



Cisco WAE Installation Requirements

Cisco WAE requirements vary depending on which components are installed together. This section provides general guidelines and minimum requirements for individual components installed on a single server, unless otherwise specified.

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Cisco WAE Server Requirements

You can install Cisco WAE on a server that meets the following requirements.

Operating System	Software	CPU	Memory	Hard Drive
Linux-x86_64	CentOS and RHEL 7.5 with latest patches	8+ cores	64 GB	50 GB

Important Notes

- Cisco WAE software is qualified on CentOS 7.5 and Red Hat Enterprise Linux 7.5.
- Only Linux distributions available in English are supported.
- Modify the `/etc/security/limits.conf` file by adding or updating the following lines to make sure your hardware supports sufficient number of threads for starting poller:

```
[user] soft stack 8192
[user] soft nproc 257805
[user] soft nofile 1000000
```

Where [user] is the userid which starts the WAE process.

Required Software Packages

Software	Version
JDK/JRE	Oracle or OpenJDK 1.8.0_102 Note Java environment variables must be configured correctly and JRE_HOME must point to a valid JRE/JDK 1.8 installation. Download the JRE package from the Oracle distribution site. For example: • Linux: Enter the following command: <pre>admin@system1 ~ # export JRE_HOME=<JDK/JRE_installation_path></pre>
Perl	5.16.3
fontconfig	2.10.95
Python	2.7.5
python-paramiko.noarch	1.16.1
python-lxml	3.2.1
python-requests	2.18.4
redhat-lsb	4.0.7 This is required for the License Server. For more information, see the " WAE Design Floating License Server " chapter in the Cisco WAE Design GUI Installation Guide .
Supervisor	3.1.4 and above

NetFlow Requirements

NetFlow Collection - (Exclusive) Memory size and CPU per server

Centralized NetFlow (WAE YANG runtime server)		
	Memory	CPU
Collector Server	32 GB	
flow_get	4 GB	
TOTAL	36 GB	8+ Cores

Distributed NetFlow (Server where the agent resides)		
	Memory	CPU
Collector Server	32 GB	
flow_cluster_agent	4 GB	
TOTAL	36 GB	8+ Cores

Distributed NetFlow (WAE YANG runtime server)		
	Memory	CPU
flow_cluster_broker	2 GB	
flow_cluster_master	2 GB	
flow_cluster_ias flow_cluster_dmd	4 GB	
TOTAL	8 GB	8+ Cores



- Note**
- One flow collection server is required per 100 Mbps of flow export bandwidth.
 - Only English Linux is supported.
 - Qualified on CentOS 7.5 and Red Hat Enterprise Linux 7.5.
 - Flow collection requires Linux Kernel 2.6.32 or greater.
 - The memory requirement listed above per collection server instance is based on the assumption of an approximate figure of 100 Mbit/s of NetFlow traffic.

Optical Collection Agents

Vendor	Supported Node Version	Software
Cisco	Cisco Network Convergence System (NCS) 2000 Series Routers, Releases 10.7, 10.8, 10.9	Cisco Evolved Programmable Network Manager 2.2 Maintenance Pack 1 Point Patch 1
Cisco Transport Controller (CTC)	Cisco Network Convergence System (NCS) 2000 Series Routers, Releases 10.7, 10.8	CTC plug-in packaged with WAE

Collection from Network Service Orchestrator

Software/Driver	Version
IOS NED	6.7
IOS-XR NED	7.6
Junos NED	4.1
Network Service Orchestrator	4.7.1
Traffic Engineering	Contact your Cisco WAE representative.

Scale Support

Parameters	Scale
Total number of Network Devices	4000
Total number of Interfaces	100000
Total number of Demands	100000
Total number of Policies (SR or RSVP or Both)	5000

Cisco WAE Design Requirements

WAE Design is a 64-bit installation on all supported operating systems.

Operating System	Software	CPU	Memory
Linux-x86_64	CentOS and RHEL 7.5 with latest patches	Intel or AMD 2+ GHz	Minimum: 8 GB Recommended: 16 GB
Windows (64-bit)	Windows Server 2008 R2 Edition Windows 10	Intel or AMD 2+ GHz	Minimum: 8 GB Recommended: 16 GB
macOS x86_64	10.8.5 to 10.13.4	Intel or AMD 2+ GHz	Minimum: 8 GB Recommended: 16 GB

Software	Version
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JDK/JRE	<p>Configuration parsing inside WAE Design requires JRE Version 1.8.0_102 (64-bits) downloaded from the Oracle distributed site. No other JRE version, variant, or source is supported.</p> <ul style="list-style-type: none"> Windows (64-bit): <ul style="list-style-type: none"> Set JRE_HOME (Control Panel > System > Advanced > Environment Variables) to point to the JRE installation path. Typically, the path is C:\Program Files\Java\jre1.8.0_102. Linux: <ul style="list-style-type: none"> The session that launches WAE Design should include in its environment: <pre>JRE_HOME=<JRE_installation_path></pre> Mac: <ul style="list-style-type: none"> Add the following line into ~/.bash_profile: <pre>export JRE_HOME=\$(/usr/libexec/jre_home -v 1.8)</pre> <p>For MacOS X 10.12 or later, also add following line in ~/.bash_profile:</p> <pre>launchctl setenv JRE_HOME `/usr/libexec/jre_home -v 1.8`</pre>
Perl	A Perl (5.10+) installation is required for certain WAE Design features.
Python	A Python installation is required for certain WAE Design features. See Required Software Packages, on page 2 .

Important Notes

- A standalone WAE Design system does not require the use of WAE Collector.
- Only Linux distributions available in English are supported.

WAE Live Requirements



Note WAE Live must be installed on a separate server than the WAE server.

Requirement	~1000 Node Network	~2000 Node Network
Supported operating system	CentOS 7.5	CentOS 7.5
CPU	8 cores, 16 threads	16 cores, 32 threads
Memory	24 GB	48 GB
Disk speed	200 MBs	320 MBs
Disk size	3 TB	10 TB
Number of network objects	100,000	500,000



- Note**
- Only Linux distributions available in English are supported.
 - Other CentOS Red Hat Enterprise Linux versions should work, but has not been tested.

Kernel Parameters

Kernel Parameters	Value
SHMALL	4294967296
SHMMAX	4398046511104
SHMMNI	4096
SEMMNS	32000
SEMMSL	250
SEMOPM	32
Maximum number of file descriptors	65535

Supported Web Browsers

Browser	Version
Google Chrome	62 or later
Firefox	56 or later
Internet Explorer	11 or later
Note Not supported on WAE Live or WAE Coordinated Maintenance.	

Cisco WAE Ports

Port	Protocol	Type	Description
*:4000	UDP	Listening	Cisco WAE Server
*:8080	TCP	Listening	Cisco WAE Server
*:8443	TCP	Listening	Cisco WAE Server, Live Server
2022 - 2023	TCP	Listening and outgoing	Cisco WAE Server
*:2024	TCP	Listening	Cisco WAE Server
4569	TCP	Listening and outgoing	Cisco WAE Server
4570	TCP	Listening	Cisco WAE Server HA
8080	TCP	Outgoing	XTC collection
127.0.0.1:9901 - 9902	TCP	Listening	SNMP polling
164	UDP	Outgoing	SNMP-based NIMOs
22	TCP	Outgoing	Collection via Telnet
23	TCP	Outgoing	Collection via SSH
*:2181	TCP	Listening	Message broker
*:9092 - 9094	TCP	Listening	Message broker
*:9000	TCP	Listening	Optical plug-in
8161	TCP	Listening	NetFlow JMS OOB
61616	TCP	Listening	NetFlow JMS IB
9090	TCP	Listening	NetFlow HTTP
2100	UDP	Listening	NetFlow
179	TCP	Listening	NetFlow BGP
*:8843	TCP	Listening	Cisco WAE Coordinated Maintenance (standalone or as part of WAE Server)
See "Configuring License Server Ports" in the Cisco WAE Design GUI Installation Guide .	TCP	Listening	License Server

