\"\"; do test -z \"\$conv\" || new_convenience=\"\$new_convenience,\$conv\"; done; func_echo_all \"\$new_convenience\"` \$wl--no-whole-archive'

```
_LT_TAGVAR(compiler_needs_object, $1)=yes
```

```
# Not sure whether something based on
# $CC $CFLAGS -v conftest.$objext -o libconftest$shared_ext 2>&1
# would be better.
output_verbose_link_cmd='func_echo_all'
# Archives containing C++ object files must be created using
```

```
# "CC -xar", where "CC" is the Sun C++ compiler. This is
```

necessary to make sure instantiated templates are included # in the archive.

```
_LT_TAGVAR(old_archive_cmds, $1)='$CC -xar -o $oldlib $oldobjs'
;;
```

```
esac
;;
```

```
esac
```

```
;;
```

```
lynxos*)
# FIXME: insert proper C++ library support
_LT_TAGVAR(ld_shlibs, $1)=no
;;
```

```
m88k*)
# FIXME: insert proper C++ library support
_LT_TAGVAR(ld_shlibs, $1)=no
```

```
;;
```

```
mvs*)
case $cc_basename in
cxx*)
# FIXME: insert proper C++ library support
_LT_TAGVAR(ld_shlibs, $1)=no
;;
*)
# FIXME: insert proper C++ library support
_LT_TAGVAR(ld_shlibs, $1)=no
;;
esac
;;
netbsd*)
if echo _ELF__| $CC -E - | $GREP _ELF__ >/dev/null; then
_LT_TAGVAR(archive_cmds, $1)="$LD -Bshareable -o $lib $predep_objects $libobjs $deplibs $postdep_objects
```

```
$linker_flags'
wlarc=
_LT_TAGVAR(hardcode_libdir_flag_spec, $1)='-R$libdir'
_LT_TAGVAR(hardcode_direct, $1)=yes
_LT_TAGVAR(hardcode_shlibpath_var, $1)=no
fi
# Workaround some broken pre-1.5 toolchains
output_verbose_link_cmd='$CC -shared $CFLAGS -v conftest.$objext 2>&1 | $GREP conftest.$objext | $SED -e
"s:-lgcc -lc -lgcc::"'
;;
```

```
*nto* | *qnx*)
_LT_TAGVAR(ld_shlibs, $1)=yes
```

;;

openbsd* | bitrig*)

if test -f /usr/libexec/ld.so; then

_LT_TAGVAR(hardcode_direct, \$1)=yes

 $_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no$

_LT_TAGVAR(hardcode_direct_absolute, \$1)=yes

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags -0 \$lib'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir'

if test -z "`echo __ELF__ | \$CC -E - | grep __ELF__`"; then

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$pic_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-retain-symbols-file,\$export_symbols -o \$lib'

```
_LT_TAGVAR(export_dynamic_flag_spec, $1)='$wl-E'
```

_LT_TAGVAR(whole_archive_flag_spec, \$1)=\$wlarc'--whole-archive\$convenience '\$wlarc'--no-whole-archive' fi

output_verbose_link_cmd=func_echo_all

else

_LT_TAGVAR(ld_shlibs, \$1)=no

fi

;;

```
osf3* | osf4* | osf5*)
case $cc_basename in
KCC*)
# Kuck and Associates, Inc. (KAI) C++ Compiler
```

```
# KCC will only create a shared library if the output file
# ends with ".so" (or ".sl" for HP-UX), so rename the library
# to its proper name (with version) after linking.
```

_LT_TAGVAR(archive_cmds, \$1)='tempext=`echo \$shared_ext | \$SED -e '\"s/\([[^()0-9A-Za-z{ }]]\)/\\\\\1/g'\"`; templib=`echo "\$lib" | \$SED -e "s/\\$tempext\..*/.so/"`; \$CC \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags --soname \$soname -o \\$templib; mv -f \\$templib \$lib'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath,\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=:

Archives containing C++ object files must be created using # the KAI C++ compiler. case \$host in osf3*) _LT_TAGVAR(old_archive_cmds, \$1)='\$CC -Bstatic -o \$oldlib \$oldobjs' ;; *) _LT_TAGVAR(old_archive_cmds, \$1)='\$CC -o \$oldlib \$oldobjs' ;; esac ;; RCC*) # Rational C++ 2.4.1 # FIXME: insert proper C++ library support _LT_TAGVAR(ld_shlibs, \$1)=no ;; cxx*) case \$host in osf3*)

_LT_TAGVAR(allow_undefined_flag, \$1)=' \$wl-expect_unresolved \$wl*'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared\$allow_undefined_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$soname `test -n "\$verstring" && func_echo_all "\$wl-set_version \$verstring"` -update_registry \$output_objdir/so_locations -o \$lib'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir'

;;

*)

_LT_TAGVAR(allow_undefined_flag, \$1)=' -expect_unresolved *'

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared\$allow_undefined_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags -msym -soname \$soname `test -n "\$verstring" && func_echo_all "-set_version \$verstring"` -update_registry \$output_objdir/so_locations -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='for i in `cat \$export_symbols`; do printf "%s %s\\n" - exported_symbol "\\$i" >> \$lib.exp; done~

echo "-hidden">> \$lib.exp~

\$CC -shared\$allow_undefined_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags
-msym -soname \$soname \$wl-input \$wl\$lib.exp `test -n "\$verstring" && \$ECHO "-set_version \$verstring"` update_registry \$output_objdir/so_locations -o \$lib~

\$RM \$lib.exp'

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='-rpath \$libdir'

;;

esac

_LT_TAGVAR(hardcode_libdir_separator, \$1)=:

Commands to make compiler produce verbose output that lists # what "hidden" libraries, object files and flags are used when # linking a shared library.

#

There doesn't appear to be a way to prevent this compiler from # explicitly linking system object files so we need to strip them # from the output so that they don't get included in the library # dependencies.

 $output_verbose_link_cmd='templist=`$CC -shared $CFLAGS -v conftest.$objext 2>&1 | $GREP "Id" | $GREP -v "Id:"`; templist=`func_echo_all "$templist" | $SED "s/\(^.*Id.*\)\(.*Id.*$\)/\1/"`; list= ; for z in $templist; do case $z in conftest.$objext) list="$list $z";; *.$objext);; *) list="$list $z";; esac; done; func_echo_all "$list"'$

;; *)

if test yes,no = "\$GXX,\$with_gnu_ld"; then

_LT_TAGVAR(allow_undefined_flag, \$1)=' \$wl-expect_unresolved \$wl*'

case \$host in

osf3*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared -nostdlib \$allow_undefined_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-soname \$wl\$soname `test -n "\$verstring" && func_echo_all "\$wlset_version \$wl\$verstring"` \$wl-update_registry \$wl\$output_objdir/so_locations -o \$lib'

;; *)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -nostdlib \$allow_undefined_flag \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-msym \$wl-soname \$wl\$soname `test -n "\$verstring" && func_echo_all "\$wl-set_version \$wl\$verstring"` \$wl-update_registry \$wl\$output_objdir/so_locations -o \$lib'

;;

esac

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-rpath \$wl\$libdir' _LT_TAGVAR(hardcode_libdir_separator, \$1)=:

Commands to make compiler produce verbose output that lists

what "hidden" libraries, object files and flags are used when

linking a shared library.

output_verbose_link_cmd='\$CC -shared \$CFLAGS -v conftest.\$objext 2>&1 | \$GREP -v "^Configured with:" | \$GREP "\-L"'

```
else
 # FIXME: insert proper C++ library support
 _LT_TAGVAR(ld_shlibs, $1)=no
fi
;;
 esac
 ;;
psos*)
 # FIXME: insert proper C++ library support
 _LT_TAGVAR(ld_shlibs, $1)=no
 ;;
sunos4*)
 case $cc_basename in
  CC*)
# Sun C++ 4.x
# FIXME: insert proper C++ library support
```

```
_LT_TAGVAR(ld_shlibs, $1)=no
  ;;
     lcc*)
  # Lucid
  # FIXME: insert proper C++ library support
  _LT_TAGVAR(ld_shlibs, $1)=no
  ;;
     *)
  # FIXME: insert proper C++ library support
  LT TAGVAR(ld shlibs, $1)=no
  ;;
   esac
   ;;
  solaris*)
   case $cc basename in
     CC* | sunCC*)
  # Sun C++ 4.2, 5.x and Centerline C++
      _LT_TAGVAR(archive_cmds_need_lc,$1)=yes
  _LT_TAGVAR(no_undefined_flag, $1)=' -zdefs'
  LT TAGVAR(archive cmds, $1)='$CC -G$allow undefined flag -h$soname -o $lib $predep objects $libobjs
$deplibs $postdep_objects $compiler_flags'
  _LT_TAGVAR(archive_expsym_cmds, $1)='echo "{ global:" > $lib.exp~cat $export_symbols | $SED -e
s/(.*)/1; >>  $lib.exp~echo "local: *; };" >> $lib.exp~
       $CC -G$allow_undefined_flag $wl-M $wl$lib.exp -h$soname -o $lib $predep_objects $libobjs $deplibs
$postdep objects $compiler flags~$RM $lib.exp'
  _LT_TAGVAR(hardcode_libdir_flag_spec, $1)='-R$libdir'
  _LT_TAGVAR(hardcode_shlibpath_var, $1)=no
  case $host os in
   solaris2.[[0-5]] | solaris2.[[0-5]].*) ;;
    *)
 # The compiler driver will combine and reorder linker options,
 # but understands '-z linker flag'.
     # Supported since Solaris 2.6 (maybe 2.5.1?)
 _LT_TAGVAR(whole_archive_flag_spec, $1)='-z allextract$convenience -z defaultextract'
     ;;
  esac
  _LT_TAGVAR(link_all_deplibs, $1)=yes
  output_verbose_link_cmd='func_echo_all'
  # Archives containing C++ object files must be created using
  # "CC -xar", where "CC" is the Sun C++ compiler. This is
  # necessary to make sure instantiated templates are included
  # in the archive.
  _LT_TAGVAR(old_archive_cmds, $1)='$CC -xar -o $oldlib $oldobjs'
  ;;
```

gcx*)

Green Hills C++ Compiler

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-h \$wl\$soname -o \$lib'

The C++ compiler must be used to create the archive.

_LT_TAGVAR(old_archive_cmds, \$1)='\$CC \$LDFLAGS -archive -o \$oldlib \$oldobjs'

;;

*) # GNU C++ compiler with Solaris linker

if test yes,no = "\$GXX,\$with_gnu_ld"; then

_LT_TAGVAR(no_undefined_flag, \$1)=' \$wl-z \${wl}defs'

if $CC --version | GREP -v '^2 > /dev/null; then$

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$pic_flag -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-h \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='echo "{ global:" > \$lib.exp~cat \$export_symbols | \$SED -e "s/(.*\)/1;/" >> \$lib.exp~echo "local: *; };" >> \$lib.exp~

\$CC -shared \$pic_flag -nostdlib \$wl-M \$wl\$lib.exp \$wl-h \$wl\$soname -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags~\$RM \$lib.exp'

Commands to make compiler produce verbose output that lists

what "hidden" libraries, object files and flags are used when

linking a shared library.

output_verbose_link_cmd='\$CC -shared \$CFLAGS -v conftest.\$objext 2>&1 | \$GREP -v "^Configured with:" | \$GREP "\-L"'

else

g++ 2.7 appears to require '-G' NOT '-shared' on this

platform.

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G -nostdlib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags \$wl-h \$wl\$soname -o \$lib'

_LT_TAGVAR(archive_expsym_cmds, \$1)='echo "{ global:" > \$lib.exp~cat \$export_symbols | \$SED -e "s/(.*\)/1;/" >> \$lib.exp~echo "local: *; };" >> \$lib.exp~

\$CC -G -nostdlib \$wl-M \$wl\$lib.exp \$wl-h \$wl\$soname -o \$lib \$predep_objects \$libobjs \$deplibs \$postdep_objects \$compiler_flags~\$RM \$lib.exp'

Commands to make compiler produce verbose output that lists

what "hidden" libraries, object files and flags are used when

linking a shared library.

output_verbose_link_cmd='\$CC -G \$CFLAGS -v conftest.\$objext 2>&1 | \$GREP -v "^Configured with:" | \$GREP "\-L"'

fi

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-R \$wl\$libdir' case \$host_os in

solaris2.[[0-5]] | solaris2.[[0-5]].*) ;;

*)

_LT_TAGVAR(whole_archive_flag_spec, \$1)='\$wl-z \${wl}allextract\$convenience \$wl-z \${wl}defaultextract';;

```
esac
fi
;;
esac
;;
```

sysv4*uw2* | sysv5OpenUNIX* | sysv5UnixWare7.[[01]].[[10]]* | unixware7* | sco3.2v5.0.[[024]]*) _LT_TAGVAR(no_undefined_flag, \$1)='\$wl-z,text'

_LT_TAGVAR(archive_cmds_need_lc, \$1)=no

LT TAGVAR(hardcode shlibpath var, \$1)=no

runpath_var='LD_RUN_PATH'

case \$cc_basename in

CC*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags' _LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -G \$wl-Bexport:\$export_symbols \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

;;

*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -shared \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags' _LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -shared \$wl-Bexport:\$export_symbols \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

;; esac ;;

sysv5* | sco3.2v5* | sco5v6*)

Note: We CANNOT use -z defs as we might desire, because we do not # link with -lc, and that would cause any symbols used from libc to # always be unresolved, which means just about no library would # ever link correctly. If we're not using GNU ld we use -z text # though, which does catch some bad symbols but isn't as heavy-handed # as -z defs.

_LT_TAGVAR(no_undefined_flag, \$1)='\$wl-z,text'

_LT_TAGVAR(allow_undefined_flag, \$1)='\$wl-z,nodefs'

_LT_TAGVAR(archive_cmds_need_lc, \$1)=no

_LT_TAGVAR(hardcode_shlibpath_var, \$1)=no

_LT_TAGVAR(hardcode_libdir_flag_spec, \$1)='\$wl-R,\$libdir'

_LT_TAGVAR(hardcode_libdir_separator, \$1)=':'

_LT_TAGVAR(link_all_deplibs, \$1)=yes

_LT_TAGVAR(export_dynamic_flag_spec, \$1)='\$wl-Bexport'

runpath_var='LD_RUN_PATH'

case \$cc_basename in

CC*)

_LT_TAGVAR(archive_cmds, \$1)='\$CC -G \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

_LT_TAGVAR(archive_expsym_cmds, \$1)='\$CC -G \$wl-Bexport:\$export_symbols \$wl-h,\$soname -o \$lib \$libobjs \$deplibs \$compiler_flags'

```
_LT_TAGVAR(old_archive_cmds, $1)='$CC -Tprelink_objects $oldobjs~
       ""$_LT_TAGVAR(old_archive_cmds, $1)"
  _LT_TAGVAR(reload_cmds, $1)='$CC -Tprelink_objects $reload_objs~
      ""$_LT_TAGVAR(reload_cmds, $1)"
  ;;
 *)
  LT TAGVAR(archive cmds, $1)='$CC -shared $wl-h,$soname -o $lib $libobjs $deplibs $compiler flags'
  _LT_TAGVAR(archive_expsym_cmds, $1)='$CC -shared $wl-Bexport:$export_symbols $wl-h,$soname -o $lib
$libobjs $deplibs $compiler_flags'
  ;;
esac
  ;;
  tandem*)
   case $cc_basename in
    NCC*)
  # NonStop-UX NCC 3.20
  # FIXME: insert proper C++ library support
  _LT_TAGVAR(ld_shlibs, $1)=no
  ;;
    *)
  # FIXME: insert proper C++ library support
  _LT_TAGVAR(ld_shlibs, $1)=no
  ;;
   esac
   ;;
  vxworks*)
   # FIXME: insert proper C++ library support
   _LT_TAGVAR(ld_shlibs, $1)=no
   ;;
  *)
   # FIXME: insert proper C++ library support
   _LT_TAGVAR(ld_shlibs, $1)=no
   ;;
 esac
 AC_MSG_RESULT([$_LT_TAGVAR(ld_shlibs, $1)])
 test no = "$_LT_TAGVAR(ld_shlibs, $1)" && can_build_shared=no
 _LT_TAGVAR(GCC, $1)=$GXX
```

```
_LT_TAGVAR(LD, $1)=$LD
```

CAVEAT EMPTOR:

There is no encapsulation within the following macros, do not change ## the running order or otherwise move them around unless you know exactly ## what you are doing... _LT_SYS_HIDDEN_LIBDEPS(\$1) _LT_COMPILER_PIC(\$1) _LT_COMPILER_C_O(\$1) _LT_COMPILER_FILE_LOCKS(\$1) _LT_LINKER_SHLIBS(\$1) _LT_SYS_DYNAMIC_LINKER(\$1) _LT_LINKER_HARDCODE_LIBPATH(\$1)

_LT_CONFIG(\$1) fi # test -n "\$compiler"

CC=\$lt_save_CC CFLAGS=\$lt_save_CFLAGS LDCXX=\$LD LD=\$lt_save_LD GCC=\$lt_save_GCC with_gnu_ld=\$lt_save_with_gnu_ld lt_cv_path_LDCXX=\$lt_cv_path_LD lt_cv_prog_gnu_ldcxx=\$lt_cv_prog_gnu_ld lt_cv_prog_gnu_ld=\$lt_save_with_gnu_ld fi # test yes != "\$_lt_caught_CXX_error"

AC_LANG_POP])#_LT_LANG_CXX_CONFIG

_LT_FUNC_STRIPNAME_CNF

-----# func_stripname_cnf prefix suffix name # strip PREFIX and SUFFIX off of NAME. # PREFIX and SUFFIX must not contain globbing or regex special # characters, hashes, percent signs, but SUFFIX may contain a leading # dot (in which case that matches only a dot). # # This function is identical to the (non-XSI) version of func_stripname, # except this one can be used by m4 code that may be executed by configure, # rather than the libtool script. m4_defun([_LT_FUNC_STRIPNAME_CNF],[dnl AC_REQUIRE([_LT_DECL_SED]) AC_REQUIRE([_LT_PROG_ECHO_BACKSLASH]) func_stripname_cnf () { case @S|@2 in .*) func_stripname_result=`\$ECHO "@S|@3" | \$SED "s%^@S|@1%%; s%\\\@S|@2\\$%%"`;; *) func_stripname_result=`\$ECHO "@S|@3" | \$SED "s%^@S|@1%%; s%@S|@2\\$%%"`;; esac } # func_stripname_cnf

_LT_SYS_HIDDEN_LIBDEPS([TAGNAME])

-----# Figure out "hidden" library dependencies from verbose
compiler output when linking a shared library.
Parse the compiler output and extract the necessary
objects, libraries and library flags.
m4_defun([_LT_SYS_HIDDEN_LIBDEPS],
[m4_require([_LT_FILEUTILS_DEFAULTS])dnl
AC_REQUIRE([_LT_FUNC_STRIPNAME_CNF])dnl
Dependencies to place before and after the object being linked:
_LT_TAGVAR(predep_objects, \$1)=
_LT_TAGVAR(postdep_objects, \$1)=
_LT_TAGVAR(postdeps, \$1)=
LT_TAGVAR(postdeps, \$1)=
LT_TAGVAR(postdeps, \$1)=
LT_TAGVAR(compiler lib search path, \$1)=

```
dnl we can't use the lt_simple_compile_test_code here,
dnl because it contains code intended for an executable,
dnl not a library. It's possible we should let each
dnl tag define a new lt_????_link_test_code variable,
dnl but it's only used here ...
m4_if([$1], [], [cat > conftest.$ac_ext << _LT_EOF
int a;
void foo (void) { a = 0; }
_LT_EOF
], [$1], [CXX], [cat > conftest.$ac_ext <<_LT_EOF
class Foo
{
public:
Foo (void) { a = 0; }
private:
int a;
};
_LT_EOF
], [$1], [F77], [cat > conftest.$ac_ext <<_LT_EOF
   subroutine foo
   implicit none
   integer*4 a
   a=0
   return
   end
_LT_EOF
], [$1], [FC], [cat > conftest.$ac_ext <<_LT_EOF
   subroutine foo
   implicit none
```

```
integer a
   a=0
   return
   end
LT EOF
], [$1], [GCJ], [cat > conftest.$ac_ext <<_LT_EOF
public class foo {
private int a;
public void bar (void) {
 a = 0:
}
};
_LT_EOF
], [$1], [GO], [cat > conftest.$ac_ext <<_LT_EOF
package foo
func foo() {
}
LT EOF
1)
```

```
_lt_libdeps_save_CFLAGS=$CFLAGS
case "$CC $CFLAGS " in #(
*\ -flto*\ *) CFLAGS="$CFLAGS -fno-lto" ;;
*\ -fwhopr*\ *) CFLAGS="$CFLAGS -fno-whopr" ;;
*\ -fuse-linker-plugin*\ *) CFLAGS="$CFLAGS -fno-use-linker-plugin" ;;
esac
```

dnl Parse the compiler output and extract the necessary
dnl objects, libraries and library flags.
if AC_TRY_EVAL(ac_compile); then
Parse the compiler output and extract the necessary
objects, libraries and library flags.

Sentinel used to keep track of whether or not we are before
the conftest object file.
pre_test_object_deps_done=no

for p in `eval "\$output_verbose_link_cmd"`; do
 case \$prev\$p in

```
-L* | -R* | -l*)
# Some compilers place space between "-{L,R}" and the path.
# Remove the space.
if test x-L = "$p" ||
test x-R = "$p"; then
prev=$p
continue
fi
```

```
# Expand the sysroot to ease extracting the directories later.
  if test -z "$prev"; then
   case $p in
   -L*) func_stripname_cnf '-L' " "$p"; prev=-L; p=$func_stripname_result ;;
   -R*) func_stripname_cnf '-R' " "$p"; prev=-R; p=$func_stripname_result ;;
   -l*) func_stripname_cnf '-l' " $p"; prev=-l; p=$func_stripname_result ;;
   esac
  fi
  case $p in
  =*) func_stripname_cnf '=' " $p"; p=$lt_sysroot$func_stripname_result ;;
  esac
  if test no = "$pre_test_object_deps_done"; then
case $prev in
-L | -R)
 # Internal compiler library paths should come after those
 # provided the user. The postdeps already come after the
 # user supplied libs so there is no need to process them.
 if test -z "$_LT_TAGVAR(compiler_lib_search_path, $1)"; then
  _LT_TAGVAR(compiler_lib_search_path, $1)=$prev$p
 else
  _LT_TAGVAR(compiler_lib_search_path, $1)="${_LT_TAGVAR(compiler_lib_search_path, $1)} $prev$p"
 fi
 ::
# The "-1" case would never come before the object being
# linked, so don't bother handling this case.
esac
  else
if test -z "$ LT TAGVAR(postdeps, $1)"; then
 _LT_TAGVAR(postdeps, $1)=$prev$p
else
 _LT_TAGVAR(postdeps, $1)="${_LT_TAGVAR(postdeps, $1)} $prev$p"
fi
  fi
  prev=
  ;;
*.lto.$objext) ;; # Ignore GCC LTO objects
*.$objext)
  # This assumes that the test object file only shows up
  # once in the compiler output.
  if test "$p" = "conftest.$objext"; then
pre_test_object_deps_done=yes
continue
  fi
  if test no = "$pre_test_object_deps_done"; then
```

```
if test -z "$_LT_TAGVAR(predep_objects, $1)"; then
```

```
_LT_TAGVAR(predep_objects, $1)=$p
 else
  _LT_TAGVAR(predep_objects, $1)="$_LT_TAGVAR(predep_objects, $1) $p"
 fi
   else
 if test -z "$_LT_TAGVAR(postdep_objects, $1)"; then
  _LT_TAGVAR(postdep_objects, $1)=$p
 else
  _LT_TAGVAR(postdep_objects, $1)="$_LT_TAGVAR(postdep_objects, $1) $p"
 fi
   fi
   ;;
 *) ;; # Ignore the rest.
 esac
done
# Clean up.
rm -f a.out a.exe
else
echo "libtool.m4: error: problem compiling $1 test program"
fi
$RM -f confest.$objext
CFLAGS=$_lt_libdeps_save_CFLAGS
# PORTME: override above test on systems where it is broken
m4 if([$1], [CXX],
[case $host os in
interix[[3-9]]*)
# Interix 3.5 installs completely hosed .la files for C++, so rather than
# hack all around it, let's just trust "g++" to DTRT.
_LT_TAGVAR(predep_objects,$1)=
_LT_TAGVAR(postdep_objects,$1)=
_LT_TAGVAR(postdeps,$1)=
;;
esac
])
case " $_LT_TAGVAR(postdeps, $1) " in
*" -lc "*) _LT_TAGVAR(archive_cmds_need_lc, $1)=no ;;
esac
_LT_TAGVAR(compiler_lib_search_dirs, $1)=
if test -n "${_LT_TAGVAR(compiler_lib_search_path, $1)}"; then
_LT_TAGVAR(compiler_lib_search_dirs, $1)=`echo " ${_LT_TAGVAR(compiler_lib_search_path, $1)}" | $SED
-e 's! -L! !g' -e 's!^ !!`
fi
```

_LT_TAGDECL([], [compiler_lib_search_dirs], [1],

[The directories searched by this compiler when creating a shared library])

_LT_TAGDECL([], [predep_objects], [1],

[Dependencies to place before and after the objects being linked to create a shared library])

_LT_TAGDECL([], [postdep_objects], [1])

_LT_TAGDECL([], [predeps], [1])

_LT_TAGDECL([], [postdeps], [1])

_LT_TAGDECL([], [compiler_lib_search_path], [1],

[The library search path used internally by the compiler when linking a shared library])

])# _LT_SYS_HIDDEN_LIBDEPS

$\# LT_LANG_F77_CONFIG([TAG])$

```
# -----
```

Ensure that the configuration variables for a Fortran 77 compiler are

suitably defined. These variables are subsequently used by _LT_CONFIG

to write the compiler configuration to 'libtool'.

m4_defun([_LT_LANG_F77_CONFIG],

[AC_LANG_PUSH(Fortran 77)

if test -z "\$F77" || test no = "\$F77"; then

_lt_disable_F77=yes

```
fi
```

LT TAGVAR(archive cmds need lc, \$1)=no _LT_TAGVAR(allow_undefined_flag, \$1)= _LT_TAGVAR(always_export_symbols, \$1)=no LT TAGVAR(archive expsym cmds, \$1)= _LT_TAGVAR(export_dynamic_flag_spec, \$1)= _LT_TAGVAR(hardcode_direct, \$1)=no _LT_TAGVAR(hardcode_direct_absolute, \$1)=no _LT_TAGVAR(hardcode_libdir_flag_spec, \$1)= LT TAGVAR(hardcode libdir separator, \$1)= _LT_TAGVAR(hardcode_minus_L, \$1)=no _LT_TAGVAR(hardcode_automatic, \$1)=no _LT_TAGVAR(inherit_rpath, \$1)=no _LT_TAGVAR(module_cmds, \$1)= _LT_TAGVAR(module_expsym_cmds, \$1)= _LT_TAGVAR(link_all_deplibs, \$1)=unknown _LT_TAGVAR(old_archive_cmds, \$1)=\$old_archive_cmds _LT_TAGVAR(reload_flag, \$1)=\$reload_flag _LT_TAGVAR(reload_cmds, \$1)=\$reload_cmds _LT_TAGVAR(no_undefined_flag, \$1)= _LT_TAGVAR(whole_archive_flag_spec, \$1)= _LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=no

Source file extension for f77 test sources.

```
ac_ext=f
```

..

Object file extension for compiled f77 test sources. objext=0 _LT_TAGVAR(objext, \$1)=\$objext

```
# No sense in running all these tests if we already determined that
# the F77 compiler isn't working. Some variables (like enable_shared)
# are currently assumed to apply to all compilers on this platform,
# and will be corrupted by setting them based on a non-working compiler.
if test yes != "$_lt_disable_F77"; then
# Code to be used in simple compile tests
lt_simple_compile_test_code="\
subroutine t
return
end
"
# Code to be used in simple link tests
lt_simple_link_test_code="\
program t
end
```

```
# ltmain only uses $CC for tagged configurations so make sure $CC is set.
_LT_TAG_COMPILER
```

```
# save warnings/boilerplate of simple test code
_LT_COMPILER_BOILERPLATE
_LT_LINKER_BOILERPLATE
```

```
# Allow CC to be a program name with arguments.
lt_save_CC=$CC
lt_save_GCC=$GCC
lt_save_CFLAGS=$CFLAGS
CC=${F77-"f77"}
CFLAGS=$FFLAGS
compiler=$CC
_LT_TAGVAR(compiler, $1)=$CC
_LT_CC_BASENAME([$compiler])
GCC=$G77
if test -n "$compiler"; then
AC_MSG_CHECKING([if libtool supports shared libraries])
AC_MSG_RESULT([$can_build_shared])
```

AC_MSG_CHECKING([whether to build shared libraries]) test no = "\$can_build_shared" && enable_shared=no

```
# On AIX, shared libraries and static libraries use the same namespace, and
 # are all built from PIC.
 case $host os in
  aix3*)
   test yes = "$enable_shared" && enable_static=no
   if test -n "$RANLIB"; then
    archive cmds="$archive cmds~\$RANLIB \$lib"
    postinstall_cmds='$RANLIB $lib'
   fi
   ;;
  aix[[4-9]]*)
if test ia64 != "$host_cpu"; then
 case $enable_shared,$with_aix_soname,$aix_use_runtimelinking in
 yes,aix,yes) ;; # shared object as lib.so file only
 yes,svr4,*) ;; # shared object as lib.so archive member only
 yes,*) enable_static=no ;; # shared object in lib.a archive as well
 esac
fi
   ;;
 esac
 AC_MSG_RESULT([$enable_shared])
```

```
AC_MSG_CHECKING([whether to build static libraries])
# Make sure either enable_shared or enable_static is yes.
test yes = "$enable_shared" || enable_static=yes
AC_MSG_RESULT([$enable_static])
```

```
_LT_TAGVAR(GCC, $1)=$G77
_LT_TAGVAR(LD, $1)=$LD
```

```
## CAVEAT EMPTOR:
```

There is no encapsulation within the following macros, do not change
the running order or otherwise move them around unless you know exactly
what you are doing...
_LT_COMPILER_PIC(\$1)
_LT_COMPILER_FILE_LOCKS(\$1)
_LT_LINKER_SHLIBS(\$1)
_LT_SYS_DYNAMIC_LINKER(\$1)
_LT_LINKER_HARDCODE_LIBPATH(\$1)

_LT_CONFIG(\$1) fi # test -n "\$compiler"

GCC=\$lt_save_GCC CC=\$lt_save_CC CFLAGS=\$lt_save_CFLAGS fi # test yes != "\$_lt_disable_F77" AC_LANG_POP])#_LT_LANG_F77_CONFIG

LT_LANG_FC_CONFIG([TAG])

Ensure that the configuration variables for a Fortran compiler are # suitably defined. These variables are subsequently used by _LT_CONFIG # to write the compiler configuration to 'libtool'. m4_defun([_LT_LANG_FC_CONFIG], [AC_LANG_PUSH(Fortran)

if test -z "\$FC" || test no = "\$FC"; then _lt_disable_FC=yes fi

LT TAGVAR(archive cmds need lc, \$1)=no _LT_TAGVAR(allow_undefined_flag, \$1)= _LT_TAGVAR(always_export_symbols, \$1)=no LT TAGVAR(archive expsym cmds, \$1)= _LT_TAGVAR(export_dynamic_flag_spec, \$1)= _LT_TAGVAR(hardcode_direct, \$1)=no _LT_TAGVAR(hardcode_direct_absolute, \$1)=no _LT_TAGVAR(hardcode_libdir_flag_spec, \$1)= LT TAGVAR(hardcode libdir separator, \$1)= _LT_TAGVAR(hardcode_minus_L, \$1)=no _LT_TAGVAR(hardcode_automatic, \$1)=no _LT_TAGVAR(inherit_rpath, \$1)=no _LT_TAGVAR(module_cmds, \$1)= _LT_TAGVAR(module_expsym_cmds, \$1)= _LT_TAGVAR(link_all_deplibs, \$1)=unknown _LT_TAGVAR(old_archive_cmds, \$1)=\$old_archive_cmds _LT_TAGVAR(reload_flag, \$1)=\$reload_flag _LT_TAGVAR(reload_cmds, \$1)=\$reload_cmds _LT_TAGVAR(no_undefined_flag, \$1)= _LT_TAGVAR(whole_archive_flag_spec, \$1)= _LT_TAGVAR(enable_shared_with_static_runtimes, \$1)=no

Source file extension for fc test sources. ac_ext=\${ac_fc_srcext-f}

Object file extension for compiled fc test sources. objext=0 _LT_TAGVAR(objext, \$1)=\$objext

No sense in running all these tests if we already determined that # the FC compiler isn't working. Some variables (like enable_shared)

```
# are currently assumed to apply to all compilers on this platform,
# and will be corrupted by setting them based on a non-working compiler.
if test yes != "$_lt_disable_FC"; then
# Code to be used in simple compile tests
lt_simple_compile_test_code="\
subroutine t
return
end
"
# Code to be used in simple link tests
lt_simple_link_test_code="\
program t
end
```

```
..
```

ltmain only uses \$CC for tagged configurations so make sure \$CC is set. _LT_TAG_COMPILER

save warnings/boilerplate of simple test code
_LT_COMPILER_BOILERPLATE
_LT_LINKER_BOILERPLATE

Allow CC to be a program name with arguments. lt_save_CC=\$CC lt_save_GCC=\$GCC lt_save_CFLAGS=\$CFLAGS CC=\${FC-"f95"} CFLAGS=\$FCFLAGS compiler=\$CC GCC=\$ac_cv_fc_compiler_gnu

```
_LT_TAGVAR(compiler, $1)=$CC
_LT_CC_BASENAME([$compiler])
```

if test -n "\$compiler"; then AC_MSG_CHECKING([if libtool supports shared libraries]) AC_MSG_RESULT([\$can_build_shared])

AC_MSG_CHECKING([whether to build shared libraries]) test no = "\$can_build_shared" && enable_shared=no

On AIX, shared libraries and static libraries use the same namespace, and # are all built from PIC. case \$host_os in aix3*) test yes = "\$enable_shared" && enable_static=no if test -n "\$RANLIB"; then

```
archive_cmds="$archive_cmds~\$RANLIB \$lib"
postinstall_cmds='$RANLIB $lib'
fi
;;
aix[[4-9]]*)
if test ia64 != "$host_cpu"; then
case $enable_shared,$with_aix_soname,$aix_use_runtimelinking in
yes,aix,yes) ;; # shared object as lib.so file only
yes,svr4,*) ;; # shared object as lib.so archive member only
yes,*) enable_static=no ;; # shared object in lib.a archive as well
esac
fi
;;
esac
AC_MSG_RESULT([$enable_shared])
```

AC_MSG_CHECKING([whether to build static libraries]) # Make sure either enable_shared or enable_static is yes. test yes = "\$enable_shared" || enable_static=yes AC_MSG_RESULT([\$enable_static])

_LT_TAGVAR(GCC, \$1)=\$ac_cv_fc_compiler_gnu _LT_TAGVAR(LD, \$1)=\$LD

```
## CAVEAT EMPTOR:
```

There is no encapsulation within the following macros, do not change
the running order or otherwise move them around unless you know exactly
what you are doing...
_LT_SYS_HIDDEN_LIBDEPS(\$1)
_LT_COMPILER_PIC(\$1)
_LT_COMPILER_FILE_LOCKS(\$1)
_LT_LINKER_SHLIBS(\$1)
_LT_SYS_DYNAMIC_LINKER(\$1)
_LT_LINKER_HARDCODE_LIBPATH(\$1)

_LT_CONFIG(\$1) fi # test -n "\$compiler"

GCC=\$lt_save_GCC CC=\$lt_save_CC CFLAGS=\$lt_save_CFLAGS fi # test yes != "\$_lt_disable_FC"

AC_LANG_POP])# _LT_LANG_FC_CONFIG

LT_LANG_GCJ_CONFIG([TAG])

Ensure that the configuration variables for the GNU Java Compiler compiler # are suitably defined. These variables are subsequently used by _LT_CONFIG # to write the compiler configuration to 'libtool'. m4_defun([_LT_LANG_GCJ_CONFIG], [AC_REQUIRE([LT_PROG_GCJ])dnl AC_LANG_SAVE

Source file extension for Java test sources. ac_ext=java

Object file extension for compiled Java test sources. objext=0 _LT_TAGVAR(objext, \$1)=\$objext

Code to be used in simple compile tests
lt_simple_compile_test_code="class foo {}"

Code to be used in simple link tests
lt_simple_link_test_code='public class conftest { public static void main(String[[]] argv) { }; }'

ltmain only uses \$CC for tagged configurations so make sure \$CC is set. _LT_TAG_COMPILER

save warnings/boilerplate of simple test code
_LT_COMPILER_BOILERPLATE
_LT_LINKER_BOILERPLATE

Allow CC to be a program name with arguments. lt_save_CC=\$CC lt_save_CFLAGS=\$CFLAGS lt_save_GCC=\$GCC GCC=yes CC=\${GCJ-"gcj"} CFLAGS=\$GCJFLAGS compiler=\$CC _LT_TAGVAR(compiler, \$1)=\$CC _LT_TAGVAR(LD, \$1)=\$LD _LT_CC_BASENAME([\$compiler])

GCJ did not exist at the time GCC didn't implicitly link libc in. _LT_TAGVAR(archive_cmds_need_lc, \$1)=no

_LT_TAGVAR(old_archive_cmds, \$1)=\$old_archive_cmds _LT_TAGVAR(reload_flag, \$1)=\$reload_flag _LT_TAGVAR(reload_cmds, \$1)=\$reload_cmds ## CAVEAT EMPTOR:

There is no encapsulation within the following macros, do not change
the running order or otherwise move them around unless you know exactly
what you are doing...
if test -n "\$compiler"; then
_LT_COMPILER_NO_RTTI(\$1)
_LT_COMPILER_PIC(\$1)
_LT_COMPILER_C_O(\$1)
_LT_LINKER_FILE_LOCKS(\$1)
_LT_LINKER_HARDCODE_LIBPATH(\$1)

_LT_CONFIG(\$1)

fi

AC_LANG_RESTORE

GCC=\$lt_save_GCC CC=\$lt_save_CC CFLAGS=\$lt_save_CFLAGS])# _LT_LANG_GCJ_CONFIG

LT_LANG_GO_CONFIG([TAG])

Ensure that the configuration variables for the GNU Go compiler # are suitably defined. These variables are subsequently used by _LT_CONFIG # to write the compiler configuration to 'libtool'. m4_defun([_LT_LANG_GO_CONFIG], [AC_REQUIRE([LT_PROG_GO])dnl AC_LANG_SAVE

Source file extension for Go test sources.
ac_ext=go

Object file extension for compiled Go test sources. objext=o _LT_TAGVAR(objext, \$1)=\$objext

Code to be used in simple compile tests
lt_simple_compile_test_code="package main; func main() { }"

Code to be used in simple link tests
lt_simple_link_test_code='package main; func main() { }'

ltmain only uses \$CC for tagged configurations so make sure \$CC is set. _LT_TAG_COMPILER # save warnings/boilerplate of simple test code
_LT_COMPILER_BOILERPLATE
_LT_LINKER_BOILERPLATE

Allow CC to be a program name with arguments. lt_save_CC=\$CC lt_save_CFLAGS=\$CFLAGS lt_save_GCC=\$GCC GCC=yes CC=\${GOC-"gccgo"} CFLAGS=\$GOFLAGS compiler=\$CC _LT_TAGVAR(compiler, \$1)=\$CC _LT_TAGVAR(LD, \$1)=\$LD _LT_CC_BASENAME([\$compiler])

Go did not exist at the time GCC didn't implicitly link libc in. _LT_TAGVAR(archive_cmds_need_lc, \$1)=no

_LT_TAGVAR(old_archive_cmds, \$1)=\$old_archive_cmds _LT_TAGVAR(reload_flag, \$1)=\$reload_flag _LT_TAGVAR(reload_cmds, \$1)=\$reload_cmds

CAVEAT EMPTOR:

There is no encapsulation within the following macros, do not change
the running order or otherwise move them around unless you know exactly
what you are doing...
if test -n "\$compiler"; then
_LT_COMPILER_NO_RTTI(\$1)
_LT_COMPILER_PIC(\$1)
_LT_COMPILER_C_O(\$1)
_LT_LINKER_SHLIBS(\$1)
_LT_LINKER_HARDCODE_LIBPATH(\$1)

_LT_CONFIG(\$1) fi

AC_LANG_RESTORE

GCC=\$lt_save_GCC CC=\$lt_save_CC CFLAGS=\$lt_save_CFLAGS])#_LT_LANG_GO_CONFIG

LT_LANG_RC_CONFIG([TAG])

Ensure that the configuration variables for the Windows resource compiler # are suitably defined. These variables are subsequently used by _LT_CONFIG # to write the compiler configuration to 'libtool'. m4_defun([_LT_LANG_RC_CONFIG], [AC_REQUIRE([LT_PROG_RC])dnl AC_LANG_SAVE

Source file extension for RC test sources. ac_ext=rc

Object file extension for compiled RC test sources. objext=o _LT_TAGVAR(objext, \$1)=\$objext

Code to be used in simple compile tests
lt_simple_compile_test_code='sample MENU { MENUITEM "&Soup", 100, CHECKED }'

Code to be used in simple link tests
lt_simple_link_test_code=\$lt_simple_compile_test_code

ltmain only uses \$CC for tagged configurations so make sure \$CC is set. _LT_TAG_COMPILER

save warnings/boilerplate of simple test code
_LT_COMPILER_BOILERPLATE
_LT_LINKER_BOILERPLATE

Allow CC to be a program name with arguments. lt_save_CC=\$CC lt_save_CFLAGS=\$CFLAGS lt_save_GCC=\$GCC GCC= CC=\${RC-"windres"} CFLAGS= compiler=\$CC _LT_TAGVAR(compiler, \$1)=\$CC _LT_CC_BASENAME([\$compiler]) _LT_TAGVAR(lt_cv_prog_compiler_c_o, \$1)=yes

if test -n "\$compiler"; then : _LT_CONFIG(\$1) fi

GCC=\$lt_save_GCC AC_LANG_RESTORE CC=\$lt_save_CC CFLAGS=\$lt_save_CFLAGS # LT_PROG_GCJ

AC_DEFUN([LT_PROG_GCJ], [m4_ifdef([AC_PROG_GCJ], [AC_PROG_GCJ], [m4_ifdef([A][M_PROG_GCJ], [A][M_PROG_GCJ], [AC_CHECK_TOOL(GCJ, gcj,) test set = "\${GCJFLAGS+set}" || GCJFLAGS="-g -O2" AC_SUBST(GCJFLAGS)])])[]dnl])

Old name: AU_ALIAS([LT_AC_PROG_GCJ], [LT_PROG_GCJ]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([LT_AC_PROG_GCJ], [])

```
# LT_PROG_GO
# ------
AC_DEFUN([LT_PROG_GO],
[AC_CHECK_TOOL(GOC, gccgo,)
])
```

```
# LT_PROG_RC
# ------
AC_DEFUN([LT_PROG_RC],
[AC_CHECK_TOOL(RC, windres,)
])
```

Old name: AU_ALIAS([LT_AC_PROG_RC], [LT_PROG_RC]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([LT_AC_PROG_RC], [])

#_LT_DECL_EGREP

If we don't have a new enough Autoconf to choose the best grep # available, choose the one first in the user's PATH. m4_defun([_LT_DECL_EGREP], [AC_REQUIRE([AC_PROG_EGREP])dnl AC_REQUIRE([AC_PROG_FGREP])dnl test -z "\$GREP" && GREP=grep _LT_DECL([], [GREP], [1], [A grep program that handles long lines]) _LT_DECL([], [EGREP], [1], [An ERE matcher]) _LT_DECL([], [FGREP], [1], [A literal string matcher]) dnl Non-bleeding-edge autoconf doesn't subst GREP, so do it here too AC_SUBST([GREP])

])

#_LT_DECL_OBJDUMP

-----# If we don't have a new enough Autoconf to choose the best objdump
available, choose the one first in the user's PATH.
m4_defun([_LT_DECL_OBJDUMP],
[AC_CHECK_TOOL(OBJDUMP], objdump, false)
test -z "\$OBJDUMP" && OBJDUMP=objdump
_LT_DECL([], [OBJDUMP], [1], [An object symbol dumper])
AC_SUBST([OBJDUMP])
])

_LT_DECL_DLLTOOL

Ensure DLLTOOL variable is set. m4_defun([_LT_DECL_DLLTOOL], [AC_CHECK_TOOL(DLLTOOL, dlltool, false) test -z "\$DLLTOOL" && DLLTOOL=dlltool _LT_DECL([], [DLLTOOL], [1], [DLL creation program]) AC_SUBST([DLLTOOL])])

_LT_DECL_SED

Check for a fully-functional sed program, that truncates # as few characters as possible. Prefer GNU sed if found. m4_defun([_LT_DECL_SED], [AC_PROG_SED test -z "\$SED" && SED=sed

Xsed="\$SED -e 1s/^X//"

_LT_DECL([], [SED], [1], [A sed program that does not truncate output])

_LT_DECL([], [Xsed], ["\\$SED -e 1s/^X//"],

[Sed that helps us avoid accidentally triggering echo(1) options like -n])])#_LT_DECL_SED

 m4_defun([AC_PROG_SED], [AC_MSG_CHECKING([for a sed that does not truncate output]) AC_CACHE_VAL(lt_cv_path_SED, [# Loop through the user's path and test for sed and gsed. # Then use that list of sed's as ones to test for truncation. as_save_IFS=\$IFS; IFS=\$PATH_SEPARATOR for as dir in \$PATH do IFS=\$as_save_IFS test -z "\$as dir" && as dir=. for lt_ac_prog in sed gsed; do for ac_exec_ext in " \$ac_executable_extensions; do if \$as_executable_p "\$as_dir/\$lt_ac_prog\$ac_exec_ext"; then lt_ac_sed_list="\$lt_ac_sed_list \$as_dir/\$lt_ac_prog\$ac_exec_ext" fi done done done IFS=\$as_save_IFS lt_ac_max=0 lt ac count=0 # Add /usr/xpg4/bin/sed as it is typically found on Solaris # along with /bin/sed that truncates output. for lt_ac_sed in \$lt_ac_sed_list /usr/xpg4/bin/sed; do test ! -f "\$lt_ac_sed" && continue cat /dev/null > conftest.in lt ac count=0 echo \$ECHO_N "0123456789\$ECHO_C" >conftest.in # Check for GNU sed and select it if it is found. if "\$lt_ac_sed" --version 2>&1 < /dev/null | grep 'GNU' > /dev/null; then lt_cv_path_SED=\$lt_ac_sed break fi while true; do cat conftest.in conftest.in >conftest.tmp mv -f conftest.tmp conftest.in cp conftest.in conftest.nl echo >>conftest.nl \$lt_ac_sed -e 's/a\$//' < conftest.nl >conftest.out || break cmp -s conftest.out conftest.nl || break # 10000 chars as input seems more than enough test 10 -lt "\$lt_ac_count" && break lt_ac_count=`expr \$lt_ac_count + 1` if test "\$lt_ac_count" -gt "\$lt_ac_max"; then lt_ac_max=\$lt_ac_count lt_cv_path_SED=\$lt_ac_sed fi done

done]) SED=\$lt_cv_path_SED AC_SUBST([SED]) AC_MSG_RESULT([\$SED])])#AC_PROG_SED])#m4_ifndef

Old name: AU_ALIAS([LT_AC_PROG_SED], [AC_PROG_SED]) dnl aclocal-1.4 backwards compatibility: dnl AC_DEFUN([LT_AC_PROG_SED], [])

_LT_CHECK_SHELL_FEATURES

-----# Find out whether the shell is Bourne or XSI compatible,
or has some other useful features.
m4_defun([_LT_CHECK_SHELL_FEATURES],
[if ((MAIL=60; unset MAIL) || exit) >/dev/null 2>&1; then
lt_unset=unset
else
lt_unset=false
fi
__LT_DECL([], [lt_unset], [0], [whether the shell understands "unset"])dnl

```
# test EBCDIC or ASCII
```

```
case `echo X|tr X '\101`` in
A) # ASCII based system
# \n is not interpreted correctly by Solaris 8 /usr/ucb/tr
lt_SP2NL='tr \040 \012'
lt_NL2SP='tr \015\012 \040\040'
;;
*) # EBCDIC based system
lt_SP2NL='tr \100 \n'
lt_NL2SP='tr \100 \n0'
;;
esac
_LT_DECL([SP2NL], [lt_SP2NL], [1], [turn spaces into newlines])dnl
_LT_DECL([NL2SP], [lt_NL2SP], [1], [turn newlines into spaces])dnl
```

])#_LT_CHECK_SHELL_FEATURES

_LT_PATH_CONVERSION_FUNCTIONS

Determine what file name conversion functions should be used by

func_to_host_file (and, implicitly, by func_to_host_path). These are needed

for certain cross-compile configurations and native mingw.

```
m4_defun([_LT_PATH_CONVERSION_FUNCTIONS],
[AC_REQUIRE([AC_CANONICAL_HOST])dnl
AC_REQUIRE([AC_CANONICAL_BUILD])dnl
AC_MSG_CHECKING([how to convert $build file names to $host format])
AC_CACHE_VAL(lt_cv_to_host_file_cmd,
[case $host in
*-*-mingw*)
 case $build in
  *-*-mingw*) # actually msys
   It cv to host file cmd=func convert file msys to w32
   ;;
  *-*-cygwin*)
   lt_cv_to_host_file_cmd=func_convert_file_cygwin_to_w32
   ;;
  * ) # otherwise, assume *nix
   lt_cv_to_host_file_cmd=func_convert_file_nix_to_w32
   ;;
 esac
 ;;
*-*-cygwin*)
 case $build in
  *-*-mingw*) # actually msys
   lt_cv_to_host_file_cmd=func_convert_file_msys_to_cygwin
   ;;
  *-*-cygwin*)
   lt_cv_to_host_file_cmd=func_convert_file_noop
   ;;
  *) # otherwise, assume *nix
   lt_cv_to_host_file_cmd=func_convert_file_nix_to_cygwin
   ;;
 esac
 ;;
*) # unhandled hosts (and "normal" native builds)
 lt_cv_to_host_file_cmd=func_convert_file_noop
 ;;
esac
1)
to_host_file_cmd=$lt_cv_to_host_file_cmd
AC_MSG_RESULT([$lt_cv_to_host_file_cmd])
_LT_DECL([to_host_file_cmd], [lt_cv_to_host_file_cmd],
    [0], [convert $build file names to $host format])dnl
AC_MSG_CHECKING([how to convert $build file names to toolchain format])
AC_CACHE_VAL(lt_cv_to_tool_file_cmd,
[#assume ordinary cross tools, or native build.
lt_cv_to_tool_file_cmd=func_convert_file_noop
case $host in
*-*-mingw*)
```

```
case $build in
 *-*-mingw* ) # actually msys
 lt_cv_to_tool_file_cmd=func_convert_file_msys_to_w32
 ;;
 esac
 ;;
 esac
])
to_tool_file_cmd=$lt_cv_to_tool_file_cmd
AC_MSG_RESULT([$lt_cv_to_tool_file_cmd])
_LT_DECL([to_tool_file_cmd], [lt_cv_to_tool_file_cmd],
 [0], [convert $build files to toolchain format])dnl
])#_LT_PATH_CONVERSION_FUNCTIONS
 GNU LESSER GENERAL PUBLIC LICENSE
 Version 3, 29 June 2007
```

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As used herein, "this License" refers to version 3 of the GNU Lesser General Public License, and the "GNU GPL" refers to version 3 of the GNU General Public License.

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1.64 librdkafka 0.11.6

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MurMurHash2 Library

//-----

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1.65 libseccomp 2.3.1 :3.el7

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2. On 2009-11-01, iMatix exercised an option to acquire FastMQ and its assets, including ZeroMQ. On or before 2010-01-05 the FastMQ copyrights in ZeroMQ were transferred to iMatix ([commit](https://github.com/zeromq/libzmq/commit/4f6baf4dde627656b63cc4e2acdb78a8577ba640)). The FastMQ legal entity was subsequently liquidated.

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1.86 pierrec/lz4 v2.2.0

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Version 3, 29 June 2007

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1.88 pkg-errors v0.9

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* Small patch to handle trailing slashes in --proto_path flag.

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* Small patch to fix Python CallMethod().

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* Small optimizations to Python serialization.

Leandro Lucarella <llucax@gmail.com>

* VI syntax highlighting tweaks.

* Fix compiler to not make output executable.

Dilip Joseph <dilip.antony.joseph@gmail.com>

* Heuristic detection of sub-messages when printing unknown fields in text format.

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* Added @Override annotation to generated Java code where appropriate.

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* Tru64 support.

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* Solaris 10 + Sun Studio fixes.

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* Slicing support for repeated scalar fields for the Python API.

Oleg Smolsky <oleg.smolsky@gmail.com>

- * MS Visual Studio error format option.
- * Detect unordered_map in stl_hash.m4.

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* gzip/zlib I/O support.

Michael Poole <mdpoole@troilus.org>

- * Fixed warnings about generated constructors not explicitly initializing
- all fields (only present with certain compiler settings).
- * Added generation of field number constants.

Wink Saville <wink@google.com>

* Fixed initialization ordering problem in logging code.

Will Pierce <willp@nuclei.com>

* Small patch improving performance of in Python serialization.

Alexandre Vassalotti <alexandre@peadrop.com>

* Emacs mode for Protocol Buffers (editors/protobuf-mode.el).

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* Added Swap(), SwapElements(), and RemoveLast() to Reflection interface.

Alexander Melnikov <alm@sibmail.ru>

* HPUX support.

Oliver Jowett <oliver.jowett@gmail.com>

- * Detect whether zlib is new enough in configure script.
- * Fixes for Solaris 10 32/64-bit confusion.

Evan Jones <evanj@mit.edu>

- * Optimize Java serialization code when writing a small message to a stream.
- * Optimize Java serialization of strings so that UTF-8 encoding happens only once per string per serialization call.
- * Clean up some Java warnings.
- * Fix bug with permanent callbacks that delete themselves when run.

Michael Kucharski <m.kucharski@gmail.com>

* Added CodedInputStream.getTotalBytesRead().

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* Fixed m4/acx_pthread.m4 problem for some Linux distributions.

William Orr <will@worrbase.com>

- * Fixed detection of sched_yield on Solaris.
- * Added atomicops for Solaris

Andrew Paprocki <andrew@ishiboo.com>

- * Fixed minor IBM xlC compiler build issues
- * Added atomicops for AIX (POWER)

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1.105 react-dates 12.7.1

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1.106 react-datetime 2.14.0

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1.107 react-dom 16.3.2

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1.108 react-form 3.5.5

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1.109 react-onclickoutside 6.7.1

1.110 react-popper 0.10.1

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1.111 react-redux 5.0.7

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1.112 react-router-dom 4.2.2

1.113 react-router-redux 5.0.0

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1.114 react-router-redux 5.0.0-alpha.9

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1.115 react-select 1.2.1

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1.116 redux 4.0.0

1.117 redux-promise-middleware 5.1.1

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1.118 sarama-cluster.v2 v2.1.15

1.119 scala-compiler 2.11.0

1.120 schedule-python 0.5.0

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1.121 shopify/sarama v1.11.0

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1.122 simplejson 3.16.0

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1.123 sirupsen/logrus 0.10.0

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1.124 spring-boot-starter-tomcat 2.0.3

1.125 tinylib/msgp 1.0.2

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1.126 Werkzeug 0.16.0

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1.127 whatwg-fetch 2.0.4

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1.128 zlib 1.2.7

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