Auto Smartports and Static Smartports Macros CLI Commands

macro

To apply a macro to an interface or to apply and debug a macro on an interface, use the **macro** interface configuration command.

macro {**apply** | **trace**} *macro-name* [**parameter** {*value*}] [**parameter** {*value*}] [**parameter** {*value*}]

Syntax Description

apply	Applies a macro to an interface.
trace	Applies a macro to an interface and then debugs it.
macro-name	Specifies the name of the macro.
parameter *value*	(Optional) Specifies unique parameter values that are specific to the interface. You can enter up to three keyword-value pairs. Parameter keyword matching is case sensitive. All matching occurrences of the keyword are replaced with the corresponding value.

Command Default

None.

Command Modes

Interface configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

You can use the **macro apply** *macro-name* interface configuration command to apply and show the macros running on an interface.

You can use the **macro trace** *macro-name* interface configuration command to apply and then debug the macro to find any syntax or configuration errors.

If a command fails because of a syntax error or a configuration error when you apply a macro, the macro continues to apply the remaining commands to the interface.

When creating a macro that requires the assignment of unique values, use the **parameter** *value* keywords to designate values specific to the interface.

Keyword matching is case sensitive. All matching occurrences of the keyword are replaced with the corresponding value. Any full match of a keyword, even if it is part of a larger string, is considered a match and is replaced by the corresponding value.

Some macros might contain keywords that require a parameter value. You can use the **macro apply** *macro-name* **?** command to display a list of any required values in the macro. If you apply a macro without entering the keyword values, the commands are invalid and are not applied.

There are Cisco-default Smartports macros embedded in the switch software. You can display these macros and the commands that they contain by using the **show parser macro** user EXEC command.

Follow these guidelines when you apply a Cisco-default Smartports macro on an interface:

- Display all macros on the switch by using the **show parser macro** user EXEC command. Display the contents of a specific macro by using the **show parser macro name** *macro-name* user EXEC command.
- Keywords that begin with **$** indicate that a unique parameter value is required. Append the Cisco-default macro with the required values by using the **parameter** *value* keywords.

  The Cisco-default macros use the **$** character to identify required keywords. You can use the **$** character to define keywords when you create a macro.

When you apply a macro to an interface, the macro name is automatically added to the interface. You can display the applied commands and macro names by using the **show running-config interface** *interface-id* user EXEC command.

A macro applied to an interface range functions the same way as a macro applied to a single interface. When you use an interface range, the macro is applied sequentially to each interface within the range. If a macro command fails on one interface, it is still applied to the remaining interfaces.

You can delete a macro-applied configuration on an interface by entering the **default interface** *interface-id* interface configuration command.

Examples

After you use the **macro name** global configuration command, you can apply it to an interface. This example shows how to apply a user-created macro called *duplex* to an interface:

```
Switch(config-if)# macro apply duplex
```

To debug a macro, use the **macro trace** interface configuration command to find any syntax or configuration errors in the macro as it is applied to an interface.

```
Switch(config-if)# macro trace duplex
Applying command...'duplex auto'
%Error Unknown error.
Applying command...'speed nonegotiate'
```

This example shows how to display the Cisco-default *cisco-desktop* macro and how to apply the macro and set the access VLAN ID to 25 on an interface:

```
Switch# show parser macro cisco-desktop
------------------------------------------------------------------
Macro name : cisco-desktop
Macro type : default

# Basic interface - Enable data VLAN only
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access

# Enable port security limiting port to a single
# MAC address -- that of desktop
switchport port-security
switchport port-security maximum 1

# Ensure port-security age is greater than one minute
# and use inactivity timer
switchport port-security violation restrict
switchport port-security aging time 2
switchport port-security aging type inactivity

# Configure port as an edge network port
spanning-tree portfast
```

```
spanning-tree bpduguard enable
------------------------------------------------------------
Switch#
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# interface gigabitethernet1/0/4
Switch(config-if)# macro apply cisco-desktop $AVID 25
```

Related Commands

Command	Description
macro description	Adds a description about the macros that are applied to an interface. This command is required for Auto Smartports to function.
macro global	Applies a macro on a switch or applies and traces a macro on a switch.
macro global description	Adds a description about the macros that are applied to the switch.
show parser macro	Displays the macro definition for all macros or for the specified macro.

macro auto device

To replace macro default parameter values with values that are specific to your switch, use the **macro auto device** global configuration command. Use the **no** form of this command to remove the parameter values.

macro auto device {**access-point** | **ip-camera** | **lightweight-ap** | **media-player** | **phone** | **router** | **switch**} [*parameter=value*]

no macro auto device {**access-point** | **ip-camera** | **lightweight-ap** | **media-player** | **phone** | **router** | **switch**} [*parameter=value*]

Syntax Description

access-point	Replaces the access-point default parameter value: NATIVE_VLAN=1
ip-camera	Replaces the IP video surveillance camera default parameter value: ACCESS_VLAN=1
lightweight-ap	Replaces the lightweight access point default parameter value: ACCESS_VLAN=1
media-player	Replaces the digital media player default parameter value: ACCESS_VLAN=1
phone	Replaces the IP phone default parameter values: ACCESS_VLAN=1 VOICE_VLAN=2
router	Replaces the router default parameter value: NATIVE_VLAN=1
switch	Replaces the switch default parameter value: NATIVE_VLAN=1
parameter=value	(Optional) Replaces the macro default parameter values. Enter new values in the form of name value pair separated by spaces: [<name1>=<value1> <name2>=<value2>...]

Command Default

Macro default parameter values are defined previously.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use the **macro auto device** global configuration command to replace macro default parameter values with values that are specific to your switch. Use the **no** form of this command to remove the parameter values.

Use the **show macro device** privileged EXEC command to display the contents of the macros. Use the *parameter=value* keywords to replace default parameter values within a specific macro.

You can also use the **macro auto execute** global configuration command to specify default parameter values. This command also requires that you specify an event trigger and a built-in or user-defined macro. If you enable both the **macro auto device** and the **macro auto execute** commands, the parameters specified in the command last executed is applied to the switch. Only one command is active on the switch.

To verify that a macro is applied to an interface, use the **show macro auto interface** user EXEC command.

Examples

This example shows how to display the IP phone macro parameter values, enable the IP phone macro, and change the default voice VLAN to 20:

```
Switch# show macro auto device phone
Device:phone
Default Macro:CISCO_PHONE_AUTO_SMARTPORT
Current Macro:CISCO_PHONE_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN VOICE_VLAN
Defaults Parameters:ACCESS_VLAN=1 VOICE_VLAN=2
Current Parameters:ACCESS_VLAN=1 VOICE_VLAN=2

Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# macro auto device phone VOICE_VLAN=20
Switch(config)# end
Switch# show macro auto device phone
Device:phone
Default Macro:CISCO_PHONE_AUTO_SMARTPORT
Current Macro:CISCO_PHONE_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN VOICE_VLAN
Defaults Parameters:ACCESS_VLAN=1 VOICE_VLAN=2
Current Parameters:VOICE_VLAN=20
```

Related Commands

Command	Description
macro auto execute	Configures mapping from an event trigger to a built-in macro.
macro auto global processing	Enables Auto Smartports on a switch.
macro auto mac-address-group	Configures MAC address groups.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.
show shell	Displays information about event triggers and macros.

macro auto execute

To replace built-in macro default values and to configure mapping from an event trigger to a built-in or user-defined macro, use the **macro auto execute** global configuration command.

macro auto execute *event trigger* {[**builtin** *built-in macro name*] | [**remote** *url*]} [*parameter*=*value*] [*{function contents}*]

no macro auto execute *event trigger* {[**builtin** *built-in macro name*] | [**remote** *url*]} [*parameter*=*value*] [*{function contents}*]

Syntax Description

event trigger	Defines mapping from an event trigger to a built-in macro. Specifies an *event trigger*: • CISCO_DMP_EVENT • CISCO_IP_CAMERA_EVENT • CISCO_PHONE_EVENT • CISCO_ROUTER_EVENT • CISCO_SWITCH_EVENT • CISCO_WIRELESS_AP_EVENT • CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT • WORD—Apply a user-defined event trigger such as a MAC address group.
builtin *built-in macro name*	(Optional) Specifies a **builtin** *built-in macro name*: • CISCO_AP_AUTO_SMARTPORT Specify the parameter value: NATIVE_VLAN=1. • CISCO_DMP_AUTO_SMARTPORT Specify the parameter value: ACCESS_VLAN=1. • CISCO_IP_CAMERA_AUTO_SMARTPORT Specify the parameter value: ACCESS_VLAN=1. • CISCO_LWAP_AUTO_SMARTPORT Specify the parameter value: ACCESS_VLAN=1. • CISCO_PHONE_AUTO_SMARTPORT Specify the parameter values: ACCESS_VLAN=1 and VOICE_VLAN=2. • CISCO_ROUTER_AUTO_SMARTPORT Specify the parameter value: NATIVE_VLAN=1. • CISCO_SWITCH_AUTO_SMARTPORT Specify the parameter value: NATIVE_VLAN=1.
parameter=value	(Optional) *parameter=value*—Replaces default values for parameter values shown for the *bultin-macro name,* for example, ACCESS_VLAN=1. Enter new values in the form of name value pair separated by a space: [<name1>=<value1> <name2>=<value2>...].
{function contents}	(Optional) *{function contents}* Specifies a user-defined macro to associate with the trigger. Enter the macro contents within braces. Begin the Cisco IOS shell commands with the left brace and end the command grouping with the right brace.

remote *url*	(Optional) Specifies a remote server location: • The syntax for the local flash file system on the standalone switch or the stack master: **flash:** • The syntax for the local flash file system on a stack member: **flash** *member number***:** • The syntax for the FTP: **ftp:**[[**//***username*[**:***password*]@*location*]/*directory*]**/***filename* • The syntax for an HTTP server: **http://**[[*username***:***password*]@]{*hostname* | *host-ip*}[/*directory*]**/***filename* • The syntax for a secure HTTP server: **https://**[[*username***:***password*]@]{*hostname* | *host-ip*}[/*directory*]**/***filename* • The syntax for the NVRAM: **nvram://**[[*username***:***password*]@][/*directory*]**/***filename* • The syntax for the Remote Copy Protocol (RCP): **rcp:**[[**//***username*@*location*]/*directory*]**/***filename* • The syntax for the Secure Copy Protocol (SCP): **scp:**[[//*username*@*location*]/*directory*]/*filename* • The syntax for the TFTP: **tftp:**[[**//***location*]/*directory*]**/***filename*

Command Default None.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines Use the **macro auto execute** global configuration command to replace the built-in macro default values with values that are specific to your switch.

The switch automatically maps from event triggers to built-in macros. The built-in macros are system-defined macros in the software image. You can also create user-defined macros by using the Cisco IOS shell scripting capability.

You can create new event triggers by using the **shell trigger** global configuration commands. Use the **show shell triggers** privileged EXEC command to display the contents of the user-defined triggers and macros.

You can use the **macro auto mac-address-group** global configuration command to create event triggers for devices that do not support Cisco Discovery Protocol (CDP) or Link Layer Discovery Protocol (LLDP).

You can use the remote macro feature to store macros in a central location for designated network switches to use. You can then maintain and update the macro files for use by multiple switches. Use **remote** *url* to configure the remote server location and macro path information. There are no specific file extension requirements for saved macro files.

Auto Smartports macros and antimacros (the antimacro is the portion of the applied macro that removes it at link down) have these guidelines and limitations:

- You can delete or change the built-in macros. However, you can override a built-in macro by creating a user-defined macro with the same name. To restore the original built-in macro, delete the user-defined macro.
- If you enable both the **macro auto device** and the **macro auto execute** global configuration commands, the parameters specified in the command last executed are applied to the switch. Only one command is active on the switch.
- To avoid system conflicts when macros are applied, remove all port configurations except for 802.1x authentication.
- Do not configure port security when enabling Auto Smartports on the switch.
- If the macro conflicts with the original configuration, either the macro does not apply some of the original configuration commands, or the antimacro does not remove them. (The antimacro is the portion of the applied macro that removes the macro at a link-down event.)

  For example, if 802.1x authentication is enabled, you cannot remove the switchport-mode access configuration. Remove the 802.1x authentication before removing the switchport mode configuration.
- A port cannot be a member of an EtherChannel when you apply Auto Smartports macros.
- The built-in-macro default data VLAN is VLAN 1. The default voice VLAN is VLAN 2. If your switch uses different access, native, or voice VLANs, use the **macro auto device** or the **macro auto execute** global configuration commands to configure the values.
- For 802.1x authentication or MAC authentication bypass (MAB), to detect non-Cisco devices, configure the RADIUS server to support the Cisco attribute-value pair **auto-smart-port=***event trigger.*
- The switch supports Auto Smartport macros only on directly connected devices. Multiple device connections, such as hubs, are not supported.
- If authentication is enabled on a port, the switch ignores a MAC address trigger if authentication fails.
- The order of CLI commands within the macro and the corresponding antimacro can be different.

Examples

This example shows how to use two built-in macros for connecting Cisco switches and Cisco IP phones to the switch. This example modifies the default voice VLAN, access VLAN, and native VLAN for the trunk interface:

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#!!! the next command modifies the access and voice vlans
Switch(config)#!!! for the built in Cisco IP phone auto smartport macro
Switch(config)# macro auto execute CISCO_PHONE_EVENT builtin CISCO_PHONE_AUTO_SMARTPORT
ACCESS_VLAN=10 VOICE_VLAN=20
Switch(config)#
Switch(config)#!!! the next command modifies the Native vlan used for inter switch trunks
Switch(config)# macro auto execute CISCO_SWITCH_EVENT builtin CISCO_SWITCH_AUTO_SMARTPORT
NATIVE_VLAN=10
```

```
Switch(config)#
Switch(config)#!!! the next command enables auto smart ports globally
Switch(config)# macro auto global processing
Switch(config)#
Switch(config)# exit

Switch# !!! here is the running configuration of the interface connected
Switch# !!! to another Cisco Switch after the Macro is applied
Switch#
Switch# show running-config interface gigabitethernet1/0/1
Building configuration...

Current configuration : 284 bytes
!
interface GigabitEthernet1/0/1
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 10
 switchport mode trunk
 srr-queue bandwidth share 10 10 60 20
 queue-set 2
 priority-queue out
 mls qos trust cos
 auto qos voip trust
 macro description CISCO_SWITCH_EVENT
end
```

This example shows how to map a user-defined event trigger called media player to a user-defined macro.

1. Connect the media player to an 802.1x- or MAB-enabled switch port.
2. On the RADIUS server, set the attribute-value pair to **auto-smart-port**=DMP_EVENT.
3. On the switch, create the event trigger DMP_EVENT, and enter the user-defined macro commands.
4. The switch recognizes the attribute-value pair=DMP_EVENT response from the RADIUS server and applies the macro associated with this event trigger.

```
Switch(config)# shell trigger DMP_EVENT mediaplayer
Switch(config)# macro auto execute DMP_EVENT {
if [[ $LINKUP == YES ]]; then
conf t
 interface $INTERFACE
   macro description $TRIGGER
   switchport access vlan 1
   switchport mode access
   switchport port-security
   switchport port-security maximum 1
   switchport port-security violation restrict
   switchport port-security aging time 2
   switchport port-security aging type inactivity
   spanning-tree portfast
   spanning-tree bpduguard enable
   exit
fi
if [[ $LINKUP == NO ]]; then
conf t
interface $INTERFACE
     no macro description $TRIGGER
     no switchport access vlan 1
     if [[ $AUTH_ENABLED == NO ]]; then
        no switchport mode access
     fi
     no switchport port-security
     no switchport port-security maximum 1
```

```
     no switchport port-security violation restrict
     no switchport port-security aging time 2
     no switchport port-security aging type inactivity
     no spanning-tree portfast
     no spanning-tree bpduguard enable
     exit
fi
```

Table 4-1 Supported Cisco IOS Shell Keywords

Command	Description
{	Begin the command grouping.
}	End the command grouping.
[[	Use as a conditional construct.
]]	Use as a conditional construct.
else	Use as a conditional construct.
==	Use as a conditional construct.
fi	Use as a conditional construct.
if	Use as a conditional construct.
then	Use as a conditional construct.
-z	Use as a conditional construct.
$	Variables that begin with the $ character are replaced with a parameter value.
#	Use the # character to enter comment text.

Table 4-2 Unsupported Cisco IOS Shell Reserved Keywords

Command	Description
|	Pipeline.
case	Conditional construct.
esac	Conditional construct.
for	Looping construct.
function	Shell function.
in	Conditional construct.
select	Conditional construct.
time	Pipeline.
until	Looping construct.
while	Looping construct.

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto global processing	Enables Auto Smartports on a switch.
macro auto mac-address-group	Configures MAC address groups.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.
show shell	Displays information about event triggers and macros.

macro auto global processing

To enable Auto Smartports macros on the switch, use the **macro auto global processing** global configuration command. Use the **no** form of this command to disable the macros.

macro auto global processing

no macro auto global processing

Syntax Description

This command has no arguments or keywords.

Command Default

Auto Smartports is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use the **macro auto global processing** global configuration command to globally enable macros on the *switch*. To disable macros on a specific *port*, use the **no macro auto processing** command in interface mode.

When using 802.1x or MAB authentication, you need to configure the RADIUS server to support the Cisco attribute-value pair **auto-smart-port**=*event trigger*. If authentication fails, the macro is not applied. If the 802.1x or MAB authentication fails on the interface, the switch does not use the fallback CDP event trigger.

When CDP-identified devices advertise multiple capabilities, the switch chooses a capability first by switch and then by router.

To verify that a macro is applied to an interface, use the **show macro auto interface** privileged EXEC command.

Examples

This example shows how enable Auto Smartports on the switch and to disable the feature on a specific interface:

```
Switch(config)# macro auto global processing
Switch(config)# interface interface_id
Switch(config-if)# no macro auto processing
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute	Configures mapping from an event trigger to a built-in macro.

Command	Description
macro auto mac-address-group	Configures MAC address groups.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.
show shell	Displays information about event triggers and macros.

macro auto mac-address-group

To create an event trigger for devices that do not support Cisco Discovery Protocol (CDP) or Link Layer Discover Protocol (LLDP), use the **macro auto mac-address-group** global configuration command. Use the **no** form of this command to delete the group.

macro auto mac-address-group *name* [**mac-address list** *list*] | [**oui** [**list** *list* | **range** *start-value* **size** *number*]]

no macro auto mac-address-group *name* [**mac-address list** *list*] | [**oui** [**list** *list* | **range** *start-value* **size** *number*]]

Syntax Description

name	Specifies the group name.
mac-address list *list*	(Optional) Configures a list of MAC addresses separated by a space.
oui	(Optional) Specifies an operationally unique identifier (OUI) **list** or **range**. • **list**—Enter an OUI list in hexadecimal format separated by spaces. • **range**—Enter the starting OUI hexadecimal value (*start-value*). • **size**—Enter the length of the range (*number*) from 1 to 5 to create a list of sequential addresses.

Command Default

No groups are defined.

Command Modes

Group configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use the **macro auto mac-address-group** global configuration command to create an event trigger for devices that do not support CDP or LLDP. Use the MAC address group as a trigger to map to a built-in or user-defined macro by using the **macro auto execute** global configuration command. At link-up, the switch detects the device type and applies the specified macro.

The switch supports up to ten MAC address groups. Each group can have up to 32 OUI and 32 MAC configured addresses.

Examples

This example shows how to create a MAC-address-group event trigger called *address_trigger* and how to verify your entries:

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# macro auto address-group mac address_trigger
Switch(config-addr-grp-mac)# mac-address list 2222.3333.3334 22.33.44 a.b.c
Switch(config-addr-grp-mac)# oui list 455555 233244
```

```
Switch(config-addr-grp-mac)# oui range 333333 size 2
Switch(config-addr-grp-mac)# exit
Switch(config)# end
Switch# show running configuration
!
!macro auto mac-address-group address_trigger
 oui list 333334
 oui list 333333
 oui list 233244
 oui list 455555
 mac-address list 000A.000B.000C
 mac-address list 0022.0033.0044
 mac-address list 2222.3333.3334
!

<output truncated>
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute	Configures mapping from an event trigger to a built-in macro.
macro auto global processing	Enables Auto Smartports on a switch.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.
show shell	Displays information about event triggers and macros.

macro auto processing

To enable Auto Smartports macros on an interface, use the **macro auto processing** interface configuration command. Use the **no** form of this command to disable the macros.

macro auto processing

no macro auto processing

Syntax Description

This command has no arguments or keywords.

Command Default

Auto Smartports is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use the **macro auto processing** interface configuration command to enable macros on a specific interface. To disable macros on a specific interface, use the **no macro auto processing** interface configuration command.

A port cannot be a member of an EtherChannel when you apply Auto Smartports macros. If you use EtherChannels, disable Auto Smartports on the EtherChannel interface by using the **no macro auto processing** interface configuration command. The EtherChannel interface applies the configuration to the member interfaces.

To verify that a macro is applied to an interface, use the **show macro auto interface** privileged EXEC command.

Examples

This example shows how to enable Auto Smartports on the switch and to disable the feature on a specific interface:

```
Switch(config)# interface gigabitethernet 0/1
Switch(config-if)# no macro auto processing
Switch(config-if)# exit
Switch(config)# macro auto global processing
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute	Configures mapping from an event trigger to a built-in macro.
macro auto mac-address-group	Configures MAC address groups.

Command	Description
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.
show shell	Displays information about event triggers and macros.

macro auto sticky

To configure macros to remain active after a link-down event, referred to as *macro persistence*, use the **macro auto sticky** global configuration command. Use the **no** form of this command to disable the macro persistence.

macro auto sticky

no macro auto sticky

Syntax Description

This command has no arguments or keywords.

Command Default

Macro persistence is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use the **macro auto sticky** global configuration command so that macros remain active after a link-down event.

Examples

This example shows how to enable macro persistence in the global configuration mode:

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config-if)# macro auto sticky
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute	Configures mapping from an event trigger to a built-in macro.

Command	Description
macro auto global processing	Enables Auto Smartports on a switch.
macro auto mac-address-group	Configures MAC address groups.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.
show shell	Displays information about event triggers and macros.

macro description

To enter a description about which macros are applied to an interface, use the **macro description** interface configuration command. Use the **no** form of this command to remove the description. This command is mandatory for Auto Smartports to work.

macro description *text*

no macro description *text*

Syntax Description

description *text*	Enters a description about the macros that are applied to the specified interface.

Command Default

None.

Command Modes

Interface configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use the **description** keyword to associate comment text or the macro name with an interface. When multiple macros are applied on a single interface, the description text is from the last applied macro.

You can verify your settings by entering the **show parser macro description** privileged EXEC command.

Examples

This example shows how to add a description to an interface:

```
Switch(config-if)# macro description duplex settings
```

Related Commands

Command	Description
macro apply	Applies a macro on an interface.
macro global	Applies a macro on a switch or applies and traces a macro on a switch.
macro global description	Adds a description about the macros that are applied to the switch.
macro trace	Applies and traces a macro on an interface.
show parser macro	Displays the macro definition for all macros or for the specified macro.

macro global

To apply a macro to a switch or to apply and debug a macro on a switch, use the **macro global** global configuration command.

macro global {**apply** | **trace**} *macro-name* [**parameter** {*value*}] [**parameter** {*value*}] [**parameter** {*value*}]

Syntax Description

apply	Applies a macro to the switch.
trace	Applies a macro to a switch and debugs the macro.
macro-name	Specifies the name of the macro.
parameter *value*	(Optional) Specifies unique parameter values that are specific to the switch. You can enter up to three keyword-value pairs. Parameter keyword matching is case sensitive. All matching occurrences of the keyword are replaced with the corresponding value.

Command Default

None.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Note You can delete a global macro-applied configuration on a switch only by entering the **no** version of each command in the macro.

Use the **macro global apply** *macro-name* global configuration command to apply the macro to an interface.

Use the **macro global trace** *macro-name* global configuration command to apply and then debug the macro to find any syntax or configuration errors.

If a command fails when you apply a macro because of a syntax error or a configuration error, the macro continues to apply the remaining commands to the switch.

When creating a macro that requires the assignment of unique values, use the **parameter** *value* keywords to designate values specific to the switch.

Keyword matching is case sensitive. All matching occurrences of the keyword are replaced with the corresponding value. Any full match of a keyword, even if it is part of a larger string, is considered a match and is replaced by the corresponding value.

Some macros might contain keywords that require a parameter value. You can use the **macro global apply** *macro-name* **?** command to display a list of any required values in the macro. If you apply a macro without entering the keyword values, the commands are invalid and are not applied.

There are Cisco-default Smartports macros embedded in the switch software. You can display these macros and the commands they contain by using the **show parser macro** user EXEC command.

Follow these guidelines when you apply a Cisco-default Smartports macro on a switch:

- Display all macros on the switch by using the **show parser macro** user EXEC command. Display the contents of a specific macro by using the **show parser macro name** *macro-name* user EXEC command.
- Keywords that begin with **$** indicate that a unique parameter value is required. Append the Cisco-default macro with the required values by using the **parameter** *value* keywords.

  The Cisco-default macros use the **$** character to help identify required keywords. There is no restriction on using the **$** character to define keywords when you create a macro.

When you apply a macro to a switch, the macro name is automatically added to the switch. You can display the applied commands and macro names by using the **show running-config** user EXEC command.

Examples

After you have created a new macro by using the **macro auto execute** global configuration command, you can apply it to a switch. This example shows how see the **snmp** macro, how to apply the macro, set the hostname to test-server, and set the IP precedence value to 7:

```
Switch# show parser macro name snmp
Macro name : snmp
Macro type : customizable

#enable port security, linkup, and linkdown traps
snmp-server enable traps port-security
snmp-server enable traps linkup
snmp-server enable traps linkdown
#set snmp-server host
snmp-server host ADDRESS
#set SNMP trap notifications precedence
snmp-server ip precedence VALUE

------------------------------------------------
Switch(config)# macro global apply snmp ADDRESS test-server VALUE 7
```

To debug a macro, use the **macro global trace** global configuration command to find any syntax or configuration errors in the macro when you apply it to a switch. In this example, the **ADDRESS** parameter value was not entered, the `snmp-server host` command failed, and the remainder of the macro is applied to the switch:

```
Switch(config)# macro global trace snmp VALUE 7
Applying command...'snmp-server enable traps port-security'
Applying command...'snmp-server enable traps linkup'
Applying command...'snmp-server enable traps linkdown'
Applying command...'snmp-server host'
%Error Unknown error.
Applying command...'snmp-server ip precedence 7'
```

Related Commands

Command	Description
macro apply	Applies a macro on an interface.
macro description	Adds a description about the macros that are applied to an interface.
macro global description	Adds a description about the macros that are applied to the switch.
macro trace	Applies and traces a macro on an interface.
show parser macro	Displays the macro definition for all macros or for the specified macro.

macro global description

To enter a description about the macros that are applied to a switch, use the **macro global description** global configuration command. Use the **no** form of this command to remove the description.

macro global description *text*

no macro global description *text*

Syntax Description

text	A description about the macros that are applied to the switch.

Command Default None.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines Use the **description** keyword to associate comment text or the macro name with a switch. When multiple macros are applied on a switch, the description text is from the last applied macro.

You can verify your settings by entering the **show parser macro description** privileged EXEC command.

Examples This example shows how to add a description to a switch:

```
Switch(config)# macro global description udld aggressive mode enabled
```

Related Commands

Command	Description
macro apply	Applies a macro on an interface.
macro description	Adds a description about the macros that are applied to an interface.
macro global	Applies a macro on a switch or applies and traces a macro on a switch.
macro trace	Applies and debugs a macro on an interface.
show parser macro	Displays the macro definition for all macros or for the specified macro.

shell trigger

To create an event trigger, use the **shell trigger** global configuration command. Use the **no** form of this command to delete the trigger.

shell trigger *identifier description*

no shell trigger *identifier description*

Syntax Description

identifier	Specifies the event trigger identifier. The identifier should have no spaces or hyphens between words.
description	Specifies the event trigger description text.

Command Default

System-defined event triggers:

- CISCO_DMP_EVENT
- CISCO_IPVSC_AUTO_EVENT
- CISCO_PHONE_EVENT
- CISCO_SWITCH_EVENT
- CISCO_ROUTER_EVENT
- CISCO_WIRELESS_AP_EVENT
- CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use this command to create user-defined event triggers for use with the **macro auto device** and the **macro auto execute** global configuration commands.

To support dynamic device discovery when using IEEE 802.1x authentication, you need to configure the RADIUS authentication server to support the Cisco attribute-value pair: **auto-smart-port=***event trigger.*

Examples

This example shows how to create a user-defined event trigger called RADIUS_MAB_EVENT:

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# shell trigger RADIUS_MAB_EVENT MAC_AuthBypass Event
Switch(config)# end
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute	Configures mapping from an event trigger to a built-in macro.
macro auto global processing	Enables Auto Smartports on a switch.
macro auto mac-address-group	Configures MAC address groups.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.
show shell	Displays information about event triggers and macros.

show macro auto

To display Auto Smartports macro information, use the **show macro auto** user EXEC command.

show macro auto {**address-group** [*address-group-name*] | **device** [**access-point**] [**ip-camera**] [**lightweight-ap**] [**media-player**] [**phone**] [**router**] [**switch**] | **global** [*event_trigger*] | **interface** [*interface_id*]}

Syntax Description

address-group [*address-group-name*]	Displays address-group information. (Optional) *address-group-name*—Displays information for the specified address group.
device [**access-point**] [**ip-camera**] [**lightweight-ap**] [**media-player**] [**phone**] [**router**] [**switch**]	Displays device information about one or more devices. • (Optional) **access-point**—Autonomous access point • (Optional) **ip-camera**—Cisco IP video surveillance camera • (Optional) **lightweight-ap**—Lightweight access point • (Optional) **media-player**—Digital media player • (Optional) **phone**—Cisco IP phone • (Optional) **router**—Cisco router • (Optional) **switch**—Cisco switch
global [*event_trigger*]	Displays Auto Smartports information about the switch. (Optional) *event_trigger*—Displays information about the specified event trigger.
interface [*interface_id*]	Displays interface status. (Optional) *interface_id*—Displays information about the specified interface.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Usage Guidelines

Use this command to display the Auto Smartports information for the switch. Use the **show macro auto device** privileged EXEC command to display the configurable parameters for a device.

Examples

This example shows how to use the **show macro auto device** privileged EXEC command to view the configuration on the switch:

```
Switch# show macro auto device
Device:lightweight-ap
```

```
Default Macro:CISCO_LWAP_AUTO_SMARTPORT
Current Macro:CISCO_LWAP_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN
Defaults Parameters:ACCESS_VLAN=1
Current Parameters:ACCESS_VLAN=1

Device:access-point
Default Macro:CISCO_AP_AUTO_SMARTPORT
Current Macro:CISCO_AP_AUTO_SMARTPORT
Configurable Parameters:NATIVE_VLAN
Defaults Parameters:NATIVE_VLAN=1
Current Parameters:NATIVE_VLAN=1

Device:phone
Default Macro:CISCO_PHONE_AUTO_SMARTPORT
Current Macro:CISCO_PHONE_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN VOICE_VLAN
Defaults Parameters:ACCESS_VLAN=1 VOICE_VLAN=2
Current Parameters:ACCESS_VLAN=1 VOICE_VLAN=2

Device:router
Default Macro:CISCO_ROUTER_AUTO_SMARTPORT
Current Macro:CISCO_ROUTER_AUTO_SMARTPORT
Configurable Parameters:NATIVE_VLAN
Defaults Parameters:NATIVE_VLAN=1
Current Parameters:NATIVE_VLAN=1

Device:switch
Default Macro:CISCO_SWITCH_AUTO_SMARTPORT
Current Macro:CISCO_SWITCH_AUTO_SMARTPORT
Configurable Parameters:NATIVE_VLAN
Defaults Parameters:NATIVE_VLAN=1
Current Parameters:NATIVE_VLAN=1

Device:ip-camera
Default Macro:CISCO_IP_CAMERA_AUTO_SMARTPORT
Current Macro:CISCO_IP_CAMERA_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN
Defaults Parameters:ACCESS_VLAN=1
Current Parameters:ACCESS_VLAN=1

Device:media-player
Default Macro:CISCO_DMP_AUTO_SMARTPORT
Current Macro:CISCO_DMP_AUTO_SMARTPORT
Configurable Parameters:ACCESS_VLAN
Defaults Parameters:ACCESS_VLAN=1
Current Parameters:ACCESS_VLAN=1
```

This example shows how to use the **show macro auto address-group** *name* privileged EXEC command to view the TEST3 address group configuration on the switch:

```
Switch# show macro auto address-group TEST3
MAC Address Group Configuration:

Group Name                       OUI         MAC ADDRESS
-------------------------------------------------------------
TEST3                          2233.33     0022.0022.0022
                               2233.34
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute	Configures mapping from an event trigger to a built-in macro.
macro auto global processing	Enables Auto Smartports on a switch.
macro auto mac-address-group	Configures MAC address groups.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show shell	Displays information about event triggers and macros.

show parser macro

To display the parameters for all configured macros or for one macro on the switch, use the **show parser macro** user EXEC command.

show parser macro [{**brief** | **description** [**interface** *interface-id*] | **name** *macro-name*}]

Syntax Description

brief	(Optional) Displays the name of each macro.
description [**interface** *interface-id*]	(Optional) Displays all macro descriptions or the description of a specific interface.
name *macro-name*	(Optional) Displays information about a single macro identified by the macro name.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Examples

This is a partial output example from the **show parser macro** command. The output for the Cisco-default macros varies depending on the switch platform and the software image running on the switch:

```
Switch# show parser macro
Total number of macros = 6
------------------------------------------------------------------
Macro name : cisco-global
Macro type : default global
# Enable dynamic port error recovery for link state
# failures
errdisable recovery cause link-flap
errdisable recovery interval 60

<output truncated>

------------------------------------------------------------------
Macro name : cisco-desktop
Macro type : default interface
# macro keywords $AVID
# Basic interface - Enable data VLAN only
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access

<output truncated>

------------------------------------------------------------------
Macro name : cisco-phone
Macro type : default interface
# Cisco IP phone + desktop template
# macro keywords $AVID $VVID
# VoIP enabled interface - Enable data VLAN
```

```
# and voice VLAN (VVID)
# Recommended value for access vlan (AVID) should not be 1
switchport access vlan $AVID
switchport mode access

<output truncated>

------------------------------------------------------------------
Macro name : cisco-switch
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Do not apply to EtherChannel/Port Group
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID

<output truncated>

------------------------------------------------------------------
Macro name : cisco-router
Macro type : default interface
# macro keywords $NVID
# Access Uplink to Distribution
# Define unique Native VLAN on trunk ports
# Recommended value for native vlan (NVID) should not be 1
switchport trunk native vlan $NVID

<output truncated>

------------------------------------------------------------------
Macro name : snmp
Macro type : customizable

#enable port security, linkup, and linkdown traps
snmp-server enable traps port-security
snmp-server enable traps linkup
snmp-server enable traps linkdown
#set snmp-server host
snmp-server host ADDRESS
#set SNMP trap notifications precedence
snmp-server ip precedence VALUE

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

This is an example of output from the **show parser macro name** command:

```
Switch# show parser macro name standard-switch10
Macro name : standard-switch10
Macro type : customizable
macro description standard-switch10
# Trust QoS settings on VOIP packets
auto qos voip trust
# Allow port channels to be automatically formed
channel-protocol pagp
```

This is an example of output from the **show parser macro brief** command:

```
Switch# show parser macro brief
    default global   : cisco-global
    default interface: cisco-desktop
    default interface: cisco-phone
    default interface: cisco-switch
    default interface: cisco-router
```

```
    customizable     : snmp
```

This is an example of output from the **show parser macro description** command:

```
Switch# show parser macro description
Global Macro(s): cisco-global
Interface    Macro Description(s)
-------------------------------------------------------------
Gi1/0/1        standard-switch10
Gi1/0/2       this is test macro
-------------------------------------------------------------
```

This is an example of output from the **show parser macro description interface** command:

```
Switch# show parser macro description interface gigabitethernet1/0/2
Interface    Macro Description
-------------------------------------------------------------
Gi1/0/2      this is test macro
-------------------------------------------------------------
```

Related Commands

Command	Description
macro apply	Applies a macro on an interface or applies and traces a macro on an interface.
macro description	Adds a description about the macros that are applied to an interface.
macro global	Applies a macro on a switch or applies and traces a macro on a switch.
macro global description	Adds a description about the macros that are applied to the switch.
show running-config	Displays the operating configuration.

show shell

Usage Guidelines

The **show shell** command is a feature at the Cisco IOS level. You may first have to enable Cisco IOS Shell by entering the **terminal shell** command before you can enter the **show shell** command. For more information, see the Cisco IOS Shell configuration guide on Cisco.com: http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_ios_shell.pdf

To display shell information, use the **show shell** user EXEC command.

show shell [**environment** | **functions** [**brief** | *shell_function*] | **triggers**]

Syntax Description

environment	(Optional) Displays shell environment information.
functions [**brief** | *shell_function*]	(Optional) Displays macro information. • **brief**—Names of the shell functions. • *shell_function*—Name of a shell function.
triggers	(Optional) Displays event trigger information.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced on Catalyst 3650 switches.

Examples

This example shows how to use the **show shell** *triggers* privileged EXEC command to view the event triggers in the switch software:

```
Switch# term shell
Switch# show shell triggers
User defined triggers
---------------------
Built-in triggers
-----------------
Trigger Id: CISCO_CUSTOM_EVENT
Trigger description: Custom macroevent to apply user defined configuration
Trigger environment: User can define the macro
Trigger mapping function: CISCO_CUSTOM_AUTOSMARTPORT

Trigger Id: CISCO_DMP_EVENT
Trigger description: Digital media-player device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_DMP_AUTO_SMARTPORT

Trigger Id: CISCO_IPVSC_EVENT
Trigger description: IP-camera device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
 The value in parenthesis is a default value
```

```
Trigger mapping function: CISCO_IP_CAMERA_AUTO_SMARTPORT

Trigger description: Last resortevent to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_LAST_RESORT_SMARTPORT

Trigger Id: CISCO_PHONE_EVENT
Trigger description: IP-phone device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
and $VOICE_VLAN=(2), The value in the parenthesis is a default value
Trigger mapping function: CISCO_PHONE_AUTO_SMARTPORT

Trigger Id: CISCO_ROUTER_EVENT
Trigger description: Router device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $NATIVE_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_ROUTER_AUTO_SMARTPORT

Trigger Id: CISCO_SWITCH_ETHERCHANNEL_CONFIG
Trigger description: etherchannel parameter
Trigger environment: $INTERFACE_LIST=(),$PORT-CHANNEL_ID=(),
                              $EC_MODE=(),$EC_PROTOCOLTYPE=(),
                              PORT-CHANNEL_TYPE=()
Trigger mapping function: CISCO_ETHERCHANNEL_AUTOSMARTPORT

Trigger Id: CISCO_SWITCH_EVENT
Trigger description: Switch device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $NATIVE_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_SWITCH_AUTO_SMARTPORT

Trigger Id: CISCO_WIRELESS_AP_EVENT
Trigger description: Autonomous ap device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $NATIVE_VLAN=(1)
 The value in the parenthesis is a default value
Trigger mapping function: CISCO_AP_AUTO_SMARTPORT

Trigger Id: CISCO_WIRELESS_LIGHTWEIGHT_AP_EVENT
Trigger description: Lightweight-ap device event to apply port configuration
Trigger environment: Parameters that can be set in the shell - $ACCESS_VLAN=(1)
  The value in the parenthesis is a default value
Trigger mapping function: CISCO_LWAP_AUTO_SMARTPORT

Trigger Id: word
Trigger description: word
Trigger environment:
Trigger mapping function:
```

This example shows how to use the **show shell functions** privileged EXEC command to view the built-in macros in the switch software:

```
Switch# show shell functions
#User defined functions:

#Built-in functions:
function CISCO_AP_AUTO_SMARTPORT () {
    if [[ $LINKUP == YES ]]; then
        conf t
            interface  $INTERFACE
                macro description $TRIGGER
                switchport trunk encapsulation dot1q
                switchport trunk native vlan $NATIVE_VLAN
                switchport trunk allowed vlan ALL
                switchport mode trunk
                switchport nonegotiate
                auto qos voip trust
                mls qos trust cos
                if [[ $LIMIT == 0 ]]; then
                  default srr-queue bandwidth limit
                else
                  srr-queue bandwidth limit $LIMIT
                fi
                if [[ $SW_POE == YES ]]; then
                   if [[ $AP125X == AP125X ]]; then
                      macro description AP125X
                      macro auto port sticky
                      power inline port maximum 20000
                   fi
                fi
             exit
        end
    fi
    if [[ $LINKUP == NO ]]; then
        conf t
            interface  $INTERFACE
                no macro description
                no switchport nonegotiate
                no switchport trunk native vlan $NATIVE_VLAN
                no switchport trunk allowed vlan ALL
                no auto qos voip trust
                no mls qos trust cos
                default srr-queue bandwidth limit
                if [[ $AUTH_ENABLED == NO ]]; then
                  no switchport mode
                  no switchport trunk encapsulation
                fi
                if [[ $STICKY == YES ]]; then
                   if [[ $SW_POE == YES ]]; then
                      if [[ $AP125X == AP125X ]]; then
                         no macro auto port sticky
                         no power inline port maximum
                      fi
                   fi
                fi
            exit
        end
    fi
}
<output truncated>
```

Related Commands

Command	Description
macro auto device	Configures macro default parameter values.
macro auto execute	Configures mapping from an event trigger to a built-in macro.
macro auto global processing	Enables Auto Smartports on a switch.
macro auto mac-address-group	Configures MAC address groups.
macro auto sticky	Configures macro persistence.
shell trigger	Creates event triggers.
show macro auto	Displays information about macros.