



# Cisco WAN Automation Engine Release Notes, Release 6.4

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This document describes the features, limitations, and bugs for Cisco WAN Automation Engine (Cisco WAE) Release 6.4.

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## Introduction

Cisco WAE is a model-driven path visibility and path computation engine that simulates, automates, and optimizes multi-vendor, multi-layer networks by leveraging time-series traffic and flow data. For more information on Cisco WAE, visit <http://www.cisco.com/go/wae>.



# New Features

This section contains the following new features:

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## WAE Design

The following table describes all new features related to WAE Design.

Feature	Description
<b>New Tools/Optimization Tool Enhancements</b>	
New tool to perform capacity planning optimization on plan files. <b>(Tools &gt; Capacity Planning Optimization)</b>	Enables capacity planning to address increased traffic and congestion.  To alleviate congestion, the optimizer enables: <ul style="list-style-type: none"> <li>• Upgrade of existing circuits by adding more capacity to them.</li> <li>• Augmentation of these circuits with associated port circuits.</li> <li>• Addition of parallel circuits to existing circuits.</li> <li>• Specification of new adjacencies between nodes that were not initially connected.</li> </ul> The optimizer operates on both Layer 3 and Layer 1 and provides failure set optimization options.  For more information, see the “Capacity Planning Optimization” chapter in the <a href="#">WAE Design User Guide</a> .
New LSP Setup Bandwidth Optimization tool. <b>(Tools &gt; LSP Setup BW Optimization)</b>	Creates/removes LSPs for specified LSP groups and shares Setup BW evenly within each group.  For more information, see the “LSP Setup Bandwidth Optimization” chapter in the <a href="#">WAE Design User Guide</a> .

Feature	Description
New SR-TE BW optimization tool. <b>(Tools &gt; SR-TE BW Optimization)</b>	The Segment Routing (SR) TE Bandwidth (BW) Optimization tool enables: <ul style="list-style-type: none"> <li>• Reduction of the traffic utilization of selected interfaces to below a specified threshold.</li> <li>• Analysis on how well congestion mitigation works when using segment routing over different failure scenarios.</li> </ul> For more information, see the “SR-TE Bandwidth Optimization” chapter in the <a href="#">WAE Design User Guide</a> .
New LSP Disjoint Optimization tool. <b>(Tools &gt; LSP Disjoint Path Optimization)</b>	Extended support for LSP disjointness includes: <ul style="list-style-type: none"> <li>• Enhancements to the disjointness algorithm that enable the optimization tools to find disjointness under a broader set of constraints.</li> <li>• Enhancements to Inter-Area for disjointness—the LSP Disjoint Path Optimization tool tries to find disjoint LSP paths for Inter-Area LSPs.</li> </ul> For more information, see the “LSP Disjoint Path Optimization” chapter in the <a href="#">WAE Design User Guide</a> .
Enhancements to the LSP Loadshare Optimization tool. <b>(Tools &gt; LSP Loadshare Optimization)</b>	It is possible to specify a subset of interfaces whose utilization should be optimized. The produced reports are enhanced.
Enhancement to optimize inter-AS SR LSPs. See also the <a href="#">Simulation of Inter-AS SR LSPs</a> . <b>(Tools &gt; SR-TE Optimization)</b>	The SR-TE Optimization tool is extended to create Segment Lists for inter-AS SR LSPs. For more information, see the “SR-TE Optimization” chapter in the <a href="#">WAE Design User Guide</a> .
<b>Layer 1 Enhancements</b>	
Ability to set the number of new L1 circuits that are created when they are being duplicated.	For more information, see the “Simulation” chapter (“Duplicate L1 Objects”) in the <a href="#">WAE Design User Guide</a> .
Ability to set L1 node type.	For more information, see the “Layer 1 Simulation” chapter (“Create L1 Nodes”) in the <a href="#">WAE Design User Guide</a> .
Enhancement to find L1 links that are causing lambda blocking.	For more information, see the “Layer 1 Simulation” chapter (“Lambda Assignments”) in the <a href="#">WAE Design User Guide</a> .
Addition of a Network Option that controls whether Layer 1 rerouting has converged under failures.	The Simulation tab includes the new option: “Layer 1 rerouting convergence under failures.”
Option to fail the L1 object causing the Worst Case L1 Utilization on a selected L1 Link.	—

Feature	Description
L1 Simulation Enhancements.	The Simulator includes L1 simulation enhancements with respect to parallel L1 Links and routing and Lambda assignment.
<b>Visualization Enhancements</b>	
Enhancement to easily view association between L1 links and LSPs and demands.	Selecting a Demand in the network plot automatically highlights the associated L1 Links that are carrying the Demand. Selecting an LSP in the network plot automatically highlights the associated L1 Links that are carrying the LSP.  For more information, see the “Layer 1 Simulation” chapter (“Multi-Layer Views”) in the <i>WAE Design User Guide</i> .
Improvements to readability of L1 link text.	The text displayed for L1 Links is easier to read especially in cases where L1 Links are colored with darker colors.
Improvements to the visualization of L1 link utilization.	L1 Links are colored based on their utilization and worst-case utilization. The thresholds and corresponding colors are the same as in L3.
<b>Patch File Enhancements</b>	
Additional plan attributes for LSP-related objects are now supported.	The <code>create_patch</code> and <code>apply_patch</code> tools consider more properties with respect to LSPs, LSP Paths, Named Paths, Named Path Hops, Segment Lists, and Segment List Hops.
New location and improvements to creating, applying, and viewing patches.  (Tools > Patches)	For more information, see the “Patch Files” chapter in the <i>WAE Design User Guide</i> .
<b>RSVP-TE and SR Simulation Enhancements</b>	
SR LSPs can now be specified as segment list hops in segment lists associated to SR LSPs (Binding SIDs).	For more information, see the “Segment Routing Simulation” chapter in the <i>WAE Design User Guide</i> .
Simulation of Inter-AS SR LSPs.	It is possible to simulate inter-AS SR LSPs. For more information, see the “Segment Routing Simulation” chapter (“Routing Inter-AS SR LSPs”) in the <i>WAE Design User Guide</i> .
Support of Extended Admin Groups for LSPs and LSP Paths.	For more information, see the “RSVP TE Simulation” chapter (“Affinities”) in the <i>WAE Design User Guide</i> .
<b>Usability Enhancements</b>	
Usability enhancement to close tabbed windows.	In the WAE Design main window, users can now close tabbed windows by clicking on the “X” in the top right corner of the tab, instead of having to explicitly select the File > Close menu.
Ability to simultaneously plot multiple demands in the same Demand Plot.	For more information, see the “Traffic Demand Modeling” chapter (“View Demand Plots”) in the <i>WAE Design User Guide</i> .

Feature	Description
Usability enhancement to the SR-TE Optimization tool when setting up constraints.	Users no longer need to pre-tag nodes that should be avoided and then type in the name of the tag in the Constraints dialog box. For more information, see the “SR-TE Optimization” chapter (“Constraints”) in the <i>WAE Design User Guide</i> .
Usability enhancement to improve L1 Circuit creation and association to Port Circuits.	For more information, see the “Layer 1 Simulation” chapter (“Create L1 Circuits”) in the <i>WAE Design User Guide</i> .
Usability enhancement in Network Options.	Layer 3 and Layer 1 simulation convergence modes are grouped together in the Simulation tab of the Network Options.
Improvements to “Save to”/“Open from” menus.	<p>The following menus:</p> <ul style="list-style-type: none"> <li>• File &gt; Open from/Save to WAE</li> <li>• File &gt; Open from/Save to &gt; Design Archive</li> </ul> <p>were changed to:</p> <ul style="list-style-type: none"> <li>• File &gt; Open from/Save to &gt; WAE Automation Server</li> <li>• File &gt; Open from/Save to &gt; Archive</li> </ul>
Usability enhancement to the API Documentation.	The API documentation has been updated to “WAE Design API.”
<b>Deprecated</b>	
The <code>mate_jasper</code> tool is no longer supported.	—

## WAE Live

The following table describes all new features related to WAE Live.

Feature	Description
Option to select the Collector Server network.	Ability to select which network on the Collector Server to insert a plan file into WAE Live.  For more information, see the “Multi-Network Management” chapter in the <a href="#">WAE Live Administration Guide</a> .
Option to add a remote network link.	Ability to add a remote network link in a multi-network environment.  For more information, see the Multi-Network Management” chapter (“Adding a Remote Network Link”) in the <a href="#">WAE Live Administration Guide</a> .
Ability to use plan files from external archives.	The WAE Live and WAE Collector server plan files can be separate from each other for the purpose of collecting plan file data from external archives.  For more information, see the “Data Source Settings” chapter (“Collecting Plan Files from External Archives”) in the <a href="#">WAE Live Administration Guide</a> .
<b>Explore UI Enhancements</b>	
Ability to filter Interface Queues based on interface descriptions in the Explore view.	The Explore Interfaces UI includes a new description column in the Interfaces table that enables: <ul style="list-style-type: none"> <li>• Filtering on interface descriptions.</li> <li>• Creating reports on interface queues with descriptions.</li> <li>• Creating user-defined properties with interface queue descriptions.</li> </ul>

Feature	Description
Numerous enhancements in the Explore table.	<p>The Explore table includes the following enhancements:</p> <ul style="list-style-type: none"> <li>• LSPs tab <ul style="list-style-type: none"> <li>– Enables hop selection in the Actual Path column, which takes you to the appropriate interfaces in the Interfaces table.</li> <li>– The Related Objects button enables filtering on both LSP source and destination nodes.</li> </ul> </li> <li>• Interfaces tab—Enables filtering on both local and remote interfaces.</li> <li>• Nodes tab <ul style="list-style-type: none"> <li>– Enables filtering on the LSP destination and actual path.</li> <li>– The Related Objects menu LSPs menu changed LSPs to explicitly state LSPs Source.</li> </ul> </li> </ul>
Enhancement to WAE Live graph performance.	Performance is improved for the initial loading of WAE Live graphs with more than one month worth of data by sending sampled data rather than sending every data point to the UI.

## WAE Collection

The following table describes all new features related to collection configuration.

Feature	Description.
<b>Collector Server (WAE Collector UI)</b>	
All WAE Collector UI configuration features are described in the “Collecting Network Information” chapter (“Collecting Basic Information Using the WAE Collector UI”) in the <a href="#">WAE Platform Configuration Guide</a> .	
Multiple network data collection using the UI.	<p>Ability to configure collection on more than one network.</p> <p>For more information, see the “Add Additional Networks for Collection” section.</p>
New management IP editing capability on the Node List table.	<p>Ability to edit the Management IP address for one or more nodes directly on the Node List table.</p> <p>For more information, see the “View and Manage the Node List” section (“Edit Node Credentials”).</p>

Feature	Description.
New option to set collection storage history.	Ability to configure how long or how many collections to store in the collector server.  For more information, see the “Configure Collection History” section.
<b>Advanced (Manual) Collection</b>	
New multi-layer collection capability.	Ability to collect inventory and topology information from a multi-layer (Layer 1 and Layer 3) network. Layer 1 (optical) collection has been tested with Cisco DWDM networks with Cisco Network Convergence Systems (NCS) 2000 and Cisco ONS 15454.  For more information, see the “Collecting Multi-Layer Information” chapter in the <a href="#">WAE Platform Configuration Guide</a> .
Option to remove amplifier L1 links and nodes from topology collection.	For more information, see the “Collecting Multi-Layer Information” chapter in the <a href="#">WAE Platform Configuration Guide</a> .
Option to collect feasibility metric and limit information in L1 circuits.	For more information, see the “Collecting Multi-Layer Information” chapter (“Collecting Feasibility Properties for L1 Circuits”) in the <a href="#">WAE Platform Configuration Guide</a> .
Option to collect failed L1 links.	For more information, see the “Collecting Multi-Layer Information” chapter (“Collecting Inactive or Failed L1 Circuit Objects”) in the <a href="#">WAE Platform Configuration Guide</a> .
Support for point-to-multipoint (P2MP) RSVP LSP collection from Cisco IOS XR and Juniper devices.	The <code>parse_configs</code> and <code>snmp_find_rsvp</code> tools have been enhanced to support P2MP LSPs and paths.  <b>Note</b> P2MP collection has been tested on Cisco IOS XR 5.1.3.
Extended support for Segment Routing (SR) LSPs and paths from IS-IS to OSPFv2.	The <code>parse_configs</code> tool has been modified.



## WAE System

The following table describes all new features related to the WAE System.

Feature	Description
Ability to show or hide components from the WAE System Settings page.	Administrators can configure which applications can be hidden from the WAE UI. For more information, see the “User Management” chapter in the <i>WAE System Administrator Guide</i> .
New WAE Statistics > Database Info page.	You can now view and monitor database information such as space usage, read/write cache rate percentage, and disk input/output performance from the WAE Statistics > Database Info page.  For more information, see the “Services and Statistics” chapter in the <i>WAE System Administrator Guide</i> .
Option to set the time zone on a per-user basis.	For more information, see the “User Management” chapter in the <i>WAE System Administrator Guide</i> .

## WAE Modeling

### Network Model Manager

The Network Model Manager is a new WAE UI tool that can be used to augment the network model generated by the Collector Server with traffic demand and visual layout information (by applying a template plan file). It then stores the augmented plan file in WAE Design Archive. For more information, see the “Viewing a Network Model” chapter in the *WAE Platform Configuration Guide*.

## Schema Changes

Refer to the `/opt/cariden/software/mate/current/docs/table_schema.html` file for a complete reference.

### New Columns in Plan Tables

Plan Table	New Column	Type	Description
<L1Links>	WCFailures	Derived	L1 failures causing the worst case utilization.
<L1Nodes>	Type	Plan	Identified node type as a reconfigurable optical add-drop multiplexer (ROADM) or an amplifier.
<LSPPaths>	Tags	Plan	Tags assigned to the LSP Path.

## CLI Changes

WAE Design, WAE Live, and WAE Collector CLI tools are located in the `/opt/cariden/software/mate/current/bin`. For available CLI options and descriptions, execute the CLI tool with the `-help` option.

## New CLI Tools

CLI Tool	Description
<b>WAE Design Optimization</b>	
<code>capacity_planning_opt</code>	Optimizes capacity planning by upgrading existing circuits and creating new circuits to meet maximum utilization thresholds. L1 circuits may be optionally created.
<code>lsp_setup_BW_opt</code>	Adds or removes LSPs for each LSP group and shares the setup bandwidth evenly within each group.
<code>lsp_disjoint_path_opt</code>	Optimizes routing of LSPs to respect disjoint path requirements and to minimize the specified path metric.
<code>sr_te_bw_opt</code>	Mitigates congestion by rerouting demands via private SR LSPs with optimized routings. Interfaces whose utilization exceed the given threshold are considered to be congested.
<code>sr_te_bw_analysis</code>	Provides segment routing congestion mitigation analysis across different scenarios. More detailed information on SR congestion mitigation can be found in the <code>sr_te_bw_opt</code> tool.
<b>Multi-Layer Collection</b>	
<code>wae-ml</code>	Provides the multi-layer services needed for multi-layer data collection.  This tool is available in <code>\$WAE_ROOT/bin</code> . For more information, see the “Collecting Multi-Layer Information” chapter in the <a href="#">WAE Platform Configuration Guide</a> .
<code>access_netconf</code>	Merges L1 model with the L3 model.

## New CLI Options

The following table describes all new CLI options.

CLI Tool	Option	Description
<b>WAE Live Server</b>		
<code>mld</code>	<code>mld -createnetwork</code>	New CLI option to the <code>mld</code> command to create networks.
<b>WAE Design</b>		

CLI Tool	Option	Description
lsp_loadshare_opt	-opt-interfaces-table <file>	This is a table of interfaces whose utilization should be optimized. Default is all.
sr_te_opt	-avoid-nodes-table <file>	Segment List (SL) entries will be created to route away from any nodes in this table. Default is none. If nodes are additionally specified via the -avoid-nodes-tag option, the union of these nodes should be considered.

## Removed or Deprecated CLIs

The following table describes all removed or deprecated CLI features.

Feature	Description
explicit_LSP_path_init	The following options of the explicit_LSP_path_init tool are deprecated: <ul style="list-style-type: none"> <li>• -routing-selection</li> <li>• -strict-circuit-priority</li> <li>• -strict-srlg-priority</li> <li>• -strict-node-priority</li> <li>• -strict-site-priority</li> <li>• -strict-llink-priority</li> </ul>

## API Changes

### New APIs

The following table describes all new API features. WAE Design API documentation is located in \$CARIDEN\_HOME/docs/api/design.

Feature	Description
<b>WAE Design APIs</b>	
CapacityPlanningOptimizer	Optimizes capacity planning by upgrading existing circuits and creating new circuits to meet maximum utilization thresholds. L1 circuits may be optionally created.
LSPDisjointPathOptimizer	Optimize routing of LSPs to respect disjoint path requirements and to minimize the specified path metric.
SRTEOptimizer	Finds the shortest segment route for a given set of SR LSPs.
SRTEBWOptimizer	Mitigates congestion on selected interfaces.

Feature	Description
<code>NodeConfiguredSRLGs</code>	The <code>NodeConfiguredSRLGs</code> enables users to associate a set of SRLGs to a Node for LSP routing purposes. To specify the set of SRLGs, WAE Design uses a set of SRLG keys. The <code>NodeConfiguredSRLGs</code> returns the set of SRLGs configured on a particular node.
<code>CreatePatch</code>	The new <code>CreatePatch</code> tool uses the <code>com.cisco.wae.design.tools</code> function. The <code>CreatePatch.run(network1, network2)</code> returns a string containing the XML patch.
<code>ApplyPatch</code>	Applies the operations defined in the patch to a network.
<code>L1NodeLayoutPropertiesRecord</code>	Support for setting/getting L1 Node Layout Properties in the API.
<code>ColumnRecords</code>	<code>ColumnRecords</code> now supports all <code>ColumnData</code> content.
<code>SimAnalysis.populateResultsFromNetwork(net)</code>	Preserves worst-case simulation analysis data from a plan file read into API. Populates API result records from <code>SimAnalysis</code> results of a previous run that is saved in the Network.
<code>rehome()</code>	New method for the circuit class <code>rehome()</code> . Provides the ability to re-home circuits.

## Removed or Deprecated APIs

The following table describes all removed or deprecated API features.

Feature	Description
The Design API function to generate patch files using the <code>PlanComparator</code> tool has been removed. This is replaced by the <code>CreatePatch</code> API tool in 6.4.	The actual function call that was removed is: <code>com.cisco.wae.design.tools.PlanComparator.generatePatch(network1, network2)</code> , which would return a string containing the XML patch.
The “import OSPF” function has been removed.	This function is not a part of the WAE Design schema, so there is no need to expose it via the API.

## Documentation Changes

The *Cisco WAE Plan Table Schema and CLI Reference* document has been removed from the Cisco WAE documentation set. The *Cisco WAE Server Installation Guide* is available only on Cisco.com: <http://www.cisco.com/c/en/us/support/routers/quantum-wan-automation-visibility-engine/products-installation-guides-list.html>.

## Open Source

A list of open source software used in WAE can be found in [Open Source Software Used in Cisco WAN Automation Engine](#).

## Bugs

The following are descriptions of the open and resolved bugs in Cisco WAE Release 6.4. The bug ID links you to the Cisco Bug Search tool.

### Open Bugs

**Table 1**      *Open Bugs*

Bug ID	Description
<a href="#">CSCva21574</a>	Collector Server log files increase in size and takes up too much disk space on the server.

### Resolved Bugs

**Table 2**      *Resolved Bugs*

Bug ID	Description
<a href="#">CSCuy05290</a>	The <code>ml_restore</code> command fails with permission issues.
<a href="#">CSCuy13871</a>	Sometimes after running <code>ifx_env.sh</code> , the environment is only partially configured and <code>ml_backup</code> fails.
<a href="#">CSCuz02936</a>	After server installation, <code>wae-ml-d</code> is not started without manual intervention.
<a href="#">CSCuz67029</a>	In WAE Live, if you edit a report and click Run, the changes you made will not be integrated in the report.
<a href="#">CSCva12875</a>	Incorrect LSP status for Alacatel Lucent 7950XRS devices.

## Using the Bug Search Tool

Use the Bug Search tool to search for a specific bug or to search for all bugs in a release.

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- Step 1** Go to <http://tools.cisco.com/bugsearch>.
- Step 2** At the Log In screen, enter your registered Cisco.com user name and password; then, click **Log In**. The Bug Search page opens.



**Note** If you do not have a Cisco.com user name and password, you can register for them at <http://tools.cisco.com/RPF/register/register.do>.

- Step 3** To search for a specific bug, enter the bug ID in the Search For field and press **Return**.

- Step 4** To search for bugs in the current release:
- a. In the Search For field, enter a problem, feature, or a product name (for example, **Cisco WAN Automation Engine**) and press **Return**. (Leave the other fields empty.)
  - b. When the search results are displayed, use the filter tools to find the types of bugs you are looking for. You can search for bugs by modified date, status, severity, and so forth.

To export the results to a spreadsheet, click the **Export Results to Excel** link.

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## Known Limitations

This section describes the limitations and restrictions for Cisco WAE.

### WAE Design

In some Linux installations with Xfce desktop installed, the documentation does not open from the WAE Design GUI Help menu. The workaround is to do one of the following:

- Open the help files from a terminal in the `$CARIDEN_HOME/docs` directory.
- Install a default browser.
- Install the following packages:

```
yum install evince
yum groupinstall "X Window System"
yum groupinstall "Desktop"
yum groupinstall "General Purpose Desktop"
```

### WAE Collector and WAE Network Interface (NI)

- Due to vendor MIB limitations, Collector cannot represent QoS traffic on interfaces that have more than one VLAN configured. If a network contains such interfaces, their queue traffic statistics are omitted from the collection. The total traffic on these interfaces is still measured. As a result, per class-of-service demands estimated through Demand Deduction are less accurate. Estimates of traffic totals over all classes of services, however, are not affected.
- Due to lack of MIB support, SR tunnel type is not collected for Cisco IOS XR routers through SNMP.
- Collection of interface egress shaping rate for Alcatel-Lucent devices does not support LAG interfaces.

### WAE NI

- The interval for continuous LSP discovery in WAE NI cannot be less than 60 seconds.
- LSP's ActualPathHop cannot be resolved when using continuous collection. As a workaround, use interval-based collection.

## Collector

- Juniper MIBs do not support P2MP LSPs.
- If upgrading the Collector server from 5.6x to 6.1x or 6.2, the `$CARIDEN_ROOT/etc/collector/server/db-persistence/DiscoveryEngineImplementation.db` file must be removed prior to starting the web server. Since installation automatically starts the web server, the recommendation is to remove this prior to installation.
- OSPFv3 and IPv6 IS-IS databases cannot be collected. The workaround is to use a manual snapshot.
- SNMPv3 is not an available option when configuring default credentials.
- `snmp_find_interfaces`
  - Does not support association of a GRE tunnel with the physical interface it uses to reach the tunnel destination since the IP-Tunnel MIB lacks this information.
  - Does not update LAG port status if LAGs are discovered running both `parse_configs` and `snmp_find_interfaces`. The workaround is to run only `snmp_find_interfaces`.
- Juniper routers: Signaled standby LSP path option is not available from the standard MPLS-TE MIB for Juniper routers. Only the active path option name is collected.
- Cisco IOS XR routers
  - IGP topology collected through `parse_igp` and `login_find_igp_db`
  - IS-IS link-state database with TE extensions contains incorrect interface “admin-weights” (TE metric) on Intel-based routers.
  - IPv6 IS-IS link-state database does not contain IPv6 interface addresses or parallel interfaces. This information is only available when Cisco IOS XR supports IS-IS IPv6 TE extensions. The `snmp_find_interfaces` tool collects this information.
  - MAC Accounting is not supported.
  - `snmp_find_rsvp` does not set the Standby value in the <LSPPaths> table for signaled backup paths or collect named affinities configured with affinity-maps.
- BGP peers
  - `find_bgp` does not build BGP pseudo-nodes among internal ASNs.
  - `find_bgp` does not collect BGP peers under PE-CE VRFs.
- `parse_configs`
  - Does not accurately detect the bandwidth of some Juniper ‘ge’ interfaces that have a capacity of 10 Gbps.
  - Collects POS bundles, but has limitations due to unavailability of the port OperStatus property.
- TE Extended Admin Groups (EAGs), also known as extended affinities, are only supported from Juniper and `parse_configs`.
- There is no support for building port circuits for LAG members that are not within the same IGP (inter-AS circuits)
- It is not possible to distinguish between physically connected and unconnected LAG ports that are down for LAG port matching.
- `snmp_find_ospf_db` cannot be used when routers have a large number of links that cannot fit into a single PDU.
- `find_bgpls` does not support multi-area OSPF or multi-level IS-IS, non-TE-enabled interfaces, and pseudo-nodes. The workaround is to use SNMP- or login-based discovery.

- `get_inventory` does not collect Juniper multi-chassis router hardware inventory.
- Segment routing
  - SR protected adjacency SIDs are not supported.
  - Concurrent RSVP-TE and SR-TE paths are not supported on the same LSP.

## Deployer

### Cisco Open SDN Controller (OSC)

During detailed PCEP tunnel creation or when modifying PCEP tunnels, affinity values are misinterpreted if multiple affinities are specified. This limits you to specifying one affinity for `IncludeAffinity`, `IncludeAnyAffinity`, and `ExcludeAffinity`, and each of these values must be a number within [0,31].

### NSO Controller

- LSP affinities are deployed, while interfaces affinities require separate provisioning.
- LSPs that exist in the network by another controller cannot be updated.
- Deployment of each RSVP-TE named-path or SR-TE segment-list is limited to a single LSP.
- Cisco IOS XR: WAE client specifies the XR LSP signaled-name, while NSO service and device use tunnel-id. The workaround is to deploy all Cisco IOS XR LSPs using the tunnel-id and to make sure that existing LSPs are not redeployed.
- NEDs (NSO console)
  - For Cisco IOS XR, there is no option to give the IP address of the LSP directly; you can only specify a loopback address. There is no option to give tunnel affinity values directly; you can only specify an affinity-map name.
  - For Junos, there is no inter-domain keyword, which is used only when an inter-area LSP is created.

## WAE System

### Installation and Startup

- The WAE NI server and the WAE Core server cannot reside on the same device or on the same VM. Note that the *Cisco WAE Server Installation Guide* assumes that they are on the same device. If needed, contact your support representative for further installation details.
- If the OS is using an old CA certificate to verify the integrity of the EPEL repository, you might see this error from the OS vendor:

```
Error: Cannot retrieve metalink for repository: epel. Please verify its path and try again.
```

- One workaround is to perform an offline installation. For instructions, refer to the “Offline Installation” chapter in the *Cisco WAE Server Installation Guide*.
- Another workaround is to change https to http.



**Note**

This is not a secure solution. For information on how to resolve OS security issues, contact your OS vendor.

1. In the `/etc/yum.repos.d/epel.repo` file, change the first instance of `https` to `http`.

```
sudo vim /etc/yum.repos.d/epel.repo
```

Change `https` to `http` in the following line:

```
mirrorlist=[https://mirrors.fedoraproject.org/metalink-repo=epel-6&arch=$basearch]
```

2. Execute `yum` to clean up `makecache`.

```
sudo yum clean all && yum makecache
```

3. Rerun the installer. For detailed installation instructions, see the *Cisco WAE Server Installation Guide*.

```
sudo bash wae-k9-<version>.bin
```

- The `$CARIDEN_HOME` directory is not automatically added to `$PATH` (only `$CARIDEN_HOME/bin` is). If not in `$CARIDEN_HOME/bin`, to start the WAE Design GUI from the command line, you must specify its full path.

```
/opt/cariden/software/mate/current/mate
```

## Web Server

The `embedded_web_server` tool is deprecated. The recommendation is to use the `wae-web-server` service, which is constantly monitored to be brought up automatically.

By default, this web service starts upon installation completion. Therefore, if you stop the web server using the `embedded_web_server` tool (`embedded_web_server -action stop`), the web server does not stop. The workaround is the following:

```
service wae-svcs-mon stop
embedded_web_server -action stop
```

## WAE Statistics UI

The WAE Statistics page does not open in all browsers. The workaround is the following:

1. Click the WAE Statistics link. The URL format is `https://<server_IP>:8443`. Example:

```
https://192.0.2.14:8443
```

2. Copy the URL of this page to another browser window.
3. In the new browser, change the URL port from 8443 to 8843. Example:

```
https://192.0.2.14::8843 Ex
```

4. Follow the browser messages to accept the connection and add it as an exception.

## Web User Management

Both the System UI and the WAE Design Archive UI have local user management capabilities. If both are used to configure users, WAE uses the most recently updated information. The recommendation is to use only the System UI to manage local users.

## License Check Failures on Newer Linux Distributions

Some newer Linux distributions have started using a new way (via `biosdevname`) of naming hardware devices, including the network interfaces. This causes some software that depends on the traditional naming (for example, `eth0`, `eth1`) to fail on license checks, including MATE.

The workaround is to append `biosdevname=0` to the kernel line of the grub configuration file and reboot. (Syntax varies among distributions.)

After reboot, you should be able to use `ifconfig` to verify that the NICs are named `eth0` (or `eth1`, ...) instead of the `biosdevname` names (such as `p34p1`).

## Java Memory

Certain tools (such as `parse_configs`) may require more memory to start than what is available. The symptom is an error message similar to the following:

```
Error occurred during initialization of VM.
Could not reserve enough space for object heap.
Error: Could not create the Java Virtual Machine.
Error: A fatal exception has occurred. Program will exit.
```

The workaround is to set the maximum memory to a low enough value in the `CARIDEN_JAVA_OPTIONS` variable before calling the tool. An example setting is as follows:

```
set CARIDEN_JAVA_OPTIONS=-Xmx1000m
```

## Accessibility Features

For a list of accessibility features in Cisco WAE, visit Cisco's [Voluntary Product Accessibility Template \(VPAT\)](#) website, or contact [accessibility@cisco.com](mailto:accessibility@cisco.com).

All product documents are accessible except for images, graphics and some charts. If you would like to receive the product documentation in audio format, braille, or large print, contact [accessibility@cisco.com](mailto:accessibility@cisco.com).

## Related Documentation

For related documentation, see the [Cisco WAE 6.4 Documentation Roadmap](#).

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