Cisco WAE 7.1.2 Release Notes

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Introduction

This document describes the features, limitations, and bugs for Cisco WAN Automation Engine (Cisco WAE) Release 7.1.2

Note This document describes features and changes since Cisco WAE 7.1.1. For information on Cisco WAE 7.1, see the Cisco WAE 7.1 Release Notes

Cisco WAN Automation Engine (WAE) provides the tools to create and maintain a model of the current network through the continual monitoring and analysis of the network and the traffic demands that are placed on it. This network model contains all relevant information about a network at a given time, including topology, configuration, and traffic information. You can use this information as a basis for analyzing the impact on the network due to changes in traffic demands, paths, node and link failures, network optimizations, or other changes.

The Cisco WAE platform is an open, programmable framework that interconnects software modules, communicates with the network, and provides APIs to interface with external applications.

Note To find related Cisco WAE documentation, see the Cisco WAE 7.1.2 Documentation Roadmap

This document contains the following topics:

What's New in Cisco WAE 7.1.2

The following features are new in Cisco WAE 7.1.2.

Feature	For more information, see...
The Cisco WAE UI is redesigned to provide a more simplified way to create and configure a network model.	"Network Model Configuration—Cisco WAE UI" chapter in the *Cisco WAE 7.1.2 User Guide*
Cisco WAE supports High Availability (HA) by method of warm standby. Two instances of WAE nodes are configured to run in parallel, where the primary node is configured in master mode and the secondary node is configured in standby mode. The user must manually do a failover if the primary node goes down.	"Administration" chapter ("Configure High Availability" topic) in the *Cisco WAE 7.1.2 User Guide*
Parse Configuration capability includes an updated configuration parse agent that supports collection and parsing of all types of LSPs, VPN, and SRLGs.	"Network Model Configuration—Expert Mode" chapter ("Configure Agents Using the Expert Mode" topic) in the *Cisco WAE 7.1.2 User Guide*
IGP topology NIMO supports collection from multiple IGP processes. Separate IGP configurations can be applied for each IGP created.	"Network Interface Modules (NIMOs)" chapter ("Topology Collection Using the IGP Database" topic) *Cisco WAE 7.1.2 User Guide*
New node-filter options replace the blacklist option in IGP topology collection configuration.	"Network Interface Modules (NIMOs)" chapter ("Topology Collection Using the IGP Database" topic) *Cisco WAE 7.1.2 User Guide*
A new command to rebuild DARE network from scratch is available. From the Expert Mode, navigate to **/wae:wae/components/aggregators/aggregator <*network_name*>** and click **rebuild**.	"NIMO Collection Consolidation" chapter in the *Cisco WAE 7.1.2 User Guide*
A new storage format option to save model information is available. When "native" is selected, the information is stored as a plan file. Performance is faster if saved as a plan file.	"Network Interface Modules (NIMOs)" chapter ("Traffic Collection" and "Running External Scripts Against a Network Model" topics) *Cisco WAE 7.1.2 User Guide*. It can also be seen in the Network Model Composer when configuring traffic collection or a custom script ("Network Model Creation—Cisco WAE UI" chapter in the "Run Traffic Collection or a Custom Script" topic).
LDAP authentication configuration is supported.	"Administration" chapter ("Configure LDAP" topic) in the *Cisco WAE 7.1.2 User Guide*

Feature	For more information, see...
L1 collection supports diversity circuit information. L1 circuits can be configured to be disjoint from other L1 circuits. **Note** Collection and model building for L1 diversity is being released as an engineering field trial (EFT). From the Cisco WAE Expert Mode, you can edit and view L1 diversity contraints in wae:networks/network/<*network-name*>/l1-model/l1-diversity-constraints. **Note** Cisco EPN Manager does not support diversity contraints with respect to SRLGs.	• "Multilayer (L1-L3) Collection" chapter ("Configure L3-L1 Mapping Information" topic) in the *Cisco WAE 7.1.2 User Guide* • *Cisco WAE Design 7.1.2 User Guide*
L1 collection includes 400 MXP 8-QAM (supported by Spectrum Switched Optical Networks (SSON) with flexible spectrum) circuit information that can be modeled and viewed in Cisco WAE Design. The Cisco WAE model captures the information as 3x100GE clients carried over a single 300G L1 circuit that occupies 100 GHz of spectrum. **Note** Collection and model building for 400 MXP 8-QAM circuits is being released as an engineering field trial (EFT).	"Layer 1 Simulation" chapter in *Cisco WAE Design 7.1.2 User Guide*
L1 Simulation now supports the following features: • Ability to map corresponding frequency (THz) and wavelength (nm) values • Optical channels with spectral width that can be configured. • Flexibility in defining valid spectral ranges per L1 link. • Ability to create a Central Frequency ID Blacklist.	"Layer 1 Simulation" chapter in *Cisco WAE Design 7.1.2 User Guide*
Multilayer collection includes the option to enter L1-L3 circuit mapping.	"Multilayer (L1-L3) Collection" chapter ("Configure L3-L1 Mapping Information" topic) in the *Cisco WAE 7.1.2 User Guide*
The default Cisco WAE login password for admin has changed.	"Next Steps" chapter ("Log In to the Cisco WAE UI" topic) in the *Cisco WAE 7.1.2 Installation Guide*
A new option is added to the Demand Deduction tool that controls whether multicast demands are fixed.	"Traffic Demand Modeling" chapter ("Estimating Demand Traffic Using Demand Deduction" topic) in *Cisco WAE Design 7.1.2 User Guide*
SR LSP supports color property which is a 32 bit numerical value.	"Segment Routing Simulation" chapter ("Creating SR LSPs and Their LSP Paths" topic) in the *Cisco WAE Design 7.1.2 User Guide*
A new property called Protocol origin is introduced for SR LSP path to identify the component or protocol that originates the SR LSP path. Protocol Origin can be set to the following values: Local, PCE Initiated, and BGP Initiated.	"Segment Routing Simulation" chapter ("Creating SR LSPs and Their LSP Paths" topic) in the *Cisco WAE Design 7.1.2 User Guide*

Feature	For more information, see...
The Simulation Analysis Report now includes a pie chart representation of the impact of failures on maximum utilization.	"Simulation Analysis" chapter ("Simulation Analysis Reports" topic) in the *Cisco WAE Design 7.1.2 User Guide*
The selected External Endpoint Member on a network is now represented by an yellow triangle.	"Plot Legend for Design Layouts" chapter ("External Endpoint Members" topic) in the *Cisco WAE Design 7.1.2 User Guide*
A new Network Option is added that controls whether or not Demands are deleted when Private LSPs are deleted.	"MPLS Simulation" chapter ("Deleting Demands when Private LSPs are Deleted" topic) in the *Cisco WAE Design 7.1.2 User Guide*.
The L1 Node to Site Assignment tool is enhanced to consider information from the <L1NodeSiteMappingRules> table.	"Visualizing a WAE Network" chapter ("Assign Sites to Layer 1 Nodes Dialog Box" topic) in the *Cisco WAE 7.1.2 Network Visualization Guide*.
A new filtering to interfaces option is added to the External Endpoints and External Endpoint Members tables.	—
The LSP table and Interfaces table have a new property UUID which represents LSP UUID and Interface UUID repectively.	—
A new mate_convert CLI option allows the exclusion of NetInt* information from plan files.	—

Beta Features

The following features in this release are in beta or are being released as an engineering field trial (EFT).

Feature	For more information, see...
A new Cisco Evolved Programmable Network Manager (Cisco EPN Manager) agent has been added to support the collection of optical topology for Cisco Network Convergence System (NCS) 2000 series, Release 10.9. This agent also receives notifications from Cisco EPN Manager when the status of links and circuits change and updates the network model accordingly. When using the Expert Mode, changes to the nodes, circuits, and so on can be seen in the agent-model tab from the following path: wae:wae/agents/optical-agent:optical-agents/optical-agent/<*epnm_agent_name*>. **Note** If optical provisioning is not done through Cisco EPN Manager, notifications are not received.	"Network Model Configuration—Cisco WAE UI" chapter in the *Cisco WAE 7.1.2 User Guide*
LSP collection (lsp-config-nimo) configuration has been updated and a new LSP NSO agent has been introduced. An "experimental" ruleset has also been added to support this feature.	"Network Interface Modules (NIMOs)" chapter ("Segment Routing Traffic Matrix Collection" topic) *Cisco WAE 7.1.2 User Guide*

Feature	For more information, see...
Segment Routing traffic matrix collection (sr-traffic-matrix-nimo) has been updated and a new telemetry agent has been introduced.	• "Network Interface Modules (NIMOs)" chapter ("Segment Routing Traffic Matrix Collection" topic) *Cisco WAE 7.1.2 User Guide* • "Telemetry Configuration" chapter *Cisco WAE 7.1.2 User Guide*

Upgrade from Cisco WAE 7.1.1.x

This procedure outlines the steps necessary to upgrade from Cisco WAE 7.1.1.x.

Before you begin

Download the upgrade script package (upgrade_scripts.zip) from the same location where the Cisco WAE 7.1.2 software package resides in the Cisco Download Software site.

Procedure

Step 1 Start Cisco WAE 7.1.1.

Step 2 Unzip the upgrade_scripts.zip file and run the wae_upgrade script.

```
# wae_upgrade.sh -export -install-dir <WAE_7.1.1_install_directory> -run-dir
<WAE_7.1.1_run_directory> -conf-dir <store_config_data_directory>
```

Step 3 Stop Cisco WAE 7.1.1.

```
# wae --stop
```

Step 4 Install and run Cisco WAE 7.1.2.

Step 5 Run the script to import all the configurations from Cisco WAE 7.1.1.

```
# wae_upgrade.sh -import -install-dir <WAE_7.1.2_install_directory> -run-dir
<WAE_7.1.2_run_directory> -conf-dir <import_data_config_directory>
```

Step 6 Run collections in Cisco WAE 7.1.2 to update the network models.

Documentation

To find descriptions of all related Cisco WAE documentation, see the Cisco WAE 7.1.2 Documentation Roadmap.

Note We sometimes update the documentation after original publication. Therefore, you should always review the documentation on Cisco.com for any updates.

Bugs

Resolved Bugs

The following are descriptions of the resolved bugs in Cisco WAE Release 7.1.2.

Table 1: Resolved Bugs

Bug ID	Description
CSCvk00610	The Cisco WAE Modeling Daemon (WMD) crashes when demand deduction is running.
CSCvk00622	LSPs and paths are missing from the network model coming from WMD. The WMD log contains many patch errors.
CSCvm73290	WMD crashes when traffic collection is running.
CSCvj58951	Running SNMP_FIND_NODES in the external-executable-nimo fails.
CSCvj61268	Inventory collection does not work properly for Juniper devices.
CSCvj74972	Protocol is always set to OSPF even if the network is running ISIS.
CSCvk29500	There are multiple issues seen during traffic collection that leads to a JVM crash.
CSCvk53326	The topo-bgpls-xtc-nimo does not collect eBGP links.
CSCvm33208	The Cisco WAE Scheduler stops working.
CSCvm40526	The topo-igp-nimo does not save affinity information for interfaces in the WAE database.
CSCvm51321	Collection from Huawei routers does not resolve SR-TE LSP Destinations in the topo-bgpls-xtc-nimo.
CSCvm62102	SNMPv3 timeout does not include what node IP times out and NetIntSNMP_error is not set.
CSCvm66200	Errors regarding TrafficCalculatorRfs illegal references appear.
CSCvm73293	Log files are not cleaned up.
CSCvm98818	The topo-igp-nimo does not collect AdjSIDs from ISIS networks.
CSCvj27161	Remove jackson-databind Insecure Deserialization vulnerability.
CSCvk18311	Inventory collection fails with a "None" status.
CSCvk22914	Plan files need to have MAC addresses.
CSCvk22953	The `-log-start-new` option does not work. The snapshot logs are overwritten with each subsequent snapshot.
CSCvk31684	The as-merge nimo does not merge multiple links between a pair of AS routers.
CSCvk46043	The apply_patch tool displays incorrect information for actual path hops.
CSCvk47978	The SNMPv3 engine is not working.
CSCvk54980	The WAE SR Bandwidth Optimization tool does not optimize the LSP to the shortest path with available bandwidth.
CSCvk55490	The traffic-poller-nimo calculations takes long.

Bug ID	Description
CSCvk62975	The snmp_find_interfaces tool incorrectly assigns ports to LAGs.
CSCvk19227	Cisco WAE does not convert collected L3VPN information from hexadecimal to ASCII on RD and RTs collected from Huawei CX600-X2 series devices.
CSCvm29447	Cisco WAE kafka process dies at least once a week.
CSCvm37863	Enable Cisco WAE to discover end-to-end multi IGP network by modifying the IGP setting with options: ISIS, OSPF, and BOTH.
CSCvm45795	DARE aggregator fails to copy vpn-name information from networks containing vpn-name information.
CSCvm57253	Packages reload when simultaneous collections are scheduled. This interrupts collections and causes running of SNMP traffic pollers to stop collecting.
CSCvm57261	Traffic poller fails to import l1-model with the network causing dependency issues.
CSCvm62365	Plot demands show demands are routed through an extra hop.
CSCvm63370	Cisco WAE version information must be displayed when **wae --version** command is run.
CSCvm65287	SR-TE Optimization for LSP avoiding user specified nodes fails when IGP metric between some nodes is greater than 5.
CSCvm67226	Collection of multiple process IDs for Huawei router on topo-igp-nimo must be supported.
CSCvm70210	topo-bgp-ls-xtc-nimo does not collect full topology if there are multiple routing processes configured on the network.
CSCvm74623	login_find_igp_db unable to parse new field **'SubTLV len: 74** in Juniper Junos router version 17.2R4.
CSCvm75482	lsp-pcep-xtc-nimo does not collect PCEP RSVP LSP information.
CSCvm88740	Warning log: `Use snmp_sess_select_info2() for processing large file descriptors` repeats endlessly during SNMP collection.
CSCvm94665	lsp-cfg-parse-nimo does not return segment-list information and does not reflect unresolved-hop information for legacy tunnel TE configuration when next hops cannot be resolved.
CSCvk12991	Add API to replace the content of NetInt tables in a plan.

Using the Cisco Bug Search Tool

You can use the Cisco Bug Search Tool to search for a specific bug or to search for all bugs in a release.

Procedure

Step 1 Go to the http://tools.cisco.com/bugsearch

Step 2 Enter your registered Cisco.com username and password, and click **Log In**.

The Bug Search page opens.

Note If you do not have a Cisco.com username and password, you can http://tools.cisco.com/RPF/register/register.do

Step 3 Use any of these options to search for bugs, and then press Enter (Return) to initiate the search:

- To search for a specific bug, enter the bug ID in the Search For field.
- To search for bugs based on specific criteria, enter search criteria, such as a problem description, a feature, or a product name, in the Search For field.
- To search for bugs based on products, enter or select a product from the Product list. For example, if you enter “WAE,” you get several options from which to choose.
- To search for bugs based on releases, in the Releases list select whether to search for bugs affecting a specific release, bugs that were fixed in a specific release, or both. Then enter one or more release numbers in the Releases field.

Step 4 When the search results are displayed, use the filter tools to narrow the results. You can filter the bugs by status, severity, and so on.

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

Known Limitations

This section describes known limitations and restrictions for Cisco WAE:

WAE System

License Check Failures on Newer Linux Distributions

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

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).

NIMO Consolidation

The aggregator uses DARE to consolidate NIMOs into one network model. If you update the topo-igp-nimo node-filter configuration, or if a node goes down after running the initial DARE configuration, you must do the following:

1. Update the topo-igp-nimo exclusion or inclusion list.
2. Run collection on the topo-igp-nimo.
3. Run the WAE CLI rebuild tool to rebuild DARE and sync the updated NIMO node information:

```
wae@wae# wae components aggregators aggregator <aggregator_network_name> rebuild
```

WAE Collection

- LDP data collection can only be performed by executing CLI tools using the external-executable-nimo.
- NetFlow collection is not supported on Alcatel-Lucent devices.
- Due to vendor MIB limitations, WAE 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, demands for every class of service estimated through Demand Deduction are less accurate. Estimates of traffic totals over all classes of services, however, are not affected.
- Collection of interface egress shaping rate for Alcatel-Lucent devices does not support LAG interfaces.
- Juniper MIBs do not support P2MP LSPs.
- WAE cannot associate a GRE tunnel with the physical interface it uses to reach the tunnel destination because the IP-Tunnel MIB lacks this information.
- For Juniper routers, the signaled standby LSP option is not available from the standard MPLS-TE MIB. Only the active path option name is collected.
- For Cisco IOS XR routers:
  - IGP topology collected through topo-igp-nimo module:
    - 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.
  - MAC accounting is not supported (although you can collect MAC traffic through an external NIMO).
  - The lsp-snmp-nimo module does not set the Standby value in the <LSPPaths> table for signaled backup paths or collect named affinities configured with affinity-maps.
- BGP peers:
  - The topo-bgp-nimo module does not build BGP pseudo-nodes among internal ASNs.
  - The topo-bgp-nimo module does not collect BGP peers under PE-CE VRFs.
- 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.
- With segment routing, concurrent RSVP-TE and SR-TE paths are not supported on the same LSP.

WAE Multilayer Collection

- The optical plug-in is supported on Oracle JRE 1.8 but not on OpenJDK JRE. Oracle JRE 1.8 is not packaged with Cisco WAE. You can download Oracle JRE 1.8 from Oracle’s website.

If you are using a JRE other than Oracle JRE 1.8 for other Java programs and you want to use the optical plug-in, you must download Oracle JRE 1.8 and add the following lines to the beginning of the *<WAE_installation_directory>* /packages/optical-ctc-plugin/run.sh file:

```
#!/bin/bash
export JAVA_HOME=<path_to_JRE_installation_directory>
export PATH=$JAVA_HOME/bin:$PATH
```

- Multilayer collection for Cisco devices is supported only on the following platforms:
  - Cisco Network Convergence System (NCS) 2000 platforms running version 10.61, 10.7, and 10.8 for L1 devices when using the CTC optical agent. NCS 2000 platforms running version 10.9 is supported when using the Cisco Evolved Programmable Network Manager optical agent (EPN-M optical agent).
  - Cisco Aggregation Services Routers (ASR) 9000, Cisco Carrier Routing System (CRS), and Cisco NCS 5500 platforms running IOS-XR for L3 devices.
- Multilayer collection is limited to the collection of unprotected circuits.
- Collection of WSON and SSON circuits are supported.
- Collection of non-WSON circuits is only supported when using the EPN-M optical agent. It is not supported when using the CTC optical agent.
- L3-L1 mapping by LMP is supported only if the controller interface name is the same as the actual L3 interface name or of the form "dwdmx/x/x/x" where the "x/x/x/x" subscript matches that of the corresponding L3 interface.
- Central Frequency ID mapping is currently supported only for circuit paths but not for path hops.

Cisco WAE Modeling Daemon

Cisco WAE Modeling Daemon (WMD) configuration can be viewed from the Cisco WAE UI, but configuration edits must be done using the Expert Mode or WAE CLI.

WAE Design

- macOS Sierra 10.12 and later implements an additional security measure for applications that are not distributed through the App Store; this includes WAE Design.

  By default, WAE Design is in a quarantine state as shown by the following command on a terminal:

  ```
  xattr wae_design.app
  ```

  The command returns the following output for a quarantined application:

  ```
  com.apple.quarantine
  ```

  As a workaround, remove WAE Design from quarantine by entering the following command in the directory where WAE Design is installed:

  ```
  xattr -r -d com.apple.quarantine wae_design.app
  ```

  You can now run WAE Design from macOS Sierra 10.12 and later.

- If you are using macOS X 10.12 or later with the WAE Design GUI and the Parse Configs tool (**File > Get Plan from > Configs**), add the following lines in ~/.bash_profile:

```
launchctl setenv JAVA_HOME `/usr/libexec/java_home -v 1.8`
export JAVA_HOME=$(/usr/libexec/java_home -v 1.8)
```

FlexLM License Server

You cannot run the floating license server on a setup (Linux VM or actual host) that uses bonded virtual interfaces (that is, a setup with multiple interfaces that have the same MAC address but different IP addresses within a VM). If the WAE Design client tries to check out a license from a setup that uses bonded virtual interfaces, the license checkout fails with the error "No license found."

As a workaround, run the floating license server in a standard Linux VM or host.

WAE Coordinated Maintenance

Cisco WAE Coordinated Maintenance 1.3.1 supports the WAE archive only when the data source is CDB.

Accessibility Features

For a list of accessibility features in Cisco WAE, visit https://www.cisco.com/c/en/us/about/accessibility/voluntary-product-accessibility-templates.html (VPAT) website, or contact accessibility@cisco.com.

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