

## 802.1x Configuration Commands

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# Chapter 1 802.1x Configuration Commands

## 1.1 802.1x Configuration Commands

802.1x configuration commands include:

- dot1x enable
- dot1x port-control
- dot1x multiple-hosts
- dot1x default
- dot1x max-req
- dot1x reauth-max
- dot1x re-authentication
- dot1x timeout quiet-period
- dot1x timeout re-authperiod
- dot1x timeout tx-period
- dot1x user-permit
- dot1x authentication method
- dot1x authen-type、 dot1x authentication type
- dot1x guest-vlan
- dot1x guest-vlan id
- aaa authentication dot1x
- debug dot1x error
- debug dot1x state
- debug dot1x packet
- show dot1x

## 1.1.1 dot1x enable

**Description****dot1x enable****no dot1x enable****Parameter**

None

**Default**

None

**Instruction**

Use this command to enable 802.1x feature. The 802.1x feature cannot be enabled on an interface. If 802.1x feature is disabled, then all 802.1x packets will be forwarded like other multi-cast packets in VLAN rather than be received by CPU.

**Command mode**

Global configuration

**Example**

The following example enables dot1x:

```
Switch(config)#dot1x enable
```

```
Switch(config)#
```

## 1.1.2 dot1x port-control

**Description****dot1x port-control {*auto*|*force-authorized*|*force-unauthorized*}****no dot1x port-control****Parameter**

Parameter	Description
-----------	-------------

<b>auto</b>	Enables 802.1x protocol authentication method
<b>force-authorized</b>	Disables 802.1X on the interface and causes the port to change to the authorized state without any authentication exchange required.
<b>force-unauthorized</b>	Denies all access through this interface by forcing the port to change to the unauthorized state, ignoring all attempts by the client to authenticate.

## Default

force-authorized

## Instruction

The 802.1X protocol is supported on Layer 2 static-access ports. You can use the auto keyword only if the port is not configured as one of these types:

- Trunk port—If you try to enable 802.1X on a trunk port, an error message appears, and 802.1X is not enabled. If you try to change the mode of an 802.1X-enabled port to trunk, the port mode is not changed.
- EtherChannel port—Before enabling 802.1X on the port, you must first remove it from the EtherChannel. If you try to enable 802.1X on an EtherChannel or on an active port in an EtherChannel, an error appears, and 802.1X is not enabled. If you enable 802.1X on a not-yet active port of an EtherChannel, the port does not join the EtherChannel.
- Switch Port Analyzer (SPAN) destination port—You can enable 802.1X on a port that is a SPAN destination port; however, 802.1X is disabled until the port is removed as a SPAN destination. You can enable 802.1X on a SPAN source port.

## Command mode

interface configuration

## Example

The following example enables 802.1x on interface f0/24:

```
Switch(config_f0/24)# dot1x port-control auto
Switch(config_f0/24)#
```

The following example configures interface f0/23 as the vlan trunk port and enables 802.1x:

```
Switch(config_f0/23)#switchport mode trunk
Switch(config_f0/23)#dot1x port-control auto
802.1x Control Failed, 802.1x cannot cmd on vlanTrunk port(f0/23)
Switch(config_f0/23)#
```

### 1.1.3 dot1x multiple-hosts

#### Description

To allow multiple hosts (clients) on an 802.1X-authorized switch port that has the dot1x port-control interface configuration command set to auto, use the dot1x multiple-hosts command. To return to the default setting, use the no form of this command.

**dot1x multiple-hosts**

**no dot1x multiple-hosts**

#### Parameter

None

#### Default

disabled

#### Instruction

In multi-host mode, only one of the attached hosts has to be successfully authorized for all hosts to be granted network access (the multi-host mode authenticates one client, but after the client is authenticated, traffic is allowed from all other MAC addresses.). If the port becomes unauthorized (reauthentication fails or an Extensible Authentication Protocol over LAN [EAPOL] logoff message is received), all attached clients are denied access to the network.

The single-host mode allows only one client per port, that is, one MAC address to authenticate, and all others are blocked.

#### Command mode

interface configuration

#### Example

The following example enables multiple-hosts on interface f0/24:

```
Switch(config_f0/24)# dot1x multiple-hosts  
Switch(config_f0/24)#
```

### 1.1.4 dot1x default

#### Description

To reset the global 802.1X authentication parameters to their default values as specified in the latest IEEE 802.1X standard, use the dot1x default command.

#### dot1x Default

#### Parameter

None

#### Default

None

#### Instruction

To reset the global 802.1X authentication parameters to their default values.

#### Command mode

Global configuration

#### Example

The following example shows how to reset the global 802.1X parameters:

```
Switch(config)#dot1x default  
Switch(config)#
```

### 1.1.5 dot1x max-req

#### Description

To set the maximum number of times that a networking device or Ethernet switch network module can send an Extensible Authentication Protocol (EAP) request/identity frame to a client (assuming that a response is not received) before restarting the authentication process, use the dot1x max-req command in interface configuration or global configuration mode. To set the number of times to the default setting of 2, use the no form of this command.

**dot1x max-req** *count*

**no dot1x max-req**

**Parameter**

Parameter	Description
<i>count</i>	Maximum number of retries. The value is from 1 through 10.

**Default**

2

**Instruction**

Change the maximum number of retries to ensure to pass the authentication between certain clients and authentication servers.

**Command mode**

Global configuration

**Example**

The following example sets 4 as the maximum number of times:

```
Switch(config)#dot1x max-req 4
```

```
Switch(config)#
```

**1.1.6 dot1x reauth-max****Description**

**dot1x reauth-max** *count*

**no dot1x reauth-max**

**Parameter**

Parameter	Description
<i>count</i>	Maximum number of retries. The value is from 1 through 10.

**Default**

4



**Instruction**

Use this command to set maximum number of reauthentications. The authentication will be suspended when there is no response from client on exceeding the number of this configured reauthentication times.

**Command mode**

Global configuration

**Example**

The following example set 5 as the maximum number of reauthentications:

```
Switch(config)#dot1x reauth-max 5
Switch(config)#
```

**1.1.7 dot1x re-authentication****Description**

To enable the periodic reauthentication of the client, use the dot1x re-authentication command. To return to the default setting, use the no form of this command.

**dot1x re-authentication**

**no dot1x re-authentication**

**Parameter**

None

**Default**

None

**Instruction**

You configure the amount of time between the periodic reauthentication attempts by using the dot1x timeout re-authperiod global configuration command.

**Command mode**

Global configuration

**Example**

This example shows how to enable the periodic reauthentication:

```
Switch(config)#dot1x re-authentication
Switch(config)#
```

**1.1.8 dot1x timeout quiet-period****Description**

**dot1x timeout quiet-period** *time*

**no dot1x timeout quiet-period**

**Parameter**

Parameter	Description
<i>time</i>	Period of reenabling authentication, in the range from 0 to 65535 seconds

**Default**

60s

**Instruction**

There will be a period of quiet time after authentication failure during which switch doesn't receive or enable any authentication.

**Command mode**

Global configuration

**Example**

The following example configures quiet period value to 40:

```
Switch(config)#dot1x timeout quiet-period 40
Switch(config)#
```

### 1.1.9 dot1x timeout re-authperiod

#### Description

**dot1x timeout re-authperiod** *time*

**no dot1x timeout re-authperiod**

#### Parameter

Parameter	Description
<i>time</i>	Period of reauthentication, in the range from 1 to 4294967295 seconds

#### Default

3600s

#### Instruction

This command is valid only after enabling the **dot1x re-authentication command**.

#### Command mode

Global configuration

#### Example

The following example configures dot1x reauthentication period to 7200s:

```
Switch(config)# dot1x timeout re-authperiod 7200  
Switch(config)#
```

### 1.1.10 dot1x timeout tx-period

#### Description

**dot1x timeout tx-period** *time*

**no dot1x timeout tx-period**

**Parameter**

Parameter	Description
time	Time is from 1 to 65535s.

**Default**

30s

**Instruction**

This command specifies the time interval of the host client to respond to the authentication request. The switch will resend the authentication request when exceeding this time interval.

**Command mode**

Global configuration

**Example**

The following command sets 24 as the timeout period:

```
Switch(config_f0/0)# dot1x timeout tx-period 24
Switch(config_f0/0)#
```

**1.1.11 dot1x user-permit****Description**

**dot1x user-permit xxx yyy zzz**

**no dot1x user-permit**

**Parameter**

Parameter	Description
xxx	Username
yyy	Username
zzz	Username

**Default**

All users are allowed to pass without user-bind.

**Instruction**

Use this command to bind user on the interface, eight users can be binded on each interface. When enabled 802.1x authentication, the authentication is only available to the binding user.

**Command mode**

interface configuration

**Example**

The following example configures a,b,c,d as the binding user on interface f0/1:

```
Switch(config_f0/1)# dot1x user-permit a b c d
Switch(config_f0/1)#
```

## 1.1.12 dot1x authentication method

**Description**

**dot1x authentication method xxx**

**no dot1x authentication method**

**Parameter**

Parameter	Description
xxx	Method name

**Default**

“default”method

**Instruction**

Use this command to configure authentication method on an interface. This command is one of the authentication methods that AAA provides. Each interface only uses one authentication method. When AAA performs authentication for users of 802.1x, it will select the configured authentication method to perform.

**Command mode**

interface configuration

## Example

The following example configures abcd as the authentication method on interface f0/1; this method uses local username for authentication. The following example configures efgh as the authentication method on interface f0/2:

```
Switch(config) #aaa authentication dot1x abcd local
Switch(config) #aaa authentication dot1x efgh radius
Switch(config) #int f0/1
Switch(config_f0/1)# dot1x authentication method abcd
Switch(config_f0/1)# int f0/2
Switch(config_f0/2)# dot1x authentication method efgh
```

### 1.1.13 dot1x accounting enable

#### Description

**dot1x accounting enable**

**no dot1x accounting enable**

#### Parameter

Parameter	Description
None	

#### Default

The accounting function is disabled.

#### Explanation

The accounting function must be used together with the authentication function. You'd better enable the dotx re-authentication function.

#### Command mode

Port configuration mode

#### Example

The following commands are used to configure the dot1x authentication function on port f0/1 and enable the accounting function:

```
Switch(config) #dot1x enable
Switch(config) #int f0/1
Switch(config_f0/1)# dot1x port atuo
```

```
Switch(config_f0/1)# dot1x accounting enable
```

### 1.1.14 dot1x accounting method

#### Description

**dot1x accounting method xxx**

**no dot1x accounting method**

#### Parameter

Parameter	Description
xxx	Name of the accounting method

#### Default

the **default** method

#### Explanation

The accounting method configured by this command must be one of the AAA accounting methods. Each port has only one accounting method. After the dot1x accounting function is enabled, the method is used for accounting.

#### Command mode

Port configuration mode

#### Example

In the following example, an **abcd** accounting method is set for port f0/1. The radius server must be used in this method.

```
Switch(config) # aaa accounting network abcd start-stop group radius
Switch(config) #radius host 192.168.20.100
Switch(config) #int f0/1
Switch(config_f0/1)# dot1x accounting method abcd
```

### 1.1.15 dot1x authen-type、 dot1x authentication type

#### Description

To configure global dot1x authentication type, use the **dot1x authen-type command**. **Use the no form of this command to restore the default value.**

**dot1x authen-type {chap|eap}**

**no dot1x authen-type**

### Parameter

None

### Default

Default global is chap.

Default on an interface refers to the default global.

### Instruction

Use this command to configure authentication type. The authentication type will decide AAA to use Chap or Eap. The challenge that MD5 needs will be formed locally when using Chap. The challenge that MD5 needs will be formed on the authentication server when using Eap. Each interface only uses one kind of authentication type. It is the globally-configured one by default. The interface will not stop using this kind of authentication type until the no form of this command is used.

### Command mode

Interface and global configuration

### Example

The following example configures Chap and Eap as the authentication type and the global authentication type on the interface f0/1

```
Switch(config) #dot1x authen-type eap
```

```
Switch(config) #int f0/1
```

```
Switch(config_f0/1) # dot1x authentication type chap
```

## 1.1.16 dot1x guest-vlan

### Description

To specify an active VLAN as an IEEE 802.1x guest VLAN, use the dot1x guest-vlan command in interface configuration mode. To return to the default setting, use the no form of this command.

**dot1x guest-vlan**

**no dot1x guest-vlan**



**Parameter**

None

**Default**

No guest VLAN is configured.

**Instruction**

*When you enable the guest-vlan command, the software will assign the corresponding port to a guest VLAN when it does not receive a response from the client.*

*This command is used with the dot 1x guest-vlan id interface configuration command.*

**Command mode**

Global configuration

**Example**

The following example enables global guest-vlan feature:

```
Switch(config) #dot1x guest-vlan
```

**1.1.17 dot1x guest-vlan id****Description**

To configure dot1x guest-vlan id value on an interface, use the dot1x guest-vlan command. Use the no form of this command to restore the default value.

**dot1x guest-vlan id**

**no dot1x guest-vlan**

**Parameter**

Id: guest vlan value, which can be any configured vlan id in the system

**Default**

0

**Instruction**

*When you enable the `guest-vlan` command, the software will assign the corresponding port to a guest VLAN when it does not receive a response from the client.*

*This command is used with the `dot 1x guest-vlan` global configuration command.*

**Command mode**

interface configuration

**Example**

The following example configures `guest-vlan id` value on an interface:

```
Switch(config_if) #dot1x guest-vlan 2
```

**1.1.18 dot1x forbid multi-network-adapter****Description**

**dot1x forbid multi-network-adapter**

**no dot1x forbid multi-network-adapter**

Run **dot1x forbid multi-network-adapter** to configure the Supplicant to shut down multiple network adapters. Run **no dot1x forbid multi-network-adapter** to resume the default configuration.

**Parameter**

None

**Default**

None

**Explanation**

This command can disable the Supplicant with multiple network adapters to prevent the agent.

**Command mode**

Port configuration mode

## Example

The following command is run in port mode to disable the Supplicant with multiple network adapters.

```
Switch(config_if) # dot1x forbid multi-network-adapter
```

### 1.1.19 aaa authentication dot1x

## Description

To specify one or more authentication, authorization, and accounting (AAA) methods for use on interfaces running IEEE 802.1X, use the `aaa authentication dot1x` command. To disable authentication, use the `no` form of this command

```
aaa authentication dot1x {Default} method1 [method2...]
```

```
no aaa authentication dot1x {Default} method1 [method2...]
```

## Parameter

Parameter	Description
<b>Default</b>	Uses the listed authentication methods that follow this parameter as the default list of methods when a user logs in.
<i>method1</i> [ <i>method2...</i> ]	enable 、 group radius、 line、 local、 local-case、 None

## Default

No authentication is performed.

## Instruction

The method parameter identifies the list of methods that the authentication algorithm tries in the given sequence to validate the password provided by the client. The only method that is truly 802.1X-compliant is the group radius method, in which the client data is validated against a RADIUS authentication server. The remaining methods enable AAA to authenticate the client by using locally configured data. For example, the local and local-case methods use the username and password that are saved in the configuration file. The enable and line methods use the enable and line passwords for authentication.

## Command mode

Global configuration

## Example

The following example configures RADIUS as the dot1x authentication method:

```
Switch(config)#aaa authentication dot1x default radius
```

```
Switch(config)#
```

### 1.1.20 debug dot1x error

#### Description

```
debug dot1x error
```

#### Parameter

None

#### Default

None

#### Instruction

This command is used to debug all error information during dot1x running to locate errors.

### 1.1.21 debug dot1x state

#### Description

```
debug dot1x state
```

#### Parameter

None

#### Default

None

#### Instruction

Output format is as follows:

```
2003-3-18 17:40:09 802.1x:AuthSM(F0/10) state Connecting-> Authenticating, event rxRespId
```

```
2003-3-18 17:40:09 802.1x:F0/10 Create user for Enter authentication
```

```
2003-3-18 17:40:09 802.1x:BauthSM(F0/10) state Idle-> Response, event authStart
```

2003-3-18 17:40:09 802.1x:F0/10 user "myname" denied, Authentication Force Failed

2003-3-18 17:40:09 802.1x:F0/10 Authentication Fail

2003-3-18 17:40:09 802.1x:BauthSM(F0/10) state Response-> Fail, event aFail

### 1.1.22 debug dot1x packet

#### Description

**debug dot1x packet**

#### Parameter

None

#### Default

*None*

#### Instruction

2003-3-18 17:40:09 802.1x:F0/10 Tx --> Supplicant(0008.74bb.d21f)

EAPOL ver:01, type:00, len:5

EAP code:01, id:03, type:01, len:5

00

2003-3-18 17:40:09 802.1x:F0/10 Rx <-- Supplicant(0008.74bb.d21f)

EAPOL ver:01, type:00, len:10

EAP code:02, id:03, type:01, len:10

62 64 63 6f 6d a5

### 1.1.23 show dot1x

#### Description

To show 802.1x configuration information, use the show dot1x command.

**show dot1x** [interface *intf-id*]

#### Parameter

Parameter	Description
<i>intf-id</i>	The concrete physical interface.

## Default

None

## Instruction

This command is used to show 802.1x configuration information.

## Command mode

EXEC

## Example

The following example configures dot1x port-control auto on the interface f0/10:

```
Switch_config#sho dot1x
802.1X Parameters
reAuthen      No
reAuth-Period 3
quiet-Period  10
Tx-Period     30
Supp-timeout  30
Server-timeout 30
reAuth-max    4
max-request   2
authen-type   Eap
IEEE 802.1x on port F0/10 enabled
Authorized          Yes
Authen Type         Eap
Authen Method       default
Permit Users        All Users
Multiple Hosts      Disallowed
Supplicant           aaa(0008.74bb.d21f)
Current Identifier   21
Authenticator State Machine
State                Authenticated
Reauth Count         0
Backend State Machine
State                Idle
Request Count        0
Identifier (Server)  20
Port Timer Machine
Auth Tx While Time   16
Backend While Time   16
reAuth Wait Time     3
Hold Wait Time       0
```

