



User Workspace Management

- [Access the User Workspace Management Interface](#), page 1
- [User Management Workspace User Types](#), page 4
- [Projects \(Admin User\)](#), page 5
- [Users \(Admin User\)](#), page 9
- [CML Server \(Admin User\)](#), page 11
- [Connectivity](#), page 30
- [Using the VM Control Tool \(Admin User\)](#), page 32
- [Cisco Modeling Labs Licenses \(Admin User\)](#), page 37
- [Node Resources](#), page 40
- [Documentation](#), page 52

Access the User Workspace Management Interface

After you have started the Cisco Modeling Labs server, you can access the **User Workspace Management** interface to manage user accounts, projects, licenses, and virtual machine images on the Cisco Modeling Labs server.

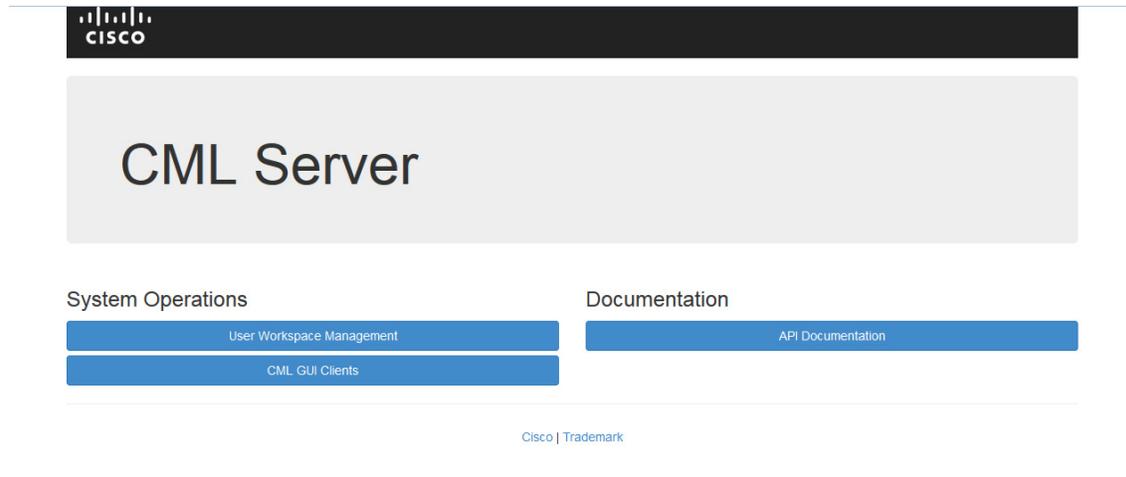
To access the **User Workspace Management** interface, complete the following steps:

Step 1

In a web browser, enter the IP address or hostname in the format, `http://<IP address | hostname>`.

The CML Server main menu page is displayed.

Figure 1: CML Server Main Menu



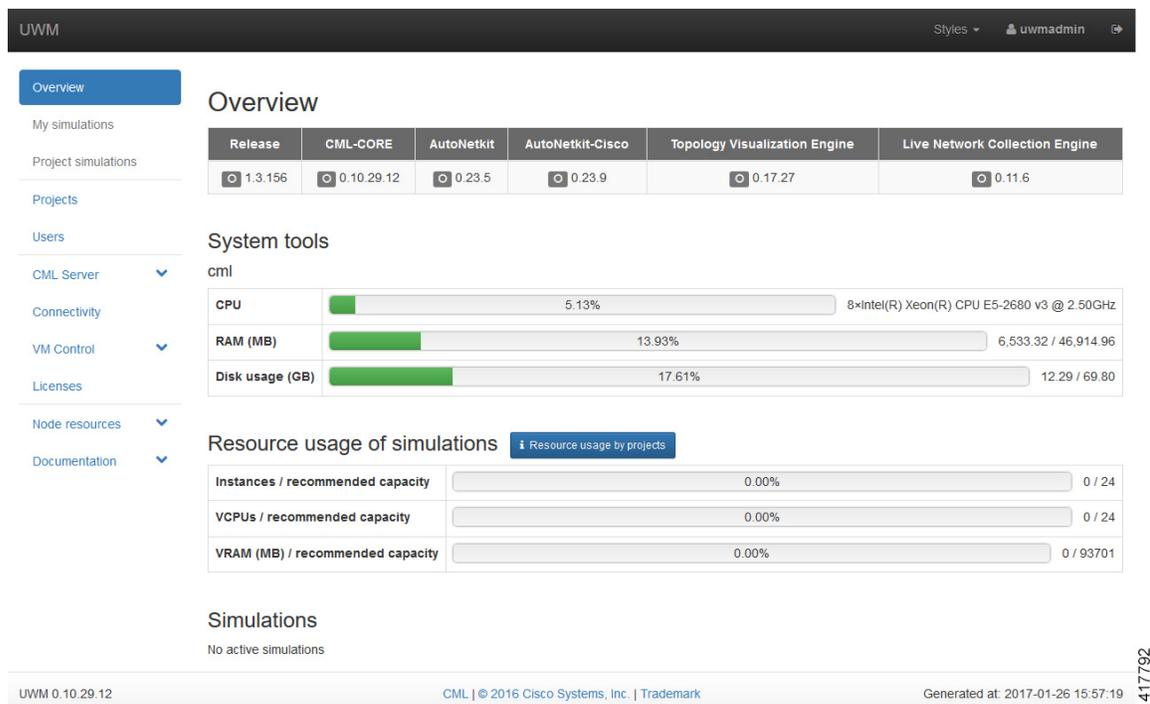
Step 2 Click **User Workspace Management** to access the **User Workspace Management** interface.

Step 3 Log in to the **User Workspace Management** interface using the username `uwadmin` and the password `password`.

Note You can log in to the **User Workspace Management** as either an administrator or as a non-administrative user. `Uwadmin` is an administrative user.

The application opens on the **Overview** page.

Figure 2: User Workspace Management Overview



The task bar on the left enables the following functions:

- **Projects**—Allows you to import and export projects. You can also add new projects, enable, disable, modify, and delete current projects.
- **Users**—Allows you add new user accounts, enable, disable, modify, and delete current user accounts.
- **CML Server**—Available options are:
 - **System Configuration**—Allows you to control system configuration. You can set configuration parameters for the System, Networks, VIRT Services, Infrastructure, and Resources.
 - **System Tools**—Allows you to collect, view and download system status information. Display Statistics reports historical system operation data such as the number simulations that have been run, the mix of nodes in the simulations, and so on. Download System Logs Collection gathers log files from the system which are invaluable when troubleshooting and diagnosing issues; delivered as a .ZIP file. Check Health Status performs a system check and generates a report on same.
 - **Download**
- **Connectivity**—Allows you to add L2 FLAT IP addresses, L3 SNAT IP addresses, and Project Management IP Addresses.
- **VM Control**—Allows system administrators to stop specific components of an active simulation. Available options are:

- **Nodes**
- **Networks**
- **Ports and Floating IPs**
- **Hosts**
- **Allocated Ports**
- **Licenses**—Allows you to manage product licenses on the system.
- **Node Resources**—Available options are:
 - **Flavors**—Allows you add and delete virtual machine flavors.
 - **Images**—Allows you add new virtual machine images, modify, and delete current images. You can also modify and delete image snapshots.
 - **Containers**—Allows you to manage and add new LXC images and templates.
 - **Subtypes**—Allows you to import, export, and duplicate subtypes.
- **Repositories**—Allows you add, delete, and refresh files from Git repositories.
- **Documentation**—Available options are:
 - **STD API**—Allows you to access STD API documentation.
 - **UWM API**—Allows you to access to UWM API documentation.
 - **Simulation Concepts**—Allows you to access Cisco Modeling Labs simulation concepts documentation.

User Management Workspace User Types

Within the User Management Workspace interface there are two types of users available. These are administrator and non-administrator user. The following tables describe the different functions available for each user type.

Table 1: Available Functions for Administrator Users

Function	Description
Overview	Allows you to view current system version information, physical resource usage, and a list of all deployed simulations. You can stop all or selected simulations.
Projects	Allows you to import and export projects. You can also add new projects, enable, disable, modify, and delete current projects.
Users	Allows you add new users, enable, disable, modify, and delete current users.

Function	Description
CML Server	Under System Configuration, you can set configuration parameters. Under System Status, you can collect, view and download system status information.
Connectivity	Allows you to add and delete L2 Flat IP, L3 Snat IP, and Management IP allocations for projects.
VM Control	Allows you to delete nodes, networks, ports and IP allocations, as well as disable some host services when problems are encountered.
Licenses	Allows you to manage product licenses on the system.
Node Resources	Allows you add new images, modify, and delete current images. You can also modify and delete image snapshots. You can add and delete flavors and import and export subtypes. You can also create a new subtype based on one of the available built in subtypes. You can manage and add new LXC images and templates.
Repositories	Allows you to add, delete, and refresh files from Git repositories.
Documentation	Allows you to access STD and UWM API documentation.

Table 2: Available Functions for Non-Administrator Users

Function	Description
My Simulations	Review and operate a user's own simulations.
Project Simulations	Review simulations in a user's own project.
Connectivity	Review a user's own IP address allocations.
Node Resources	Review details for flavors and subtypes. Review and add new images, LXC images and templates for use by the user's own project.
Repositories	Allows you to add, delete, and refresh files from Git repositories.
Documentation	Allows you to access STD and UWM API documentation.

Projects (Admin User)

Within the **User Workspace Management** interface, a project represents a set of resources that are available to all users of that project. It has the following characteristics:

- By default, each project is created with one user account that has the same name as the project.

- Each user belongs to exactly one project. Users should typically each have a project of their own, hence creating a new project is the preferred and efficient process for adding new users.
- Additional users can be assigned to a project as required.
- If a user is added to a project, the username of the user is prefixed with the project name.
- Deleting a user account does not delete a project that the user is assigned to.
- Deleting a project deletes all users of the project.

In the **Projects** page, you can perform a number of operations for projects. These operations are:

Operation	Description
Import	Imports a project and its users from a JavaScript Object Notation (JSON) or tab-Separated values (TSV) file.
Export	Exports a project and its users as a JSON or TSV file.
Add	Creates a new project and its default user.
Enable	Enables a selected project.
Disable	Disables a selected project.
Modify	Modifies details for a selected project.
Delete	Deletes a selected project and its users.

Create a Project

To create a new project, and a user for the project complete the following steps:

-
- Step 1** In the **User Workspace Management** interface, click **Projects**.
The **Projects** page, which lists all of the current projects, appears.
- Step 2** Click **Add** to create a new project.

The **Create Project** page appears.

Figure 3: Create a New Project

Step 3 Under **General Settings**, add a name and a description for the project. In the **Expires** field, you can either add an expiry date for the project or accept the default, which is **Never**, meaning the project will never expire. Leave the **Enabled** check box checked to enable the project for use.

Step 4 Under **Project Quotas**, you can either accept the default values for the system quotas or increase or decrease them based on your project requirements:

- **Instances** quota is the maximum number of virtual machines of any type that can be operational at any given time within the project per user or for all users associated with that project.
- **RAM (MB)** is the maximum RAM that can be consumed by virtual machines running in the project per user or for all users associated with that project.
- **VCPUS** is the maximum number of virtual cores consumed by the virtual machines running in the project.

Step 5 Click **Create**.

The **Edit User** page appears.

Figure 4: Edit the Project User

410632

Using this window, you can add details for the new user created when the project is created.

- Step 6** In the **Password** and **Password Again** fields, enter a new password for the user.
Note The default password can be used or a more meaningful password can be entered. This password can also be changed at a later time.
- Step 7** In the **Email** field, add a valid email address for the user.
 By default, the user is assigned a member role, which means the user is a non-admin account. Set Role to admin if the user needs to perform the same administrative functions as the uwadmin user.
- Step 8** In the **Expires** field, you can add an expiry date for the user or accept the default **Never**. Leave the **Enabled** check box checked to enable the project for immediate use. Alternatively, you can set up a project and users, but you cannot enable them to be configured and available at a later time.
- Step 9** Click **Save** to save the changes for the user.
- Step 10** (Optional) To confirm that the project has been added, click **Projects** to view the newly added project, and click **Users** to view the newly added user.

Export a Project

Export allows you to export selected projects and all their users to a JSON or TSV file.

To export a project and all its users, complete the following steps:

- Step 1** Check the check box beside the project or projects for export.
- Step 2** Click **Export** to export the selected projects and all their users.
- Step 3** From the drop-down list, choose the type of file to export to, JSON or TSV.

The **Open** dialog box appears.

- Step 4** Click the **Save File** radio button and click **OK** to save the file.
The exported file is saved to the specified location.

Import a Project

Files for import must be in the JSON or TSV format and must have previously been exported from the **User Workspace Management** interface.



Note The uwadmin project and user are not modified by this function when imported data contains it.

To import a project and its users, complete the following steps:

- Step 1** Click **Import** to import a new project and its associated users.
The **Import Projects and Users** page appears.
- Step 2** Click **Browse** to locate the applicable JSON or TSV file for import.
Note If you import projects and users that already exist, they will be updated.
- Step 3** Click **Import**.
The newly imported project is listed on the **Projects** page.

Users (Admin User)

Within the **User Workspace Management** interface, you can manage user accounts from the **Users** page. User accounts permit access to the Cisco Modeling Labs server from the Cisco Modeling Labs client.

In the **Users** page, you can perform a number of operations for users. These operations are:

Operation	Description
Add	Creates a new user account.
Enable	Enables a selected user account.
Disable	Disables a selected user account.
Modify	Modifies details for a selected user account.
Delete	Deletes a selected user account.

Create a User

To create an additional user under an existing project, complete the following steps:



Note

It is preferred for each user to have their own project.

Step 1 In the **User Workspace Management** interface, log in as admin and click **Users**.

The **Users** page, which lists all the users, appears.

Step 2 Click **Add** to create a new user.

The **Create User** page appears.

Figure 5: Create a New User

The screenshot shows the 'Create user' form with the following fields and values:

- Username:** uwadmin- (with an 'Add (+)' icon)
- Password:** (empty)
- Password again:** Password again
- Email:** unset
- Project:** uwadmin (dropdown menu)
- Role:** _member_ (dropdown menu)
- Expires:** never (with a calendar icon)
- Enabled:**

At the bottom of the form are two buttons: 'Create' and 'Cancel'.

410630

Step 3 In the **Username** field, enter a username for the new user.

Note To create multiple users, click the **Add (+)** icon to the right of the **Username** field.

Step 4 In the **Password** and **Password Again** fields, enter a password for the new user.

Step 5 In the **Email** field, enter a valid email address for the user.

Step 6 From the **Project** drop-down list, choose the applicable project for the user.

Step 7 From the **Role** drop-down list, choose the applicable role for the user.

Note A user with administrative rights has administrative rights across the entire system.

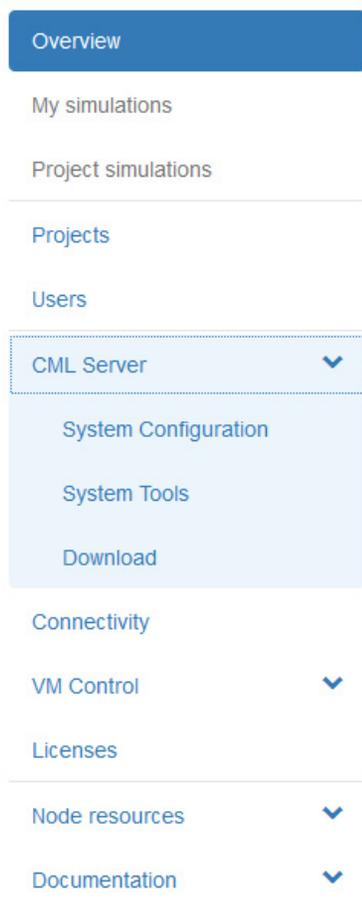
- Step 8** In the **Expires** field, you can either add an expiry date for the user or accept the default, which is **Never**.
- Step 9** Leave the **Enabled** check box checked.
- Step 10** Click **Create**.
The **User <Project Name>-<Username>** page appears.
This page presents details and project quotas for the user.
- Step 11** (Optional) Click **Modify User** to amend the details for a user, or click **Delete User** to delete the user.
- Step 12** Click **Users** to view the newly created user.

CML Server (Admin User)

Within the **User Workspace Management** interface, under **CML Server**, you are able to make changes to your Cisco Modeling Labs server configuration under the **System Configuration** option.

Under the **System Status** option, you can review system operational statuses and download log files.

Figure 6: CML Server Options



System Configuration

Within the **User Workspace Management** interface, under **CML Server > System Configuration**, you are able to make changes to your Cisco Modeling Labs server configuration.

You can update the following system control parameters.

- System
- Networks
- Services
- Infrastructure
- Resources

System Configuration Controls

To update system configuration controls, complete the following steps:

Step 1 In the **User Workspace Management** interface, click **CML Server > System Configuration**.

The **System Configuration Controls** page appears.

Figure 7: System Configuration Controls

Step 2 Update the fields as required.

Table 3: System Configuration Parameters

Parameter	Description
Hostname	Enter the server hostname.
Domain Name	Enter the domain name.
NTP Server	Enter the DNS name or IP address for the NTP server. If you are behind a firewall/proxy, ensure that your NTP server is reachable from this location.
Ramdisk enabled	This option must be enabled to speed up I/O operations.

Parameter	Description
VNC enabled	Use this option to start the VNC server on the host. It operates on TCP port 5901.
VNC Password	Enter the password for the VNC server.
Primary Ethernet Port	Enter the primary ethernet port.
Use DHCP on Primary Ethernet port?	Use this option to enable DHCP on the primary ethernet port.
Static IP address	Enter the static IP address.
Primary port network	Enter the primary port network.
Primary port netmask	Enter the primary port netmask.
Primary port gateway	Enter the primary port gateway.
Primary DNS server IP address	Enter the primary DNS server IP address.
Secondary DNS server IP address	Enter the secondary DNS server IP address. Ensure you do not set the same address as you set for the primary DNS server IP address.
Is your system behind a proxy?	Use this option if your system is behind a proxy.
HTTP/HTTPS Proxy	Enter the URL of your internal access proxy in the following format "http://<proxy IP or name>:<port number>/".

Step 3 Click **Apply Changes** when you are finished to save your changes.

Networks Configuration

To update the Networks configuration, complete the following steps:

Step 1 In the **User Workspace Management** interface, click **CML Server > System Configuration**.

The **System Configuration Controls** page appears. Click the **Networks** tab to access the network parameters.

Figure 8: Networks Configuration

Step 2 Update the fields as required.

Table 4: Networks Configuration Parameters

Parameter	Description
Flat Network Port	Enter the Flat network port.
Flat Network Address	Enter the Flat network address.
Flat Network Address/Mask	Enter the Flat network address/mask.
Flat Network Netmask	Enter the Flat network netmask.

Parameter	Description
Flat Network Gateway IP Address	Enter the Flat network gateway IP address.
Flat Address Pool Start Address	Enter the Flat address pool start address.
Flat Address Pool End Address	Enter the Flat address pool end address.
Flat Primary DNS server IP address	Enter the Flat primary DNS server IP address.
Flat Secondary DNS server IP address	Enter the Flat secondary DNS server IP address. Ensure you do not set the same address as you set for the primary DNS server IP address.
2nd Flat Network Enabled	Use this option if a second Flat network, Flat1, is to be enabled.
2nd Flat Network Port	Enter the name of the host's physical port used for the L2 Flat network, Flat1.
2nd Flat Network Address	Enter the IP address for the second Flat network, Flat1.
2nd Flat Network Address/Mask	Enter the Flat network address/mask for Flat1.
2nd Flat Network Netmask	Enter the Flat network netmask for Flat1.
2nd Flat Network Gateway IP Address	Enter the Flat network gateway IP address for Flat1.
2nd Flat Address Pool Start Address	Enter the Flat address pool start address for Flat1.
2nd Flat Address Pool End Address	Enter the Flat address pool end address for Flat1.
2nd Flat Primary DNS server IP address	Enter the Flat primary DNS server IP address for Flat1.
2nd Flat Secondary DNS server IP address	Enter the Flat secondary DNS server IP address for Flat1. Ensure you do not set the same address as you set for the primary DNS server IP address.
Snat Network Port	Enter the name of the host's physical port used for L3 Snat network, ext-net.
Snat Network Address	Enter the IP address for the CML host in the L3 Snat network.
Snat Network Address/Mask	Enter the Snat network address/mask.
Snat Network Netmask	Enter the Snat network netmask.
Snat Network Gateway IP Address	Enter the Snat network gateway IP address.
Snat Address Pool Start Address	Enter the Snat address pool start address.
Snat Address Pool End Address	Enter the Snat address pool end address.

Parameter	Description
Snat Primary DNS server IP address	Enter the Snat primary DNS server IP address.
Snat Secondary DNS server IP address	Enter the Snat secondary DNS server IP address. Ensure you do not set the same address as you set for the primary DNS server IP address.

Step 3 Click **Apply Changes** when you are finished to save your changes.

Services Configuration

To update the services configuration, complete the following steps:

Step 1 In the **User Workspace Management** interface, click **CML Server > System Configuration**.

The **System Configuration Controls** page appears. Click the **Services** tab to access the services parameters.

Figure 9: Services Configuration

The screenshot shows the 'System Configuration Controls' page with the 'Services' tab selected. The configuration table is as follows:

Parameter	Value
Apache server port	80
Start host-granted TCP port	10000
End host-granted TCP port	17000
First VM Serial Console TCP port	17000
Last VM Serial Console TCP port	18000
Web Services port	19399
UWM port	19400
AutoNetkit webserver port	19401
Live Visualization	19402

Step 2 Update the fields as required.

Table 5: Services Configuration Parameters

Parameter	Description
Apache Server Port	Enter the number for the Apache server port.
Start Host-granted TCP Port	Host grants TCP ports to the simulations starting from this value.
End Host-granted TCP Port	Host grants TCP ports to the simulations ending with this value.
First VM Serial Console TCP Port	Simulated VMs with serial consoles use TCP ports starting from this value.
Last VM Serial Console TCP Port	Simulated VMs with serial consoles use TCP ports ending with this value.

Parameter	Description
Web Services Port	Enter the TCP port number for the simulation engine services.
UWM Port	Enter the TCP port number for the User Workspace Management interface.
AutoNetkit Webserver Port	Enter the TCP port number for the configuration engine preview interface.
Live Visualization Webserver Port	Enter the TCP port number for the Live Visualization interface.
UWM Web-SSH Port	Enter the TCP port number for the User Workspace Management SSH web interface.
Nova Websocket Serial Port	Enter the TCP port number for the websocket-based serial console connections.
Disable Serial Timeout	Disable timeout of serial consoles after 15 minutes of inactivity.
Nova Websocket VNC Port	Enter the TCP port number for the websocket-based VNC console connections.
Docker Registry Port	Enter the port number for the docker registry.

Step 3 Click **Apply Changes** when you are finished to save your changes.

Infrastructure Configuration

To update the Infrastructure configuration, complete the following steps:

Step 1 In the **User Workspace Management** interface, click **CML Server > System Configuration**.

The **System Configuration Controls** page appears. Click the **Infrastructure** tab to access the infrastructure parameters.

Figure 10: Infrastructure Configuration

Step 2 Update the fields as required.

Table 6: Infrastructure Configuration Parameters

Parameter	Description
OpenStack Password	Enter the password for administrator access to OpenStack operations.
MySQL Password	Enter the password for OpenStack database access.
Guest Account Present?	Use this option to create a default guest account.

Step 3 Click **Apply Changes** when you are finished to save your changes.

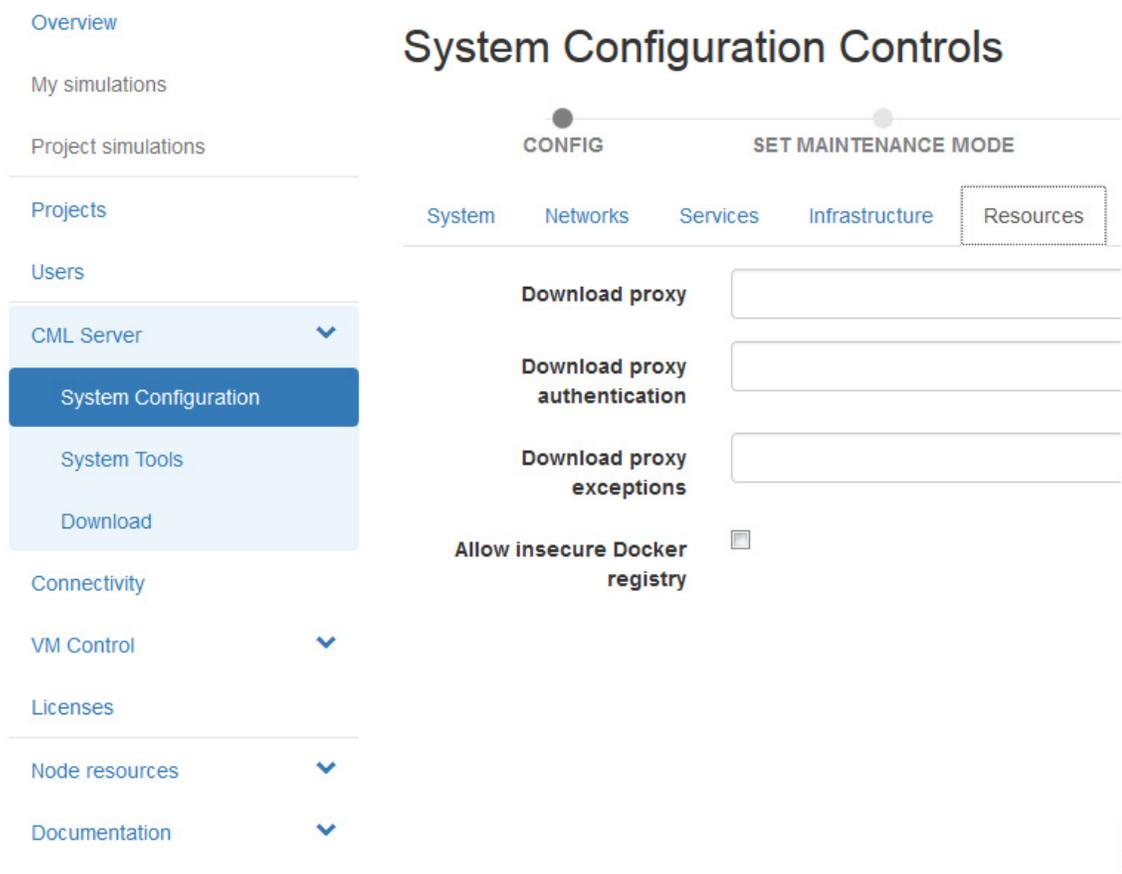
Resources Configuration

To update the Resources configuration, complete the following steps:

Step 1

In the **User Workspace Management** interface, click **CML Server > System Configuration**. The **System Configuration Controls** page appears. Click the **Resources** tab to access the resources parameters.

Figure 11: Resources Configuration



418005

Step 2

Update the fields as required.

Table 7: Resources Configuration Parameters

Parameter	Description
Download Proxy	Enter the proxy server for downloading files, such as images and external git repositories, from outside the local network. Leave blank if the use of a proxy is not required.

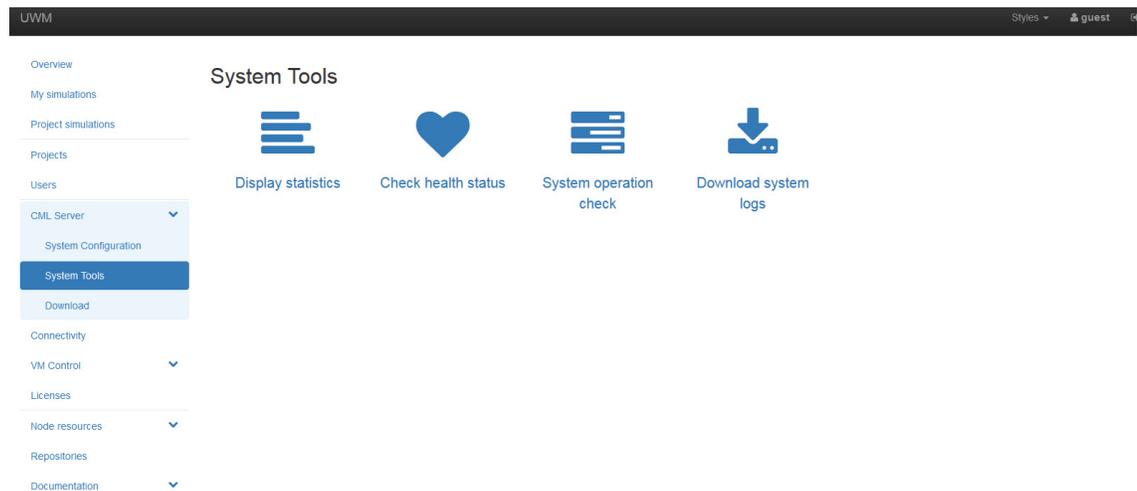
Parameter	Description
Download Proxy Authentication	Enter download proxy credentials in the format "<username>:<password>".
Download Proxy Exceptions	Provide a list all host names and/or IP addresses for image and git repository sources where the download proxy shall not be used, such as servers, on the local network.

Step 3 Click **Apply Changes** when you are finished to save your changes.

System Tools

Within the **User Workspace Management** interface, under **CML Server > System Tools**, you can view various statistics concerning the usage and operation of your system and check on server status and system services. You also have the ability to download system log files.

Figure 12: System Tools Options



To download the system log files, click **Download System Logs**. A dialog box is displayed where you can opt to open or save the system log file.

420566

System Statistics

You can view various statistics concerning the usage and operation of your Cisco Modeling Labs system. System statistics are available from the **User Workspace Management** interface under **CML Server > System Tools > Display Statistics**.

The following areas are covered:

Table 8: System Statistics

Area	Description															
Statistics	<p data-bbox="680 342 1520 405">Lists the memory usage history per day, week and month and their average and maximum usage stats.</p> <div data-bbox="695 457 1057 730"> <h3 data-bbox="695 457 821 489">Statistics</h3> <p data-bbox="711 510 846 531">System / Statistics</p> <table border="1" data-bbox="699 569 1019 716"> <thead> <tr> <th data-bbox="699 569 873 590">Memory usage history</th> <th data-bbox="889 569 954 590">Average</th> <th data-bbox="963 569 1003 590">Max</th> </tr> </thead> <tbody> <tr> <td data-bbox="699 611 781 632">Last month</td> <td data-bbox="889 611 954 632">50.77%</td> <td data-bbox="963 611 1019 632">99.77%</td> </tr> <tr> <td data-bbox="699 653 781 674">Last week</td> <td data-bbox="889 653 954 674">65.39%</td> <td data-bbox="963 653 1019 674">99.77%</td> </tr> <tr> <td data-bbox="699 695 781 716">Last day</td> <td data-bbox="889 695 954 716">71.50%</td> <td data-bbox="963 695 1019 716">85.09%</td> </tr> </tbody> </table> </div>	Memory usage history	Average	Max	Last month	50.77%	99.77%	Last week	65.39%	99.77%	Last day	71.50%	85.09%			
Memory usage history	Average	Max														
Last month	50.77%	99.77%														
Last week	65.39%	99.77%														
Last day	71.50%	85.09%														
Projects and Users	<p data-bbox="680 789 1174 821">Lists the number of current projects and users.</p> <div data-bbox="699 888 1057 999"> <h3 data-bbox="699 888 938 919">Projects and users</h3> <table data-bbox="727 936 938 982"> <tbody> <tr> <td data-bbox="727 936 906 957">Number of projects</td> <td data-bbox="914 936 938 957">11</td> </tr> <tr> <td data-bbox="751 957 906 978">Number of users</td> <td data-bbox="914 957 938 978">13</td> </tr> </tbody> </table> </div>	Number of projects	11	Number of users	13											
Number of projects	11															
Number of users	13															
Simulations	<p data-bbox="680 1052 1507 1115">Lists details for the number of active simulations and nodes for the last week, the last month, the previous 24 hours, and those currently running.</p> <div data-bbox="695 1171 1057 1451"> <h3 data-bbox="695 1171 854 1203">Simulations</h3> <table border="1" data-bbox="699 1230 1019 1444"> <thead> <tr> <th data-bbox="699 1230 776 1251">Active</th> <th data-bbox="829 1230 938 1251">Simulations</th> <th data-bbox="963 1230 1019 1251">Nodes</th> </tr> </thead> <tbody> <tr> <td data-bbox="699 1272 808 1293">In last month</td> <td data-bbox="862 1272 902 1293">253</td> <td data-bbox="963 1272 1019 1293">1687</td> </tr> <tr> <td data-bbox="699 1314 808 1335">In last week</td> <td data-bbox="862 1314 902 1335">94</td> <td data-bbox="963 1314 1019 1335">821</td> </tr> <tr> <td data-bbox="699 1356 808 1377">In last day</td> <td data-bbox="862 1356 902 1377">42</td> <td data-bbox="963 1356 1019 1377">565</td> </tr> <tr> <td data-bbox="699 1398 748 1419">Now</td> <td data-bbox="862 1398 902 1419">2</td> <td data-bbox="963 1398 1019 1419">76</td> </tr> </tbody> </table> </div> <p data-bbox="680 1493 1029 1524">There are two further categories:</p>	Active	Simulations	Nodes	In last month	253	1687	In last week	94	821	In last day	42	565	Now	2	76
Active	Simulations	Nodes														
In last month	253	1687														
In last week	94	821														
In last day	42	565														
Now	2	76														

Area	Description																																										
Subtype Usage in Simulations	<p data-bbox="643 285 1308 317">Lists the subtypes and their average and maximum usage stats.</p> <p data-bbox="659 369 935 401">Subtype usage in simulations</p> <table border="1" data-bbox="659 411 1036 1010"> <thead> <tr> <th data-bbox="667 415 781 443">Subtype</th> <th data-bbox="902 415 976 443">Average</th> <th data-bbox="992 415 1027 443">Max</th> </tr> </thead> <tbody> <tr> <td data-bbox="667 464 716 485">ASAv</td> <td data-bbox="919 464 967 485">0.26</td> <td data-bbox="1000 464 1016 485">2</td> </tr> <tr> <td data-bbox="667 506 756 527">CSR1000v</td> <td data-bbox="919 506 967 527">0.47</td> <td data-bbox="1000 506 1032 527">15</td> </tr> <tr> <td data-bbox="667 548 740 569">IOS XRv</td> <td data-bbox="919 548 967 569">0.50</td> <td data-bbox="1000 548 1016 569">8</td> </tr> <tr> <td data-bbox="667 590 716 611">IOSv</td> <td data-bbox="919 590 967 611">3.03</td> <td data-bbox="1000 590 1032 611">73</td> </tr> <tr> <td data-bbox="667 632 748 653">IOSvL2</td> <td data-bbox="919 632 967 653">0.61</td> <td data-bbox="1000 632 1032 653">12</td> </tr> <tr> <td data-bbox="667 674 748 695">jumphost</td> <td data-bbox="919 674 967 695">0.04</td> <td data-bbox="1000 674 1016 695">1</td> </tr> <tr> <td data-bbox="667 716 699 737">lxc</td> <td data-bbox="919 716 967 737">0.03</td> <td data-bbox="1000 716 1016 737">2</td> </tr> <tr> <td data-bbox="667 758 740 779">lxc-iperf</td> <td data-bbox="919 758 967 779">0.33</td> <td data-bbox="1000 758 1032 779">20</td> </tr> <tr> <td data-bbox="667 800 756 821">lxc-ostinato</td> <td data-bbox="919 800 967 821">0.05</td> <td data-bbox="1000 800 1016 821">3</td> </tr> <tr> <td data-bbox="667 842 740 863">mgmt-lxc</td> <td data-bbox="919 842 967 863">0.64</td> <td data-bbox="1000 842 1016 863">1</td> </tr> <tr> <td data-bbox="667 884 740 905">NX-OSv</td> <td data-bbox="919 884 967 905">0.33</td> <td data-bbox="1000 884 1016 905">3</td> </tr> <tr> <td data-bbox="667 926 732 947">server</td> <td data-bbox="919 926 967 947">0.26</td> <td data-bbox="1000 926 1016 947">3</td> </tr> <tr> <td data-bbox="667 968 886 989">all (nodes ran in a simulation)</td> <td data-bbox="919 968 967 989">6.54</td> <td data-bbox="1000 968 1032 989">81</td> </tr> </tbody> </table>	Subtype	Average	Max	ASAv	0.26	2	CSR1000v	0.47	15	IOS XRv	0.50	8	IOSv	3.03	73	IOSvL2	0.61	12	jumphost	0.04	1	lxc	0.03	2	lxc-iperf	0.33	20	lxc-ostinato	0.05	3	mgmt-lxc	0.64	1	NX-OSv	0.33	3	server	0.26	3	all (nodes ran in a simulation)	6.54	81
Subtype	Average	Max																																									
ASAv	0.26	2																																									
CSR1000v	0.47	15																																									
IOS XRv	0.50	8																																									
IOSv	3.03	73																																									
IOSvL2	0.61	12																																									
jumphost	0.04	1																																									
lxc	0.03	2																																									
lxc-iperf	0.33	20																																									
lxc-ostinato	0.05	3																																									
mgmt-lxc	0.64	1																																									
NX-OSv	0.33	3																																									
server	0.26	3																																									
all (nodes ran in a simulation)	6.54	81																																									
Simulation/node Operation Failures	<p data-bbox="643 1073 1471 1136">Lists the number of simulation/node failures for the last week, the last month, and the previous 24 hours.</p> <p data-bbox="659 1188 902 1209">Simulation/node operation failures</p> <table border="1" data-bbox="659 1220 1182 1346"> <thead> <tr> <th data-bbox="659 1220 740 1241"></th> <th data-bbox="748 1220 862 1241">Simulation launch</th> <th data-bbox="870 1220 1016 1241">Simulation termination</th> <th data-bbox="1024 1220 1105 1241">Node start</th> <th data-bbox="1114 1220 1182 1241">Node stop</th> </tr> </thead> <tbody> <tr> <td data-bbox="659 1251 740 1272">In last month</td> <td data-bbox="797 1251 821 1272">60</td> <td data-bbox="935 1251 951 1272">5</td> <td data-bbox="1057 1251 1089 1272">64</td> <td data-bbox="1130 1251 1162 1272">111</td> </tr> <tr> <td data-bbox="659 1283 740 1304">In last week</td> <td data-bbox="805 1283 821 1304">6</td> <td data-bbox="935 1283 951 1304">0</td> <td data-bbox="1057 1283 1073 1304">0</td> <td data-bbox="1130 1283 1146 1304">0</td> </tr> <tr> <td data-bbox="659 1314 740 1335">In last day</td> <td data-bbox="805 1314 821 1335">1</td> <td data-bbox="935 1314 951 1335">0</td> <td data-bbox="1057 1314 1073 1335">0</td> <td data-bbox="1130 1314 1146 1335">0</td> </tr> </tbody> </table>		Simulation launch	Simulation termination	Node start	Node stop	In last month	60	5	64	111	In last week	6	0	0	0	In last day	1	0	0	0																						
	Simulation launch	Simulation termination	Node start	Node stop																																							
In last month	60	5	64	111																																							
In last week	6	0	0	0																																							
In last day	1	0	0	0																																							

Area	Description																																				
<p>AutoNetkit</p>	<p>Lists details for the number of configurations generated in the last week, the last month, and the previous 24 hours, including the number of invalid topologies encountered. The category Subtype Usage in Configured Topologies lists the subtypes used in configuration requests along with their average and maximum usage stats.</p> <p>AutoNetkit</p> <p>Configs in last month 128 (3 invalid topologies) Configs in last week 23 (0 invalid topologies) Configs in last day 6 (0 invalid topologies)</p> <p>Subtype usage in configured topologies</p> <table border="1"> <thead> <tr> <th>Subtype</th> <th>Average</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>ASAv</td> <td>0.40</td> <td>2</td> </tr> <tr> <td>CSR1000v</td> <td>0.91</td> <td>15</td> </tr> <tr> <td>IOS XRv</td> <td>0.48</td> <td>8</td> </tr> <tr> <td>IOSv</td> <td>4.42</td> <td>73</td> </tr> <tr> <td>IOSvL2</td> <td>0.93</td> <td>12</td> </tr> <tr> <td>lxc</td> <td>0.09</td> <td>2</td> </tr> <tr> <td>lxc-iperf</td> <td>0.46</td> <td>20</td> </tr> <tr> <td>lxc-ostinato</td> <td>0.20</td> <td>3</td> </tr> <tr> <td>NX-OSv</td> <td>0.42</td> <td>2</td> </tr> <tr> <td>server</td> <td>0.40</td> <td>2</td> </tr> <tr> <td>all (topology size)</td> <td>8.70</td> <td>80</td> </tr> </tbody> </table>	Subtype	Average	Max	ASAv	0.40	2	CSR1000v	0.91	15	IOS XRv	0.48	8	IOSv	4.42	73	IOSvL2	0.93	12	lxc	0.09	2	lxc-iperf	0.46	20	lxc-ostinato	0.20	3	NX-OSv	0.42	2	server	0.40	2	all (topology size)	8.70	80
Subtype	Average	Max																																			
ASAv	0.40	2																																			
CSR1000v	0.91	15																																			
IOS XRv	0.48	8																																			
IOSv	4.42	73																																			
IOSvL2	0.93	12																																			
lxc	0.09	2																																			
lxc-iperf	0.46	20																																			
lxc-ostinato	0.20	3																																			
NX-OSv	0.42	2																																			
server	0.40	2																																			
all (topology size)	8.70	80																																			

System Health Status

You can check on server status and system services that are running using the **Check Health Status** option. It performs a system check and generates a report. It is available from the **User Workspace Management** interface under **CML Server > System Tools > Check Health Status**.

Table 9: Health Status Check

Area	Services Checked
Server Status	<p>Click each entry to view further details.</p> <ul style="list-style-type: none"> • Disk space • RAM • CPU • Network interfaces • Proxy • Hypervisor • NTP • Bridge patch applied • OpenStack cluster infrastructure
System Services	<p>Click each entry to view further details.</p> <ul style="list-style-type: none"> • MySQL • RabbitMQ • OpenStack cluster host information • OpenStack system services • OpenStack endpoint URLs • OpenStack system response • AutoNetkit services • CML-CORE services • STD configuration

Figure 13: Health Status Page

**Note**

When an issue is discovered, a red x is displayed next to the entry. Click the entry to view further details.

Available options on the **Health Status** page are:

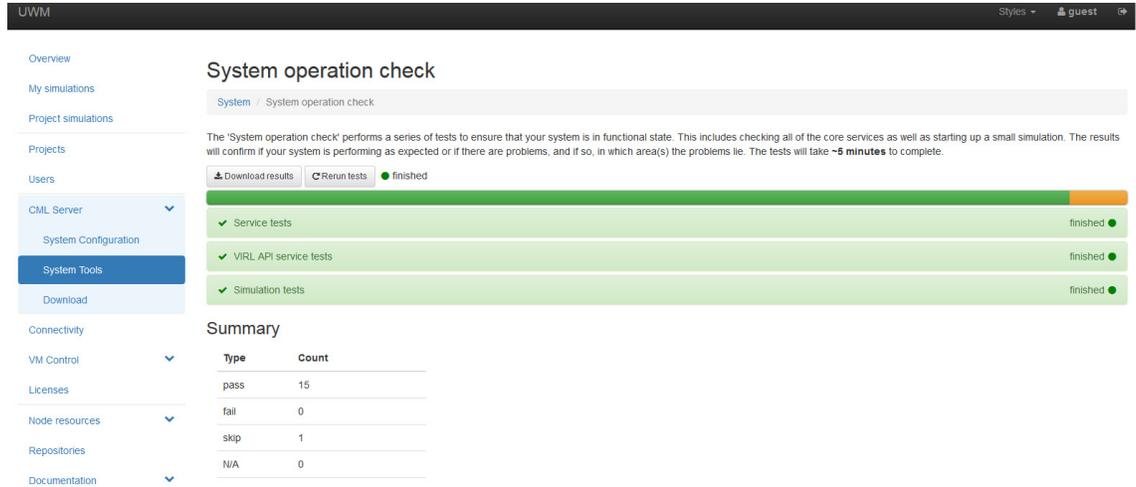
- **Check Again:** Allows you to run the health status check again.
- **Download:** Allows you to open or download the health status log file.
- **Display RAW Report:** Displays the health status log file to screen.

System Operation Check

The System Operation Check performs a series of tests to ensure that your system is in a fully functional state. These tests include checking all of the core services as well as starting up a small simulation. The results will confirm if your system is performing as expected or if there are problems, and if so, in which area(s) the

problems lie. The tests will take ~5 minutes to complete. the system operation check is available from the **User Workspace Management** interface under **CML Server > System Tools > System Operation Check**.

Figure 14: System Operation Check



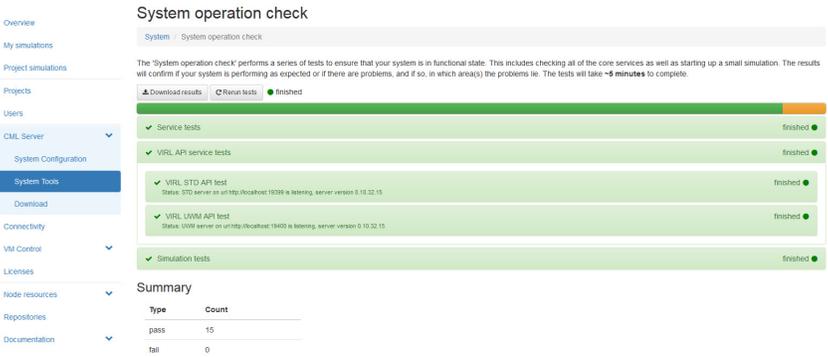
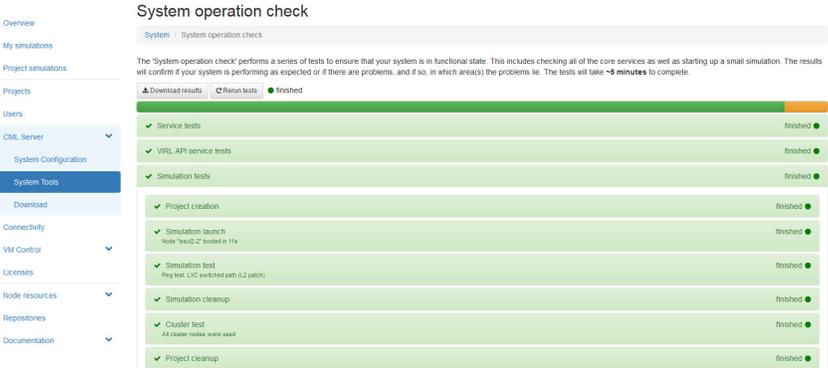
420567

The following areas are tested:

Table 10: System Operation Check Tests

Area	Description
Service	<p>Click each entry to view further details of the tests run.</p>

420569

Area	Description						
<p>VIRL API Service</p>	<p>Click each entry to view further details of the tests run.</p>  <p>System operation check</p> <p>The "System operation check" performs a series of tests to ensure that your system is in functional state. This includes checking all of the core services as well as starting up a small simulation. The results will confirm if your system is performing as expected or if there are problems, and if so, in which area(s) the problems lie. The tests will take ~8 minutes to complete.</p> <p>Download results Rerun tests finished</p> <ul style="list-style-type: none"> Service tests finished VIRL API service tests finished VIRL STD API test finished VIRL LWM API test finished Simulation tests finished <p>Summary</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>pass</td> <td>15</td> </tr> <tr> <td>fail</td> <td>0</td> </tr> </tbody> </table>	Type	Count	pass	15	fail	0
Type	Count						
pass	15						
fail	0						
<p>Simulation</p>	<p>Click each entry to view further details of the tests run.</p>  <p>System operation check</p> <p>The "System operation check" performs a series of tests to ensure that your system is in functional state. This includes checking all of the core services as well as starting up a small simulation. The results will confirm if your system is performing as expected or if there are problems, and if so, in which area(s) the problems lie. The tests will take ~8 minutes to complete.</p> <p>Download results Rerun tests finished</p> <ul style="list-style-type: none"> Service tests finished VIRL API service tests finished Simulation tests finished Project creation finished Simulation batch finished Simulation test finished Simulation cleanup finished Cluster test finished Project cleanup finished 						

The **Summary** table provides details of tests passed, failed, skipped or not applicable.

Available options on the **System Operation Check** page are:

- **Download Results:** Allows you to open or download the system operation check log file.
- **Rerun Tests:** Allows you to run the tests again.

Download

Within the **User Workspace Management** interface, under **CML Server > Download**, you are able to download various Cisco Modeling Labs client versions and Python libraries as shown.

Figure 15: Files Available for Download

Download	
CML-1.3.0-39-setup_32.exe	168.7 MB
CML-1.3.0-39-setup_64.exe	171.9 MB
CML-1.3.0-39.dmg	297.8 MB
VIRL_CLIENTS-0.10.28.7-py2-none-any.rev_92f08dc.bin.whl	25.9 MB

Double-click on the applicable file(s) to download it.

Connectivity

Within the **User Workspace Management** interface, the **Connectivity** page provides details on all OpenStack ports available on the external (FLAT and SNAT) and project management networks.

- L2 FLAT IP address allocations—Create an externally reachable fixed IP address for a project.
- L3 SNAT IP address allocations—Create a floating IP address for a project. Floating IPs are externally reachable and are mapped to an internal fixed IP address.
- Project Management IP address allocations—Create a fixed IP address on the management network of the selected project. This IP address can be statically assigned to the nodes.

Create a Port Connection

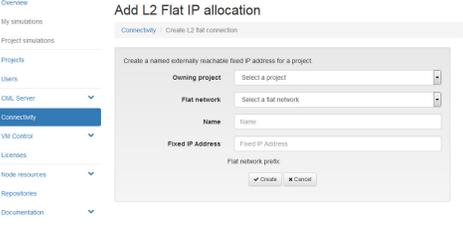
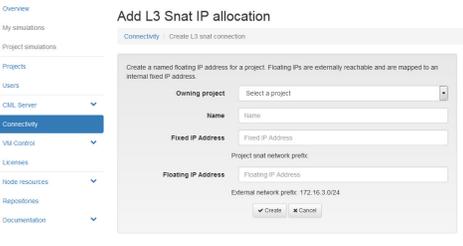
To create a new port connection, complete the following steps:

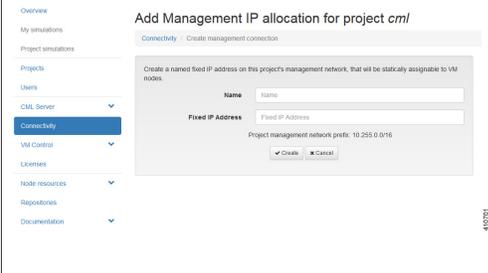
-
- Step 1** In the **User Workspace Management** interface, click **Connectivity**. The **Outside Connections** page, which lists all current port connections appears.
- Step 2** Connections are grouped into three areas: **L2 FLAT**, **L3 SNAT**, and **Project Management**. Click **Add** in the applicable group to create the required port connection for that type.

The corresponding **Add IP Allocation** page appears.

Step 3

Complete the fields as required for the applicable port connection.

Connection Type	Field	Description
	Owning Project	Choose a project from the drop-down list.
	FLAT Network	Choose a FLAT network from the drop-down list.
	Name	Enter a name for the new port connection.
	Fixed IP address	Enter a custom IP address from the range defined by the prefix displayed, or to have an address automatically assigned, leave this field blank.
	Owning Project	Choose a project from the drop-down list.
	Name	Enter a name for the new port connection.
	Fixed IP Address	Enter a custom IP address from the range defined by the prefix displayed, or to have an address automatically assigned, leave this field blank.

Connection Type	Field	Description
	Floating IP Address	Enter a custom IP address from the range defined by the prefix displayed, or to have an address automatically assigned, leave this field blank.
Project Management 	Name	Enter a name for the new port connection.
	Fixed IP Address	Enter a custom IP address from the range defined by the prefix displayed, or to have an address automatically assigned, leave this field blank.

Step 4 Click **Create**.

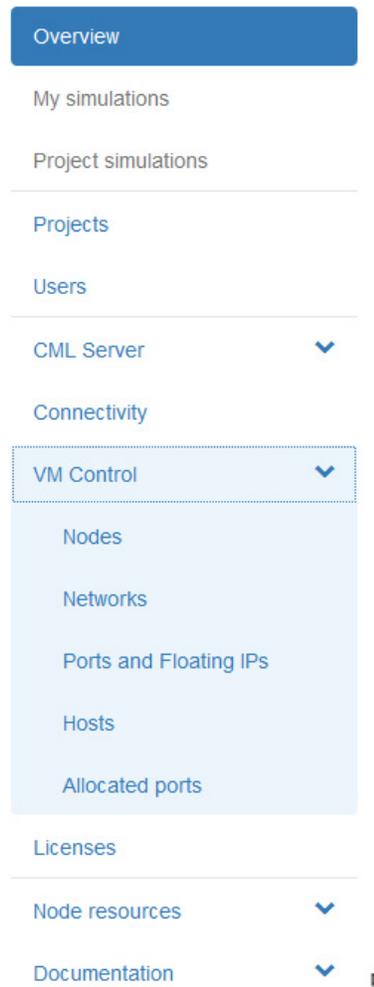
The new connection is created and its details are displayed in the **Connectivity** page.

Using the VM Control Tool (Admin User)

The **VM Control** tool is available to aid system administrators with troubleshooting issues encountered in the **User Workspace Management** interface. The tool enables system administrators to stop specific

components of an active session. In circumstances where components of a session fail to be deleted through the normal shutdown methods, this tool enables system administrators to remove blocked components.

Figure 16: VM Control Tool



VM Control Nodes

The **Nodes** page lists all the nodes for all the currently running projects for all users. You can delete a specific node or all the nodes for a specific project or projects.

Figure 17: Nodes Page

The screenshot shows the 'Nodes' page in a web interface. On the left is a navigation menu with options like Overview, My simulations, Project simulations, Projects, Users, CML Server, Connectivity, VM Control (selected), Networks, Ports and Floating IPs, and Hosts. The main content area is titled 'Nodes' and includes a warning: 'WARNING: The VM Control panels are meant for troubleshooting purposes only and should not be used in normal workflows. Removing important resources may break your system.' Below the warning, there are two sections: 'Nodes of project guest' and 'Nodes of project hyerra'. Each section contains a table with columns for Name, Node host name, Status, and Options. The 'guest' project has four nodes, and the 'hyerra' project has one node. A 'Delete selected' button is present at the end of each table.

Nodes of project <i>guest</i>				
Name	Node host name	Status	Options	
<input type="checkbox"/> </guest-cml-12/endpoint>-<Controls-FzW1B1>-<london>	cml	● ACTIVE		
<input type="checkbox"/> </guest-cml-12/endpoint>-<Controls-FzW1B1>-<new-york>	cml	● ACTIVE		
<input type="checkbox"/> </guest-cml-12/endpoint>-<Controls-FzW1B1>-<paris>	cml	● ACTIVE		
<input type="checkbox"/> </guest-cml-12/endpoint>-<Controls-FzW1B1>-<san-francisco>	cml	● ACTIVE		

Nodes of project <i>hyerra</i>				
Name	Node host name	Status	Options	
<input type="checkbox"/> </hyerra/endpoint>-<70_nodes_topology-9defLa>-<losv-1>	cml	● ACTIVE		

410654

Step 1 To delete a specific node:

- In the node list for the applicable project, check the corresponding check box.
- Click **Delete** in the **Options** column.
The node is deleted.

Step 2 To delete all the nodes for a specific project:

- In the node list for the applicable project, check the corresponding **Name** check box.
Note When you check the **Name** check box for a particular project, the check boxes for all the nodes in the project are automatically checked. You cannot uncheck individual nodes within a project; either all the nodes or no nodes are checked.
- Click **Delete Selected**.
All nodes for the particular project are deleted.

VM Control Networks

The **Networks** page lists all the networks for all the currently running projects for all the users. You can delete a specific network or all the networks for a specific project or projects.

Figure 18: Networks Page

410653

Step 1

To delete a specific network:

- In the network list for the applicable project, check the corresponding **Name** check box.
- Click **Delete** in the **Options** column.
The network is deleted.

Step 2

To delete all the networks for a specific project:

- In the network list for the applicable project, check the corresponding **Name** check box.
Caution When you check the **Name** check box, the check boxes for all the networks in the project are automatically checked. In the **Networks** page, for each user project, two networks are listed in blue with an information icon. These two networks are specifically created for use by all users of the project when the project is created. These networks cannot be recreated automatically; the project would need to be deleted and recreated as a whole. We recommend that you do not delete these networks. Uncheck the check boxes for these two networks before clicking **Delete Selected**.
- Click **Delete Selected**.
All the networks for the particular project are deleted.

VM Control Ports and Floating IPs

The **Ports and Floating IPs** page lists all the ports and floating IPs for all the currently running projects for all the users. You can delete a specific port or floating IP or all the ports and floating IPs for a specific project or projects.

Figure 19: Ports and Floating IPs Page

Ports and Floating IPs

WARNING: The VM Control panels are meant for troubleshooting purposes only and should not be used in normal workflows. Removing important resources may break your system.

Ports of network <guest-cml-12/endpoint>-<Controls-FzW1Bi>-<london-to-new-york> Delete selected

Name	Status	Fixed IP Address	Options
<guest-cml-12/endpoint>-<Controls-FzW1Bi>-<london>-<london-to-new-york>	ACTIVE	10.255.255.2	
<guest-cml-12/endpoint>-<Controls-FzW1Bi>-<new-york>-<london-to-new-york>	ACTIVE	10.255.255.1	

Ports of network <guest-cml-12/endpoint>-<Controls-FzW1Bi>-<london-to-paris> Delete selected

Name	Status	Fixed IP Address	Options
<guest-cml-12/endpoint>-<Controls-FzW1Bi>-<london>-<london-to-paris>	ACTIVE	10.255.255.1	
<guest-cml-12/endpoint>-<Controls-FzW1Bi>-<paris>-<london-to-paris>	ACTIVE	10.255.255.2	

Ports of network <guest-cml-12/endpoint>-<Controls-FzW1Bi>-<london-to-san-francisco> Delete selected

410655

Step 1

To delete a specific port or floating IP:

- In the port or floating IP list for the applicable project, check the corresponding check box.
- Click **Delete** in the **Options** column.
The port or floating IP is deleted.

Step 2

To delete all the ports or floating IPs for a specific project:

- In the port or floating IP list for the applicable project, check the **Name** check box.
Note When you check the **Name** check box for a particular project, the check boxes for all the ports or floating IPs in the project are automatically checked. You can uncheck individual ports or floating IPs within the project as required.
- Click **Delete Selected**.
All ports or all floating IPs for the particular project are deleted.

VM Control Hosts

The **Hosts** page lists all the compute services and network agents. Maintenance mode on a host disables the compute service on that node. It prevents new virtual machines from being deployed on that host.

Figure 20: Hosts Page

Name	Enabled	Alive	Last update	Options
cert	✓ True	✓ True	2016-03-01 16:36:36	ⓘ
compute	✓ True	✓ True	2016-03-01 16:36:38	ⓘ
conductor	✓ True	✓ True	2016-03-01 16:36:42	ⓘ
consoleauth	✓ True	✓ True	2016-03-01 16:36:40	ⓘ
dhcp-agent	✓ True	✓ True	2016-03-01 16:36:26	ⓘ
l3-agent	✓ True	✓ True	2016-03-01 16:36:27	ⓘ
linuxbridge-agent	✓ True	✓ True	2016-03-01 16:36:24	ⓘ
metadata-agent	✓ True	✓ True	2016-03-01 16:36:26	ⓘ
scheduler	✓ True	✓ True	2016-03-01 16:36:39	ⓘ

410652

VM Control Allocated Ports

The **Allocated ports** page lists details for all of the currently allocated ports on the system.

Figure 21: Allocated Ports Page

IP Address	Port	Protocol	Username	Simulation	Node	Task
0.0.0.0	10000	tcp	guest	~jumpost	jumpost	tcp-forward
0.0.0.0	10001	tcp	testing	3_node_test-jQRPEF	~mgmt-lxc	lxc-management
0.0.0.0	10002	tcp	testing	mixed-Vwe8r6	~mgmt-lxc	lxc-management
0.0.0.0	10003	tcp	guest	mixed_4_nodes-x8YY09	~mgmt-lxc	lxc-management
0.0.0.0	10004	tcp	guest	40_nodes_mixed_topology-SUQ29-JLu_HP	~mgmt-lxc	lxc-management

418009

Cisco Modeling Labs Licenses (Admin User)

Within the **User Workspace Management** interface, you can manage Cisco Modeling Labs licenses. A license specifies the options that are enabled for Cisco Modeling Labs.

The **Licenses** page provides details on all the licenses that are currently installed on the CML server. These include the license ID, type of license, number of nodes per license, and the expiry date.

Figure 22: Licenses Page

The screenshot shows the 'Licenses' page in the User Workspace Management interface. On the left is a navigation menu with options like Overview, My simulations, Project simulations, Projects, Users, CML Server, Connectivity, VM Control, Licenses (selected), Node resources, Repositories, and Documentation. The main content area is titled 'Licenses' and includes a 'Register licenses' button. Below this is a table with the following data:

License ID	Feature name	Node count	Expiry date	Remove license
20160224034240575	CML_CORPORATE	-	31-Mar-2016	Remove
20160224035659761	CML_CISCO_VM_CAPACITY	15	31-Mar-2016	Remove
Active node capacity (will drop on)		200	31-Mar-2016	
		215	31-Mar-2016	

Below the table, the 'License verification results' section displays the following information:

- Product licensing status is licensed as CML_CORPORATE.
- Product license expires in 30 days.
- Licensed Cisco VM capacity is 215 nodes.

A note at the bottom states: 'In case of unexpected license verification results, please consult the latest entries in the verification log below.' There are 'Reload' and 'Show log' buttons at the bottom of this section.

410635

Register a Cisco Modeling Labs License

To register a license, complete the following steps:

- Step 1** Open the email containing your Cisco Modeling Labs license key.
- Step 2** Using a text editor, open the attached .lic file.
- Step 3** In the **User Workspace Management** interface, click **Licenses**. The **Licenses** page, which lists all valid licenses, appears.
- Step 4** Click **Register License** to register a valid license.

The **Register licenses** page appears.

Figure 23: Register Licenses

The screenshot shows the 'Register licenses' page. On the left is a navigation menu with items: Overview, My simulations, Project simulations, Projects, Users, CML Server, Connectivity, VM Control, Licenses (highlighted), Node resources, Repositories, and Documentation. The main content area has a breadcrumb 'Licenses / Register'. Below this, there is a text block explaining that licenses are required for functionality and are bound to the server instance, requiring Host Name and MAC Address information. It shows 'Host Name' as 'cml' and 'Mac Address' as '005056a65932'. A instruction says to paste the license key into a text area below. The text area is labeled 'Licenses' and contains the placeholder text 'Licenses'. At the bottom of the text area are two buttons: 'Register' and 'Cancel'. A vertical ID '410638' is on the right side of the screenshot.

Step 5 Copy and paste the license key from the .lic file into the **Licenses** text area.

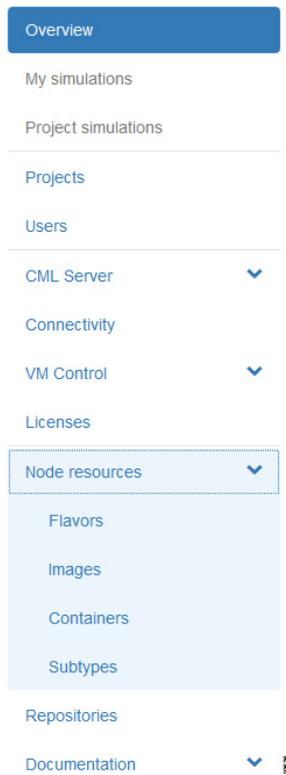
Step 6 Click **Register**.
The license is applied.

Step 7 Return to the **Licenses** page to view the newly registered license.

Node Resources

Within the **User Workspace Management** interface, under **Node Resources**, you can manage virtual machine run-time parameters and virtual machine images. You can also manage LXC container images and templates.

Figure 24: Available Node Resources



Virtual Machine Flavors

Within the **User Workspace Management** interface, as part of the creation process for virtual machine images, a virtual machine flavor is created. Flavors are used in each virtual machine to define the CPU, memory (RAM) allocation, disk space, the number of cores, and so on.

In the **Flavors** page, you can perform two operations for flavors. These operations are:

Operation	Description
Add	Creates a new flavor.
Delete	Deletes a selected flavor.

Create a Virtual Machine Flavor

To create a new virtual machine flavor, complete the following steps:

- Step 1** In the **User Workspace Management** interface, in admin mode, click **Flavors**.
The **Flavors** page, which lists all of the available flavors, appears.
- Step 2** Click **Add** to create a new flavor.
The **Create Flavor** page appears.

Figure 25: Create a Flavor

The screenshot shows the 'Create Flavor' page in the User Workspace Management interface. The page has a left-hand navigation menu with options like Overview, My simulations, Project simulations, Projects, Users, CML Server, Connectivity, VM Control, Licenses, Node resources, Flavors, Images, Containers, Subtypes, Repositories, and Documentation. The 'Flavors' option is selected. The main content area is titled 'Create Flavor' and contains a form with the following fields:

- Name:** A text input field with the placeholder text 'Name'.
- RAM (MB):** A dropdown menu currently showing '256'.
- Virtual CPUs:** A dropdown menu currently showing '1'.

Below the form are two buttons: 'Create' and 'Cancel'. Below the form is a section titled 'Recommended Values' containing a table:

Subtype	RAM (MB)	Virtual CPUs
ASAv	2048	1
CSR1000v	3072	1
CSR1000v-1	3072	1
generic	256	1
IOS XRv	3072	1
IOS XRv 9000	16384	4
IOSv	512	1

410625

- Step 3** In the **Name** field, enter a name for the flavor.
- Step 4** From the **RAM** drop-down list, choose the amount of memory allocation for the flavor.
- Step 5** From the **Virtual CPUs** drop-down list, choose the number of virtual CPUs for the flavor.
- Step 6** Click **Create** to create your virtual machine flavor.
The **Flavors** page appears with the newly created flavor listed.
- Step 7** Under the **Options** column, use the **Delete** option to delete a virtual machine flavor.

Images

Within the **User Workspace Management** interface, you can add new images, update details for existing images, or delete images from the system. Additionally, you can take a snapshot of the disk content of a virtual machine image. This newly created user-specific disk image can be used in other simulated sessions.

Cisco Modeling Labs 1.3 includes the following images built into the Cisco Modeling Labs client:

- Cisco IOSv Software Release 15.6(2)T
- Cisco IOSv Layer 2 Switch Software Release 15.2 (03.2017)
- Cisco IOS XRv Software Release 6.1.3 CCO
- Linux server (Ubuntu 16.04.1 Cloud-init)
- Unmanaged switch
- Cisco ASAv Software Release 9.7.1

For the most up-to-date list of virtual images, see [Release Notes for Cisco Modeling Labs 1.3](#).

The following demo images are available from the FileExchange:

- Cisco IOS XRv 9000 Software Release 6.0.1 demo image
- Cisco CSR1000v Software Release 16.5.1b XE-based demo image
- Cisco NX-OSv 9000 Software Release 7.0.3.16.1 demo image

In the **Images** page, you can perform a number of operations for images. These operations are:

Operation	Description
Add	Creates a new virtual machine image.
Modify	Modifies details for a selected virtual machine image.
Delete	Deletes a selected virtual machine image.

Create a Virtual Machine Image

To create a new virtual machine image, complete the following steps:

-
- Step 1** In the **User Workspace Management** interface, log in as admin and click **Images**. The **Images** page, which lists all of the available registered images, appears.
- Step 2** Click **Add** to create a new image.

The **Create VM Image** page appears.

Figure 26: Create VM Image

410626

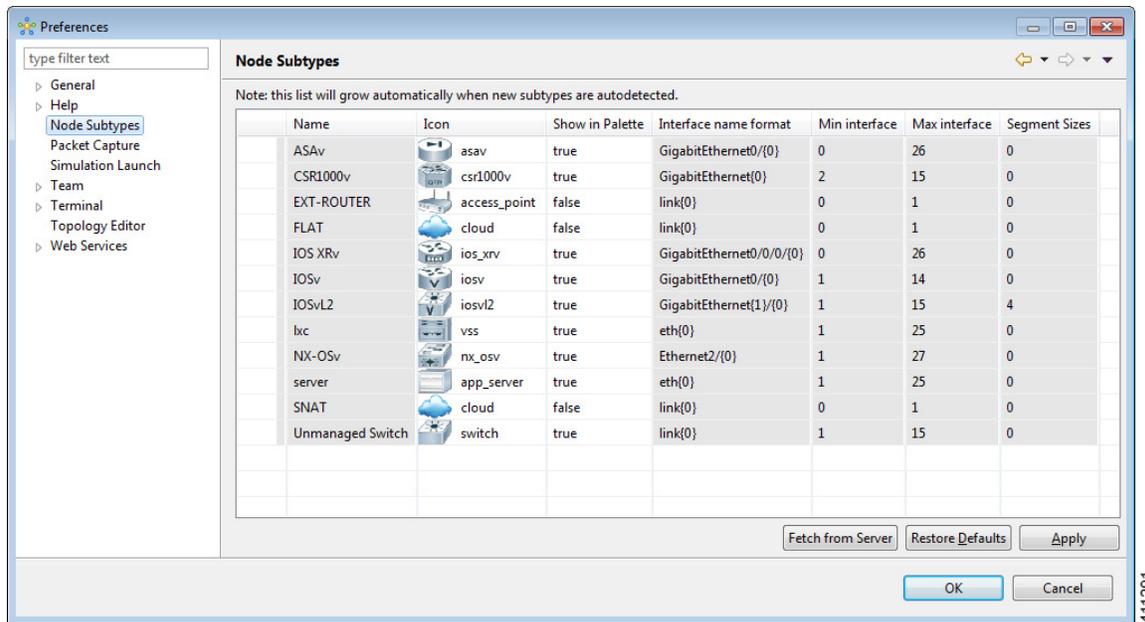
- Step 3** From the **Owning Project** drop-down list, choose the appropriate project for the new image.
- Step 4** Click the **Project Specific** check box if you want the new image to be private and only available to the owning project.
- Step 5** From the **Subtype** drop-down list, choose the appropriate subtype for the new image.
- Step 6** In the **Name/Version** field, enter a name or version number for the image.
- Step 7** In the **Release** field, enter the release number for the image.
- Step 8** Click the appropriate **Image Source**: File on Server, URL, or Local Image File.
- Step 9** In the **Image Path** field, enter a path on the server/virtual machine (an HTTP, FTP or TFTP URL) or choose a file to upload.
- Step 10** To upload an image from your own device, click **Browse** to navigate to the image file.
- Step 11** Click **Create** to create your virtual machine image.

Note The creation process can take a while depending on where the image file is located relative to the Cisco Modeling Labs server. Both virtual machine disk (VMDK) and QEMU copy-on-write 2 (QCOW2) image formats are supported. As part of the creation process for images, a default flavor is also created if missing, which contains information on the CPU and memory allocation for the virtual machine image.

The **Image <Image Name>** page, which contains the details and properties of the virtual machine image, appears.

- Step 12** Click **Images** to view the newly added image.
- Step 13** Under the **Options** column, use the **Modify** or **Delete** options to amend the details for the virtual machine or to delete a virtual machine image. After the image is installed, it is available for users to select for their topology simulation.
- Step 14** In the **Cisco Modeling Labs** client, click **File > Preferences > Node Subtypes**. The **Node Subtypes** dialog box is displayed.

Figure 27: Available Node Subtypes



- Step 15** In the **Node Subtypes** dialog box, click **Fetch from Server**. The **Confirm** dialog box is displayed.
- Step 16** Click **OK** to update the list of node subtypes based on the currently configured Cisco Modeling Labs server.

Create an Image Snapshot

When a Linux server is present in a running simulation, you can take a snapshot of the disk content of the server. This newly created user-specific disk image can be used in other simulated sessions.

To take a snapshot of the server's disk content, complete the following steps.

- Step 1** Log in to the **User Workspace Management** interface.
- Note** You must log in as a user other than the uwmadmin user, for example, guest.
- Step 2** On the **Overview** page, under **Sessions**, choose the applicable running session.

Step 3

A list of active virtual machines is displayed.

Choose the applicable virtual machine image, and under the **Options** column, click the **Create Snapshot** icon.

Figure 28: Create Snapshot Icon

The screenshot shows the 'Simulation live_visualization-vJzUTM details' page. It includes a table of nodes with the following data:

User	Project	Status	Started	Expires
guest-cml-12	guest	ACTIVE	2016-03-08 20:23:28	never

Node	Subtype	State	Management IPs	External Connections	Options
iosv-1	IOSv	ACTIVE	10.255.0.2	telnet://172.23.81.101:17292 telnet://172.23.81.101:17293	
iosv-2	IOSv	ACTIVE	10.255.0.3	telnet://172.23.81.101:17294 telnet://172.23.81.101:17295	
iosv-3	IOSv	ACTIVE	10.255.0.4	telnet://172.23.81.101:17296 telnet://172.23.81.101:17297	
iosv2-1	IOSvL2	ACTIVE	10.255.0.5	telnet://172.23.81.101:17298 telnet://172.23.81.101:17299	
iosv2-2	IOSvL2	ACTIVE	10.255.0.6	telnet://172.23.81.101:17300 telnet://172.23.81.101:17301	

Project details for the newly created snapshot are displayed.

Figure 29: Newly Created Image Snapshot

The screenshot shows the 'Project image snapshot guest-IOSv-iosv-1 details' page. A green notification bar at the top states: 'Saving snapshot of node "iosv-1" as image "guest-IOSv-iosv-1"...'. The details for the snapshot are as follows:

- Name:** guest-IOSv-iosv-1
- OpenStack ID:** 46a8647d-cbee-40f3-8fa7-e520f57531b
- Project:** a3d9b4c352584cf959679e09cebcc9c
- Updated:** 2016-03-08 20:39:22.000000
- Status:** queued
- Size:** 0.00 B (0)
- Minimum Disk Size:** 2 GB
- Converted qcow2 image checksum:** None (every image is forced through conversion, even qcow2)

The new image snapshot is listed under the Image Snapshot section on the Images page.

Figure 30: Available Image Snapshots

The screenshot shows the UWM interface with the following components:

- Header:** UWM, Styles, guest-cml-12
- Left Navigation:** My simulations, Project simulations, Connectivity, Node resources (expanded), Flavors, Images (selected), Containers, Subtypes, Repositories, Documentation.
- Main Content:**
 - Images:** Saving snapshot of node "iosv-1" as image "guest-IOSv-iosv-1"...
 - Disk usage (GB):** 40.42 / 70.04 (57.71% used)
 - Images in this project:** No images are owned by the current project.
 - Image snapshots in this project:**

Image	Release	Status	Created	Updated	Size	Options
guest-IOSv-iosv-1	-	active	2016-03-08 20:39:22	2016-03-08 20:39:41	122.12 MiB	[Edit] [Delete]
guest-server-server-1	14.04.2	active	2016-02-08 07:56:17	2016-02-08 07:56:34	1.01 GiB	[Edit] [Delete]

The image snapshot can be reused in the Cisco Modeling Labs client under **Properties > Node > VM Image**. See [Cisco Modeling Labs Corporate Edition User Guide, Release 1.3](#) for more information.

Containers

In the **User Workspace Management** interface, the **Containers** page provides a list of LXC images and templates. Here you can manage LXC container images and templates.

In the **Containers** page, you can perform a number of operations for LXC images and templates. These operations are:

Operation	Description
Add	Create a new LXC image and/or LXC template.
Modify	Modify details for LXC images
Delete	Delete LXC images and templates as required.

Create an LXC Image

To create a new LXC image, complete the following steps:

Step 1 Click **Node Resources > Containers** in the **User Workspace Management** interface.

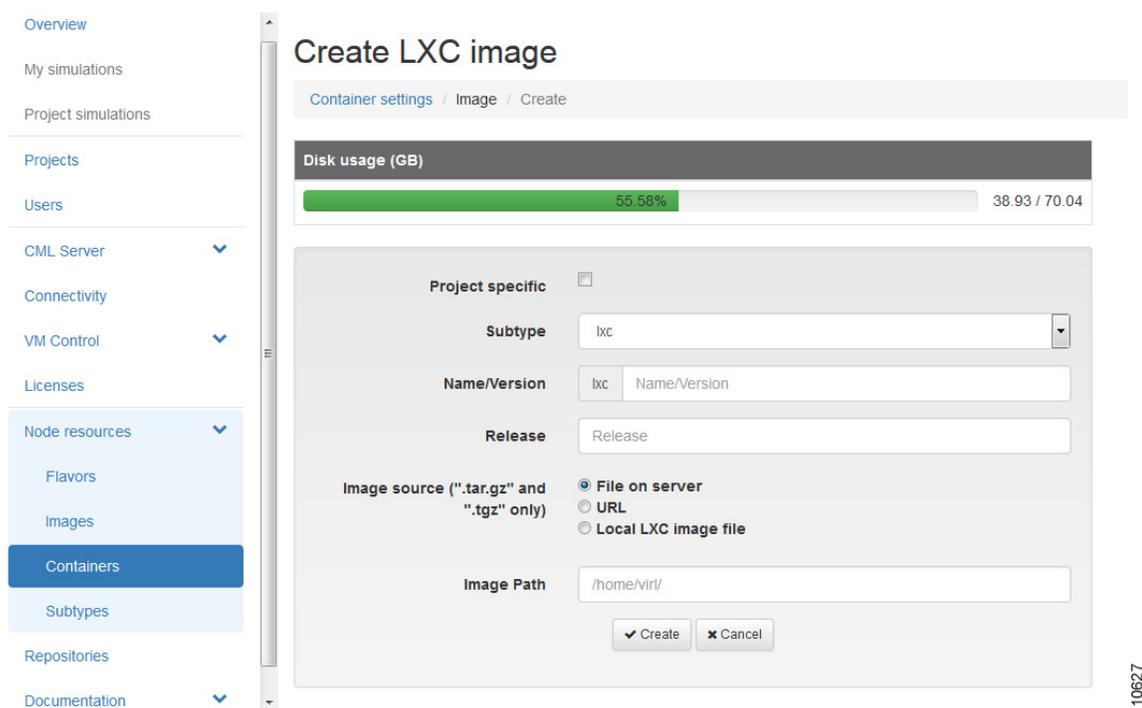
Step 2

The **Containers** page, which lists all of the available LXC images and templates, appears.

Click **Add** to create a new LXC image.

The **Create LXC Image** page appears.

Figure 31: Create an LXC Image



410627

Step 3

Click the **Project Specific** check box if you want the new image to be private and only available to the owning project.

Step 4

Choose the appropriate subtype for the new LXC image from the **Subtype** drop-down list.

Step 5

Enter a name or version number for the image in the **Name/Version** field.

Step 6

Enter the release number for the image in the **Release** field.

Step 7

Click the appropriate **Image Source**: File on Server, URL, or Local Image File.

Step 8

Enter a path on the server/virtual machine (an HTTP, FTP or TFTP URL) or choose a file to upload in the **Image Path** field.

Step 9

Click **Browse** to navigate to the LXC image file to upload an image from your own device.

Step 10

Click **Create** to create your LXC image.

Step 11

Click **Images** to view the newly added image.

Step 12

Under the **Options** column, use the **Modify** or **Delete** options to amend the details for the LXC image or to delete an LXC image. After the LXC image is installed, it is available for users to select for their topology simulation.

Create an LXC Template

To create a new LXC template, complete the following steps:

- Step 1** Click **Node Resources > Containers** in the **User Workspace Management** interface.
The **Containers** page, which lists all of the available LXC images and templates, appears.
- Step 2** Click **Add** to create a new LXC template.
The **Create LXC Template** page appears.

Figure 32: Create a LXC Template

The screenshot displays the 'Create LXC template' page. On the left is a navigation sidebar with the following items: Overview, My simulations, Project simulations, Projects, Users, CML Server, Connectivity, VM Control, Licenses, Node resources (expanded), Flavors, Images, Containers (highlighted), Subtypes, Repositories, and Documentation. The main content area has a breadcrumb trail: Container settings / Template / Create. Below this is a 'Disk usage (GB)' section with a green progress bar at 55.59% and the text '38.93 / 70.04'. The main form is titled 'Create LXC template' and contains the following fields:

- Project specific:** A checkbox that is currently unchecked.
- Subtype:** A dropdown menu with 'lxc' selected.
- Name/Version:** A text input field with 'lxc' in the first part and 'Name/Version' in the second part.
- Release:** A text input field with 'Release' entered.
- Template source:** Three radio buttons: 'File on server' (selected), 'URL', and 'Local template file'.
- Template Path:** A text input field with '/home/virt/' entered.

At the bottom of the form are two buttons: 'Create' and 'Cancel'.

410628

- Step 3** Click the **Project Specific** check box if you want the new image to be private and only available to the owning project.
- Step 4** Choose the appropriate subtype for the new LXC image from the **Subtype** drop-down list.
- Step 5** Enter a name or version number for the image in the **Name/Version** field.
- Step 6** Enter the release number for the image in the **Release** field.
- Step 7** Click the appropriate **Template Source**: File on Server, URL, or Local Image File.
- Step 8** Enter a path on the server/virtual machine (an HTTP, FTP or TFTP URL) or choose a file to upload in the **Template Path** field.
- Step 9** Click **Browse** to navigate to the LXC image file to upload from your own device.
- Step 10** Click **Create** to create your LXC template.
- Step 11** Click **Images** to view the newly added LXC template.

Subtypes

In the **User Workspace Management** interface, the **Subtypes** page provides a list of integrated subtypes, which users can use as templates to create their own custom subtypes. Using the **Specialize** option for a subtype, a user can duplicate the subtype template and make the necessary updates to create a new custom subtype. Subtypes can be imported and exported, which allows users to apply their custom subtypes to other Cisco Modeling Labs server installations.

In the **Subtypes** page, you can perform a number of operations for subtypes. These operations are:

Operation	Description
Import	Imports a subtype from a JSON file.
Export	Exports a subtype to a JSON file.
Specialize	Duplicates an available subtype to create a custom subtype.

Import a Subtype

Subtypes for import must be available in a JSON file.

To import a subtype, complete the following steps:

- Step 1** Click **Import** to import a new subtype.
The **Import Subtypes** page appears.
- Step 2** Paste the subtype details from the JSON file into the text area.
- Step 3** Click **Import**.

The newly imported subtype is listed on the **Subtypes** page.

- Step 4** (Optional) Click **Specialize** to create a custom subtype based on the newly imported subtype, click **Modify** to amend the details for the subtype, or click **Delete** to delete the subtype.

Create a Custom Subtype

To create a custom subtype, complete the following steps:

- Step 1** For the applicable subtype, under the **Options** column and click the **Specialize** icon.

The **Specialize Subtype** page appears.

- Step 2** Update the subtype fields as required.

Note You can use the default values on the **Subtypes** page; however, you must provide a new name for the new subtype.

Table 11: New Subtype Fields

Field	Description
Name of new subtype	Enter a name for the new subtype.
Description of plugin	Provide a description of the plug-in to be created.
Name of management interface	Enter a name for the management interface.
Names of dummy interfaces	Enter names for dummy interfaces, inserted between management interface and first data interface.
Pattern for data interface names	Provide the interface name format, for example, GigabitEthernet0/{0}.
First data interface number	Enter a valid integer for the first interface.
Max count of data interfaces	Enter the maximum allowed number of interfaces.
Number of interfaces per LC	Enter the permitted number of interfaces per line card (LC) allowed.
Number of serial interfaces	Choose the number of interfaces allowed. Options are 0 , 1 , 2 , 3 , and 4 .
Protocol for network CLI	Choose the type of console connection. Options are Telnet or SSH .
Make VNC access available	Allow VNC access. Enabled when the check box is checked.
Name of icon for GUI	Enter a name for the subtype icon that is displayed in the Cisco Modeling Labs client.

Field	Description
Show subtype on GUI palette	Allow the subtype icon to be displayed in the Cisco Modeling Labs client. Enabled when the check box is checked.
Configuration disk type	Choose the type of configuration disk. Options are cdrom , disk , cloud-init , iso9660 , and vfat . For LXC subtypes, set to lxc .
ISO 9660 Level in cdrom Disk	Choose the ISO 9660 level in cdrom disk. Options are 2 , 3 , and 4 .
Name of file for config drive	Enter a name for the configuration drive file.
Virtual interface model	Choose a virtual interface model. Options are e1000 , virtio , and rtl8139 .
Main disk bus model	Choose a main disk bus model. Options are ide , virtio , and scsi .
RAM (MB) allocated per node	Specify the amount of RAM (MB) to use for each node.
Number of CPUs allocated per node	Choose the number of CPUs to allocate per node. Value range is 1 to 16.
Extra comma-separated image properties	Enter any additional image properties, set on all images added for that subtype through the Create New Image page.
Name of default image	Enter a name for the default image.
Name of default flavor	Enter a name for the default flavor for VM-based subtypes and a default template name for LXC subtypes.

Note You can choose to go with the default values on the Subtypes page; though you must provide a name for the new subtype.

Step 3 When completed, click **Create** to create the new custom subtype.

The new subtype is created and its details are displayed in the **Subtypes** page for the new subtype.

Note For a newly created subtype, the value in the **Dynamic** column is **Yes**, which indicates that the subtype is not built into the server, and therefore may be modified or deleted.

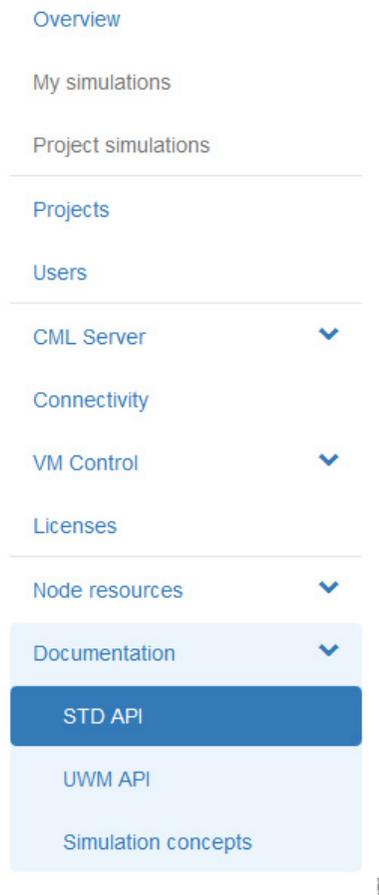
Step 4 (Optional) On this page, you can click **Specialize** to create a custom subtype based on the newly created subtype, click **Modify** to amend the details for the subtype, or click **Delete** to delete the subtype.

Step 5 Click the **Subtypes** tab to see the custom subtype listed on the page.

Documentation

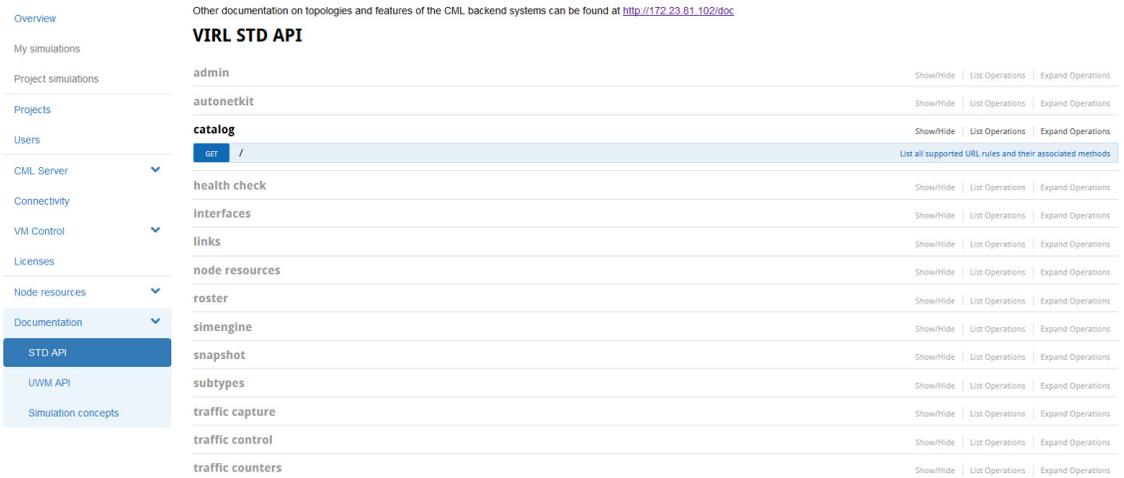
Within the **User Workspace Management** interface, you can access STD API and User Workspace Management API documentation. It is available from **User Workspace Management > Documentation**.

Figure 33: Documentation Options



To access the STD API, click **STD API**. The **STD API** page is displayed.

Figure 34: Standard API

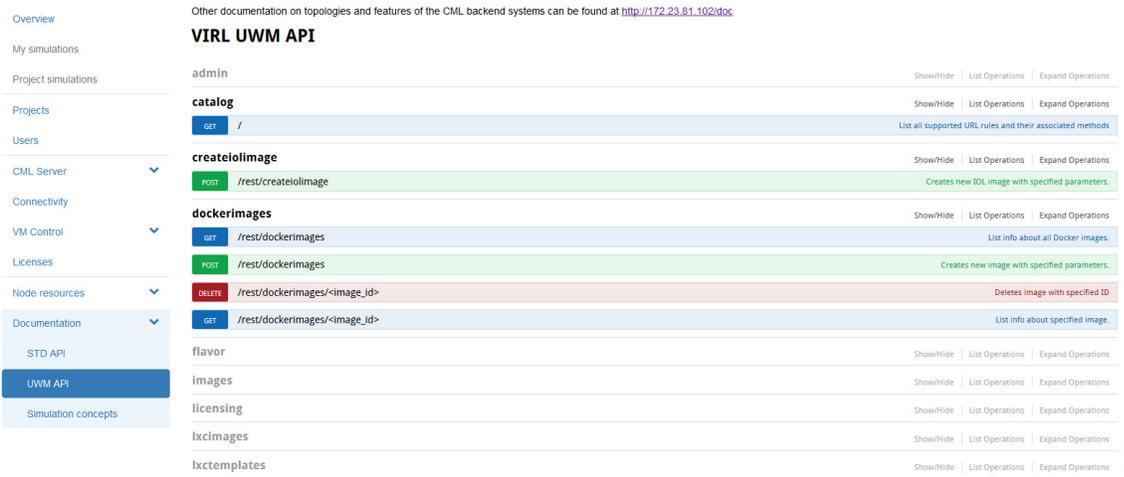


418011

From this page, you are able to browse the available REST calls and see examples of the call structures for the STD API.

To access the User Workspace Management API, click **UWM API**. The **UWM API** page is displayed.

Figure 35: UWM API



418010

From this page, you are able to browse the available REST calls and see examples of the call structures for the UWM API.

To access the Cisco Modeling Labs simulation concepts' pages, click **Simulation concepts**. The **Simulation concepts** main page is display. Click **1. README** to access the documentation.

Figure 36: Simulation Concepts Documentation

The screenshot shows a web page for VIRT 0.10.29.12 documentation. The page title is "1. README". The left sidebar contains navigation links: "Previous topic: VIRT", "Next topic: 1.1. Introduction", "This Page: Show Source", and "Quick search" with a search input field and a "Go" button. The main content area lists the following topics:

- 1.1. Introduction
- 1.2. Terminology and Overview
- 1.3. VIRT-CLIENTS package
- 1.4. Projects, Users and Special Networks
- 1.5. VIRT Nodes
- 1.6. Configuration
- 1.7. Installation
- 1.8. OpenStack Client
- 1.9. VIRT User Workspace Management Server
- 1.10. VIRT Service Topology Director Server
- 1.11. Troubleshooting

The footer of the page includes the text "© Copyright 2016, Cisco Systems, Inc. All rights reserved. Created using Sphinx 1.2.3." and a vertical ID "418013" on the right side.