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define interface-range

To create an interface-range macro, use the **define interface-range** command in global configuration mode. To remove an interface-range macro, use the **no** form of this command.

define interface-range *macro-name interface-range*

Syntax Description

macro-name	Name of the interface-range macro.
interface-range	Type of interface range. • For a list of valid values, see the "Usage Guidelines" section.

Command Default

Interface-range macro is not configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(14)SX	This command was introduced.
12.2(17d)SXB	This command was integrated into Cisco IOS XE Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

- The **define interface-range** command applies a particular configuration on multiple interfaces and creates multiple logical, and sub interfaces.
- An interface range macro name can comprise up to 32 characters.
- An interface range for a macro can accept a maximum of five ranges. However, the subinterface range for a macro accepts only one range.
- An interface range cannot span slots.
- Use the *interface-type slot/first-interface last-interface* format to enter the interface range.
- Valid values for the *interface-type* argument are as follows:
  - **atm** —Supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2
  - **ethernet**

- **fastethernet**
- **ge-wan** —Supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2
- **gigabitethernet**
- **loopback**
- **port-channel** *interface-number* —Valid values are from 1 to 256
- **pos** —Supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2
- **tengigabitethernet**
- **tunnel**
- **vlan** *vlan-id* —Valid values are from 1 to 4094

Examples

The following example shows how to create a multiple-interface macro:

```
Device(config)# define interface-range macro1 ethernet 1/2 - 5, fastethernet 5/5 - 10
```

The following example shows how to create multiple loopback interfaces:

```
Device(config)# define interface-range loopback1-10
```

Related Commands

Command	Description
interface range	Executes a command on multiple ports at the same time.

duplex

To configure duplex operation on an interface, use the**duplex** command in interface configuration mode. To return to the default value, use the **no** form of this command.

duplex {**full**| **half**| **auto**}

no duplex

Syntax Description

full	Specifies full-duplex operation.
half	Specifies half-duplex operation.
auto	Enables autonegotiation. The interface automatically operates at half or full-duplex depending on environmental factors, such as the type of media and the transmission speeds for the peer routers, hubs, and switches used in the network configuration.

Command Default

Half-duplex mode

For the 4-Port 10/100 Fast Ethernet Shared Port Adapter (SPA) and the 2-Port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 router, the default is **auto**.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.2(10)P	This command was introduced.
12.2S	This command was integrated into Cisco IOS Release 12.2S.
12.2(14)SX	This command was modified. Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was modified. Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2 SXB.
12.2(20)S2	This command was implemented on the 4-Port 10/100 Fast Ethernet SPA and the 2-Port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 router.

Usage Guidelines

General Usage Guidelines

To use the autonegotiation capability (that is, automatically detect speed and duplex modes) you must set both the **speed** command and the **duplex** command to auto.

Duplex Options and Interfaces

The table below lists the supported command options by an interface.

Table 1: Supported Duplex Command Options

Interface Type	Supported Syntax	Default Setting	Usage Guidelines
10/100-Mbps module	**duplex** [**half** | **full**]	See the "Usage Guidelines" section.	Run the **no duplex auto** command to set the speed to **auto**. If the speed is set to **10** or **100**, and you do not configure the duplex setting, the duplex is set to **half.**
100-Mbps fiber modules	**duplex** [**half** | **full**]	**half**	
Gigabit Ethernet interfaces	**duplex full**	**full**	
10-Mbps ports	**duplex** [**half** | **full**]	**half**	

If the transmission speed on a 16-port RJ-45 Gigabit Ethernet port is set to 1000, the duplex mode is set to full. If the transmission speed is changed to 10 or 100, the duplex mode stays at half-duplex. You must configure the correct duplex mode when the transmission speed is changed to 10 or 100 from 1000.

Gigabit Ethernet is full-duplex only. You cannot change the duplex mode on Gigabit Ethernet ports or on a 10/100/1000-Mbps port that is configured for Gigabit Ethernet.

When manually configuring the interface speed to either 10 or 100-Mbps, you should also configure the duplex mode on the interface.

Caution Changing the interface speed and duplex mode configuration might shut down and reenable the interface during reconfiguration.

Usage Guidelines for the 4-Port 10/100 Fast Ethernet SPA and the 2-Port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 router

The **duplex** command is applied to the SPA interfaces that are using the RJ-45 media. Gigabit Ethernet interfaces using fiber media support full-duplex mode only, and use the **negotiation** command to enable and disable autonegotiation.

To enable the autonegotiation capability on an RJ-45 interface, you must set either the **speed** command or the **duplex** command to **auto**. The default configuration is that both commands are set to **auto**.

Note For the Cisco AS5300, the **duplexfullhalfauto**} command syntax replaces the duplex commands: **half-duplex**and **full-duplex.**Cisco 7600 series routers cannot automatically negotiate the interface speed and duplex mode if either of the connecting interfaces is configured to a value other than **auto**.

The table below describes the interface behavior for different combinations of the **duplex** and **speed** command settings. The specified **duplex** command configured with the specified **speed** command produces the resulting system action.

If you specify both **duplex** and **speed** settings other than **auto**on an RJ-45 interface, then autonegotiation is disabled for the interface.

Note If you need to force an interface port to operate with certain settings and therefore need to disable autonegotiation, you must be sure that the remote link is configured with compatible link settings for proper transmission. This includes the support of flow control on the link.

Note Every interface on a 4-Port 10/100 Fast Ethernet SPA supports transmission of pause frames to stop packet flow when the Modular Services Card (MSC) is full. You cannot disable flow control for an interface on the 4-Port 10/100 Fast Ethernet SPA. Hence the flow control support is not configurable, but it is advertised during autonegotiation. If you disable autonegotiation, then you must be sure that the remote device is configured to support flow control because flow control is automatically enabled for all interfaces on the 4-Port 10/100 Fast Ethernet SPA.

Table 2: Relationship Between duplex and speed Commands

duplex Command	speed Command	Resulting System Action
duplex auto	**speed auto**	Autonegotiates both speed and duplex mode s. The interface advertises capability for the following link settings: • 10-Mbps and half-duplex • 10-Mbps and full-duplex • 100-Mbps and half-duplex • 100-Mbps and full-duplex • 1000-Mbps and half-duplex • 1000-Mbps and full-duplex

duplex Command	speed Command	Resulting System Action
duplex auto	**speed 10** or**speed100**or**speed1000**	Autonegotiates the duplex mode. The interface advertises the capability for the configured speed with capability for both half-duplex or full-duplex mode. For example, if the **speed100**command is configured with **duplexauto**, then the interface advertises the following capability: • 100-Mbps and half-duplex • 100-Mbps and full-duplex
duplex half or**duplexfull**	**speed auto**	Autonegotiates the speed. The interface advertises the capability for the configured duplex mode with capability for both 10-Mbps and 100-Mbps operation for Fast Ethernet interfaces, and 10-Mbps, 100-Mbps, and 1000-Mbps for Gigabit Ethernet interfaces. For example, if the **duplexfull**command is configured with the **speedauto** command, then the interface advertises the following capability: • 10-Mbps and full-duplex • 100-Mbps and full-duplex • 1000-Mbps and full-duplex (Gigabit Ethernet interfaces only)
duplex half	**speed 10**	Forces 10-Mbps and half-duplex operation, and disables autonegotiation on the interface.
duplex full	**speed 10**	Forces 10-Mbps and full-duplex operation, and disables autonegotiation on the interface.
duplex half	**speed 100**	Forces 100-Mbps and half-duplex operation, and disables autonegotiation on the interface.

duplex Command	speed Command	Resulting System Action
duplex full	**speed 100**	Forces 100-Mbps and full-duplex operation, and disables autonegotiation on the interface.
duplex half	**speed 1000**	Forces 1000-Mbps and half-duplex operation, and disables autonegotiation on the interface (Gigabit Ethernet only).
duplex full	**speed 1000**	Forces 1000-Mbps and full-duplex operation, and disables autonegotiation on the interface (Gigabit Ethernet only).

Examples

The following example shows how to configure a full-duplex operation on a Cisco AS5300:

```
Router(config)# interface fastethernet 0
Router(config-if)# duplex full
```

The following example shows how to specify the advertisement of half-duplex support only, and either 10-Mbps or 100-Mbps capability during autonegotiation for the second interface (port 1) on the SPA located in the bottom subslot (1) of the MSC that is installed in slot 2 of the Cisco 7304 router:

```
Router# configure terminal
Router(config)# interface fastethernet 2/1/1
Router(config-if)# duplex half
Router(config-if)# speed auto
```

With this configuration, the interface advertises the following capabilities during autonegotiation:

- 10-Mbps and half-duplex
- 100-Mbps and half-duplex

Note Flow control support is always advertised when autonegotiation is enabled.

Related Commands

Command	Description
interface	Configures an interface and enters interface configuration mode.
interface fastethernet	Selects a particular Fast Ethernet interface for configuration.
interface gigabitethernet	Selects a particular Gigabit Ethernet interface for configuration.

Command	Description
show controllers	Displays information that is specific to the hardware on a module.
show controllers fastethernet	Displays Fast Ethernet interface information, transmission statistics, and errors, and the applicable MAC destination address and VLAN filtering tables.
show controllers gigabitethernet	Displays Gigabit Ethernet interface information, transmission statistics, and errors, and applicable MAC destination address and VLAN filtering tables.
show interfaces	Displays traffic that is seen by a specific interface.
show interfaces fastethernet	Displays information about Fast Ethernet interfaces.
show interfaces gigabitethernet	Displays information about Gigabit Ethernet interfaces.
speed	Sets the port speed for a Fast Ethernet interface.

errdisable recovery

To configure recovery mechanism variables, use the **errdisable recovery** command in global configuration mode. To return to the default state, use the **no** form of this command.

errdisable recovery {**cause** {**all**| **arp-inspection**| **bpduguard**| **channel-misconfig**| **dhcp-rate-limit**| **dtp-flap**| **gbic-invalid**| **l2ptguard**| **link-flap**| **pagp-flap**| **psecure-violation**| **security-violation**| **rootguard**| **udld**| **unicast-flood**}| **interval** *seconds*}

no errdisable recovery {**cause** {**all**| **arp-inspection**| **bpduguard**| **channel-misconfig**| **dhcp-rate-limit**| **dtp-flap**| **gbic-invalid**| **l2ptguard**| **link-flap**| **pagp-flap**| **psecure-violation**| **security-violation**| **rootguard**| **udld**| **unicast-flood**}| **interval** *seconds*}

Syntax Description

cause	Enables error-disable recovery from a specific cause.
all	Enables the recovery timers for all error-disable causes.
arp-inspection	Enables error-disable recovery from an Address Resolution Protocol (ARP) inspection cause.
bpduguard	Enables the recovery timer for the Bridge Protocol Data Unit (BPDU)-guard error-disable cause.
channel-misconfig	Enables the recovery timer for the channel-misconfig error-disable cause.
dhcp-rate-limit	Enables the recovery timer for the Dynamic Host Configuration Protocol (DHCP)-rate-limit error-disable cause.
dtp-flap	Enables the recovery timer for the Dynamic Trunking Protocol (DTP)-flap error-disable cause.
gbic-invalid	Enables the recovery timer for the Gigabit Interface Converter (GBIC)-invalid error-disable cause.
l2ptguard	Enables the recovery timer for the Layer 2 Protocol Tunneling (L2PT) error-disable cause.
link-flap	Enables the recovery timer for the link-flap error-disable cause.
pagp-flap	Enables the recovery timer for the Port Aggregation Protocol (PAgP)-flap error-disable cause.
psecure-violation	Enables the recovery timer for the psecure-violation error-disable cause.

security-violation	Enables the automatic recovery of ports that were disabled because of 802.1X security violations.
rootguard	Enables the recovery timer for the root-guard error-disable cause.
udld	Enables the recovery timer for the Unidirectional Link Detection (UDLD) error-disable cause.
unicast-flood	Enables the recovery timer for the unicast-flood error-disable cause.
interval *seconds*	Specifies the time, in seconds, to recover from a specified error-disable cause. The range is from 30 to 86400. The default interval is 300.

Command Default

The recovery mechanisms are disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.0(1)M	This command was introduced in a release earlier than Cisco IOS Release 15.0(1)M.
12.2(14)SX	This command was modified. This command was implemented on the Supervisor Engine 720.
12.2(17d)SXB	This command was modified. This command was implemented on the Supervisor Engine 2.
12.2(18)SXD	This command was modified. The **arp-inspection** keyword was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

A cause (bpduguard, channel-misconfig, dhcp-rate-limit, dtp-flap, l2ptguard, link-flap, pagp-flap, psecure-violation, security-violation, rootguard, udld, or unicast-flood) is defined as the reason why the error-disable state occurred. When a cause is detected on an interface, the interface is placed in an error-disable state (an operational state that is similar to the link-down state). If you do not enable error-disable recovery for the cause, the interface stays in the error-disable state until a shutdown and no shutdown occur. If you enable recovery for a cause, the interface is brought out of the error-disable state and allowed to retry operation once all the causes have timed out.

You must enter the **shutdown** command and then the **no shutdown** command to manually recover an interface from the error-disable state.

Note A separate line is required each time you want to enter the **errdisable recovery cause** command to add a new reason for recovery; each new reason does not get appended to the original single line. This means you must enter each new reason separately.

Examples

This example shows how to enable the recovery timer for the BPDU-guard error-disable cause:

```
Router(config)#
 errdisable recovery cause bpduguard
```

This example shows how to set the recovery timer to 300 seconds:

```
Router(config)#
 errdisable recovery interval 300
```

Related Commands

Command	Description
show errdisable recovery	Displays the information about the error-disable recovery timer.
show interfaces status	Displays the interface status or a list of interfaces in an error-disabled state on LAN ports only.
shutdown	Disables an interface.