



Overview of Cisco Modeling Labs

- [Cisco Modeling Labs, page 1](#)
- [Cisco Modeling Labs Server Components, page 1](#)
- [Cisco Modeling Labs Client, page 2](#)
- [Virtual Images, page 2](#)
- [Cisco Modeling Labs Component Requirements, page 3](#)
- [Cisco Modeling Labs Framework, page 5](#)

Cisco Modeling Labs

Cisco Modeling Labs is a scalable and extensible software platform that enables operators, engineers, network designers, and architects to design Cisco-based networks and run simulations using virtual versions of selected Cisco operating systems. Cisco Modeling Labs comprises the Cisco Modeling Labs server and the Cisco Modeling Labs client. Together, they provide a sandbox environment that facilitates the design, configuration, visualization, and simulation of network topologies quickly and efficiently.

- **Cisco Modeling Labs server:** A shared resource containing the capability to initiate topologies using installed virtual images.
- **Cisco Modeling Labs client:** A point-and-click GUI that simplifies topology creation and initial device configurations along with continuous updates. It also permits access to the Cisco Modeling Labs server functionality.

Cisco Modeling Labs Server Components

The Cisco Modeling Labs server is available as:

- A Linux distribution that is bundled within the VMware Open Virtual Appliance (OVA) file for VMware ESXi. The bundle includes all the supporting files.
- A Linux distribution that is bundled with an ISO image file for bare-metal environments. The bundle includes all the supporting files.

The Cisco Modeling Labs 1.1 server is a shared resource used by end users to run backend functions, such as router bootstrap configurations, spinning up routers to operate with designated operating systems, and modifying and testing configurations.

Cisco Modeling Labs comprises a framework of components. The main components are:

- **OpenStack:** An open-source platform for creating and managing large groups of virtual servers in a cloud-computing configuration. It is used for node control, management, and networking.
- **AutoNetkit:** An automated configuration engine that uses templates to provide working router configurations based on user-supplied and default parameters for each virtual machine (VM).
- **Services Topology Director:** Generates OpenStack calls for the creation of VMs and links based on the XML topology definition created by the Cisco Modeling Labs client. Additionally, it provides the bootstrap configuration, which can be autogenerated, generated manually, or imported.

Cisco Modeling Labs Client

The Cisco Modeling Labs client is a cross-platform user interface for creating and editing network designs and simulating those network topologies on the Cisco Modeling Labs server. The Cisco Modeling Labs client offers the following benefits:

- The ability to use a graphical point-and-click editor to quickly create and edit complex network topologies in a sandbox.
- Access to the build, visualization, and launch functions available in the Cisco Modeling Labs server.

The Cisco Modeling Labs client enables you to interact directly with your running simulations from the user interface. The Cisco Modeling Labs client also provides the functionality to generate default router configurations before launching the topology simulation.

For further information on the Cisco Modeling Labs client, see [Using the Cisco Modeling Labs Client Overview](#).

Virtual Images

Cisco Modeling Labs 1.1 includes the following images built into the Cisco Modeling Labs client:

- Cisco Virtual IOS (IOSv) Software Release 15.5(3)M
- Cisco IOSv Layer 2 Switch Software Release 15.2 (4.0.63)E
- Linux server (Ubuntu 14.04.2 LTS Cloud-init)

Additionally, the following demonstration images are included in the build:

- Cisco IOS XRv Software Release 5.3.1 CCO
- Cisco CSR1000v Software Release 3.1.6 XE-based

The following production images are available to purchase separately:

- Cisco IOS XRv Software Release 5.3.1
- Cisco CSR1000v Software Release 3.1.6

- Cisco ASAv Software Release 9.4.1

See [Release Notes for Cisco Modeling Labs 1.1](#) for more information on Cisco virtual software-supported features.

Cisco Modeling Labs Component Requirements

The following tables identify the minimum requirements for installing and operating the Cisco Modeling Labs Corporate Edition, Release 1.1. For additional information, see [Cisco Modeling Labs Corporate Edition Client Installation Guide, Release 1.1](#) and [Cisco Modeling Labs Corporate Edition System Administrator Installation Guide, Release 1.1](#). These guides provide detailed information on platform requirements for installing and operating Cisco Modeling Labs Corporate Edition, Release 1.1 for system administrators and end users.



Important

The requirements listed in the following table are for topologies containing Cisco IOSv nodes only. You must use the resource calculator for topologies containing nodes other than Cisco IOSv nodes.

This is a basic rule of thumb since there are many variables, such as the type of nodes running (Cisco IOSv versus Cisco IOS XRv), the number of routing protocols, the timers set on each node, the amount of traffic, and so on. Each of these use their share of computational resources that are usually running on dedicated hardware.

Table 1: Server Hardware Requirements

Requirement	Description
Small Installation (Minimum)	Server with capacity to run base package of 15 IOSv nodes
Memory (RAM)	16 GB
Disk Space	250 GB minimum
Processors	4 CPU cores
Small and Medium Installation	Server with a capacity to run up to 50 nodes
Memory (RAM)	128 GB
Disk Space	250 GB minimum
Processors	16 CPU cores
Large Installation	Server with a capacity to run up to 100 nodes
Memory (RAM)	256 GB
Disk Space	250 GB minimum
Processors	40 CPU cores

Table 2: Server Software Requirements

Requirement	Description
VMware vSphere	<p>One of the following:</p> <ul style="list-style-type: none"> • ESXi 5.1 U2 (Build 1483097) • ESXi 5.5 U1 (Build 1623387) • ESXi 6.0 (Build 2494585) <p>Note You must verify that you are using vSphere Client v5.5 Update 2 (Build 1993072) or later before deploying Cisco Modeling Labs. Failure to use the minimum version will result in a failed deployment that returns an error stating that nested virtualization is not supported.</p>
Browser	<p>One of the following:</p> <ul style="list-style-type: none"> • Google Chrome Version 33.0 or later • Internet Explorer 10.0 or later • Mozilla Firefox 28.0 or later • Safari 7.0 or later <p>Note Internet Explorer is not supported for use with the AutoNetkit Visualization functionality and the User Workspace Management interface.</p>

Table 3: Client Hardware Requirements

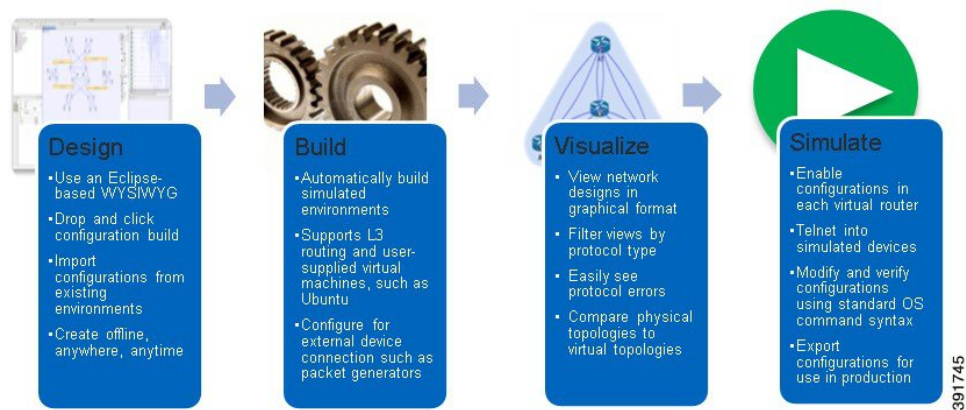
Requirement	Description
Operating System	<p>Either of the following:</p> <ul style="list-style-type: none"> • Microsoft Windows <ul style="list-style-type: none"> ◦ Windows 7 or ◦ Windows 8 • OS X <ul style="list-style-type: none"> ◦ OS X 10.8 or later
Memory (RAM)	500 MB
Disk Space	200 MB

Table 4: Client Software Requirements

Requirement	Description
Java Runtime Environment (JRE)	For Windows and OS X, either of the following: <ul style="list-style-type: none"> • Version 6 • Version 7 • Version 8
Browser	One of the following: <ul style="list-style-type: none"> • Google Chrome Version 33.0 or later • Internet Explorer 10.0 or later • Mozilla Firefox 28.0 or later • Apple Safari 7.0 or later <p>Note Internet Explorer is not supported for use with the AutoNetkit Visualization functionality and the User Workspace Management interface.</p>

Cisco Modeling Labs Framework

Figure 1: Cisco Modeling Labs Framework



Cisco Modeling Labs includes numerous features that enable you to create and simulate small and large network designs. This user guide is organized in a task-based format where the main features are grouped into four sections that are referred to as phases.

The following items describe each phase which should help you determine, which section to refer to when using this guide:

- 1 Design:** This phase includes the tasks for creating a network topology. You use a blank canvas to create topologies from scratch or import existing network topologies. You can also adjust where and how interfaces are used on each device.
- 2 Build:** This phase includes the tasks associated with configuring routers, external connections, and servers, creating the required configurations, setting up interfaces, IP addressing, and routing protocols for the virtual routers. There are several ways to create these configurations. You can use the AutoNetkit functionality to set up the initial configuration, or you can input your own configuration details. Whatever configurations you create in this phase will be the configurations that the Cisco Modeling Labs server will use when it initiates the node simulations.
- 3 Visualization:** This phase is optional and operates only if you use AutoNetkit to create your configurations during the build phase. It includes the tasks related to running visualization scenarios of your network design and configuration. It provides visual views of your topology whereby you can see how the nodes will interact with each other in specific circumstances, including physical set up, as well as with specific routing protocols, such as IS-IS and OSPF. It also supports MPLS and BGP.
- 4 Simulation:** This phase includes the tasks for initiating the nodes and making them active. Once the nodes are operational, you can use Telnet or SSH to connect to the consoles as you would connect to a router console. You can run connectivity tests and modify configurations. This is where the power of the product is realized: you can modify and test configurations as if you were on actual physical devices. In this phase, you can also save your configurations and extract them for sharing with others or save them and use them as reference when configuring the production network.