CHAPTER 4

Troubleshooting QoS

Introduction

An important factor to consider when troubleshooting a Voice over Wireless LAN (VoWLAN) is the impact that Quality of Service (QoS) and Call Admissions Control plays on the quality of a call within the Cisco Unified Wireless Network (CUWN). QoS ensures that traffic is prioritized and trusted as traffic traverses the wired and wireless LAN.

With QoS, bandwidth can be managed more efficiently across LANs, including WLANs and WANs. QoS provides enhanced and reliable network service by doing the following:

- Supporting dedicated bandwidth for critical users and applications
- Controlling jitter and latency (required by real-time (RTP) traffic such as for voice)
- Managing and minimizing network congestion
- Shaping network traffic to smooth the traffic flow
- Setting network traffic priorities

In an effort to understand the technology from a design and deployment perspective, we would strongly encourage you to read and understand WLAN Quality of Service as described in the *VoWLAN Design Guide 4.1*, which can be located here.

https://www.cisco.com/en/US/docs/solutions/Enterprise/Mobility/vowlan/41dg/vowlan_ch2.html

Troubleshooting QoS

When troubleshooting QoS, there are basic criteria that you need to understand and adhere to when deploying a VoWLAN when using the Cisco Unified Wireless Network. The following are criteria that need to be met:

- Ensure that WMM is configured on the Wireless LAN Controller.
- Ensure that RTP packets have the proper QoS markings.
- Select the “Platinum” QoS profile for the VoWLAN when using Cisco Unified Wireless LAN Controller and configure the 802.1p tag to “6”.
- Enable Differentiated Services Code Point (DSCP) preservation on the Cisco IOS switch (mls qos trust dscp) and/or use a QoS Service Policy to allocate the appropriate level of priority.
  - Option 1 - If you choose to create a QoS Service Policy on an interface between the AP and the WLAN, ensure that the voice traffic (RTP) has the highest priority as follows:

RTP (DSCP = EF) to COS = 6

SCCP (DSCP = CS3) to COS = 4

- Option 2 - If you choose to implement AutoQoS, ensure that the switches are using the same version of IOS code. If the IOS switches are different, or the IOS code varies from switch to switch, understand how AutoQoS is configured from version to version. AutoQoS can actually cause more harm than good if QoS profiles are not consistent between switches. In most cases, DSCP preservation is the best way to ensure that RTP traffic is forwarded with the aspirate markings across the LAN.

Figure 4-1 Class Map, Policy-Map and Service Policy Example

Step 1: Classify Traffic

```
6504-2(config)#class-map match-all RTP
6504-2(config-cmap)#match ip dscp ef
6504-2(config)#class-map match-all SCCP
6504-2(config-cmap)#match ip dscp cs3
```

Step 2: Assign the Classified Traffic to a Policy Map

```
6504-2(config)#policy-map VOICE
6504-2(config-pmap)#class RTP
6504-2(config-pmap-c)#set cos 6
6504-2(config-pmap)#class SCCP
6504-2(config-pmap-c)#set cos 4
```

Note If this is a L3 link, it is important to utilize the “set dscp ef” and “set dscp cs3” parameters, rather than the CoS. A L2 link will mark according to CoS, whereas a L3 link will only evaluate L3 markings. (i.e., CoS = L2 / DSCP = L3).

Step 3: Assign the Policy Map to an interface using the Service-Policy command.

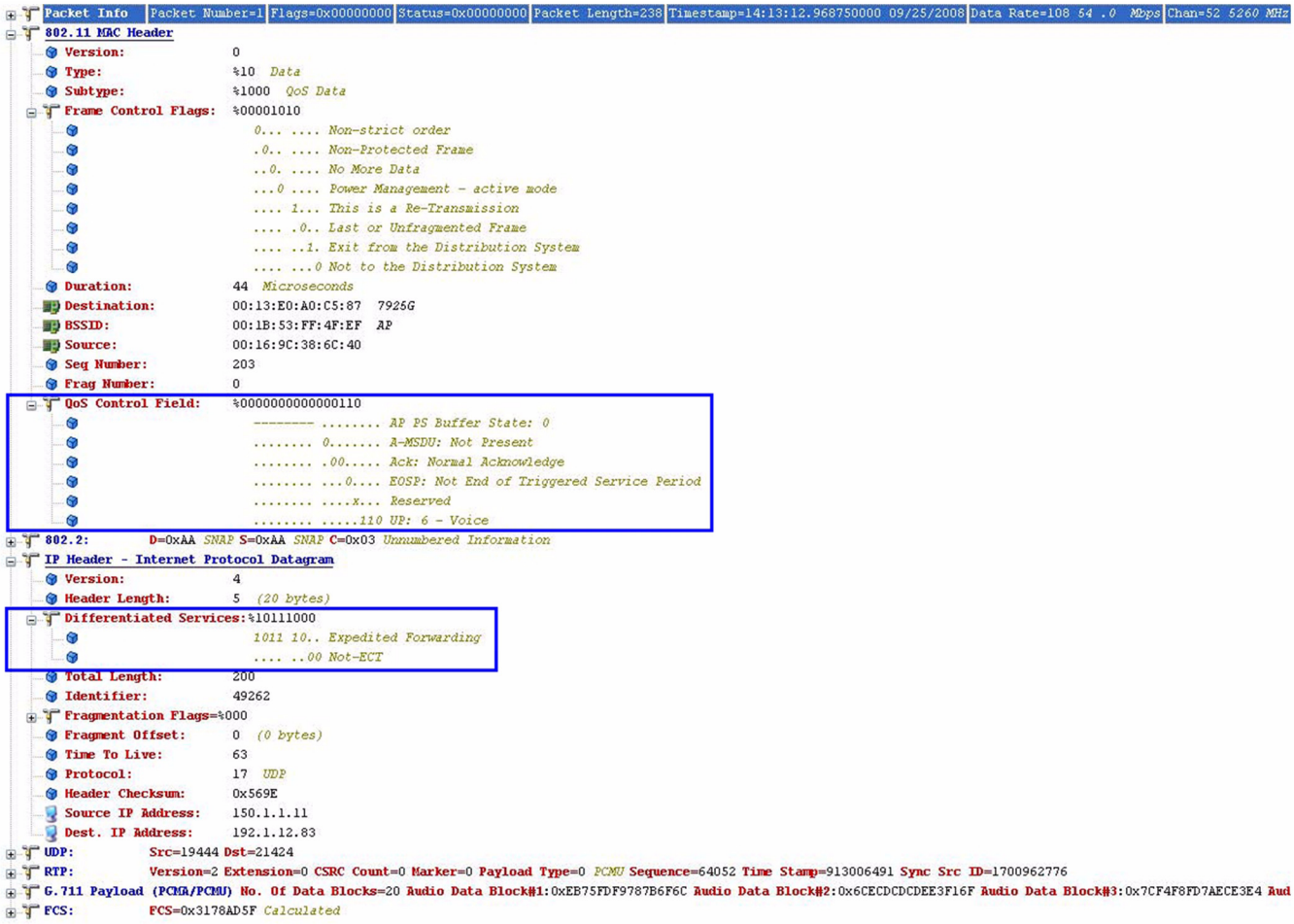
```
6504-2(config)#int g4/1
6504-2(config-if)#Service-policy output VOICE
6504-2(config-if)#Service-policy input VOICE
```

Figure 4-2 DSCP Preservation Example

```
6504-2(config)#int g4/1
6504-2(config-if)#mls qos trust dscp
```

As you can see from Figure 4-1 and Figure 4-2, while classifying traffic might seem like a good idea, it is more important to keep the VoWLAN deployment as simple as possible. Since the 792xG Series wireless IP phone will send RTP traffic over the WLAN with the appropriate markings, we recommend that Systems Engineers create a baseline for the VoWLAN by preserving the existing markings on each interface between the AP and the WLC. This will ensure that DSCP is trusted in both directions as the RTP streams traverse the switched network.

Figure 4-3 DSCP and User Priority (UP) Example



As of Cisco Wireless LAN Controller release 5.x and later, TCLAS is a supported mechanism within the Cisco Unified Wireless Network and is used to maintain QoS without the need for DSCP preservation on the switched LAN. TCLAS is negotiated within the ADDTS packets, which are used to request medium time in order to place or receive a call over the air on an AP. We will cover details with regard to the ADDTS Request and Response in the section on CAC, but for now, understand that there are several benefits to using TCLAS.