QASA CLI GUIDE

Security Function

Contents

1. Commands for ACL

absolute-periodic/periodic

Command	**[no] absolute-periodic {Monday|Tuesday|Wednesday|Thursday|Friday|Saturday |Sunday}<start_time>to{Monday|Tuesday|Wednesday|Thursday|Friday|Saturday |Sunday}<end_time>** **[no]periodic{{Monday+Tuesday+Wednesday+Thursday+Friday +Saturday+Sunday} |daily| weekdays | weekend} <start_time> to <end_time>**
Parameter	**Monday**: Monday **Tuesday:** Tuesday **Wednesday:** Wednesday **Thursday:** Thursday **Friday:** Friday **Saturday:** Saturday **Sunday:** Sunday **daily:** Every day of the week **weekdays:** Monday thru Friday **weekend:** Saturday thru Sunday **<start_time>:** start time ,HH:MM:SS (hour: minute: second) **<end_time>:** end time,HH:MM:SS (hour: minute: second)
Default	No time-range configuration by default.
Mode	Time-range mode.
Usage	This command is used for the switch configuration command in effective time-range. By creating a time period and referencing it in a command, the user can make the command take effect within the time range defined that time period. For example, an ACL rule only needs to take effect within a specific time range, it can be configured first and then referenced when configuring the ACL rule, so that the ACL rule can only take effect within the time range defined for that time period. In a time period, the time range can be defined in two ways: Absolute cycle time: a period of time that takes effect within a specified time range, such as Tuesday 8:00 to Saturday 8:00. Periodic period: a period of time in which a cycle (such as 14 to 16:00 a week) takes effect. The no command deletes the configured time-range.
Example	Make configurations effective within the period from9:15:30 to 12:30:00 during Tuesday to Saturday.

	Switch(config)#time-range admin_timer **Switch(config-time-range-admin_timer)#absolute-periodic Tuesday 9:15:30 to Saturday 12:30:00** Make configurations effective within the period from 14:30:00 to 16:45:00 on Monday, Wednesday, Friday and Sunday. **Switch(config-time-range-admin_timer)#periodic Monday Wednesday Friday Sunday** **14:30:00 to 16:45:00**

absolute start

Command	**[no] absolute start <start_time><start_data> [end <end_time><end_data>]**
Parameter	**<start_time>:** start time ,HH:MM:SS (hour: minute: second) **<start_data>:** start data ,YYYY.MM.DD（year.month.day） **<end_time>:** end time ,HH:MM:SS (hour: minute: second) **<end_data>:** end data ,YYYY.MM.DD（year.month.day）
Default	No time-range configuration by default.
Mode	Time-range mode.
Usage	Defines an absolute time-range, this time-range operates subject to the clock of this equipment. Absolute time and date, assign specific year, month, day, hour, minute of the start, shall not configure multiple absolute time and date, when in repeated configuration, the latter configuration covers the absolute time and date of the former configuration. The no command deletes configuration.
Example	Make configurations effective from 6:00:00 to 13:30:00 from Oct. 1, 2004 to Jan. 26, 2005. **Switch(config)#time-range admin_timer** **Switch(config-time-range-admin_timer)#absolute start 6:00:00 2004.10.1 end 13:30:00 2005.1.26**

access-list (ip extended)

Command	**access-list <num> {deny | permit} icmp {{<slpAddr><sMask>} | any-source | {host-source <slpAddr>}} {{<dlpAddr><dMask>} | any-destination | {host-destination <dlpAddr>}} [<icmp-type> [<icmp-code>]] [precedence <prec>] [tos <tos>] [time-range<time-range-name>]** **access-list <num> {deny | permit} igmp {{<slpAddr><sMask>} | any-source | {host-source <slpAddr>}} {{<dlpAddr><dMask>} | any-destination | {host-destination <dlpAddr>}} [<igmp-type>] [precedence <prec>] [tos <tos>][time-range <time-range-name>]** **access-list <num> {deny | permit} tcp {{ <slpAddr><sMask> } | any-source |** **{host-source <slpAddr> }} [s-port { <sPort> | range <sPortMin><sPortMax> }]** **{{ <dlpAddr><dMask> } | any-destination | {host-destination <dlpAddr> }} [d-port** **{ <dPort> | range <dPortMin><dPortMax> }] [ack+ fin+ psh+ rst+ urg+ syn]** **[precedence <prec>] [tos <tos>][time-range <time-range-name>]** **access-list <num> {deny | permit} udp {{ <slpAddr><sMask> } | any-source |** **{host-source <slpAddr> }} [s-port { <sPort> | range <sPortMin><sPortMax>]** **{{ <dlpAddr><dMask> } | any-destination | {host-destination <dlpAddr> }} [d-port** **{ <dPort> | range <dPortMin><dPortMax> }] [precedence <prec>] [tos <tos>]** **[time-range<time-range-name>]** **access-list <num> {deny | permit} {eigrp | gre | igrp | ipinip | ip | ospf |<protocol-num> } {{ <slpAddr><sMask> } | any-source | {host-source <slpAddr> }} {{ <dlpAddr><dMask> } | any-destination | {host-destination <dlpAddr> }} [precedence <prec>]** **[tos <tos>][time-range <time-range-name>]** **no access-list <num>**
Parameter	**<num>:** the No. of access-list, 100-299 **deny:** deny packets **permit:** permit packets

	<sIpAddr>: the source IP address, the format is dotted decimal notation **<sMask>:** the reverse mask of source IP, the format is dotted decimal notation **<sPort>:** source port No., 0-65535 **<sPortMin>:** the down boundary of source port **<sPortMax>:** the up boundary of source port **<protocol>:** the No. of upper-layer protocol of ip, 0-255 **<dIpAddr>:** the destination IP address, the format is dotted decimal notation **<dMask>:** the reverse mask of destination IP, the format is dotted decimal notation **<dPort>:** destination port No. 0-65535 **<dPortMin>:** the down boundary of destination port **<dPortMax>:** the up boundary of destination port **<igmp-type>:** the type of igmp, 0-15 **<icmp-type>:** the type of icmp, 0-255 **<icmp-code>:** protocol No. of icmp, 0-255 **<prec>:** IP priority, 0-7 **<tos>:** to value, 0-15 **<time-range-name>:** the name of time-range
Default	The name of time-range.
Mode	Global mode.
Usage	Creates a numeric extended IP access rule to match specific IP protocol or all IP protocol; When the user assigns specific <num> for the first time, ACL of the serial number is created, then the lists are added into this ACL; the access list which marked 200-299 can configure not continual reverse mask of IP address. **<igmp-type>**represents the type of IGMP packet, and usual values. Kindly refer to the following description: 17(0x11): IGMP QUERY packet 18(0x12): IGMP V1 REPORT packet 22(0x16): IGMP V2 REPORT packet 23(0x17): IGMP V2 LEAVE packet 34(0x22): IGMP V3 REPORT packet 19(0x13): DVMR packet 20(0x14): PIM V1 packet ***Particular notice:*** *The packet types included here are not the types excluding IP OPTION. Normally, IGMP packet contains OPTION fields, and such configuration is of no use for this type of packet. If you want to configure the packets containing OPTION, please directly use the manner where OFFSET is configured.*

	The no command deletes configuration.
Example	To create the numeric extended access-list whose serial No. is 110, deny icmp packet to pass, and permit udp packet with destination address 192. 168. 0. 1 and destination port 32 to pass. **Switch(config)#access-list 110 deny icmp any-source any-destination** **Switch(config)#access-list 110 permit udp any-source host-destination 192.168.0.1 d-port 32**

access-list (ip standard)

Command	**access-list <num> {deny | permit} {{<slpAddr><sMask >} | any-source|{host-source <slpAddr>}}** **no access-list <num>**
Parameter	**<num>:** the No. of access-list, 100-199 **deny:** deny packets **permit:** permit packets **<slpAddr>:** the source IP address, the format is dotted decimal notation **<sMask>:** the reverse mask of source IP, the format is dotted decimal notation
Default	By default, no access-lists are configured.
Mode	Global mode.
Usage	Creates a numeric standard IP access-list. If this access-list exists, then add a rule list; When the user assigns specific <num> for the first time, ACL of the serial number is created, then the lists are added into this ACL. The "no access-list <num>"operation of this command is to delete a numeric standard IP access-list.
Example	Create a numeric standard IP access-list who's serial No. is 20, and permit date packets with source address of 10.1.1.0/24 to pass, and deny other packets with source address of 10.1.1.0/16. **Switch(config)#access-list 20 permit 10.1.1.0 255.0.0.0** **Switch(config)#access-list 20 deny 10.1.1.0 255.0.0.0**

access-list(mac extended)

Command	**access-list <num> {deny | permit} {any-source-mac | {host-source-mac <slpAddr>}}** **<host_smac>} | {<smac><smac-mask>}} {any-destination-mac |** **{host-destination-mac <host_dmac>} | {<dmac><dmac-mask>}}** **[untagged-eth2 | tagged-eth2 |** **untagged-802-3 | tagged-802-3]** **no access-list <num>**
Parameter	**<num>:** the access-list No. which is a decimal's No. from 1100-1199 **deny:** deny packets **permit:** permit packets **any-source-mac:** any source address **host-source-mac:** source mac address **<slpAddr>:** the source IP address, the format is dotted decimal notation **<host_smac>:** source mac address **<smac>:** source mac address **<smac-mask>:** mask (reverse mask) of source MAC address **any-destination-mac:** any destination address **host-destination-mac:** destination MAC address **<host_dmac>:** destination MAC address **<dmac>:** destination MAC address **<dmac-mask>:** mask (reverse mask) of destination MAC address **untagged-eth2:** format of untagged ethernet II packet **tagged-eth2:** format of tagged ethernet II packet; **untagged-802-3:** format of untagged ethernet 802.3 packet **tagged-802-3:** format of tagged ethernet 802.3 packet
Default	By default, no access-list is configured.
Mode	Global Mode.
Usage	Defines an extended numeric MAC ACL rule. When the user assigns specific <num> for the first time, ACL of the serial number is created, then the lists are added into this ACL. "no access-list <num>" command deletes an extended numeric MAC access-list rule.
Example	Permit tagged-eth2 with any source MAC addresses and any destination MAC addresses and the packets pass. **Switch(config)#access-list 1100 permit any-source-mac any-destination-mac tagged-eth2**

access-list(mac-ip extended)

Command	access-list<num>{deny|permit}{any-source-mac| {host-source-mac<host_smac>}| {<smac><smac-mask>}} {any-destination-mac|{host-destination-mac <host_dmac>}| {<dmac><dmac-mask>}}icmp {{<source><source-wildcard>}|any-source| {host-source<source-host-ip>}} {{<destination><destination-wildcard>}| any-destination|{host-destination<destination-host-ip>}}[<icmp-type> [<icmp-code>]] [precedence <precedence>] [tos <tos>][time-range<time-range-name>] access-list<num>{deny|permit}{any-source-mac| {host-source-mac<host_smac>}| {<smac><smac-mask>}} {any-destination-mac|{host-destination-mac <host_dmac>}| {<dmac><dmac-mask>}}igmp {{<source><source-wildcard>}|any-source| {host-source<source-host-ip>}} {{<destination><destination-wildcard>}| any-destination| {host-destination<destination-host-ip>}} [<igmp-type>] [precedence <precedence>] [tos <tos>][time-range<time-range-name>] access-list <num> {deny|permit}{any-source-mac| {host-source-mac<host_smac> }| { <smac><smac-mask> }}{any-destination-mac| {host-destination-mac <host_dmac> }| { <dmac><dmac-mask> }}tcp {{ <source><source-wildcard> }|any-source| {host-source <source-host-ip> }}[s-port{ <port1> | range <sPortMin><sPortMax> }] {{ <destination><destination-wildcard> } | any-destination | {host-destination <destination-host-ip> }} [d-port { <port3> | range <dPortMin><dPortMax> }] [ack+fin+psh+rst+urg+syn] [precedence<precedence>] [tos <tos>] [time-range <time-range-name>] access-list <num> {deny|permit}{any-source-mac| {host-source-mac<host_smac> }| { <smac><smac-mask> }}{any-destination-mac| {host-destination-mac <host_dmac> }| { <dmac><dmac-mask> }}udp {{ <source><source-wildcard> }|any-source|

	{host-source <source-host-ip> }}[s-port{ <port1> | range <sPortMin><sPortMax> }] **{{ <destination><destination-wildcard> }|any-destination| {host-destination** **<destination-host-ip> }}[d-port{ <port3> | range <dPortMin><dPortMax> }]** **[precedence <precedence>] [tos <tos>][time-range <time-range-name>]** **access-list <num> {deny|permit}{any-source-mac| {host-source-mac <host_smac> }|** **{ <smac><smac-mask> }} {any-destination-mac|{host-destination-mac <host_dmac> }|** **{ <dmac><dmac-mask> }}** **{eigrp|gre|igrp|ip|ipinip|ospf|{ <protocol-num> }}** **{{ <source><source-wildcard> }|any-source|{host-source <source-host-ip> }}** **{{ <destination><destination-wildcard> }|any-destination| {host-destination** **<destination-host-ip> }}[precedence <precedence>] [tos <tos>][time-range** **<time-range-name>]** **no access-list <num>**
Parameter	**<num>:** access-list serial No. this is a decimal's No. from 3100-3299 **deny:** deny packets **permit:** permit packets **any-source-mac:** any source mac address **any-destination-mac:** any destination mac address **host_smac , smac:** source mac address **smac-mask:** (reverse mask) of source MAC address **host_dmac , dmas:** destination mac address **dmac-mask:** (reverse mask) of destination MAC address **protocol:** No. of name or IP protocol. It can be a key word: eigrp, gre, icmp, igmp, igrp, ip, ipinip, ospf, tcp, or udp, or an integer from 0-255 of list No. of IP address. Use key word 'ip' to match all Internet protocols (including ICMP, TCP, AND UDP) list. **source-host-ip:** Number of source network or source host of packet delivery. Numbers of 32-bit binary system with dotted decimal notation expression. **source-wildcard:** reverse of source IP. Numbers of 32-bit binary system expressed by decimal's numbers with four-point separated, reverse mask. **destination-host-ip:** No. of destination network or host to which packets are delivered. Numbers of 32-bit binary system with dotted decimal notation expression.

	destination-wildcard: mask of destination. Numbers of 32-bit binary system expressed by decimal's numbers with four-point separated, reverse mask. **s-port:** means the need to match TCP/UDP source port. **port1:** value of TCP/UDP source interface Number. Interface Number is an integer from 0-65535. **d-port:** means need to match TCP/UDP destination interface. **sPortMin:** the down boundary of source port. **sPortMax:** the up boundary of source port. **port3:** value of TCP/UDP destination interface No., Interface No. is an integer from 0-65535. **dPortMin:** the down boundary of destination port **dPortMax:** the up boundary of destination port **[ack] [fin] [psh]** **[rst] [urg] [syn]:** only for TCP protocol, multi-choices of tag positions are available, and when TCP data reports the configuration of corresponding position, then initialization of TCP data report is enabled to form a match when in connection **precedence:** packets can be filtered by priority which is a number from 0-7 **tos:** packets can be filtered by service type which ia number from 0-15 **icmp-type:** ICMP packets can be filtered by packet type which is a number from 0-255 **icmp-code:** ICMP packets can be filtered by packet code which is a number from 0-255 **igmp-type:** ICMP packets can be filtered by IGMP packet name or packet type which is a number from 0-255 **time-range-name:** name of time range
Default	By default, no access-list is configured.
Mode	Global Mode.
Usage	Defines an extended numeric MAC-IP ACL rule. When the user assigns specific <num> for the first time, ACL of the serial number is created, then the lists are added into this ACL; the access list which marked 3200-3299 cannot configure continual reverse mask of IP address. The no command deletes an extended numeric MAC-IP ACL access-list rule.
Example	Permit the passage of TCP packet with source MAC 00-12-34-45-XX-XX, any destination MAC address, source IP address 100.1.1.0 255.0.0.0, and source port 100. **Switch(config)#access-list 3199 permit 00-12-34-45-67-00 00-00-00-00-FF-FF any-destination-mac tcp 100.1.1.0 255.0.0.0 s-port 100 any-destination**

access-list (mac standard)

Command	**access-list <num> {deny | permit} {any-source-mac | {host-source-mac <host_smac> } | {<smac><smac-mask>} }** **no access-list <num>**
Parameter	**<num>:** the access-list No. which is a decimal's No. from 700-799 **deny:** deny packets **permit:** permit packets **host_smac**, **smac:** source mac address **smac-mask:** (reverse mask) of source MAC address
Default	By default, no access-list is configured.
Mode	Global mode.
Usage	Defines a standard numeric MAC ACL rule. When the user assigns specific <num> for the first time, ACL of the serial number is created, then the lists are added into this ACL. The no command deletes a standard numeric MAC ACL access-list rule.
Example	Permit the passage of packets with source MAC address 00-00-XX-XX-00-01, and deny passage of packets with source MAC address 00-00-00-XX-00-ab. **Switch(config)# access-list 700 permit 00-00-00-00-00-01 00-00-FF-FF-00-00** **Switch(config)# access-list 700 deny 00-00-00-00-00-ab 00-00-00-FF-00-00**

clear access-group statistic

Command	**clear access-group statistic [ethernet <interface-name>]**
Parameter	**interface-name**: interface-name
Default	None.
Mode	Global Mode.
Usage	Empty packet statistics information of the specified interface.
Example	Empty packet statistics information of interface. **Switch#clear access-group statistic interface ethernet 1/0/7**

firewall

Command	**firewall {enable | disable}**
Parameter	**{enable | disable}:** enable or disable
Default	None.
Mode	Global Mode.
Usage	Enables or disables firewall. Whether enabling or disabling firewall, access rules can be configured. But only when the firewall is enabled, the rules can be used in specific orientations of specific ports. When disabling the firewall, all ACL tied to ports will be deleted.
Example	To enable firewall. **Switch(config)#firewall enable**

ip access extended

Command	**[no] ip access extended <name>**
Parameter	**name:** the name of the access list. The name can be formed by non-all-digit characters of length of 1 to 32.
Default	By default, no access-list is configured.
Mode	Interface Configuration Mode.
Usage	Creates a named extended IP access list. When this command is issued for the first time, an empty access list will be created. The no prefix will remove the named extended IP access list including all the rules.
Example	To create an extended IP access list name admin_ACL. **Switch(config)#ip access-list extended admin_ACL**

ip access standard

Command	**[no] ip access standard<name>**
Parameter	**name**: the name of the access list. The name can be formed by non-all-digit characters of length of 1 to 32.
Default	By default, no access-list is configured.
Mode	Global mode.
Usage	Creates a named standard access list. When this command is issued for the first time, an empty access list will be created. The no prefix will remove the named standard access list including all the rules in the list.
Example	To create a standard IP access list name admin_ACL. **Switch(config)#ip access-list standard admin_ACL**

ipv6 access-list

Command	**ipv6 access-list <num-std> {deny | permit} {<sIPv6Prefix/sPrefixlen> | any-source | {host-source <sIPv6Addr>}}** **no ipv6 access-list <num-std>**
Parameter	**num-std:** the list number, list range is between 500 ~ 599 **deny:** deny packets **permit:** permit packets **sIPv6Prefix:** the prefix of the ipv6 source address **sPrefixlen:** the length of prefix of the ipv6 source address, range is between 1~128 **sIPv6Addr:** the ipv6 source address
Default	By default, no access-list is configured.
Mode	Global mode.
Usage	Creates a numbered standard IP access-list, if the access-list already exists, then a rule will add to the current access-list. The no command deletes a numbered standard IP access-list.
Example	Create a numbered 520 standard IP access-list, allow the source packet from 2003:1:2:3::1/64 pass through the net, and deny all the other

	packet from the source address 2003:1:2::1/48 pass through. **Switch (config)#ipv6 access-list 520 permit 2003:1:2:3::1/64** **Switch (config)#ipv6 access-list 520 deny 2003:1:2:3::1/48**

ipv6 access standard

Command	**ipv6 access-list standard <name>** **no ipv6 access-list standard <name>**
Parameter	**name**: the name for access list, the character string length is from 1 to 32.
Default	By default, no access-list is configured.
Mode	Global mode.
Usage	Creates a name-based standard IPv6 access list. When this command runs for the first time, only an empty access list with no entry will be created. The no command deletes the name-based standard IPv6 access list (including all entries).
Example	Creates a standard IPv6 access list named admin_ACL. **Switch(config)#ipv6 access-list standard admin_ACL**

show ip traffic

Command	**ipv6 access-list extended <name>** **no ipv6 access-list extended <name>**
Parameter	**name:** the name for access list, the character string length is from 1 to 32.
Default	By default, no access-list is configured.
Mode	Global Mode.
Usage	Creates a name-based extended IPv6 access list. When this command is run for the first time, only an empty access list with no entry will be created. The no command deletes the name-based extended IPv6 access list.
Example	Creates an extensive IPv6 access list named admin_ACL. **Switch(config)#ipv6 access-list extended admin_ACL**

{ip|ipv6|mac|mac-ip} access-group

Command	**{ip|ipv6|mac|mac-ip} access-group <name> {in} [traffic-statistic]** **no {ip|ipv6|mac|mac-ip} access-group <name> {in}**
Parameter	**name**: the name for access list, the character string length is from 1 to 32. **traffic-statistic:** flow statistics
Default	By default, the entry of port is not bound ACL.
Mode	Port Mode.
Usage	Applies an access-list on some direction of port, and determines if ACL rule is added by statistic counter or not by options. **Note**: when an ACL has multiple rules, traffic-statistic can't configure. There are four kinds of packet head field based on concerned: MAC ACL, IP ACL, MAC-IP ACL and IPv6 ACL; to some extent, ACL filter behavior (permit, deny) has a conflict when a data packet matches multi types of four ACLs. The strict priorities are specified for each ACL based on outcome veracity. It can determine final behavior of packet filter through priority when the filter behavior has a conflict. When binding ACL to port, there are some limits as below: 1. Each port can bind a MAC-IP ACL, an IP ACL, a MAC ACL and an IPv6 ACL. 2. When binding four ACLs and data packet matching the multi ACLs simultaneity, the priority from high to low are shown as below, Ingress IPv6 ACL Ingress MAC-IP ACL Ingress MAC ACL Ingress IP ACL The no command deletes access-list binding on the port.
Example	Binding AAA access-list to entry direction of port. **Switch(config)#interface ethernet 1/0/5** **Switch(config-If-Ethernet1/0/5)#ip access-group aaa in**

mac access extended

Command	**mac-access-list extended <name>** **no mac-access-list extended <name>**
Parameter	**name**: name of access-list excluding blank or quotation mark, and it must start with letter, and the length cannot exceed to 32. (remark: sensitivity on capital or small letter.)
Default	By default, no access-list is configured.
Mode	Global mode.
Usage	Defines a name-manner MAC ACL or enters access-list configuration mode. After assigning this command for the first time, only an empty name access-list is created and no list item is included. The no command deletes this ACL.
Example	To create an MAC ACL named mac_acl. **Switch(config)# mac-access-list extended mac_acl** **Switch(config-mac-ext-nacl-mac_acl)#**

mac-ip access extended

Command	**mac-ip-access-list extended <name>** **no mac-ip-access-list extended <name>**
Parameter	**name:** name of access-list excluding blank or quotation mark, and it must start with letter, and the length cannot exceed 32 (remark: sensitivity on capital or small letter).
Default	By default, no named MAC-IP access-list.
Mode	Global Mode.
Usage	Defines a name-manner MAC-IP ACL or enters access-list configuration mode. After assigning this command for the first time, only an empty name access-list is created and no list item is included. The no command deletes this ACL.
Example	Create an MAC-IP ACL named macip_acl. **Switch(config)# mac-ip-access-list extended macip_acl** **Switch(config-macIp-ext-nacl-macip_acl)#**

permit | deny (ip extended)

Command	**[no] {deny | permit} icmp {{<slpAddr><sMask>} | any-source | {host-source <slpAddr>}} {{<dlpAddr><dMask>} | any-destination | {host-destination <dlpAddr>}} [<icmp-type> [<icmp-code>]] [precedence <prec>][tos <tos>] [time-range<time-range-name>]** **[no] {deny | permit} igmp {{<slpAddr><sMask>} | any-source | {host-source <slpAddr>}} {{<dlpAddr><dMask>} | any-destination | {host-destination <dlpAddr>}} [<igmp-type>] [precedence <prec>] [tos <tos>] [time-range<time-range-name>]** **[no] {deny | permit} tcp {{ <slpAddr><sMask> } | any-source | {host-source <slpAddr> }} [s-port { <sPort> | range <sPortMin><sPortMax> }] {{ <dlpAddr> <dMask> } | any-destination | {host-destination <dlpAddr> }} [d-port { <dPort> | range <dPortMin><dPortMax> }] [ack+fin+psh+rst+urg+syn] [precedence <prec>] [tos <tos>][time-range <time-range-name>]** **[no] {deny | permit} udp {{ <slpAddr><sMask> } | any-source | {host-source <slpAddr> }} [s-port { <sPort> | range <sPortMin><sPortMax> }] {{ <dlpAddr> <dMask> } | any-destination | {host-destination <dlpAddr> }} [d-port { <dPort> | range <dPortMin><dPortMax> }] [precedence <prec>] [tos <tos>] [time-range<time-range-name>]** **[no] {deny | permit} {eigrp | gre | igrp | ipinip | ip | ospf | <protocol-num>} {{<slpAddr><sMask>} | any-source | {host-source <slpAddr>}} {{<dlpAddr> <dMask>} | any-destination | {host-destination <dlpAddr>}} [precedence <prec>] [tos <tos>][time-range<time-range-name>]**
Parameter	**deny:** deny packets **permit:** permit packets

	<sIpAddr>: the source IP address, the format is dotted decimal notation **<sMask>:** the reverse mask of source IP, the format is dotted decimal notation **<sPort>:** source port No., 0-65535 **<sPortMin>:** the down boundary of source port **<sPortMax>:** the up boundary of source port **<dIpAddr>:** the destination IP address, the format is dotted decimal notation **<dMask>:** the reverse mask of destination IP, the format is dotted decimal notation, attentive position o, ignored position 1 **<dPort>:** destination port No. 0-65535 **<dPortMin>:** the down boundary of destination port **<dPortMax>:** the up boundary of destination port **<igmp-type>:** the type of igmp, 0-15 **<icmp-type>:** the type of icmp, 0-255 **<icmp-code>:** protocol No. of icmp, 0-255 **<prec>:** IP priority, 0-7 **<tos>:** to value, 0-15 **<time-range-name>:** time range name
Default	By default, no access-list is configured.
Mode	Name extended IP access-list configuration mode.
Usage	Creates a name extended IP access rule to match specific IP protocol or all IP protocol. The no command will delete this access list.
Example	To create the extended access-list, deny icmp packet to pass, and permit udp packet with destination address 192. 168. 0. 1 and destination port 32 to pass. **Switch(config)# ip access-list extended admin_ACL** **Switch(config-ip-ext-nacl-admin_ACL)#deny igmp any-source any-destination** **Switch(config-ip-ext-nacl-admin_ACL)#permit udp any-source host-destination 192.168.0.1 d-port 32**

permit | deny (ip standard)

Command	**{deny | permit} {{<sIpAddr><sMask>} | any-source | {host-source <sIpAddr>}}** **no {deny | permit} {{<sIpAddr><sMask>} | any-source | {host-source <sIpAddr>}}**
Parameter	**deny:** deny packets **permit:** permit packets **<sIpAddr>:** the source IP address, the format is dotted decimal notation **<sMask>:** the reverse mask of source IP, the format is dotted decimal notation
Default	By default, no access-list configured.
Mode	Name standard IP access-list configuration mode.
Usage	Creates a name standard IP access rule. The no command deletes this name standard IP access rule.
Example	Permit packets with source address 10.1.1.0/24 to pass, and deny other packets with source address 10.1.1.0/16. **Switch(config)#ip access-list standard ipFlow** **Switch(config-std-nacl-ipFlow)# permit 10.1.1.0 255.0.0.0** **Switch(config-std-nacl-ipFlow)# deny 10.1.1.0 255.0.0.0**

permit | deny (ipv6 extended)

Command	**[no] {deny | permit} icmp {{<sIPv6Prefix/sPrefixlen>} | any-source | {host-source <sIPv6Addr>}} {<dIPv6Prefix/dPrefixlen> | any-destination | {host-destination <dIPv6Addr>}} [<icmp-type> [<icmp-code>]] [dscp <dscp>] [flow-label <fl>] [time-range <time-range-name>]** **[no] {deny | permit} tcp { <sIPv6Prefix/sPrefixlen> | any-source | {host-source <sIPv6Addr> }} [s-port { <sPort> | range <sPortMin><sPortMax> }] { <dIPv6Prefix/dPrefixlen> | any-destination | {host-destination <dIPv6Addr> }} [d-port { <dPort> | range <dPortMin><dPortMax> }] [syn | ack | urg | rst | fin | psh] [dscp <dscp>] [flow-label <fl>][time-range <time-range-**

	name>] **[no] {deny | permit} udp { <sIPv6Prefix/sPrefixlen> | any-source | {host-source <sIPv6Addr> }} [s-port { <sPort> | range <sPortMin><sPortMax> }] { <dIPv6Prefix/dPrefixlen> | any-destination | {host-destination <dIPv6Addr> }} [d-port { <dPort> | range <dPortMin><dPortMax> }] [dscp <dscp>] [flow-label <fl>][time-range <time-range-name>]** **[no] {deny | permit} <next-header> {<sIPv6Prefix/sPrefixlen> | any-source | {host-source <sIPv6Addr>}} {<dIPv6Prefix/dPrefixlen> | any-destination | {host-destination <dIPv6Addr>}} [dscp <dscp>] [flow-label <fl>][time-range <time-range-name>]** **[no] {deny | permit} {<sIPv6Prefix/sPrefixlen> | any-source | {host-source <sIPv6Addr>}} {<dIPv6Prefix/dPrefixlen> | any-destination | {host-destination <dIPv6Addr>}} [dscp <dscp>] [flow-label <fl>] [time-range<time-range-name>]**
Parameter	**deny:** deny packets **permit:** permit packets **<sIPv6Addr>:** the source IPv6 address **<sPrefixlen>:** the length of the IPv6 address prefix, the range is 1～128 **<sPort>:** source port number, the range is 0～65535 **<sPortMin>:** the down boundary of source port **<sPortMax>:** the up boundary of source port **<dIPv6Addr>:** the destination IPv6 address **<dPrefixlen>:** the length of the IPv6 address prefix, the range is 1～128 **<dPort>:** destination port number, the range is 0～65535 **<dPortMin>:** the down boundary of destination port **<dPortMax>:** the up boundary of destination port **<icmp-type>:** icmp type **<icmp-code>:** icmp protocol number **<dscp>:** IPv6 priority ,the range is 0～63 **<flowlabel>:** value of the flow label, the range is 0～1048575 **syn,ack,urg,rst,fin,psh,tcp:** label position **<next-header>:** the IPv6 next-header **<time-range-name>:** time range name

Default	By default, No access control list configured.
Mode	IPv6 nomenclature extended access control list mode.
Usage	Creates an extended nomenclature IPv6 access control rule for specific IPv6 protocol. The no command will delete this access list.
Example	To create an extended access control list named udpFlow, denying the icmp packets while allowing udp packets with destination address 2001:1:2:3::1 and destination port 32. **Switch(config)#ipv6 access-list extended udpFlow** **Switch(config-ipv6-ext-nacl-udpFlow)#deny icmp any any-destination** **Switch(config-ipv6-ext-nacl-udpFlow)#ppermit udp any-source host-destination 2001:1:2:3::1 dPort 32**

permit | deny (ipv6 standard)

Command	**[no] {deny | permit} {{<sIPv6Prefix/sPrefixlen>} | any-source | {host-source <sIPv6Addr>}}**
Parameter	**deny:** deny packets **permit:** permit packets **<sPrefixlen>:** the length of the IPv6 address prefix, the valid range is 1~128 **<sIPv6Addr>:** the source IPv6 address
Default	No access list is configured by default.
Mode	Standard IPv6 nomenclature access list mode.
Usage	Creates a standard nomenclature IPv6 access control rule. The no form of this command deletes the nomenclature standard IPv6 access control rule.
Example	Permit packets with source address of 2001:1:2:3::1/64 while denying those with source address of 2001:1:2:3::1/48. **Switch(config)#ipv6 access-list standard ipv6Flow** **Switch(config-ipv6-std-nacl-ipv6Flow)# permit 2001:1:2:3::1/64** **Switch(config-ipv6-std-nacl-ipv6Flow)# deny 2001:1:2:3::1/48**

permit | deny (mac extended)

Command	**[no]{deny|permit} {any-source-mac|{host-source-mac <host_smac> }|{ <smac> <smac-mask> }} {any-destination-mac|{host-destination-mac <host_dmac> }|{ <dmac><dmac-mask> }} [cos <cos-val> [<cos-bitmask>]] [vlanId <vid-value> [<vid-mask>]] [ethertype <protocol> [<protocol-mask>]]** **[no]{deny|permit} {any-source-mac|{host-source-mac <host_smac> }|{ <smac> <smac-mask> }} {any-destination-mac|{host-destination-mac <host_dmac> }|{ <dmac><dmac-mask> }} [untagged-eth2 [ethertype <protocol>[protocol-mask]]]** **[no]{deny|permit}{any-source-mac|{host-source-mac <host_smac> }|{ <smac> <smac-mask> }} {any-destination-mac|{host-destination-mac <host_dmac> }|{ <dmac><dmac-mask> }} [untagged-802-3]** **[no]{deny|permit} {any-source-mac|{host-source-mac <host_smac> }|{ <smac> <smac-mask> }} {any-destination-mac|{host-destination-mac <host_dmac> }|{ <dmac><dmac-mask> }} [tagged-eth2 [cos <cos-val>[<cos-bitmask>]] [vlanId <vid-value> [<vid-mask>]] [ethertype <protocol>[<protocol-mask>]]]** **[no]{deny|permit}{any-source-mac|{host-source-mac <host_smac> }|{ <smac> <smac-mask> }} {any-destination-mac|{host-destination-mac <host_dmac> }|{ <dmac><dmac-mask> }} [tagged-802-3 [cos <cos-val>[<cos-bitmask>]] [vlanId <vid-value> [<vid-mask>]]]**
Parameter	**deny:** deny packets **permit:** permit packets **any-source-mac:** any source of MAC address **any-destination-mac:** any destination of MAC address **host_smac, smac:** source MAC address **smac-mask:** mask (reverse mask) of source MAC address **host_dmac, dmas:** destination MAC address **dmac-mask:** (reverse mask) of destination MAC address **untagged-eth2:** format of untagged ethernet II packet **tagged-eth2:** format of tagged ethernet II packet **untagged-802-3:** format of untagged ethernet 802.3 packet **tagged-802-3:** format of tagged ethernet 802.3 packet **cos-val:** cos value, 0-7 **cos-bitmask:** cos mask, 0-7reverse mask and mask bit is consecutive

	vid-value: VLAN No, 1-4094 **vid-bitmask:** VLAN mask, 0-4095, reverse mask and mask bit is consecutive **protocol:** specific Ethernet protocol No., 1536-65535 **protocol-bitmask:** protocol mask, 0-65535, reverse mask and mask bit is consecutive
Default	By default, no access-list is configured.
Mode	Name extended MAC access-list configuration mode.
Usage	Defines an extended name MAC ACL rule. Notice: mask bit is consecutive means the effective bit must be consecutively effective from the first bit on the left, no ineffective bit can be added through. For example: the reverse mask format of one byte is: 00001111b; mask format is 11110000; and this is not permitted: 00010011. The no command deletes this extended name IP access rule.
Example	The forward source MAC address is not permitted as 00-12-11-23-XX-XX of 802.3 data packet. **Switch(config)# mac-access-list extended macExt** **Switch(config-mac-ext-nacl-macExt)#deny 00-12-11-23-00-00 00-00-00-00-ff-ff any-destination-mac untagged-802-3** **Switch(config-mac-ext-nacl-macExt)#deny 00-12-11-23-00-00 00-00-00-00-ff-ff** **any-destination-mac tagged-802-3**

permit | deny (mac-ip extended)

Command	**[no]{deny|permit} {any-source-mac|{host-source-mac<host_smac>}|** **{<smac><smac-mask>}} {any-destination-mac|{host-destination-mac<host_dmac>}|** **{<dmac><dmac-mask>}} icmp{{<source><source-wildcard>}|any-source|** **{host-source<source-host-ip>}} {{<destination><destination-wildcard>}|** **any-destination|{host-destination <destination-host-ip>}}** **[<icmp-type> [<icmp-code>]] [precedence <precedence>] [tos <tos>][time-range<time-range-name>]** **[no]{deny|permit} {any-source-mac|{host-source-mac<host_smac>}|** **{<smac><smac-mask>}} {any-destination-mac|{host-**

	destination-mac<host_dmac>}| {<dmac><dmac-mask>}} igmp{{<source><source-wildcard>}|any-source| {host-source<source-host-ip>}} {{<destination><destination-wildcard>}| any-destination|{host-destination <destination-host-ip>}} [<igmp-type>] [precedence <precedence>] [tos <tos>][time-range<time-range-name>] [no]{deny|permit}{any-source-mac|{host-source-mac <host_smac> }| { <smac> <smac-mask> }}{any-destination-mac|{host-destination-mac<host_dmac> }| { <dmac><dmac-mask> }}tcp{{ <source><source-wildcard> }|any-source| {host-source <source-host-ip> }}[s-port { <port1> |range <sPortMin><sPortMax> }] {{ <destination><destination-wildcard> } | any-destination| {host-destination <destination-host-ip> }} [d-port { <port3> | range<dPortMin><dPortMax> }] [ack+fin+psh+rst+urg+syn] [precedence <precedence>] [tos <tos>] [time-range <time-range-name>] [no]{deny|permit}{any-source-mac|{host-source-mac <host_smac> }|{ <smac> <smac-mask> }}{any-destination-mac|{host-destination-mac <host_dmac> }| { <dmac><dmac-mask> }}udp{{ <source><source-wildcard> }|any-source| {host-source <source-host-ip> }}[s-port{ <port1> | range <sPortMin><sPortMax> }] {{ <destination><destination-wildcard> }|any-destination| {host-destination <destination-host-ip> }} [d-port { <port3> | range <dPortMin><dPortMax> }] [precedence <precedence>] [tos <tos>][time-range <time-range-name>] [no]{deny|permit}{any-source-mac|{host-source-mac<host_smac>}|{<smac> <smac-mask>}}{any-destination-mac|{host-destination-mac<host_dmac>}| {<dmac><dmac-mask>}}{eigrp|gre|igrp|ip|ipinip|ospf|{<protocol-num>}} {{<source><source-wildcard>}|any-source|{host-

	source<source-host-ip>}} **{{<destination><destination-wildcard>}|any-destination|{host-destination** **<destination-host-ip>}} [precedence <precedence>] [tos <tos>] [time-range<time-range-name>]**
Parameter	**num:** access-list serial No. this is a decimal's No. from 3100-3199 **deny:** deny packets **permit:** permit packets **any-source-mac:** any source MAC address **any-destination-mac:** any destination MAC address **host_smac, smac:** source MAC address **smac-mask:** (reverse mask) of source MAC address **host_dmac, dmas:** destination MAC address **dmac-mask:** (reverse mask) of destination MAC address **protocol:** No. of name or IP protocol. It can be a key word: eigrp, gre, icmp, igmp, igrp, ip, ipinip, ospf, tcp, or udp, or an integer from 0-255 of list No. of IP address. Use key word 'ip' to match all Internet protocols (including ICMP, TCP, AND UDP) list **source-host-ip, source:** No. of source network or source host of packet delivery. Numbers of 32-bit binary system with dotted decimal notation expression **source-wildcard:** reverse of source IP. Numbers of 32-bit binary system expressed by decimal's numbers with four-point separated, reverse mask **destination-host-ip, destination:** destination No. of destination network or host to which packets are delivered. Numbers of 32-bit binary system with dotted decimal notation expression **destination-wildcard:** mask of destination. I Numbers of 32-bit binary system expressed by decimal's numbers with four-point separated, reverse mask **s-port:** means the need to match TCP/UDP source port **port1:** value of TCP/UDP source interface No., Interface No. is an integer from 0-65535 **<sPortMin>:** the down boundary of source port **<sPortMax>:** the up boundary of source port **d-port:** means need to match TCP/UDP destination interface **port3:** value of TCP/UDP destination interface No., Interface No. is an integer from 0-65535 **<dPortMin>:** the down boundary of destination port **<dPortMax>:** the up boundary of destination port **[ack] [fin] [psh]** **[rst] [urg] [syn]:** (optional) only for TCP protocol, multi-choices of tag positions are available, and when TCP data reports the configuration of corresponding position, then initialization of TCP data report is enabled to form a match when in connection

	precedence: packets can be filtered by priority which is a number from 0-7 **tos:** packets can be filtered by service type which ia number from 0-15 **icmp-type:** ICMP packets can be filtered by packet type which is a number from 0-255 **icmp-code:** ICMP packets can be filtered by packet code which is a number from 0-255 **igmp-type:** ICMP packets can be filtered by IGMP packet name or packet type which is a number from 0-255 **time-range-name:** name of time range
Default	By default, no access-list is configured.
Mode	Name extended MAC-IP access-list configuration mode.
Usage	Defines an extended name MAC-IP ACL rule. No form deletes one extended numeric MAC-IP ACL access-list rule.
Example	Deny the passage of UDP packets with any source MAC address and destination MAC address, any source IP address and destination IP address, and source port 100. **Switch(config)# mac-ip-access-list extended macIpExt** **Switch(config-macip-ext-nacl-macIpExt)# deny any-source-mac any-destination-mac** **udp any-source s-port 100 any-destination**

show access-lists

Command	**show access-lists [<num>|<acl-name>]**
Parameter	**<num>|<acl-name>:** specific ACL No|specific ACL name character string.
Default	None.
Mode	Admin Mode.
Usage	Reveals ACL of configuration. When not assigning names of ACL, all ACL will be revealed, used x time（s）indicates the times of ACL to be used.
Example	Reveal ACL of configuration. **Switch#show access-lists** access-list 10(used 0 time(s)) access-list 10 deny any-source

	access-list 100(used 1 time(s)) access-list 100 deny ip any any-destination access-list 100 deny tcp any any-destination access-list 1100(used 0 time(s)) access-list 1100 permit any-source-mac any-destination-mac tagged-eth2 14 2 0800

show access-group

Command	**show access-group in (interface {Ethernet | Ethernet IFNAME})**
Parameter	**IFNAME**: Port name
Default	10 packets /second.
Mode	Admin/ Global Mode.
Usage	Displays the ACL binding status on the port. When not assigning interface names, all ACL tied to port will be revealed.
Example	Displays all ACL bound to the port. **Switch#show access-group** interface name: Ethernet 1/0/1 IP Ingress access-list used is 100, traffic-statistics Disable. interface name: Ethernet1/0/2 IP Ingress access-list used is 1, packet(s) number is 11110.

show firewall

Command	**show firewall**
Parameter	None.
Default	None.
Mode	Admin/ Global Mode.
Usage	Reveals configuration information of packet filtering functions.
Example	Display firewall status. **Switch#show firewall** Firewall status: Enable.

show ipv6 access-lists

Command	**show ipv6 access-lists [<num>|<acl-name>]**
Parameter	**<num>:** the number of specific access control list, the valid range is 500～699, amongst 500～599 is digit standard IPv6 ACL number, 600～699 is the digit extended IPv6 ACL number **<acl-name>:** the nomenclature character string of a specific access control list, lengthening within 1～32
Default	None.
Mode	Admin/ Global Mode.
Usage	Shows the configured IPv6 access control list. When no access control list is specified, all the access control lists will be displayed; in used x time（s） is shown the times the ACL had been quoted.
Example	Show the configured IPv6 access control list. **Switch#show ipv6 access-lists** ipv6 access-list 500(used 1 time(s)) ipv6 access-list 500 deny any-source ipv6 access-list 510(used 1 time(s)) ipv6 access-list 510 deny ip any-source any-destination ipv6 access-list 510 deny tcp any-source any-destination ipv6 access-list 520(used 1 time(s)) ipv6 access-list 520 permit ip any-source any-destination

show time-range

Command	**show time-range <word>**
Parameter	**<word>:** assigns name of time-range needed to be revealed.
Default	None.
Mode	Admin/ Global Mode.
Usage	Reveals configuration information of time range functions. When not assigning time-range names, all time-range will be revealed. in used x time（s） is shown the times the ACL had been quoted.
Example	Reveal configuration information of time range functions. **Switch#show time-range** time-range timer1 (inactive, used 0 times)

	absolute-periodic Saturday 0:0:0 to Sunday 23:59:59 time-range timer2 (inactive, used 0 times) absolute-periodic Monday 0:0:0 to Friday

time-range

Command	**[no] time-range <time_range_name>**
Parameter	**<time_range_name>:** time range name must start with letter or number, and the length cannot exceed to 32 characters long.
Default	By default, no time-range configuration.
Mode	Global Mode.
Usage	Creates the name of time-range as time range name, enter the time-range mode at the same time. The no command is used to delete this time range.
Example	Create a time-range named admin_timer. **Switch(config)#Time-range admin_timer**

2. Commands for Self-defined ACL

userdefined-access-list standard offset

Command	**userdefined-access-list standard offset [window1 { l3start | l4start} <offset>]** **[window2 { l3start | l4start } <offset>] [window3 { l3start | l4start } <offset>]** **[window4 { l3start | l4start } <offset>] [window5 { l3start | l4start } <offset>]** **[window6 { l3start | l4start } <offset>] [window7 { l3start | l4start } <offset>]** **[window8 { l3start | l4start } <offset>] [window9 { l3start | l4start } <offset>]** **[window10 { l3start | l4start } <offset>] [window11 { l3start | l4start } <offset>]** **[window12 { l3start | l4start } <offset>]** **no userdefined-access-list standard offset [window1] [window2] [window3] [window4] [window5] [window6] [window7] [window8] [window9] [window10] [window11] [window12]**
Parameter	**window1-window12:** self-defined window 1 to 12 **l3start:** The start offset position is start of layer3 (It can be effective only when the start of layer3 exists) **l4start:** The start offset position is start of layer4 (It can be effective only when the start of layer4 exists) **offset:** The configured offset is from 0 to 178 (unit is 2Bytes)
Default	No Configuration Template.
Mode	Global Mode.
Usage	Creates a standard self-defined ACL template. If the template exists, the corresponding window of the template can be modified. {l2endoftag | l3start | l4start}: used to configure the start offset position of a window, <offset>: used to the offset of a window, the range is <0-178>, unit is 2Bytes,namely, 0 means 0Bytes offset and 1 means 2Bytes offset. Standard self-defined ACL template can configure the start offset position and offset for 12 window at most. One standard self-defined ACL template can be shared in global mode. The window cannot be modified if the standard self-defined ACL rule is configured with this window. But if the standard self-defined ACL rule is not configured, the window configuration can be modified with this command. The no command can delete one or more offset configuration of the window in the template or delete the whole template. The window in the template can be deleted successfully when it is not used by the self-

	defined ACL rule. Ipv6 only supports window1-6, the biggest offset of l3start includes the head of L2, and the biggest offset of l4start includes the head of L2 and L3. The no command deletes the window of the standard self-defined ACL template. If the window is not specified, the standard self-defined ACL template will be deleted.
Example	To create a global template with 7 windows (3-9) to configure the start offset position and the offset: **Switch(config)#userdefined-access-list standard offset window3 l2start 0 window4 l2start 2 window5 l3start 0 window6 l3start 1 window7 l3start 2 window8 l4start 1 window9 l4start 2**

userdefined-access-list standard

Command	**userdefined-access-list standard <1200-1299> {permit|deny} {window1|window2| window3|window4|window5|window6|window7|window8|window9|window10| window11|window12}** **no userdefined-access-list standard <1200-1299> {permit|deny} {window1|window2| window3|window4|window5|window6|window7|window8|window9|window10| window11|window12}**
Parameter	**<1200-1299>:** the access-list No. from 1200 to 1299 in decimal notation **permit:** permit access **deny:** deny access **window1-window12:** custom windows 1 to 12
Default	By default, no any access-list configured.
Mode	Global Mode.
Usage	Creates a numbered standard self-defined ACL. If the standard self-defined ACL exists, then a rule will be added to the ACL. When users specify the specified <num> for the first time, create the ACL with this serial number, and then add the entry into this ACL. The no command deletes a numbered standard self-defined ACL.
Example	Permit the second bytes of the start of l3 is 0x4501. Permit the packets that the forth byte of the start of l4 is 0xFF.

	Configure a rule in the same list to deny the packets that the fifth and the sixth bytes of the start of l3 is 0xFFAA. **Switch(config)#userdefined-access-list standard offset window1 l3start 0 window2 l4start 1** **Switch(config)#userdefined-access-list standard 1200 permit window1 4501 FFFF window2 00FF 00FF** **Switch(config)#userdefined-access-list standard offset window3 l3start 2**

userdefined access-group

Command	**userdefined access-group <name> {in} [traffic-statistic]** **no userdefined access-group <name> {in}**
Parameter	**<name>:** the access-list name from 1200-1399 in decimal notation.
Default	By default, user defined-access-list is not bound to the port.
Mode	Physical Port Configuration Mode.
Usage	Applies user defined-access-list to one direction of the port. Decides whether the statistical counter should be added to the ACL according to the options. A self-defined access-list can be bound to the ingress of a port and can be configured at the ingress of the same port with other access-lists at the same time. The deny rule is precedent when different access-lists are matching, that means if there is an access-list match the deny rule, the deny rule must be executed, the permit rule will be executed oppositely. The no command deletes the configuration bound to the port.
Example	The configured self-defined access-list is shown in the following: **Switch(config)#userdefined-access-list standard offset window1 l3start 0 window2 l4start 1** **Switch(config)#userdefined-access-list standard 1300 permit window1 4501 FFFF window2 00FF 00FF** Bind the self-defined access-list to Ethernet1/1: **Switch(config)#interface ethernet1/1** **Switch(config-if-ethernet1/1)#userdefined access-group 1300 in**

vacl userdefined access-group

Command	**vacl userdefined access-group <name> {in} vlan <vlanId> [traffic-statistic]** **no vacl userdefined access-group <name> {in} vlan <vlanId>**
Parameter	**<name>:** the access-list name from 1200 to 1399 in decimal notation **vlanId:** the bound VLAN, the range is 1-4094
Default	By default, user defined-access-list is not bound to the port.
Mode	Global Mode.
Usage	Applies user defined-access-list to one direction of the specified VLAN, decides whether the statistical counter should be added to the ACL according to the options or not. A self-defined access-list can be bound to the ingress of a VLAN and can be configured at the ingress of the same VLAN with other access-lists at the same time. The deny rule is precedent when different access-lists are matching, that means if there is an access-list matches the deny rule, the deny rule must be executed, the permit rule will be executed oppositely. The no command deletes the configuration bound to the specified VLAN.
Example	The configured self-defined access-list is shown in the following: **Switch(config)#userdefined-access-list standard offset window1 l3start 0 window2 l4start 1** **Switch(config)#userdefined-access-list standard 1300 permit window1 4501 FFFF window2 00FF 00FF** Bind the self-defined access-list to VLAN1: **Switch(config)#vacl userdefined access-group 1300 in vlan 1**

3. Commands for 802.1x

dot1x accept-mac

Command	**[no] dot1x accept-mac <mac-address> [interface <interface-name>]**
Parameter	**mac-address**: stands for MAC address **interface-name:** for interface name and port number
Default	None.
Mode	Global Mode.
Usage	Adds a MAC address entry to the dot1x address filter table. If a port is specified, the entry added applies to the specified port only. If no port is specified, the entry added applies to all the ports. The dot1x address filter function is implemented according to the MAC address filter table, dot1x address filter table is manually added or deleted by the user. When a port is specified in adding a dot1x address filter table entry, that entry applies to the port only; when no port is specified, the entry applies to all ports in the switch. When dot1x address filter function is enabled, the switch will filter the authentication user by the MAC address. Only the authentication request initialed by the users in the dot1x address filter table will be accepted, the rest will be rejected. The no command deletes the entry from dot1x address filter table.
Example	Adding MAC address 00-01-34-34-2e-0a to the filter table of Ethernet 1/0/5. **Switch(config)#dot1x enable** **Switch(config)#dot1x accept-mac 00-01-34-34-2e-0a interface ethernet 1/0/5**

dot1x eapor enable

Command	**[no] dot1x eapor enable**
Parameter	**None.**
Default	EAP relay authentication is used by default.
Mode	Global Mode.
Usage	Enables the EAP relay authentication function in the switch. The switch and RADIUS may be connected via Ethernet or PPP. If an

	Ethernet connection exists between the switch and RADIUS server, the switch needs to authenticate the user by EAP relay (EAPoR authentication); if the switch connects to the RADIUS server by PPP, the switch will use EAP local end authentication (CHAP authentication). The switch should use different authentication methods according to the connection between the switch and the authentication server. The no command sets EAP local end authentication.
Example	Setting EAP local end authentication for the switch. **Switch(config)#no dot1x eapor enable**

dot1x enable

Command	**[no] dot1x enable**
Parameter	**None.**
Default	802.1x function is not enabled in global mode by default; if 802.1x is enabled under Global Mode, 802.1x will not be enabled for the ports by default.
Mode	Global Mode and Port Mode.
Usage	Enables the 802.1x function in the switch and ports. The 802.1x authentication for the switch must be enabled first to enable 802.1x authentication for the respective ports. If Spanning Tree or MAC binding is enabled on the port, or the port is a Trunk port or member of port aggregation group, 802.1x function cannot be enabled for that port unless such conditions are removed. The no command disables the 802.1x function.
Example	Enabling the 802.1x function of the switch and enable 802.1x for port1/0/12. **Switch(config)#dot1x enable** **Switch(config)#interface ethernet 1/0/12** **Switch(config-if-ethernet1/0/12)#dot1x enable**

dot1x ipv6 passthrough

Command	**[no] dot1x ipv6 passthrough**
Parameter	**None.**
Default	IPv6 pass through function is disabled on the switch by default.
Mode	Port Mode.
Usage	Enables IPv6 pass through function on a switch port, only applicable when access control mode is user based. The function can only be enabled when 802.1x function is enabled both globally and on the port, with user based being the control access mode. After it is enabled, users can send IPv6 messages without authentication. The no operation of this command will disable the function.
Example	To enable IPv6 pass through function on port Ethernet1/0/12. **Switch(config)#dot1x enable** **Switch(config)#interface ethernet 1/0/12** **Switch(config-if-ethernet1/0/12)#dot1x enable** **Switch(config-if-ethernet1/0/12)#dot1x ipv6 passthrough**

dot1x guest-vlan

Command	**dot1x guest-vlan <vlanid>** **no dot1x guest-vlan**
Parameter	**Vlanid**: the specified VLAN id, ranging from 1 to 4094.
Default	By default, there is no 802.1x guest-vlan function on the port.
Mode	Port Mode.
Usage	Sets the guest-vlan of the specified port. The access device will add the port into Guest VLAN if there is no supplicant getting authenticated successfully in a certain stretch of time because of lacking exclusive authentication supplicant system or the version of the supplicant system being too low in Guest VLAN, users can get 802.1x supplicant system software, update supplicant system or update some other applications (such as anti-virus software, the patches of operating system). When a user of a port within Guest VLAN starts an authentication, the port will remain in Guest VLAN in the case of a failed authentication. If the authentication finishes successfully, there are two possible results:

	1. The authentication server assigns an Auto VLAN, causing the port to leave Guest VLAN to join the assigned Auto VLAN. After the user gets offline, the port will be allocated back into the specified Guest VLAN. 2. The authentication server assigns an Auto VLAN, then the port leaves Guest VLAN and joins the specified VLAN. When the user becomes offline, the port will be allocated to the specified Guest VLAN again. ***Attention*** : There can be different Guest VLAN set on different ports, while only one Guest VLAN is allowed on one port. Only when the access control mode is port based, the Guest VLAN can take effect. If the access control mode of the port is mac based or user based, the Guest VLAN can be successfully set without taking effect. The no command is used to delete the guest-vlan.
Example	To set Guest-VLAN of port Ethernet1/0/3 as VLAN 10. **Switch(config)#dot1x enable** **Switch(config)#interface ethernet 1/0/3** **Switch(config-if-ethernet1/0/3)#dot1x guest-vlan 10**

dot1x macfilter enable

Command	**[no] dot1x macfilter enable**
Parameter	**None.**
Default	dot1x address filter is disabled by default.
Mode	Port Mode.
Usage	Enables the dot1x address filter function in the switch. When dot1x address filter function is enabled, the switch will filter the authentication user by the MAC address. Only the authentication request initialed by the users in the dot1x address filter table will be accepted. The no command disables the dot1x address filter function.
Example	Enabling dot1x address filter function for the switch. **Switch(config)#dot1x macfilter enable**

dot1x macbased guest-vlan

Command	**dot1x macbased guest-vlan <vlanid>** **no dot1x macbased guest-vlan**
Parameter	**vlanid**: the configured vlan id, the range is from 1 to 4094.
Default	Do not configure 802.1x macbased guest-vlan by default.
Mode	Port Mode.
Usage	Configures to appoint the port's guest-vlan based on the mac authentication. If there is no dedicated authentication client or the client version was too low, and it makes no clients authenticate successfully on the port in some time, then the access device will make this user join to the guest VLAN. User can get the 802.1x client software in guest VLAN, update the client or do other updating things (such as anti-virus software, system patches and etc.) When the user under the port in Guest VLAN issues the authentication, this port will be stay in guest VLAN if the authentication is failed; if it was successful, there are two situations as below: 1. The authentication server issues an auto VLAN, in this time, the user left the guest VLAN and joined to the auto VLAN. After the user was down line, this user will be assigned to the configured guest VLAN again. 2. The authentication server do not issue the VLAN, in this time, the user left the guest VLAN and joined to the configured native VLAN. After the user is down line, this user will be assigned to the configured guest VLAN again. ***Notice :*** 1. dot1x mac based guest-vlan can be configured only on the port based on mac authentication and in HYBRID mode. 2. Different mac based guest VLAN can be configured on different ports, but only one Mac based guest VLAN can be configured on one port. The no command deletes this guest-vlan.
Example	Configure the guest-vlan of Ethernet1/0/3 as Vlan 10. **Switch(config-if-ethernet1/0/3)#dot1x macbased guest-vlan 10**

dot1x macbased port-down-flush

Command	**[no] dot1x macbased port-down-flush**
Parameter	**None.**
Default	The command is not enabled by default.
Mode	Port Mode.
Usage	Enables this command, when the dot1x certification according to mac is down, delete the user who passed the certification of the port. When user who passed the certification according to mac changed among different ports, delete the user for the new certification. The command should be enable to delete the user. The no command does not make the down operation.
Example	When the dot1x certification according to mac is down, delete the user who passed the certification of the port. **Switch(config)#dot1x macbased port-down-flush**

dot1x max-req

Command	**dot1x max-req <count>** **no dot1x max-req**
Parameter	**count:** the times to re-transfer EAP request/ MD5 frames, the valid range is 1 to 10.
Default	The default maximum for retransmission is 2.
Mode	Global Mode.
Usage	Sets the number of EAP request/MD5 frame to be sent before the switch re-initials authentication on no supplicant response. The default value is recommended in setting the EAP request/ MD5 retransmission times. The no command restores the default setting.
Example	Changing the maximum retransmission times for EAP request/ MD5 frames to 5 times. **Switch(config)#dot1x max-req 5**

dot1x user allow-movement

Command	**[no] dot1x user allow-movement**
Parameter	**None.**
Default	By default disable the authentication function after the user moves the port.
Mode	Global Mode.
Usage	Enables the authentication function after the user moves the port, so the switch allows user to process this authentication. In the condition that the switch connects with hub, when the user will be moved to other port, dot1x user allow-movement command should be enabled. The no command disables the function.
Example	Enable the authentication function after the user moves the port. **Switch(config)#dot1x user allow-movement**

dot1x user free-resource

Command	**dot1x user free-resource <prefix><mask>** **no dot1x user free-resource**
Parameter	**prefix**: the segment for limited resource, in dotted decimal format. **mask:** the mask for limited resource, in dotted decimal format.
Default	There is no free resource by default.
Mode	Global Mode.
Usage	To configure 802.1x free resource. This command is available only if user based access control is applied. If user based access control has been applied, this command configures the limited resources which can be accessed by the un-authenticated users. For port based and MAC based access control, users could access no network resources before authentication. If TrustView management system is available, the free resource can be configured in TrustView server, and the TrustView server will distribute the configuration to the switches. To be noticed, only one free resource can be configured for the overall network. The no form command closes this function.

Example	To configure the free resource segment as 1.1.1.0, the mask is 255.255.255.0. **Switch(config)#dot1x user free-resource 1.1.1.0 255.255.255.0**

dot1x max-user macbased

Command	**dot1x max-user macbased <number>** **no dot1x max-user macbased**
Parameter	**number**: the maximum users allowed, the valid range is 1 to 256.
Default	The default maximum user allowed is 1.
Mode	Port Mode.
Usage	Sets the maximum users allowed to connect to the port. This command is available for ports using MAC-based access management, if MAC address authenticated exceeds the number of allowed user, additional users will not be able to access the network. The no command restores the default setting.
Example	Setting port 1/0/3 to allow 5 users. **Switch(config-if-ethernet1/0/3)#dot1x max-user macbased 5**

dot1x max-user userbased

Command	**dot1x max-user userbased <number>** **no dot1x max-user userbased**
Parameter	**number**: the maximum number of users allowed to access the network, ranging from 1~256.
Default	The maximum number of users allowed to access each port is 10 by default.
Mode	Port Mode.
Usage	Sets the upper limit of the number of users whose allowed access the specified port when using user-based access control mode. This command can only take effect when the port adopts user-based access control mode. If the number of authenticated users exceeds the upper limit of the number of users allowed access the network, those extra users cannot access the network.

	The no command is used to reset the default value.
Example	Setting port 1/0/3 to allow 5 users. **Switch(config-if-ethernet1/0/3)#dot1x max-user userbased 5**

dot1x portbased mode single-mode

Command	**[no] dot1x portbased mode single-mode**
Parameter	**None.**
Default	Disable the single-mode by default.
Mode	Port Mode.
Usage	Sets the single-mode based on portbased authentication mode. This command takes effect when the access mode of the port is set as portbased only. Before configuring the single-mode, if the port has enabled dot1x port-method portbased command and exist online users, the switch will enforce all users of this port are offline. After that, this port only allows a user to pass the authentication, the user can access the specified network resource, but other authentication users of this port will be denied and cannot access the network. After disabling the single-mode, the switch also enforce the authenticated user who is offline. The no command disables this function.
Example	Set port 1/0/1 based on port authentication mode to single mode. **Switch(config-if-ethernet1/0/1)#dot1x portbased mode single-mode**

dot1x port-control

Command	**dot1x port-control {auto | force-authorized | force-unauthorized}** **no dot1x port-control**
Parameter	**auto:** enable 802.1x authentication, the port authorization status is determined by the authentication information between the switch and the supplicant. **force-authorized:** sets port to authorized status, unauthenticated data is allowed to pass through the port. **force-unauthorized:** will set the port to non-authorized mode, the switch will not provide authentication for the supplicant and prohibit data from passing through the port.
Default	When 802.1x is enabled for the port, auto is set by default.
Mode	Port Mode.
Usage	Sets the 802.1x authentication status. If the port needs to provide 802.1x authentication for the user, the port authentication mode should be set to auto. The no command restores the default setting.
Example	Setting port1/0/1 to require 802.1x authentication mode. **Switch(config-if-ethernet1/0/1)#dot1x port-control auto**

dot1x port-method

Command	**dot1x port-method {macbased | portbased | userbased {standard | advanced}}** **no dot1x port-method**
Parameter	**macbased:** means the access control method based on MAC address. **portbased:** means the access control method based on port. **userbased:** means the access control method based on user, it can be divided into two types, one is standard access control method, and the other is advanced access control method. **standard:** Standard Access Control Method Based on User. **advanced:** Advanced User-Based Access Control.
Default	Advanced access control method based on user is used by default.
Mode	Port Mode.

Usage	This command is used to configure the dot1x authentication method for the specified port. When port based authentication is applied, only one host can authenticate itself through one port. And after authentication, the host will be able to access all the resources. When MAC based authentication is applied, multiple host which are connected to one port can access all the network resources after authentication. When either of the above two kinds of access control is applied, un-authenticated host cannot access any resources in the network. When user based access control is applied, un-authenticated users can only access limited resources of the network. The user based access control falls into 2 kinds: the standard access control and the advanced access control. The standard user based access control does not limit the access to the limited resources when the host is not authenticated yet. While the user based advanced access control can control the access to the limited resources before authentication is done. ***Notes :*** For standard control method based on user, the 802.1x free resource must be configured first, and it needs to be used with dot1x private client enable. The no form command restores the default access control method.
Example	To configure the access control method based on port for Etherent1/0/4. **Switch(config-if-ethernet1/0/4)#dot1x port-method portbased**

dot1x private client enable

Command	**[no] dot1x privateclient enable**
Parameter	**None.**
Default	Private 802.1x authentication packet format is disabled by default.
Mode	Global Mode.
Usage	To configure the switch to force the authentication client to use private 802.1xauthentication protocol. To implement integrated solution, the switch must be enabled to use private 802.1x protocol, or many applications will not be able to function. For detailed information, please refer to DCBI integrated solution. If the switch forces the authentication client to use private 802.1x protocol, the standard client will not be able to work. The no prefix will disable the command and allow the authentication client to use the standard 802.1x authentication protocol.

Example	To force the authentication client to use private 802.1x authentication protocol. **Switch(config)#dot1x privateclient enable**

dot1x re-authenticate

Command	**dot1x re-authenticate [interface <interface-name>]**
Parameter	**interface-name**: stands for port number, omitting the parameter for all ports.
Default	None.
Mode	Global Mode.
Usage	Enables real-time 802.1x re-authentication (no wait timeout requires) for all ports or a specified port. It makes the switch to re-authenticate the client at once without waiting for re-authentication timer timeout. This command is no longer valid after authentication.
Example	Enabling real-time re-authentication on port1/0/8. **Switch(config)#dot1x re-authenticate interface ethernet 1/0/8**

dot1x re-authentication

Command	**[no] dot1x re-authentication**
Parameter	**None.**
Default	Periodical re-authentication is disabled by default.
Mode	Global Mode.
Usage	Enables periodical supplicant authentication. When periodical re-authentication for supplicant is enabled, the switch will re-authenticate the supplicant at regular interval. This function is not recommended for common use. The no command disables this function.
Example	Enabling the periodical re-authentication for authenticated users. **Switch(config)#dot1x re-authentication**

dot1x timeout quiet-period

Command	**dot1x timeout quiet-period <seconds>** **no dot1x timeout quiet-period**
Parameter	**seconds:** the silent time for the port in seconds, the valid range is 1 to 65535.
Default	The default value is 10 seconds.
Mode	Global Mode.
Usage	Sets time to keep silent on supplicant authentication failure. Default value is recommended. The no command restores the default value.
Example	Setting the silent time to 120 seconds. **Switch(config)#dot1x timeout quiet-period 120**

dot1x timeout re-authperiod

Command	**dot1x timeout re-authperiod <seconds>** **no dot1x timeout re-authperiod**
Parameter	**seconds:** the interval for re-authentication, in seconds, the valid range is 1 to 65535.
Default	The default value is 3600 seconds.
Mode	Global Mode.
Usage	Sets the supplicant re-authentication interval. dot1x re-authentication must be enabled first before supplicant re-authentication interval can be modified. If authentication is not enabled for the switch, the supplicant re-authentication interval set will not take effect. The no command restores the default setting.
Example	Setting the re-authentication time to 1200 seconds. **Switch(config)#dot1x timeout re-authperiod 1200**

dot1x timeout tx-period

Command	**dot1x timeout tx-period <seconds>** **no dot1x timeout tx-period**
Parameter	**seconds:** the interval for re-transmission of EAP request frames, in seconds; the valid range is 1 to 65535.
Default	The default value is 30 seconds.
Mode	Global Mode.
Usage	Sets the interval for the supplicant to re-transmit EAP request/identity frame. Default value is recommended. The no command restores the default setting.
Example	Setting the EAP request frame re-transmission interval to 1200 secs. **Switch(config)#dot1x timeout tx-period 1200**

dot1x unicast enable

Command	**[no] dot1x unicast enable**
Parameter	**None.**
Default	The 802.1x unicast pass through function is not enabled in global mode.
Mode	Global Mode.
Usage	Enables the 802.1x unicast pass through function of switch. The 802.1x unicast pass through authentication for the switch must be enabled first to enable the 802.1x unicast pass through function, then the 802.1x function is configured. The no operation of this command will disable this function.
Example	Enabling the 802.1x unicast pass through function of the switch and enable the 802.1x for port 1/0/1. **Switch(config)#dot1x enable** **Switch(config)# dot1x unicast enable** **Switch(config)#interface ethernet1/0/1** **Switch(Config-If-Ethernet1/0/1)#dot1x enable**

show dot1x

Command	**show dot1x [interface <interface-list>]**
Parameter	**interface-list**: the port list, If no parameter is specified, information for all ports is displayed.
Default	None.
Mode	Admin/Global Mode.
Usage	Displays dot1x parameter related information, if parameter information is added, corresponding dot1x status for corresponding port is displayed.
Example	Display information about dot1x global parameter for the switch. **Switch#show dot1x** Global 802.1x Parameters reauth-enabled no reauth-period 3600 quiet-period 10 tx-period 30 max-req 2 authenticator mode passive Mac Filter Disable MacAccessList : dot1x-EAPoR Enable dot1x-privateclient Disable dot1x-unicast Disable 802.1x is enabled on ethernet Ethernet1/0/1 Authentication Method: Port based Max User Number:1 Status Authorized Port-control Auto Supplicant 00-03-0F-FE-2E-D3 Authenticator State Machine State Authenticated Backend State Machine State Idle Reauthentication State Machine State Stop

4.Commands for the Number Limitation Function of MAC and IP in Port, VLAN

ip arp dynamic maximum

Command	**ip arp dynamic maximum <value>** **no ip arp dynamic maximum**
Parameter	**value**: upper limit of the number of dynamic ARP in the VLAN, ranging from 1 to 4096.
Default	The number limitation function of dynamic ARP in the VLAN is disabled.
Mode	VLAN Configuration Mode.
Usage	Sets the max number of dynamic ARP allowed in the VLAN, and at the same time, enables the number limitation function of dynamic ARP in the VLAN. When configuring the max number of dynamic ARP allowed in the VLAN, if the number of dynamically learnt ARP in the VLAN is already larger than the max number to be set, the extra dynamic ARP will be deleted. The no command is used to disable the number limitation function of dynamic ARP in the VLAN.
Example	Enable the number limitation function of dynamic ARP in VLAN 1, the max number to be set is 50. **Switch(config)#interface vlan1** **Switch(config-if-vlan1)# ip arp dynamic maximum 50**

ipv6 nd dynamic maximum

Command	**ipv6 nd dynamic maximum <value>** **no ipv6 nd dynamic maximum**
Parameter	**value**: upper limit of the number of dynamic NEIGHBOR in the VLAN, ranging from 1 to 4096.
Default	The number limitation function of dynamic NEIGHBOR in the VLAN is disabled.
Mode	VLAN Configuration Mode.
Usage	Set the max number of dynamic NEIGHBOR allowed in the VLAN, and, at the same time, enable the number limitation function of dynamic

	NEIGHBOR in the VLAN. When configuring the max number of dynamic NEIGHBOR allowed in the VLAN, if the number of dynamically learnt NEIGHBOR in the VLAN is already larger than the max number to be set, the extra dynamic NEIGHBOR will be deleted. The no command is used to disable the number limitation function of dynamic NEIGHBOR in the VLAN.
Example	Enable the number limitation function of dynamic NEIGHBOR in VLAN 1, the max number to be set is 50. **Switch(config)#interface vlan1** **Switch(config-if-vlan1)# ipv6 nd dynamic maximum 50**

show arp-dynamic count

Command	**show arp-dynamic count {vlan | interface ethernet <portName>}**
Parameter	**vlan**: the specified vlan ID **portName:** the name of layer-2 port
Default	None.
Mode	Admin/Global Mode.
Usage	Displays the number of dynamic ARP of corresponding port and VLAN.
Example	Display the number of dynamic ARP of the port and VLAN which are configured with number limitation function of ARP. **Switch# show arp-dynamic count interface ethernet 1/0/3** Port MaxCount CurrentCount --- Ethernet1/0/3 5 1 **Switch# show arp-dynamic count vlan 1** Vlan MaxCount CurrentCount --- 1 55 15 ---

show mac-address dynamic count

Command	**show mac-address dynamic count { vlan | interface ethernet <portName>}**
Parameter	**vlan**: display the specified VLAN ID **portName:** the name of layer-2 port
Default	None.
Mode	Admin/Global Mode.
Usage	Displays the number of dynamic MAC of corresponding port and VLAN.
Example	Display the number of dynamic MAC of the port and VLAN which are configured with number limitation function of MAC. **Switch# show mac-address dynamic count interface ethernet 1/0/3** Port MaxCount CurrentCount --- Ethernet1/0/3 5 1 --- **Switch# show mac-address dynamic count vlan 1** Vlan MaxCount CurrentCount --- 1 55 15 ---

show nd-dynamic count

Command	**show nd-dynamic count { vlan | interface ethernet <portName>}**
Parameter	**vlan**: display the specified VLAN ID **portName:** the name of layer-2 port
Default	None.
Mode	Admin/Global Mode.
Usage	Displays the number of dynamic ND of corresponding port and VLAN.
Example	Display the number of dynamic ND of the port and VLAN which are configured with number limitation function of ND.

	Switch# show nd-dynamic count interface ethernet 1/0/3 Port MaxCount CurrentCount --- Ethernet1/0/3 5 1 --- **Switch# show nd-dynamic count vlan 1** Vlan MaxCount CurrentCount --- 1 55 15 ---

switchport arp dynamic maximum

Command	**switchport arp dynamic maximum <value>** **no switchport arp dynamic maximum**
Parameter	**value**: upper limit of the number of dynamic ARP of the port, ranging from 1 to 4096.
Default	The number limitation function of dynamic ARP on the port is disabled.
Mode	Port Mode.
Usage	Sets the max number of dynamic ARP allowed by the port, and, at the same time, enable the number limitation function of dynamic ARP on the port. When configuring the max number of dynamic ARP allowed by the port, if the number of dynamically learnt ARP on the port is already larger than the max number to be set, the extra dynamic ARP will be deleted. TRUNK ports do not supports this function. The no command is used to disable the number limitation function of dynamic ARP on the port.
Example	Enable the number limitation function of dynamic ARP in port 1/0/2 mode, the max number to be set is 20. **Switch(config)#interface ethernet 1/0/2** **Switch(config-if-ethernet1/0/2)# switchport arp dynamic maximum 20**

switchport mac-address dynamic maximum

Command	**switchport mac-address dynamic maximum <value>** **no switchport mac-address dynamic maximum**
Parameter	**value**: upper limit of the number of dynamic MAC address of the port, ranging from 1 to 4096.
Default	The number limitation function of dynamic MAC address on the port is disabled.
Mode	Port Mode.
Usage	Sets the max number of dynamic MAC address allowed by the port, and at the same time, enables the number limitation function of dynamic MAC address on the port. When configuring the max number of dynamic MAC address allowed by the port, if the number of dynamically learnt MAC address on the port is already larger than the max number of dynamic MAC address to be set, the extra dynamic MAC addresses will be deleted. This function is mutually exclusive to functions such as dot1x, MAC binding, if the functions of dot1x, MAC binding or TRUNK are enabled on the port, this function will not be allowed. The no command is used to disable the number limitation function of dynamic MAC address on the port.
Example	Enable the number limitation function of dynamic MAC address in port 1/0/2 mode, the max number to be set is 20. **Switch(config)#interface ethernet 1/0/2** **Switch(config-if-ethernet1/0/2)# switchport mac-address dynamic maximum 20**

switchport mac-address violation

Command	**switchport mac-address violation {protect | shutdown} [recovery <5-3600>]** **no switchport mac-address violation**
Parameter	**protect:** protect mode **shutdown:** shutdown mode **recovery:** Configure the border port to automatically restore after execute shutdown violation mode **<5-3600>:** Recovery time, do not restore by default.
Default	By default, the port is in protected mode.

Mode	Port Mode.
Usage	Sets the violation mode of the port. The port sets the violation mode after enabling the number limit function of MAC only. If the violation mode is protect, the port only disables the dynamic MAC address learning function when the MAC address number of the port exceeds the upper limit of secure MAC. If the violation mode is shutdown, the port will be disabled when the MAC address number exceeds the upper limit of secure MAC, and the user can enable the port by configuring no shutdown command manually or the automatic recovery timeout. The no command restores the violation mode to protect.
Example	Set the violation mode as shutdown, the recovery time as 60s for port1. **Switch(config)#interface ethernet 1/0/1** **Switch(config-if-ethernet1/0/1)# switchport mac-address violation shutdown recovery 60**

switchport nd dynamic maximum

Command	**switchport nd dynamic maximum <value>** **no switchport nd dynamic maximum**
Parameter	**value**: upper limit of the number of dynamic NEIGHBOR of the port, ranging from 1 to 4096.
Default	The number limitation function of dynamic ARP on the port is disabled.
Mode	Port Mode.
Usage	Sets the max number of dynamic NEIGHBOR allowed by the port, and, at the same time, enable the number limitation function of dynamic NEIGHBOR on the port. When configuring the max number of dynamic NEIGHBOR allowed by the port, if the number of dynamically learnt NEIGHBOR on the port is already larger than the max number to be set, the extra dynamic NEIGHBOR will be deleted. TRUNK ports do not support this function. The no command is used to disable the number limitation function of dynamic NEIGHBOR on the port.
Example	Enable the number limitation function of dynamic NEIGHBOR in port 1/0/2 mode, the max number to be 20. **Switch(config)#interface ethernet 1/0/2** **Switch(config-if-ethernet1/0/2)# switchport nd dynamic maximum 20**

vlan mac-address dynamic maximum

Command	**vlan mac-address dynamic maximum <value>** **no vlan mac-address dynamic maximum**
Parameter	**value**: upper limit of the number of MAC address in the VLAN, ranging from 1 to 4096.
Default	The number limitation function of dynamic MAC address in the VLAN is disabled.
Mode	VLAN Configuration Mode.
Usage	Sets the max number of dynamic MAC address allowed in the VLAN, and, at the same time, enable the number limitation function of dynamic MAC address in the VLAN. When configuring the max number of dynamic MAC allowed in the VLAN, if the number of dynamically learnt MAC address in the VLAN is already larger than the max number to be set, the extra dynamic MAC addresses will be deleted. After enabling number limitation function of dynamic MAC in the VLAN, the number limitation of MAC is only applied to general access port, the number of MAC on TURNK ports and special ports which has enabled dot1x, MAC binding function will not be limited or counted. The no command is used to disable the number limitation function of dynamic MAC address in the VLAN.
Example	Enable the number limitation function of dynamic MAC address in VLAN 1, the max number to be set is 50. **Switch(config)#vlan1** **Switch(config-if-vlan1)#vlan mac-address dynamic maximum 50**

5. Commands for AM Configuration

am enable

Command	**[no] am enable**
Parameter	**None.**
Default	AM function is disabled by default.
Mode	Global Mode.
Usage	Globally enables/disables AM function. The no command disables AM function.
Example	Enable AM function on the switch. **Switch(config)#am enable**

am port

Command	**[no] am port**
Parameter	**None.**
Default	AM function is disabled on all port.
Mode	Port Mode.
Usage	Enables/disables AM function on port. The no command disables AM function on the port.
Example	Enable AM function on interface 1/0/3 of the switch. **Switch(config-if-ethernet 1/0/3)#am port**

am ip-pool

Command	**[no] am ip-pool <ip-address><num>**
Parameter	**ip-address**: the starting address of an address segment in the IP address pool. **num:** the number of consecutive addresses following ip-address, less than or equal with 32.

Default	By default, IP address pool is empty.
Mode	Port Mode.
Usage	Sets the AM IP segment of the interface, allows/denies the IP messages or APR messages from a source IP within that segment to be forwarded via the interface. The no command deletes the configuration.
Example	Configure that interface 1/0/3 of the switch will forward data packets from an IP address which is one of 10 consecutive IP addresses starting from 10.10.10.1. **Switch(config-if-ethernet 1/0/3)#am ip-pool 10.10.10.1 10**

am mac-ip-pool

Command	**[no] am mac-ip-pool <mac-address><ip-address>**
Parameter	**mac-address**: the source MAC address **ip-address:** the source IP address of the packets, which is a 32 bit binary number represented in four decimal numbers.
Default	By default, MAC-IP address pool is empty.
Mode	Port Mode.
Usage	Sets the AM MAC-IP address of the interface, allows/denies the IP messages or APR messages from a source IP within that segment to be forwarded via the interface. The no command deletes the configuration.
Example	Configure that the interface 1/0/3 of the switch will allow data packets with a source MAC address of 11-22-22-11-11-11 and a source IP address of 10.10.10.1 to be forwarded. **Switch(config-if-ethernet 1/0/3)#am mac-ip-pool 11-22-22-11-11-11 10.10.10.1**

no am all

Command	**no am all [ip-pool | mac-ip-pool]**
Parameter	**ip-pool**: the IP address pool **mac-ip-pool:** the MAC-IP address pool
Default	By default, both address pools are empty at the beginning.

Mode	Global Mode.
Usage	Deletes MAC-IP address pool or IP address pool or both pools configured by all users.
Example	Delete all configured IP address pools. **Switch(config)#no am all ip-pool**

show am

Command	**show am [interface <interface-name>]**
Parameter	**interface-name**: the name of the interface of which the configuration information will be displayed.
Default	None.
Mode	Admin/Global Mode.
Usage	Displays the configured AM entries. No parameter means to display the AM configuration information of all interfaces.
Example	Display all configured AM entries. **Switch#show am interface ethernet 1/0/5** AM is enabled Interface Etherne1/0/5 am interface am ip-pool 50.10.10.1 30 am mac-ip-pool 00-02-04-06-08-09 20.10.10.5 am ip-pool 50.20.10.1 20

6. Commands for Security Feature

dosattack-check srcip-equal-dstip enable

Command	**[no] dosattack-check srcip-equal-dstip enable**
Parameter	**None.**
Default	This function is disabled on the switch by default.
Mode	Global Mode.
Usage	Enables the function by which the switch checks if the source IP address is equal to the destination IP address. By enabling this function, data packet whose source IP address is equal to its destination address will be dropped. The "no" form of this command disables this function.
Example	Drop the data packet whose source IP address is equal to its destination address. **Switch(config)# dosattack-check srcip-equal-dstip enable**

dosattack-check tcp-flags enable

Command	**[no] dosattack-check srcip-equal-dstip enable**
Parameter	**None.**
Default	This function is disabled on the switch by default.
Mode	Global Mode.
Usage	Enables the function by which the switch will check the unauthorized TCP label function. With this function enabled, the switch will be able to drop follow four data packets containing unauthorized TCP label: SYN=1 while source port is smaller than 1024; TCP label positions are all 0 while it's serial No. =0; FIN=1, URG=1, PSH=1 and the TCP serial No. =0; SYN=1 and FIN=1. This function can be used associating the "do attack-check ipv4-first-fragment enable" command. The "no" form of this command will disable this function.
Example	Drop one or more types of above four packet types. **Switch(config)# dosattack-check tcp-flags enable** **Switch(config)# dosattack-check srcip-equal-dstip enable**

dosattack-check srcport-equal-dstport enable

Command	**[no] dosattack-check srcport-equal-dstport enable**
Parameter	**None.**
Default	This function is disabled on the switch by default.
Mode	Global Mode.
Usage	Enables the function by which the switch will check if the source port is equal to the destination port. With this function enabled, the switch will be able to drop TCP and UDP data packet whose destination port is equal to the source port. This function can be used associating the "dosattack-check ipv4-first-fragment enable" function so to block the IPv4 fragment TCP and UDP data packet whose destination port is equal to the source port. The no command disables this function.
Example	Drop the non-fragment TCP and UDP data packet whose destination port is equal to the source port. **Switch(config)#dosattack-check srcport-equal-dstport enable**

dosattack-check icmp-attacking enable

Command	**[no] dosattack-check icmp-attacking enable**
Parameter	**None.**
Default	By default, disable the ICMP fragment attack checking function on the switch.
Mode	Global Mode.
Usage	Enables the ICMP fragment attack checking function on the switch. With this function enabled, the switch will be protected from the ICMP fragment attacks, dropping the fragment ICMPv4/v6 data packets whose net length is smaller than the specified value. The "no" form of this command disables this function.
Example	Enable the ICMP fragment attack checking function. **Switch(config)#dosattack-check icmp-attacking enable**

dosattack-check icmpV4-size

Command	**dosattack-check icmpV4-size <64-1023>**
Parameter	**<64-1023>:** the max net length of the ICMPv4 data packet permitted by the switch.
Default	The value is 0x200 by default.
Mode	Global Mode.
Usage	Configures the max net length of the ICMPv4 data packet permitted by the switch. To use this function you have to enable "dosattack-check icmp-attacking enable" first.
Example	Set the max net length of the ICMPv4 data packet permitted by the switch to 100. **Switch(config)#dosattack-check icmp-attacking enable** **Switch(config)#dosattack-check icmpV4-size 100**

7. Commands for TACACS+

tacacs-server authentication host

Command	**tacacs-server authentication host <ip-address> [port <port-number>][timeout <seconds>] [key {0 | 7} <string>] [primary]** **no tacacs-server authentication host <ip-address>**
Parameter	**ip-address**: the IP address of the server **port-number:** the listening port number of the server, the valid range is 0~65535, amongst 0 indicates it will not be an authentication server **seconds:** the value of TACACS+ authentication timeout timer, shown in seconds and the valid range is 1~60 **string:** the key string, If key option is set as 0, the key is not encrypted and its range should not exceed 64 characters, if key option is set as 7, the key is encrypted and its range should not exceed 64 characters **primary:** indicates it's a primary server
Default	No TACACS+ authentication configured on the system by default.
Mode	Global Mode.
Usage	This command is for specifying the IP address, port number, timeout timer value and the key string of the TACACS+ server used on authenticating with the switch. The parameter port is for define an authentication port number which must be in accordance with the authentication port number of specified TACACS+ server which is 49 by default. The parameters key and timeout is used to configure the self-key and self-timeout, if the switch is not configure the timeout<seconds> and key<string>, it will use the global value and key by command tacacs-server timeout<seconds> and tacacs-server key <string>. This command can configure several TACACS+ servers communicate with the switch. The configuration sequence will be used as authentication server sequence. And in case primary is configured on one TACACS+ server, the server will be the primary server. The no form of this command deletes TACACS+ authentication server.
Example	Configure the TACACS+ authentication server address to 192.168.1.2, and use the global configured key. **Switch(config)#tacacs-server authentication host 192.168.1.2**

tacacs-server key

Command	**tacacs-server key {0 | 7} <string>** **no tacacs-server key**
Parameter	**string**: the key string of the TACACS+ server. If key option is set as 0, the key is not encrypted and its range should not exceed 64 characters, if key option is set as 7, the key is encrypted and its range should not exceed 64 characters.
Default	None.
Mode	Global Mode.
Usage	Configures the key of TACACS+ authentication server. The key is used on encrypted packet communication between the switch and the TACACS+ server. The configured key must be in accordance with the one on the TACACS+ server or else no correct TACACS+ authentication will be performed. It is recommended to configure the authentication server key to ensure the data security. The no command deletes the TACACS+ server key.
Example	Configure test as the TACACS+ server authentication key. **Switch(config)#tacacs-server key 0 test**

tacacs-server nas-ipv4

Command	**tacacs-server nas-ipv4 <ip-address>** **no tacacs-server nas-ipv4**
Parameter	**ip-address**: the source IP address of TACACS+ packet, in dotted decimal notation, it must be a valid unicast IP address.
Default	By default, no specific source IP address for TACACS+ packet is configured, the IP address of the interface from which the TACACS+ packets are sent is used as source IP address of TACACS+ packet.
Mode	Global Mode.
Usage	Configure the source IP address of TACACS+ packet sent by the switch. The source IP address must belong to one of the IP interface of the switch, otherwise a failure message of binding IP address will be returned when the switch send TACACS+ packet. We suggest using the IP address of loopback interface as source IP address, it avoids that the packets from TACACS+ server are dropped when the interface link-down.

	The no command deletes the configuration.
Example	Configure the source ip address of TACACS+ packet as 192.168.2.254. **Switch(config)#tacacs-server nas-ipv4 192.168.2.254**

tacacs-server timeout

Command	**tacacs-server timeout <seconds>** **no tacacs-server timeout**
Parameter	**seconds:** the value of TACACS+ authentication timeout timer, shown in seconds and the valid range is 1~60.
Default	3 seconds by default.
Mode	Global Mode.
Usage	Configures a TACACS+ server authentication timeout timer. The command specifies the period, the switch waits for the authentication through TACACS+ server. When connected to the TACACS+, and after sent the authentication query data packet to the TACACS+ server, the switch waits for the response. If no replay is received during specified period, the authentication is considered failed. The no command restores the default configuration.
Example	Configure the timeout timer of the tacacs+ server to 30 seconds. **Switch(config)#tacacs-server timeout 30**

8. Commands for RADIUS

aaa enable

Command	**[no] aaa enable**
Parameter	**None.**
Default	AAA authentication is not enabled by default.
Mode	Global Mode.
Usage	Enables the AAA authentication function in the switch. The AAA authentication for the switch must be enabled first to enable IEEE 802.1x authentication for the switch. The no command disables the AAA authentication function.
Example	Enabling AAA function for the switch. **Switch(config)#aaa enable**

aaa-accounting enable

Command	**[no] aaa-accounting enable**
Parameter	**None.**
Default	AAA accounting is not enabled by default.
Mode	Global Mode.
Usage	Enables the AAA accounting function in the switch. When accounting is enabled in the switch, accounting will be performed according to the traffic or online time for port, the authenticated user is using. The switch will send an "accounting started" message to the RADIUS accounting server on starting the accounting, and an accounting packet for the online user to the RADIUS accounting server every five seconds, and an "accounting stopped" message is sent to the RADIUS accounting server on accounting end. **Note**: The switch send the "user offline" message to the RADIUS accounting server only when accounting is enabled, the "user offline" message will not be sent to the RADIUS authentication server. The no command disables the AAA accounting function.
Example	Enabling AAA accounting for the switch. **Switch(config)#aaa-accounting enable** **Switch(config)#aaa enable**

aaa-accounting update

Command	**aaa-accounting update {enable | disable}**
Parameter	**None.**
Default	By default, Enable the AAA update accounting function.
Mode	Global Mode.
Usage	Enables or disables the AAA update accounting function. After the update accounting function is enabled, the switch will sending accounting message to each online user on time.
Example	Disable the AAA update accounting function for switch. **Switch(config)#aaa-accounting update disable**

radius nas-ipv4

Command	**radius nas-ipv4 <ip-address>** **no radius nas-ipv4**
Parameter	**ip-address**: the source IP address of the RADIUS packet, in dotted decimal notation, it must be a valid unicast IP address.
Default	By default, No specific source IP address for RADIUS packet is configured, the IP address of the interface from which the RADIUS packets are sent is used as source IP address of RADIUS packet.
Mode	Global Mode.
Usage	Configures the source IP address for RADIUS packet sent by the switch. The source IP address must belong to one of the IP interface of the switch, otherwise a failure message of binding IP address will be returned when the switch send RADIUS packet. We suggest using the IP address of loopback interface as source IP address, it avoids that the packets from RADIUS server are dropped when the interface link-down. The no command deletes the configuration.
Example	Configure the source ip address of RADIUS packet as 192.168.2.254. **Switch(config)#radius nas-ipv4 192.168.2.254**

radius nas-ipv6

Command	**radius nas-ipv6 <ipv6-address>** **no radius nas-ipv6**
Parameter	**ipv6-address**: the source IPv6 address of the RADIUS packet, it must be a valid unicast IPv6 address.
Default	By default, No specific source IPv6 address for RADIUS packet is configured, the IPv6 address of the interface from which the RADIUS packets are sent is used as source IPv6 address of RADIUS packet.
Mode	Global Mode.
Usage	Configures the source IPv6 address for RADIUS packet sent by the switch. The source IPv6 address must belong to one of the IPv6 interface of the switch, otherwise a failure message of binding IPv6 address will be returned when the switch send RADIUS packet. We suggest using the IPv6 address of loopback interface as source IPv6 address, it avoids that the packets from RADIUS server are dropped when the interface link-down. The no command deletes the configuration.
Example	Configure the source ipv6 address of RADIUS packet as 2001:da8:456::1. **Switch(config)#radius nas-ipv6 2001:da8:456::1**

radius-server accounting host

Command	**radius-server accounting host {<ipv4-address> | <ipv6-address>} [port <port-number>] [key {0 | 7} <string>] [primary]** **no radius-server accounting host {<ipv4-address> | <ipv6-address>}**
Parameter	**ipv4-address:** stands for the server IPv4 address **ipv6-address:** stands for the server IPv6 address **port-number:** server listening port number from 0 to 65535 **string:** the key string. If key option is set as 0, the key is not encrypted and its range should not exceed 64 characters, if key option is set as 7, the key is encrypted and its range should not exceed 64 characters. **primary:** for primary server. Multiple RADIUS sever can be configured and would be available. RADIUS server will be searched by the configured order if primary is not configured, otherwise, the specified RADIUS server will be used first.

Default	No RADIUS accounting server is configured by default.
Mode	Global Mode.
Usage	Specifies the IPv4/IPv6 address and the port number, whether be primary server for RADIUS accounting server. This command is used to specify the IPv4/IPv6 address and port number of the specified RADIUS server for switch accounting, multiple command instances can be configured. The <port-number> parameter is used to specify accounting port number, which must be the same as the specified accounting port in the RADIUS server; the default port number is 1813. If this port number is set to 0, accounting port number will be generated at random and can result in invalid configuration. This command can be used repeatedly to configure multiple RADIUS servers communicating with the switch, the switch will send accounting packets to all the configured accounting servers, and all the accounting servers can be backup servers for each other. If primary is specified, then the specified RADIUS server will be the primary server. It only configures a RADIUS primary server whether the server use IPv4 address or IPv6 address. The no command deletes the RADIUS accounting server.
Example	Sets the RADIUS accounting server of IPv6 address to 2004:1:2:3::2, as the primary server, with the accounting port number as 3000. **Switch(config)#radius-server accounting host 2004:1:2:3::2 port 3000 primary**

radius-server authentication host

Command	**radius-server authentication host {<ipv4-address> | <ipv6-address>}[port <port-number>] [key {0 | 7} <string>] [primary] [access-mode {dot1x | telnet}]** **no radius-server authentication host {<ipv4-address> | <ipv6-address>}**
Parameter	**ipv4-address**: stands for the server IPv4 address **ipv6-address:** stands for the server IPv6 address **port-number:** server listening port number from 0 to 65535 **string:** the key string. If key option is set as 0, the key is not encrypted and its range should not exceed 64 characters, if key option is set as 7, the key is encrypted and its range should not exceed 64 characters. **primary:** for primary server. Multiple RADIUS sever can be configured and would be available. RADIUS server will be searched by the configured order if primary is not configured, otherwise, the specified RADIUS server will be used first.

	dot1x | telnet: designates the current RADIUS server only use 802.1x authentication or telnet authentication, all services can use current RADIUS server by default.
Default	No RADIUS authentication server is configured by default.
Mode	Global Mode.
Usage	Specifies the IPv4 address or IPv6 address and listening port number, cipher key, whether be primary server or not and access mode for the RADIUS server. This command is used to specify the IPv4 address or IPv6 address and port number, cipher key string and access mode of the specified RADIUS server for switch authentication, multiple command instances can be configured. The port parameter is used to specify authentication port number, which must be the same as the specified authentication port in the RADIUS server, the default port number is 1812. If this port number is set to 0, the specified server is regarded as non-authenticating. This command can be used repeatedly to configure multiple RADIUS servers communicating with the switch, the configured order is used as the priority for the switch authentication server. When the first server has responded (whether the authentication is succeed or failed), switch does not send the authentication request to the next. If primary is specified, then the specified RADIUS server will be the primary server. It will use the cipher key which be configured by radius-server key <string> global command if the current RADIUS server not configure key<string>. Besides, it can designate the current RADIUS server only use 802.1x authentication or telnet authentication via access-mode option. It is not configure access-mode option and all services can use current RADIUS server by default. The no command deletes the RADIUS authentication server.
Example	Setting the RADIUS authentication server address as 2004:1:2:3::2. **Switch(config)#radius-server authentication host 2004:1:2:3::2**

radius-server dead-time

Command	**radius-server dead-time <minutes>** **no radius-server dead-time**
Parameter	**minutes**: the down -restore time for RADIUS server in minutes, the valid range is 1 to 255.
Default	The default value is 5 minutes.

Mode	Global Mode.
Usage	This command specifies the time to wait for the RADIUS server to recover from inaccessible to accessible. When the switch acknowledges a server to be inaccessible, it marks that server as having invalid status, after the interval specified by this command; the system resets the status for that server to valid. The no command restores the default setting.
Example	Setting the down-restore time for RADIUS server to 3 minutes. **Switch(config)#radius-server dead-time 3**

radius-server key

Command	**radius-server key {0 | 7} <string>** **no radius-server key**
Parameter	**string:** a key string for RADIUS server, If key option is set as 0, the key is not encrypted and its range should not exceed 64 characters, if key option is set as 7, the key is encrypted and its range should not exceed 64 characters.
Default	None.
Mode	Global Mode.
Usage	Specifies the key for the RADIUS server (authentication and accounting). The key is used in the encrypted communication between the switch and the specified RADIUS server. The key set must be the same as the RADIUS server set, otherwise, proper RADIUS authentication and accounting will not perform properly. The no command deletes the key for RADIUS server.
Example	Setting the RADIUS authentication key to be “test”. **Switch(config)#radius-server key 0 test**

radius-server retransmit

Command	**radius-server retransmit <retries>** **no radius-server retransmit**
Parameter	**retries**: a retransmission times for RADIUS server, the valid range is 0 to 100.
Default	The default value is 3 times.
Mode	Global Mode.
Usage	This command specifies the retransmission time for a packet without a RADIUS server response after the switch sends the packet to the RADIUS server. If authentication information is missing from the authentication server, AAA authentication request will need to be re-transmitted to the authentication server. If AAA request retransmission count reaches the retransmission time threshold without the server responding, the server will be considered too as not work, the switch sets the server as invalid. The no command restores the default setting.
Example	Setting the RADIUS authentication packet retransmission time to five times. **Switch(config)#radius-server retransmit 5**

radius-server timeout

Command	**radius-server timeout <seconds>** **no radius-server timeout**
Parameter	**seconds**: the timer value (second) for RADIUS server timeout, the valid range is 1 to 1000.
Default	The default value is 3 seconds.
Mode	Global Mode.
Usage	This command specifies the interval for the switch to wait RADIUS server response. The switch waits for corresponding response packets after sending RADIUS Server request packets. If RADIUS server response is not received in the specified waiting time, the switch resends the request packet or sets the server as invalid according to the current conditions.

	The no command restores the default setting.
Example	Setting the RADIUS authentication timeout timer value to 30 seconds. **Switch(config)#radius-server timeout 30**

radius-server accounting-interim-update timeout

Command	**radius-server accounting-interim-update timeout <seconds>** **no radius-server accounting-interim-update timeout**
Parameter	**seconds**: the interval of sending fee-counting update messages, in seconds, ranging from 60 to 3600.
Default	The default interval of sending fee-counting update messages is 300 seconds.
Mode	Global Mode.
Usage	This command sets the interval at which NAS sends fee-counting update messages. In order to realize the real time fee-counting of users, from the moment the user becomes online, NAS will send a fee-counting update message of this user to the RADIUS server at the configured interval. The interval of sending fee-counting update messages is relative to the maximum number of users supported by NAS. The smaller the interval, the less the maximum number of the users supported by NAS; the bigger the interval, the more the maximum number of the users supported by NAS. The following is the recommended ratio of interval of sending fee-counting update messages to the maximum number of the users supported by NAS: The maximum number of users The interval of sending fee-counting update messages(in seconds) 1-299 300（default） 300-599 600 600-1199 1200 1200-1799 1800 ≥1800 3600 The no operation of this command will reset to the default configuration.
Example	The maximum number of users supported by NAS is 700, the interval of sending fee-counting update messages 1200 seconds. **Switch(config)#radius-server accounting-interim-update timeout 1200**

show aaa authenticated-user

Command	**show aaa authenticated-user**
Parameter	**None.**
Default	None.
Mode	Admin/Global Mode.
Usage	Displays the authenticated users online. Usually the administrator concerns only information about the online user, the other information displayed is used for troubleshooting by technical support.
Example	Displays the authenticated users online. **Switch#show aaa authenticated-user** ---------- authenticated users ---------- UserName Retry RadID Port EapID ChapID OnTime UserIP MAC ---------- ---------- total: 0 ----------

show aaa authenticating-user

Command	**show aaa authenticating-user**
Parameter	**None.**
Default	None.
Mode	Admin/Global Mode.
Usage	Displays the authenticating users. Usually the administrator concerns only information about the authenticating user, the other information displays is used for troubleshooting by the technical support.
Example	Display the authenticating users. **Switch#show aaa authenticating-user** ----------authenticating users ---------- User-name Retry-time Radius-ID Port Eap-ID Chap-ID Mem-Addr State ---------- ---------- total: 0 ----------

show aaa config

Command	show aaa config
Parameter	None.
Default	None.
Mode	Admin/Global Mode.
Usage	Displays whether aaa authentication, accounting are enabled and information for key, authentication and accounting server specified.
Example	Display aaa configuration information. **Switch#show aaa config** ---------- AAA config data ---------- Is Aaa Enabled = 1 :1 means AAA authentication is enabled, 0 means is not enabled Is Account Enabled= 1 :1 means AAA account is enabled, 0 means is not enabled MD5 Server Key = yangshifeng : Authentication key authentication server sum = 2 :Configure the number of authentication server .....

show radius authenticated-user count

Command	show radius authenticated-user count
Parameter	None.
Default	None.
Mode	Admin/Global Mode.
Usage	Shows the number of on-line users who have already passed the authentication.
Example	To show the number of on-line users who have already passed the authentication. **Switch#show radius authenticated-user count** The authenticated online user num is: 105

show radius authenticating-user count

Command	**show radius authenticating-user count**
Parameter	**None.**
Default	None.
Mode	Admin/Global Mode.
Usage	Shows the number of the authenticating-user.
Example	To show the number of the authenticating-user. **Switch#show radius authenticating-user count** The authenticating user num is: 10

show radius count

Command	**show radius count {authenticated-user|authenticating-user} count**
Parameter	**authenticated-user:** displays the authenticated users online **authenticating-user:** displays the authenticating users
Default	None.
Mode	Admin/Global Mode.
Usage	Displays the statistics for users of RADIUS authentication.
Example	To display the statistics for users of RADIUS authentication. **Switch#show radius authenticated-user count** The authenticated online user num is: 0

9. Commands for SSL Configuration

ip http secure-server

Command	**[no] ip http secure-server**
Parameter	**None.**
Default	By default, this function is disabled.
Mode	Global Mode.
Usage	This command is used to enable and disable SSL function. After enabling SSL function, the users visit the switch through https client, switch and client use SSL connect, can form safety SSL connect channel. After that, all the data which transmit of the application layer will be encrypted, then ensure the privacy of the communication. The no command disables SSL function.
Example	Enable SSL function. **Switch(config)#ip http secure-server**

ip http secure-port

Command	**ip http secure-port <port-number>** **no ip http secure-port**
Parameter	**port-number:** means configured port number, range between 1025 and 65535. 443 is for default.
Default	By default, SSL port number is not configured.
Mode	Global Mode.
Usage	Configures/deletes port number by SSL used. If this command is used to configure the port number, then the configured port number is used to monitor. If the port number for https is changed, when users try to use https to connect, must use the changed one. For example:https://device:port_number. SSL function must reboot after every change. The no command removes the configured port number.

Example	Configure the port number is 1028. **Switch(config)#ip http secure-port 1028** **Switch(config)#ip http secure-server**

ip http secure-ciphersuite

Command	**ip http secure-ciphersuite {des-cbc3-sha|rc4-128-sha| des-cbc-sha}** **no ip http secure-ciphersuite**
Parameter	**aes256-sha** : encrypted algorithm AES_256, summary algorithm SHA **rc4-128-sha:** encrypted algorithm RC4_128, summary algorithm SHA **ecdhe-rsa-aes256-sha:** encrypted algorithm ECDHE_RSA_AES_256, summary algorithm SHA
Default	By default, SSL secure password suite is not configured.
Mode	Global Mode.
Usage	Configures/deletes secure cipher suite by SSL used. If this command is used to configure the secure cipher suite, specified encryption method will be used. The SSL should be restarted to take effect after changes on configuration. When des-cbc-sha is configured, IE 7.0 or above is required. No command removes the configured secure password suite.
Example	Configure the secure cipher suite is aes256-sha **Switch(config)#ip http secure-ciphersuite aes256-sha**

show ip http secure-server status

Command	**ip show ip http secure-server status**
Parameter	**None.**
Default	None.
Mode	Admin/Global Mode.
Usage	Show the status for the configured SSL.
Example	Show the status for the configured SSL. **Switch(config)#show ip http secure-server status**

	HTTP secure server status: Enabled HTTP secure server port: 1028 HTTP secure server ciphersuite: aes256-sha

10. Commands for IPv6 Security RA

ipv6 security-ra enable

Command	**[no] ipv6 security-ra enable**
Parameter	**None.**
Default	The IPv6 security RA function is disabled by default.
Mode	Global Mode.
Usage	Globally enables IPv6 security RA function, all the RA advertisement messages will not be forwarded through hardware, but only sent to CPU to handle. Only after enabling the global security RA function, the security RA on a port can be enabled. Globally disabling security RA will clear all the configured security RA ports. The global security RA function and the global IPv6 SAVI function are mutually exclusive, so they cannot be enabled at the same time. The no operation of this command will globally disable IPv6 security RA function.
Example	Globally enable IPv6 security RA. **Switch(config)#ipv6 security-ra enable**

ipv6 security-ra enable

Command	**[no] ipv6 security-ra enable**
Parameter	**None.**
Default	The IPv6 security RA function is disabled by default.
Mode	Port Configuration Mode.
Usage	Enables IPv6 security RA on a port, causing this port not to forward the received RA message. Only after globally enabling the security RA function, can the security RA on a port be enabled. Globally disabling security RA will clear all the

	configured security RA ports. The no ipv6 security-ra enable will disable the IPv6 security RA on a port.
Example	Enable IPv6 security RA on a port. **Switch(config-if-ethernet1/0/2)#ipv6 security-ra enable**

show ipv6 security-ra

Command	**show ipv6 security-ra [interface <interface-list>]**
Parameter	**interface-list:** Specifies the port number. No parameter will display all distrust ports, entering a parameter will display the corresponding distrust port.
Default	None.
Mode	Admin/Global Mode.
Usage	Displays all the interfaces with IPv6 RA function enabled.
Example	Display all the interfaces with IPv6 RA function enabled. **Switch# show ipv6 security-ra** IPv6 security ra config and state information in the switch Global IPv6 Security RA State: Enable Ethernet1/0/1 IPv6 Security RA State: Yes Ethernet1/0/3 IPv6 Security RA State: Yes

11. Commands for MAB

authentication mab

Command	**authentication mab {radius|local} (none)** **no authentication mab**
Parameter	**radius:** means RADIUS authentication mode **local:** means the local authentication **none:** means the authentication is needless
Default	By default, using RADIUS authentication mode.
Mode	Global Mode.
Usage	Configures the authentication mode and priority of MAC address authentication none option is used to the fleeing function of MAC address authentication. If all configured RADIUS servers don't respond, switch will adopt none authentication mode to allow that MAC address authentication users access the network directly. The option of local is used for the local authentication of MAC address, it authenticates through the local user name and password. If configured as the method of authentication mab radius local none, judge if configured the user name and password used in mab authentication in local when the radius server has no response. If it has been configured, use the local authentication, if not, use the backup none authentication. The no command restores the default authentication mode.
Example	Configure the local authentication and the fleeing function of MAC address authentication. **Switch(config)#authentication mab radius local none**

clear mac-authentication-bypass binding

Command	**clear mac-authentication-bypass binding {mac WORD | interface (ethernet IFNAME | IFNAME) | all}**
Parameter	**mac:** Delete MAB binding of the specified MAC address **IFNAME:** Delete MAB binding of the specified port **all:** Delete all MAB binding
Default	None.
Mode	Admin Mode.

Usage	Clears MAB binding information.
Example	Delete all MAB binding. **Switch#clear mac-authentication-bypass binding all**

mac-authentication-bypass binding-limit

Command	**mac-authentication-bypass binding-limit <1-100>** **no mac-authentication-bypass binding-limit**
Parameter	**1-100:** the max binding number of MAB, ranging from 1 to 100.
Default	By default, the max binding number of MAB is 3.
Mode	Port Configuration Mode.
Usage	Sets the max binding number of MAB. Sets the max binding number of MAB. When the binding number reaches to the max value, the port will stop binding, if the max binding number is less than the current binding number of the port, the setting will be unsuccessful. The no command will restore the default binding number as 3.
Example	Configure the max binding number as 10. **Switch(config)#interface ethernet 1/0/1** **Switch(config-if-ethernet1/0/1)#mac-authentication-bypass binding-limit 10**

mac-authentication-bypass enable

Command	**[no] mac-authentication-bypass enable**
Parameter	**None.**
Default	By default, disable the global and port MAB function.
Mode	Port Configuration Mode.
Usage	Enables the global and port MAB function. To process MAB authentication of a port, enable the global MAB function first, and then, enable the MAB function of the corresponding port. The no command disables MAB function.

Example	Enable the global and port Eth1/0/1 MAB function. **Switch(config)#mac-authentication-bypass enable** **Switch(config)#interface ethernet 1/0/1** **Switch(config-if-ethernet1/0/1)#mac-authentication-bypass enable**

mac-authentication-bypass guest-vlan

Command	**mac-authentication-bypass guest-vlan <1-4094>** **no mac-authentication-bypass guest-vlan**
Parameter	**1-4094:** guest vlan ID, ranging from 1 to 4094.
Default	By default, the max binding number of MAB is 3.
Mode	Port Configuration Mode.
Usage	Sets guest vlan of MAB authentication. Sets guest vlan of MAB authentication, only Hybrid port use this command, it does not take effect on access port. After MAB authentication is failing, if the existent guest vlan is configured by the port connecting to the MAB user, the MAB user can join and access guest vlan. The no command deletes guest vlan.
Example	Configure guest vlan of MAB authentication for port 1/0/1. **Switch(config)#interface ethernet 1/0/1** **Switch(config-if-ethernet1/0/1)#mac-authentication-bypass guest-vlan 10**

mac-authentication-bypass spoofing-garp-check

Command	**[no] mac-authentication-bypass spoofing-garp-check**
Parameter	**None.**
Default	By default, disable spoofing-garp-check function.
Mode	Global Mode.
Usage	Enables the spoofing-garp-check function, MAB function will not deal with spoofing-garp any more When the terminal of Windows operating system detects the address conflict, it will send a gratuitous ARP to correct the error ARP entries generated by gratuitous ARP of the conflict detection. This command is used to detect the spoofing-garp

	when occurring the address conflict, MAB function is not deal with the packet any more. ***Notice**: when enabling the check function, all ARP will be processed the Software check, it will add switch's load.* The no command disables the function.
Example	Enable spoofing-garp-check function. **Switch(config)#mac-authentication-bypass spoofing-garp-check enable**

mac-authentication-bypass timeout linkup-period

Command	**mac-authentication-bypass timeout linkup-period <0-30>** **no mac-authentication-bypass timeout linkup-period**
Parameter	**0-30:** After the port is shutdown automatically, the interval before it up again, the unit is second, 0 means there is no down/up operation.
Default	By default, the interval is 0.
Mode	Port Configuration Mode.
Usage	Sets the interval between down and up when VLAN binding in a port is changing to assure the user can obtain IP again. When MAB authentication is successful, belong to vlan according to auto-vlan setting, when MAB authentication is failing, belong to vlan according to guest-vlan setting. After linkup-period is set, when VLAN binding of a port is changing, the port will be shutdown automatically, and will be up again after linkup-period to assure the client obtain IP. The no command to restore default values.
Example	To configure down/up time as 12s. **Switch(config)#mac-authentication-bypass timeout linkup-period 12**

mac-authentication-bypass timeout offline-detect

Command	**mac-authentication-bypass timeout offline-detect (0 | <60-7200>)** **no mac-authentication-bypass timeout offline-detect**
Parameter	**0 | <60-7200>:** offline-detect time, the range is 0 or 60 to 7200s.
Default	By default, offline-detect time is 180s.
Mode	Global Mode.
Usage	Configures offline-detect time. When offline-detect time is 0, the switch does not detect MAB binding, when offline-detect time is 60s to 7200s, the switch timely detects the flow corresponding to the MAB binding. If there is no flow in the period of offline-detect time, it will delete this binding and forbid the flow to pass. The no command restores the default value.
Example	Configure offline-detect time as 200s. **Switch(config)#mac-authentication-bypass timeout offline-detect 200**

mac-authentication-bypass timeout quiet-period

Command	**mac-authentication-bypass timeout quiet-period <1-60>** **no mac-authentication-bypass timeout quiet-period**
Parameter	**1-60:** quiet-period, ranging from 1 to 60s
Default	By default, quiet-period is 30s.
Mode	Global Mode.
Usage	Sets quiet-period of MAB authentication. If MAB authentication is failing, within the quiet-period the switch will not respond the authentication request of this MAC, after quiet-period, it will respond the request again. The no command restores quiet-period as the default value.
Example	Configure quiet-period of MAB authentication as 60s. **Switch(config)#mac-authentication-bypass timeout quiet-period 60**

mac-authentication-bypass timeout reauth-period

Command	**mac-authentication-bypass timeout quiet-period <1-60>** **no mac-authentication-bypass timeout quiet-period**
Parameter	**1-3600:** reauthentication interval, ranging from 1 to 3600s.
Default	By default, reauthentication interval is 30s.
Mode	Global Mode.
Usage	Sets the reauthentication interval at failing authentication state. At failing authentication state, the user processes the reauthentication timely until the authentication is successful; at the successful state, the user can access the network resources. The no command restores the default value.
Example	Configure reauthentication time as 20s. **Switch(config)#mac-authentication-bypass timeout reauth-period 20**

mac-authentication-bypass timeout stale-period

Command	**mac-authentication-bypass timeout stale-period <0-60>** **no mac-authentication-bypass timeout stale-period**
Parameter	**0-60:** The time that delete the binding, ranging from 0 to 60s.
Default	By default, it takes 30 s. to delete the binding.
Mode	Global Mode.
Usage	Sets the time that delete the binding user after MAB port is down. If the time that deletes the binding as 0, deletes all user binding of this port as soon as the MAB port is down, if the time is bigger than 0, deletes the user binding with a delay after the MAB port is down. The no command restores the default value.
Example	Configure the deletion time as 40s. **Switch(config)#mac-authentication-bypass timeout stale-period 40**

mac-authentication-bypass username-format

Command	**[no] mac-authentication-bypass username-format {mac-address | {fixed username WORD password WORD}}**
Parameter	**mac-address**: Use MAC address of MAB user as username and password to authenticate. **fixed username WORD password WORD:** Use the specified username and password to authenticate, the length of username and password ranges between 1 and 32 characters.
Default	By default, use MAC address of MAB user as username and password to authenticate.
Mode	Global Mode.
Usage	Sets the authentication method of MAB authentication. There are two methods for MAB authentication: use MAC address of MAB user as username and password to authenticate or use the specified username and password to authenticate. If there is no specified username and password, the device uses the first method to authenticate by default. The no command to restore default values.
Example	All MAB users use the same username and password to authenticate, the username is mab-user, and the password is mab-pwd. **Switch(config)#mac-authentication-bypass username-format fixed username mab-user password mab-pwd**

show mac-authentication-bypass

Command	**show mac-authentication-bypass {interface {ethernet IFNAME | IFNAME)|}**
Parameter	**IFNAME**: Port name
Default	None.
Mode	Admin/Global Mode.
Usage	Shows the binding information of MAB authentication.
Example	To show the binding information of MAB authentication. **Switch#show mac-authentication-bypass** The Number of all binding is 5

	MAC Interface Vlan ID State --- 04-0a-eb-6a-7f-88 Ethernet1/0/1 1 MAB_QUIET 03-0a-eb-6a-7f-88 Ethernet1/0/1 1 MAB_QUIET 02-0a-eb-6a-7f-88 Ethernet1/0/1 1 MAB_AUTHENTICATED 00-0a-eb-6a-7f-8e Ethernet1/0/1 1 MAB_AUTHENTICATED **Switch(config)#show mac-authentication-bypass int e1/0/1** Interface Ethernet1/0/1 user config: MAB enable: Enable Binding info: 1 --- MAB Binding built at SUN JAN 01 01:14:48 2006 VID 1, Port: Ethernet1/1 Client MAC: 00-0a-eb-6a-7f-8e Binding State: MAB_AUTHENTICATED Binding State Lease: 164 seconds left

12. Commands for MAB PPPoE Intermediate Agent

pppoe intermediate-agent

Command	**[no] pppoe intermediate-agent**
Parameter	**None.**
Default	By default, disable global PPPoE intermediate agent function.
Mode	Global Mode.
Usage	Enables global PPPoE intermediate agent function. After enable global PPPoE IA function, process the packet of PPPoE discovery stage according to the related configuration. The no command disables global PPPoE intermediate agent function.
Example	Enable global PPPoE intermediate agent function. **Switch(config)#pppoe intermediate-agent**

pppoe intermediate-agent (Port)

Command	**[no] pppoe intermediate-agent**
Parameter	**None.**
Default	By default, disabled PPPoE intermediate agent function of the port.
Mode	Port Configuration Mode.
Usage	Enables PPPoE intermediate agent function of the port. After enabling PPPoE IA function of the port, add vendor tag for PPPoE packet of the port. ***Note:*** 1. It must enable global pppoe intermediate-agent function. 2. At least one port is connected to PPPoE server, and the port mode is trust. The no command disables PPPoE intermediate agent function of the port.
Example	Enable PPPoE intermediate agent function of the port ethernet 1/0/2. **Switch(config-if-ethernet1/0/2)#pppoe intermediate-agent**

pppoe intermediate-agent circuit-id

Command	**[no] pppoe intermediate-agent circuit-id <string>**
Parameter	**string**: circuit-id, the max character number is 63 bytes.
Default	This function is not configured by default.
Mode	Port Configuration Mode.
Usage	Configures circuit ID of the port. This command configures circuit-id alone for each port, the priority is higher than pppoe intermediate-agent identifier-string command. The no command cancels this configuration.
Example	Configure circuit-id as abcd/efgh on port ethernet1/0/3 of vlan3. **Switch(config-if-ethernet1/0/3)#pppoe intermediate-agent circuit-id abcd/efgh**

pppoe intermediate-agent delimiter

Command	**pppoe intermediate-agent delimiter <WORD>** **no pppoe intermediate-agent delimiter**
Parameter	**WORD**: the delimiter, its range is (#|.|,|;|:|/|space)
Default	By default, the fields is comparted with '\0'.
Mode	Global Mode.
Usage	Configures the delimiter among the fields in circuit-id and remote-id. After configuring the delimiter, the added fields of circuit-id and remote-id use the configured delimiter to compart. ***Notice***: The global pppoe intermediate-agent function must be enabled. The no command cancels the configuration.
Example	Configuration delimiter is space. **Switch(config)#pppoe intermediate-agent delimiter space**

pppoe intermediate-agent format

Command	**pppoe intermediate-agent format (circuit-id | remote-id) (hex | ascii)** **no pppoe intermediate-agent format (circuit-id | remote-id)**
Parameter	**hex:** hexadecimal **ascii:** ASCII code
Default	This function is not configured by default.
Mode	Global Mode.
Usage	Configures the format with hex or ASCII for circuit-id and remote-id. Encapsulation circuit-id and remote-id with hex ASCII format to vendor tag. ***Notice***: The global pppoe intermediate-agent function must be enabled. The no command cancels the configuration.
Example	To configure the trust port 1/0/1 to enable vendor-tag strip function. **Switch(config)#pppoe intermediate-agent format remote-id ascii**

pppoe intermediate-agent remote-id

Command	**[no] pppoe intermediate-agent remote-id <string>**
Parameter	**string**: remote-id, the max character number is 63 bytes
Default	This function is not configured by default.
Mode	Port Configuration Mode.
Usage	Configures remote-id of the port. Configures remote-id for each port, if there is no configuration, use switch's MAC as remote-id value. The no command cancels this configuration.
Example	Configure remote-id as abcd on port ethernet1/0/2. **Switch(config-if-ethernet1/0/2)# pppoe intermediate-agent remote-id abcd**

pppoe intermediate-agent trust

Command	**[no] pppoe intermediate-agent trust**
Parameter	**None.**
Default	By default, the port is an untrust port.
Mode	Port Configuration Mode.
Usage	Configures the port as trust port. The port which connect to server must be configured as trust port. ***Note***: At least one trust port is connected to PPPoE server. The no command configures the port as untrust port.
Example	Configure port ethernet1/0/1 as trust port. **Switch(config-if-ethernet1/0/1)#pppoe intermediate-agent trust**

pppoe intermediate-agent type self-defined circuit-id

Command	**pppoe intermediate-agent type self-defined circuit-id {vlan | port | id (switch-id (mac | hostname) | remote-mac) | string WORD}** **no pppoe intermediate-agent type self-defined circuit-id**
Parameter	**vlan:** VLAN ID **port:** port number **id switch-id mac:** the local MAC address **id switch-id hostname:** the local host name **remote-mac:** the remote MAC address **string WORD:** the specified keyword
Default	By default, this configuration is null.
Mode	Global Mode.
Usage	Configures the self-defined circuit-id. This configuration and type tr-101 circuit-id are mutually exclusive, it will clear the corresponding configuration of type tr-101 circuit-id. The no command cancels the configuration.
Example	Configure the self-defined circuit-id as vlan port id switch-id hostname. **Switch(config)#pppoe intermediate-agent type self-defined circuit-id vlan port id switch-id hostname**

pppoe intermediate-agent type self-defined remoteid

Command	**pppoe intermediate-agent type self-defined remoteid {mac | vlan-mac | hostname | string WORD}** **no pppoe intermediate-agent type self-defined remote-id**
Parameter	**mac:** Ethernet port MAC address **vlan-mac:** IP interface MAC address **hostname:** the local host name **string WORD:** the specified keyword
Default	By default, this configuration is empty.
Mode	Global Mode.
Usage	Configures the self-defined remote-id. Configuration order of this command according to the fields order in remote-id. The no command cancels the configuration.
Example	Configure the self-defined remote-id as string abcd mac hostname. **Switch(config)#pppoe intermediate-agent type self-defined remoteid string abcd mac hostname**

pppoe intermediate-agent vendor-tag strip

Command	**[no] pppoe intermediate-agent vendor-tag strip**
Parameter	**None.**
Default	By default, disable vendor-tag strip function of the port.
Mode	Port Configuration Mode.
Usage	Enables vendor-tag strip function of the port. If the received packet includes vendor tag from server to client, strip this vendor tag. ***Note***: 1. Must enable global pppoe intermediate-agent function. 2. It must be configured on trust port. The no command cancels this function.
Example	Trust port ethernet1/0/1 enables vendor tag strip function.

	Switch(config-if-ethernet1/0/1)#pppoe intermediate-agent trust **Switch(config-if-ethernet1/0/1)#pppoe intermediate-agent vendor-tag strip**

show pppoe intermediate-agent access-node-id

Command	**show pppoe intermediate-agent access-node-id**
Parameter	**None.**
Default	By default, the configuration information is null.
Mode	Admin mode
Usage	This command is used to show access-node-id configured by user.
Example	Show access-node-id configuration information. **Switch#show pppoe intermediate-agent access-node-id** pppoe intermediate-agent access-node-id is : abcd

show pppoe intermediate-agent identifier-string option delimiter

Command	**show pppoe intermediate-agent identifier-string option delimiter**
Parameter	**None.**
Default	By default, the configuration information is null.
Mode	Admin mode.
Usage	Shows the configured identifier-string, the combo format and delimiter of slot, port and vlan.
Example	Show the configuration information for pppoe intermediate-agent identifier-string. **Switch# show pppoe intermediate-agent identifier-string option delimiter** config identifier string is : abcd config option is : slot , port and vlan the first delimiter is : "# " the second delimiter is : "/ "

show pppoe intermediate-agent info

Command	**show pppoe intermediate-agent info [interface ethernet <interface-name>]**
Parameter	**interface-name**: port name
Default	By default, the configuration information is null.
Mode	Admin mode.
Usage	Shows the related PPPoE IA configuration information of all ports or the specified port. Checks the configuration information of the corresponding port, show whether the port is trust port, strip function is enabled, rate limit is enabled, show the configured circuit ID and remote ID.
Example	Show pppoe intermediate-agent configuration information of port ethernet1/0/2. **Switch# show pppoe intermediate-agent info interface ethernet 1/0/2** Interface IA Trusted vendor Strip Rate limit circuit id remote id ---------- ------ ------ ---------- ------- --------- ---- Ethernet1/0/2 yes no no no test1/port1 host1

13. Commands for VLAN-ACL

clear vacl statistic vlan

Command	**clear vacl [in | out] statistic vlan [<1-4094>]**
Parameter	**in | out**: Clear the traffic statistic of the ingress/egress. **1-4094:** The VLAN which needs to clear the VACL statistic information. If do not input VLAN ID, then clear all VLAN statistic information.
Default	None.
Mode	Admin mode.
Usage	This command can clear the statistic information of VACL.
Example	Clear VACL statistic information of Vlan1. **Switch#clear vacl statistic vlan 1**

show vacl vlan

Command	**show vacl [in | out] vlan [<1-4094>] | [begin | include | exclude <regular-expression>]**
Parameter	**in | out:** Show ingress/egress configuration and statistic. **1-4094:** The VLAN which needs to show the configuration and the statistic information of VACL. If do not input VLAN ID, then show VACL configuration and statistic information of all VLANs. **begin | include | exclude <regular-expression>:** the regular expression matches any characters except the line feed character. ^ match the beginning of the row $ match the end of the row | match the character string at the left or right of upright line [0-9] match the number 0 to the number 9 [a- z] match the lowercase a to z [aeiou] match any letter in “aeiou” \ Escape Character is used to match the intervocalic character, for example, \$ will match the $ character, but it is not match the end of the character string \w match the letter, the number or the underline \b match the beginning or the end of the words \W match any characters which are not alphabet letter, number and underline \B match the locations which are not the begin or end of the word [^x] match any characters except x [^aeiou] match any characters except including aeiou letters * repeat zero time or many times

	+ repeat one time or many times (n) repeat n times (n,) repeat n or more times (n, m) repeat n to m times **At present, the regular expression used does not support the following syntaxes:** \s match the blank character \d match the number \S match any characters except blank character \D match non-number character ? repeat zero time or one time
Default	None.
Mode	Admin mode.
Usage	This command shows the configuration and the statistic information of VACL.
Example	Show vlan2 VACL statistics. **Switch#show vacl vlan 2** Vlan 2: IP Ingress access-list used is 100, traffic-statistics Disable.

vacl ipv6 access-group

Command	**vacl ipv6 access-group (<500-699> | WORD) {in } (traffic-statistic|) vlan WORD** **no ipv6 access-group {<500-699> | WORD} {in } vlan WORD**
Parameter	**<500-699> | WORD**: Configure the IPv6 numeric standard ACL or IPV6 standard ACL rule. **in | out:** Filter inlet/ outlet flow. **traffic-statistic:** Enable the statistic of matched packets number. **vlan WORD:** The VLAN will be bound to VACL.
Default	None.
Mode	Global mode.
Usage	This command configures VACL of IPv6 on the specific VLAN. Use ";" or "-" to input the VLAN or multi-VLANs, but do not exceed 128, and CLI length cannot exceed 80 characters. Egress direction filtering and extended IPv6 is not supported by switch. The no command deletes the configuration.
Example	Configure the numeric IPv6 ACL for Vlan 5.

	Switch(config)#vacl ipv6 access-group 600 in traffic-statistic vlan 5

vacl mac access-group

Command	**vacl mac access-group {<700-1199> | WORD} {in } [traffic-statistic] vlan WORD** **no vacl mac access-group {<700-1199> | WORD} {in } vlan WORD**
Parameter	**<700-1199> | WORD**: Configure the numeric IP ACL (include: <700-799> MAC standard access list, <1100-1199> MAC extended access list) or the named ACL. **in:** Filter the ingress traffic. **traffic-statistic:** Enable the statistic of matched packets number. **vlan WORD:** The VLAN will be bound to VACL.
Default	None.
Mode	Global mode.
Usage	This command configures VACL of MAC type on the specific VLAN. Use ";" or "-" to input the VLAN or multi-VLANs, but do not exceed 128, and CLI length cannot exceed 80 characters. Egress direction filtering is not supported by switch. The no command deletes the configuration.
Example	Configure the numeric MAC ACL for Vlan 1-5 **Switch(config)#vacl mac access-group 700 in traffic-statistic vlan 1-5**

vacl mac-ip access-group

Command	**vacl mac-ip access-group {<3100-3299> | WORD} {in } [traffic-statistic] vlan WORD** **no vacl mac-ip access-group {<3100-3299> | WORD} {in } vlan WORD**
Parameter	**<3100-3299> | WORD**: Configure the numeric MAC-IP ACL or the named ACL. **in:** Filter the ingress traffic. **traffic-statistic:** Enable the statistic of matched packets number. **vlan WORD:** The VLAN will be bound to VACL.
Default	None.

Mode	Global mode.
Usage	This command configures VACL of MAC-IP type on the specific VLAN. Use ";" or "-" to input the VLAN or multi-VLANs, but do not exceed 128, and CLI length cannot exceed 80 characters. Egress direction filtering is not supported by switch. The no command deletes the configuration.
Example	Configure the numeric MAC-IP ACL for Vlan 1, 2, 5. **Switch(config)#vacl mac-ip access-group 3100 in traffic-statistic vlan 1;2;5**

14. Commands for SAVI

ipv6 cps prefix

Command	**ipv6 cps prefix <ipv6-address> vlan <vid>** **no ipv6 cps prefix<ipv6-address>**
Parameter	**ipv6-address**: the address prefix of link, like 2001::/64. **vid:** vlan ID of the current link.
Default	None.
Mode	Global mode.
Usage	Configures IPv6 address prefix of the link manually. Users should configure local address prefix: fe80::/64 of the link before enable the function of matching address prefix of the link, it accepts the packets of which source addresses are the local addresses of the link. The no command deletes IPv6 address prefix.
Example	Configure IPv6 address prefix of the link manually is 2001::/64. **Switch(config)#ipv6 cps prefix 2001::/64 vlan 10**

ipv6 cps prefix check enable

Command	**[no] ipv6 cps prefix check enable**
Parameter	**None.**
Default	By default, disabled, SAVI address prefix check function.
Mode	Global mode.
Usage	Enables SAVI address prefix check function. After enable the prefix check function, if the IPv6 address prefix of the packets do not accord with the link prefix, then do not establish the corresponding IPv6 address binding. If users enable the matched address prefix of the link, configure the local address prefix of fe80::/64 first, accept the packets with the source address as local link address. Disable address prefix check function by default. The no command will disable this function.
Example	Enable SAVI address prefix check function. **Switch(config)#ipv6 cps prefix check enable**

ipv6 dhcp snooping trust

Command	**[no] ipv6 dhcp snooping trust**
Parameter	**None.**
Default	By default, this function is disabled.
Mode	Port mode.
Usage	Configures the port as dhcpv6 trust port, it does not establish dynamic DHCPv6 binding again and allows all DHCPv6 protocol packets to pass. Set the port as dhcpv6 trust attribute, enable uplink port of the switch with SAVI function for connecting dhcpv6 server or dhcpv6 relay generally. no command deletes the port trust function.
Example	Set ethernet1/0/1 to be DHCP trust port. **Switch(config)#interface ethernet1/0/1** **Switch(config-if-ethernet1/0/1)#ipv6 dhcp snooping trust**

ipv6 nd snooping trust

Command	**[no] ipv6 nd snooping trust**
Parameter	**None.**
Default	By default, this function is disabled.
Mode	Port mode.
Usage	Configures the port as slaac trust and RA trust port, this port will not establish dynamic slaac binding anymore and forwards RA packets. If the port disables ipv6 nd snooping trust function, it is considered to untrusted RA packets port and discards all RA packets. Setting the port as trust attribute, enable the uplink port of the switch with SAVI or the conjoint port between switches with SAVI generally. The no command deletes the port trust function.
Example	Set the port ethernet1/0/1 to be nd trust port. **Switch(config)#interface ethernet1/0/1** **Switch(config-if-ethernet1/0/1)#ipv6 nd snooping trust**

savi check binding

Command	**savi check binding <simple | probe> mode** **no savi check binding mode**
Parameter	**simple:** only check the port state for conflict binding, if the state is up, keep the conflict binding and do not set new binding. If the state is down, deletes the conflict binding to set a new one. **probe:** besides checking the port state for conflict binding, it will send NS packets to probe the usability of the corresponding user when the port state is up. If receiving the responded NA packets from users, it will keep the current conflict binding and does not set new binding, otherwise delete the conflict binding to set new one.
Default	Disabled.
Mode	Global mode.
Usage	Configures the check mode for conflict binding. It is recommended to configure probe mode to prevent the attack that the spurious address conflict binding deletes the legal user binding. The no command deletes the check mode.
Example	Configure the conflict binding check mode to probe mode. **Switch(config)#savi check binding probe mode**

savi enable

Command	**[no] savi enable**
Parameter	**None.**
Default	By default, disable the global SAVI function.
Mode	Global mode.
Usage	Enables the global SAVI function. Command configuration can be processed for SAVI function after enabling the global SAVI function. Because SAVI function has already contained security RA function, global SAVI function and security RA function are mutually exclusive in the global mode. The no command disables this global function.
Example	Enable SAVI function. **Switch(config)#savi enable**

savi ipv6 binding num

Command	**savi ipv6 binding num <limit-num>** **no savi ipv6 binding num**
Parameter	**limit-num:** set the range from 0 to 65535.
Default	The default value of the port binding number is 65535.
Mode	Port mode.
Usage	Configures the number of the corresponding binding with the port. The configured binding number only include the dynamic binding type of slaac, dhcp. If the binding sum exceeds the configured number, this port does not create new dynamic binding any more, if the configured number is 0, this port does not create any dynamic binding. The no command restores the default value.
Example	Configure the binding number to be 100 for port ethernet1/0/1. **Switch(config)#interface ethernet1/0/1** **Switch(config-if-ethernet1/0/1)# savi ipv6 binding num 100**

savi ipv6 check source binding

Command	**savi ipv6 check source binding ip <ip-address> mac <mac-address> interface <if-name> {type [slaac | dhcp] lifetime <lifetime> | type static}** **no savi ipv6 check source binding ip <ip-address> interface <if-name>**
Parameter	**ip-address**: the unicast IPv6 address, including local link and global unicast address. **mac-address:** the mac address of Ethernet. **if-name:** the port name, like interface ethernet 1/0/1. **slaac | dhcp:** slaac means create the dynamic binding for slaac type, dhcp means create the dynamic binding for dhcp type. **lifetime:** configure the lifetime period for the dynamic binding, the unit is second. **static:** create the binding of the static type.
Default	None.
Mode	Global mode.

Usage	Configures the static or dynamic binding function manually. After the dynamic binding configuration by handwork is overtime, the corresponding binding will be deleted but the configuration is still be kept, so the binding still be shown. If the binding needs to take effect again, it should delete it first and configure a new binding again. When the binding type is static type, do not configure lifetime period, the lifetime period is infinite. The no command deletes the configured binding.
Example	Configure the dynamic binding of slaac type for SAVI manually. **Switch(config)#savi ipv6 check source binding ip 2001::10 mac 00-25-64-BB-8F-04** **Interface ethernet1/0/1 type slaac lifetime 2010** Configure the static binding for SAVI manually. **Switch(config)#savi ipv6 check source binding ip 2001::20 mac 00-25-64-BB-8F-04** **Interface ethernet1/0/1 type static**

savi ipv6 check source ip-address mac-address

Command	**savi ipv6 check source [ip-address mac-address | ip-address | mac-address]** **no savi ipv6 check source**
Parameter	None.
Default	Disabled.
Mode	Port mode.
Usage	Enables the control authentication function for the packets of the port. The global SAVI function must be enabled before configuring this command. The no command disables this function.
Example	Enable the control filtering function of the packets on port ethernet1/0/1. **Switch(config)#interface ethernet1/0/1** **Switch(config-if-ethernet1/0/1)# savi ipv6 check source ip-address mac-address**

savi ipv6 {dhcp-only | slaac-only | dhcp-slaac} enable

Command	**[no] savi ipv6 {dhcp-only | slaac-only | dhcp-slaac} enable**
Parameter	**dhcp-only**: dhcp-only application scene **slaac-only:** slaac-only application scene **dhcp-slaac:** combination application scene of dhcp-only and slaac-only
Default	By default, disable SAVI application scene.
Mode	Global mode.
Usage	Enables SAVI application scene function. dhcp-only application scene only detects DHCPv6 packets and DAD NS packets of link-local ipv6 address to be IPv6 address with target field, it does not detect DAD NS packets of non-link-local address. slaac-only application scene detects DAD NS packets of all types. dhcp-slaac combination application scene detects all DHCPv6 and DAD NS packets. Disable all kinds of application scene detection function for SAVI by default. The no command disables the function.
Example	Enable the specified dhcp-only application scene for SAVI. **Switch(config)#savi ipv6 dhcp-only enable**

savi ipv6 mac-binding-limit

Command	**savi ipv6 mac-binding-limit <limit-num>** **no savi ipv6 mac-binding-limit**
Parameter	**limit-num**: set the ranging from 1 to 10, the default dynamic binding number is 32 for the same MAC address.
Default	The default dynamic binding number is 32 for the same MAC address.
Mode	Global mode.
Usage	Configures the dynamic binding number of the same MAC address. This command is used to prevent the exhaust attack of the dynamic binding entry for SAVI. The no command restores the default value.
Example	Set the dynamic binding number to be 5 for the same MAC address. **Switch(config)#isavi ipv6 mac-binding-limit 5**

savi max-dad-dalay

Command	**savi max-dad-delay <max-dad-delay>** **no savi max-dad-delay**
Parameter	**max-dad-delay**: set the ranging between 1 and 65535 seconds, its default value is 1 second.
Default	Its default value is 1 second.
Mode	Global mode.
Usage	Configures the dynamic binding at DETECTION state and send lifetime period of DAD NS packet detection. It is recommended to use the default value. The no command restores the default value.
Example	Set the detection lifetime as 2 seconds. **Switch(config)#savi max-dad-delay 2**

savi max-dad-prepare-delay

Command	**savi max-dad-prepare-delay <max-dad-prepare-delay>** **no savi max-dad-prepare-delay**
Parameter	**max-dad-prepare-delay**: set the ranging between 1 and 65535 seconds, its default value is 1 second.
Default	Its default value is 1 second.
Mode	Global mode.
Usage	Configures lifetime period of redetection for the dynamic binding. It is recommended to user the default value. The no command restores the default value.
Example	Set the redetection lifetime as 2 seconds. **Switch(config)#savi max-dad-prepare-delay 2**

savi max-slaac-life

Command	**savi max-slaac-life <max-slaac-life>** **no savi max-slaac-life**
Parameter	**max-slaac-life**: set the ranging between 1 and 31536000 seconds, its default value is 4 hours.
Default	Its default value is 4 hours.
Mode	Global mode.
Usage	Configures lifetime period of slaac dynamic binding at BOUND state. The no command restores the default value.
Example	Configure lifetime period of slaac binding type as 2010 seconds at BOUND state. **Switch(config)#savi max-slaac-life 2000**

savi timeout bind-protect

Command	**savi timeout bind-protect <protect-time>** **no savi timeout bind-protect**
Parameter	**protect-time**: set the ranging between 1 and 300 seconds, its default value is 30 seconds.
Default	Its default value is 30 seconds.
Mode	Global mode.
Usage	Configures the bind-protect lifetime period for a port after its state from up to down. After the configured lifetime period is overtime, the port is still at down state, the binding of this port will be deleted. If the port state is changed from down to up state during the configured lifetime period, the binding of the port will reset it as lifetime period of BOUND state. If the configured parameter is 0 second, all binding of the port will be deleted immediately. The no command restores the default value.
Example	Set bind-protect lifetime period to be 20 seconds. **Switch(config)#savi timeout bind-protect 20**

show savi ipv6 check source binding

Command	**show savi ipv6 check source binding [interface<if-name>]**
Parameter	**if-name**: port name such as interface ethernet 1/0/1.
Default	None.
Mode	Admin mode.
Usage	Shows the global SAVI binding entry list.
Example	Show the global binding state of SAVI. **Switch#show savi ipv6 check source binding** Static binding count: 0 Dynamic binding count: 3 Binding count: 3 MAC IP VLAN Port Type State Expires --- 00-25-64-bb-8f-04 fe80::225:64ff:febb:8f04 1 Ethernet1/0/5 slaac BOUND 14370 00-25-64-bb-8f-04 2001::13:1 1 Ethernet1/0/5 slaac BOUND 14370 00-25-64-bb-8f-04 2001::10:1 1 Ethernet1/0/5 slaac BOUND 14370 ---