Configuration Guide

For 802.1X VLAN Assignment and MAB

T2600G-28TS _v2_170323 or Above

T2600G-52TS_v2_1703023 or Above

T2600G-28MPS_v2_170928 or Above

1910012315 REV1.0.0

December 2017

CONTENTS

1 Overview

802.1X authentication is a network access control method which safeguards network security. If the client passes the RADIUS server authentication then the client can access the LAN. Otherwise, the client cannot access the LAN.

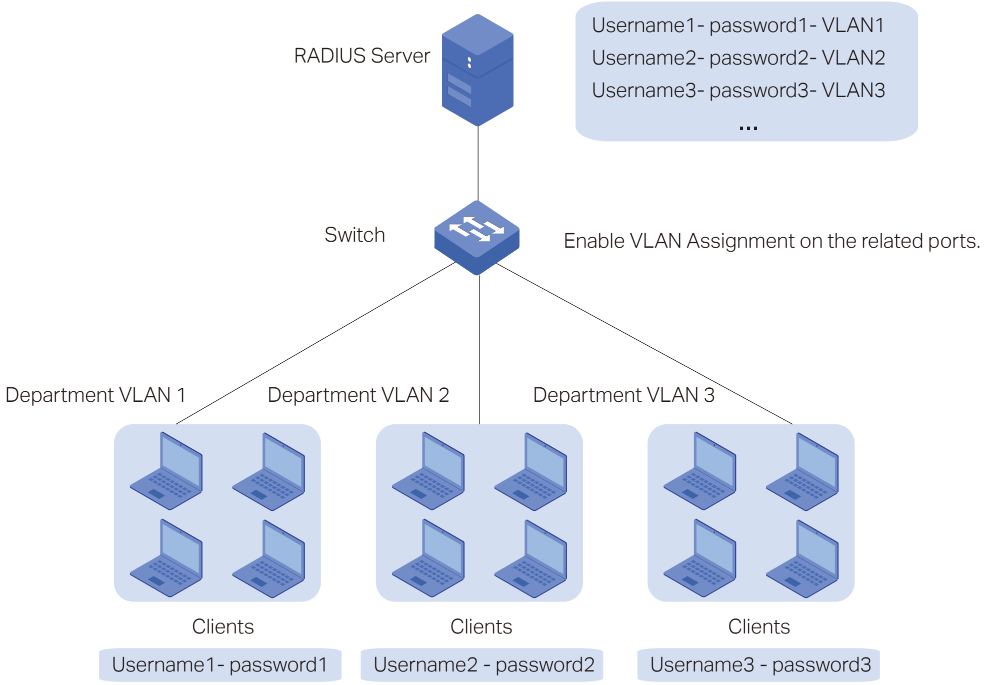
VLAN Assignment and MAB are two important features of 802.1X authentication, and act as safety controls.

VLAN Assignment

VLAN Assignment allows the RADIUS server to send the VLAN configuration to the port dynamically. VLAN Assignment is used together with 802.1X authentication. After the port is authenticated, the RADIUS server assigns the VLAN based on the username of the client connecting to the port. The username-to-VLAN mappings must already be stored in the RADIUS server database.

The figure below shows the typical topology of VLAN Assignment. VLAN Assignment is port-based. With VLAN Assignment enabled, the RADIUS server will send the VLAN configuration when the port is authenticated. VLAN IDs are assigned based on switch ports.

- If the assigned VLAN is nonexistent on the switch, the switch will create the related VLAN automatically, add the authenticated port to the VLAN and change the PVID based on the assigned VLAN.
- If the assigned VLAN exists on the switch, the switch will directly add the authenticated port to the related VLAN and change the PVID instead of creating a new VLAN.
- If no VLAN is supplied by the RADIUS server or if 802.1X authentication is disabled, the port will be still in its original VLAN.



MAB

MAB (MAC Authentication Bypass) uses the MAC address of a device to determine whether the client can get access to the network. After checking the MAC addresses of the clients that you want to access the network, add these MAC addresses into the database of the RADIUS server. With MAB enabled on th port, the switch will learn the MAC address of the device automatically and send the authentication server a RADIUS access request frame with the client's MAC address as the username and password. If the authorization succeeds, the RADIUS server grants the client access to the network. Thus devices can be authenticated without any client software installed. And MAB can be used to authenticate devices without 802.1X capability like IP phones.

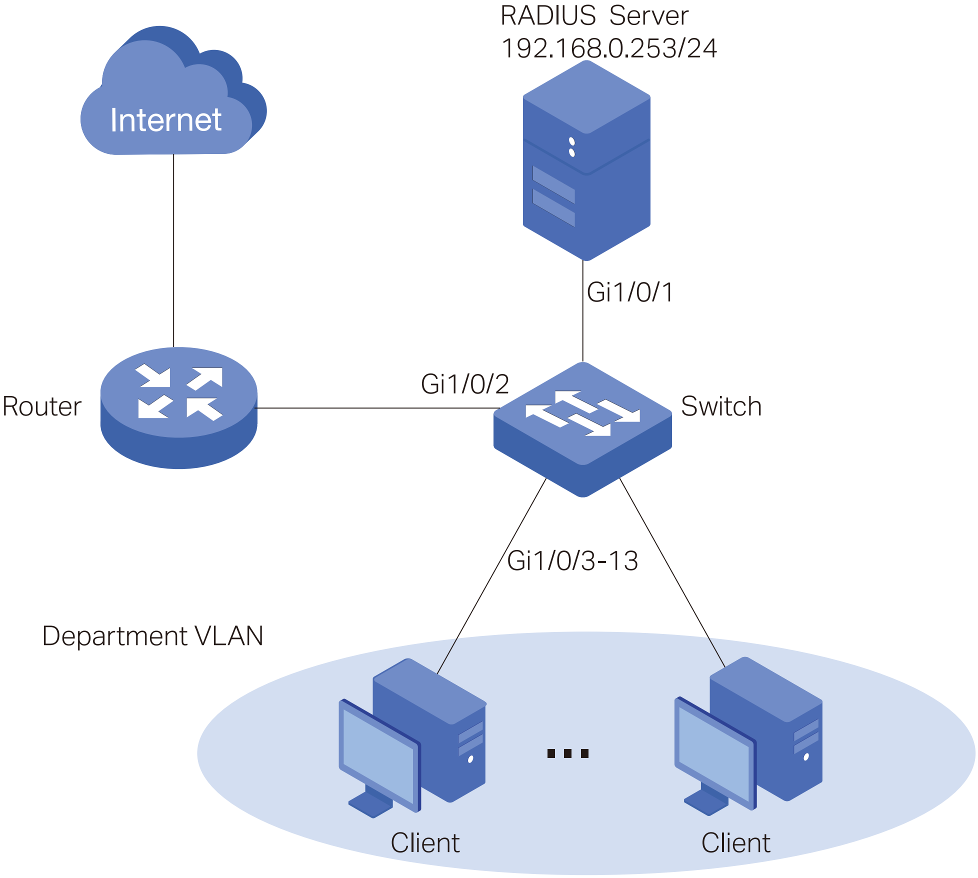
MAB interacts with the other features:

- 802.1X authentication— MAB takes effect only if 802.1X authentication is enabled on the port.
- VLAN Assignment— MAB can be used on a port with VLAN Assignment enabled. That is, if a client has an authorized MAC address identity, the switch assigns the client to a specific VLAN if VLAN Assignment is configured on the corresponding port.

2 Example for VLAN Assignment

2.1 Network Requirements

To enhance network security, a company requires that the employees can access the network normally only when their computers pass the authentication successfully. At the same time, to reduce the workload of the configuration, it is required that the ten authenticated computers can be automatically assigned to the VLANs of their departments. The network topology is shown as below.



2.2 Configuration Scheme

802.1X Authentication is commonly used in solving authentication and security problems for LAN ports. VLAN Assignment can assign multiple clients to different VLANs depending on their authentication information. Thus configure 802.1X Authentication and VLAN Assignment to meet the requirement.

The configuration is briefly summarized in the following outlines:

1) Build a RADIUS Server.

2) Configure 802.1X and VLAN Assignment on the switch.

3) Start the authentication on 802.1X client software.

2.3 RADIUS Server Introduction

A RADIUS server receives user authentication requests, authenticates the user, and then returns authentication results to the authenticator (the switch).

This guide takes FreeRADIUS.net as an example to build a RADIUS server. FreeRADIUS.net installation file can be downloaded from http://freeradius.net/index.html. Run the file and follow the wizard to install the FreeRADIUS.net on a local computer.

After installing FreeRADIUS.net on the computer, some configurations files should be modified to satisfy the 802.1X authentication requirements:

- Modify the **clients.conf** to add RADIUS client (the switch) information.
- Modify the **users.conf** to add user authentication information.

2.4 Configuration

Configuration Guidelines:

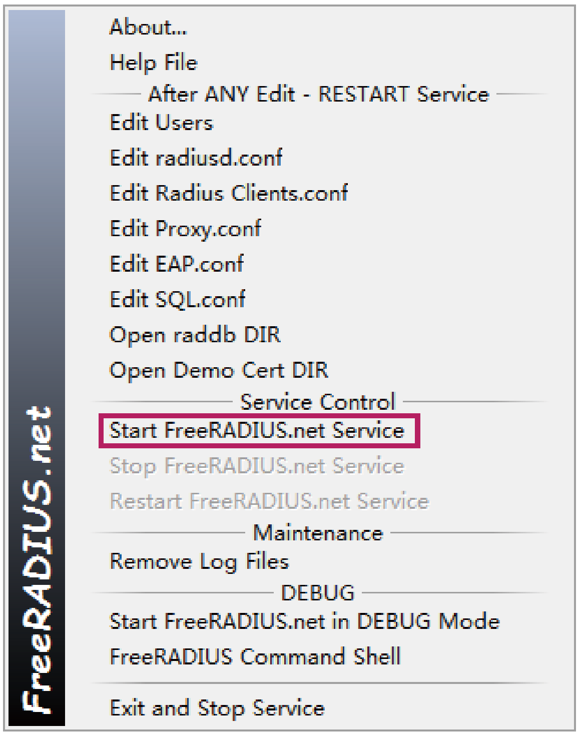
- VLAN Assignment takes effect only when the control type is **Port Based**. Set the control type as **Port Based** on the ports connected to clients.
- 802.1X authentication and Port Security cannot be enabled at the same time. Before enabling 802.1X authentication, make sure that Port Security is disabled.
- Keep 802.1X authentication disabled on ports connected to the authentication server, the internet and the management computer, which ensures the traffic will not be blocked for the switch.

Demonstrated with T2600G-28TS acting as the authenticator, FreeRADIUS.net acting as the RADIUS server and TP-Link 802.1X Client Software, the following sections provide configuration procedures. The configuration procedures on the switch will be given in two ways: using the GUI and using the CLI.

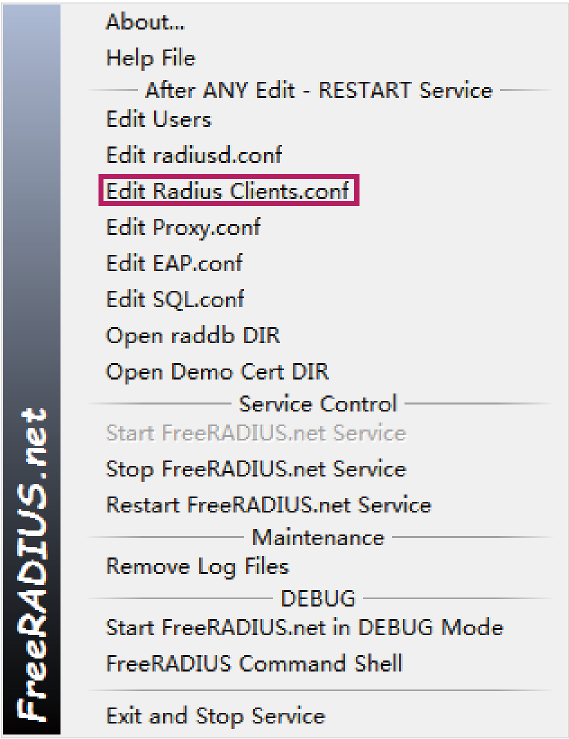
2.4.1 Build a RADIUS Server

For the network administrator, the first thing is to build a RADIUS server, and put the user information for employees into the RADIUS server. The network administrator can set different username and password for each employee or set a public username and password shared by all the employees in the same department. The setting of the username and password depends on the actual demands.

1) Right click the icon to load the following window. Choose **Start FreeRADIUS.net Service** to start the RADIUS server.



2) Right click the icon and choose **Edit Radius Clients.conf** to add an entry for the RADIUS client (T2600G-28TS).



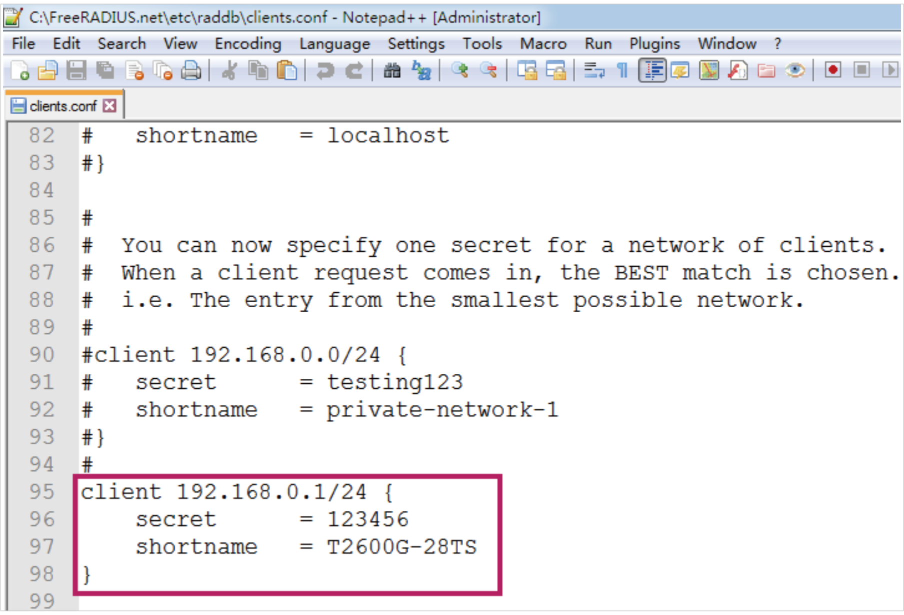
To avoid the format error of the adding code, use Notepad++ to edit configuration files.

One client section means a RADIUS client. You can choose one of the client sections and edit the following attributes. Or you can add a new client section to meet your requirements.

The **clients.conf** can be modified in three aspects:

- The IP address of network segment of the authenticator (T2600G-28TS). After the installation is completed, the default configuration file contains the commonly used network segment. Thus you can keep it as default in most cases.
- The secret which is the shared key between the RADIUS server and the switch. The RADIUS server and the switch use the key string to encrypt passwords and exchange responses.
- The shortname which is used as an alias for the fully qualified domain name, or the IP address. A value can be filled in optionally for the shortname.

According to the network topology, add the following code and save the file.

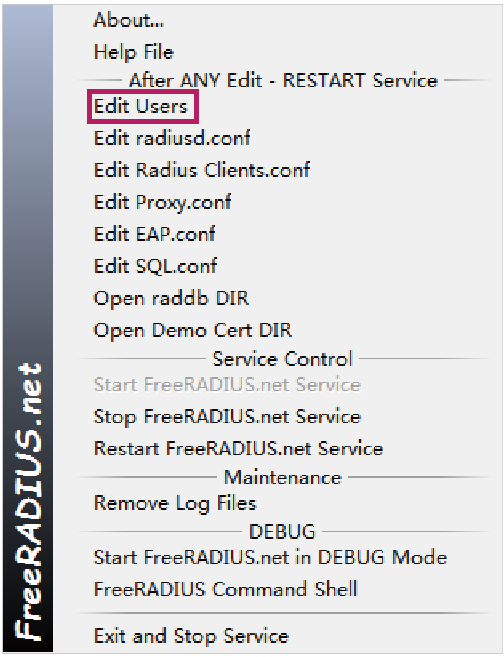

C:\FreeRADIUS.net\etc\raddb\clients.conf - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
clients.conf

```
#   shortname    = localhost
#}

#
#  You can now specify one secret for a network of clients.
#  When a client request comes in, the BEST match is chosen.
#  i.e. The entry from the smallest possible network.
#
#client 192.168.0.0/24 {
#   secret       = testing123
#   shortname    = private-network-1
#}
#
client 192.168.0.1/24 {
    secret       = 123456
    shortname    = T2600G-28TS
}

```

Note:

The secret can be any string, up to 32 characters in length.

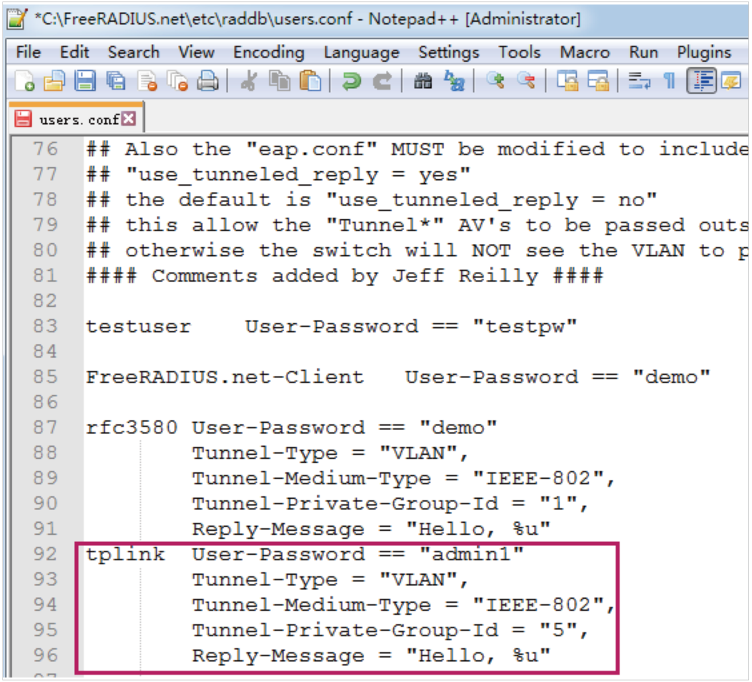
3) Right click the icon and choose **Edit Users** to add a user which the VLAN will be assigned to.



The user information can be modified in four aspects:

- **User-name** and **User-Password**, which is the authentication information of the clients**.** You can replace **rfc3580** with the username which you want and replace **demo** with the new password. Or you can ignore the default user information and add new user information which has identical format in the next line.
- **Tunnel-Type**, which indicates the tunneling protocol to be used. To configure VLAN Assignment, specify this value as VLAN.
- **Tunnel-Medium-Type**, which indicates the transport medium to use when creating a tunnel for tunneling protocols. To configure VLAN Assignment, specify this value as IEEE-802.
- **Tunnel-Private-Group-Id**, which indicates the group ID for a particular tunneled session, that is the assigned VLAN ID.

According to the network topology, add the following codes and save the file.


*C:\FreeRADIUS.net\etc\raddb\users.conf - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins
users.conf

```
## Also the "eap.conf" MUST be modified to include
## "use_tunneled_reply = yes"
## the default is "use_tunneled_reply = no"
## this allow the "Tunnel*" AV's to be passed outs
## otherwise the switch will NOT see the VLAN to p
#### Comments added by Jeff Reilly ####

testuser    User-Password == "testpw"

FreeRADIUS.net-Client   User-Password == "demo"

rfc3580 User-Password == "demo"
        Tunnel-Type = "VLAN",
        Tunnel-Medium-Type = "IEEE-802",
        Tunnel-Private-Group-Id = "1",
        Reply-Message = "Hello, %u"
tplink  User-Password == "admin1"
        Tunnel-Type = "VLAN",
        Tunnel-Medium-Type = "IEEE-802",
        Tunnel-Private-Group-Id = "5",
        Reply-Message = "Hello, %u"
```

Note:

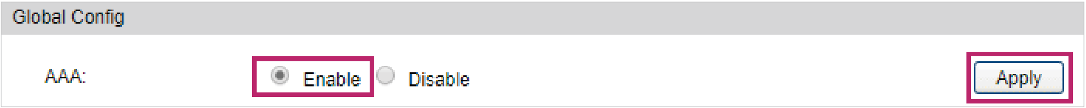
- More than one entry which indicates username-to-VLAN mapping can be added in this file or use a database to store the entries.
- The user-name can be up to 253 characters in length.

4) Click **Restart FreeRaDIUS.net Service** to restart FreeRaDIUS.net.

2.4.2 Configure VLAN Assignment on the Switch

Using the GUI

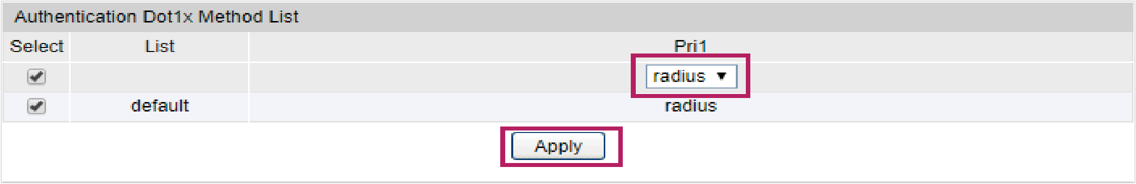
1) Choose the menu **Network Security** > **AAA** > **Global Config** to load the following page. In the **Global Config** section, enable AAA function and click **Apply**.



Global Config

AAA: ● Enable ○ Disable

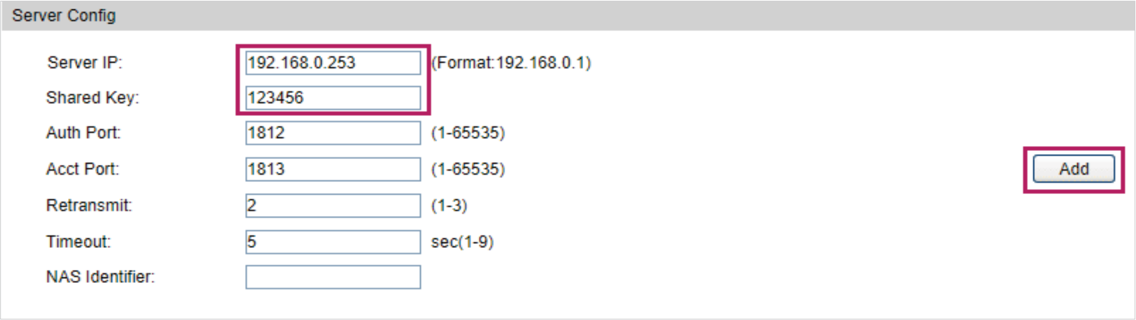
2) Choose the menu **Network Security > AAA > Dot1x List** to load the following page. In the **Authentication Dot1x Method List** section, select an existing RADIUS server group for authentication from the Pri1 drop-down list and click **Apply**.



Authentication Dot1x Method List

Select	List	Pri1
☑		radius ▼
☑	default	radius

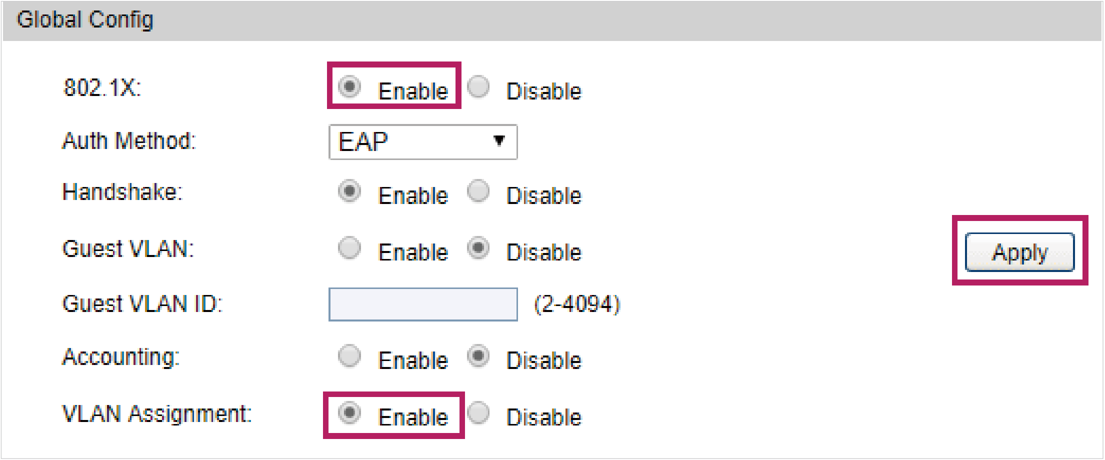
3) Choose the menu **Network Security > AAA > RADIUS Config** to load the following page. Enter the IP address of the RADIUS server and the shared key which is pre-defined in the Radius Clients.conf.



Server Config

Server IP:	192.168.0.253	(Format:192.168.0.1)
Shared Key:	123456	
Auth Port:	1812	(1-65535)
Acct Port:	1813	(1-65535)
Retransmit:	2	(1-3)
Timeout:	5	sec(1-9)
NAS Identifier:		

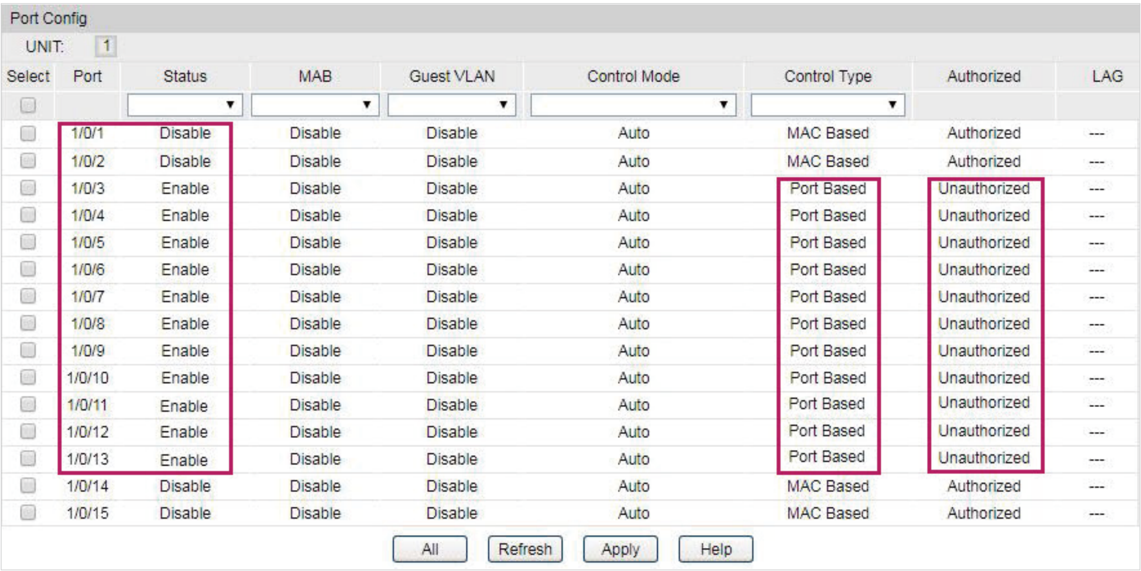
4) Choose the menu **Network Security > 802.1X > Global Config** to load the following page. In the **Global Config** section, enable **802.1X** and **VLAN Assignment** globally and click **Apply**.



Global Config

802.1X:	● Enable	○ Disable
Auth Method:	EAP ▼	
Handshake:	● Enable	○ Disable
Guest VLAN:	○ Enable	● Disable
Guest VLAN ID:		(2-4094)
Accounting:	○ Enable	● Disable
VLAN Assignment:	● Enable	○ Disable

5) Choose the menu **Network Security > 802.1X > Port Config** to load the following page. Select the port 1/0/3-13 which you want to deploy 802.1X VLAN Assignment and set the status for port1/0/3-13 as **Enable**. Set the control type as **Port Based** for port1/0/3-13. Set the status for port 1/0/1 and port 1/0/2 as **Disable** so that the RADIUS server and the internet will not be blocked for the switch.



Port Config

UNIT: 1

Select	Port	Status	MAB	Guest VLAN	Control Mode	Control Type	Authorized	LAG
□								
□	1/0/1	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/2	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/3	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/4	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/5	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/6	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/7	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/8	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/9	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/10	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/11	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/12	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/13	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/14	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/15	Disable	Disable	Disable	Auto	MAC Based	Authorized	---

Using the CLI

1) Enable AAA globally and configure the RADIUS parameters.

```
T2600G-28TS#configure

T2600G-28TS(config)#aaa enable

T2600G-28TS(config)#aaa authentication dot1x default radius

T2600G-28TS(config)#radius -server host 192.168.0.253 auth-port 1812 key 123456
```

2) Globally enable 802.1X authentication and set the authentication protocol. Enable VLAN Assignment.

```
T2600G-28TS(config)#dot1x system-auth-control

T2600G-28TS(config)#dot1x auth-method eap

T2600G-28TS(config)#dot1x vlan-assignment
```

3) Disable 802.1X authentication on port 1/0/1and port 1/0/2. Enable 802.1X authentication on port 1/0/3, set the mode as Auto, and set the control type as Port-Based.

```
T2600G-28TS(config)#interface range gigabitEthernet 1/0/1-2

T2600G-28TS(config-if-range)#no dot1x

T2600G-28TS(config-if-range)#exit

T2600G-28TS(config)#interface range gigabitEthernet 1/0/3-13

T2600G-28TS(config-if-range)#dot1x

T2600G-28TS(config-if-range)#dot1x port-method port-based

T2600G-28TS(config-if-range)#dot1x port-control auto

T2600G-28TS(config-if-range)#exit
```

4) Verify the configurations.

   Verify the global configurations of 802.1X authentication:

```
T2600G-28TS#show dot1x global
 802.1X State:                          Enabled
 Authentication Method:                     EAP
 Handshake State:                       Enabled
 Guest VLAN State:                     Disabled
 Guest VLAN ID:                             N/A
 802.1X Accounting State:              Disabled
 802.1X VLAN Assignment State:          Enabled
 Quiet-period State:                   Disabled
 Quiet-period Timer:                    10 sec.
 Max Retry-times For RADIUS Packet:           3
 Supplicant Timeout:                     3 sec.
```

   Verify the configurations of 802.1X authentication on the port:

```
T2600G-28TS#show dot1x interface
Port     State    MAB State  GuestVLAN  PortControl  PortMethod  Authorized   LAG
----     ------   ---------- ---------- ------------ ----------- ------------ -----
Gi1/0/1  disabled disabled   disabled     auto       mac-based   authorized   N/A
Gi1/0/2  disabled disabled   disabled     auto       mac-based   authorized   N/A
Gi1/0/3  enabled  disabled   disabled     auto       port-based  unauthorized N/A
Gi1/0/4  enabled  disabled   disabled     auto       port-based  unauthorized N/A
...
```

   Verify the configurations of RADIUS:

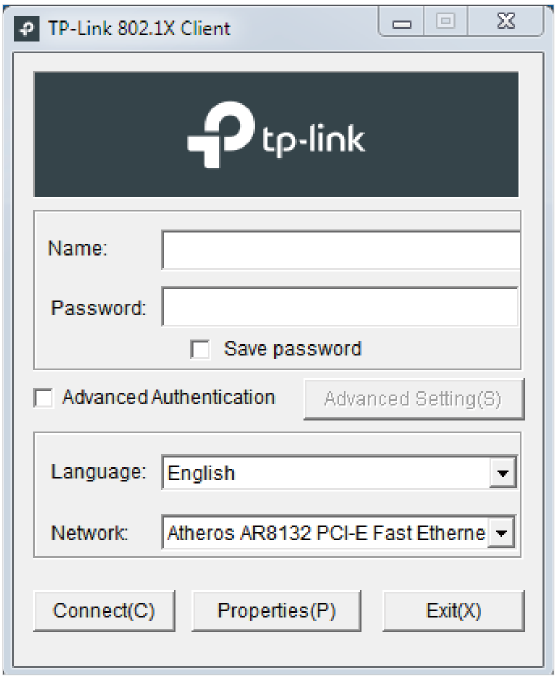
```
T2600G-28TS#show aaa global
 AAA global status:       Enable
 Module         Login List     Enable List
 Console        default        default
 Telnet         default        default
 Ssh            default        default
 Http           default        default
```

```
T2600G-28TS#show aaa authentication dot1x

Methodlist    pri1      pri2      pri3      pri4

default       radius    --        --        --


T2600G-28TS#show aaa group radius

192.168.0.253
```

2.4.3 Set Up Authentication on 802.1X Client Software

Before the employee can access the internet, the employee should input the authentication information on the 802.1X Client Software. The authentication information is the username and password which is set by the network administrator in the RADIUS server.

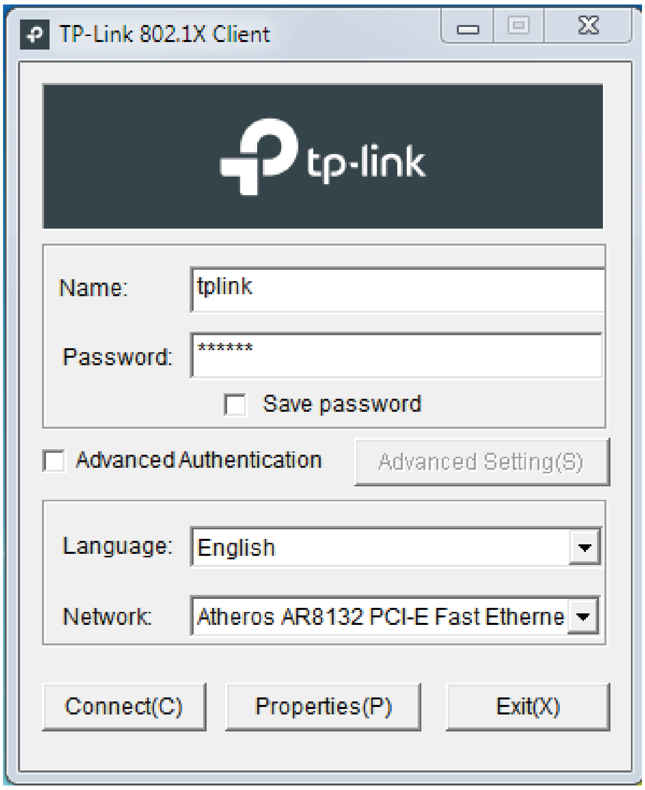
1) On the computer to be authorized, download the TP-Link 802.1X Client Software installation file from **http://www.tp-link.com/en/download-center.html**. Run the file and follow the wizard to install the 802.1X client software. After completing installation, double click the icon to run the TP-Link 802.1X Client Software. The following screen will appear.



Language: English

Network: Atheros AR8132 PCI-E Fast Etherne

2) Enter the username and password. In this example, enter “tplink” as the username and “admin1” as the password , which is set in the RADIUS server, then click **Connect**.



TP-Link 802.1X Client

Name: tplink

Password: ******

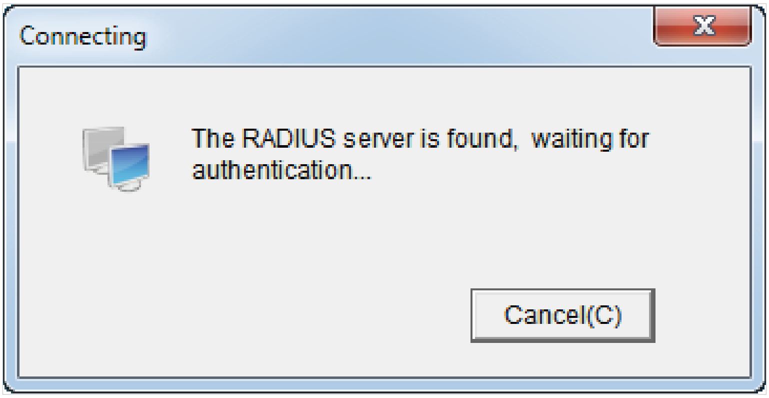
□ Save password

□ Advanced Authentication

Language: English

Network: Atheros AR8132 PCI-E Fast Etherne

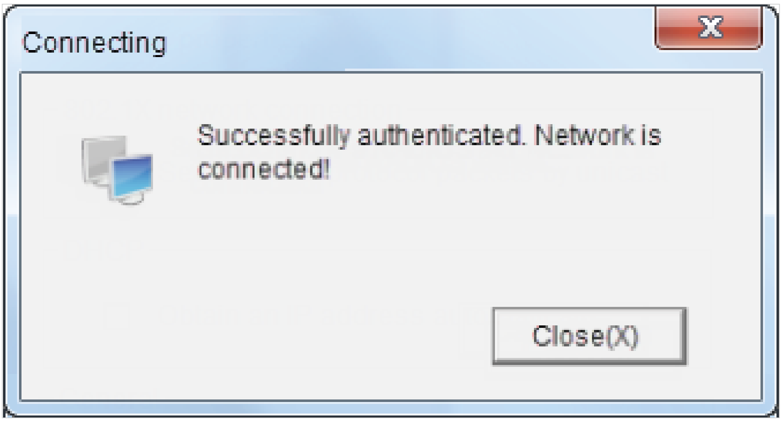
Then the 802.1X client software will automatically register to the RADIUS server and get the authority to the internet from the RADIUS server.



Connecting

The RADIUS server is found, waiting for authentication...

When passing the authentication, the following screen will appear.



Connecting

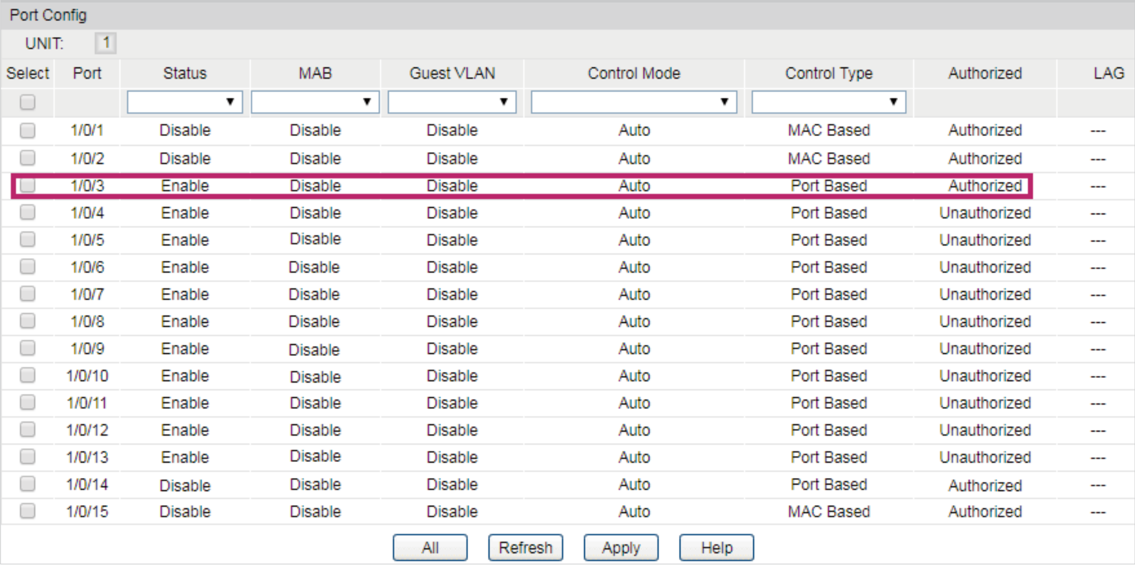
Successfully authenticated. Network is connected!

2.5 Verify the Configuration Result

After all the configurations are completed, you can follow the steps below to verify whether 802.1X VLAN Assignment works. Taking port 3 for a example, you can check the switch by using GUI and CLI.

Using the GUI

1) Choose the menu **Network Security > 802.1X > Port Config** to check whether the port 1/0/3 passes the 802.1X authentication successfully. After passing the 802.1X authentication successfully, the **Authorized** state will change from **Unauthorized** to **Authorized**.

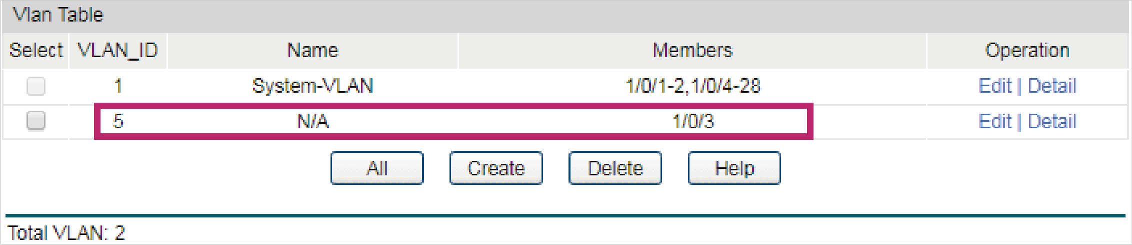


Port Config

UNIT: 1

Select	Port	Status	MAB	Guest VLAN	Control Mode	Control Type	Authorized	LAG
□								
□	1/0/1	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/2	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/3	Enable	Disable	Disable	Auto	Port Based	Authorized	---
□	1/0/4	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/5	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/6	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/7	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/8	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/9	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/10	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/11	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/12	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/13	Enable	Disable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/14	Disable	Disable	Disable	Auto	Port Based	Authorized	---
□	1/0/15	Disable	Disable	Disable	Auto	MAC Based	Authorized	---

2) Choose the menu **VLAN > 802.1Q VLAN > Global Config** to check whether the port 1/0/3 is assigned to the corresponding VLAN.



Vlan Table

Select	VLAN_ID	Name	Members	Operation
□	1	System-VLAN	1/0/1-2,1/0/4-28	Edit | Detail
□	5	N/A	1/0/3	Edit | Detail

Total VLAN: 2

Using the CLI

1) Verify the 802.1X authorization states on the port:

```
T2600G-28TS#show dot1x interface

Port     State     MAB State  GuestVLAN  PortControl  PortMethod  Authorized   LAG

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

Gi1/0/1  disabled  disabled   disabled   auto         mac-based   authorized   N/A

Gi1/0/2  disabled  disabled   disabled   auto         mac-based   authorized   N/A

Gi1/0/3  enabled   disabled   disabled   auto         port-based  authorized   N/A

...
```

2) Verify the VLAN information:

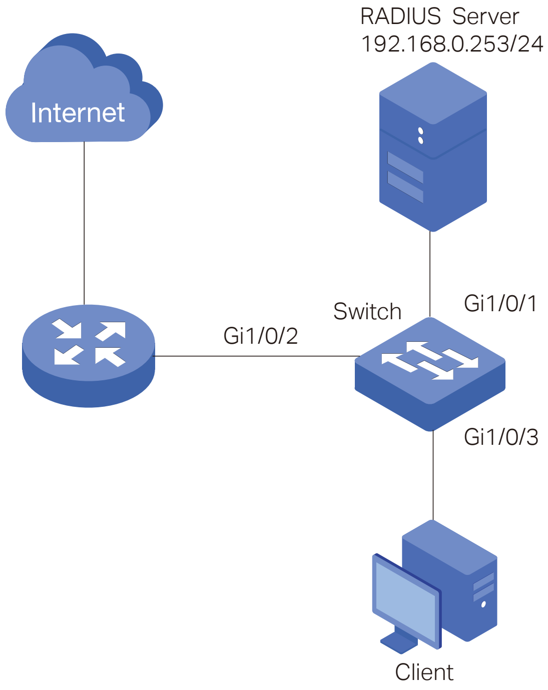
```
T2600G-28TS#show vlan

VLAN  Name                  Status     Ports

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

1     System-VLAN          active     Gi1/0/1, Gi1/0/2, Gi1/0/4, Gi1/0/5,

                                      Gi1/0/6, Gi1/0/7, Gi1/0/8, Gi1/0/9,

                                      Gi1/0/10, Gi1/0/11, Gi1/0/12, Gi1/0/13,

                                      Gi1/0/14, Gi1/0/15, Gi1/0/16, Gi1/0/17,

                                      Gi1/0/18, Gi1/0/19, Gi1/0/20, Gi1/0/21,

                                      Gi1/0/22, Gi1/0/23, Gi1/0/24, Gi1/0/25,

                                      Gi1/0/26, Gi1/0/27, Gi1/0/28

5     N/A                  active     Gi1/0/3


Primary Secondary Type               Ports

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

The port has been assigned to the related VLAN. That means 802.1X VLAN Assignment works.

3 Example for MAB

3.1 Network Requirements

The network administrator wants to restrict the authority of a device to access the network resources. The device should be authenticated before getting access to the internet. For convenience, it is better that the authentication process can be performed automatically. The network topology is shown as below.



3.2 Configuration Scheme

MAB uses the MAC address of a device to determine whether the device can get access to the network. Thus MAB can be used to authenticate devices without 802.1X Client Software.

The configuration is briefly summarized in two steps:

1) Build a RADIUS Server.

2) Configure MAB on TP-Link switch.

3.3 Configuration

Configuration Guidelines:

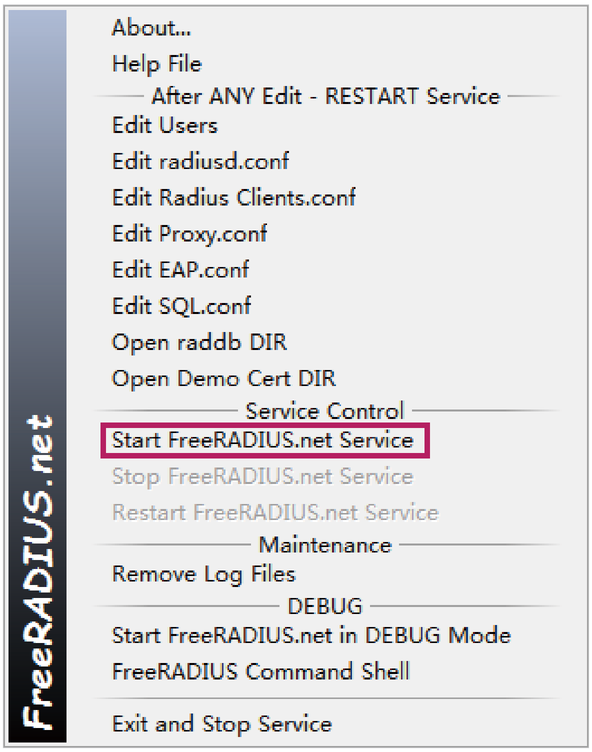
- MAB uses the MAC address of the client as the username and password. Please check the MAC addresses of the clients that you want to access the network in advance.
- MAB takes effect only when 802.1X Authentication is enabled. Enable 802.1X Authentication on the ports connected to clients.
- MAB takes effect only when Guest VLAN is disabled. Ensure that Guest VLAN is disabled when configuring MAB.
- 802.1X authentication and Port Security cannot be enabled at the same time. Before enabling 802.1X authentication, make sure that Port Security is disabled.
- Keep 802.1X authentication disabled on ports connected to the authentication server, the internet and the management computer, which ensures they will not be blocked from accessing the switch.

Demonstrated with T2600G-28TS acting as the authenticator, FreeRADIUS.net acting as the RADIUS server, the following sections provide configuration procedures. The configuration procedures on the switch will be given in two ways: using the GUI and using the CLI.

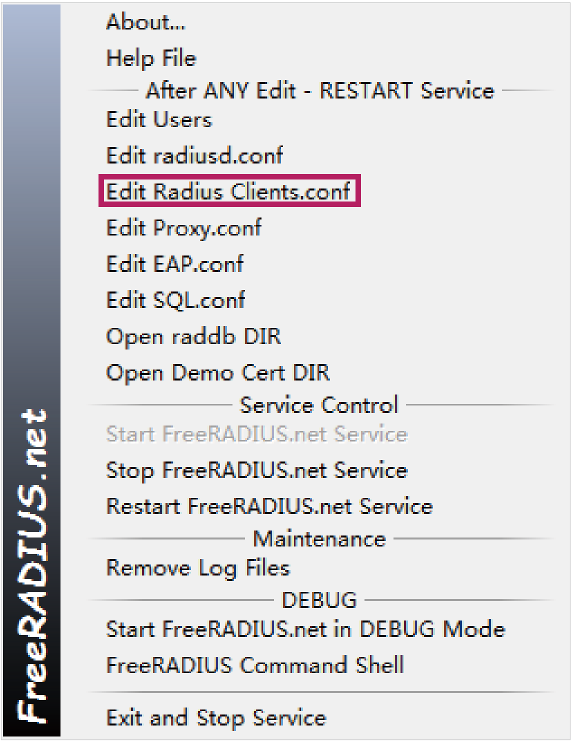
3.3.1 Build a RADIUS Server

1) Go to **http://freeradius.net/index.html** to download the FreeRADIUS.net and follow the wizard to install it.

2) Right click the icon to load the following page. Choose **Start FreeRADIUS.net Service** to start the RADIUS server.



3) Right click the icon and choose **Edit Radius Clients.conf** to add an entry for our RADIUS client (T2600G-28TS).

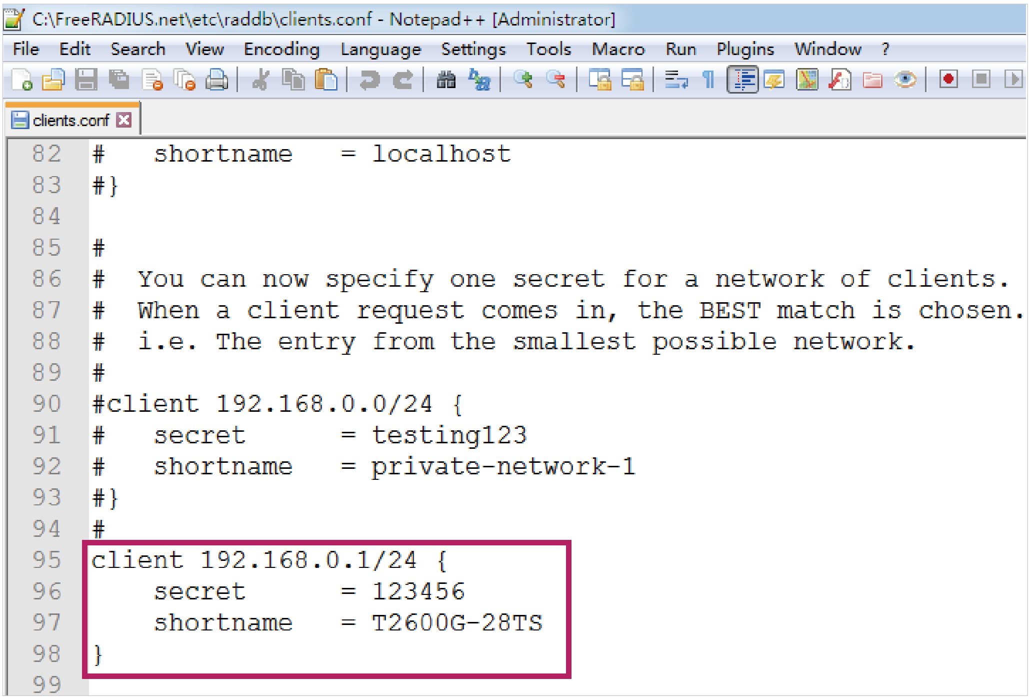


To avoid the format errors when adding code, use Notepad++ to edit configuration files.

One client section means a RADIUS client. You can choose one of the section clients and edit the following attributes. Or you can add a new client section to meet your requirements. The **Clients.conf** should be modified in three aspects:

- The IP address of network segment of the authenticator (T2600G-28TS). After the installation is completed, the default configuration file contains the commonly used network segment. Thus you can keep it as default in most cases.
- The secret which is the shared key between the RADIUS server and the switch. The RADIUS server and the switch use the key string to encrypt passwords and exchange responses.
- The shortname which is used as an alias for the fully qualified domain name, or the IP address of the RADIUS client. A value can be filled in optionally for the short name.

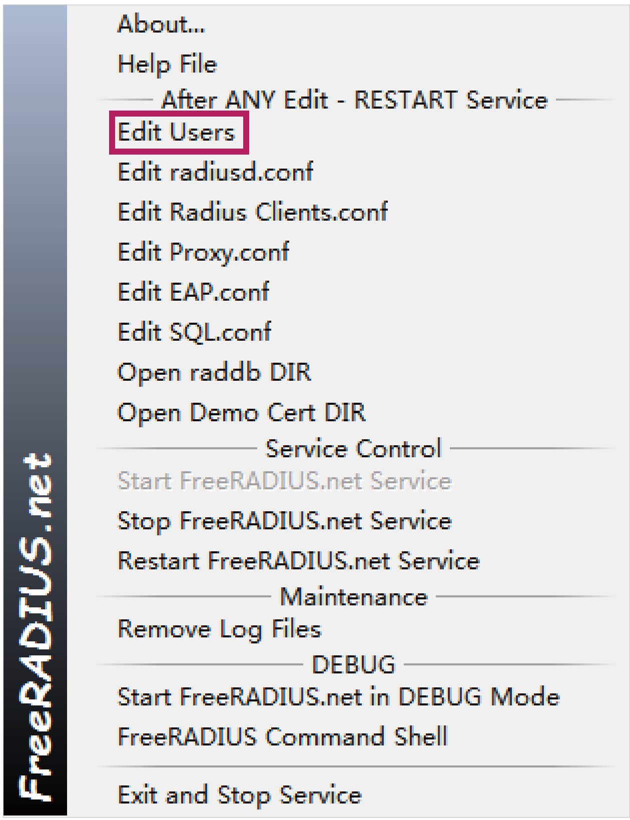
According to the network topology, add the following codes and save the file.


C:\FreeRADIUS.net\etc\raddb\clients.conf - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
clients.conf

```
#    shortname    = localhost
#}

#
#  You can now specify one secret for a network of clients.
#  When a client request comes in, the BEST match is chosen.
#  i.e. The entry from the smallest possible network.
#
#client 192.168.0.0/24 {
#    secret       = testing123
#    shortname    = private-network-1
#}
#
client 192.168.0.1/24 {
     secret       = 123456
     shortname    = T2600G-28TS
}

```

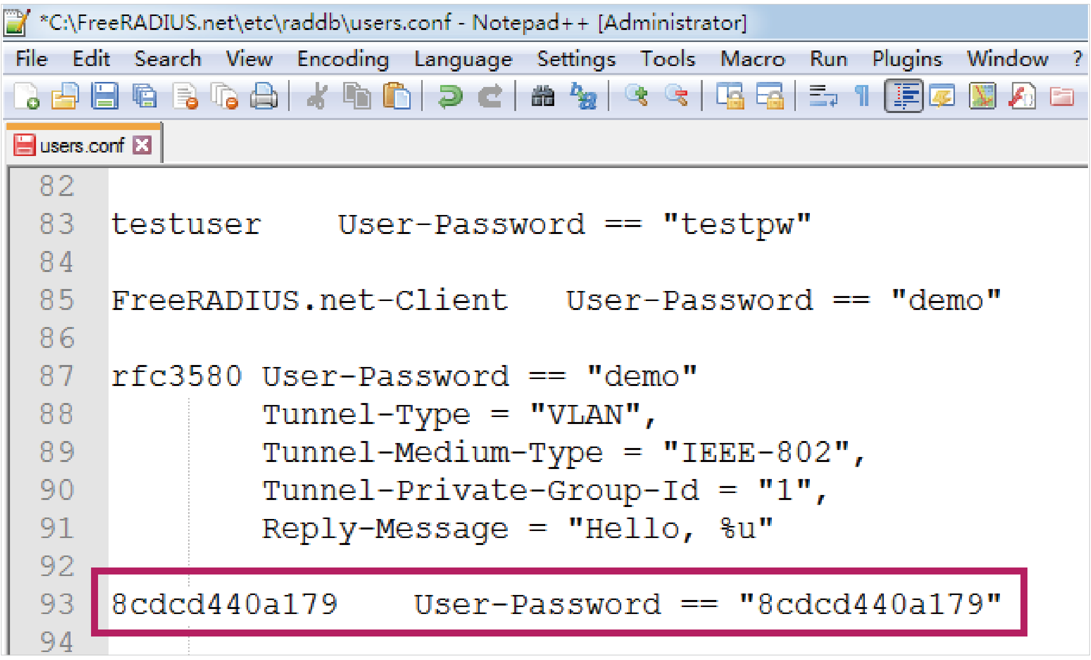
4) The MAC addresses of users should be stored in a database which can be accessed by the RADIUS server during the MAB attempt. This guide takes the internal database on the RADIUS server itself as an example.

Right Click the icon and choose **Edit Users** to add an MAB user.



MAB uses the MAC address as the username and password. You can replace **rfc3580** and **demo** with the allowed MAC address. Or you can ignore the default user information and add the MAC address in the next line.

Add the following codes and save the file:


*C:\FreeRADIUS.net\etc\raddb\users.conf - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
users.conf

```

testuser    User-Password == "testpw"

FreeRADIUS.net-Client   User-Password == "demo"

rfc3580 User-Password == "demo"
        Tunnel-Type = "VLAN",
        Tunnel-Medium-Type = "IEEE-802",
        Tunnel-Private-Group-Id = "1",
        Reply-Message = "Hello, %u"

8cdcd440a179    User-Password == "8cdcd440a179"

```

Note:

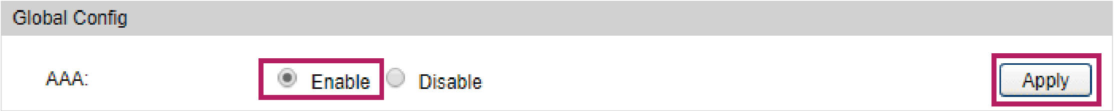
- The format of the MAC address should be 12 hexadecimal digits, all lowercase and no punctuation. Because MAB uses the MAC address as the username and password, you should apply this format to make sure the RADIUS server can differentiate MAB requests from other type of request for network access.
- If you choose other RADIUS server in MAB, please ensure that the MAC address of the allowed client should be configured as username and password.

5) Click **Restart FreeRaDIUS.net Service** to restart FreeRaDIUS.net.

3.3.2 Configure MAB on the Switch

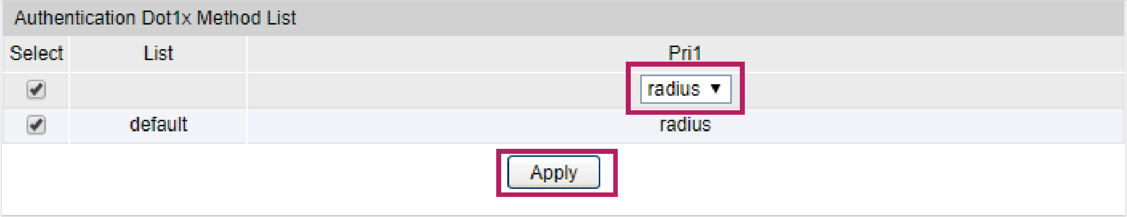
Using the GUI

1) Choose the menu **Network Security > AAA > Global Config**, enable AAA function on the switch and click **Apply**.


Global Config

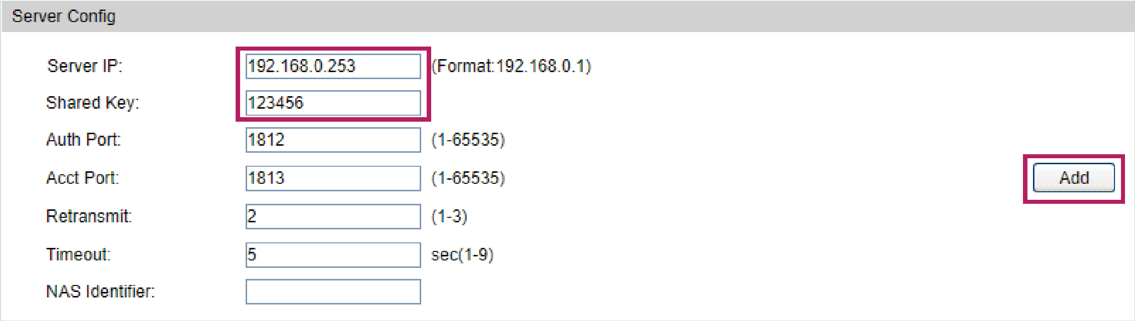
AAA: ● Enable ○ Disable

2) Choose the menu **Network Security > AAA > Dot1x List**, select an existing RADIUS server group for authentication from the Pri1 drop-down list and click **Apply**.


Authentication Dot1x Method List

Select	List	Pri1
☑		radius ▼
☑	default	radius

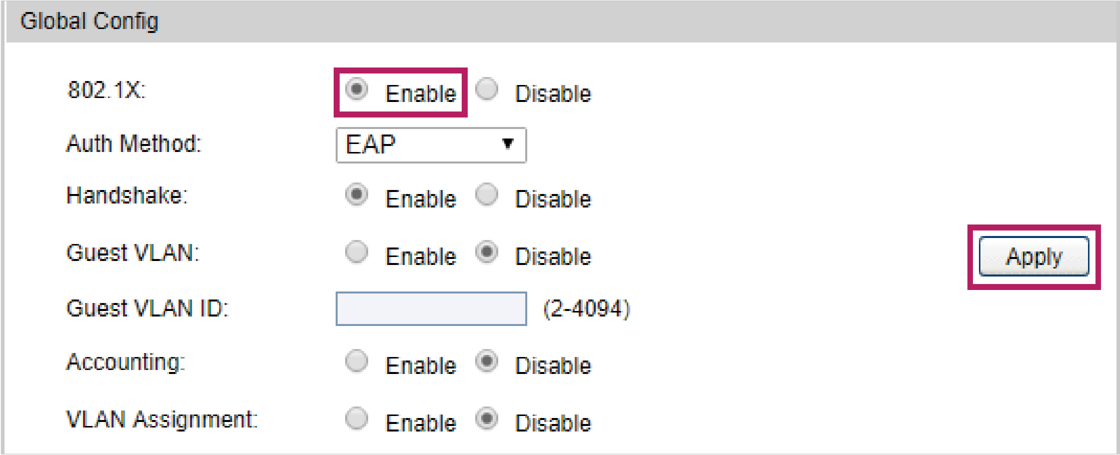
3) Choose the menu **Network Security > AAA > RADIUS Config**, and enter 192.168.0.253 which is the IP address of the RADIUS server. Enter the shared key between the RADIUS server and the switch. The RADIUS server and the switch use the key string to encrypt passwords and exchange responses.



Server Config

Server IP:	192.168.0.253	(Format:192.168.0.1)
Shared Key:	123456	
Auth Port:	1812	(1-65535)
Acct Port:	1813	(1-65535)
Retransmit:	2	(1-3)
Timeout:	5	sec(1-9)
NAS Identifier:		

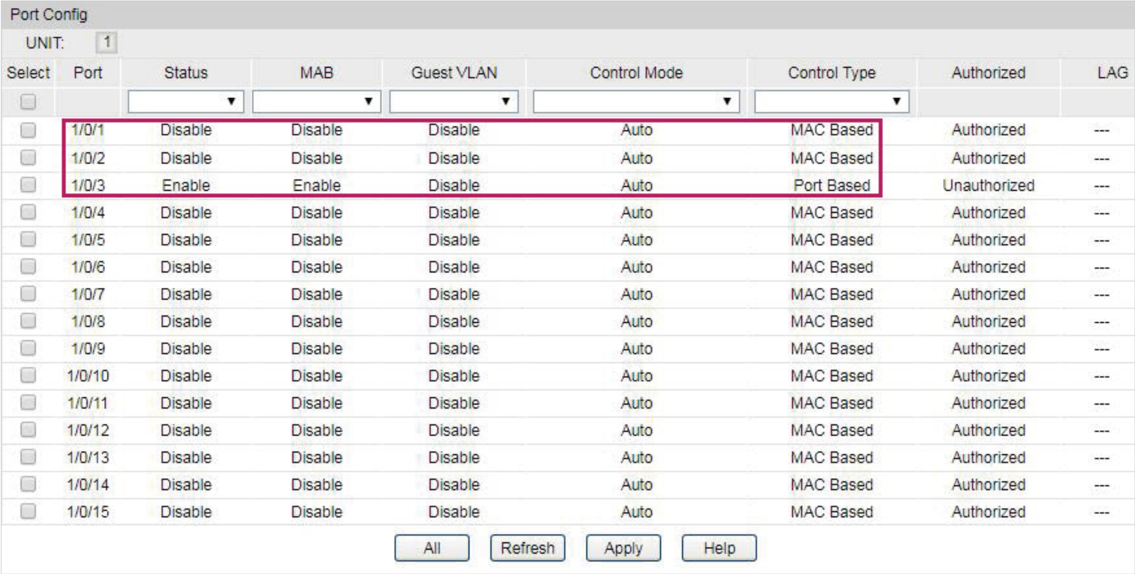
4) Choose the menu **Network Security > 802.1X > Global Config**, enable 802.1X globally and click **Apply**.



Global Config

802.1X:	● Enable ○ Disable	
Auth Method:	EAP ▼	
Handshake:	● Enable ○ Disable	
Guest VLAN:	○ Enable ● Disable	
Guest VLAN ID:		(2-4094)
Accounting:	○ Enable ● Disable	
VLAN Assignment:	○ Enable ● Disable	

5) Choose the menu **Network Security > 802.1X > Port Config** to load the following page. Select port 1/0/3 and set the status as **Enable** and set **Control Type** as **Port Based**. Enable **MAB** for port 1/0/3. Set the status for port 1/0/1 and port 1/0/2 as **Disable** so that the RADIUS server and the internet will not be blocked for the switch.



Port Config

UNIT: 1

Select	Port	Status	MAB	Guest VLAN	Control Mode	Control Type	Authorized	LAG
□		▼	▼	▼	▼	▼		
□	1/0/1	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/2	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/3	Enable	Enable	Disable	Auto	Port Based	Unauthorized	---
□	1/0/4	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/5	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/6	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/7	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/8	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/9	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/10	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/11	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/12	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/13	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/14	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
□	1/0/15	Disable	Disable	Disable	Auto	MAC Based	Authorized	---

Using the CLI

1) Enable AAA globally.

```
T2600G-28TS#configure

T2600G-28TS(config)#aaa enable

T2600G-28TS(config)#aaa authentication dot1x default radius

T2600G-28TS(config)#radius -server host 192.168.0.253 auth-port 1812 key 123456
```

2) Globally enable 802.1X authentication and set the authentication protocol.

```
T2600G-28TS(config)#dot1x system-auth-control

T2600G-28TS(config)#dot1x auth-method eap
```

3) Disable 802.1X authentication on port 1/0/1and port 1/10/2. Enable 802.1X authentication and MAB on port 1/0/3, set the mode as Auto, and set the control type as Port Based.

```
T2600G-28TS(config)#interface range gigabitEthernet 1/0/1-2

T2600G-28TS(config-if-range)#no dot1x

T2600G-28TS(config-if-range)#exit

T2600G-28TS(config)#interface gigabitEthernet 1/0/3

T2600G-28TS(config-if)#dot1x

T2600G-28TS(config-if)#dot1x port-method port-based

T2600G-28TS(config-if)#dot1x port-control auto

T2600G-28TS(config-if)#dot1x mab

T2600G-28TS(config-if)#exit
```

4) Verify the configurations.

Verify the global configurations of 802.1X authentication:

```
T2600G-28TS#show dot1x global

 802.1X State:                          Enabled

 Authentication Method:                     EAP

 Handshake State:                       Enabled

 Guest VLAN State:                     Disabled

 Guest VLAN ID:                             N/A

 802.1X Accounting State:              Disabled

 802.1X VLAN Assignment State:         Disabled

 Quiet-period State:                   Disabled

 Quiet-period Timer:               10 sec.

 Max Retry-times For RADIUS Packet:  3
 Supplicant Timeout:               3 sec.
```

Verify the configurations of 802.1X authentication on the port:

```
T2600G-28TS#show dot1x interface

 Port      State    MAB State  GuestVLAN  PortControl  PortMethod  Authorized    LAG
 ----      -----    ---------  -----------  ------------  -----------  ------------  -----
 Gi1/0/1  disabled  disabled   disabled     auto      mac-based      authorized   N/A
 Gi1/0/2  disabled  disabled   disabled     auto      mac-based      authorized   N/A
 Gi1/0/3   enabled   enabled   disabled     auto      port-based  unauthorized   N/A
...
```

Verify the configurations of RADIUS:

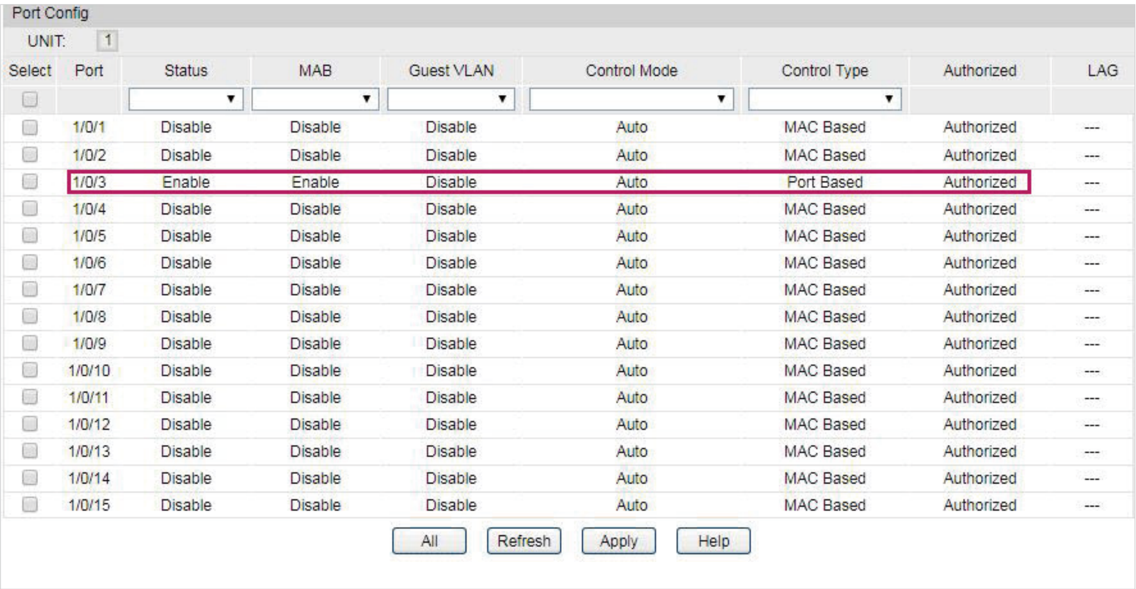
```
T2600G-28TS#show aaa global

 AAA global status:       Enable

 Module          Login List       Enable List
 Console          default              default
 Telnet           default              default
 Ssh              default              default
 Http             default              default


T2600G-28TS#show aaa authentication dot1x

Methodlist    pri1        pri2        pri3        pri4
default       radius      --          --          --


T2600G-28TS#show aaa group radius

192.168.0.253
```

3.4 Verify the Configuration Result

After all configurations are completed, you can follow the steps below to test whether MAB works.

Using the GUI

1) Choose the menu **Network Security > 802.1X > Port Config** to check whether the port 1/0/3 has passed the authentication successfully.



Port Config

UNIT: 1

Select	Port	Status	MAB	Guest VLAN	Control Mode	Control Type	Authorized	LAG
☐		▾	▾	▾	▾	▾		
☐	1/0/1	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/2	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/3	Enable	Enable	Disable	Auto	Port Based	Authorized	---
☐	1/0/4	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/5	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/6	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/7	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/8	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/9	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/10	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/11	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/12	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/13	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/14	Disable	Disable	Disable	Auto	MAC Based	Authorized	---
☐	1/0/15	Disable	Disable	Disable	Auto	MAC Based	Authorized	---

The port authentication state changes from **Unauthorized** to **Authorized**, that is, the port has passed the authentication.

2) Open a web browser and browse a website to check whether the PC can get access to the internet.

Using the CLI

1) Verify the 802.1X authorization states on the port:

```
T2600G-28TS#show dot1x interface

 Port     State    MAB State  GuestVLAN  PortControl  PortMethod    Authorized  LAG

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

 Gi1/0/1  disabled disabled   disabled   auto         mac-based     authorized  N/A

 Gi1/0/2  disabled disabled   disabled   auto         mac-based     authorized  N/A

 Gi1/0/3  enabled  enabled    disabled   auto         port-based    authorized  N/A

...
```

2) Open a web browser and browse a website and to check whether the PC can get access to the internet.

COPYRIGHT & TRADEMARKS