

# S3700-24T4F Switch

# Technical White Paper

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NETWORK SOLUTION

Model: S3700-24T4F

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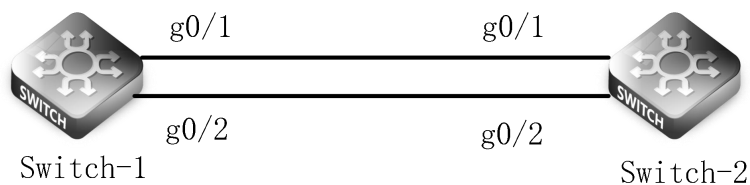
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# 1. Link Aggregation Configuration Fallible Issue

## 1.1 Issue Description

The issue of Link Aggregation function of the S3900 series switches. When configuring the dynamic LACP, the aggregation port negotiation fails due to the inconsistent physical port rate added by the aggregation port. When configuring the dynamic LACP, passive mode is selected as the aggregation mode, which will cause the two ends of aggregation ports to fail to negotiate.

## 1.2 Topology Information



## 1.3 Handling Process

- 1) Use the CRT software to connect the device, configure the dynamic LACP function on the device, first create a link aggregation group, and add the group members to the link aggregation group. **(Default Port Rate is Adaptive)**

Switch-1:

```

Switch-1#config
Switch-1_config#interface port-aggregator 1
Switch-1_config_p1#exit
Switch-1_config#interface g0/1
Switch-1_config_g0/1#aggregator-group 1 mode lacp active
Switch-1_config_p1#exit
Switch-1_config#interface g0/2
Switch-1_config_g0/2#aggregator-group 1 mode lacp active
Switch-1_config_p1#exit
  
```

Switch-2:

```

Switch-2#config
Switch-2_config#interface port-aggregator 1
Switch-2_config_p1#exit
Switch-2_config#interface g0/1
Switch-2_config_g0/1#aggregator-group 1 mode lacp active
Switch-2_config_p1#exit
  
```

```
Switch-2_config#interface g0/2
Switch-2_config_g0/2#aggregator-group 1 mode lacp active
Switch-2_config_p1#exit
```

Run the command “show aggregator-group 1 summary” to view the aggregation group information.

Switch-1:

```
Switch-1#show aggregator-group 1 summary
Flags: D - down      A - Use In port-aggregator
        U - Up        I - Not In port-aggregator
        d - default

Group Port-aggregator  Ports
-----+-----+-----
1   Po1(U)   g0/2(UA)   g0/1(UA)
```

2) Change the rate of the physical port under the aggregation port. The rate of the physical port is inconsistent, and the negotiation of the 100M rate interface fails.

Switch-1:

```
Switch-1#config
Switch-1_config#interface g0/1
Switch-1_config_g0/1#speed 100
Switch-1_config#interface g0/2
Switch-1_config_g0/1#speed 1000
```

Switch-2:

```
Switch-2#config
Switch-2_config#interface g0/1
Switch-2_config_g0/1#speed 100
Switch-2_config#interface g0/2
Switch-2_config_g0/1#speed 1000
```

View the aggregation group information, the g0/1 interface negotiation fails.

Switch-1: (Switch-2 has the same effect)

```
Switch-1#show aggregator-group 1 summary
Flags: D - down      A - Use In port-aggregator
        U - Up        I - Not In port-aggregator
        d - default
```

Group Port-aggregator Ports

```

-----+-----+-----
1      Po1(U)      g0/2(UA)      g0/1(UI)
    
```

3) There are two aggregation modes for configuring dynamic LACP: Active mode and Passive mode. When both sides are configured with Passive mode, they will passively wait for LACP negotiation packet, which leads to negotiation failure. (It is recommended to use active mode at one end and passive mode at the other mode of the aggregation group, or active mode at both ends )

Switch-1:

```

Switch-1#config
Switch-1_config#interface g0/1
Switch-1_config_g0/1#no aggregator-group 1 mode lacp active
Switch-1_config_g0/1#aggregator-group 1 mode lacp passive
Switch-1_config_p1#exit
    
```

Switch-2:

```

Switch-2#config
Switch-2_config#interface g0/1
Switch-2_config_g0/1#no aggregator-group 1 mode lacp active
Switch-2_config_g0/1#aggregator-group 1 mode lacp passive
Switch-2_config_p1#exit
    
```

View the dynamic LACP. The link negotiation of g0/1 between switch-1 and switch-2 fails. (The aggregation mode of both ends is passive) The link negotiation of g0/1 between switch-1 and switch-2 succeeds. (The aggregation mode of both ends is active)

Switch-1:

```

Switch-1#show aggregator-group 1 brief

      Aggregator-group brief infomation
      -----
Group: 1
-----
System ID : 32768 649D.9920.ECD4      Partner : 0 0000.0000.0000
Group ID : 32768 0000.0000.0000      state : lineDown
Max Ports : 8                          ports : 2
-----

Flags:  D - down      A - Use In port-aggregator
        U - Up        I - Not In port-aggregator
    
```

d - default

g0/1(UI) g0/2(UA)

## 1.4 Root Cause

To sum up, when the S3700 series switch use the Link Aggregation function, the Link Aggregation function may fail due to a configuration logic problem.

1. During the aggregation, the speed of all physical ports must be consistent.
2. When both sides are configured with Passive mode, they will passively wait for for the opposite to initiate aggregation negotiation, which leads to negotiation failure.

## 1.5 Solution

When configuring the Link Aggregation function, please follow the working principle of link aggregation for relevant configuration.

## 1.6 Suggestions and Conclusions

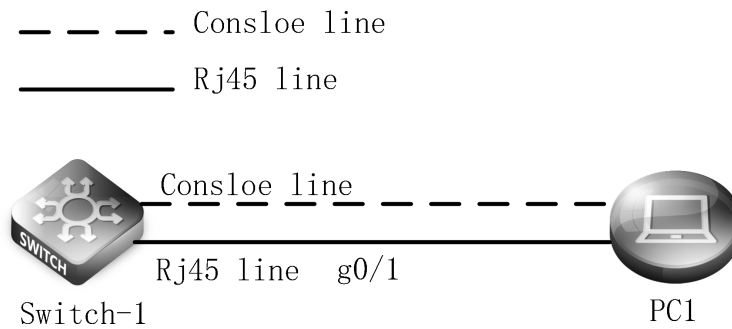
After the configuration fails, it is recommended to check the configuration file first, then, check whether the physical port is LinkUp, whether the physical port rate added by the aggregation group is consistent, and whether the aggregation mode of the aggregation group is configured reasonably.

## 2. WEB Login Fallible Scene

### 2.1 Issue Description

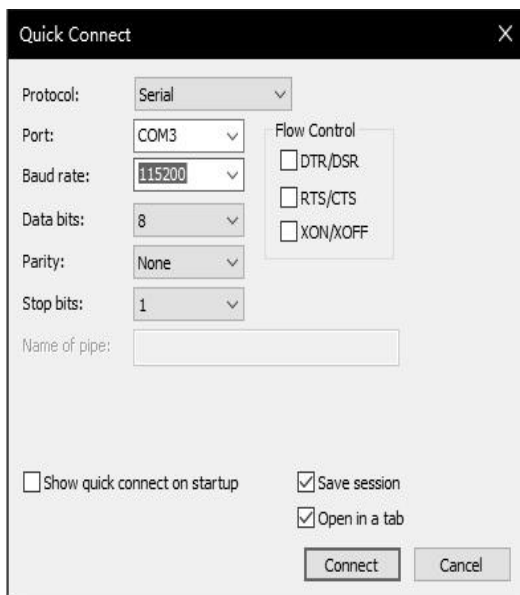
When S3700 series switch log in the WEB interface, the WEB login is failed due to the abnormal configuration of HTTP function.

### 2.2 Topology Information



### 2.3 Handling Process

- 1) Complete the scene building according to the Topo above, and connect the PC1 and the switch to the network cable and the console port.  
 Connect one end of the RJ-45 network cable to the network card interface of the PC1 and the other end to the network port of the Switch-1.  
 Connect one end of the console cable VGA to the VGA port of the PC. One end of the RJ-45 is connected to the console port on the front panel of the switch.
- 2) Use the console cable to log in the switch device, and there we recommend the super terminal, putty or SecureCRT tool. Take SecureCRT tool as an example, open the installed login software, select the serial port of login mode, port through the device manager to determine. Baud rate :115200, Data bits: 8, Parity: None, Stop bits: 1. **(Reference below)**





**Note:**

COM Number can be viewed through device manager. (right click on my computer.>manage>device manager>port (COM and LPT)

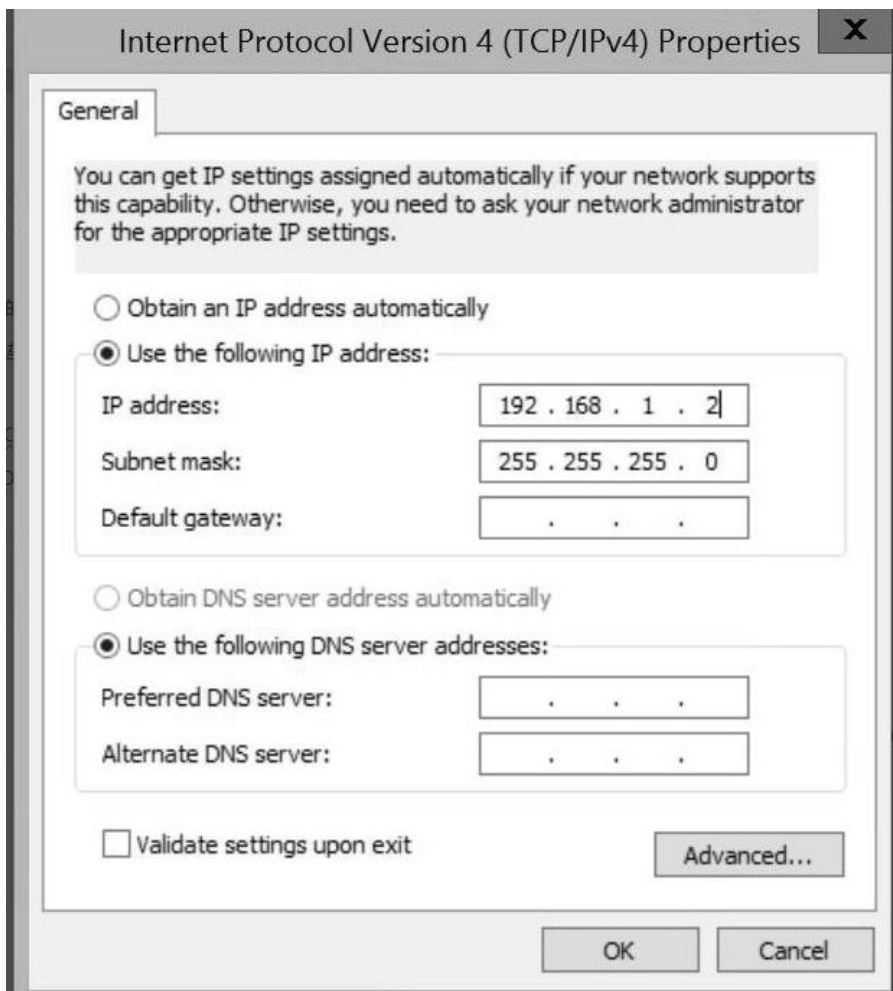
If it displays an unrecognized USB device, please download and install the corresponding driver.

3) Configure the IP address of the switch interface and IP address of the PC. **(After completing configuration of PC, click OK)**

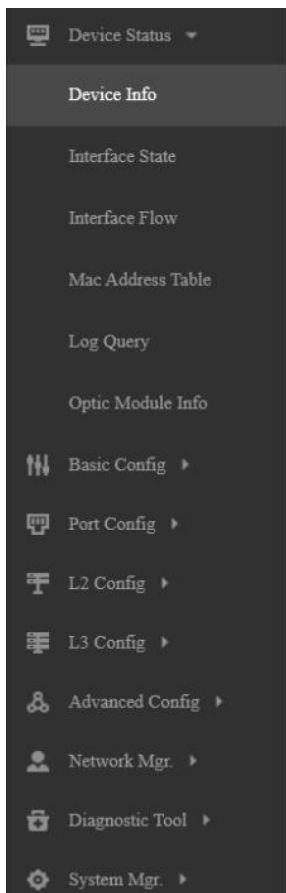
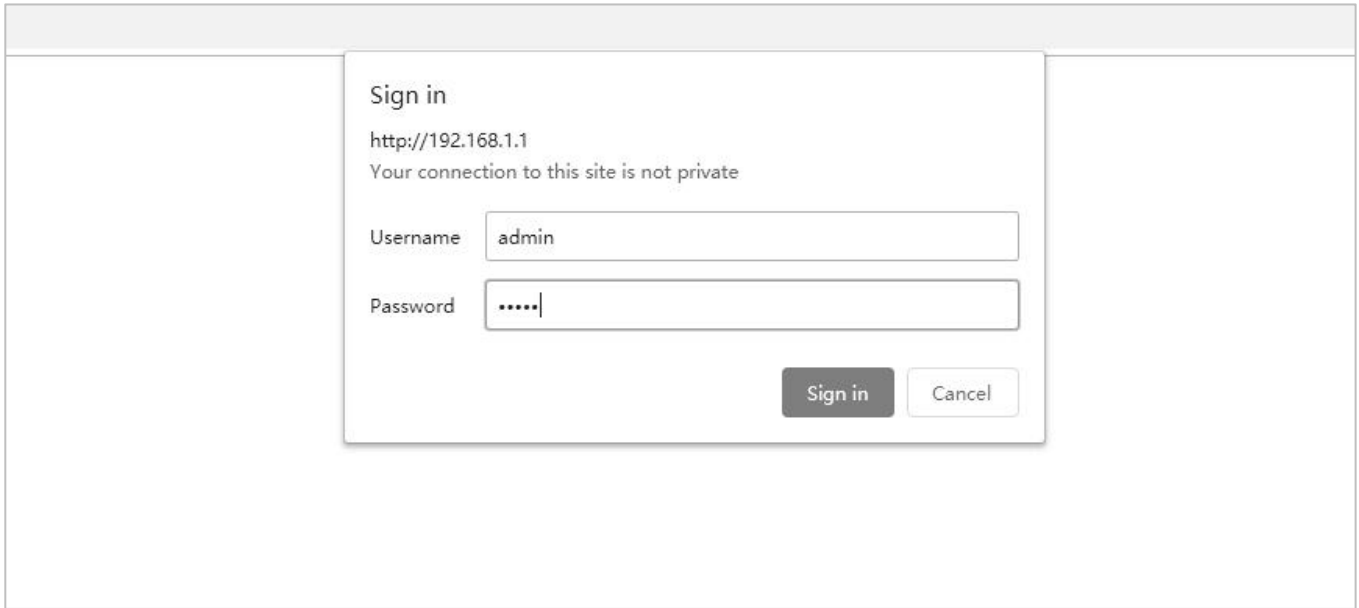
Switch-1 Config: **(The g0/1 interface belongs to VLAN1 by default)**

```
Switch-1_config#interface Vlanif 1
Switch-1_config_v10#p address 192.168.1.1 255.255.255.0
Switch-1_config_v10#exit
```

PC1 Config:



Login in the WEB management interface in PC, enter the default username and password **admin/admin** to log in to the switch.



System Information	
Device Type	S3700-24T4F
BIOS Version	0.5.2
Firmware Version	2.2.0C Build 63289
Serial No.	CG1908067301N0039
MAC Address	64:9D:99:20:EC:D4
IP Address	192.168.1.1
Current Time	1970-1-1 0:12:31
Uptime	0 Day -0 Hour -12 Minute -31 Second
CPU Usage	7%
Memory Usage	30%

[Refresh](#)

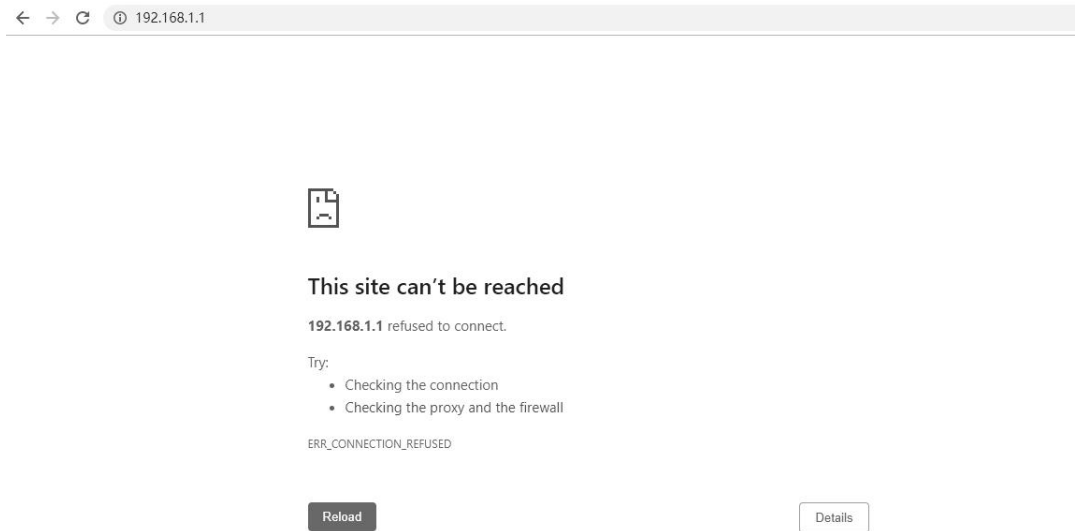
4) Close the HTTP service, the WEB management interface cannot login normally. **(default is on)**

Switch-1 Config:

```
Switch-1#config
```

```
Switch-1_config#no ip http server
```

Log in the WEB management interface in PC, and the login fails at this time.

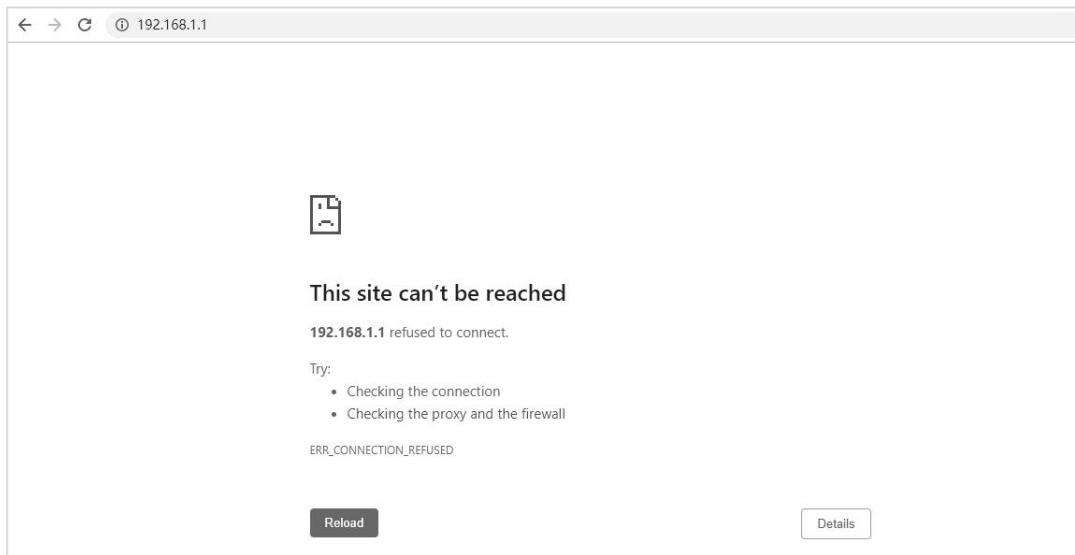


Open the HTTP service and change the HTTP protocol port number to 60. At this time, you need to add the port number to log in to the WEB interface, otherwise the login fails. (HTTP protocol port number is 80 by default)

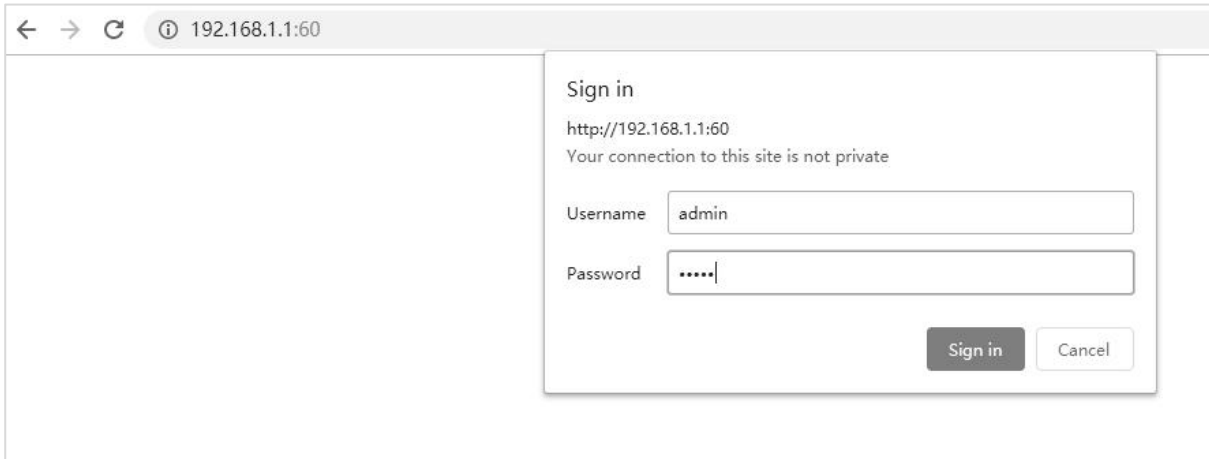
Switch-1 config:

```
Switch-1#config
Switch-1_config#ip http secure-port 60
```

Log in to the WEB management interface on the PC, and the login fails at this time.



5) Add the port number to 60 in the WEB login interface, and the login is successful.



## 2.4 Root Cause

S3700 series switch perform device management in the WEB login interface. Because the HTTP service is not opened or the default protocol port number of HTTP is changed, the login of WEB interface is abnormal.

## 2.5 Solution

Before using the WEB interface to manage the device, first turn on the HTTP service. If the login fails, it is recommended to check whether the port number of the HTTP protocol is changed.

## 2.6 Suggestions and Conclusions

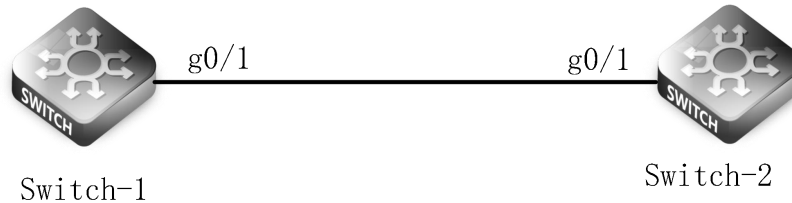
Before using the WEB interface to manage the device, first ensure the connectivity and accessibility of the physical link, then view the relevant HTTP configuration information, and log in the WEB according to the configuration information.

## 3. GVRP Configure Fallible Issue

### 3.1 Issue Description

S3700 series switch cannot support GVRP function under Access interface; after GVRP function is opened under trunk interface, VLAN information of other devices cannot be synchronized.

### 3.2 Topology Information



### 3.3 Handling Process

- 1) Complete the scene building according to the Topo above, connect the Switch-1 to Switch-2 with cables.
- 2) Configure VLAN information on the switch device.

Switch-1:

```

Switch-1_config#vlan 10, 20, 30
Switch-1_config#interface g0/1
Switch-1_config_g0/1# switchport mode trunk
Switch-1_config_g0/1#switchport trunk vlan-allowed vlan all
  
```

Switch-2:

```

Switch-2_config#vlan 40, 50, 60
Switch-2_config#interface g0/1
Switch-2_config_g0/1# switchport mode trunk
Switch-2_config_g0/1#switchport trunk vlan-allowed vlan all
  
```

- 3) Turn on the GVRP in the global mode of the device, and then operate GVRP in the interface to synchronize VLAN information of other devices.

**(GVRP function can only be enabled under Trunk interface)**

Switch-1:

```

Switch-1_config#gvrp
Switch-1_config#interface g0/1
Switch-1_config_g0/1# gvrp
  
```

Switch-2:

```

Switch-2_config#gvrp
  
```

```
Switch-2_config#interface g0/1
Switch-2_config_g0/1# gvrp
```

Check VLAN information on switch-1, and VLAN information synchronization is completed.

Switch-1:

```
Switch-1#show vlan
Switch_config#show vlan
```

VLAN	Status	Name	Ports
1	Static	Default	g0/1, g0/2, g0/3, g0/4, g0/5 g0/6, g0/7, g0/8, g0/9, g0/10 g0/11, g0/12, g0/13, g0/14, g0/15 g0/16, g0/17, g0/18, g0/19, g0/20 g0/21, g0/22, g0/23, g0/24, g0/25 g0/26, g0/27, g0/28
10	Static	VLAN0010	g0/1
20	Static	VLAN0020	g0/1
30	Static	VLAN0030	g0/1
40	Dynamic	VLAN0040	g0/1
50	Dynamic	VLAN0050	g0/1
60	Dynamic	VLAN0060	g0/1

4) Change the enabled GVRP port to the Access interface. At this time, GVRP configuration fails.

Switch-1:

```
Switch-1#config
Switch-1_config#interface g0/1
Switch-1_config_g0/1#no switchport mode
```

Switch-2:

```
Switch-2#config
Switch-2_config#interface g0/1
Switch-2_config_g0/1#no switchport mode
```

View VLAN information on Switch-1. At this time, VLAN information cannot be synchronized.

```
Switch-1#show vlan
```

VLAN	Status	Name	Ports
------	--------	------	-------

```
-----  
1   Static  Default          g0/1, g0/2, g0/3, g0/4, g0/5  
                                   g0/6, g0/7, g0/8, g0/9, g0/10  
                                   g0/11, g0/12, g0/13, g0/14, g0/15  
                                   g0/16, g0/17, g0/18, g0/19, g0/20  
                                   g0/21, g0/22, g0/23, g0/24, g0/25  
                                   g0/26, g0/27, g0/28  
  
10  Static  VLAN0010  
  
20  Static  VLAN0020  
  
30  Static  VLAN0030
```

### 3.4 Root Cause

Access interface can only pass packet with one VLAN tag, and cannot forward packet which is inconsistent with its own interface default tag. Therefore, the Access interface cannot synchronize VLAN information which results in GVRP function failure.

### 3.5 Solution

When configuring GVRP function under the interface, please ensure that the interface attribute is Trunk type and release the relevant VLAN information.

### 3.6 Suggestions and Conclusions

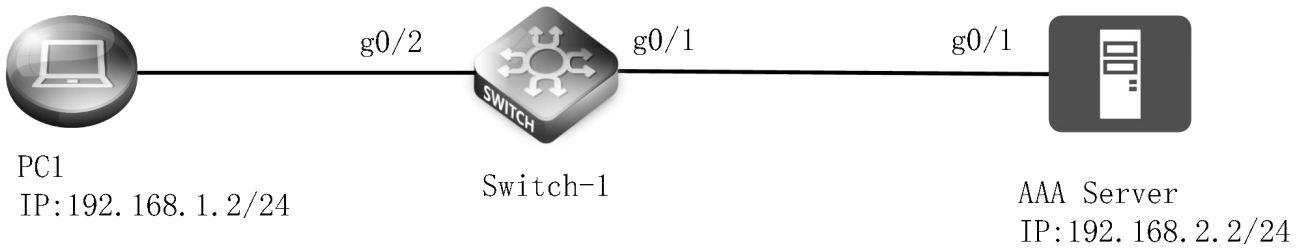
When the GVRP configuration function under the interface is abnormal, it is recommended to check whether the configuration information of corresponding interface is normal, and then check the connectivity of the physical link.

## 4. AAA Authentication Fallible Issue

### 4.1 Issue Description

When the S3700 series switch is configured with AAA Authentication, because the account and password of the remote or local database are inconsistent with the corresponding way of enabling AAA Authentication, AAA Authentication fails and the device cannot be logged in normally.

### 4.2 Topology Information



### 4.3 Handling Process

- 1) Complete the scene building according to the Topo. PC1 connects to the g0/2 interface of switch-1, and AAA server connects to the g0/1 interface of switch-1.
- 2) Configure AAA Authentication related information on the switch, and add authentication information on the AAA authentication server.

Switch-1:

```
Switch-1_config#vlan 10
Switch-1_config#int vlan 10
Switch-1_config_v10#ip address 192.168.1.254 255.255.255.0
Switch-1_config_v10#exit
Switch-1_config#vlan 20
Switch-1_config#int vlan 20
Switch-1_config_v20#ip address 192.168.2.254 255.255.255.0
Switch-1_config_v20#exit
Switch-1_config#interface g0/2
Switch-1_config_g0/2#switchport mode access
Switch-1_config_g0/2#switchport pvid 10
Switch-1_config_g0/2#exit
Switch-1_config#interface g0/1
Switch-1_config_g0/1#switchport mode access
```



```
Switch-1_config_g0/1#switchport pvid 20
Switch-1_config_g0/1#exit
Switch-1_config#aaa authentication login default group tacacs+ loca
Switch-1_config#tacacs-server host 192.168.2.2
Switch-1_config# tacacs-server key Aa123456
```

Add the shared key to AAA server: (**Aa123456**)

Network Resources > Network Devices and AAA Clients > Edit: "alex-sw1"

Name:	<input type="text" value="POE"/>
Description:	<input type="text"/>
<b>Network Device Groups</b>	
Location	<input type="text" value="All Locations"/> <input type="button" value="Select"/>
Device Type	<input type="text" value="All Device Types"/> <input type="button" value="Select"/>
<b>IP Address</b>	
<input checked="" type="radio"/> Single IP Address <input type="radio"/> IP Subnets <input type="radio"/> IP Range(s)	
IP:	<input type="text" value="192.168.2.1"/>

TACACS+

Shared Secret:

Single Connect Device

Legacy TACACS+ Single Connect Support

TACACS+ Draft Compliant Single Connect Support

RADIUS

Security

Group Access (SGA)

= Required fields

Create a username on the AAA Server: **admin**, and the password: **admin123**.

Users and Identity Stores > Internal Identity Stores > Users > Create

**General**  
Name:  Status: Enabled   
Description:   
Identity Group:

**Account Disable**  
 Disable Account if Date Exceeds:   (yyyy-Mmm-dd)

**Password Lifetime**  
 Password Never Expired/Disabled: Overwrites user account blocking in case password expired/disabled

**Password Information**  
Password must:  
• Contain 4 - 32 characters

**Enable Password Information**  
Password must:  
• Contain 4 - 32 characters

Enable Password:   
Confirm Password:

Change password on next login

Perform AAA Authentication login on PC1, and the AAA Authentication takes effect at this time. (**admin / admin123**)

```
C:\Users\Dell>telnet 192.168.1.254

C:\ Telnet 192.168.1.254
User Access Verification
Username: admin
Password:

Switch>
Switch>
```

3) Change the mode of AAA Authentication to local authentication.

Switch-1:

```
Switch-1#config
```

```
Switch-1_config#aaa authentication login default loca
```

You cannot log in using the remote database username and password at this time. (**admin / admin123**)

```
C:\Users\De11>telnet 192.168.1.254
```



```
C:\> Telnet 192.168.1.254
User Access Verification
Username:
Username:
Username: admin
Password:

Authentication failed!

Username:
```

#### 4.4 Root Cause

When S3700 series switch is enabled with AAA Authentication function, the authentication mode on the device is inconsistent with the local or remote database used, resulting in AAA Authentication failure.

#### 4.5 Solution

When enabling AAA local authentication function, S3700 series switch needs to add relevant authentication information locally; when using remote authentication, it needs to add relevant authentication information on AAA server.

#### 4.6 Suggestions and Conclusions

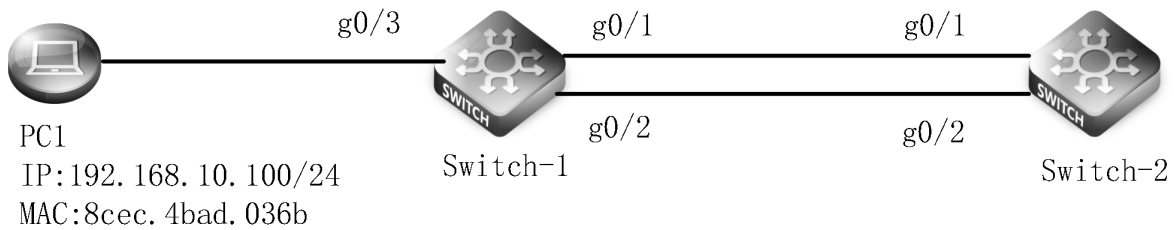
To sum up, when the switch is enabled with AAA Authentication function, it is recommended to use remote authentication as the main authentication mode and local authentication as the standby authentication mode. When the remote AAA server fails, the local authentication mode can be used to quickly log in the device for function management.

## 5. Processing Scene of MAC Address Drift Caused by Network Loop

### 5.1 Issue Description

When the S3700 series switch is building the network, the network loop causes MAC address drifts.

### 5.2 Topology Information



### 5.3 Handling Process

- 1) Complete the scene building according to the Topo. The ports at both ends of Switch-1 and Switch-2 are respectively connected.
- 2) Turn off the spanning tree enable under the switch global state. Add the G0/1 and G0/2 interfaces of Switch-1 device to VLAN10, add the g0/1 and g0/2 interfaces of Switch-2 device to VLAN10, and configure the VLAN10 interface IP of Switch-1 and Switch-2 as the same network segment, and PC1 connects to g0/3 interface of Switch-1.

Switch-1:

```
Switch-1#config
Switch-1_config#no spanning-tree
Switch-1_config#vlan 10
Switch-1_config#int vlan 10
Switch-1_config_v10#ip address 192.168.10.1 255.255.255.0
Switch-1_config_v10#exit
Switch-1_config#interface g0/1
Switch-1_config_g0/1#switchport mode access
Switch-1_config_g0/1#switchport pvid 10
Switch-1_config_g0/1#exit
Switch-1_config#interface g0/2
Switch-1_config_g0/2#switchport mode access
Switch-1_config_g0/2#switchport pvid 10
Switch-1_config#interface g0/3
```

```
Switch-1_config_g0/3#switchport mode access
Switch-1_config_g0/3#switchport pvid 10
Switch-1_config_g0/3#exit
```

Switch-2:

```
Switch-2#config
Switch-2_config#no spanning-tree
Switch-2_config#vlan 10
Switch-2_config#int vlan 10
Switch-2_config_v10#ip address 192.168.10.10 255.255.255.0
Switch-2_config_v10#exit
Switch-2_config#interface g0/1
Switch-2_config_g0/1#switchport mode access
Switch-2_config_g0/1#switchport pvid 10
Switch-2_config_g0/1#exit
Switch-2_config#interface g0/2
Switch-2_config_g0/2#switchport mode access
Switch-2_config_g0/2#switchport pvid 10
Switch-2_config_g0/2#exit
```

Execute the command ping 10.1.1.254 on the PC1 device. At this time, the ping fails and the network has a loop. Then check the MAC address table of the Switch-2 device, and find that the MAC address is drifting.

```
Switch-2#show mac address-table

      Mac Address Table (Total 1)
-----
Vlan    Mac Address      Type    Ports
----    -
10      8cec.4bad.036b   DYNAMIC g0/2
```

```
Switch-2#show mac address-table

      Mac Address Table (Total 1)
-----
```

Vlan	Mac Address	Type	Ports
10	8cec.4bad.036b	DYNAMIC	g0/1

3) Turn on the spanning tree enable under the global switch devices Switch-1 and Switch-2. At this time, the MAC address drift stops and the network returns to normal.

Switch-1:

```
Switch-1#config
Switch-1_config#spanning-tree mode rstp
```

Switch-2:

```
Switch-2#config
Switch-2_config#spanning-tree mode rstp
```

Check the spanning tree information in Switch-1 and find that the g0/2 port is blocked and the network loop is released.

```
Switch-1#show spanning-tree

Spanning tree enabled protocol RSTP(2004)

RSTP

  Root ID    Priority    32768
            Address    649D.9920.8FF1
            Port      GigaEthernet0/1
            Cost      20000
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32768
            Address    649D.9920.ECD4
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

Interface    Role Sts Cost      Pri.Nbr  Type
-----
g0/1         Root FWD 20000    128.1    P2p
g0/2         Altn BLK 20000    128.2    P2p
```

g0/3                  Desg FWD 20000          128.3          Edge

Check the MAC address table multiple times on Switch-2. At this time, the MAC address corresponds to the stable port.

Switch-2#show mac address-table

Mac Address Table (Total 2)

Vlan	Mac Address	Type	Ports
10	649d.9920.ecd5	DYNAMIC	g0/1
10	8cec.4bad.036b	DYNAMIC	g0/1

## 5.4 Root Cause

The underlying network of S3700 series switch appears circuit, which leads to ARP broadcast storm and MAC address drift.

## 5.5 Solution

When the S3700 series switch is building the network, physical loop appears, which leads to the MAC address drift. Please refer to the solution.

1. Enable spanning tree or other methods (**protocol breaking**)
2. Remove the link port or shut down the port (**physical breaking**)
3. Add loopback link to link aggregation and other methods to realize logical acyclic (**logical breaking**)

## 5.6 Suggestions and Conclusions

To sum up, when the business environment occurs the phenomenon of MAC address drift, the appropriate scheme can be selected for processing according to the needs of the business; when the phenomenon of MAC address drift occurs, the earlier to process is, the better; otherwise, the memory of the switch will be infinitely consumed, which results in the phenomenon of jam or network vibration.



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