Configuring Virtual Machine Tracker

This chapter contains the following sections:

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.
- VM Tracker supports up to 256 VMs per host.
- VM Tracker supports up to 64 VMs per host.
- VM Tracker supports up to 350 hosts across all vCenters.
- VM Tracker supports up to 600 VLANs.
- VM Tracker supports only 507 VLANs in Per VLAN Rapid Spanning Tree (PVRST) mode due to hardware limitations. To enable more than 507 VLANs, use Multiple Spanning Tree (MST).

- VM Tracker is only supported on ESXi 5.5, 6.0, 6.5, and 6.7 versions of VMware vCenter.
- VM Tracker is only supported on ESXi 5.0, 5.1, and 5.5 versions of VMware vCenter.
- The current version of VM Tracker supports only VMware orchestration. It does not support orchestration with other hypervisors.
- The current version of VM Tracker relies on Cisco Discovery Protocol (CDP) information. It does not support Link Layer Discovery Protocol (LLDP).
- 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. However, you can update the native VLAN.
- VM Tracker does not support VLAN 4095.
- VM Tracker does not support VXLAN 9504, 9508, and 9516.
- VM Tracker is not supported on the virtual port channel (vPC) switch although it can be configured on the downstream switch on the vPC setup.
- You must connect the host directly to the Cisco Nexus 9000 Series ports. Host connectivity through the IOM, fabric extender (FEX), or chassis is not supported.
- If you do not specify the virtual routing and forwarding (VRF) while configuring the remote IP address, the management VRF is used.
- If you do not configure a VLAN as a native VLAN on the interface, VM Tracker cannot remove this VLAN and disable VM Tracker.
- The username/password combination that is used to configure vShield with single sign on (SSO) in VMware vCenter is also the username/password combination that is used to build the VXLAN telemetry information.
- 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

Procedure

	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

Procedure

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

	Command or Action	Purpose
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#
```

Displaying VXLAN Telemetry

To display a list of all virtual wires that are configured for VXLAN traffic, use the **show vmtracker info vxlan-segment** command.

```
switch# show vmtracker info vxlan-segment

--------------------------------------------------------------------------------
VXLAN Segment Info (Conn:a IP:172.23.40.204 vShieldIP:172.23.40.205)
--------------------------------------------------------------------------------
Virtual Wire Name         Multicast IP                        vdnID
--------------------------------------------------------------------------------
virtual wire 1            226.0.0.0                           5001
virtual wire 2            226.0.0.1                           5002
virtual wire 3            226.0.0.2                           5003
virtual wire 4            226.0.0.3                           5004
```

To display a list of all VMs on each virtual wire on a per-host basis, use the **show vmtracker info vxlan-vm** command.

```
switch# show vmtracker info vxlan-vm

--------------------------------------------------------------------------------
VXLAN Segment Info (Conn:a IP:172.23.40.204 vShieldIP:172.23.40.205)
--------------------------------------------------------------------------------
VirtualWireName      VTEP IP          VLAN-Range   VMs
--------------------------------------------------------------------------------
virtual wire 1       10.10.10.10      11           -
virtual wire 2       10.10.10.10      11           Bob, app-1, vMotion VM
virtual wire 3       10.10.10.10      11           -
virtual wire 4       10.10.10.10      11           -
virtual wire 1       10.10.10.20      11           -
virtual wire 2       10.10.10.20      11           web-1
virtual wire 3       10.10.10.20      11           -
virtual wire 4       10.10.10.20      11           -
```

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

Procedure

	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. 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

Procedure

	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

Procedure

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

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