



Configuring Smart-Channel

This chapter describes how to configure smart-channel on Cisco NX-OS devices.

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About Smart Channel

Smart channel is a hardware-based, multi-terabit solution for the Layer 2 traffic distribution, load balancing, and redirection on the Cisco Nexus switches. This feature is supported on the Cisco Nexus 9372PX, 93108TC-EX, and the Cisco Nexus 9516 switches.



Note Smart channel feature is not supported on Cisco 9500 EX / FX line cards.

Smart channel is an aggregation of multiple physical links that creates a single logical link. You can bundle up multiple physical links into a port group to provide an increased bandwidth (an aggregate of the multiple physical links) and redundancy.

If one port within a smart channel fails, the traffic switches to the remaining ports in the smart channel.

Smart channel allows you to create a cluster of transparent mode appliances.

Smart Channel Features

The smart channel features are as follows:

- Multi-terabit solution at line rate
- Simplified provisioning and ease of deployment

- Transparency to end device and stateless protocol benefits
- Removes the requirement for an expensive external load balancer

Benefits of Smart Channel

The benefits of smart channel are as follows:

- Simultaneous redirection and load balancing
- IP-stickiness and resiliency
- Health monitoring
- Removes the requirement for an expensive external load balancer
- Hashing does not depend on the wiring or the port numbering
- Every port on the switch is used for load balancing and traffic redirection
- Automatic failure handling of servers or appliances

Examples of the Deployment Use Cases

Examples of the deployment use cases for the smart channel feature are as follows:

- Load balances to a pool of firewalls.
- Scales the VDS-TC (video-caching) solution.
- Scales the transparent mode devices.

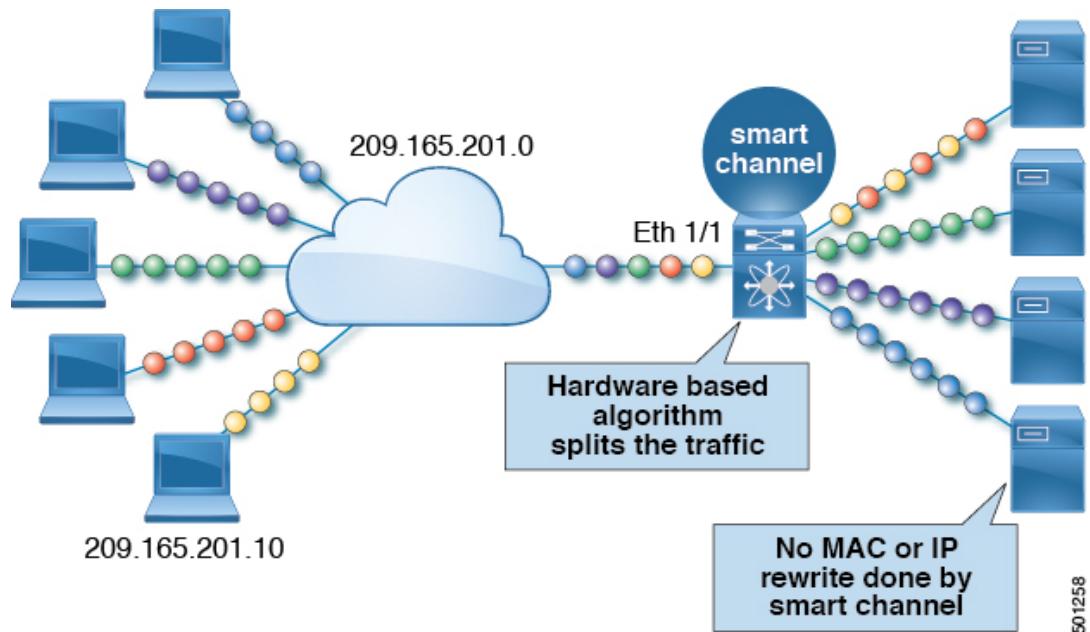
Topology Examples for Smart Channel

This section displays the following examples:

- Basic topology for smart channel
- Use case of a smart channel configuration
- Fail-action for resilient hashing

You can use the smart channel feature to load balance traffic to appliances used in a monitoring network. The following figure shows the basic topology, where the traffic is sent to the appliances where you need to load balance the traffic towards, such as the IPS or the IDS devices.

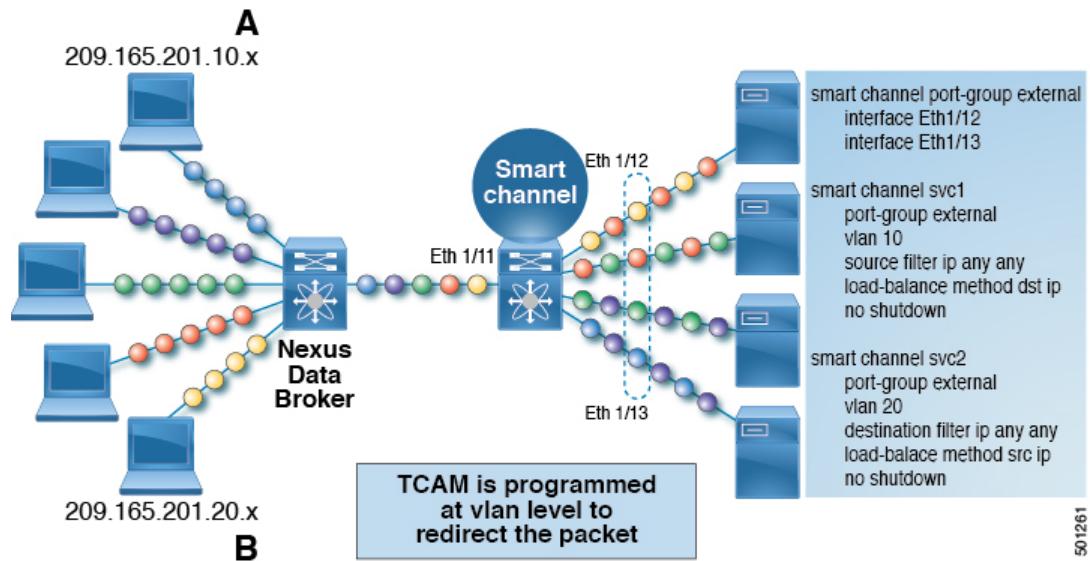
Figure 1: Standard Topology for Smart Channel



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The following example shows a typical use case of smart channel in a network where the traffic is spanned from the production environment to the monitoring environment. In this example, we are using the Cisco Nexus Data Broker to send copy of the monitoring traffic and scale monitoring networks.

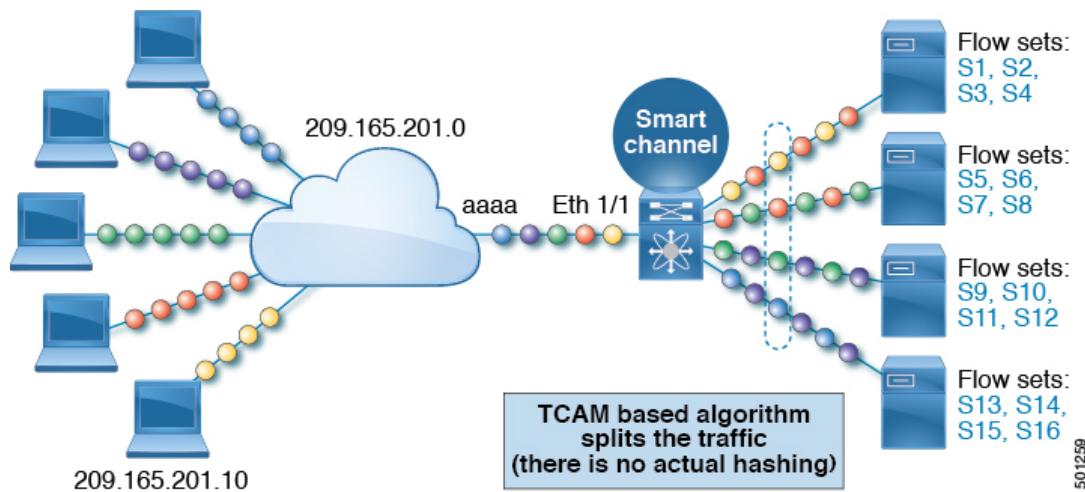
Figure 2: Use Case for a Smart Channel Configuration



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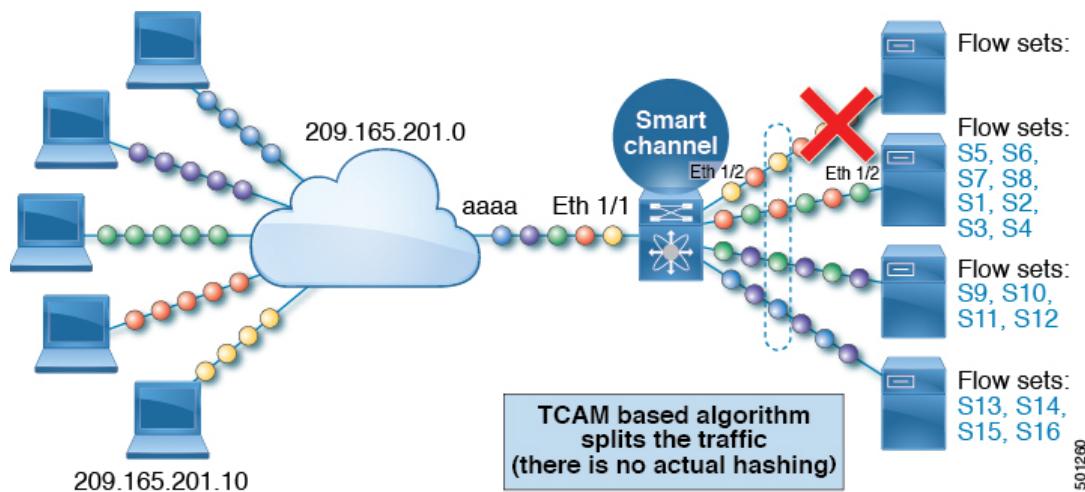
The following example shows the fail-action of a smart channel configuration:

Figure 3: Fail-Action of a Smart Channel Configuration



The following example shows the fail-action of a smart channel configuration:

Figure 4: Fail-Action of a Smart Channel Configuration



Prerequisites for Smart Channel

Smart channel has the following prerequisite:

- You must ensure that an enough TCAM size has been allocated to the VACL. To verify the TCAM size, use the **sh hardware access-list team region** command. If the appropriate TCAM size is not allocated, use the **hardware access-list team region VACL size additional of 256** command to allocate the appropriate TCAM size.

Guidelines and Limitations for Smart Channel

Smart channel has the following configuration guidelines and limitations:

- Cisco Nexus 9372PX, 93108TC-EX, and the Cisco Nexus 9516 switches support smart channel servicing.
- This feature is supported for the Cisco Nexus 9372PX, 93108TC-EX, and the Cisco Nexus 9516 switches.



Note Smart channel feature is not supported on Cisco 9500 EX / FX / R line cards.

- This feature is supported for the Cisco Nexus C93108TC-EX beginning Cisco NX-OS Release 9.2 (x).
- Smart channel does not support the vPC, port channel, and the L3 interfaces.
- Only the port group interfaces in a trunk or access mode are supported.
- You must not share the smart port-group to more than one service when the services have the access configuration.
- Ensure that the TCAM size is equal to the sum of the number of the configured VLANs on the service by the number of buckets.
- Ensure that the smart channel service does not have the same load balancing method (load-balance method src ip) and the configuration of the (source filter ip any any).
- Ensure that the port-group to be added to the smart channel service has been configured.

Default Settings for Smart Channel

The following table lists the default settings for the smart channel parameter.

Table 1: Default Smart Channel Parameter

Parameters	Default
Smart channel	Disabled

Configuring Smart Channel

Enabling Smart Channel

You must enable the smart channel feature before you can configure the smart channel services on the device.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: switch# configure terminal switch(config) #	Enters global configuration mode.
Step 2	[no] feature smart-channel Example: switch(config) # feature smart-channel	Enables or disables smart channel. By default, smart channel is disabled.
Step 3	(Optional) show feature grep smart-channel Example: switch(config-if) # show feature grep smart-channel	Displays the status of the smart channel configuration.
Step 4	(Optional) copy running-config startup-config Example: switch(config) # copy running-config startup-config	Copies the running configuration to the startup configuration.

Configuring Port Groups

After you enable smart channel, you must create a port group and configure active interfaces on that group.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: switch# configure terminal switch(config) #	Enters global configuration mode.
Step 2	[no] smart-channel port-group <i>port-group-name</i> Example: switch(config) # smart-channel port-group Webservers switch(config-port-group) #	Creates or deletes a port group.
Step 3	Required: interface ethernet type slot/port Example: switch(config) # interface ethernet 3/1 switch(config-if) #	Configures the active interfaces on the port group.

	Command or Action	Purpose
Step 4	(Optional) copy running-config startup-config Example: <pre>switch(config-port-group)# copy running-config startup-config</pre>	Copies the running configuration to the startup configuration.

Configuring the Smart Channel Service

To configure the smart channel service, you must do the following:

1. Configure the service name
2. Configure the VLAN/source/destination filters
3. Associate the port group to the smart channel service
4. Specify the load distribution scheme
5. Activate the smart channel service

Before you begin

You must enable the smart channel feature before you configure the smart channel service.



Note Beginning from Cisco Nexus NX-OS Release 9.3(3), feature Smart-channel is not supported. It is recommended to take necessary actions while upgrading from any previous release to 9.3(2) or any newer versions.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: <pre>switch# configure terminal switch(config)#</pre>	Enters global configuration mode.
Step 2	Required: [no] smart-channel service-name Example: <pre>switch(config)# smart-channel WebTraffic switch(config-smart-channel)#</pre>	Configures or disables the smart channel service.
Step 3	[no] access vlan access-vlan vlan vlan-range Example: <pre>switch(config-smart-channel)# access vlan 10-20 switch(config-port-group) #</pre>	Configures a list of VLANs for the smart channel service. While the access VLANs create the smart channel in an access mode, the VLANs in the VLAN range creates the smart channel in the trunk mode.

	Command or Action	Purpose
Step 4	[no] port group <i>port-group-name</i> Example: switch(config-smart-channel)# port group WEBSERVERS switch(config-smart-channel)#{/b>	Associates a port-group with the smart channel service.
Step 5	[no] load-balance method [src dst] Example: switch(config-smart-channel)# load-balance method src-ip switch(config-smart-channel)#{/b>	Configures the load balancing method.
Step 6	[no] destination filter ip any [any] Example: switch(config-smart-channel)# destination filter ip any any switch(config-smart-channel)#{/b>	Configures the selected destination subnets.
Step 7	[no] source filter [ipanyany] Example: switch(config-smart-channel)# source filter ip any any switch(config-smart-channel)#{/b>	Configures the selected source subnets.
Step 8	[no] load-balance method [src dst] Bucket B Example: switch(config-smart-channel)# load-balance method src Bucket 16 switch(config-port-group)#{/b>	Configures the load balancing method.
Step 9	no shut Example: switch(config-smart-channel)# no shut switch(config-smart-channel)#{/b>	Activates the smart channel service.

Verifying the Smart Channel Configuration

Smart Channel Show Commands

To display the smart channel configuration, perform one of the following tasks:

Procedure

	Command or Action	Purpose
Step 1	show smart-channel <i>service-name</i>	Displays the smart channel configuration status.

	Command or Action	Purpose
Step 2	show vlan access-list <i>vlan access-map name</i>	Displays the statistics for a smart channel service.
Step 3	show running-config smart-channel [all]	Displays the running configuration for smart channel.

Configuration Examples for Smart Channel

This example shows how to configure smart channel:

Enabling the smart channel feature.

```
switch# configure terminal
switch(config)# feature smart-channel
```

Configuring port-group.

```
switch(config)# smart-channel port-group pg1
switch(config-port-group)# interface ethernet 10/23
switch(config-pg-node)# interface ethernet 10/24
```

Configuring services.



Note Ensure that the port-group to be added to the smart channel service has been configured.

Service with Trunk configuration

```
-----
switch(config-smart-channel)# port-group pg1
switch(config-smart-channel)# vlan 67
switch(config-smart-channel)# load-balance method src ip
switch(config-smart-channel)# destination filter ip any any
switch(config-smart-channel)# no shut
```

Service with Access configuration

```
-----
switch(config-smart-channel)# port-group pg1
switch(config-smart-channel)# access vlan 68
switch(config-smart-channel)# load-balance method src ip
switch(config-smart-channel)# destination filter ip any any
switch(config-smart-channel)# no shut
```

Verifying the smart channel configuration.

```
switch(config-smart-channel)# show running-config smart-channel
version 7.0(3)I6(1)

smart-channel port-group pg1
  interface Eth10/23
  interface Eth10/24
```

Configuration Examples for Smart Channel

```
smart-channel Service1
  port-group pg1
  vlan 67
  destination filter ip any any
  load-balance method src ip
  no shutdown
```

Checking the status of the service and the port-group interfaces.

```
switch(config-smart-channel)# show smart-channel Service1

Legend:
  ST(Status): ST-Standby,LF-Link Failed,PF-Probe Failed,PD-Peer Down,IA-Inactive

Name      LB Scheme Status Buckets
-----  -----  -----  -----
Service1    src-ip     ACTIVE   2

Port Group
-----
pg1

Pool
-----
Service1_smarterc_pool
Source/Destination Filter          Protocol Port
-----  -----
0.0.0.0 / 255.255.255.255           IP        0

Member-Interface Cfg-STS Weight Op-STS
-----  -----
1      Ethernet10/23 OK      1

Bucket List
-----
Service1_smarterc_ip_1_bucket_1

Member-Interface Cfg-STS Weight Op-STS
-----  -----
2      Ethernet10/24 OK      1

Bucket List
-----
Service1_smarterc_ip_1_bucket_2

VACL config

switch# show running-config aclmgr
```

Checking the statistics.

```
switch# show vlan access-list Service1_smarterc_pool
```

Checking the fail-action.

**Note**

This is a default configuration and you are not required to perform any additional configurations.

```
switch# show smart-channel Service1

Legend:
ST(Status): ST-Standby,LF-Link Failed,PF-Probe Failed,PD-Peer Down,IA-Inactive

Name          LB Scheme Status   Buckets
-----        ----- -----
Service1      src-ip    ACTIVE   2

Port Group
-----
pg1

Pool
-----
Service1_smartc_pool
Source/Destination Filter           Protocol   Port
-----                                -----
0.0.0.0 / 255.255.255.255           IP          0

Member-Interface   Cfg-STS  Weight  Op-STS
-----          -----  -----  -----
1     Ethernet10/23  LF      1

Bucket List
-----
Service1_smartc_ip_1_bucket_1

Member-Interface   Cfg-STS  Weight  Op-STS
-----          -----  -----  -----
2     Ethernet10/24  OK      1

Bucket List
-----
Service1_smartc_ip_1_bucket_2

=====
switch# show running-config aclmgr
=====
switch# show vlan access-list Service1_smartc_pool
```

