

ThousandEyes Enterprise Agent

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ThousandEyes Enterprise Agent Overview

ThousandEyes Enterprise Agent is an enterprise network-monitoring tool that provides you an end-to-end view across networks and services that impact your business. It monitors the network traffic paths across internal, external, carrier, and internet networks in real time, to provide network performance data. Enterprise Agents are commonly installed in branch sites and data centers to provide a detailed understanding of WAN and internet connectivity.

The ThousandEyes Enterprise Agent provides the following:

- Benchmarking the performance of networks and applications.
- Detailed hop-by-hop metrics.
- End-to-end path visualization from branch or campus to data center or cloud.
- Outage detection and resolution.
- User-experience analysis.
- Visualization of the traffic-flow pattern.

Prerequisites for the ThousandEyes Enterprise Agent

- The ThousandEyes Enterprise Agent CAF images are tar files created specifically for use with the application hosting feature on Cisco routers and switches.
- Installation of the Enterprise Agent requires internet connectivity, or a proxy server. For more information, see the *ThousandEyes documentation* at: https://docs.thousandeyes.com/product-documentation/global-vantage-points/enterprise-agents/installing/cisco-devices/nexus-switches.

- The Enterprise Agent application can only be used after the user's license privileges are validated.

Resources Required for the ThousandEyes Enterprise Agent

This table describes the required resources for installing the ThousandEyes Enterprise Agent:

Table 1: Resources Required for the ThousandEyes Enterprise Agent

App Media	Maximum Resource	Minimum Supported Release
Bootflash	• CPU: 0.5 • Memory: 500MB RAM • Storage: 1G for persistent logging by applications.	Cisco NX-OS Release 10.4(2)F

Installing the ThousandEyes Enterprise Agent

Guidelines and Limitations

ThousandEyes Enterprise Agent has the following guidelines and limitations:

- NX-OS supports ThousandEyes Enterprise Agent version 5.1.1 and above.
- It is recommended to use interface eth0 for the container interface in 10.4(2)F and above. If the interface other than the eth0 is used, the app comes up with proper network configuration right after downgrade, but if the app is stopped, deactivated, or started, the default gateway will not be installed and connectivity to the app is not established. If eth1 is used in 10.4(2)F prior to downgrade, after the downgrade, the runtime configuration incorrectly reflects the VNIC as management instead of gateway (front panel port) even though the configuration within the container is correct. To resolve this issue, reconfigure the ThousandEyes Enterprise Agent. See Installing the ThousandEyes Enterprise Agent, on page 2.
- ThousandEyes Enterprise Agent supports a maximum test bandwidth of 120 Mbps. Increasing the CPU or memory allocation for the application does not increase this limit.
- On a switch that hosts a ThousandEyes Enterprise Agent, do not configure the SPAN TCAM region size as 0. When the SPAN TCAM region is 0, traffic from remote hosts to the agent is dropped instead of being punted to the application. If the region is set to 0, configure a supported nonzero size for the platform, save the configuration, and reload the switch for the change to take effect. See Configuring ACL TCAM Region Sizes in the Cisco Nexus 9000 Series NX-OS Security Configuration Guide.

Configuring Application Hosting for the ThousandEyes Enterprise Agent

Beginning with Cisco NX-OS 10.4(2)F, you can configure up to 4 IPv4 and IPv6 interfaces within the ThousandEye Enterprise agent.

Follow the steps to install the ThousandEyes Enterprise Agent.

SUMMARY STEPS

1. **configure terminal**
2. **app-hosting bridge** *bridge-index*
3. **ip address** *ip-address/mask*
4. **vrf member** *name*
5. **exit**
6. **app-hosting appid** *name*
7. **app-vnic gateway bridge** *bridge-index* **guest-interface** *guest-interface-number*
8. **guest-ipaddress** *ip-address/mask*
9. **exit**
10. **app-default-gateway** *ip-address* **guest-interface***number*
11. **nameserver#** *ip-address*
12. **app-resource docker**
13. **run-opts** *options*
14. **prepend-pkg-opts**
15. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `switch# configure terminal`	Enters global configuration mode.
Step 2	**app-hosting bridge** *bridge-index* **Example:** `switch(config)# app-hosting bridge 1`	Configures the App-hosting bridge and enters App Hosting Bridge configuration mode. <1-8> Bridge index
Step 3	**ip address** *ip-address/mask* **Example:** `switch(config-app-hosting-bridge)# ip address 172.25.44.1/30`	Configures the App Bridge IPv4 address which acts as the gateway to the Application Container.
Step 4	**vrf member** *name* **Example:** `switch(config-app-hosting-bridge)# vrf member overlay-VRF`	Sets the VRF context. If not configured, it would be part of VRF default.
Step 5	**exit** **Example:** `switch(config-app-hosting-bridge)# exit`	Exits App Bridge configuration mode and returns to global configuration mode.

	Command or Action	Purpose
Step 6	**app-hosting appid** *name* **Example:** `switch(config)# app-hosting appid te_app`	Configures an application and enters application-hosting configuration mode.
Step 7	**app-vnic gateway bridge** *bridge-index* **guest-interface** *guest-interface-number* **Example:** `switch(config-app-hosting)# app-vnic bridge 1 guest-interface 0`	Configures the guest VNIC interface for an application and enters application-hosting vnic interface mode.
Step 8	**guest-ipaddress** *ip-address/mask* **Example:** `switch(config-config-app-hosting-app-vnic)# guest-ipaddress 172.25.44.2/30`	Configures one of the available IPv4 address from the bridge 1 subnet.
Step 9	**exit** **Example:** `switch(config-config-app-hosting-vlan-access-ip)# exit`	Exits App vnic interface configuration mode and returns to app-hosting configuration mode.
Step 10	**app-default-gateway** *ip-address* **guest-interface***number* **Example:** `switch(config-app-hosting-)# app-default-gateway 172.25.44.1`	Configures the available IPv4 address from the bridge1 subnet.
Step 11	**nameserver#** *ip-address* **Example:** `Device(config-app-hosting)# name-server0 10.2.2.2`	Configures the DNS server.
Step 12	**app-resource docker** **Example:** `switch(config-app-hosting)# app-resource docker`	Enters application-hosting docker-configuration mode to specify application resource updates.

Step 13	**run-opts** *options*
	Example:
	`switch(config-app-hosting-docker)# run-opts 1 "-e TEAGENT_ACCOUNT_TOKEN=[account-token]"`
	`run-opts 10 "-e TEAGENT_DEF_IPV4_GW_ETH1=172.25.44.65"`
	`run-opts 11 "-e TEAGENT_DEF_IPV6_GW_ETH1=2001:420:287:2003:7:110:1205:1"`
	`run-opts 12 "-e TEAGENT_DEF_IPV4_GW_ETH2=172.25.44.73"`
	`run-opts 13 "-e TEAGENT_DEF_IPV6_GW_ETH2=2001:420:287:2003:7:110:1206:1"`
	`run-opts 14 "-e TEAGENT_DEF_IPV4_GW_ETH3=172.25.44.81"`
	`run-opts 15 "-e TEAGENT_DEF_IPV6_GW_ETH3=2001:420:287:2003:7:110:1207:1"`
		Specifies the Docker run time options.
		You can configure additional default gateways through the **run-opts** option. The **TEAGENT_DEF_IPV[4/6]_GW_ETH[0-3]** command is used to indicate IPv4 and IPv6 and the index is between 0-3.You can only configure 1 gateway using the **app-default-gateway** command.

	Command or Action	Purpose
Step 14	**prepend-pkg-opts** **Example:** `switch(config-app-hosting-docker)# prepend-pkg-opts`	Merges the package options with the Docker runtime options. Any duplicate variable is overwritten.
Step 15	**end** **Example:** `switch(config-app-hosting-docker)# end`	Exits application-hosting docker-configuration mode and returns to privileged EXEC mode.

Example

Following is the example for ThousandEye multi interface configuration.

```
app-hosting bridge 1
ip address 172.25.44.113/29
ipv6 address 2001:420:287:2003:7:110:1210:1/125
app-hosting bridge 2
vrf member apphosting
ip address 172.25.44.97/30
ipv6 address 2001:420:287:2003:7:110:1208:1/126
app-hosting bridge 3
vrf member te
ip address 172.25.44.105/29
ipv6 address 2001:420:287:2003:7:110:1209:1/125
app-hosting bridge 4
vrf member vxlan_blue
ip address 172.25.44.33/30
ipv6 address 2001:420:287:2003:7:110:1203:1/114
app-hosting appid tea
app-vnic gateway bridge 1 guest-interface 0
guest-ipaddress 172.25.44.114/29
guest-ipv6address 2001:420:287:2003:7:110:1210:2/125
app-vnic gateway bridge 2 guest-interface 1
guest-ipaddress 172.25.44.98/30
guest-ipv6address 2001:420:287:2003:7:110:1208:2/126
app-vnic gateway bridge 3 guest-interface 2
guest-ipaddress 172.25.44.106/29
guest-ipv6address 2001:420:287:2003:7:110:1209:2/125
app-vnic gateway bridge 4 guest-interface 3
guest-ipaddress 172.25.44.34/30
guest-ipv6address 2001:420:287:2003:7:110:1203:2/114
app-default-gateway 172.25.44.97 guest-interface 1
app-default-ipv6-gateway 2001:420:287:2003:7:110:1208:1 guest-interface 1
app-resource docker
prepend-pkg-opts
run-opts 1 "-e TEAGENT_ACCOUNT_TOKEN=[account-token]"
run-opts 2 "--hostname=southlake2-1-Multi-UsrVRF"
run-opts 5 "-e TEAGENT_PROXY_TYPE=STATIC"
run-opts 6 "-e TEAGENT_PROXY_LOCATION=proxy.domainname.com:80"
run-opts 7 "-e TEAGENT_PROXY_BYPASS_LIST=T*.domainname.com"
run-opts 8 "--dns 8:8:8:8"
run-opts 9 "--dns 8::8"
run-opts 10 "-e TEAGENT_DEF_IPV4_GW_ETH0=172.25.44.113"
run-opts 11 "-e TEAGENT_DEF_IPV6_GW_ETH0=2001:420:287:2003:7:110:1210:1"
run-opts 14 "-e TEAGENT_DEF_IPV4_GW_ETH2=172.25.44.105"
run-opts 15 "-e TEAGENT_DEF_IPV6_GW_ETH2=2001:420:287:2003:7:110:1209:1"
```

```
run-opts 16 "-e TEAGENT_DEF_IPV4_GW_ETH3=172.25.44.33"
run-opts 17 "-e TEAGENT_DEF_IPV6_GW_ETH3=2001:420:287:2003:7:110:1203:1"
```

Installing the ThousandEyes Enterprise Agent

Before you begin

You can install the ThousandEyes Enterprise Agent either from the URL given below or from the flash file system.

You can install the ThousandEyes Enterprise Agent from a file in the bootflash of the switch.

SUMMARY STEPS

1. **enable**
2. **app-hosting install appid** *application-name* **package** *package-path*
3. **app-hosting activate appid** *application-name*
4. **app-hosting start appid** *application-name*
5. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `switch> enable`	Enters privileged EXEC mode.

Step 2	**app-hosting install appid** *application-name* **package** *package-path*
	Example:
	`switch# app-hosting install 1keyes https://app.thousandeyes.com/install/download/enterprise-agent/thousandeyes-enterprise-agent-x86_64.cisco.tar`
	Or
	`switch# app-hosting install appid 1keyes package flash:/apps/[greenfield-app-tar]`
	`switch# app-hosting install appid 1keyes package bootflash:[file path]`
		Installs an application from the specified location.

Step 3	**app-hosting activate appid** *application-name* **Example:** `switch# app-hosting activate appid 1keyes`	Activates the application hosting configuration mode
Step 4	**app-hosting start appid** *application-name* **Example:**	(Optional) Starts the application.

	Command or Action	Purpose
	`switch# app-hosting start appid 1keyes`	
Step 5	**end** **Example:** `switch# end`	Exits application hosting configuration mode and returns to privileged EXEC mode.

The following is sample output from the **show app-hosting list** command:

```
switch# show app-hosting list

App id                                   State
---------------------------------------------------------
1keyes                                   RUNNING
```

Configuration Examples for ThousandEyes Enterprise Agent

Examples: Installing ThousandEyes Enterprise Agent

The following example shows how to enable apphosting feature:

```
switch> enable
switch# configure terminal
switch(config)# feature app-hosting
switch(config)# end
```

The following example shows how to configure AppHosting:

```
switch> enable
switch# configure terminal
switch(config)# app-hosting bridge 2
switch(config)# vrf member red
switch(config)# ip address 172.25.44.1/28
switch(config)# app-hosting appid 1keyes
switch(config-app-hosting)# app-vnic gateway bridge 1 guest-interface 0
switch(config-config-app-hosting)# guest-ipaddress 172.25.44.3/28
switch(config-config-app-hosting)# exit
switch(config-app-hosting)# app-default-gateway 172.25.44.1 guest-interface 0
switch(config-app-hosting)# name-server0 10.2.2.2
switch(config-app-hosting)# app-resource docker
switch(config-app-hosting-docker)# run-opts 1 "-e TEAGENT_ACCOUNT_TOKEN=[account-token]"
switch(config-app-hosting-docker)# prepend-pkg-opts
switch(config-app-hosting-docker)# end
```

The following example shows how to configure the SVI:

```
switch(config)# interface Vlan606
switch(config-if)# no shutdown
switch(config-if)# vrf member red
switch(config-if)# no ip redirects
switch(config-if)# ip address 172.30.2.193/26
switch(config-if)# ip proxy-arp
switch(config-if)# ip local-proxy-arp
switch(config-if)# interface Ethernet1/15
switch(config-if)# switchport
```

```
switch(config-if)# switchport mode trunk
switch(config-if)# switchport trunk allowed vlan 606
switch(config-if)# no shutdown
```

The following example shows how to install the ThousandEyes Enterprise Agent.

Note You can install the prepackaged Greenfield application from the flash file system.

```
Device> enable
Device# Device# app-hosting install 1keyes https://downloads.thousandeyes.com/
enterprise-agent/thousandeyes-enterprise-agent-3.0.cat9k.tar
```

Sample Configuration for ThousandEyes Enterprise Agent

The following is sample output from the **show app-hosting detail** command:

```
switch# show app-hosting detail
App id : 1keyes
Owner : appmgr
State : DEPLOYED
Application
Type : docker
Name : ThousandEyes Enterprise Agent
Version : 4.0.2
Description :
Author : ThousandEyes <support@thousandeyes.com>
Path : /bootflash/thousandeyes-enterprise-agent-4.0.2.cisco.tar.gz
URL Path :
Activated profile name : custom
Resource reservation
Memory : 2048 MB
Disk : 51 MB
CPU : 7400 units
Platform resource profiles
Profile Name CPU(unit) Memory(MB) Disk(MB)
------------------------------------------------------------------
Attached devices
Name Type Alias
---------------------------------------------
iox_trace serial/trace serial3
iox_syslog serial/syslog serial2
iox_console_aux serial/aux serial1
iox_console_shell serial/shell serial0
Network interfaces
---------------------------------------
Docker
------
Run-time information
Command :
Entry-point :
Run options in use :
Package run options :
Application health information
Status : 0
Last probe error :
Last probe output :
```

The following sample output from the **show running-configuration** command without proxy server:

```
switch# show running-config app-hosting

feature app-hosting
app-hosting signed-verification disable
app-hosting bridge 2
ip address 172.25.44.33/28
app-hosting appid 1keyes
app-vnic gateway bridge 2 guest-interface 0
guest-ipaddress 172.25.44.35/28
app-default-gateway 172.25.44.33 guest-interface 0
name-server0 171.70.168.183
name-server1 173.36.131.10
app-resource docker
prepend-pkg-opts
run-opts 1 "-e TEAGENT_ACCOUNT_TOKEN = [account-token]"
run-opts 2 "--hostname=southlake2-1"
run-opts 3 "--cap-add=NET_ADMIN"
run-opts 4 "--mount type=tmpfs,destination=/var/log/agent,tmpfs-size=140m"
run-opts 5 "-e TEAGENT_PROXY_TYPE=STATIC"
run-opts 6 "-e TEAGENT_PROXY_LOCATION=proxy.domainname.com:80"
run-opts 7 "-e TEAGENT_PROXY_BYPASS_LIST=T*.domainname.com"
```