

EKI-9728 VLAN Routing & ACL SOP

Revision Date	Revision	Description	Author
May / 2019	V1.0	Initial Released	ICG AE Raimen Liu

Abstract

❖ **This SOP explains how to configure VLAN Routing & ACL on Advantech EKI-9728 L3 industrial managed switch. VLAN Routing is related to VLAN configuration, if you were not familiar with EKI-9728 VLAN setting, please refer to below SOP first.**

❖ **Related products:**

EKI-9728

❖ **Requirement:** Advantech EKI-9728 L3 managed switch, RJ45 ethernet cable, PC

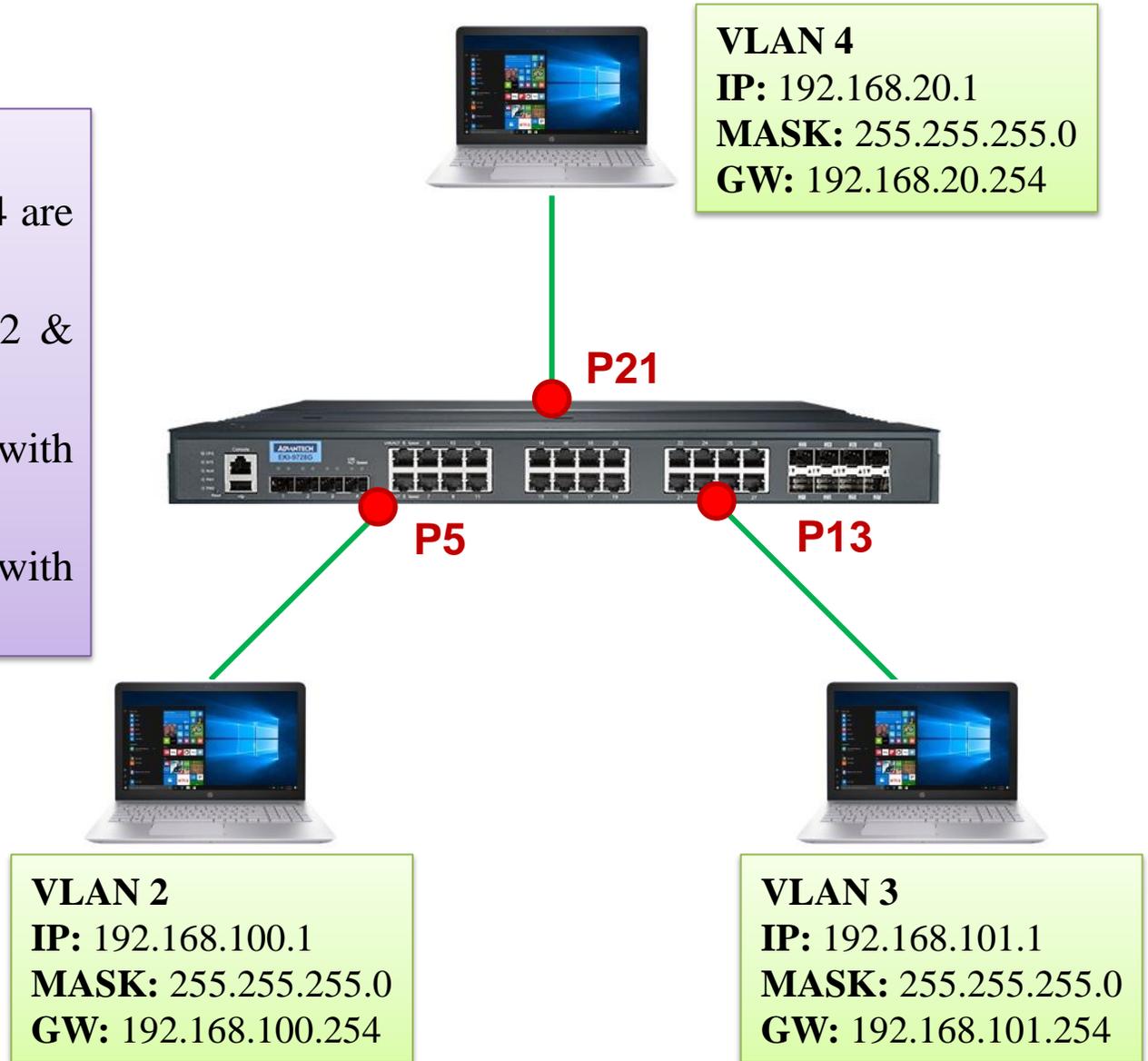
❖ **VLAN Configuration SOP:**

https://support.advantech.com/support/KnowledgeBaseSRDetail_New.aspx?Doc_Source=Knowledge+Base&SR_ID=1-1MY0UBX

Topology

Request:

1. VLAN2, VLAN3 and VLAN4 are at different subnet.
2. VLAN 4 can access VLAN 2 & VLAN 3
3. VLAN 2 **can't** communicate with VLAN 3
4. VLAN 3 **can't** communicate with VLAN 2



VLAN Setting

❖ Due to all PCs/Laptops are unaware devices, all ports belong to access port(untagged).

Switching > VLAN > Port Summary

System ▾ Switching ▾ Routing ▾ Security ▾ QoS ▾

Status Port Configuration **Port Summary** Switchport Summary Internal Usage Reset RSPAN

VLAN Port Summary

Display 25 ▾ rows Showing 1 to 25 of 42 entries

<input type="checkbox"/>	Interface ▾	Port VLAN ID ▾	Acceptable Frame Type ▾	Ingress Filtering ▾	Untagged VLANs ▾	Tagged VLANs ▾
<input type="checkbox"/>	0/1	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/2	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/3	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/4	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/5	2	Admit All	Enabled	2	
<input type="checkbox"/>	0/6	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/12	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/13	3	Admit All	Enabled	3	
<input type="checkbox"/>	0/14	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/15	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/16	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/17	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/18	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/19	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/20	1	Admit All	Disabled	1	
<input type="checkbox"/>	0/21	4	Admit All	Disabled	4	

VLAN Routing Configuration (1/4)

➤ Routing -> IP -> Configuration

Routing > IP > Configuration

System ▾ Switching ▾ Routing ▾ Security ▾ QoS ▾

Configuration Interface Summary Interface Configuration Loopback Configuration Statistics

Routing IP Configuration

Routing Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
ICMP Echo Replies	<input checked="" type="checkbox"/>
ICMP Redirects	<input checked="" type="checkbox"/>
ICMP Rate Limit Interval	<input type="text" value="1000"/> (0 to 2147483647)
ICMP Rate Limit Burst Size	<input type="text" value="100"/> (1 to 200)
Static Route Preference	<input type="text" value="1"/> (1 to 255)
Local Route Preference	<input type="text" value="0"/>
Maximum Next Hops	<input type="text" value="1"/>
Maximum Routes	<input type="text" value="480"/>
Global Default Gateway	<input type="text"/>  

Submit Refresh Cancel

VLAN Routing Configuration (2/4)

- Routing -> IP -> Interface Configuration

Routing > IP > Interface Configuration

System ▾ Switching ▾ Routing ▾ Security ▾ QoS ▾

Configuration Interface Summary **Interface Configuration** Loopback Configuration Statistics

Routing IP Interface Configuration

Type	<input checked="" type="radio"/> VLAN <input type="radio"/> Interface
VLAN	VLAN 2 ▾
Interface	0/1 ▾
Status	Down
Routing Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Admin Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
State	Inactive
Link Speed Data Rate	10
IP Address Configuration Method	<input type="radio"/> None <input checked="" type="radio"/> Manual <input type="radio"/> DHCP
DHCP Client Identifier	<input type="checkbox"/>
IP Address	192.168.100.254 (x.x.x.x)
Subnet Mask	255.255.255.0 (x.x.x.x)
MAC Address	74:FE:48:36:8C:BF

VLAN Routing Configuration (3/4)

- Routing -> IP -> Interface Configuration

Routing > IP > Interface Configuration

System ▾ Switching ▾ Routing ▾ Security ▾ QoS ▾

Configuration Interface Summary **Interface Configuration** Loopback Configuration Statistics

Routing IP Interface Configuration

Type	<input checked="" type="radio"/> VLAN <input type="radio"/> Interface
VLAN	VLAN 3 ▾
Interface	0/1 ▾
Status	Down
Routing Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Admin Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
State	Inactive
Link Speed Data Rate	10
IP Address Configuration Method	<input type="radio"/> None <input checked="" type="radio"/> Manual <input type="radio"/> DHCP
DHCP Client Identifier	<input type="checkbox"/>
IP Address	192.168.101.254 (x.x.x.x)
Subnet Mask	255.255.255.0 (x.x.x.x)
MAC Address	74:FE:48:36:8C:BF

VLAN Routing Configuration (4/4)

➤ Routing -> IP -> Interface Configuration

Routing > IP > Interface Configuration

System ▾ Switching ▾ Routing ▾ Security ▾ QoS ▾

Configuration Interface Summary **Interface Configuration** Loopback Configuration Statistics

Routing IP Interface Configuration

Type	<input checked="" type="radio"/> VLAN <input type="radio"/> Interface
VLAN	VLAN 4 ▾
Interface	0/1 ▾
Status	Down
Routing Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Admin Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
State	Inactive
Link Speed Data Rate	10
IP Address Configuration Method	<input type="radio"/> None <input checked="" type="radio"/> Manual <input type="radio"/> DHCP
DHCP Client Identifier	<input type="checkbox"/>
IP Address	192.168.20.254 (x.x.x.x)
Subnet Mask	255.255.255.0 (x.x.x.x)
MAC Address	74:FE:48:36:8C:BF

Check Routing Table

```
COM7 - PuTTY
(EKI-9728G) #show ip route

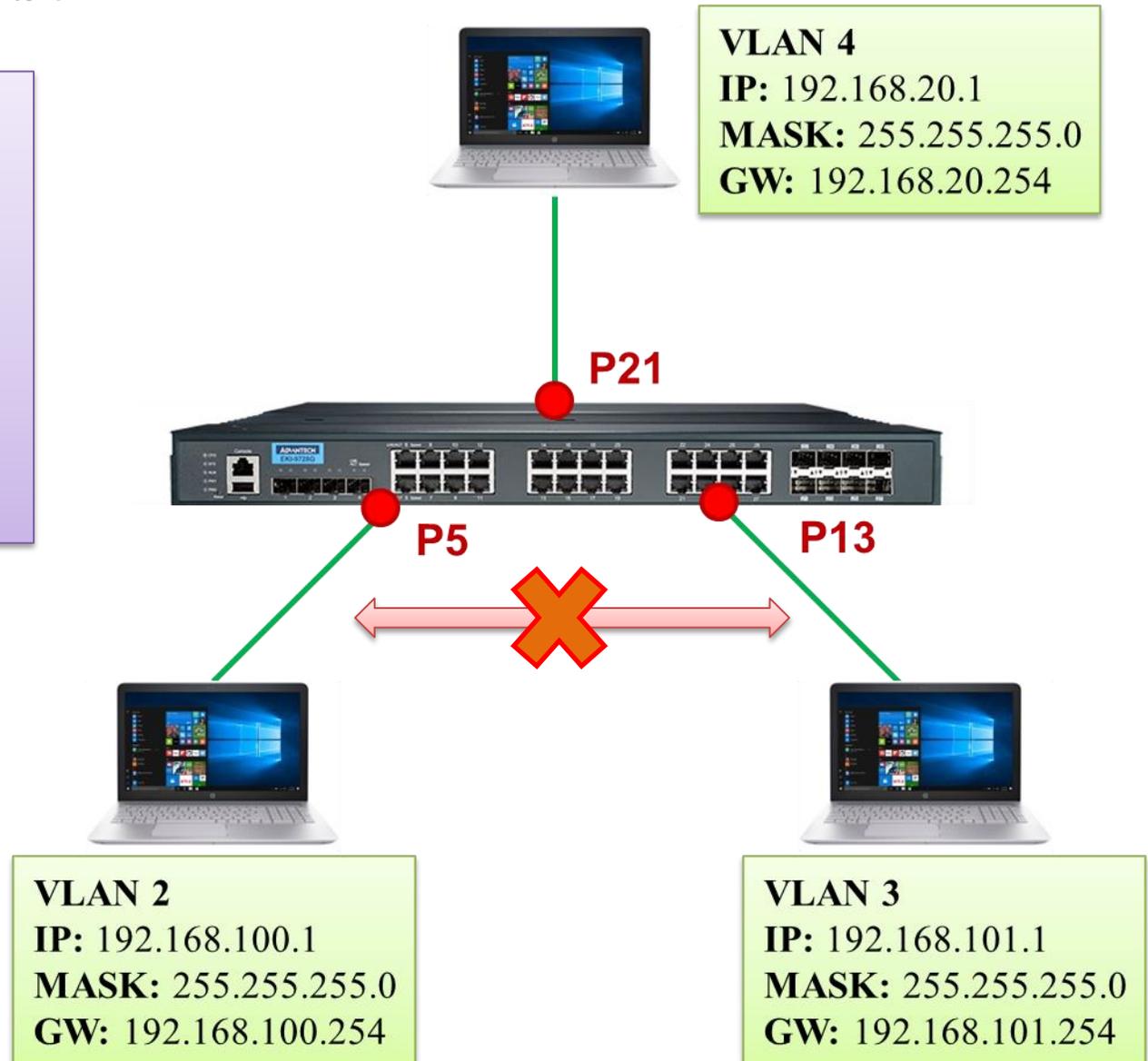
Route Codes: C - Connected, S - Static
              R - RIP Derived
              O - OSPF Derived, IA - OSPF Inter Area
              E1 - OSPF External Type 1, E2 - OSPF External Type 2
              N1 - OSPF NSSA External Type 1, N2 - OSPF NSSA External Type 2
              S U - Unnumbered Peer
              K - Kernel, P - Net Prototype

C   192.168.20.0/24 [0/0] directly connected, 2/3
C   192.168.100.0/24 [0/0] directly connected, 2/1
C   192.168.101.0/24 [0/0] directly connected, 2/2
```

Access Control List

ACL: IPv4 Extend

1. ACL List 100
 - deny VLAN2 to VLAN3
 - permit any
2. ACL List 101
 - deny VLAN3 to VLAN2
 - permit any



Access Control List Setting SOP – (1/6)

❖ Create IPv4 Extended ACL List 100 & 101. (QoS -> ACL -> Summary)

QoS > Access Control Lists > Summary Save Configuration Log Out

System ▾ Switching ▾ Routing ▾ Security ▾ QoS ▾

Summary Configuration Interfaces VLANs Control Plane Statistics

Access Control List Summary ?

Display **All** rows Showing 1 to 2 of 2 entries Filter:

<input type="checkbox"/>	ACL Identifier	ACL Type	Rules Used	Direction	Interface	VLAN
<input type="checkbox"/>	100	IPv4 Extended	2	Inbound		2
<input type="checkbox"/>	101	IPv4 Extended	2	Inbound		3

First Previous 1 Next Last

1.

Refresh Add Edit Remove

Add Access Control List ×

2.

ACL Type **IPv4 Extended** ▾

ACL Identifier **100** (100 to 199)

3. Submit Cancel

Access Control List Setting SOP – (2/6)

- ❖ Add rule for *ACL List-100*. (QoS -> ACL -> Configuration)

QoS > Access Control Lists > Configuration

System Switching Routing Security QoS

Summary Configuration Interfaces VLANs Control Plane Statistics

Access Control List Configuration

ACL Identifier: 1. 100

Display All rows Showing 1 to 2 of 2 entries

Sequence Number	ACL Type	Status	Action	Match Conditions	Rule Attributes
1	IPv4 Extended	Active	Deny	Match All: False Source IP: 192.168.100.0 Source Mask: 0.0.0.255 Destination IP: 192.168.101.0 Destination Mask: 0.0.0.255	
2	IPv4 Extended	Active	Permit	Match all packets	

First Previous 1 Next Last

ACL Remarks +

Table is Empty

2. Refresh Add Rule Remove Rule Resequence Rules

3.

There are two rules in ACL List-100. The detailed configuration, please refer to next page.

Access Control List Setting SOP – (3/6)

❖ Add two rules for *ACL List-100*.

Add IPv4 ACL Rule

Sequence Number	<input type="text" value="1"/> (1 to 2147483647)
Action	<input type="radio"/> Permit <input checked="" type="radio"/> Deny
Match Criteria	
Every	<input type="checkbox"/>
Protocol	<input type="text"/> (0 to 255, or keyword) ?
Fragments	<input type="checkbox"/>
Source IP Address / Wildcard Mask	<input type="text" value="192.168.100.0"/> / <input type="text" value="0.0.0.255"/> (x.x.x.x)
Source L4 Port	<input checked="" type="radio"/> Equal <input type="radio"/> Not Equal <input type="radio"/> Less Than <input type="radio"/> Greater Than <input type="radio"/> Range <input type="text"/> - <input type="text"/> (0 to 65535, or keyword) ?
Destination IP Address / Wildcard Mask	<input type="text" value="192.168.101.0"/> / <input type="text" value="0.0.0.255"/> (x.x.x.x)
Destination L4 Port	<input checked="" type="radio"/> Equal <input type="radio"/> Not Equal <input type="radio"/> Less Than <input type="radio"/> Greater Than <input type="radio"/> Range <input type="text"/> - <input type="text"/> (0 to 65535, or keyword) ?

Access-list 100-1 **DENY**

Source 192.169.100.0 0.0.0.255

Destination 192.168.101.0 0.0.0.255

Add IPv4 ACL Rule

Sequence Number	<input type="text" value="2"/> (1 to 2147483647)
Action	<input checked="" type="radio"/> Permit <input type="radio"/> Deny
Match Criteria	
Every	<input checked="" type="checkbox"/>
Protocol	<input type="text"/> (0 to 255, or keyword) ?
Fragments	<input type="checkbox"/>

Access-list 100-2 **PERMIT ANY**

Access Control List Setting SOP – (4/6)

- ❖ Add rule for *ACL List-101*. (QoS -> ACL -> Configuration)

QoS > Access Control Lists > Configuration

System Switching Routing Security QoS

Summary Configuration Interfaces VLANs Control Plane Statistics

Access Control List Configuration

ACL Identifier **1.** 101

Display All rows Showing 1 to 2 of 2 entries

<input type="checkbox"/>	3. Sequence Number	ACL Type	Status	Action	Match Conditions	Rule Attributes
<input type="checkbox"/>	1	IPv4 Extended	Active	Deny	Match All: False Source IP: 192.168.101.0 Source Mask: 0.0.0.255 Destination IP: 192.168.100.0 Destination Mask: 0.0.0.255	
<input type="checkbox"/>	2	IPv4 Extended	Active	Permit	Match all packets	

First Previous 1 Next Last

ACL Remarks +

Table is Empty

2. Refresh Add Rule Remove Rule Resequence Rules

There are two rules in ACL List-101. The detailed configuration, please refer to next page.

Access Control List Setting SOP – (5/6)

❖ Add rule for *ACL List-101*.

Add IPv4 ACL Rule

Sequence Number	<input type="text" value="1"/> (1 to 2147483647)
Action	<input type="radio"/> Permit <input checked="" type="radio"/> Deny
Match Criteria	
Every	<input type="checkbox"/>
Protocol	<input type="text"/> (0 to 255, or keyword) ?
Fragments	<input type="checkbox"/>
Source IP Address / Wildcard Mask	<input type="text" value="192.168.101.0"/> / <input type="text" value="0.0.0.255"/> (x.x.x.x)
Source L4 Port	<input checked="" type="radio"/> Equal <input type="radio"/> Not Equal <input type="radio"/> Less Than <input type="radio"/> Greater Than <input type="radio"/> Range <input type="text"/> - <input type="text"/> (0 to 65535, or keyword) ?
Destination IP Address / Wildcard Mask	<input type="text" value="192.168.100.0"/> / <input type="text" value="0.0.0.255"/> (x.x.x.x)
Destination L4 Port	<input checked="" type="radio"/> Equal <input type="radio"/> Not Equal <input type="radio"/> Less Than <input type="radio"/> Greater Than <input type="radio"/> Range <input type="text"/> - <input type="text"/> (0 to 65535, or keyword) ?

Access-list 101-1 **DENY**

Source 192.169.101.0 0.0.0.255

Destination 192.168.100.0 0.0.0.255

Add IPv4 ACL Rule

Sequence Number	<input type="text" value="2"/> (1 to 2147483647)
Action	<input checked="" type="radio"/> Permit <input type="radio"/> Deny
Match Criteria	
Every	<input checked="" type="checkbox"/>
Protocol	<input type="text"/> (0 to 255, or keyword) ?
Fragments	<input type="checkbox"/>

Access-list 101-2 **PERMIT ANY**

Access Control List Setting SOP – (6/6)

❖ Add rule to *Interface/VLAN* (QoS -> ACL -> VLANs)

QoS > Access Control Lists > VLANs Save Configuration Log Out

System ▾ Switching ▾ **1.** Routing ▾ Security ▾ QoS ▾

Summary Configuration Interfaces **VLANs** Control Plane Statistics

Access Control List VLAN Summary

Display **All** ▾ rows Showing 1 to 2 of 2 entries Filter:

<input type="checkbox"/>	VLAN ID	Direction	Sequence Number	ACL Type	ACL Identifier
<input type="checkbox"/>	2	Inbound	1	IPv4 Extended	100
<input type="checkbox"/>	3	Inbound	2	IPv4 Extended	101

First Previous 1 Next Last **4. Add and Check this two rows**

Refresh **2.** Add Remove

3. Access Control List VLAN Configuration

VLAN ID

Direction Inbound Outbound

Sequence Number (1 to 4294967295) (0 = Auto-generate)

ACL Identifier

Submit Cancel

Result

- ❖ VLAN1 and VLAN2 are not able to ping each other.
- ❖ VLAN3 can access VLAN1 and VLAN2.
- ❖ If you found the results are incorrect, please check the number of ACL Hit Counts whether increase or not. If not, you can refer to below two steps:
 - 1) Check all end devices have already off WiFi/Internet.
 - 2) Check the ACL rules are correct or not.

QoS > Access Control Lists > Statistics

System Switching Routing Security QoS

Summary Configuration Interfaces VLANs Control Plane **Statistics**

Access Control List Statistics

ACL Type: IPv4 Extended

ACL Identifier: 100

Display: All rows

Showing 1 to 3 of 3 entries

Sequence Number	Action	Match Conditions	Rule Attributes	Hit Count
1	Deny	Match All: False Source IP: 172.168.2.0 Source Mask: 0.0.3.255 Destination IP: 172.168.6.0 Destination Mask: 0.0.3.255		20
2	Deny	Match All: False Source IP: 172.168.2.0 Source Mask: 0.0.3.255 Destination IP: 172.168.10.0 Destination Mask: 0.0.3.255		0
3	Permit	Match all packets		563

First Previous 1 Next Last

Refresh Clear Rule Counter Clear ACL Counters



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