Cisco WAN Automation Engine Release Notes, Release 7.1.1.1

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This document describes the features, limitations, and bugs for Cisco WAN Automation Engine (Cisco WAE) Release 7.1.1.1

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

Contents

This document includes the following sections:

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,

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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 Cisco WAE 7.1.1.1

Ability to Archive Data from the Cisco WAE Modeling Daemon (WMD)

You now have the option to archive a plan file using data from either WMD or the configuration database (CDB). Prior to WAE 7.1.1.1, you were only able to get data from the CDB. To configure archive, do the following:

From the Expert Mode:

1. Navigate to **/wae:networks/network/<*network_model_name*>**.
2. Click the **plan-archive** tab.
3. Enter the archive directory.
4. From the source drop-down list, select **cdb** or **wmd**.
5. Click **commit**.
6. To save the current network model to a plan file into the archive directory you specified, click **run**.
7. To retrieve a plan file:
   a. Click **get**.
   b. Enter timestamp and plan format.

   Note Hover over fields to view more information.

   c. Click **Invoke get**.

From the WAE CLI:

```
# wae_cli -C
# configure
Entering configuration mode terminal
(config)# networks network <network_model_name> plan-archive archive-dir
<archive_directory>
(config)# networks network <network_model_name> plan-archive source <cdb_or_wmd>
# commit
```

To save the current network model to a plan file:

```
(config)# networks network <network_model_name> plan-archive run
```

To retrieve a plan file:

```
(config)# networks network <network_model_name> plan-archive get plan-format <pln_or_txt>
timestamp <yyyymmdd_hhmm>
```

Example:

```
(config)# networks network NetworkABC plan-archive get plan-format pln timestamp
20180920_1445
```

Upgrade from Cisco WAE 7.1.x

Complete the following steps when upgrading from Cisco WAE 7.1.x 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.x 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-v7.1.1.1.bin
# bash wae-linux-v7.1.1.1.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

Resolved Bugs

The following are descriptions of the resolved bugs in Cisco WAE Release 7.1.1.1.

Table 1 Resolved Bugs

Bug ID	Description
CSCvm40526	Topo-igp-nimo affinity information is not saved in the WAE database.
CSCvm33208	The WAE scheduler stops working.
CSCvm29447	The WAE Kafka process stops.
CSCvk62975	The snmp_find_interfaces tool incorrectly assigns ports to LAGs.
CSCvk54980	The WAE SR Bandwidth Optimization tool does not optimize the LSP to the shortest path with available bandwidth.
CSCvk53326	The topo-bgpls-xtc-nimo collection does not collect eBGP links.
CSCvk47978	The WAE 7.1.1 SNMPv3 engine does not work.

Table 1 Resolved Bugs (continued)

Bug ID	Description
CSCvk46043	The apply_patch tool displays incorrect information for actual path hops.
CSCvk31684	The as-merger NIMO does not merge multiple links between a pair of AS routers.
CSCvk29500	Multiple traffic poller issues result in a JVM crash.
CSCvk22953	The `-log-start-new` option does not work. The snapshot logs are overwritten with each subsequent snapshot.
CSCvk20843	A "BulkIpAddress" error appears during topo-bgpls-xtc-nimo collection.
CSCvk18311	A "get_inventory failed with exit status None" error appears when using the run_inventory tool with the `net-recorder` option set to record.
CSCvk11105	The lsp-config-nimo collection shows unresolved hops in segment lists for LSPs.
CSCvk11014	A scheduled task that has ENUM as the RPC parameter does not work.
CSCvk12991	Add an API to replace NetInt tables.
CSCvk09129	WAE Design crashes when performing explicit LSP optimization in a MAC OS.
CSCvk08038	The latest Cisco IOS-XR 6.5.1.xx images have an updated "show isis database verbose" output. As a result, the login_find_igp and topo_igp_nimo tools fail to discover the network topology from the seed router.
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*.
CSCvk00622	LSPs and paths are missing from the network model coming from WMD. The WMD log contains many patch errors.
CSCvk00610	The WAE Modeling Daemon (WMD) crashes.
CSCvj87306	Static L3-L1 mapping does not work when using optical UNI links behind muxponder (N:1 association).
CSCvj77148	PCE computed LSPs are not detected for multiprocess OSPF networks.
CSCvj74972	The network option that determines the protocol (OSPF, ISIS, etc.) is not set. Since OSPF is the default option, it is always used regardless if the network is using ISIS.
CSCvj71789	The changes in the aggregated model are not getting picked up by DARE because the topo-vpn-nimo does not advertise capabilities.
CSCvj71027	The OPM te-path tool uses setupBW=0 post optimization of an RSVP-TE LSP. However, it should use the original setupBW for the modified LSP.
CSCvj61590	Cisco Network Convergence System 5500 series node transceiver data is missing in the inventory.
CSCvj61268	The `get_inventory and build_inventory` tools do not process Juniper routers correctly.
CSCvj58951	The external-executable-nimo returns a status "1" when running the snmp_find_nodes task.
CSCvj56482	When the create_representative_plan option is enabled on an archive with demands, the -archive option does not work.
CSCvj37991	The topology NIMO whitelist should accept node names.
CSCvj07733	Network discovery fails when one or more nodes do not have the ip-manage field populated.
CSCvj06588	Only pseudonodes (PSN) remain in their own PSN site on Design Archive, although ASN and PSN were defined in named Site on Template.
CSCvj03264	In WAE Design, replace Number of Circuits to Number of L3 Circuits.

Table 1 Resolved Bugs (continued)

Bug ID	Description
CSCvj00790	In WAE Design, when a L1 circuit is attached to a L3 circuit through L3 ports, the filter in the GUI fails to pick up the association.
CSCvi84837	The copy_from_template process fails during snapshot.
CSCvi19863	There are inconsistencies between traffic simulation and traffic measurements in the plan file.

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.
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.

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 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.
