



CHAPTER 6

Getting Started with the BAC API

This chapter describes the startup process involving system configuration and API execution.

The sections in this chapter are:

- [Startup Process for API Client, page 6-1.](#)
- [Creating an API Client, page 6-3.](#)

Startup Process for API Client

The startup process for an API client interaction involves:

- [Configuring the System, page 6-1.](#)
- [Executing the API Client, page 6-2.](#)

Configuring the System

Before executing a simple client, ensure that you have completed the tasks listed in this section.



Note

These tasks are part of an initial configuration workflow that you must complete before executing a simple client for the first time. Thereafter, you can execute any number of simple clients.

Table 6-1 System Configuration Workflow

Task	Refer to
1. Install Java Development Kit version 1.6.	Sun Microsystems support site
2. Ensure that files <i>bpr.jar</i> and <i>bacbase.jar</i> are available in the classpath. These <i>.jar</i> files are located in the <i>BPR_HOME/lib</i> directory.	—
3. Access the Cisco BAC administrator user interface and ensure that the password that you set for the default bacadmin username matches the password that you set on the RDU. The default password is changeme .	<i>Cisco Broadband Access Center Administrator's Guide 3.5, 3.5.1, 3.5.2</i>

Table 6-1 System Configuration Workflow (continued)

Task	Refer to
4. Add a valid license for each technology that you provision, specifically for the CPE WAN Management Protocol (CWMP) technology and for the DPE component.	<i>Cisco Broadband Access Center Administrator's Guide 3.5, 3.5.1, 3.5.2</i>
5. From the administrator user interface, ensure if the DPE is registered with the RDU. To verify if the DPE is registered, check the DPE status from Servers > DPEs > View Device Provisioning Engines Details page.	<i>Cisco Broadband Access Center Administrator's Guide 3.5, 3.5.1, 3.5.2</i>

Executing the API Client

To execute a simple API client:



Note This procedure uses the *AddDeviceExample.java* classfile as an example.

Step 1 Compile the API classfile using the following code:

```
javac -classpath .:bpr.jar:bacbase.jar class_file
```

For example:

```
javac -classpath .:bpr.jar:bacbase.jar AddDeviceExample.java
```



Note This example assumes that the *bpr.jar* and *bacbase.jar* files exist in the local directory.

Step 2 Execute the API classfile using the following code:

```
java -cp .:bpr.jar:bacbase.jar class_file
```

For example:

```
java -cp .:bpr.jar:bacbase.jar AddDeviceExample.java
```

Step 3 Verify the results.

For example, the *AddDeviceExample* will print success or failure messages. If there is no error, the following message appears:

```
Successfully provisioned device with identifier [OUI-serial-12345]
```

You can also verify the results for the device record from the administrator user interface from the **Devices > Manage Device** page. For more information, *see Cisco Broadband Access Center Administrator's Guide 3.5, 3.5.1, 3.5.2*.

Creating an API Client

This section describes how you can connect to the RDU, create a batch, post the batch to the RDU, and verify the result.



Note This procedure uses the *AddDeviceExample.java* classfile as an example.

Step 1 Create a connection to the Provisioning API Command Engine (PACE).

```
// The PACE connection to use throughout the example. When
// executing multiple batches in a single process, it is advisable
// to use a single PACE connection that is retrieved at the start
// of the application. When done with the connection, YOU MUST
// explicitly close the connection with the releaseConnection()
// method call.
PACEConnection connection = null;

// -----
//
// 1) Connect to the Regional Distribution Unit (RDU).
//
// The parameters defined at the beginning of this class are
// used here to establish the connection. Connections are
// maintained until releaseConnection() is called. If
// multiple calls to getInstance() are called with the same
// arguments, you must still call releaseConnection() on each
// connection you received.
//
// The call can fail for one of the following reasons:
// - The hostname / port is incorrect.
// - The authentication credentials are invalid.
//
// -----
try
{
    connection = PACEConnectionFactory.getInstance(
        // RDU host
        rduHost,
        // RDU port
        rduPort,
        // User name
        userName,
        // Password
        password);
}
catch (PACEConnectionException pce)
{
    // failed to get a connection
    System.out.println("Failed to establish a PACEConnection to ["
        + userName + "@" + rduHost + ":" + rduPort + "]; "
        + pce.getMessage());
    throw new RuntimeException(pce.getMessage());
}
catch (RDUAuthenticationException bae)
{
    // failed to get a connection
    System.out.println("Failed to establish a PACEConnection to ["
        + userName + "@" + rduHost + ":" + rduPort + "]; "
        + bae.getMessage());
}
```

```

        throw new RuntimeException(bae.getMessage());
    }
// -----

```

Step 2 Get a new batch instance.

```

// -----
//
// 2) Get a new batch instance.
//
// To perform any operations in the Provisioning API, you must
// first start a batch. As you make commands against the batch,
// nothing will actually start until you post the batch.
// Multiple batches can be started concurrently against a
// single connection to the RDU.
//
// -----
Batch myBatch = connection.newBatch(
    // No reset
    ActivationMode.NO_ACTIVATION,
    // No need to confirm activation
    ConfirmationMode.NO_CONFIRMATION,
    // No publishing to external database
    PublishingMode.NO_PUBLISHING);
// -----

```

Step 3 Register the AddDeviceExample() call with the batch.

```

// -----
//
// 3) Register the add(...) call with the batch.
//
// Add to the batch the add(...) call. This will make
// the batch add the device during the post() operation. If
// multiple methods are added to a batch, they will be executed
// in the order they are registered. For example, you could
// add a device and then modify it successfully in a batch.
//
// The host name and domain name only needs to be specified if the
// device should have an explicit name assigned to it -- and this is
// only really useful if you have dynamic DNS enabled in DHCP/CNR.
// Properties can be used to store additional information that
// should be maintained by BAC. This data will be returned as a
// response to a query for device details.
//
// -----

// A CWMP device requires the following properties to
// be populated.
//
Map<String, Object> propMap = new HashMap<String, Object>();
propMap.put(IPDeviceKeys.HOME_PROV_GROUP, provisioningGroup);

myBatch.add(
    // Device type
    DeviceType.CWMP,
    // Device identifier
    new CWMPDeviceID(deviceId),
    // Host name - Not used in this example
    null,
    // Domain Name - Not used in this example
    null,
    // ownerID
    ownerId,

```

```

        // classOfService - Use default COS
        null,
        // properties
        propMap);

```

```
// -----
```

Step 4 Post a batch to the RDU.

```

//
// 4) Post the batch to the server.
//
// Executes the batch against the RDU. All of the
// methods are executed in the order entered and the data
// changes are applied against the embedded database in RDU.
//
// -----
BatchStatus batchStatus = null;
try
{
    batchStatus = myBatch.post();
}
catch (ProvisioningException pe)
{
    System.out.println("Failed to provision device with identifier ["
        + deviceId + "]; " + pe.getMessage());

    throw new RuntimeException(pe.getMessage());
}

```

```
// -----
```

Step 5 Verify the result of the connection.

```

//
// 5) Check to see if the batch was successfully posted.
//
// Verify if any errors occurred during the execution of the
// batch. Exceptions occur during post() for truly exception
// situations such as failure of connectivity to RDU.
// Batch errors occur for inconsistencies such as no lease
// information for a device requiring activation. Command
// errors occur when a particular method has problems, such as
// trying to add a device that already exists.
//
// -----
if (batchStatus.isError())
{
    // Batch error occurred.
    // we need to determine if it was a batch error or a
    // command error that caused this failure

    if (batchStatus.getFailedCommandIndex() == -1)
    {
        // this is a batch only error
        // get the error code and get the error message
        final StringBuilder msg = new StringBuilder(128);
        msg.append("Batch with ID [");
        msg.append(batchStatus.getBatchID());
        msg.append("] failed with error code [");
        msg.append(batchStatus.getStatusCode());
        msg.append("]. [");
        msg.append(batchStatus.getErrorMessage());
        msg.append("].");
    }
}

```

```

        // throw an exception or log the message
        System.out.println("Failed to add device with identifier ["
            + deviceId + "]; " + msg.toString());
    }
    else
    {
        // this is a batch error caused by a command
        final CommandStatus commandStatus =
            batchStatus.getFailedCommandStatus();

        // get the error code and get the error message
        final StringBuilder msg = new StringBuilder(128);
        msg.append("Batch with ID [");
        msg.append(batchStatus.getBatchID());
        msg.append("] failed with command error code [");
        msg.append(commandStatus.getStatusCode());
        msg.append("]. [");
        msg.append(commandStatus.getErrorMessage());
        msg.append("].");

        // throw an exception or log the message
        System.out.println("Failed to add device with identifier ["
            + deviceId + "]; " + msg.toString());
    }
}
else
{
    // Successfully added device
    System.out.println("Successfully added device with identifier ["
        + deviceId + "]);
}

```

Step 6 Release the connection to the RDU.

```

// -----
//
// 6) Release the connection to the RDU.
//
// Once the last batch has been executed, the connection can
// be closed to the RDU. It is important to explicitly
// close connections since it helps ensure clean shutdown of
// the Java virtual machine.
//
// -----
connection.releaseConnection();

```
