# Cisco WAN Automation Engine Release Notes, Release 7.1.1

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This document describes the features, limitations, and bugs for Cisco WAN Automation Engine (Cisco WAE) Release 7.1.1.

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

# Contents

This document includes the following sections:

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# Introduction

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 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 WAE documentation, see the *Cisco WAE 7.1 Documentation Roadmap.*

# What's New in WAE 7.1.1

The following are new in WAE 7.1.1:

- Network Convergence Systems (NCS) 2000 Series routers version 10.7 and 10.8 support for optical data collection.

- IOS support for LSP configuration collection (lsp-config-nimo) using Network Services Orchestrator (NSO) network element drivers (NEDs).

- WAE Live Data Store purge tool:

  The `ml_purge` tool removes all data prior to the specified timestamp.

  **Note** Before running `ml_purge`, confirm that there are no insertions running (`ml_insert_ctl -status`). Insertions might fail due to locks created by `ml_purge` while it is in operation. You might need to pause the scheduler to prevent scheduled insertions (`ml_insert_ctl -disable-scheduler`).

  To run `ml_purge`:

  `# ml_purge <`*`timestamp`*`>`

  where `<`*`timestamp`*`>` is in the following UTC format: *`year-month-day`*`T`*`hour:minutes`*

  For example:

  `# ml_purge 2017-01-31T00:00`

- DARE rebuild tool:

  The aggregator uses the Delta Aggregation Rules Engine (DARE) to combine user-specified NIMOs into a single consolidated network model. If aggregation errors appear, try rebuilding the aggregator network using the WAE CLI `rebuild` tool:

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

  The `rebuild` tool has the following additional options:

  - `action-timeout`—Timeout in minutes. The default is 600 minutes.

  - `ordered-networks`—List and specify the order in which the DARE source networks have to be processed.

> **Note** If a node goes down or if you have modified the `node-filter-list` configuration, perform the steps described in the NIMO Consolidation limitations section.

- The `node-blacklist` option in the topo-igp-nimo and topo-bgpls-xtc-nimo has been changed to `node-filter-list`. The feature has been updated so that the user has the option to exclude or include specific nodes during collection.

  1. From the WAE Expert mode (`wae:networks/network/<network_model_name>/nimo/topo-igp-nimo` tab), select one of the following from the node-filter list:

  - INCLUDE ONLY—Include only the nodes specified in the `node-filter-list` tab.
  - EXCLUDE ONLY—Exclude only the nodes specified in the `node-filter-list` tab.
  - IGNORE FILTER—Include all nodes during collection.

  CLI Example:

  ```
  # networks network networkABC nimo topo-igp-nimo node-filter EXCLUDE ONLY
  ```

  2. Navigate to the `node-filter-list` tab and enter the specific nodes you want to include or exclude. If the IGNORE FILTER option was selected in the previous step, all nodes will be included during collection regardless of any nodes added to this list.

  CLI Example:

  ```
  # networks network networkABC nimo topo-igp-nimo node-filter-list 123.82.82.82
  ```

# Upgrade from Cisco WAE 7.1

Complete the following steps when upgrading from Cisco WAE 7.1 to this release.

The examples in this procedure use the following variables:

- ~ is the HOME directory
- INSTALL=~/install
- RUN=~/run
- $INSTALL is the Cisco WAE installation directory
- $RUN is the Cisco WAE run directory

> **Note** The following procedure assumes you are familiar with Network Services Orchestrator (NSO) and its related network element drivers (NEDs) and services.

**Step 1** Confirm that ncs is not running.

```
#ps aux | grep ncs.smp
```

**Step 2** Back up your existing Cisco WAE 7.1 run and install directories. For example:

```
# cd ~
# tar cvfz wae_run_dir_backup1.tar.gz run
# tar cvfz wae_install_dir_backup1.tar.gz install
```

**Step 3**   Remove and clean up the previous installation. For example:

```
# rm -rf $INSTALL
# rm -rf $RUN
```

**Step 4**   Install the Cisco WAE package. For example:

```
# chmod 755 wae-linux-v7.1.1.bin
# bash wae-linux-v7.1.1.bin $INSTALL
```

**Step 5**   The installation program creates a bash script file named waerc that sets the environment variables. Source this file to get the settings. For example:

```
# source $INSTALL/waerc
```

**Step 6**   Run `wae-setup`, and untar the NEDs. For example:

```
# wae-setup $RUN
# cd $RUN/packages
# tar xfz ~/ncs-4.4.4-cisco-ios-5.5.tar.gz
# tar xfz  ~/ncs-4.4.4-cisco-iosxr-6.2.10.tar.gz
# tar xfz ~/ncs-4.4.4-juniper-junos-3.2.1.tar.gz
```

**Step 7**   Reinstall the run directory you backed up in Step 2. For example:

```
# cd ~
# tar xvfz wae_run_dir_backup1.tar.gz --exclude 'run/packages'
```

**Step 8**   Run Cisco WAE.

```
# cd $RUN
# wae --with-package-reload
```

**Step 9**   Confirm that ncs is running.

```
#ps aux | grep ncs.smp
```

# Documentation

To find descriptions of all related Cisco WAE documentation, see the *Cisco WAE 7.1 Documentation Roadmap.*

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

# Open Source

A list of open source software that is used in WAE can be found in *Open Source Software Used in Cisco WAN Automation Engine*.

# Bugs

## Open Bugs

The following are descriptions of the open bugs in Cisco WAE Release 7.1.1.

*Table 1*        *Open Bugs*

| Bug ID | Description |
|---|---|
| CSCvg80478 | The URL redirect from HTTP port 8080 to 8443 fails.<br>Workaround:<br>Manually enter https://*<ip_address>*:8443. |
| CSCvk03647 | The WAE Model Manager UI should not be used to configure or view network models. Instead, use the WAE Expert Mode UI or the WAE CLI. For more information on how to use the WAE Expert Mode or WAE CLI, see the *Cisco WAE User Guide*. |

## Resolved Bugs

The following are descriptions of the resolved bugs in Cisco WAE Release 7.1.1.

*Table 2*        *Open Bugs*

| Bug ID | Description |
|---|---|
| CSCvg38440 | Running SNMP_POLL results in strange summary numbers. |
| CSCvg85656 | LOGIN_FIND_IGP_DB picks up loopback ID from ISIS database |
| CSCvg91493 | SNMP_FIND_INTERFACES freezes during plan file generation. |
| CSCvh23382 | The lsp-pcep-xtc-nimo discards policies that are non-PCEP. |
| CSCvh50411 | The external-executable-nimo does not work after running it the first time. |
| CSCvh50641 | The lsp-pcep-xtc-nimo does not collect SR tunnels configured with the old SR-TE CLI. |
| CSCvh59280 | The get_show command does not work for devices with telnet access and ACS. |
| CSCvh80155 | Provide a better way to recover from DARE aggregation issues. |
| CSCvh80401 | WAE Design 6.4.11 does not compute ECMP paths again after reactivation of circuit. |
| CSCvh95235 | The WAE Design metric optimization tool hangs indefinitely or crashes when processing plan files. |
| CSCvh95603 | Issue with deriving utility measurements for circuits. |
| CSCvi01838 | NetFlow processing times have doubled in CNF/DNF. |
| CSCvi09198 | NIMOs do not support parameters supported by the underlying WAE executable. |
| CSCvi22184 | The WAE Design Metric Optimization tool runs for failure scenarios even if the 'select failure' button is disabled in the GUI. |
| CSCvi34514 | Weak ciphers exist in WAE Live. |
| CSCvi48674 | Support collection of 400G card and feasibility-limit-margin at circuit level. |
| CSCvi56017 | NIMO files in /tmp fill up disk space. |

*Table 2*        *Open Bugs (continued)*

| Bug ID | Description |
|--------|-------------|
| CSCvi59166 | The topo-bgp-nimo does not capture IPv4 addresses for the eBGP link. |
| CSCvi61521 | The topo-bgpls nimo resolves IPv4 and IPv6 links separately if both are configured on the interface. |
| CSCvi68135 | In WAE Design, the certificate management of self-signed certificates produces an error. |
| CSCvi75558 | The lsp-rfs run collection takes a long time to read device configuration during a device sync. |
| CSCvi75562 | The lsp-config-nimo takes 40 minutes to compute LSPs from the local wae-rfs model during a device sync. |
| CSCvi77857 | The topo-igp-nimo and topo-bgpls-xtc-nimo does not set aging for nodes or circuits. |
| CSCvi94975 | The sr-traffic-matrix-nimo causes the WAE server to stop. |
| CSCvj02236 | The optical-nimo should pick the maximum of the span losses when merging links. |
| CSCvj03135 | The topo-bgpls-xtc-nimo does not work. |
| CSCvj05567 | When running get_plan from configs, it does not pass the OSPF area option 'all' to the command line tool. |
| CSCvj14803 | The lsp-config-nimo does not collect all LSPs from multiple NSO instances when using layered service architecture (LSA). |
| CSCvj25403 | The topo-bgp-nimo does not model dual AF BGP sessions in the same link. |

# 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.

**Step 1**   Go to the Cisco Bug Search Tool.

**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 register here.

**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
- NIMO Consolidation
- WAE Collection
- WAE Optical Plug-In / Multi-Layer Collection
- WAE Design
- FlexLM License Server

## WAE System

### Startup

The `$CARIDEN_HOME` directory is not automatically added to `$PATH`. (Only `$CARIDEN_HOME/bin` is.) To start the WAE Design GUI from the command line when it is not under `$CARIDEN_HOME/bin`, you must specify its full path: `/opt/cariden/software/mate/current/mate`.

### 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 (see the `node-filter-list` option in the What's New in WAE 7.1.1).

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.

- 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.

- 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 Optical Plug-In / Multi-Layer Collection

- The optical plug-in (optical-nimo) is supported on Oracle JRE 1.8 but not on OpenJDK JRE. Oracle JRE 1.8 is not packaged with 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
  ```

- Multi-layer collection is supported only on the following platforms:
  - Cisco Network Convergence System (NCS) 2000 platforms running versions 10.61, 10.7,and 10.8 for L1 devices.
  - Cisco Aggregation Services Routers (ASR) 9000, Cisco Carrier Routing System (CRS), and Cisco NCS 5500 platforms running IOS-XR for L3 devices.

- Multi-layer collection is limited to the collection of unprotected circuits.

- Collection of non-WSON circuits is not supported.

- 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.

- Lambda mapping is currently supported only for circuit paths but not for path hops.

# 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.

# 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.

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.