Troubleshooting the Cisco APIC-EM

Cisco APIC-EM Components and Architecture

This section describes the components and basic architecture of the Cisco APIC-EM. You should review this section to better understand how the controller and its components operate before performing any of the troubleshooting procedures described in this chapter.

The Cisco APIC-EM consists of the following components:

- Hosts
- Linux containers (LXC)
- Grapevine
- Roots and clients
- Services
- Databases
- Networks (internal and external)
- Network connections and NICs

Related Topics

Hosts, on page 2

Linux Containers, on page 2

Hosts

A host can be either an appliance, server or virtual machine where Cisco APIC-EM has been installed. Within the hosts are the Linux containers running instances of the Grapevine clients. The Grapevine clients run the different services. The Grapevine root runs as an application on the host itself and not in any Linux containers.

You can set up either a single host or multi-host deployment for your network.

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Linux Containers

Linux containers is a virtualization technology that provides a software virtualization system for systems running GNU/Linux. These containers enable multiple virtual environments to be set up and run simultaneously.

The Cisco APIC-EM components (Grapevine roots and clients) make use of the Ubuntu operating system environment and Linux containers (LXC). The Grapevine root runs as an application on the host itself. The Grapevine clients run in LXCs within the host.

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Grapevine

The Cisco APIC-EM creates a Platform as a Service (PaaS) environment for your network, using Grapevine as an Elastic Services platform to support the controller's infrastructure and services. The Grapevine root and clients are key components of this infrastructure.

Note You can use a tool called the Grapevine developer console to troubleshoot roots and clients running services. The Grapevine developer console was bundled with the deployment files and installed when you first deployed the Cisco APIC-EM. You can access the Grapevine developer console at this controller IP address and port number: `https://<controller IP address>:14141`

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Root and Clients

The Grapevine root handles all policy management in regards to service updates, as well as the service lifecycle for both itself and the Grapevine client. The Grapevine client is where the supported services run.

Note You can remotely log into the root using SSH (Secure Shell) to troubleshoot any issues. A default idle timeout of 1 hour has been set for an SSH console login. You will be automatically logged out after 1 hour of inactivity on the SSH console.

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Services

The Cisco APIC-EM creates a Platform as a Service (PaaS) environment for your network. A service in this PaaS environment is a horizontally scalable application that adds instances of itself when demand increases, and frees instances of itself when demand decreases.

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Databases

The Cisco APIC-EM supports two databases: application and Grapevine. The application database is used for the application and external networking data. The Grapevine database is used for the Grapevine and internal network data. Both databases are replicated in a multi-host environment for scale and high availability.

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Networks

The Cisco APIC-EM architecture requires both external and internal networks to operate:

- The external network(s) consists of the network hosts, devices, and NTP servers, as well as providing access to the northbound REST APIs. The external network(s) also provides access to the controller GUI.
- The internal network consists of the Grapevine roots and clients that are connected to and communicate with each other (service to service). For forwarding to or receiving traffic from the larger external network (that consists of the connected devices and hosts, as well as NTP servers), all inbound and outbound traffic for this internal network passes through a subset of clients connected to the external network. The internal network is isolated and nonroutable from the external network(s), as well as any other internal network.

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Network Connections and NICs

The network adapters (NICs) on the host (physical or virtual) are connected to the following external networks:

- Internet (network access required for **Make A Wish** requests, Telemetry, and trustpool updates)
- Network with NTP server(s)
- Network with devices that are to be managed by the Cisco APIC-EM

Note The Cisco APIC-EM should never be directly connected to the Internet. It should not be deployed outside of a NAT configured or protected datacenter environment.

Related Topics

Cisco APIC-EM Components and Architecture, on page 1

Troubleshooting an Unsuccessful Installation

After performing an installation using the configuration wizard, you should have received an 'installation was successful' message. If you did not receive this message and your installation was unsuccessful, you can perform the following troubleshooting procedures.

Confirming that Core Services are Running

Before You Begin

You should have attempted to deploy the Cisco APIC-EM following the procedure described in this guide.

Step 1 Using a Secure Shell (SSH) client, log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Enter the following command to display the status of the core services:

```
$ sudo service grapevine status
```

Step 4 Enter your password a second time when prompted.

```
$[sudo] password for grapevine: ********
```

Command output similar to the following should appear. The core services should have a RUNNING status.

```
grapevine is running
grapevine_beacon                 RUNNING    pid 30243, uptime 0:11:11
grapevine_capacity_manager       RUNNING    pid 30549, uptime 0:11:02
grapevine_capacity_manager_lxc_plugin RUNNING    pid 30247, uptime 0:11:11
grapevine_cassandra              RUNNING    pid 30244, uptime 0:11:11
grapevine_root                   RUNNING    pid 30537, uptime 0:11:03status
```

Step 5 If any of the core services are not in the RUNNING state, enter the root cause analysis (rca) command.

```
$ rca
```

The **rca** command runs a root cause analysis script that creates a `tar` file that contains the following data:

- Log files
- Configuration files
- Command output

Step 6 Send the `tar` file created by the **rca** command procedure to Cisco support for assistance in resolving your issue.

Confirming the Multi-Host Cluster Configuration Values

Before You Begin

You should have attempted to deploy the Cisco APIC-EM following the procedure described in this guide.

Step 1 Using a Secure Shell (SSH) client, log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Enter the following command to display the multi-host configuration.

```
$ grape root display
```

Command output similar to the following should appear.

```
ROOT                                    PROPERTY             VALUE
```

```
----------------------------------------------------------------------

4cbe3972-9872-4771-800d-08c89463f1eb   hostname             root-1
4cbe3972-9872-4771-800d-08c89463f1eb   interfaces           [{'interface': 'eth0', 'ip':
'209.165.200.10', 'mac': '00:50:56:100:d2:14', 'netmask': '255.255.255.0'}, {'interface': 'eth1',
'ip': '209.165.200.10', 'mac': '00:50:56:95:5c:18', 'net  mask': '255.255.255.0'}, {'interface':
'grape-br0', 'ip': '209.165.200.11', 'mac': 'ba:ed:c4:19:0d:77', 'netmask': '255.255.255.0'}]
4cbe3972-9872-4771-800d-08c89463f1eb   is_alive             True
4cbe3972-9872-4771-800d-08c89463f1eb   last_heartbeat       Wed Sep 09, 2015 11:02:52 PM (just now)

4cbe3972-9872-4771-800d-08c89463f1eb   public_key           ssh-rsa

c2EAAAADAQABAAABAQDYlyCfidke3MTjGkzsTAu73MtG+lynFFvxWZ4xVIkDkhGC7KCs6XMhORMaABb6
bU4EX/6osa4qyta4NYaijxjL6GL6kPkSBZiEKcUekHCmk1+H+Ypp5tc0wyvSpe5HtbLvPicLrXHHI/TS
Fsa+gLPqg55TflX8RH3i8dHf1Zwq6v4nHVryjAzMXeFYnFHST9e0P62QnkAGh29ktxUpS3fKua9iCVIE
V44t+VvtFaLurG9+FW/ngZwGrR/N0ZJZl6/MQTN3 grapevine@grapevine-root

4cbe3972-9872-4771-800d-08c89463f1eb   root_id              4cbe3972-9872-4771-800d-08c89463f1eb
4cbe3972-9872-4771-800d-08c89463f1eb   root_index           0
4cbe3972-9872-4771-800d-08c89463f1eb   root_version         0.3.0.958.dev140-gda6a16
4cbe3972-9872-4771-800d-08c89463f1eb   vm_password          ******
(grapevine)

#

ROOT                                   PROPERTY             VALUE
----------------------------------------------------------------------

4cbe3972-9872-4771-800d-08c89463f1eb   hostname             root-2
4cbe3972-9872-4771-800d-08c89463f1eb   interfaces           [{'interface': 'eth0', 'ip':
'209.165.200.101, 'mac': '00:50:56:100:d2:14', 'netmask': '255.255.255.0'}, {'interface': 'eth1',
'ip': '209.165.200.11', 'mac': '00:50:56:95:5c:18', 'net  mask': '255.255.255.0'}, {'interface':
'grape-br0', 'ip': '209.165.200.11', 'mac': 'ba:ed:c4:19:0d:77', 'netmask': '255.255.255.0'}]
4cbe3972-9872-4771-800d-08c89463f1eb   is_alive             True
4cbe3972-9872-4771-800d-08c89463f1eb   last_heartbeat       Wed Sep 09, 2015 11:02:52 PM (just now)

4cbe3972-9872-4771-800d-08c89463f1eb   public_key           ssh-rsa

c2EAAAADAQABAAABAQDYlyCfidke3MTjGkzsTAu73MtG+lynFFvxWZ4xVIkDkhGC7KCs6XMhORMaABb6
bU4EX/6osa4qyta4NYaijxjL6GL6kPkSBZiEKcUekHCmk1+H+Ypp5tc0wyvSpe5HtbLvPicLrXHHI/TS
Fsa+gLPqg55TflX8RH3i8dHf1Zwq6v4nHVryjAzMXeFYnFHST9e0P62QnkAGh29ktxUpS3fKua9iCVIE
V44t+VvtFaLurG9+FW/ngZwGrR/N0ZJZl6/MQTN3 grapevine@grapevine-root

4cbe3972-9872-4771-800d-08c89463f1eb   root_id              4cbe3972-9873-4771-800d-08c89463f1eb
4cbe3972-9872-4771-800d-08c89463f1eb   root_index           0
4cbe3972-9872-4771-800d-08c89463f1eb   root_version         0.3.0.958.dev140-gda6a16
4cbe3972-9872-4771-800d-08c89463f1eb   vm_password          ******
(grapevine)
```

The following data is displayed by this command:

- `hostname`—The configured hostname.
- `interfaces`—The configured interface values, including Ethernet port, IP address, and netmask.
- `is_alive`—Status of the host. `True` indicates a running host, `False` indicates a host that has shut down.

- `last_heartbeat`—Date and time of last heartbeat message sent from the host.
- `public_key`—Public key used by host.
- `root_id`—Individual root identification number.
- `root_index`—Individual root index number.
- `root_version`—Software version of root.
- `vm_password`—VMware vSphere password that is masked.

Step 4 If any of the fields in the command output appear incorrect, enter the root cause analysis (rca) command.

```
$ rca
```

The **rca** command runs a root cause analysis script that creates a `tar` file that contains the following data:

- Log files
- Configuration files
- Command output

Step 5 Send the `tar` file created by the **rca** command procedure to Cisco support for assistance in resolving your issue.

Resolving Access to the Cisco APIC-EM GUI

You access the Cisco APIC-EM GUI by entering the IP address that you configured for the network adapter using the configuration wizard. This IP address connects to the external network. Enter the IP address in your browser in the following format:

https://*IP address*

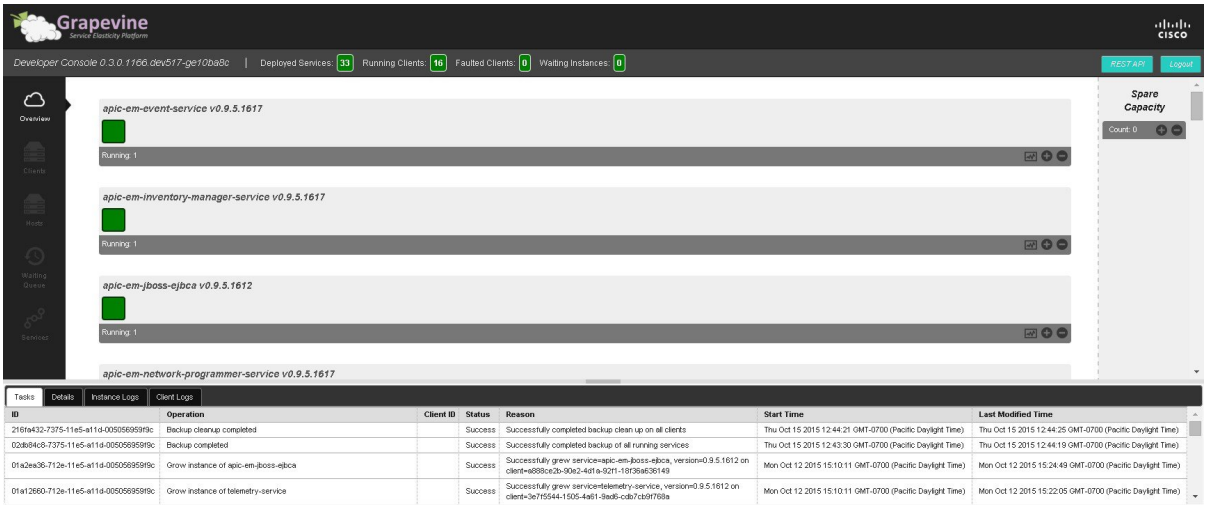
If you are unable to access the Cisco APIC-EM GUI, you must access the Grapevine developer console to check for faulty or failed services.

The Grapevine developer console allows you to monitor the health of your Cisco APIC-EM deployment. The Grapevine developer console is part of the Service Elasticity Platform (Grapevine). You access the Grapevine developer console by entering the IP address that you configured for the network adapter using the configuration wizard, but with a specific port number (**14141**).

For a multi-host cluster, you do not have to log into each host. In a multi-host cluster, you get a single, consolidated view of all of the services running on all three hosts. Multiple instances of services running on different hosts will appear in the Grapevine developer console in a multi-host cluster.

Note A default idle timeout of 1 hour has been set for the Grapevine developer console. You will be automatically logged out after 1 hour of inactivity on the Grapevine developer console.

Figure 1: Grapevine Developer Console



To access the Grapevine developer console to check for faulty or failed services, follow the procedure described below.

Before You Begin

You should have attempted to deploy the Cisco APIC-EM following the procedure described in this guide.

Step 1 Access the Grapevine developer console by opening a browser window and entering the IP address that you configured for the network adapter using the configuration wizard.

Note This IP address connects the appliance to the external network.

For example, enter the following IP address with required port number:

https:*//external network IP address:***14141**

Step 2 Enter your administrative username and password when prompted.
The administrative username and password were configured by you using the configuration wizard.

After you enter the username and password, the Grapevine developer console appears. Each installed service with its version number appears in the console in an alphabetical list. Below each service is a square icon that represents the health of the service. Services that have been installed and are operational are green. Faulty or failed services are red.

Step 3 Scroll down the list and confirm that the following services are installed and running for your deployment:

- reverse-proxy
- router
- ui

Note whether the service is operational or faulty.

Step 4 Review the console **Tasks** tab below the list of services for any error messages about any faulty services. Note the reason given for the faulty or failed service.

Step 5 Contact Cisco support with the following information:

- Whether any of the services listed in **Step 3** are inoperable or faulty.
- Whether any errors are in the console **Tasks** tab located at the bottom of the console.

Troubleshooting the Configuration

Perform the following procedures to troubleshoot possible configuration issues.

Updating the Configuration Using the Wizard

You can troubleshoot the Cisco APIC-EM deployment by running the configuration wizard a second time and updating any earlier configuration entries. The configuration wizard saves and displays your previous configuration settings, so you do not have to reenter them.

Note When performing this procedure, controller downtime occurs. For this reason, we recommend that you perform this procedure during a maintenance time period. For information about changing settings for a multi-host configuration, see Changing the Settings in a Multi-Host Cluster Using the Wizard

Before You Begin

You have deployed Cisco APIC-EM using the procedures described in this guide.

Step 1 Using a Secure Shell (SSH) client, log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Restart the configuration wizard using the following command.

```
$ config_wizard
```

Step 4 Review the current configuration values in the configuration wizard and click **next>>**, until you access the specific step where you wish to update your previous configuration entry.
For example, if you need to enter a new NTP server IP address, click **next >>** until you get to the **NTP SERVER SETTINGS** screen.

Step 5 Update the value that was previously entered in the configuration wizard and is currently displayed. For example, you can update the NTP server settings by entering a new IP address.

Step 6 Click **next>>** until the last step of the configuration wizard process.

Step 7 Click **proceed>>** to have the configuration wizard save and apply your configuration changes to your Cisco APIC-EM deployment.

Resetting the Cisco APIC-EM

You can troubleshoot a Cisco APIC-EM deployment by resetting the controller back to configuration values that were originally set using the configuration wizard the first time. A reset of the controller is helpful, when the controller has gotten itself into an unstable state and other troubleshooting activities have not resolved the situation.

In a multi-host environment, you need to perform this procedure on only a single host. After performing this procedure on a single host, the other two hosts will be automatically reset.

Before You Begin

You have deployed the Cisco APIC-EM using the procedures described in this guide.

Step 1 Using a Secure Shell (SSH) client, log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Navigate to the `bin` directory on the Grapevine root. The `bin` directory contains the grapevine scripts.

Step 4 Enter the **reset_grapevine** command at the prompt to run the reset grapevine script.

```
$ reset_grapevine
```

The **reset_grapevine** command returns the configuration settings back to values that you configured when running the configuration wizard for the first time. The configuration settings are saved to a .JSON file. This .JSON file is located at: `/etc/grapevine/controller-config.json`. The **reset_grapevine** command uses the data in the `controller-config.json` file to return to the earlier configuration settings, so do not delete this file. If you delete this file, you must run the configuration wizard again and reenter your configuration data.

You are then prompted to reenter your Grapevine password.

Step 5 Enter your Grapevine password a second time.

```
[sudo] password for grapevine:********
```

You are then prompted to delete all virtual disks The virtual disks are where the Cisco APIC-EM database resides. For example, data about devices that the controller discovered are saved on these virtual disks. If you enter yes (**y**), all of

this data is deleted. If you enter no (**n**), then the new cluster will come up populated with your existing data once the reset procedure completes.

Step 6 Enter **n** to prevent the deletion all of the virtual disks.

```
THIS IS A DESTRUCTIVE OPERATION
Do you want to delete all VIRTUAL DISKS in your APIC-EM cluster? (y/n):n
```

You are then prompted to delete all Cisco APIC-EM authentication timeout policies, user password policies, and user accounts other than the primary administrator account.

Step 7 Enter **n** to prevent the deletion of all authentication timeout policies, user password policies, and user accounts other than the primary administrator account.

```
THIS IS A DESTRUCTIVE OPERATION
Do you want to delete authentication timeout policies, user password policies,
and Cisco APIC-EM user accounts other than the primary administrator account? (y/n): n
```

You are then prompted to delete any imported certificates.

Step 8 Enter **n** to prevent the deletion of any imported certificates.

```
THIS IS A DESTRUCTIVE OPERATION
Do you want to delete the imported certificates? (y/n): n
```

You are then prompted to delete any backups.

Step 9 Enter **n** to prevent the deletion of any backups.

```
THIS IS A DESTRUCTIVE OPERATION
Do you want to delete the backups? (y/n): n
```

The controller then resets itself with the configuration values that were originally set using the configuration wizard the first time. When the controller is finished resetting, you are presented with a command prompt from the controller.

Step 10 Using the Secure Shell (SSH) client, log out of the host.

Restoring the Controller to the Factory Default

In certain situations, you may want to restore the Cisco APIC-EM to its original factory default settings. For example, if your controller appliance is being replaced or simply has an undesirable configuration that needs to be completely removed. Under these circumstances, you can restore the controller to its factory defaults and then proceed to reconfigure it as a new controller.

This procedure describes how to a restore the factory defaults to the controller.

Caution This procedure shuts down both the Cisco APIC-EM and the host (physical or virtual) on which it resides. At the end of this procedure, you will need to access the host and restart it.

Before You Begin

You have already deployed the Cisco APIC-EM using the procedures described in this guide.

You have access to the Cisco APIC-EM using either a physical console or a Telnet connection.

Step 1 Using a Secure Shell (SSH) client, log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Enter the **reset_grapevine factory** command at the prompt.

```
$ reset_grapevine factory
```

Step 4 Enter your Linux grapevine password a second time to start the reset process.

```
$ sudo password for grapevine *********
```

After entering this command a warning appears that the **reset_grapevine factory** command will shut down the controller.

You are then prompted to confirm your desire to run the **reset_grapevine factory** command.

Step 5 Enter **Yes** to confirm that you want to run the **reset_grapevine factory** command.
The controller then performs the following tasks:

- Stops all running clients and services
- Stops and shuts down any Linux containers
- Deletes all cluster data
- Deletes all user data
- Deletes the configuration files including secrets and private keys
- Shuts down the controller
- Shuts down the host (physical or virtual)

What to Do Next

Perform the following tasks:

- Start up the host (physical or virtual).
- After start up, the configuration wizard appears and prompts you to re-deploy the Cisco APIC-EM.
- Proceed to re-deploy the Cisco APIC-EM using the configuration wizard.

Creating a Support File for the Cisco APIC-EM

You can troubleshoot the Cisco APIC-EM deployment by creating a support file. This support file consists of logs, configuration files, and command output. After you create this support file, you can then email it to Cisco support for assistance.

Before You Begin

You have deployed the Cisco APIC-EM using the procedures described in this guide.

Step 1 Using a Secure Shell (SSH) client, log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Navigate to the `bin` directory on the host. The `bin` directory contains the grapevine scripts.

Step 4 To create the support file, enter the **rca** command in this directory.

```
$ rca
mkdir: created directory '/tmp grapevine-rca-2014-05-27_04-22-20-PM_PDT-0700'

---------------------------------------------------------------------
RCA package created On Tues May 27 16:22:20 PDT 2014
---------------------------------------------------------------------

[INFO] Generating log for 'vmstat 1 10'
[sudo] password for grapevine:
```

The **rca** command runs a root cause analysis script that creates a `tar` file that contains log files, configuration files, and the command output.

What to Do Next

Send the `tar` file created by this procedure to Cisco support for assistance in resolving your issue.

Troubleshooting Services

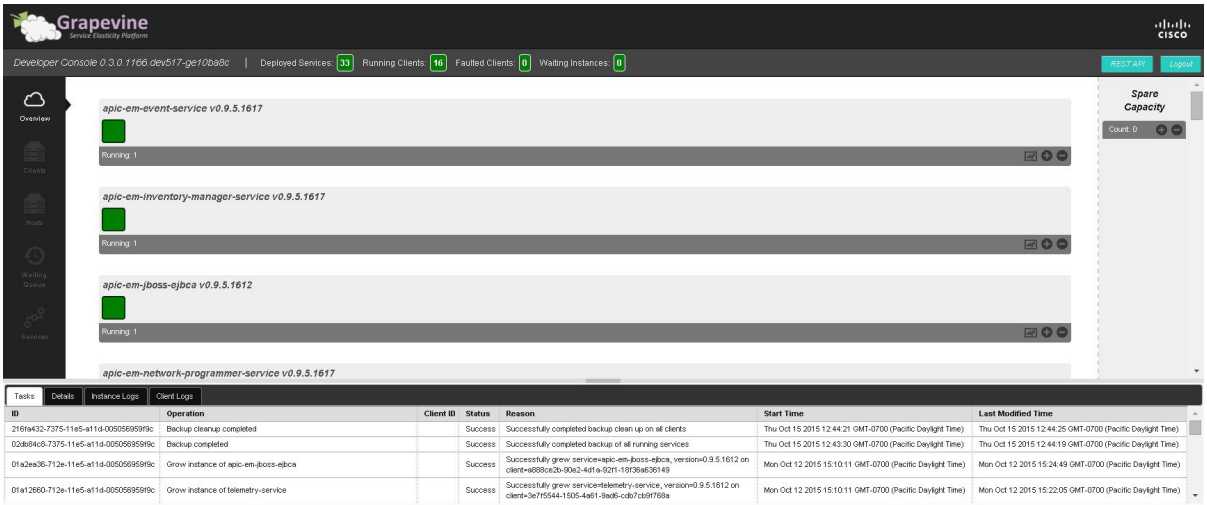
You can use the troubleshooting procedures in this section to assist in troubleshooting service issues.

You can use the Grapevine developer console to review the status of a service instance (active, inactive, or failed) to assist in identifying a service problem. You can also use the Grapevine developer console to check the service logs to identify any problems. After identifying a failed or faulty service, you can then manually grow and/or harvest service instances to try to resolve the problem.

Grapevine Developer Console

The Cisco APIC-EM creates a Platform as a Service (PaaS) environment for your network. A service in this PaaS environment is a horizontally scalable application that adds instances of itself when increasing loads occur on a client within the network. You use the Grapevine developer console to troubleshoot these services. The Grapevine developer console tools were bundled with the deployment files and installed when you first deployed the Cisco APIC-EM.

Figure 2: Grapevine Developer Console



Note For a multi-host cluster, you do not have to log into each host to view the Grapevine developer console. In a multi-host cluster, you get a single, consolidated view of all of the services running on all three hosts.

The Grapevine developer console provides the following windows and functionality:

- **Overview—**Provides a list of services with information about their version and status. You can add or remove services in this window.
- **Clients—**Provides detailed client information in this window.
- **Hosts—**Provides detailed host information in this window.
- **Waiting Queue—**Provides information about the waiting queue.
- **Services—**Provides detailed service information. You can add or remove services in this window.
- **Logs—**Provides detailed task, instance, and client logs

Note You cannot access the Grapevine developer console as a Linux root user. You can only access the Grapevine developer console using the administrator username and password that you configured during the deployment process.

Related Topics

Creating a Service Instance Manually
Removing a Service Instance Manually
Reviewing the Service Version, Status, and Logs, on page 15

Logging into the Grapevine Developer Console

You are able to perform the following tasks using the Grapevine developer console:

- Review the status of each service
- Review the version of each service
- Review the logs of each service

Note Only advanced users should access the Grapevine developer console to perform any troubleshooting tasks for the services.

Before You Begin

You must have successfully deployed the Cisco APIC-EM and it must be operational.

Step 1 Access the Grapevine developer console by opening a browser window and entering the IP address that you configured for the network adapter using the configuration wizard.

Note This IP address connects the appliance to the external network.

For example, enter the following IP address with required port number:

https://*external network IP address:***14141**

Step 2 Enter your administrative username and password when prompted.
The administrative username and password were configured by you using the configuration wizard.

The console for the Elastic Service Platform (Grapevine) appears.

What to Do Next

Proceed to review any of the service versions, status, and logs for any troubleshooting purpose.

Reviewing the Service Version, Status, and Logs

You are able to perform the following tasks using the Grapevine developer console:

- Review the status of each service
- Review the version of each service
- Review the logs of each service

Note Only advanced users should access the console to perform the tasks described in this procedure or attempt to troubleshoot the services.

Before You Begin

You must have successfully deployed the Cisco APIC-EM and it must be operational.

Step 1 Access the Grapevine developer console by opening a browser window and entering the IP address that you configured for the network adapter using the configuration wizard.

Note This IP address connects the appliance to the external network.

For example, enter the following IP address with required port number:

https:*//external network IP address:***14141**

Step 2 Enter your administrative username and password when prompted.
The administrative username and password were configured by you using the configuration wizard.

The console for the Elastic Service Platform (Grapevine) appears.

Step 3 Review the status of each service listed in the **Overview** window in the console.
Each service is represented by a square. A green colored square represents an active instance of the service, and a red colored square represents a service with a faulty or failed instance. Squares without color represents inactive services (no instances initiated and running).

In a multi-host environment, a service may be represented by two green colored squares, indicating that the service is running on two different hosts within your cluster. Place your cursor over each square to view the host that the service is running on.

Step 4 Review the version of each service in the **Overview** window in the console.
The version is located in the header of each listed service.

Step 5 Review the service logs by clicking a specific active instance of a service (green square icon) and then viewing the **Instance** or **Client** logs located at the bottom of the window.

What to Do Next

When finished with the Grapevine developer console, click the **Logout** button to log out of the console.

Related Topics

About Cisco APIC-EM Services
Services
Grapevine Developer Console, on page 14

Monitoring Services and Clients Using the CLI

In addition to the developer console, a command-line interface on the host is also provided for troubleshooting purposes. This CLI allows you to monitor the health of the Cisco APIC-EM from the command line.

Before You Begin

You have deployed the Cisco APIC-EM using the procedures described in this guide.

Step 1 Using a Secure Shell (SSH) client, log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Display all of the Cisco APIC-EM services currently installed by entering the **grape service display** command. Key data about each service is then displayed separated by hash marks.

```
$ grape service display

...

#
rabbitmq                  config                    {}
rabbitmq                  core_service              True
rabbitmq                  enabled                   False
rabbitmq                  endpoint_config           {u'default':
{u'backend_protocol': u'amqp', u'backend_path': u'',
u'frontend_protocol': u'', u'frontend_path': u'', u'frontend_port':
0, u'backend_port': 5672}}
rabbitmq                  kill_as_group             True
rabbitmq                  max_instances             1
rabbitmq                  min_instances             0
rabbitmq                  priority                  1
rabbitmq                  queue_config              {u'queues': [],
u'bindings': [], u'exchanges': []}
rabbitmq                  requirements              {u'template_id':
u'default', u'persistent_disk': False}
rabbitmq                  run_as_group              grapevine
rabbitmq                  run_as_user               grapevine
rabbitmq                  service_type              rabbitmq
rabbitmq                  spare_count               0
rabbitmq                  start_secs                10
rabbitmq                  static_load               10
rabbitmq                  status_interval           60
rabbitmq                  stop_as_group             True
rabbitmq                  stop_signal               TERM
rabbitmq                  version                   1.0.0
#

...
```

Step 4 Display running instances of the Cisco APIC-EM services by entering the **grape instance display** command. Key data about running instances of service is then displayed separated by hash marks.

```
$ grape instance display

...
```

```
#
4c4c83db-2da6-4a04-9af6-96c8dac692d1   client_id
4c4c83db-2da6-4a04-9af6-96c8dac692d1
4c4c83db-2da6-4a04-9af6-96c8dac692d1   endpoint_config
{u'default': {u'backend_port': 5672, u'backend_protocol': u'amqp'}}
4c4c83db-2da6-4a04-9af6-96c8dac692d1   interfaces
[{'interface': 'eth0', 'ip': '192.168.0.1', 'mac': '00:50:56:9f:6c:c4'},
{'interface': 'eth1', 'ip': '172.16.0.15', 'mac': '00:50:56:9f:71:46'}]
4c4c83db-2da6-4a04-9af6-96c8dac692d1   is_error           None
4c4c83db-2da6-4a04-9af6-96c8dac692d1   service_type       rabbitmq
4c4c83db-2da6-4a04-9af6-96c8dac692d1   state              running
4c4c83db-2da6-4a04-9af6-96c8dac692d1   task_id            None
4c4c83db-2da6-4a04-9af6-96c8dac692d1   timestamp
Fri Oct 03, 2014 02:05:43 PM (4 days ago)
4c4c83db-2da6-4a04-9af6-96c8dac692d1   version            1.0.0
#

...
```

Note All services should have a *state* property value of *running*.

Step 5 Display all Grapevine clients currently running in Cisco APIC-EM by entering the **grape client display** command. Key data about each client is then displayed separated by hash marks.

```
$ grape client display

CLIENT                                  PROPERTY             VALUE
-----------------------------------------------------------------------
ae63a6c1-a946-4df7-a68d-33227eed8134   client_id        ae63a6c1-a946-4df7-a68d-33227eed8134
ae63a6c1-a946-4df7-a68d-33227eed8134   client_version   0.1.0.212.dev633-gf7e21de
ae63a6c1-a946-4df7-a68d-33227eed8134   interfaces      [{'interface': 'eth0', 'ip': '192.168.0.32',

'mac': '00:50:56:9f:3a:90'}]
ae63a6c1-a946-4df7-a68d-33227eed8134   is_alive         True
ae63a6c1-a946-4df7-a68d-33227eed8134   last_heartbeat   Wed Oct 08, 2014 10:22:50 AM (15 secs ago)
ae63a6c1-a946-4df7-a68d-33227eed8134   template_id      default
ae63a6c1-a946-4df7-a68d-33227eed8134   vm_id            ce0a634a-5475-4450-9dce-f3217d855ac4
#

...
```

All clients should have a *is alive* property of *True*.

Troubleshooting Passwords

Perform the following procedures to troubleshoot password issues.

Performing Password Recovery with an Existing Administrator

To perform password recovery for a user (administrator, installer or observer) where there exists at least one controller administrator (ROLE_ADMIN) user account, take the following steps:

1 Contact the existing administrator to set up a temporary password for the user that requires password recovery.

Note The administrator can set up a temporary password by deleting the user's account and then recreating it with the lost password. The user can then log back into the controller to regain access and change the password once again to whatever he or she desires.

2 The user then needs to log into the controller with the temporary password and change the password.

Note Passwords are changed in the controller GUI using the **Change Password** window. For information about changing passwords, see Chapter 4, Managing Users and Roles in the *Cisco Application Policy Infrastructure Controller Enterprise Module Configuration Guide*.

Performing Password Recovery with No Existing Administrator

The following procedure describes how to perform password recovery where there exists only one controller administrator (ROLE_ADMIN) user account and this account cannot be successfully logged into.

Note We recommend that you create at least two administrator accounts for your deployment. With two administrator accounts, if one account is locked for whatever reason then the other account can be used to unlock that locked account.

Step 1 If there are no other existing administrator (ROLE_ADMIN) user accounts, use an SSH client from your terminal to log into the host (physical or virtual) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 Enter the Linux username ('grapevine') and password when prompted.

Step 3 On the console, enter the following command on the Grapevine root.

```
$ config_wizard
```

This command starts up the Cisco APIC-EM configuration process.

Step 4 Choose the **<Create a new APIC-EM cluster>** option.

Step 5 Proceed through the configuration process until reaching the step to configure the **APIC-EM ADMIN USER SETTINGS**.

Step 6 Specify a new administrator user password.

Step 7 Reenter the new administrator user password for confirmation.

Step 8 Proceed through the configuration wizard and its process until completion.

Caution To save the data in the Cisco APIC-EM database as part of the reset, ensure that **no** is chosen when prompted in **HARVEST ALL VIRTUAL DISKS**.

This final step will bring down the cluster and then bring it back up again (similar to running the **reset_grapvine** command).

Performing Password Recovery for the Linux Grapevine User Account

You can use the following procedure to recover from the loss of the Linux grapevine user password. This procedure reconfigures the Linux grapevine user password that is required for accessing the host's Linux operating system.

Before You Begin

You should be logged into the host (physical or virtual) using a Linux console to access the Linux kernel.

Step 1 Reboot the host (physical or virtual) while logged into the Linux console.

Step 2 Press "e" upon seeing the GNU GRUB menu to edit the boot commands.

Note In a VMware environment, you may need to press a different key to view the GNU GRUB menu. Refer to your VMware documentation for information about access to the GNU GRUB menu. Additionally, there may be different keys to press to enter the boot sequence depending upon the BIOS used for the host.

Step 3 Search for the line in the GNU GRUB menu output that begins with "linux" and change “ro” to “rw”, and append "init=/bin/bash" to that line.

For example, search for this line:

```
linux /vmlinuz-3.13.0-24-generic root=/dev/mapper/grapevine--vg-root ro cgroup_enable=memory
swapaccount=1 quiet sqlash $vt_handoff
```

And change it to this line:

```
linux /vmlinuz-3.13.0-24-generic root=/dev/mapper/grapevine--vg-root rw cgroup_enable=memory
swapaccount=1 quiet sqlash $vt_handoff init=/bin/bash
```

Step 4 Press **Ctrl-x** or the **F10** key to proceed with the boot process.

Note We recommend that you use the **F10** key to proceed with the boot process.

At this point, the host will boot up in root mode. You can now enter the Linux **passwd** command to reset the password for the Linux grapevine user.

Step 5 Enter the Linux **passwd** command to reset the password for the Linux grapevine user.

```
$ passwd grapevine
```

Caution This procedure permits you to change the Linux **grapevine** user password. Do not change the Linux **root** user password at any point in this procedure. Resetting the Linux root user password reduces the security of the host.

Step 6 When prompted, enter a new Linux grapevine password.

Step 7 When prompted, confirm the new Linux grapevine password by entering it a second time.

Step 8 Enter the following **reboot** command to reboot the system.

```
$ /sbin/reboot -f
```

The system reboots and will start up with new configuration and password.

At the end of the reboot process, you are presented with the GNU GRUB menu.

Step 9 Press **Enter** to boot up in the Ubuntu OS.

Step 10 After booting up in the Ubuntu OS, log back into the host by entering your Linux grapevine username and password.

Note Enter the Linux grapevine password created in step 6 above.

Step 11 Restart the configuration wizard using the following command.

```
$ config_wizard
```

Proceed through the configuration wizard process by clicking **next>>** and accepting the pre-configured values until you reach the **LINUX USER SETTINGS** step.

Note The **config_wizard** command is in the PATH of the 'grapevine' user, and not the "root" user. Either run the command as the "grapevine" user, or fully qualify the command as the "root" user. For example: **/home/grapevine/bin/config_wizard**

Step 12 When prompted to enter values for the **LINUX USER SETTINGS**, enter the new Linux grapevine password that you created earlier in step 6.

Note You need to start up the configuration wizard and run through the configuration process to synchronize the Linux grapevine user password to the controller itself.

Step 13 Click **next>>** and continue through the configuration wizard process, until the last step of this process.

Note When prompted to enter values for the **CONTROLLER CLEAN-UP** step, be sure to enter **no** for both **Harvest All Virtual Disks** and **Delete All Users**.

Step 14 At the end of the configuration wizard process, click **proceed>>** to have the configuration wizard save and apply your configuration changes to the Cisco APIC-EM.

Troubleshooting Commands

You can issue commands on both Grapevine root and clients to troubleshoot the Cisco APIC-EM.

Related Topics

Root Commands, on page 22

Client Commands, on page 24

Root Commands

The following table describes commands that you can issue on the Grapevine root to troubleshoot the Cisco APIC-EM.

Note Enter the **grape help** command on Grapevine root to view the available commands.

Table 1: Root Troubleshooting Commands

Root Command	Description
grape backup delete	Deletes the existing controller backup file. If you are unable to back up your current controller database, then you may want to delete it and restore an earlier smaller controller backup file.
grape capacity_plugin display	Displays the current settings used by Grapevine.
grape client display	Displays the number of Grapevine clients that are currently running. This command also displays any clients that have faulted.
grape client status	Displays the status of the Grapevine clients.
grape host evacuate *host_id*	The **grape host evacuate** command harvests all of the services on the host where it is issued. If you issue this command on a host in a multi-host cluster, then the services are harvested and transferred to the remaining two hosts in the cluster. If you issue this command on a host in a single host configuration, all the services are harvested.
grape host status *host_id*	The **grape host status** command displays all of the services on the host where it is issued.
grape instance display	Displays the Cisco APIC-EM services that are currently running.
grape instance status	Displays the status of the Cisco APIC-EM services.
grape network display	Displays the current external network configuration used by both Grapevine and the Cisco APIC-EM including: • IP addresses • Netmask • DNS servers

Root Command	Description
grape release display current	Displays the versions of the Cisco APIC-EM services that are currently running.
grape release display latest	Displays the latest available versions of the Cisco APIC-EM services.
grape release update force	Updates a service for Cisco APIC-EM. Use this command to force a service update.
grape root display	Displays the Grapevine root properties, including: hostname, interfaces, root ID, and version.
grape service display	Displays the Cisco APIC-EM services that are currently installed.
grape update_service display	Displays the current automatic services update configuration. Additional fields in the command output indicate the last time the Cisco cloud was polled for updates (`last_connect_time`), as well as the Cisco cloud status(`last_connect_status`). For example, whether the Cisco cloud is reachable, unreachable, etc.
grape version	Displays the version of Grapevine that the Grapevine root is running.
rca	The **rca** command runs a root cause analysis script that creates a tar file that contains log files, configuration files, and the command output. After running this command and creating the tar file, you can send the file to Cisco support for assistance in resolving an issue.
reset_grapevine	The **reset_grapevine** command returns the configuration settings back to values that you configured when running the configuration wizard for the first time. The configuration settings are saved to a .JSON file. This .JSON file is located at: `$ /etc/grapevine/controller-config.json`.
reset_grapevine factory	The **reset_grapevine factory** command returns the configuration settings back to their factory defaults. **Caution** This command shuts down both Cisco APIC-EM and the host (physical or virtual) where the controller resides. After running this command, you will need to access the host and reboot it.
securityutil openport	Displays the open ports on the Grapevine root and clients. An open port is any TCP or UDP port, for which a listener exists on one or more IP addresses.

Root Command	Description
sudo service grapevine status	Determines the status of the Grapevine root core services and whether all of the root core services are running.

Related Topics

Troubleshooting Commands, on page 21

Client Commands

The following table describes commands that you can issue on the Grapevine client to troubleshoot the Cisco APIC-EM.

Table 2: Client Troubleshooting Commands

Client Command	Description
grape version	Displays the version of Grapevine that the Grapevine client is running.
sudo service grapevine status	Determines the status of the Grapevine client core services and whether all of the client core services are running.

Related Topics

Troubleshooting Commands, on page 21

Troubleshooting Log Files

You can use log files to troubleshoot the Cisco APIC-EM. Log files are stored on both the Grapevine root and clients.

Note Logging files are persistent across any system failures and software updates for change management.

Related Topics

Root Log Files, on page 25
Client Log Files, on page 26

Root Log Files

The following table lists log files located on the Grapevine root that can be used to troubleshoot the Cisco APIC-EM.

Table 3: Root Log Files

Directory	Filename	Description
`/var/log/`	`boot.log`	This log file provides you with the details of the boot process and any errors that may occur during this process. Use this log file to troubleshoot any of the following problems: • Why did the Grapevine client fail to communicate with the Grapevine root? • Why did the Grapevine client fail to upgrade?
`/var/log/`	`config_wizard.log`	Use this log file to determine if there were any errors during the initial Grapevine configuration and deployment.
`/var/log/`	`grapevine_manager.log`	Use this log file to determine if there were any errors during a manual file update using the **Update Settings** fields in the controller's UI.
`/var/log/grapevine`	`supervisord.log`	Use this log file to determine whether any of the Grapevine root core services unexpectedly expired.
`/var/log/grapevine`	`cassandra.log`	Use this log file to determine whether the Grapevine database is healthy.

Directory	Filename	Description
/var/log/grapevine	grapevine_root.log	Use this log file to troubleshoot any of the following problems: • Why did Grapevine fail to grow or harvest a service instance? • Why did an automatic service update fail? • Why did Grapevine fail to communicate with a Grapevine client?
/var/log/grapevine	grapevine_capacity_manager.log	Use this log file to determine why Grapevine failed to grow or harvest a Grapevine client.

Related Topics

Troubleshooting Log Files, on page 24

Client Log Files

The following table lists log files located on the Grapevine client that can be used to troubleshoot the Cisco APIC-EM.

Table 4: Client Log Files

Directory	Filename	Description
/var/log	boot.log	Use this log file to determine the following: • Why did this Grapevine client fail to communicate with the root? • Why did this Grapevine client fail to upgrade?
/var/log/grapevine	supervisord.log	Use this log file to determine if any of the Grapevine client core services unexpectedly died?

Directory	Filename	Description
/var/log/grapevine	grapevine_client.log	This log file provides you with the details of the Grapevine client daemon bootstrap process and any errors that may occur during this process. Use this log file to determine the following: • Why did this Grapevine client fail to grow or harvest a service instance? • Why did this Grapevine client fail to communicate to the Grapevine root?
/var/log/grapevine/services	service-name/version/service-name.log	Use this log file to determine why did a service fail to perform some operation?

Related Topics

Troubleshooting Log Files, on page 24