Red Hat CloudForms 4.6

Configuring the Lenovo Physical Infrastructure Provider

Adding and configuring the Lenovo physical infrastructure provider in Red Hat CloudForms

Last Updated: 2018-03-01

Red Hat CloudForms 4.6 Configuring the Lenovo Physical Infrastructure Provider

Adding and configuring the Lenovo physical infrastructure provider in Red Hat CloudForms

Red Hat CloudForms Documentation Team
cloudforms-docs@redhat.com

Lenovo Documentation
icfeedback@lenovo.com

Legal Notice

Abstract

Adding and configuring the Lenovo physical infrastructure provider in Red Hat CloudForms. If you have a suggestion for improving this guide or have found an error, please submit a Bugzilla report at http://bugzilla.redhat.com against Red Hat CloudForms Management Engine for the Documentation component. Please provide specific details, such as the section number, guide name, and CloudForms version so we can easily locate the content.

Table of Contents

CHAPTER 1. OVERVIEW

The Lenovo® Physical Infrastructure Provider provides IT administrators the ability to integrate the management features of Lenovo XClarity Administrator with the hybrid-cloud management capabilities of Red Hat CloudForms. Lenovo expands the physical-infrastructure management for on-premise cloud configurations by leveraging Lenovo hardware management. It provides the configuration, monitoring, event management, and power monitoring needed to reduce cost and complexity through server consolidation and simplified management.

Key features include:

- Seamlessly integrates with one or more Lenovo XClarity Administrator virtual appliances, providing a summary view of the Lenovo infrastructure, relationship views of physical servers and virtual hosts, and configuration of servers using Configuration Patterns
- Provides a single interface to monitor Lenovo hardware that is managed by multiple instances of Lenovo XClarity Administrator
- Automatically discovers hardware that is managed by Lenovo XClarity Administrator
- Manage devices for use in on-premise cloud deployments
- Provides a timeline of server events
- Uses customizable filters to organize views of managed devices across the data center
- Generates relationships between physical servers and the virtual hosts (such as ESXI, ovirt, KVM, and Red Hat OpenStack)
- Manages current system settings (such as BMC, uEFI, and boot order settings) on the managed devices
- Simplifies system management through custom policies and automation that respond to the health status of physical servers

CHAPTER 2. CONFIGURING LENOVO XCLARITY ADMINISTRATOR

Lenovo XClarity Administrator virtual appliances are connected to CloudForms by adding physical-infrastructure providers. Physical-infrastructure providers enable you to manage and interact with devices that are managed by Lenovo XClarity Administrator. After the physical-infrastructure provider is added, the servers that are managed by the Lenovo XClarity Administrator are registered in CloudForms. Managed devices can be monitored, configured, and updated using Lenovo XClarity Administrator. The physical-infrastructure provider surfaces information about these managed devices and the Lenovo XClarity Administrator instance.

2.1. SETTING UP LENOVO XCLARITY ADMINISTRATOR

For information about downloading and setting up Lenovo XClarity Administrator, see Installing and setting up Lenovo XClarity Administrator in the Lenovo XClarity Administrator online documentation.

Note: You can use all available features in Lenovo XClarity Administrator for free for up to 90 days. After 90 days, you can continue to use Lenovo XClarity Administrator to manage and monitor your hardware for free; however, you must purchase a full-function-enablement license to continue using Lenovo XClarity Administrator to configure your hardware using Configuration Patterns and to deploy operating systems. Lenovo XClarity Pro provides entitlement to service and support and the full-function-enablement license for Lenovo XClarity Administrator. For more information about purchasing Lenovo XClarity Pro, contact your Lenovo representative or authorized business partner.

2.2. DISCOVERING AND MANAGING HARDWARE USING LENOVO XCLARITY ADMINISTRATOR

Lenovo XClarity Administrator can discover manageable devices in your environment by performing an SLP discovery for devices that are on the same IP subnet as Lenovo XClarity Administrator. A specified IP address or range of IP addresses also can be used, or information can be imported from a spreadsheet, a process that is known as a *bulk import*. Discovery options can be accessed by clicking **Hardware > Discover and Manage New Devices** from the menu bar. Discovered devices can then be managed by Lenovo XClarity Administrator. During the management process, you are asked for login credentials for the management controller of the target servers and given the option to create a recovery account for the servers. For more information about discovering and managing devices, see the Lenovo XClarity Administrator online documentation.

Note:

- Ensure that the devices that you intend to manage are supported by Lenovo XClarity Administrator. For information about supported devices, see Supported devices in the Lenovo XClarity Administrator online documentation.
- Ensure that firmware for all devices that you intend to manage using Lenovo XClarity Administrator are at the required levels. For more information about supported firmware levels, see Supported firmware in the Lenovo XClarity Administrator online documentation.

CHAPTER 3. MANAGING PHYSICAL-INFRASTRUCTURE PROVIDERS

3.1. ADDING A PHYSICAL-INFRASTRUCTURE PROVIDER

Lenovo XClarity Administrator virtual appliances are connected to CloudForms by adding physical-infrastructure providers. Physical-infrastructure providers enable you to manage and interact with devices that are managed by Lenovo XClarity Administrator.

Note: You must be logged in to CloudForms as a user with permission to add providers. The default user is admin, password smartvm.

Complete the following steps for each Lenovo XClarity Administrator instance that you want to connect to CloudForms.

To connect to a specific Lenovo XClarity Administrator instance:

1. Navigate to **Compute > Physical Infrastructure > Providers.**
2. Click **Configuration**, then click **Add a New Infrastructure Provider** .
3. Enter a **Name** for the provider (for example, Physical Infrastructure Manager).
4. From the **Type** list, select "Lenovo XClarity".
5. Accept the default **Zone**.
6. In the credentials area, provide the following:
    a. Enter the hostname, IPv4 address, or IPv6 address of the Lenovo XClarity Administrator instance.
    b. Enter “443” for the API port.
    c. Enter the username and password used to log in to the Lenovo XClarity Administrator instance.
7. Click **Validate** to confirm that you can connect to the Lenovo XClarity Administrator instance.
8. Click **Add**.

To discover and then connect to a range of Lenovo XClarity Administrator instances:

1. Discover Lenovo XClarity Administrator instances:
    a. Navigate to **Compute > Physical Infrastructure > Providers**.
    b. Click **Configuration**, then click **Discover Physical Infrastructure Providers**.
    c. From the **Type** list, select “Lenovo XClarity Administrator.”
    d. Enter the IP address range starting with **From Address** and ending with **To Address**.
    e. Enter the port.
    f. Click **Start** to begin the discovery process.

2. Update credentials for each discovered physical-infrastructure provider (Lenovo XClarity Administrator instance):

    a. Navigate to **Compute > Physical Infrastructure > Providers**.

    b. Select the providers to be edited.

    c. Click the **Configuration** button in the menu.

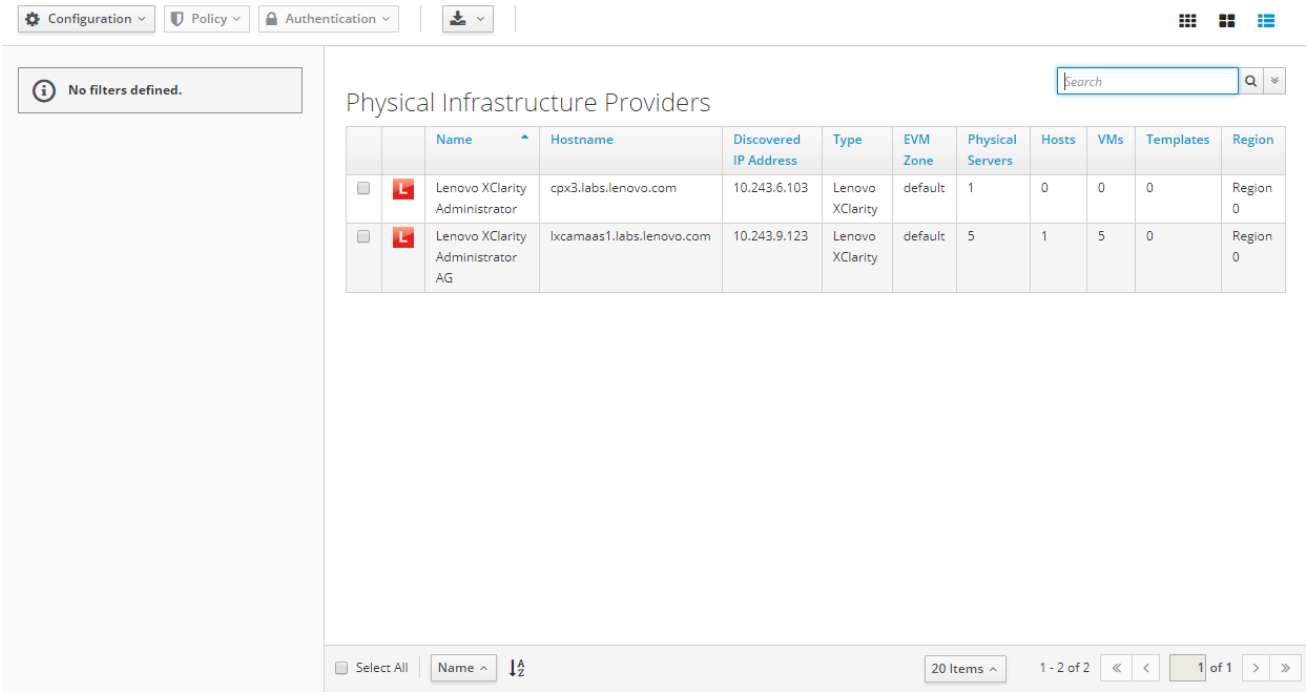
    d. Click **Edit selected infrastructure providers**.

    e. Enter the username and password used to log in to the Lenovo XClarity Administrator instance.

    f. Click **Validate** to confirm that you can connect to the Lenovo XClarity Administrator instance.

    g. Click **Save**. A flash message is displayed, confirming your changes were performed successfully.

After adding the physical-infrastructure providers, you can view all available providers by navigating to **Compute > Physical Infrastructure > Providers** as shown below.



3.2. REFRESHING PHYSICAL-INFRASTRUCTURE PROVIDERS

CloudForms regularly polls the physical-infrastructure providers to retrieve the latest data, including managed devices, relationships, and power states. You can manually retrieve the latest data by completing the following steps.

1. Navigate to **Compute > Physical Infrastructure > Providers**.

2. Select a physical-infrastructure provider to be refreshed.

3. Click **Configuration**, then click **Refresh Relationships and Power States**.

4. Click **OK**.

3.3. REMOVING A PHYSICAL-INFRASTRUCTURE PROVIDER

You can delete a physical-infrastructure provider by completing the following steps.

1. Navigate to **Compute > Physical Infrastructure > Providers**.
2. Select the physical-infrastructure provider to be removed.
3. Click **Configuration**, then click **Remove Infrastructure Providers from Inventory**.
4. Click **OK**.

3.4. EDITING A PHYSICAL-INFRASTRUCTURE PROVIDER

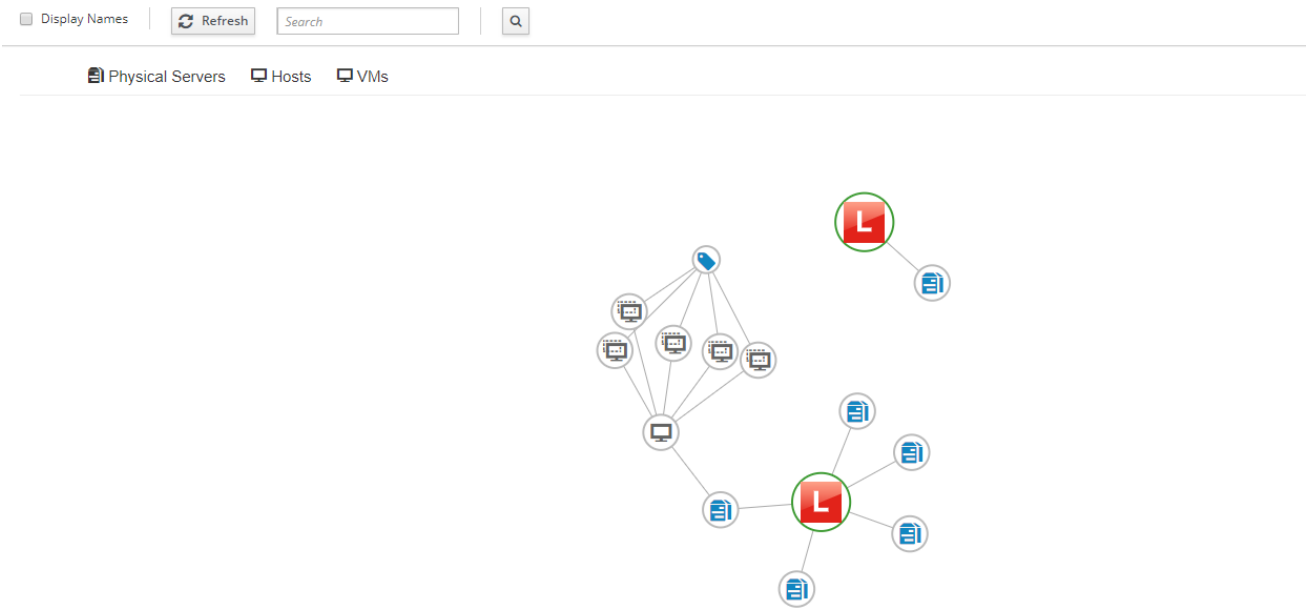
You can modify system settings for a physical-infrastructure provider by completing the following steps.

1. Navigate to **Compute > Physical Infrastructure > Providers**.
2. Select the physical-infrastructure provider to be modified.
3. Click the **Configuration** button in the menu.
4. Click **Edit selected infrastructure providers**.
5. Make the required changes, and revalidate credentials if necessary.
6. Click **Save**. A flash message is displayed, confirming your changes were performed successfully.

CHAPTER 4. VIEWING RELATIONSHIPS

4.1. VIEWING RELATIONSHIPS BETWEEN PHYSICAL SERVERS AND VIRTUAL HOSTS

CloudForms shows relationships between virtual host systems and physical servers and the virtual hosts for each physical-infrastructure provider. The topology view provides a graphical representation of the relationships, allowing you to easily navigate between connected nodes (see the following figure).



To display the topology view for a specific physical-infrastructure provider, complete the following steps.

1. Navigate to **Compute > Physical Infrastructure > Providers**.
2. Select the physical-infrastructure provider to be viewed.
3. From the overview section, select **Topology** to display the Topology page. From this page, you can perform the following actions:
   - Hide or show all physical server by clicking **Physical Servers**.
   - Hide or show all hosts by clicking **Hosts**.
   - Hide or show all VMs by clicking **VMs**.
   - Double-click or right-click a node in the graph to navigate to the summary pages for that node.

4.2. VIEWING SERVER RELATIONSHIPS

You can view a list of all physical servers that are managed by a specific physical-infrastructure provider.

1. Navigate to **Compute > Physical Infrastructure > Providers**.

2. Select the physical-infrastructure provider to be viewed.

3. Click **Physical Servers** in the **Relationships** section.

4.3. VIEWING VIRTUAL-HOST RELATIONSHIPS

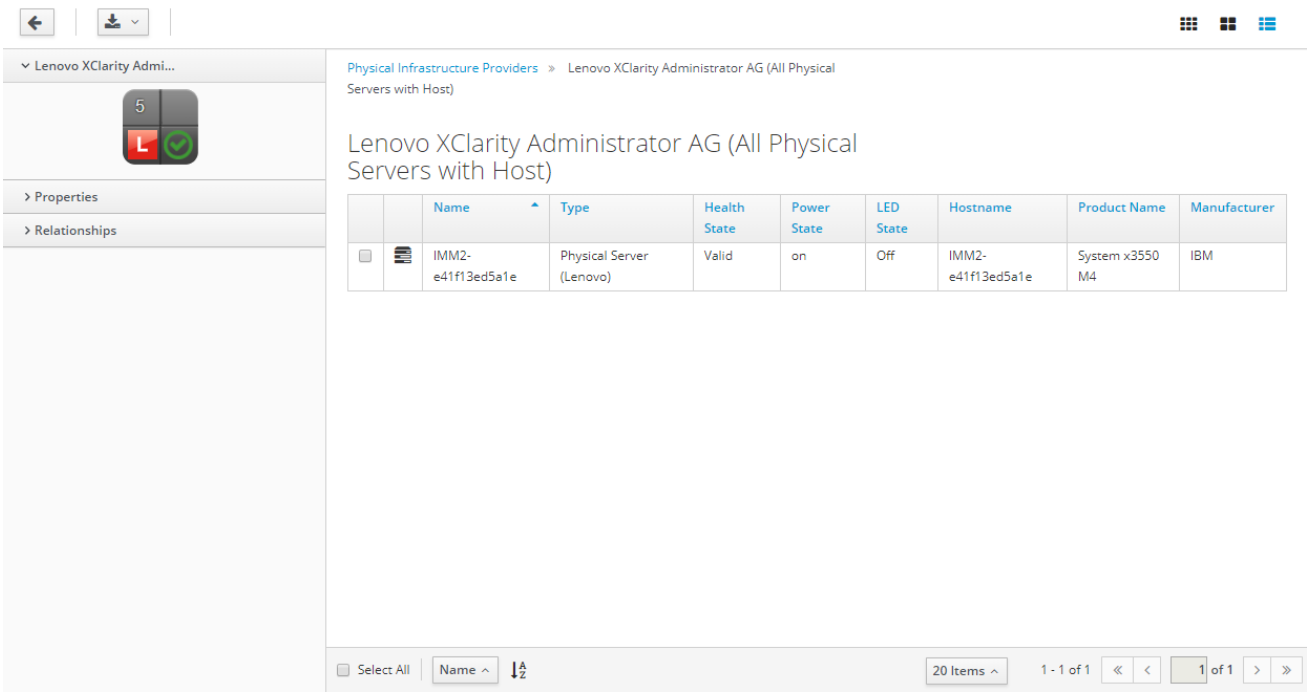
You can view a list of physical servers that are associated with hosts that are managed by a specific physical-infrastructure provider.

1. Navigate to **Compute > Physical Infrastructure > Providers**.

2. Select the physical-infrastructure provider to be viewed.

3. Click **Physical Servers with Host** button in the **Relationships** section.

You should see a list of physical servers that are associated with hosts as shown below.



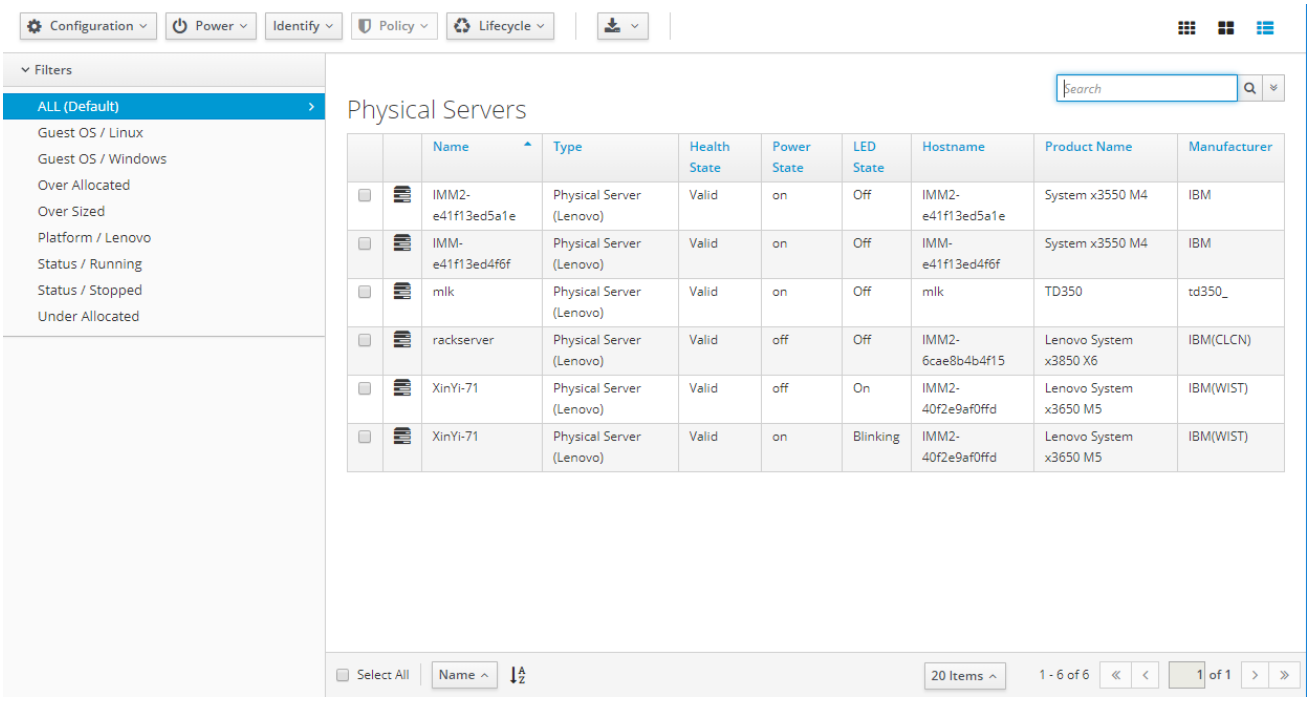
CHAPTER 5. MANAGING PHYSICAL SERVERS

After the Lenovo physical-infrastructure provider is added, the servers that are managed by Lenovo XClarity Administrator are registered in CloudForms. You can then view and manage those servers.

5.1. VIEWING A PHYSICAL SERVER

To view a list of all physical servers that are managed by all physical-infrastructure providers, navigate to **Compute > Physical Infrastructure > Servers**. The Physical Servers page is displayed (see the following figure).

Tip: You can sort the table columns to make it easier to find specific servers. In addition, you can choose the types of servers to display by selecting server types from the **Filters** drop-down list or entering text (such as a name or IP address) in the **Search** field.



5.2. VIEWING THE TIMELINE FOR A PHYSICAL SERVER

A *timeline* is a tool that enables you to track the state of a physical server over a period of time. This includes power activity, device additions and removals, and firmware changes. The timeline is useful to identify critical failures, identify behavior patterns, audit user actions, and troubleshoot problems.

Note: Timelines are available only for physical servers that have associated events.

To view the timeline with events for a specific physical server, complete the following steps

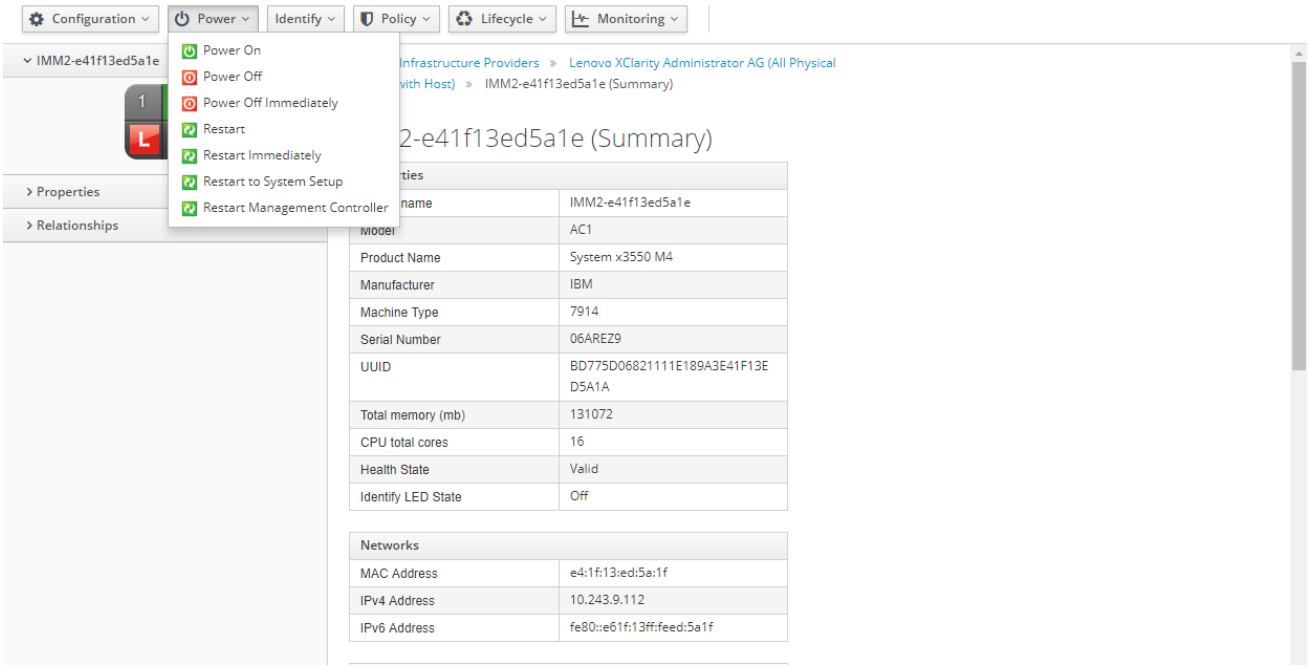
1. Navigate to **Compute > Physical Infrastructure > Servers**.
2. Select the physical server that has events.
3. Click the **Monitoring > Timelines** from the top menu.
4. Select the event types and the period in the options filter. Filters can be used to focus attention on specific messages of interest in a specific time interval.

5. Click **Apply**. The timeline is displayed with events that match the specified filters. You can click an event to view the event details.

5.3. POWERING ON AND OFF A PHYSICAL SERVER

You can perform power operations on the physical servers by completing the following steps.

1. Navigate to **Compute > Physical Infrastructure > Servers**.
2. Select the physical server.
3. Click **Power** from the top menu, and then click one of the following power actions:
   - **Power on** - Powers on the server.
   - **Power off** - Shuts down the operating system and powers off the server.
   - **Power off immediately** - Powers off the server.
   - **Restart** - Shuts down the operating system and restarts the server.
   - **Restart immediately** - Restarts the server.
   - **Restart to System Setup** - Restarts the server back to default BIOS/UEFI (F1) Setup.
   - **Restart Management Controller** - Restarts the baseboard management controller in the sever.

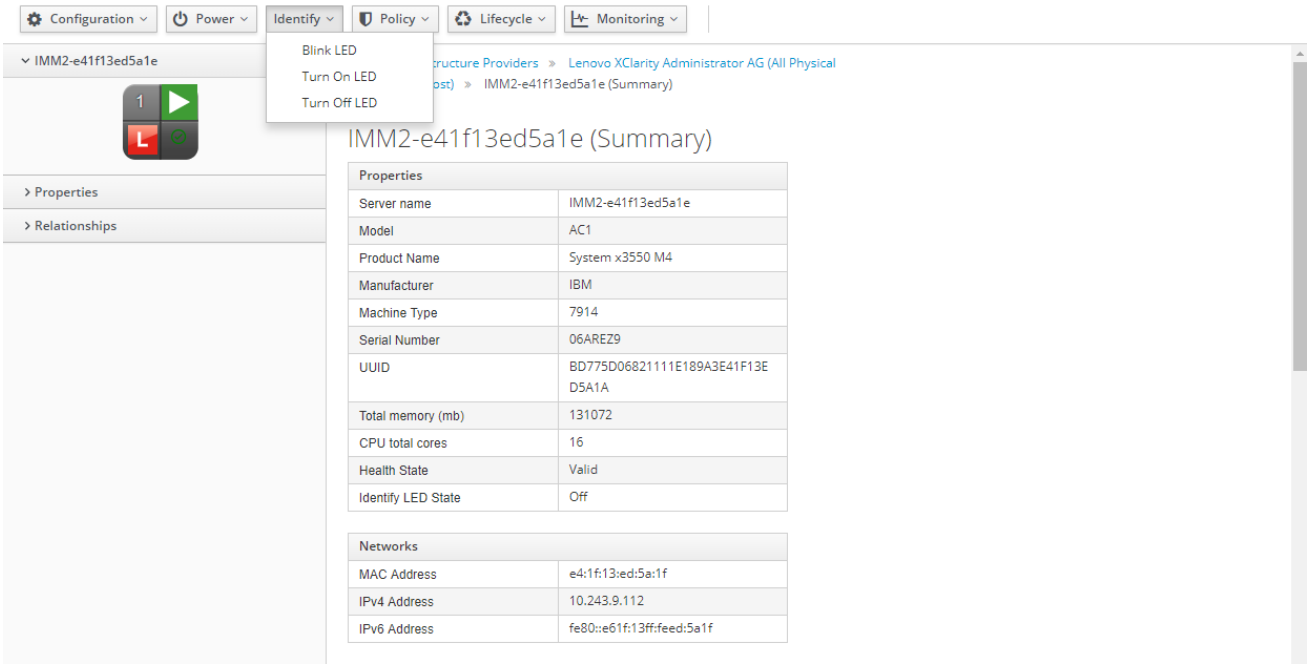


5.4. LOCATING A PHYSICAL SERVER

You can change the Location LED state on a physical server to locate the sever in the data center.

1. Navigate to **Compute > Physical Infrastructure > Servers**.
2. Select the physical server.

3. Click **Identify** from the top menu, and then click the appropriate action: **Blink LED**, **Turn On LED**, or **Turn Off LED**.

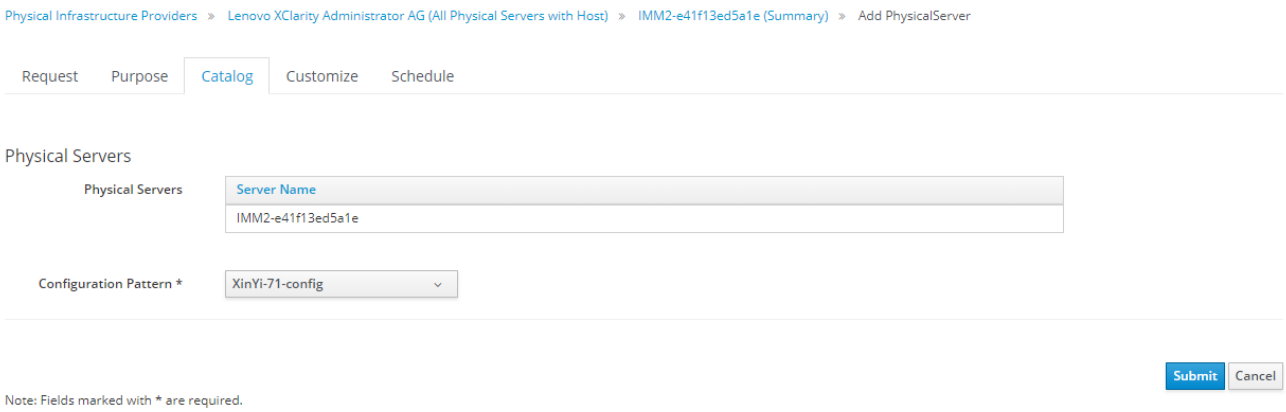


5.5. PROVISIONING PHYSICAL SERVERS USING CONFIGURATION PATTERNS

You can use configuration patterns in Lenovo XClarity Administrator to quickly provision or preprovision multiple servers from a single set of defined configuration settings. Configuration patterns act as templates for configuring logical storage, I/O adapters, boot order, and other baseboard management controller and Unified Extensible Firmware Interface (UEFI) settings.

A physical-infrastructure provider can discover configuration patterns that are defined on the associated Lenovo XClarity Administrator instance. A configuration pattern can then be applied to a single or multiple physical servers.

Note: Configuration patterns can be assigned only to physical servers that do not have a pattern assigned to them.



You can deploy a configuration pattern to one or more physical server by completing the following steps.

1. Navigate to **Compute > Physical Infrastructure > Servers** to display the Physical Servers page.
2. Click a server (to display the server details page) or select multiple servers that you want to provision.
3. Click **Lifecycle > Provision Physical Server** from the top menu to display the Add Physical Server page.
4. On the **Request** tab, enter an email address into the **E-Mail** field.
5. On the **Catalog** tab, select the configuration pattern that you want to deploy from the **Configuration Pattern** drop-down menu, and then click **Submit**. The Requests page is displayed.
6. Click the request that was created to deploy the configuration pattern from the **Requests** table. The Apply Configuration Pattern page is displayed.
7. Click the check mark button.
8. Enter the reason for performing this action in the **Reason** field.
9. Click **Submit** to deploy the configuration pattern to the specified server. You can monitor the status of the action in the **Requests** table.

CHAPTER 6. TROUBLESHOOTING PHYSICAL INFRASTRUCTURE PROVIDER PROBLEMS

CHAPTER 7. AUTOMATING TASKS BASED ON EVENTS

You can use CloudForms to automatically perform specific tasks when certain events occur on servers that are managed by Lenovo XClarity Administrator through a Lenovo physical-infrastructure provider. To create an automation task, you must create and configure a custom domain. To automatically invoke the task when a certain event occurs, you must create, configure and assign a custom policy.

For more information about the CloudForms automation function, see Scripting Actions in CloudForms website.

7.1. CREATING AN AUTOMATED TASK

To create an automated task, you must first create and configure a custom domain.

A *domain* is a collection of tasks that can be automated. The tasks are run in a sequence that is defined by the domain priority. A task in a domain with a higher priority overrides the same task in a lower-priority domain. In this way, CloudForms provides core domains and allows you to override automated tasks using your own custom domains.

Each domain contains a set of namespaces. A *namespace* is a container that organizes and categorizes tasks. A namespace can contain child namespaces as well as classes.

A *class* is a template for a specific task. A class uses a schema to populate a class instance with default values. A class instance can contain attributes, calls to methods, and relationships.

The *methods* define the task that you want to perform. It uses Ruby code to run the various operations.

As an example, the following steps describe how to create an automated task for performing a power action (such as powering on, power off, or restarting the server) on the physical server which is first detected by the Lenovo physical-infrastructure provider.

Note: You must be logged in to CloudForms as a user with permission to create domains. The default user is admin, password smartvm.

7.1.1. Step 1. Create a custom domain.

1. Navigate to **Automation > Automate > Explorer**.
2. Click **Configuration > Add a New Domain** from the top menu.
3. Enter a domain name (for example, Lenovo).
4. Select **Enable** to enable the domain.
5. Click **Add**.

7.1.2. Step 2. Add the LenovoXclarity and Event Handler class to the custom domain.

1. Copy the LenovoXclarity class to the custom domain.
    a. Select the **ManageIQ** core domain.
    b. Navigate to **ManageIQ > System > Event > EmsEvent > LenovoXclarity** .
    c. Click **Configuration > Copy this Class** from the top menu.

d. Select the custom domain from the **To Domain** drop-down menu.

e. Click **Copy**.

2. Copy the Event Handler class to the custom domain.

a. Select the **ManageIQ** core domain.

b. Navigate to **ManageIQ > System > Event Handlers** .

c. Select the instance that you wish (for example, event_action_policy).

d. Click **Configuration > Copy this Instance** from the top menu.

e. Select the custom domain from the **To Domain** drop-down menu.

f. Click **Copy**.

g. Select the **event_action_policy** method.

h. Click the **Configuration** icon, and then click the **Copy this method** icon.

i. Click **Copy**.

3. Create a new instance of the LenovoXclarity class.

a. Select the **ManageIQ** core domain.

b. Navigation to name of the custom domain (for example, Lenovo), and click **System > Event > EmsEvent >LenovoXclarity**.

c. Click **Configuration > Add a new Instance** from the top menu.

d. Enter a name for the new class instance (for example, FQXHMTS0003G, which is the event that is generated when inventory data cannot be retrieved from a device).
Important: The class-instance name must be the same as the name of the event that triggers the task to be invoked. CloudForms matches the class instance with the event by this name. To find the event name, see Messages in the Lenovo XClarity Administrator online documentation.

e. Add the path to the event handlers copied in the field's **rel3**.
There are three available policy operations:

- Physical Server Reset
- Physical Server Start
- Physical Server Shutdown
  There are three available policy events:
- physical_server_reset
- physical_server_start
- physical_server_shutdown
  The policy actions and the policy events must match. For example, use the following path to the policy operation **Physical Server Shutdown**:

```
/System/event_handlers/event_action_policy?
target=physical_server&policy_event=physical_server_shutdown&para
m=
The policy_event value is matched with the policy operation
applied.
```

f. Click **Add**.

7.1.3. Step 3. Create a namespace.

1. Select the custom domain (**Lenovo**) .
2. Click **Configuration > Add a New Namespace** from the top menu.
3. Enter a unique name for the namespace (for example, Functions).
4. Click **Add**.

7.1.4. Step 4. Create a class.

1. Select the namespace that you created in the previous step (for example, Functions).
2. Click **Configuration > Add a New Class** from the top menu.
3. Enter a unique name for the class (for example, Power_actions).
4. Click **Add**.

7.1.5. Step 5. Create a method for the class.

1. Create a method.
   a. Select the class that you created (for example, Power_actions).
   b. Click the **Methods** tab.
   c. Click **Configuration > Add a new method** from the top menu.
   d. Select **"inline"** for the type.
   e. Enter a name for the method (for example, power_off).
   f. Enter the following script in the **Data** field:

```
server = $evm.vmdb('PhysicalServer').first $evm.log(:info,
"Powering Server #{server.name} OFF")
server.power_off exit MIQ_OK
```

   g. Click **Validate** to verify the syntax.
   h. Click **Add**.
2. Add a schema to the class.
   a. Select the class that you created (for example, Power_actions).

b. Select the **Schema** tab.

c. Click **Configuration > Edit selected Schema** from the top menu.

d. Click the **+** icon to add a field to the schema.

e. Enter **"execute"** for the name.

f. Select **"Method"** for the type

g. Select **"String"** for the data type.

h. Enter **"Power_actions"** for the default value.

i. Click the check mark icon.

j. Click **Save**.

3. Add the method to the class.

a. Select the **Instances** tab.

b. Enter the name of the method that you created earlier (for example, power_off).

c. Click **Add**.

7.2. INVOKING AN AUTOMATED TASK WHEN AN EVENT OCCURS

To automatically invoke the task when a certain event occurs, you must create, configure and assign a custom policy.

As an example, the following steps describe how to perform a specific automated task when CloudForms receives certain events (that you define).

Note: You must be logged in to CloudForms as a user with permission to create policies. The default user is admin, password smartvm.

7.2.1. Step 1. Create and configure a policy.

1. Navigate to **Control > Explorer**.
2. Click **Policies > All Policies > Control Policies > Physical Infrastructure Control Policies** .
3. Click **Configuration > Add a new Physical Server Control Policy** from the top menu.
4. Enter a description (for example, Lenovo_Policy).
5. Click **Add**.

7.2.2. Step 2. Create a custom action.

1. Create a custom action.

a. Navigation to **Action > All Actions** .

b. Click **Configuration > Add a new action** from the top menu.

c. Enter a description (for example, Power_Off_Server).

d. For Action Type select **Invoke a custom Automation**.

e. Enter a message (for example, create).

f. Fill the Request field with **Call_Instance**.

g. Specify the following attributes in the order give:

- Specify the **Namespace** attribute, and set the value to the new domain and namespace (<domain_name>/<namespace>) (for example, Lenovo/Functions).
- Specify the **Class** attribute, and set the value to the class (for example, Power_actions).
- Specify the **Instance** attribute, and set the value to the instance (for example, Physical_Server_PowerOff).

h. Click **Add**.

2. Configure the policy that you created.

a. Select the new policy (for example, Lenovo_Policy).

b. Click **Configuration > Edit this policy's Event assignments** from the top menu.

c. Find Physical Server operation, and select the **Physical Server Shutdown** option.

d. Click **Save**.

e. Select the new policy event.

f. Click **Configuration > Edit Actions for this policy Event** from the top menu.

g. From the **Order of Actions if All Conditions are True** field, select the custom action that you created in the previous step (for example, Power_Off_Server).

h. Click **Save**.

7.2.3. Step 3. Create and assign a policy profile.

1. Create a policy profile.

a. Click **Policy Profiles > All Policy Profiles**.

b. Click **Configuration > Add a new Policy Profile** from the top menu.

c. Enter a description for the policy (for example, Lenovo_Policy_Profile).

d. Select your policy and drag it to the right.

e. Click **Add**.

2. Assign the policy profile to the Lenovo physical-infrastructure providers:

a. Navigate to **Compute > Physical Infrastructure > Providers**.

b. Select the physical-infrastructure providers to which you want to assign the policy profile.

c. Click **Policy > Manage Policies** form the top menu.

d. Select the policy profile that you just created (for example, Lenovo_Policy_Profile).

e. Click **Save**.