Content

Chapter 1 Commands for WMM QoS

1.1 apsd

Command: apsd

      no apsd

Function: Enable APSD, the no command will disable APSD.

Parameter: None.

Default: Enable APSD (Automatic Power Save Delivery).

Command Mode: Radio configuration mode.

Usage Guide: When enabled APSD, Client can send query frame automatically to get the cache data from the AP, it increased Client sleeping time and extended battery life. Use command of **show wireless ap profile <1-16> radio <1-2>** to check whether APSD is enabled.

Example: Enable APSD.

AC(config-ap-profile-radio)#apsd

1.2 qos ap-edca

Command: qos ap-edca {background | best-effort | video | voice} {aifs *<1-15>* | cwmin *<cwmin-time>* | cwmax *<cwmax-time>* | max-burst *<0-999900>*}

      no qos ap-edca {background | best-effort | video | voice} {aifs | cwmin | cwmax | max-burst }

Function: Set the EDCA parameters of each AC (access class) on AP to provide different ability of channels competition. The no command will restore to be the default value.

Parameter: background(background flows): the lowest priority queue, high throughput. Large scale data that requires a large number of throughput and time-insensitives is sent to this queue.

      best-effort(best-effort flows): medium throughput and delay, the medium priority queue , the most common IP data is sent to this queue.

      video(video flows): high priority and minimum delay queue, time-sensitive video stream is automatically sent to this queue.

      voice (voice flows): high priority and minimum delay queue, time-sensitive data such as network voice and media stream is automatically sent to this queue.

      aifs: Arbitration intercede frame space(AIFS) specifies the waiting time of a data frame, the waiting time is measured by numbers of intervals, aifs range is 1 to 15.

      cwmin: minimum contention window (in milliseconds), this parameter will be

input into the algorithm of sending retransmission random initial fallback waiting time. Minimum contention window is the upper limit of a range; this range will determine the random initial fallback wait time. The first random value will be between 0 to the minimum contention window. If the first random initial rollback waiting time terminates before sending the data frame, then the number of retransmissions will increase, and random fallback waiting time value will be doubled. Random fallback waiting time value will always be doubling until its size reaches the maximum value of contention window. Legal minimum contention window value is 1, 3, 7, 15, 31, 63, 127, 255, 511; it must be less than the maximum competition window value.

      cwmax: Maximum contention window (in milliseconds), is double the random initial fallback waiting time limit. Random fallback wait for the time value will always be doubling until the data frame is sent or reaches maximum contention window value. Once the random fallback waiting time value reaches the maximum contention window value, the retransmission will continue until it reaches the maximum allowable number of retransmissions. legal maximum contention window value is 3, 7, 15, 31, 63, 127, 255, 511, or 1023. Maximum contention window value must be greater than the minimum contention window value.

      max-burst: Maximum burst length (in microseconds). This parameter specifies the maximum burst length allowed on the wireless network packet burst. A burst message is a collection sent no head information frame. Reducing frame head information can bring higher throughput and better performance. Maximum burst length range is 0 to 999900. This parameter will only be applied to the transport stream sent to the client by the AP.

Default:

Voice

AIFS,1 aifsn

Minimun Contention Windows,3 msecs

Maximum Contention Windows,7 msecs

Maximum Burst Duration, 1500 usec

Video

AIFS,1 aifsn

Minimun Contention Windows,7 msecs

Maximum Contention Windows,15 msecs

Maximum Burst Duration, 3000 usec

Best-Effort

AIFS,3 aifsn

Minimun Contention Windows,15 msecs

Maximum Contention Windows,63 msecs

Maximum Burst Duration,0 usec

Background

AIFS,7 aifsn

Minimun Contention Windows,15 msecs

Maximum Contention Windows,1023 msecs

Maximum Burst Duration,0 usec

Command Mode: Radio configuration mode.

Usage Guide: Use command of **show wireless ap profile *<1-16>* radio *<1-2>* qos ap-edca** to check the configured values of the parameters.

Example: Set AIFS as 10, cwmin as 7, cwmax as 15, max-burst as 1000.

AC(config-ap-profile-radio) #qos ap-edca background aifs 10

AC(config-ap-profile-radio)#qos ap-edca background cwmin 7

AC(config-ap-profile-radio)#qos ap-edca background cwmax 15

AC(config-ap-profile-radio)#qos ap-edca background max-burst 1000

1.3 qos edca template{custom | voice | default}

Command: qos edca template{custom | voice | default}

Function: Configure the template used by QoS Edca.

Parameters: custom：use custom configuration.

           voice：use the configuration of voice flow priority.

           default：use factory default configuration.

Default: custom.

Command Mode: AP Profile Radio Global Mode..

Usage Guide: In custom mode, user can modify edca parameter according to need; in voice and default modes, system gives the reference value, users under these two modes cannot modify edca parameter.

Example: Use the configuration of voice flow priority.

AC (config-ap-profile-radio)#qos edca template voice

1.4 qos station-edca

Command: qos station-edca {background | best-effort | video | voice} {aifs *<1-15>* | cwmin *<cwmin-time>* | cwmax *<cwmax-time>* | txop-limit *<0-65535>*}

          no qos station-edca {background | best-effort | video | voice} {aifs | cwmin| cwmax | txop-limit}

Function: Set the EDCA parameters of each AC (access class) on Client to provide different ability of channels competition. The no command will restore to be the default

value.

Parameter: background(background flows): the lowest priority queue, high throughput. Large scale data that requires a large number of throughput and time- insensitive is sent to this queue.

best-effort(best-effort flows): medium throughput and delay, the medium priority queue , the most common IP data is sent to this queue.

video(video flows): high priority and minimum delay queue, time-sensitive video stream is automatically sent to this queue.

voice (voice flows): high priority and minimum delay queue, time-sensitive data such as network voice and media stream is automatically sent to this queue.

aifs: Arbitration intercede frame space(AIFS) specifies the waiting time of a data frame, the waiting time is measured by numbers of intervals, aifs range is 1 to 15.

cwmin: minimum contention window (in milliseconds), this parameter will be input into the algorithm of sending retransmission random initial fallback waiting time. Minimum contention window is the upper limit of a range; this range will determine the random initial fallback wait time. The first random value will be between 0 to the minimum contention window. If the first random initial rollback waiting time terminates before sending the data frame, then the number of retransmissions will increase, and random fallback waiting time value will be doubled. Random fallback waiting time value will always be doubling until its size reaches the maximum value of contention window. Legal minimum contention window value is 1, 3, 7, 15, 31, 63, 127, 255, 511; it must be less than the maximum competition window value.

cwmax: Maximum contention window (in milliseconds), is double the random initial fallback waiting time limit. Random fallback wait for the time value will always be doubling until the data frame is sent or reaches maximum contention window value. Once the random fallback waiting time value reaches the maximum contention window value, the retransmission will continue until it reaches the maximum allowable number of retransmissions. legal maximum contention window value is 3, 7, 15, 31, 63, 127, 255, 511, or 1023. Maximum contention window value must be greater than the minimum contention window value.

txop-limit: Transmission opportunities were limited, it is the interval of client enabled WMM function transmitted data to the wireless medium, this value specifies a WMM client who has the right to initiate the data transmission time interval to the wireless network and the range is from 0 to 65535.

Default:

Voice

AIFS,2 aifsn

Minimun Contention Windows,3 msecs

Maximum Contention Windows,7 msecs

Transmission Opportunity Limit, 47 32us

Video

AIFS,2 aifsn

Minimun Contention Windows,7 msecs

Maximum Contention Windows,15 msecs

Transmission Opportunity Limit, 94 32us

Best-Effort

AIFS,3 aifsn

Minimun Contention Windows,15 msecs

Maximum Contention Windows,63 msecs

Transmission Opportunity Limit, 0 32us

Background

AIFS,7 aifsn

Minimun Contention Windows,15 msecs

Maximum Contention Windows,1023 msecs

Transmission Opportunity Limit, 0 32us

Command Mode: Radio configuration mode.

Usage Guide: Use the command: show wireless ap profile *<1-16>* radio *<1-2>* qos ap-edca to examine the setting parameter values.

Example: Set AIFS as 200, cwmin as 3, cwmax as 511, txop-limit as 2000.

AC(config-ap-profile-radio)#qos station-edca best-effort aifs 200

AC(config-ap-profile-radio)#qos station-edca best-effort cwmin 3

AC(config-ap-profile-radio)#qos station-edca best-effort cwmax 511

AC(config-ap-profile-radio)#qos station-edca best-effort txop-limit 2000

1.5 show wireless ap profile radio qos

Command: show wireless ap profile *<1-1024>* radio *<1-2>* qos [{ap-edca | station-edca}]

Function: Show the EDCA parameters configured.

Parameter: *<1-1024>*: ap profile id.

              <1-2>: Radio index.

              ap-edca: show AP EDCA parameters.

              station-edca: show station EDCA parameters.

Default: None.

Command Mode: Admin mode.

Usage Guide: If not set with ap-edca or station-edca, then show all the EDCA parameters,

otherwise show the corresponding EDCA parameters.

Example: Show EDCA parameters of profile 1 radio 1.

AC#show wireless ap profile 1 radio 1 qos

AP Profile ID................................. 1

Profile Name.................................. Profile1

Radio... 1 - 802.11b/g/n

Mode.. 802.11b/g/n

WMM Mode...................................... Disable

AP EDCA Configuration

QoS Queues	AIFS	Minimum Contention Window	Maximum Contention Window	Maximum Burst
Voice (0)	111	3	15	11111
Video (1)	112	7	255	22222
Best-Effort (2)	113	15	255	33333
Background (3)	10	7	1023	1000

Station EDCA Configuration

QoS Queues	AIFS	Minimum Contention Window	Maximum Contention Window	Tx Op Limit
Voice (0)	111	3	15	471
Video (1)	111	7	31	941
Best-Effort (2)	111	31	127	111
Background (3)	111	127	511	111

1.6 show wireless ap radio status

Command: show wireless ap *<macaddr>* radio *<1-2>* status

Function: Show the Radio status information on the AP.

Parameter: *<macaddr>*: MAC address of AP.

        <1-2>: Radio index.

Default: None.

Command Mode: Admin mode.

Usage Guide: Show the Radio status information of specified MAC on the AP to check the AP channel, channel bandwidth, WLAN Utilization and so on.

Example: Show the Radio 1 status information with MAC address of 00-03-0f-18-ed-90 on the AP.

AC#show wireless ap 00-03-0f-18-ed-90 radio 1 status

MAC address.................................... 00-03-0f-18-ed-90

Location.. 111

Radio.. 1 - 802.11b/g/n

Supported Channels............................. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Channel.. 6

Channel Bandwidth.............................. 20 MHz

Fixed Channel Indicator........................ Yes

Manual Channel Adjustment Status............... Success

Transmit Power................................. 1

Fixed Power Indicator.......................... Yes

Manual Power Adjustment Status................. Not Started

Authenticated Clients.......................... 0

Total Neighbors................................ 312

WLAN Utilization............................... 62

Radio Resource Measurement..................... Enabled

1.7 wmm

Command: wmm

         no wmm

Function: After enabling WMM function, AP support WMM protocol. The no command will disable WMM function.

Parameter: None.

Default: Enable WMM Qos function.

Command Mode: Radio configuration mode.

Usage Guide: Enabled WMM on the AC, it will be saved into the AP configuration policy of AC.

Example: Enable WMM.

AC (config-ap-profile-radio)#wmm

Chapter 2 Commands for Client QoS

2.1 ap client-qos

Command: ap client-qos

   no ap client-qos

Function: Enable the AC global Client QoS function. The no command will disable this function.

Parameter: None.

Command Mode: Wireless global configuration mode.

Default: Disable.

Usage Guide: Use this command to enable AC global QoS function. QoS function switch includes the global switch and the network switch, enable the global switch to use the ACL, the DiffServ, as well as rate limiting, etc. Functions of the down/up have been configured for the client in the network.

Example: Enable AC global Client QoS function.

AC(config-wireless)#ap client-qos

AC(config-wireless)#

2.2 client-qos access-control

Command: client-qos access-control {down | up} {ip {<*1-199*> | <*acl-name*>} | ipv6 <*acl-name*> | mac <*acl-name*>}

   no client-qos access-control {down | up}

Function: Configure the default control list information of clients associated with network. No command will delete the control list information.

Parameter: down is downlink, egress direction of each Client in current network.

   up is uplink, ingress direction of Client in current network.

   <*1-199*> is ACL table name of IPv4 type, named with numbers.

   <*acl-name*> is ACL table name of IPv4 type, named with a string.

   ipv6 <*acl-name*> is ACL table names of IPv6 type, named with a string.

   mac <*acl-name*> is ACL table names of MAC type, named with a string.

Command Mode: Network configuration mode.

Default: None.

Usage Guide: Use this command to configure the uplink and downlink control lists of network, in each direction only one control list can be configured, AP configuration file should be sent to make the configuration to be effective.

Example: Configure control IP list 1 of client to the network downlink direction.

AC(config-network)#client-qos access-control down ip 1

AC(config-network)#

2.3 client-qos bandwidth-limit

Command: client-qos bandwidth-limit {down | up} *<1-4194303>*

            no client-qos bandwidth-limit

Function: Set default maximum bandwidth rate (unit: Kbits per second) of Client QoS associated with this Network. No command will set the default maximum bandwidth rate value as 0 which does not limit the bandwidth rate.

Parameter: down is downlink, Client egress direction of the current network.

            up is the uplink, Client ingress direction of current network.

            <1-4194303> is the maximum bandwidth rate value.

Command Mode: Network configuration mode.

Default: The default value is 0 which does not limit the bandwidth rate.

Usage Guide: Use this command to set default maximum bandwidth rate (unit: Kbits per second) of Client QoS associated with this Network. No command will set the default maximum bandwidth rate value as 0 which does not limit the bandwidth rate.

Example: Configuration the rate restriction as 100 to the downslink direction of the network.

AC(config-network)#client-qos bandwidth-limit down 100

AC(config-network)#

2.4 client-qos bandwidth-limit arp

Command: client-qos bandwidth-limit arp {down | up} <1-128>

         no client-qos bandwidth-limit arp {down | up}

Function: Configure the maximum rate limit (unit: pps) of arp packet of the associated client. The no command cancels it.

Parameters: down is down link which is way out of the clients.

            up is up link which is way in of the clients.

            <1-128> is the maximum rate limit of arp packet.

Command Mode: Network configuration mode.

Default: No limitation.

Usage Guide: This command is used to configure the maximum rate limit (unit: pps) of arp packet of the associated client. The no command cancels it. The command of ap client-qos which can enable the global client QoS of AC under the wireless global mode

and the command of client-qos enable which can enable the client QoS function of the current network under the network configuration mode should be enabled before use this command.

Example: Configure the rate limit of down link arp packet as 6.

AC(config-network)# client-qos bandwidth-limit arp down 6

2.5 client-qos diffserv-policy

Command: client-qos diffserv-policy {down | up} *<policy-name>*
             no client-qos diffserv-policy {down | up}

Function: Configure the default DiffSer policy of clients associated with the network. No command will delete the configured default DiffSer policy.

Parameter: down is downlink, Client egress direction of the current network.

             up is the uplink, Client ingress direction of current network.

             <policy-name> is name of the policy list.

Command Mode: Network configuration mode.

Default: None.

Usage Guide: Use this command to configure the uplink and downlink DiffSer policy of the network, in each direction only one DiffSer policy can be configured, AP configuration file should be sent to make the configuration to be effective.

Example: Configure DiffSer policy table p to the downlink direction of the network.

AC(config-network)#client-qos diffserv-policy down p

AC(config-network)#

2.6 client-qos enable

Command: client-qos enable
             no client-qos enable

Function: Enable AP Client QoS of current network. The no command will disable this function.

Parameter: None.

Command Mode: Network configuration mode.

Default: Disable.

Usage Guide: Use this command to enable the AP Client QoS function of current network. QoS function switches including global switch and current network switch, in order to use the function of the configured ACL, DiffServ and rate limit of down/up, etc, it needs to enable both the global swtiches.

Example: Enable AP Client QoS function of current network.

AC(config-network)#client-qos enable

AC(config-network)#

2.7 debug wireless ap-client-qos

Command: debug wireless ap-client-qos {error | internal} <*macaddr*>

　　　　no debug wireless ap-client-qos { error | internal } <*macaddr*>

Function: Enable the AP Client QoS error or internal information debugging of a VAP. No command will disable this function.

Parameter: <*macaddr*> is the MAC address of VAP.

Command Mode: Admin mode.

Default: Disable.

Usage Guide: Use this command to enable the AP Client QoS error or internal information debugging.

Example: Enable the AP Client QoS internal information debugging of the VAP.

AC#debug wireless ap-client-qos internal 00-03-0f-03-24-00

MAC:00-03-0f-03-24-00   internal   WD_LEVEL_WSAP_CONF_CLTQOS_CALLBACK debug is on

MAC:00-03-0f-03-24-00 internal WD_LEVEL_WSAP_CONF_CLTQOS_INFO debug is on

2.8 debug wireless ap-client-qos dump

Command: debug wireless ap-client-qos { packet-rx | packet-tx } dump <*macaddr*>

Function: Enable the AP Client QoS packet content of a VAP. The no command will disable this function.

Parameter: <*macaddr*> is the MAC address of VAP.

Command Mode: Admin mode.

Default: Disable.

Usage Guide: Use this command to enable AP Client QoS packet content function, the contents of the packet are hexadecimal format.

Example: Enable the AP Client QoS packet content of a VAP.

AC#debug wireless ap-client-qos packet-tx dump 00-03-0f-03-24-00

MAC:00-03-0f-03-24-00   packet

WD_LEVEL_WSAP_CONF_CLTQOS_LIST_UPDATE_PKT_TX debug is on

MAC:00-03-0f-03-24-00   packet

WD_LEVEL_WSAP_CONF_CLTQOS_LIST_RENAME_PKT_TX debug is on

MAC:00-03-0f-03-24-00   packet

WD_LEVEL_WSAP_CONF_CLTQOS_LIST_DELETE_PKT_TX debug is on

MAC:00-03-0f-03-24-00   packet

WD_LEVEL_WSAP_CONF_CLTQOS_MODE_UPDATE_PKT_TX debug is on

MAC:00-03-0f-03-24-00   packet

WD_LEVEL_WSAP_CONF_CLTQOS_ACL_DEF_REPLY_PKT_TX debug is on

MAC:00-03-0f-03-24-00   packet

WD_LEVEL_WSAP_CONF_CLTQOS_POLICY_DEF_REPLY_PKT_TX debug is on

2.9 policy

**Command: policy   {<*1-10000000*>   <*1-1000000*>   conform-action   {drop |
set-prec-transit   <*0-7*> | set-dscp-transit   <*0-63*> | set-cos-transit   <*0-7*>}
{exceed-action {drop}}**

Function: Configure policy supervision rules.

Parameter: <*1-10000000*> is the maximum transmission rate and the unit is Kbits per
second.

          <*1-1000000*> burst rate and the unit is Kbytes.

Command Mode: Global configuration mode.

Default: None.

Usage Guide: This command is used to configure the policy supervision rules, and the
actions of drop and mark cannot be used.

Example: Configure a policy supervision rule, set the rate of dscp packets value as 12.

AC(config-policymap-p-class-c)#policy 100 100 conform-action transmit set-dscp-transmit
12

AC(config-policymap-p-class-c)#

2.10 qos max-bandwidth

Command: qos max-bandwidth {down|up} <1-4194303>

          no qos max-bandwidth {down|up}

Function: Configure the maximum bandwidth rate associated with this SSID (The unit is
Kbits/s. User inputting will be changed as (user inputting/64)*64). The no command
recovers to be default (do not limit bandwidth rate).

Parameters: down is downlink and is the egress direction of each client in current
network (configure the allowed maximum bandwidth from AP to client).

          up is uplink and is the ingress direction of each client in current network
(configure the allowed maximum bandwidth from client to AP).

          <1-4194303> is the restriction value of maximum bandwidth rate.

Command Mode: Network Configuration Mode.

Default: The maximum bandwidth rate is 0 as default (do not limit bandwidth rate).

Usage Guide: Configure the maximum bandwidth rate associated with this SSID (The unit is Kbits/s. User inputting will be changed as (user inputting/64)*64. When the configuration value is less than 64, make it as 64). The no command recovers to be default (do not limit bandwidth rate).

Example: Configure the allowed maximum bandwidth from AP to client as 100Kbits/s (100 will be changed as 64).

AC(config-network)#qos max-bandwidth down 100

Information: the input value 100 is scaled to 64

2.11 ratelimit-whitelist enable

Command: ratelimit-whitelist enable

               no ratelimit-whitelist enable

Function: Enable or disable the white list rate-limit function under the network, this function is effective for the VAP of AP.

Parameters: None.

Commond Mode: Network Configuration Mode.

Default: Disable.

Usage Guide: Under the network mode, enable or disable the white list rate-limit function. This function is effective for the VAP of AP.

Example: Enable the QOS white list rate-limit function.

AC(config-network)# ratelimit-whitelist enable

2.12 ratelimit-whitelist bandwidth-limit

Command: ratelimit-whitelist bandwidth-limit {down|up} *<1-4194303>*

               no ratelimit-whitelist bandwidth-limit {down|up}

Function: Configure the bandwidth of uplink and downlink under the network mode. The no command recovers it t be the default value.

Parameters: down is downlink, it is the outlet of the client in the current network.

               up is downlink, it is the inlet of the client in the current network.

               <1-4194303> is the maximum bandwidth rate-limit value.

Commond Mode: Network Configuration Mode.

Default: It does not limit the rate.

Usage Guide: This command is used to configure the bandwidth of uplink and downlink

under the network mode. The no command recovers it t be the default value of 0.

Example: Configure the QOS white list rate-limit as 1024 of the downlink.

AC(config-network)# ratelimit-whitelist bandwidth-limit down 1024

2.13 ratelimit-whitelist client-mac

Command: ratelimit-whitelist client-mac   <macAddr>

               no ratelimit-whitelist client-mac   <macAddr>

Function: Add or delete the client to the rate-limit white list under the network mode.

Parameters: <macAddr> client mac address.

Commond Mode: Network Configuration Mode.

Default: None.

Usage Guide: This command is used to add the client to the rate-limit white list under the network mode. The no command deletes it.

Example: Add a client into the white list.

AC(config-network)# ratelimit-whitelist client-mac 00-0d-a3-13-30-69

2.14 show wireless client client-qos radius status

Command: show wireless client *<macaddr>* client-qos radius status

Function: Show data details of Client QoS associated with a managed AP.

Parameter: *<macaddr>* is the MAC address of client.

Command Mode: Admin mode.

Default: None.

Usage Guide: Use this command to show data details of Client QoS associated with a managed AP. This information is obtained from the radius server.

Example: Show the Client QoS data details obtained from the radius server.

AC#show wireless client e0-05-c5-8e-10-2f client-qos radius status

MAC address..................................... e0-05-c5-8e-10-2f

SSID... guest1

Bandwidth Limit Down........................... <none>

Bandwidth Limit Up............................. <none>

Access Control Down............................ <none>

Access Control Up.............................. <none>

Diffserv Policy Down........................... <none>

Diffserv Policy Up............................. <none>

2.15 show wireless client client-qos status

Command: show wireless client *<macaddr>* client-qos status

Function: Show data details of Client QoS associated with a managed AP.

Parameter: *<macaddr>* is MAC address of client.

Command Mode: Admin mode.

Default: None.

Usage Guide: Use this command to show data details of Client QoS associated with a managed AP.

Example: Show data details of Client QoS associated with a managed AP.

AC#show wireless client e0-05-c5-8e-10-2f client-qos status

MAC address.................................... e0-05-c5-8e-10-2f

SSID... guest1

Client QoS Operational Status.................. Enabled

Bandwidth Limit Down........................... 0

Bandwidth Limit Up............................. 0

Access Control Down............................ <none>

Access Control Up.............................. <none>

Diffserv Policy Down........................... p

Diffserv Policy Up............................. <none>