



Visualizing the Simulation

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Live Visualization

The Live Visualization phase provides a live, real-time visual representation of the running simulation in the Cisco Modeling Labs client.



Note

In order to use the Live Visualization feature, the topology must use an LXC management node when launched. Under **Properties > Topology**, check the **Use an LXC Management Node** check box when designing your topology. Then generate the node configurations using parameters defined in AutoNetkit.

For the running simulation, you can see the LXC management node in the **Simulations** view.

Live Visualization runs in an separate, external Web browser window. Ensure that you use a compatible browser, as described in [Cisco Modeling Labs Server Requirements](#) for the version of Cisco Modeling Labs that you are using.

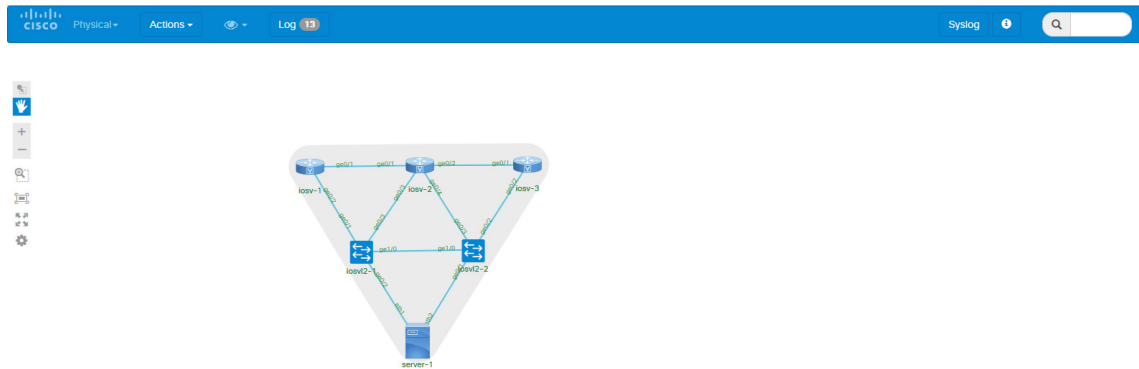


Note

Live Visualization is independent of AutoNetkit. It does not require AutoNetkit to run. However, a valid Cisco Modeling Labs license is required in order to use this feature. Also, ensure that each node has started up successfully and has applied its configuration before attempting to run a Live Visualization. A running node is displayed in green on the canvas and is displayed in green with [ACTIVE] in the **Simulations** view.

The following figure shows an overview of the Live Visualization phase as it appears in a browser window.

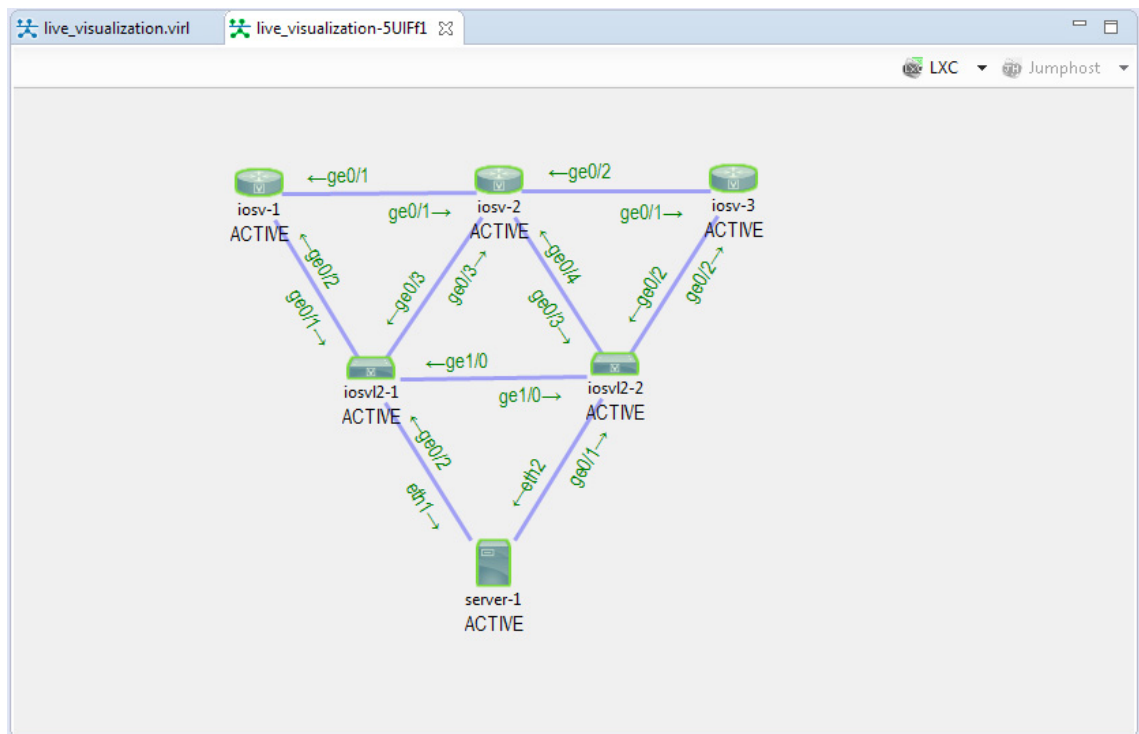
Figure 1: Live Visualization Overview



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The following figure shows how the Live Visualization compares to the topology design.

Figure 2: Topology Design



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View the Live Visualization

To access the Live Visualization for a running simulation, complete the following steps:

**Note**

The simulation must be configured to use an LXC management node when launched. This is enabled under **Properties** > **Topology** view by checking the **Use an LXC Management Node** check box. Then generate the node configurations using AutoNetkit.

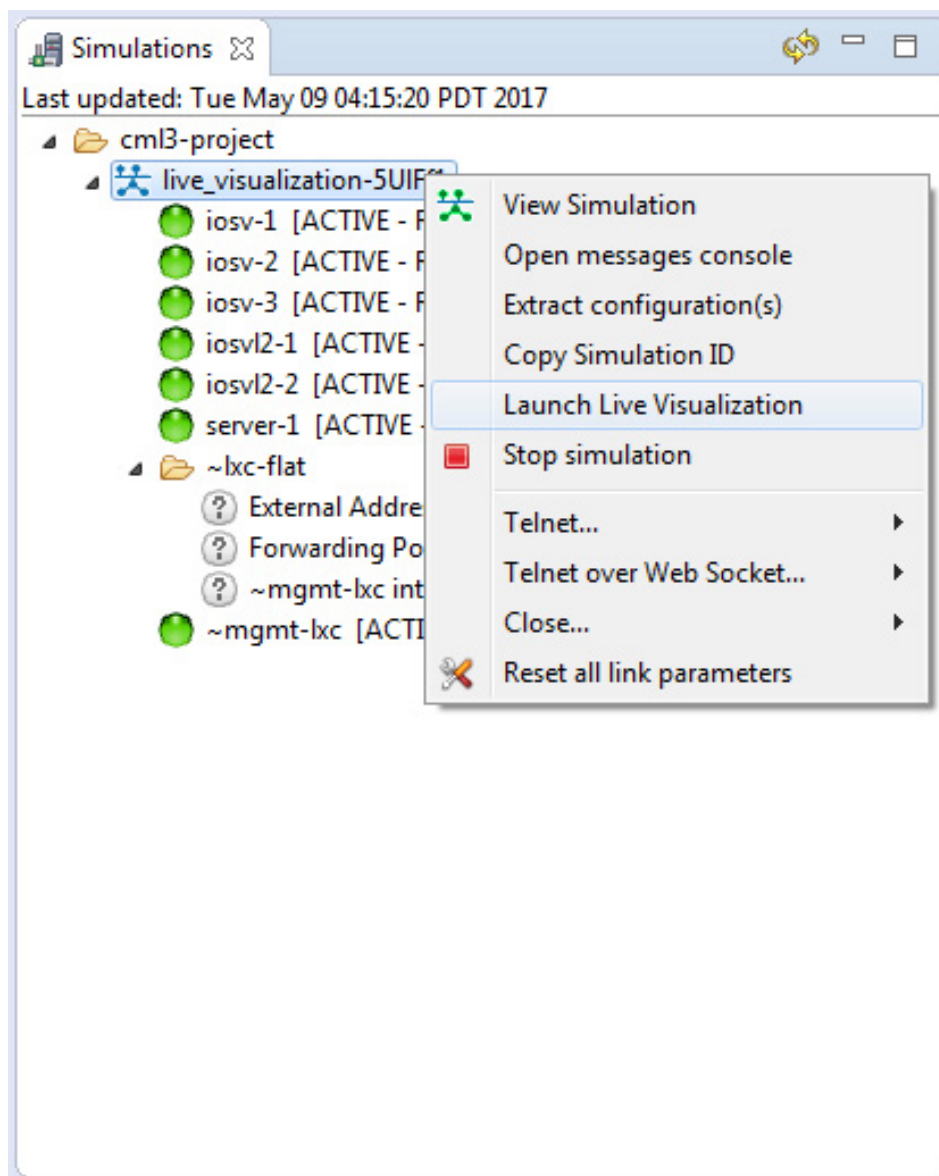
Step 1

In the **Simulations** view, right-click the simulation name.

Step 2

From the drop-down list displayed, click **Launch Live Visualization**.

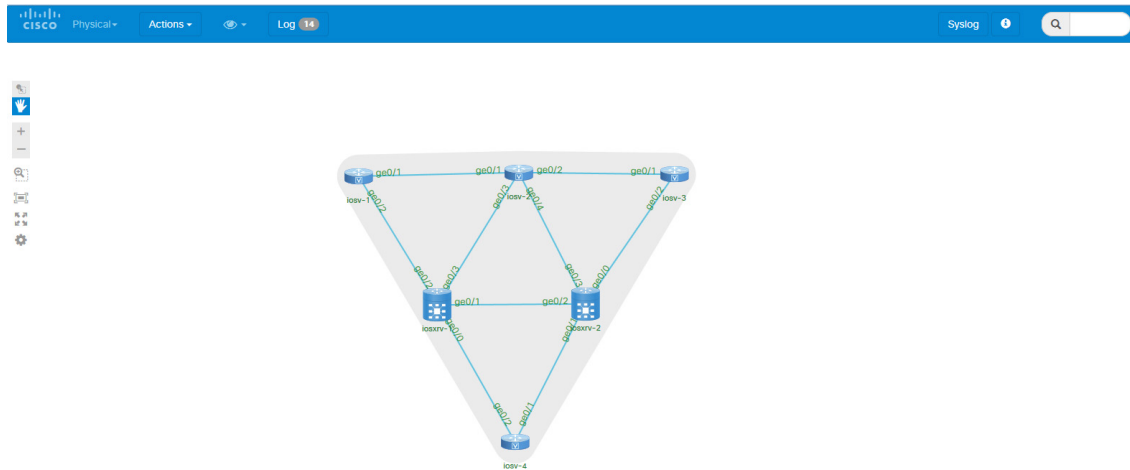
Figure 3: Launch Live Visualization Option



A web browser opens.

- Step 3** Enter your username and password and click **Log In**.
The Live Visualization opens in a web browser as shown.

Figure 4: Live Visualization View



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Note You are only prompted for your user credentials the first time you launch a Live Visualization.

- Step 4** You can also access the Live Visualization for a running simulation from the User Workspace Management interface. In the User Workspace Management interface, login and under **My Simulations**, choose the applicable running simulation. The details page for the running simulation is displayed.

Figure 5: Accessing Live Simulations from the User Workspace Management Interface

Overview

My simulations

Project simulations

Projects

Users

CML Server

Connectivity

VM Control

Licenses

Node resources

Repositories

Documentation

Simulation live_vis_traceroute-U5TsdJ details

Simulations | live_vis_traceroute-U5TsdJ

Refresh

Live Visualization Stop simulation Set expiration Download original vml file

User	Project	Status	Started	Expires
guest	guest	ACTIVE	2016-03-21 17:18:32	never

Nodes

Show 10 entries

Start nodes Stop nodes Extract configs

Filter:

Node	Subtype	State	Management IPs	External Connections	Options
iosv-1	IOSv	ACTIVE	10.255.0.9	telnet://172.23.81.124:17108 telnet://172.23.81.124:17109	📄 📡 📡 📡
iosv-2	IOSv	ACTIVE	10.255.0.4	telnet://172.23.81.124:17000 telnet://172.23.81.124:17001	📄 📡 📡 📡
iosv-3	IOSv	ACTIVE	10.255.0.7	telnet://172.23.81.124:17007 telnet://172.23.81.124:17104	📄 📡 📡 📡
iosv-4	IOSv	ACTIVE	10.255.0.5	telnet://172.23.81.124:17002 telnet://172.23.81.124:17003	📄 📡 📡 📡
iosxrv-1	IOS Xrv	ACTIVE	10.255.0.8	telnet://172.23.81.124:17105 telnet://172.23.81.124:17106	📄 📡 📡 📡 📡

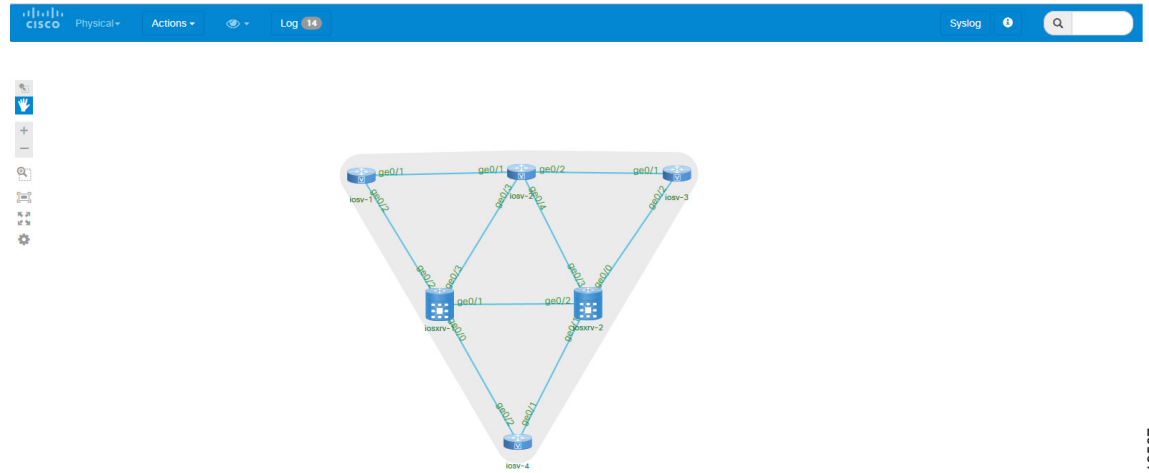
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- Step 5** Choose **Live Visualization** to launch the Live Visualization for the running simulation in a new web browser.

Live Visualization Overlay Options

The initial Live Visualization overlay that is displayed in the browser window is the physical model of the topology. The physical model shows the nodes and interface connections between the nodes based on the .virl file. It is similar to the Cisco Modeling Labs topology view.

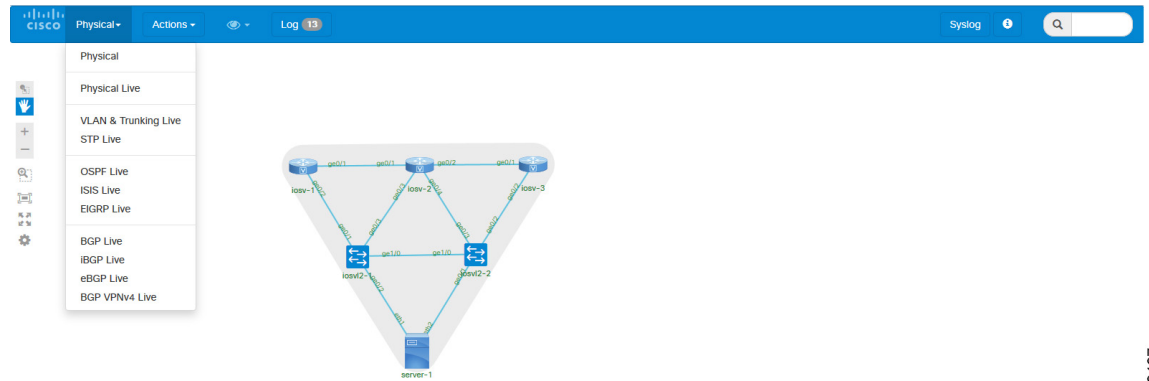
Figure 6: Initial Overlay



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The **Physical** drop-down list provides a series of overlays such as the physical live overlay, the OSPF live overlay, the iBGP live overlay and so on. When you select one of these options, Cisco Modeling Labs collects the live data from the nodes in the topology and draws the protocol map.

Figure 7: List of Physical Overlays

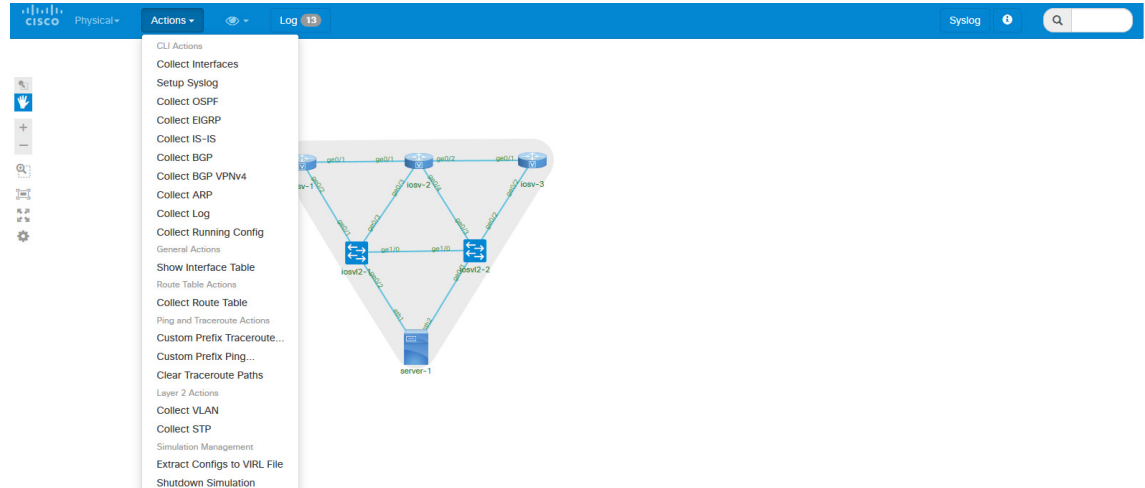


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The **Actions** drop-down list provides a list of actions that are applied for each specific protocol. When an action is selected from the **Actions** drop-down list, this results in commands being executed on each active

virtual machine. The **Actions** drop-down list also provides other functions such as Shutdown Simulation, Show Interface Table, Clear Traceroute Paths.

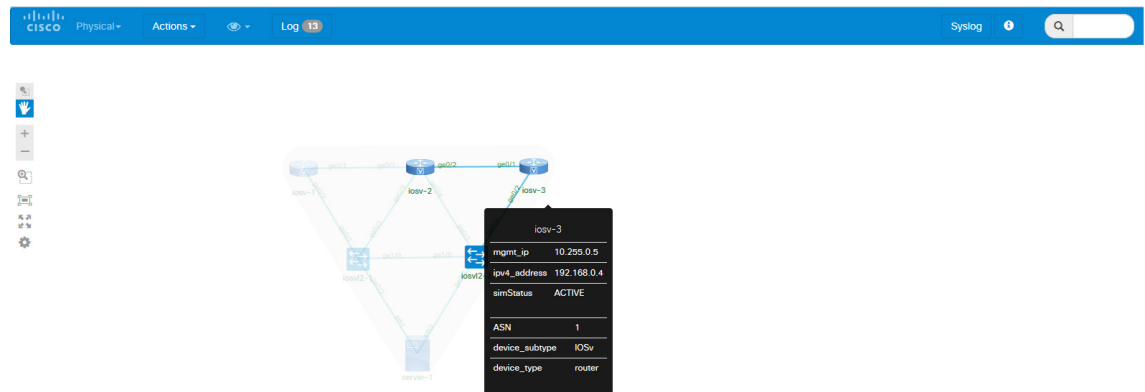
Figure 8: List of Actions Options



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Placing the cursor over a node displays a pop-up view of information about that node. The type of information displayed depends on the selected option and node configuration. You can also hover over the connections to see connection details.

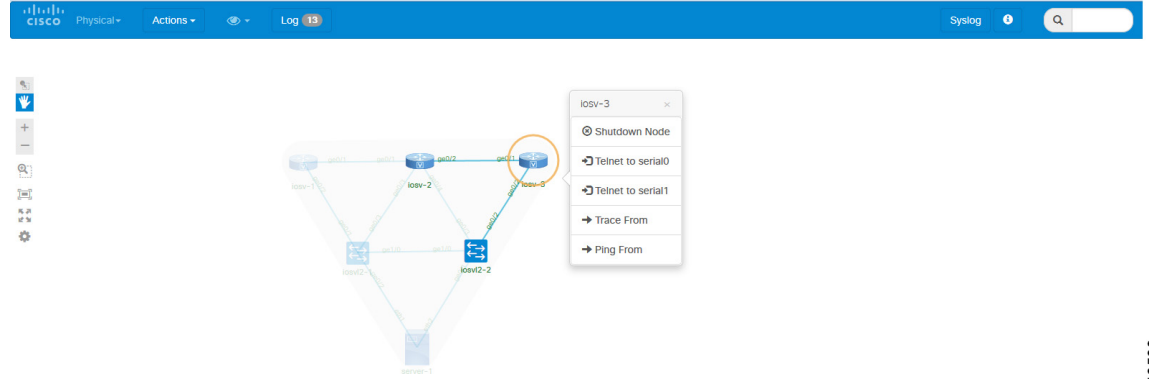
Figure 9: Node Information



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Selecting a node displays a pop-up menu of available options for the node.

Figure 10: Node Options



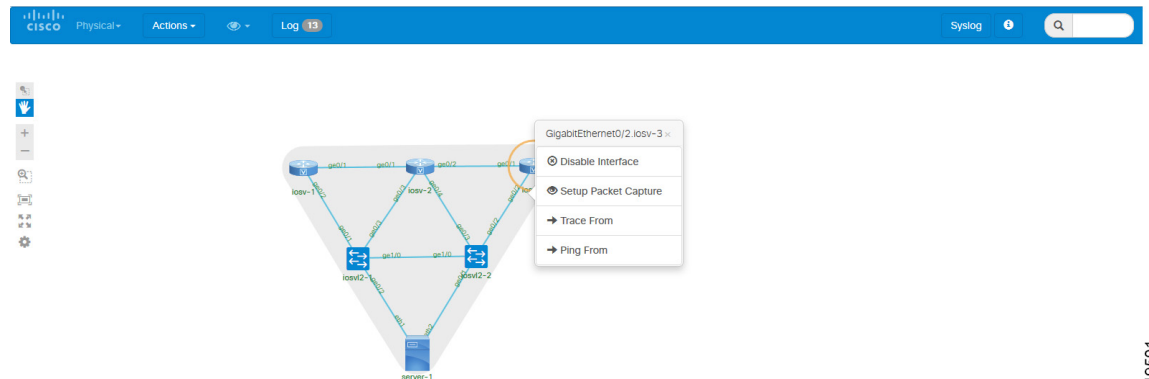
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Available options are:

- **Shutdown Node:** Allows you to shutdown a running node, with the results reported in the **Log** view.
- **Telnet to Serial0/Serial1:** Allows you to Telnet to a node's serial ports 0 and 1. Opens a console port to serial or aux ports from within the web browser.
- **Collect Node Route Table:** Allows you to collect the route table from every node in the simulation, with the results reported in the **Log** view.
- **Plot Routes to Prefix (alpha):** Allows you to select a node and the system will show the next hops taken by traffic to this node's loopback address. This only work for nodes that are Cisco IOSv instances.
- **Ping From/To:** Allows you to ping from one node to another node. A five packet ping is triggered from source to destination, with the results reported in the **Log** view.
- **Trace From/To:** Allows you to execute a traceroute between nodes, with the results reported in the **Log** view.

Selecting an interface displays a pop-up menu of available options for the interface.

Figure 11: Interface Options



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Available options are:

- **Disable/Enable Interface:** Allows you to disable an interface, with the results reported in the **Log** view.
- **Setup Packet Capture:** Allows you to start a packet capture. Opens the User Workspace Management interface in a new web browser, where you can set the required capture limits.
- **Plot Routes to Prefix (alpha):** Allows you to select an interface and the system will show the next hops taken by traffic to this interface's loopback address.
- **Trace From/To:** Allows you to execute a traceroute between interfaces, with the results reported in the **Log** view.
- **Ping From/To:** Allows you to ping from one interface to another interface, with the results reported in the **Log** view.

Physical Connections

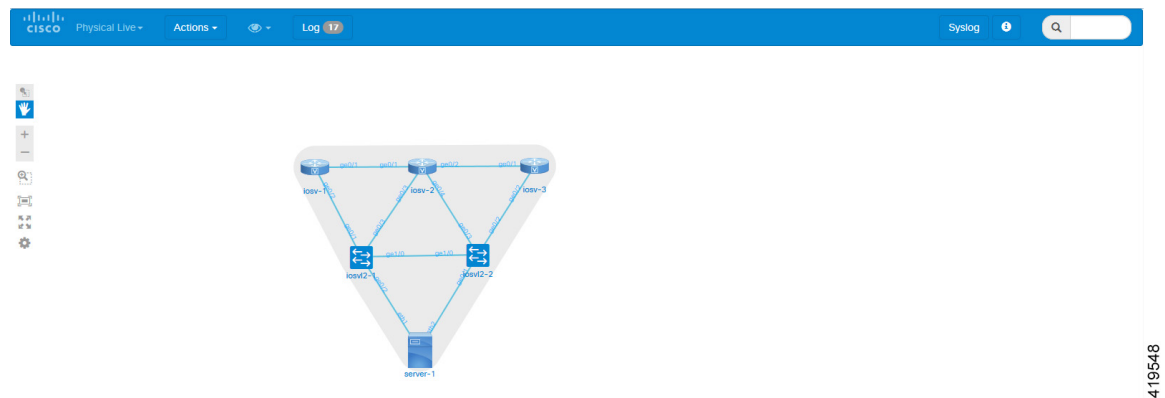
To view the live physical data, place the cursor over the **Physical** list and select **Physical Live** from the drop-down list.



Note

The collect interfaces action is run automatically when a Live Visualization session is first loaded.

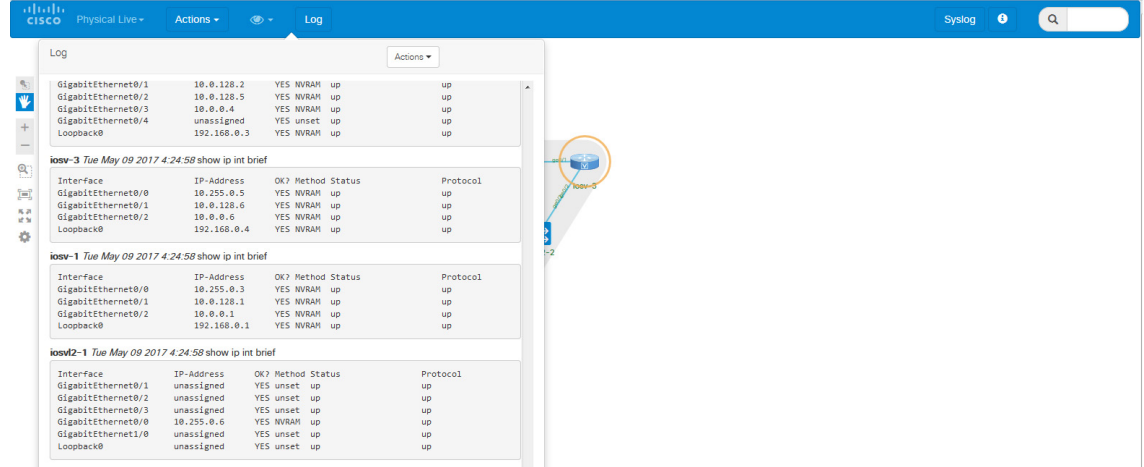
Figure 12: Physical Live Overlay



Hovering over an interface displays the information collected about the interface. The command **Actions > Collect Interfaces** is used to collect IP addressing information from the interfaces in order to perform reverse

mappings, such as, IGP, BGP, and traceroute data processing. If the IPs are changed, you need to re-run this command. You can view the command applied in the **Log** view.

Figure 13: Physical Live Log Output



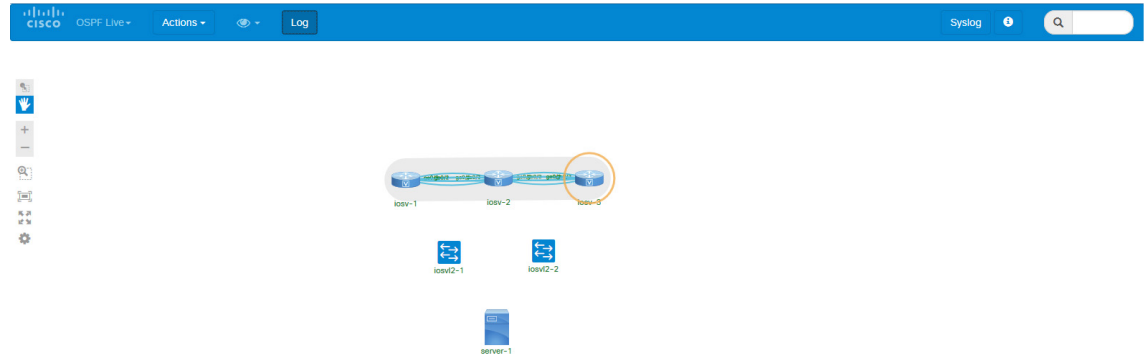
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OSPF

To view the live OSPF data, do either of the following:

- Choose **Physical > OSPF Live** from the drop-down list; or
- Choose **Actions > Collect OSPF**. For both options, the **Collect OSPF** action runs the relevant show OSPF command on the nodes and then triggers the processor to parse and build the connectivity. The results are shown as adjacencies on the topology.

Figure 14: OSPF Live Overlay



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You can view the show command applied in the **Log** view.

Figure 15: OSPF Live Log Output

The screenshot shows the 'Log' view in the Cisco Live simulation. The log contains the following entries:

```

iosv-3 Tue May 09 2017 4:26:41 show ip ospf neighbor
Neighbor ID Pr1 State Dead Time Address Interface
192.168.0.1 1 FULL/DROTHER 00:00:39 10.0.0.1 GigabitEthernet0/2
192.168.0.3 1 FULL/BDP 00:00:35 10.0.0.4 GigabitEthernet0/2
192.168.0.3 1 FULL/BDP 00:00:35 10.0.128.5 GigabitEthernet0/1

iosv-1 Tue May 09 2017 4:26:41 show ip ospf int brief
Interface PID Area IP Address/Mask Cost State Nbrs F/C
Lo0 1 0 192.168.0.1/32 1 LOOP 0/0
Gi0/2 1 0 10.0.0.1/17 1 DROTHER 2/2
Gi0/1 1 0 10.0.128.1/30 1 BDR 1/1

iosv2-1 Tue May 09 2017 4:26:41 show ip ospf neighbor

iosv-3 Tue May 09 2017 4:26:41 show ip ospf int brief
Interface PID Area IP Address/Mask Cost State Nbrs F/C
Lo0 1 0 192.168.0.4/32 1 LOOP 0/0
Gi0/2 1 0 10.0.0.6/17 1 DR 2/2
Gi0/1 1 0 10.0.128.6/30 1 DR 1/1

iosv2-2 Tue May 09 2017 4:26:41 show ip ospf neighbor

iosv-2 Tue May 09 2017 4:26:41 show ip ospf int brief
Interface PID Area IP Address/Mask Cost State Nbrs F/C
Lo0 1 0 192.168.0.3/32 1 LOOP 0/0
Gi0/3 1 0 10.0.0.4/17 1 BDR 2/2
Gi0/2 1 0 10.0.128.5/30 1 BDR 1/1

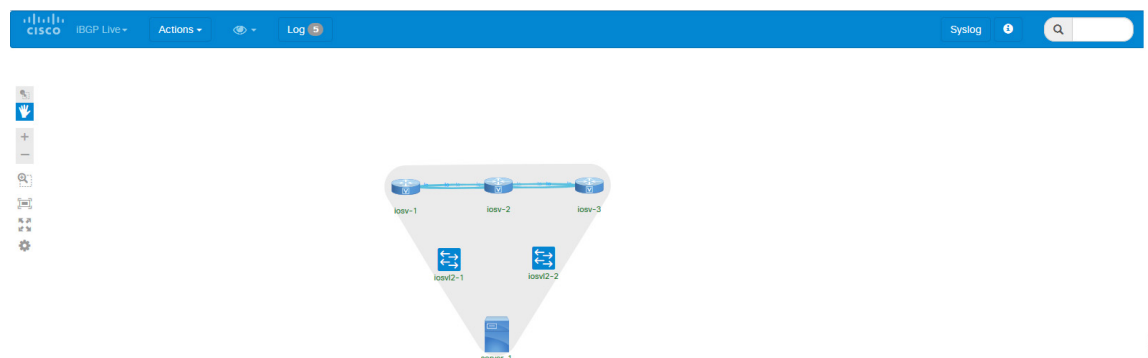
```

iBGP

To view the live iBGP data, do either of the following:

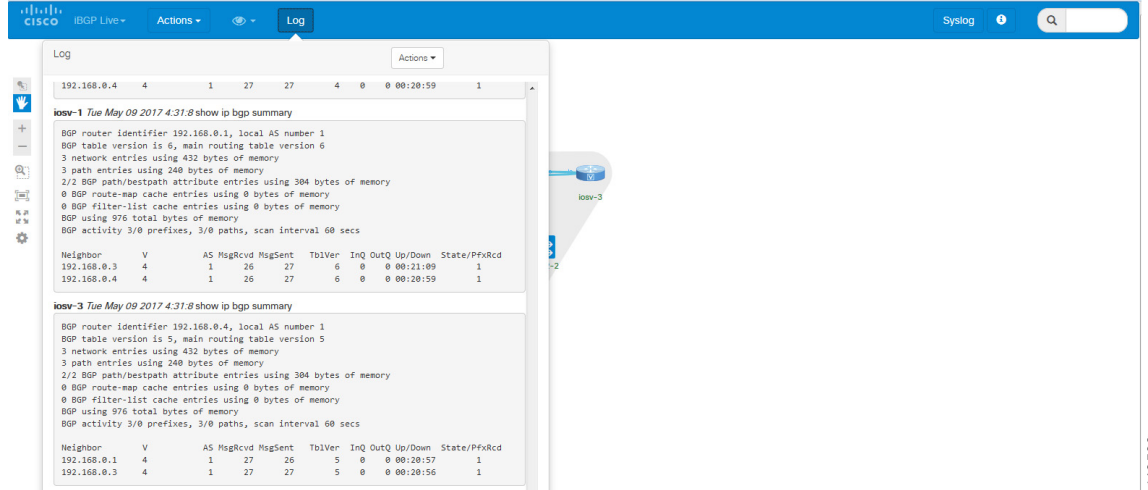
- Choose **Physical > iBGP Live** from the drop-down list; or
- Choose **Actions > Collect BGP**. For both options, the **Collect BGP** action runs the relevant show BGP command on the nodes and then triggers the processor to parse and build the connectivity. The results are shown as adjacencies on the topology.

Figure 16: iBGP Live Overlay



You can view the show command applied in the **Log** view.

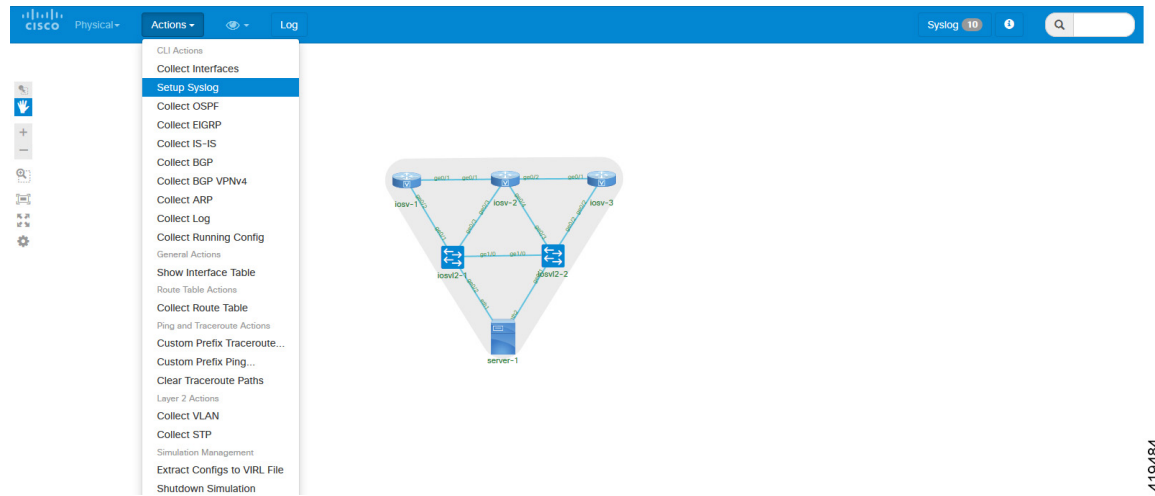
Figure 17: iBGP Live Log Output



SYSLOG

You can configure all nodes to send syslog messages to a syslog process. From the **Actions** drop-down list, click **Setup Syslog**. This sets up the virtual machines to send syslog messages to the LXC management node.

Figure 18: Setup Syslog Option



These messages are forwarded through a web socket to the front-end and can be seen under the **Syslog** option.

Figure 19: Syslog Process

The screenshot displays the Cisco Modeling Labs (CML) interface. On the left, a network topology is shown with nodes labeled iosv-1, iosv-2, iosv-3, iosv2-1, iosv2-2, and server-1. The main area on the right shows the Syslog log viewer, which contains the following log entries:

```

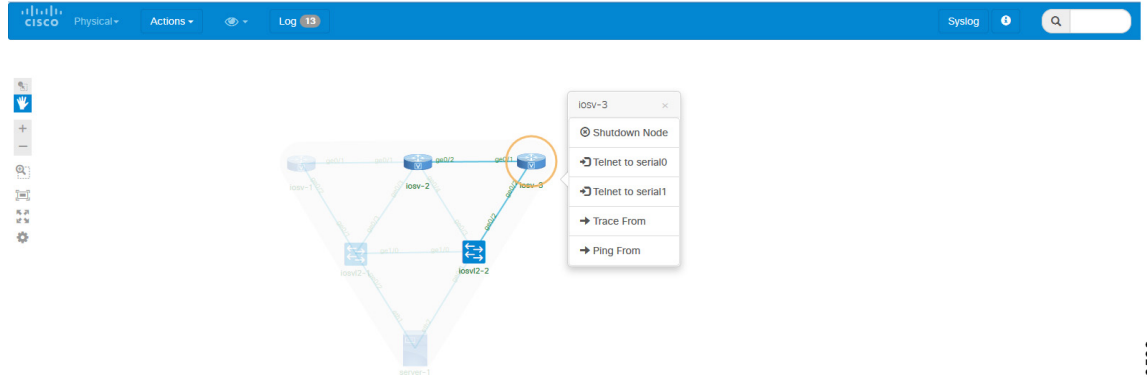
*May 9 11:32:14.785 UTC: NSYS-6-LOGGINGHOST_STARTSTOP: Logging to host 10.255.0.2 port 514 (Mgmt-intf) started - CLI initiated
iosv2-1 May 9 11:32:33
*May 9 11:32:18.593 UTC: NSYS-6-LOGGINGHOST_STARTSTOP: Logging to host 10.255.0.2 port 514 (Mgmt-intf) started - CLI initiated
iosv2-2 May 9 11:32:33
*May 9 11:32:12.445 UTC: NSYS-6-LOGGINGHOST_STARTSTOP: Logging to host 10.255.0.2 port 514 (Mgmt-intf) started - CLI initiated
iosv-1 May 9 11:35:11
*May 9 11:34:46.940 UTC: NSYS-5-CONFIG_I: Configured from console by cisco on vty0 (10.255.0.2)
iosv-2 May 9 11:35:11
*May 9 11:34:58.965 UTC: NSYS-5-CONFIG_I: Configured from console by cisco on vty0 (10.255.0.2)
iosv-3 May 9 11:35:11
*May 9 11:34:49.945 UTC: NSYS-5-CONFIG_I: Configured from console by cisco on vty0 (10.255.0.2)
  
```

Live Visualization Traceroute

The traceroute functionality allows you to view the different routes used between the nodes in your topology.

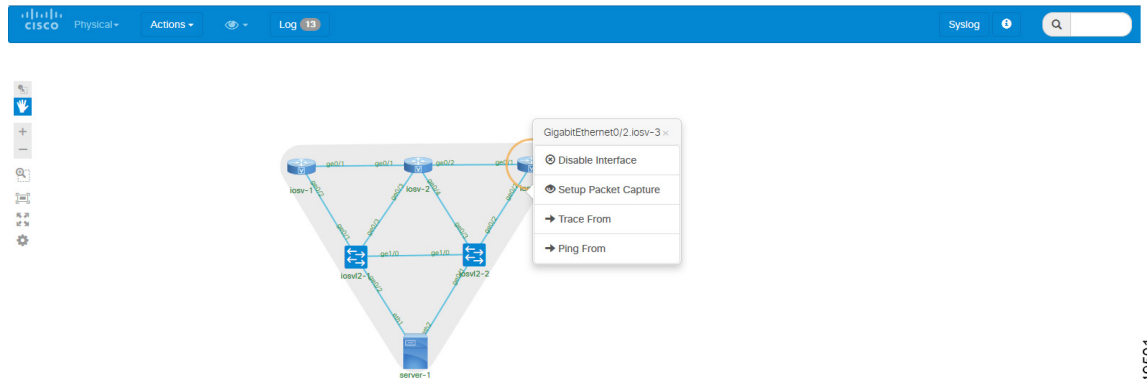
In the Live Visualization, for the source node or source interface, left-click on the applicable node to access the drop-down menu and choose **Trace From**.

Figure 20: Node Menu



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Figure 21: Interface Menu

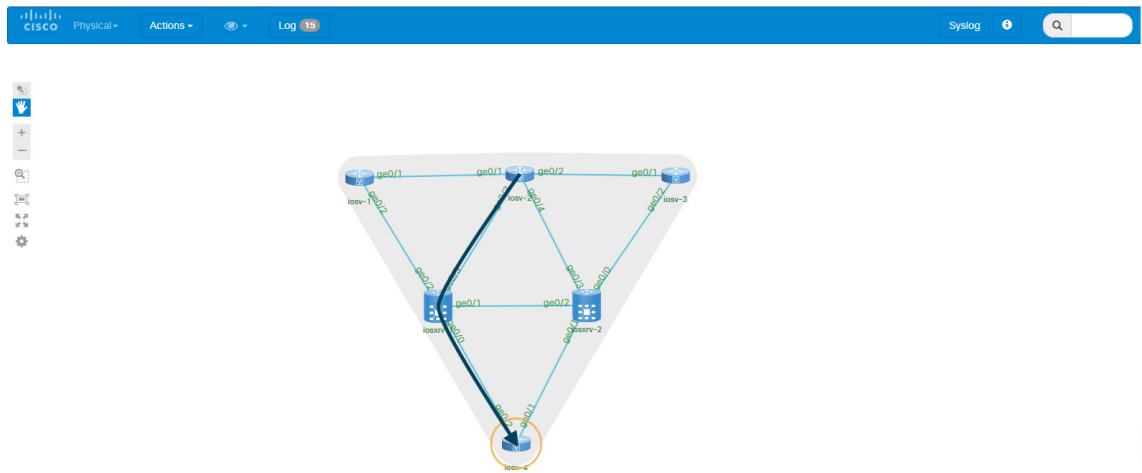


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Next choose a destination node (for the loopback), or destination interface and from the drop-down menu, choose **Trace To**.

This is then matched to the appropriate IP address, using the interfaces IP addresses collected using the interfaces command. This, together with the node identifier, is then sent to the Live Visualization back-end for formatting and running of the command.

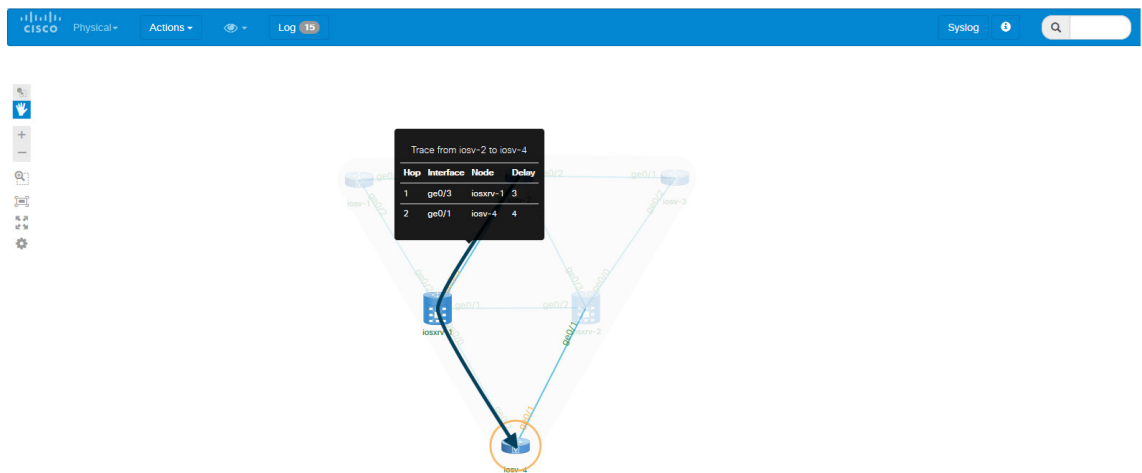
Figure 22: Traceroute Path Displayed



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When a traceroute is executed, hovering the mouse over the path displays information on the path taken.

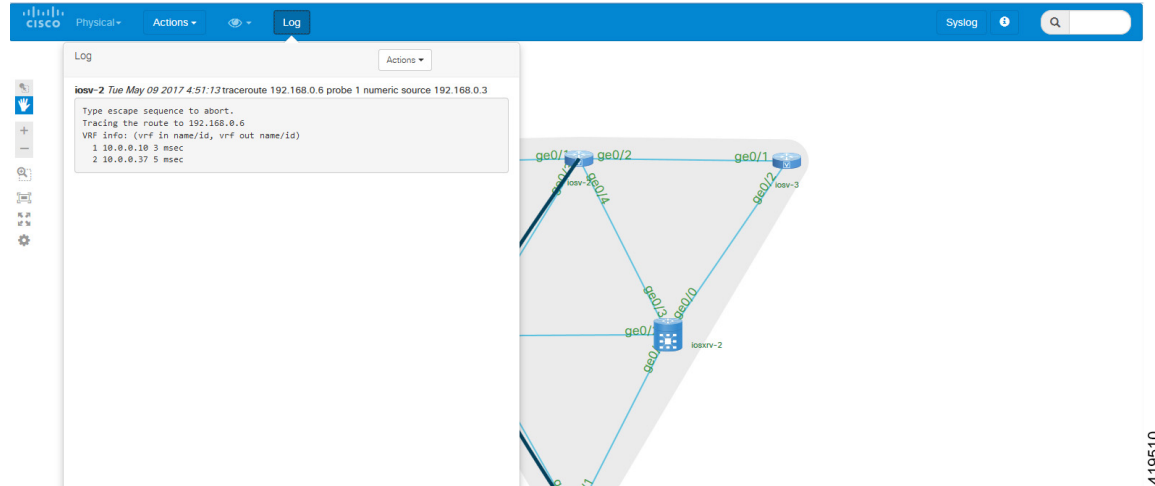
Figure 23: Information on the Path Taken



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Details on the command executed for the traceroute are available in the Log view.

Figure 24: Traceroute Log



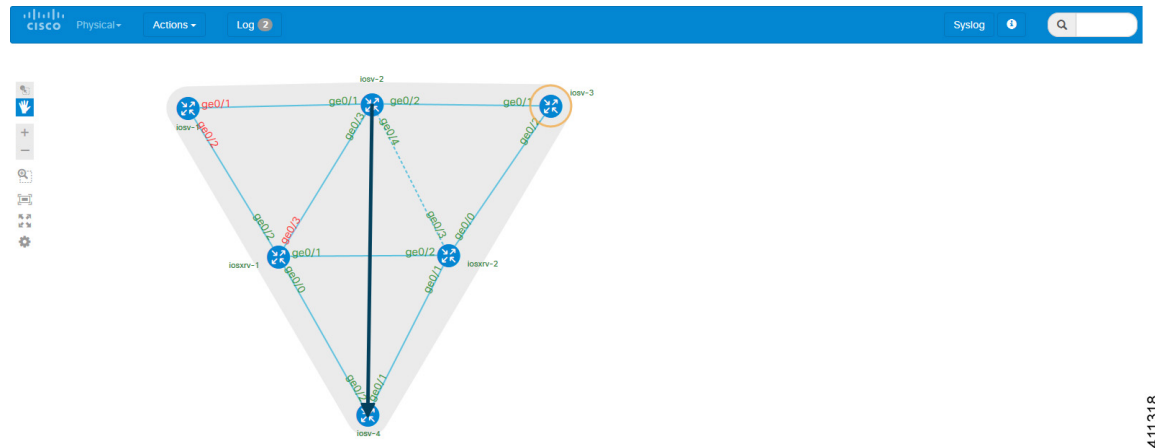
When an interface is disabled in the Live Visualization, the disabled interface name is shown in red. For a disabled node, all its interface names are shown in red. An interface that has link parameters set is displayed as a dashed line.

In the following example, the interface ge0/3 has been disabled so the path is rerouted. The interfaces ge0/1 and ge0/2 for node iosv-1 indicate that the node is disabled.

The interfaces ge0/4 and ge0/3 connecting nodes iosv-2 and iosrv-2 indicate that link parameters have been set for this link.

Re-running the previous traceroute now shows a different path.

Figure 25: Updated Image Showing Rerouted Path



Additionally, the disabled interface is displayed in the Cisco Modeling Labs client with red text and a red dot on a broken line. The link parameters link is shown with a Tools icon. The disabled node is shown in grey with its interfaces displayed as dashed lines, as shown in the following image.

Figure 26: Updated Details in the Cisco Modeling Labs Client

