Cisco Nexus 9000 Series NX-OS Virtual Machine Tracker Configuration Guide, Release 10.1(x)

First Published: 2021-02-16

Last Modified: 2023-09-11

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Preface

This preface includes the following sections:

- Audience, on page v
- Document Conventions, on page v
- Related Documentation for Cisco Nexus 9000 Series Switches, on page vi
- Documentation Feedback, on page vi
- Communications, Services, and Additional Information, on page vi

Audience

This publication is for network administrators who install, configure, and maintain Cisco Nexus switches.

Document Conventions

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which you supply the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments that are separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments that are separated by a vertical bar indicate a required choice.
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.

Convention	Description
`variable`	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string includes the quotation marks.

Examples use the following conventions:

Convention	Description
`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information that you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Related Documentation for Cisco Nexus 9000 Series Switches

The entire Cisco Nexus 9000 Series switch documentation set is available at the following URL:

http://www.cisco.com/en/US/products/ps13386/tsd_products_support_series_home.html

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to nexus9k-docfeedback@cisco.com. We appreciate your feedback.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
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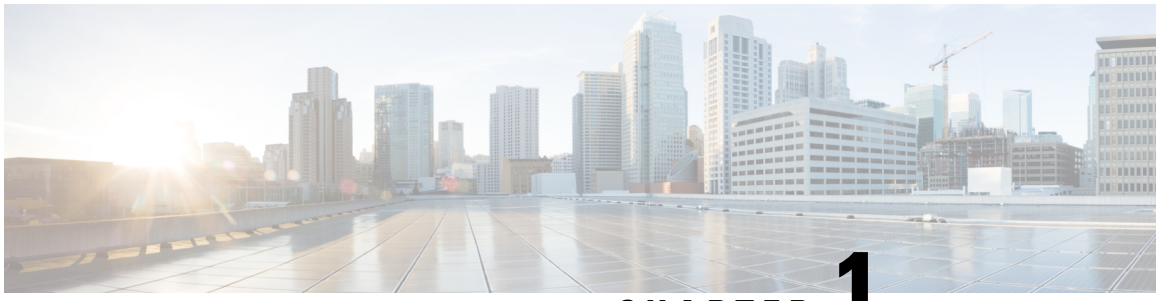
Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

Preface



CHAPTER 1

New and Changed Information

This chapter provides release-specific information for each new and changed feature in the *Cisco Nexus 9000 Series NX-OS Virtual Machine Tracker Configuration Guide*.

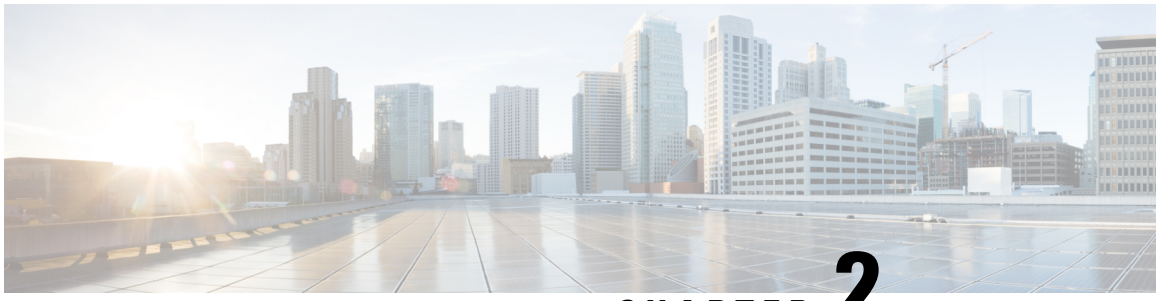
- New and Changed Information, on page 1

New and Changed Information

Table 1: New and Changed Features for Release 10.1(1)

Feature	Description	Changed in Release	Where Documented
No feature updates for this release	Not applicable	Not applicable	Not applicable

New and Changed Information



CHAPTER 2

Overview

This chapter contains the following sections:

- Licensing Requirements, on page 3
- Supported Platforms, on page 3
- Information About Virtual Machine Tracker, on page 3
- Virtual Machine Tracker and VMware vCenter, on page 4

Licensing Requirements

For a complete explanation of Cisco NX-OS licensing recommendations and how to obtain and apply licenses, see the *Cisco NX-OS Licensing Guide* and the *Cisco NX-OS Licensing Options Guide*.

Supported Platforms

Starting with Cisco NX-OS release 7.0(3)I7(1), use the Nexus Switch Platform Support Matrix to know from which Cisco NX-OS releases various Cisco Nexus 9000 and 3000 switches support a selected feature.

Information About Virtual Machine Tracker

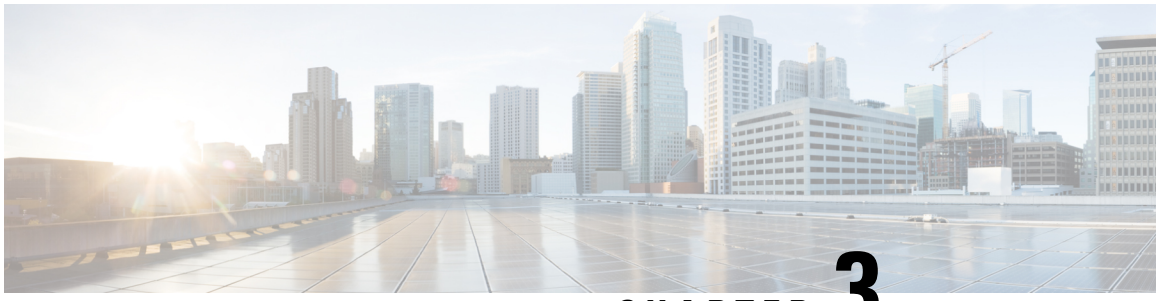
Virtual Machine Tracker (VM Tracker) works together with VMware vCenter and enables you to do the following:

- Identify the Cisco Nexus 9000 Series port that is used for each VM
- Identify the VLAN requirements of each VM
- Track the movement of VMs from one host (ESXi) to another
- Track VM configuration changes such as additions, deletions, or modifications of VLANs, and configure VLANs on Cisco Nexus 9000 Series ports accordingly
- Track the additions or deletions of VMs and hosts, and configure VLANs on Cisco Nexus 9000 Series ports accordingly
- Track the state of VMs and dynamically provisions VLANs on the Cisco Nexus 9000 server facing physical ports.

Virtual Machine Tracker and VMware vCenter

VM Tracker synchronizes with VMware vCenter to retrieve the following information:

- The host on which the VMs exist.
- The Cisco Nexus 9000 Series ports through which the VM traffic flows.
- The virtual network interface card (vNIC) that connects the VM to a virtual switch.
- The power state of the VM.
- The VLAN information of port groups or distributed virtual switch (DVS) port groups.
- The port groups or DVS port groups that are required for the VM.



CHAPTER 3

Configuring Virtual Machine Tracker

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- Creating a New Connection to vCenter, on page 6
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Information About Virtual Machine Tracker

Guidelines and Limitations for VM Tracker

VM Tracker has the following guidelines and limitations:

- **show** commands with the **internal** keyword are not supported.
- For all ports on which VM Tracker is enabled, you must not perform any Layer 2 or Layer 3 configuration that is related to switchports and VLANs.
- VM Tracker supports up to four vCenter connections.
- VM Tracker supports high availability and the fault tolerance features of vCenter.
- You must connect a host directly to the port of a Cisco Nexus 9000 Series switch. Host connectivity through fabric interconnect, another switch, or chassis is not supported.

Note Connecting a host through a fabric extender (FEX) is supported by a Cisco Nexus 9000 Series switch.

- When VMware Distributed Resource Scheduler (DRS) is enabled, VMTracker cannot immediately detect when the VM is powered on. However when VMTracker later performs a full sync with VMware VCenter, the VM becomes recognized by VMTracker. Disabling VMware DRS avoids this issue.

Enabling Virtual Machine Tracker

By default, the VM Tracker feature is enabled on all interfaces.

SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **[no] feature vmtracker**

DETAILED STEPS

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **[no] feature vmtracker**	Enables the VM Tracker feature on all interfaces. The **no** form of the command disables the VM Tracker feature on all interfaces.

Example

This example shows how to enable VM Tracker:

```
switch# configure terminal
switch(config)# feature vmtracker
switch(config)#
```

Creating a New Connection to vCenter

SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **[no] vmtracker connection** *connection-name*
3. switch(config-vmt-conn)# **[no] remote** {**ip address** *ip_address* | **port** *port_number* | **vrf**}
4. switch(config-vmt-conn)# **username** *username* **password** *password*
5. switch(config-vmt-conn)# **[no] connect**

DETAILED STEPS

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.

	Command or Action	Purpose
Step 2	switch(config)# **[no] vmtracker connection** *connection-name*	Enters VM Tracker connection configuration mode for the connection name specified. The **no** form of the command disables the connection.
Step 3	switch(config-vmt-conn)# **[no] remote** {**ip address** *ip_address* | **port** *port_number* | **vrf**}	Configures remote IP parameters.
Step 4	switch(config-vmt-conn)# **username** *username* **password** *password*	Verifies the username and password to connect to vCenter.
Step 5	switch(config-vmt-conn)# **[no] connect**	Connects to vCenter. The **no** form of the command disconnects VM Tracker from vCenter.

Example

This example shows how to create a new connection to VMware vCenter:

```
switch# configure terminal
switch(config)# vmtracker connection conn1
switch(config-vmt-conn)# remote ip address 20.1.1.1 port 80 vrf management
switch(config-vmt-conn)# username user1 password abc1234
switch(config-vmt-conn)# connect
```

Synchronizing Information with VMware vCenter

By default, VM Tracker tracks all asynchronous events from VMware vCenter and updates the switchport configuration immediately. Optionally, you can also configure a synchronizing mechanism that synchronizes all host, VM, and port group information automatically with VMware vCenter at a specified interval.

Command	Purpose
[no] set interval find-new-host *val*	Sets the interval, in seconds, for finding hosts that are newly connected to vCenter. The **no** form of the command disables the previously configured interval. The default duration is 3600 seconds.
[no] set interval sync-full-info *val*	Sets the interval, in seconds, for synchronizing all host, VM, and port group related information with vCenter. The **no** form of the command disables the previously configured interval. The default duration is 3600 seconds.
vmtracker connection *connection-name* **refresh**	Synchronizes all host, VM, and port group related information with vCenter immediately for the specified connection.

Example

This example shows how to set an interval for finding hosts that are newly connected to vCenter:

```
switch(config-vmt-conn)# set interval find-new-host 300
```

This example shows how to set an interval for synchronizing all host, VM, and port group information with vCenter:

```
switch(config-vmt-conn)# set interval sync-full-info 120
```

This example shows how to immediately synchronize all host, VM, and port group information with vCenter:

```
switch# vmtracker connection conn1 refresh
```

Compatibility Checking on a VPC Topology

On a VPC topology, VM Tracker performs a Type 2 compatibility checking. The checking ensures that for a particular connection name, the following fields match across the VPC peers:

- The vCenter IP address that VM Tracker should connect to.
- The vCenter port number that VM Tracker should connect on.
- The allowed VLAN range for that particular connection.
- The username/password combination that VM Tracker should use to connect to the vCenter Server.

To determine if the VPC checking was successful, use the **show vpc consistency-parameters global** command.

The following is an example of VPC checking:

```
switch# show vpc  consistency-parameters global

    Legend:
        Type 1 : vPC will be suspended in case of mismatch

Name                        Type  Local Value            Peer Value
-------------               ----  ---------------------- -----------------------
Vlan to Vn-segment Map      1     No Relevant Maps       No Relevant Maps
STP Mode                    1     Rapid-PVST             Rapid-PVST
STP Disabled                1     None                   None
STP MST Region Name         1     ""                     ""
STP MST Region Revision     1     0                      0
STP MST Region Instance to  1
 VLAN Mapping
STP Loopguard               1     Disabled               Disabled
STP Bridge Assurance        1     Enabled                Enabled
STP Port Type, Edge         1     Normal, Disabled,      Normal, Disabled,
BPDUFilter, Edge BPDUGuard        Disabled               Disabled
STP MST Simulate PVST       1     Enabled                Enabled
Interface-vlan admin up     2     1-8                    1-8
Interface-vlan routing      2     1-8                    1-8
capability
vmtracker connection        2     conn1, 10.193.174.215, conn1, 10.193.174.215,
params                             80, 1-4094             80, 1-4094
Allowed VLANs               -     1-100                  1-100
Local suspended VLANs       -     -                      -
```

```
switch#
```

Verifying the Virtual Machine Tracker Configuration

Use the following commands to display and verify VM Tracker configuration information:

Command	Purpose
show running-config vmtracker [**all**]	Displays the VM Tracker configuration.
show vmtracker [**connection** *conn_name*] {{**info** [**interface** *intf_id*]{**summary** | **detail** | **host** | **vm** | **port-group**}} | **event-history**}	Displays the VM Tracker configuration based on the following: • Connection • Interface • Event history
show vmtracker [**connection** *conn_name*] **status**	Displays the IP address and connection status of the vCenter connection specified.
show logging level vmtracker	Displays the logging level of the syslog messages for VM Tracker.

Enabling Virtual Machine Tracker on Specific Interfaces

When VM Tracker is enabled by using the **[no] feature vmtracker** command, it is enabled on all interfaces by default. You can optionally disable and enable it on specific interfaces by using the **[no] vmtracker enable** command.

SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **interface** *type slot/port*
3. switch(config-if)# **[no] vmtracker enable**

DETAILED STEPS

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **interface** *type slot/port*	Enters the interface configuration mode for the specified interface.
Step 3	switch(config-if)# **[no] vmtracker enable**	Enables the VM Tracker feature on the specified interface.

	Command or Action	Purpose
		The **no** form of the command disables the VM Tracker feature on the specified interface.

Example

This example shows how to enable VM Tracker on a specified interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/3/1
switch(config-if)# vmtracker enable
```

Configuring Dynamic VLAN Creation

Enabling Dynamic VLAN Creation

Dynamic creation and deletion of VLANs globally is enabled by default. When dynamic VLAN creation is enabled, if a VM is moved from one host to another and the VLAN required for this VM does not exist on the switch, the required VLAN is automatically created on the switch. You can also disable this capability. However, if you disable dynamic VLAN creation, you must manually create all the required VLANs.

Before you begin

Ensure that the VM Tracker feature is enabled.

SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **vmtracker connection** *connection-name*
3. switch(config-vmt-conn)# **[no] autovlan enable**

DETAILED STEPS

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **vmtracker connection** *connection-name*	Enters VM Tracker connection configuration mode for the connection name specified.
Step 3	switch(config-vmt-conn)# **[no] autovlan enable**	Enables dynamic VLAN creation and deletion. The **no** form of the command disables dynamic VLAN creation and deletion.

Example

This example shows how to enable dynamic VLAN creation:

```
switch# configure terminal
switch(config)# vmtracker connection conn1
switch(config-vmt-conn)# autovlan enable
```

Configuring an Allowed VLAN List

By default, all VLANs can be configured dynamically on interfaces. You can also define a restricted list of such VLANs.

Before you begin

Ensure that the VM Tracker feature is enabled.

SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **vmtracker connection** *connection-name*
3. switch(config-vmt-conn)# **allowed-vlans** {*allow-vlans* | **add** *add-vlans* | **except** *except-vlans* | **remove** *remove-vlans* | **all**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **vmtracker connection** *connection-name*	Enters VM Tracker connection configuration mode for the connection name specified.
Step 3	switch(config-vmt-conn)# **allowed-vlans** {*allow-vlans* | **add** *add-vlans* | **except** *except-vlans* | **remove** *remove-vlans* | **all**}	Configures a list of VLANs that can be dynamically configured on interfaces.

Example

This example shows how to configure a list of allowed VLANs:

```
switch# configure terminal
switch(config)# vmtracker connection test
switch(config-vmt-conn)# allowed-vlans 100-101
```

Example Configuration for Virtual Machine Tracker

This example shows how to create a connection with vCenter:

```
switch# configure terminal
switch(config)# feature vmtracker
switch(config)# vmtracker connection test
switch(config-vmt-conn)# remote ip address 20.1.1.1 port 80 vrf management
switch(config-vmt-conn)# username user1 password abc@123
```

```
switch(config-vmt-conn)# connect
switch(config-vmt-conn)# show vmtracker status


Connection           Host/IP                              status
-------------------------------------------------------------------------
test                 20.1.1.1                             Connected

switch(config-vmt-conn)# show vmtracker info detail
-------------------------------------------------------------------------------
Interface       Host            VMNIC   VM         State PortGroup  VLAN-Range
-------------------------------------------------------------------------------
Ethernet1/3/1   20.2.2.2        vmnic4  No-OS1     on    PGroup100  100

-------------------------------------------------------------------------------


switch(config-vmt-conn)# show running-config vmtracker
!Command: show running-config vmtracker
!Time: Mon Mar 10 09:07:47 2014
version 6.0(2)U3(1)
feature vmtracker
vmtracker connection test
remote ip address 20.1.1.1 port 80
username user1 password abc@123
connect


switch(config-vmt-conn)# show running-config interface ethernet 1/3/1
!Command: show running-config interface Ethernet1/3/1
!Time: Mon Mar 10 09:09:13 2014
version 6.0(2)U3(1)
interface Ethernet1/3/1
switchport mode trunk
switchport trunk allowed vlan 1,100
```

Note VLAN 1 is the native VLAN on interface Ethernet1/3/1.

This example shows how to verify VM Tracker information after you power off the VM on vCenter:

```
switch(config-vmt-conn)# show vmtracker info detail
-------------------------------------------------------------------------------
Interface       Host            VMNIC   VM         State PortGroup  VLAN-Range
-------------------------------------------------------------------------------
Ethernet1/3/1   20.2.2.2        vmnic4  No-OS1     off   PGroup100  100

-------------------------------------------------------------------------------


switch(config-vmt-conn)# show running-config interface ethernet 1/3/1
!Command: show running-config interface Ethernet1/3/1
!Time: Mon Mar 10 09:09:13 2014
version 6.0(2)U3(1)
interface Ethernet1/3/1
switchport mode trunk
switchport trunk allowed vlan 1, 100
```

This example shows how to verify VM Tracker information after you add a new VLAN through vCenter:

```
switch(config-vmt-conn)# show vmtracker info detail
--------------------------------------------------------------------------------
Interface       Host            VMNIC   VM         State PortGroup  VLAN-Range
--------------------------------------------------------------------------------
Ethernet1/3/1   20.2.2.2        vmnic4  No-OS1     on    PGroup100  100
Ethernet1/3/1   20.2.2.2        vmnic4  No-OS1     on    PGroup103  103

--------------------------------------------------------------------------------


switch(config-vmt-conn)# show running-config interface ethernet 1/3/1
!Command: show running-config interface Ethernet1/3/1
!Time: Mon Mar 10 09:11:06 2014
version 6.0(2)U3(1)
interface Ethernet1/3/1
switchport mode trunk
switchport trunk allowed vlan 1,100,103
```

This example shows how verify VM Tracker event-history information:

```
switch(config-vmt-conn)# show vmtracker event-history
--------------------------------------------------------------------------------
Event History (Connection:test NumEv:6 IP:20.1.1.1)
--------------------------------------------------------------------------------
EventId    Event Msg
--------------------------------------------------------------------------------
77870      Reconfigured No-OS1 on 20.2.2.2 in N3K-VM
77867      No-OS1 on  20.2.2.2 in N3K-VM is powered on
77863      Reconfigured No-OS1 on 20.2.2.2 in N3K-VM
77858      No-OS1 on  20.2.2.2 in N3K-VM is powered off
```

This example shows how to disconnect from vCenter:

```
switch(config)# vmtracker connection test
switch(config-vmt-conn)# no connect
switch(config-vmt-conn)# show vmtracker status
Connection          Host/IP                              status
-------------------------------------------------------------------------------
test                20.1.1.1                             No Connect

switch(config-vmt-conn)# sh running-config interface ethernet 1/3/1
!Command: show running-config interface Ethernet1/3/1
!Time: Mon Mar 10 09:15:43 2014
version 6.0(2)U3(1)
interface Ethernet1/3/1
switchport mode trunk
switchport trunk allowed vlan 1

switch(config-vmt-conn)# show vmtracker info detail
--------------------------------------------------------------------------------
Interface       Host            VMNIC   VM         State PortGroup  VLAN-Range
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------
```

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