Mapping PMIP QoS to WiFi Networks
(draft-kaippallimalil-netext-pmip-qos-wifi-03)

IETF 88 Vancouver, Canada

Updates from version-02 to 03

- Added 2 authors: Rajesh Pazhyannur, Parviz Yegani
- Two main chapters: 3 (admission control based mapping) and 4 (no-admission control)
- Use cases for admission control
  - MN Initiated QoS Signaling
  - Network Initiated QoS Signaling (802.11aa based)
  - Hybrid (WMM based)
- DSCP mapping for non-admission control mechanism.
- Other changes:
  - Moved the architecture section to Appendix.

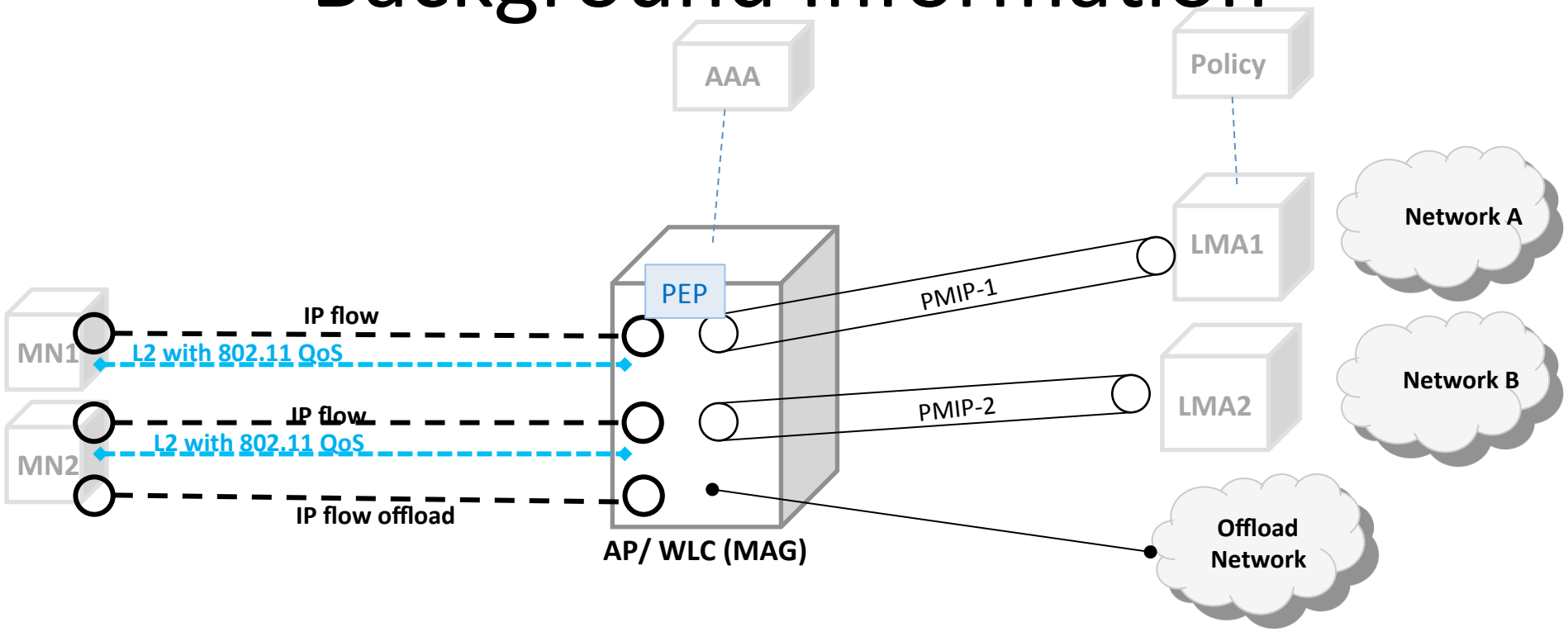
Why we need per user QoS
(and what is missing)

- WiFi radio is a limited resource and has to be managed to achieve better and fair utilization.
  For example, during WiFi radio congestion or for services like VoIP, per user/flow scheduling and policing can utilize the scarce resources better.
- QoS Policies may be statically configured in WiFi AP on per service basis. However, it cannot differentiate per user.
- Per user QoS policies for PMIP mobile sessions between MAG – LMA are available. DSCP of these flows can be used to prioritize flows at WiFi AP. However, other per user information (ARP, AMBR, GBR) needs to be addressed.
- Mapping from parameters in PMIP QoS to 802.11 AC + other QoS parameters needs to be consistent when different providers and equipment are configured.

Gap:

- How to signal QoS in WiFi access when MN initiates request, and when network pushes QoS.
- How to map WiFi QoS parameters to PMIP QoS.

Background Information



QoS in Mobile Networks

provided for IP flow/session.

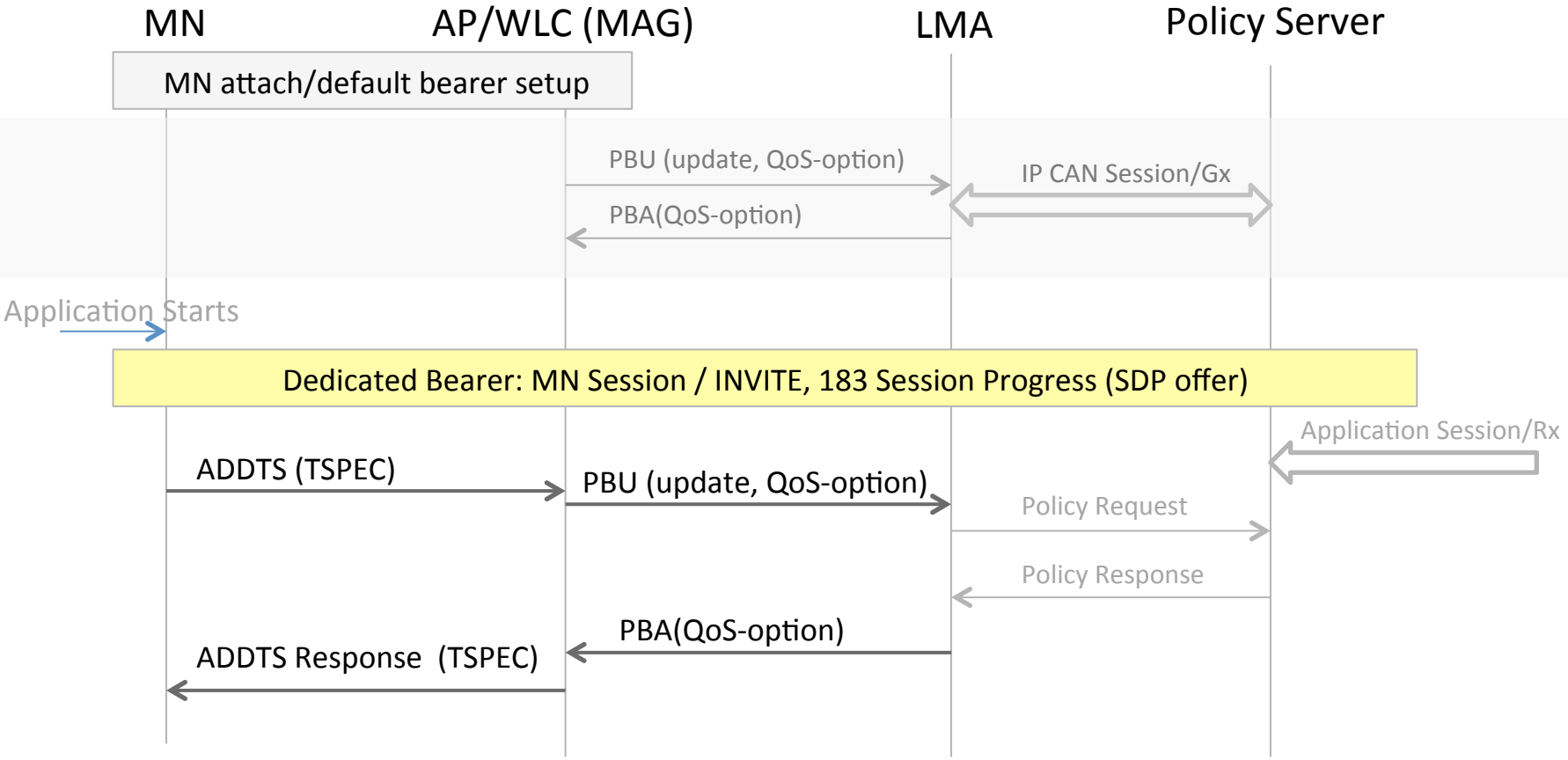
Reservation of resources for GBR flows

QoS in WiFi

provided for Ethernet frames.

No reservation of resources.

Case A: MN Initiated QoS Signaling

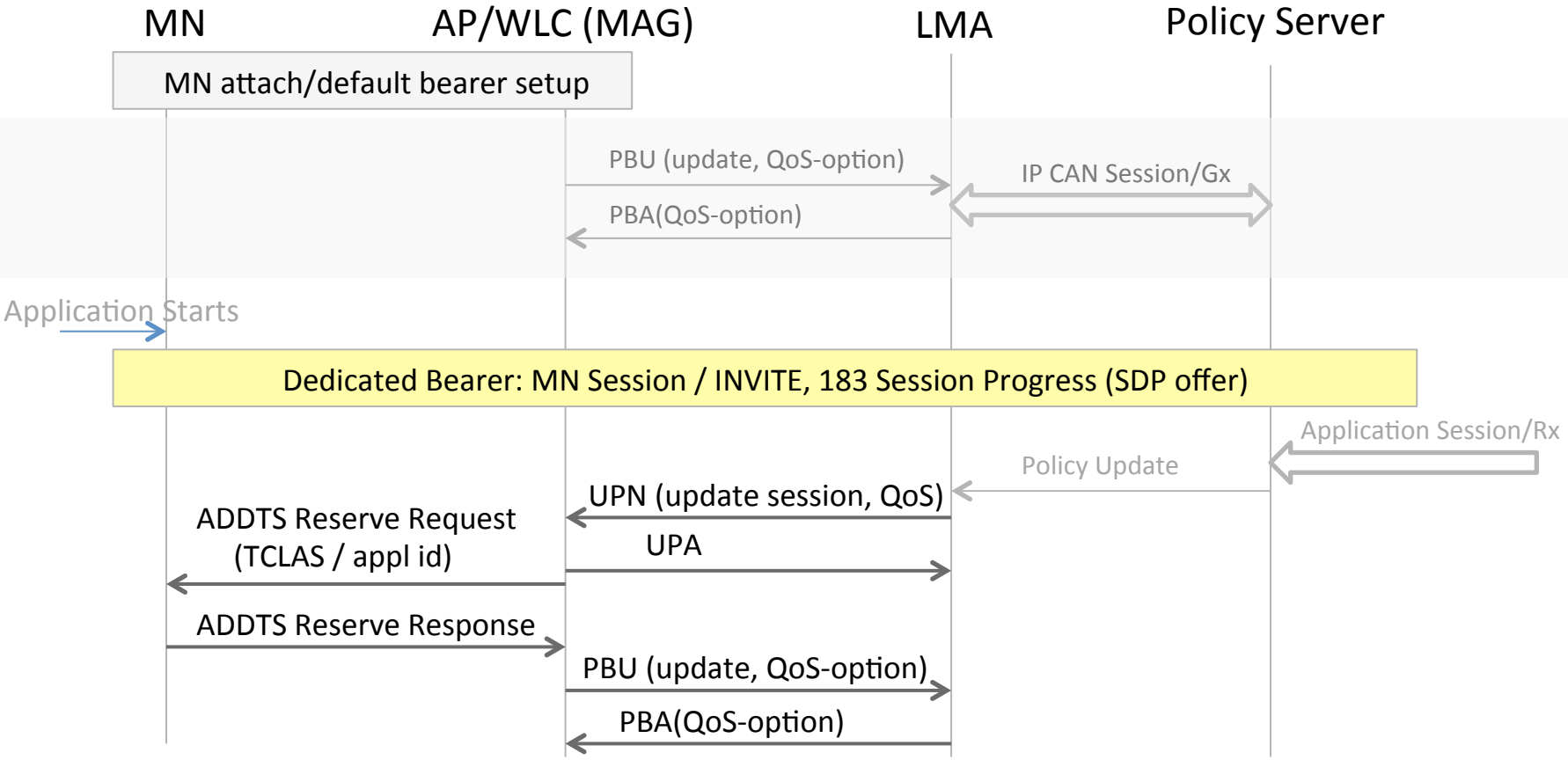


Need to associate IP flow/connection for PMIP session with WiFi QoS request

→ TSPEC in ADDTS Request contains IP flow/connection identifier

→ MAG associates request to PMIP session.

Case B: Network Initiated QoS Signaling

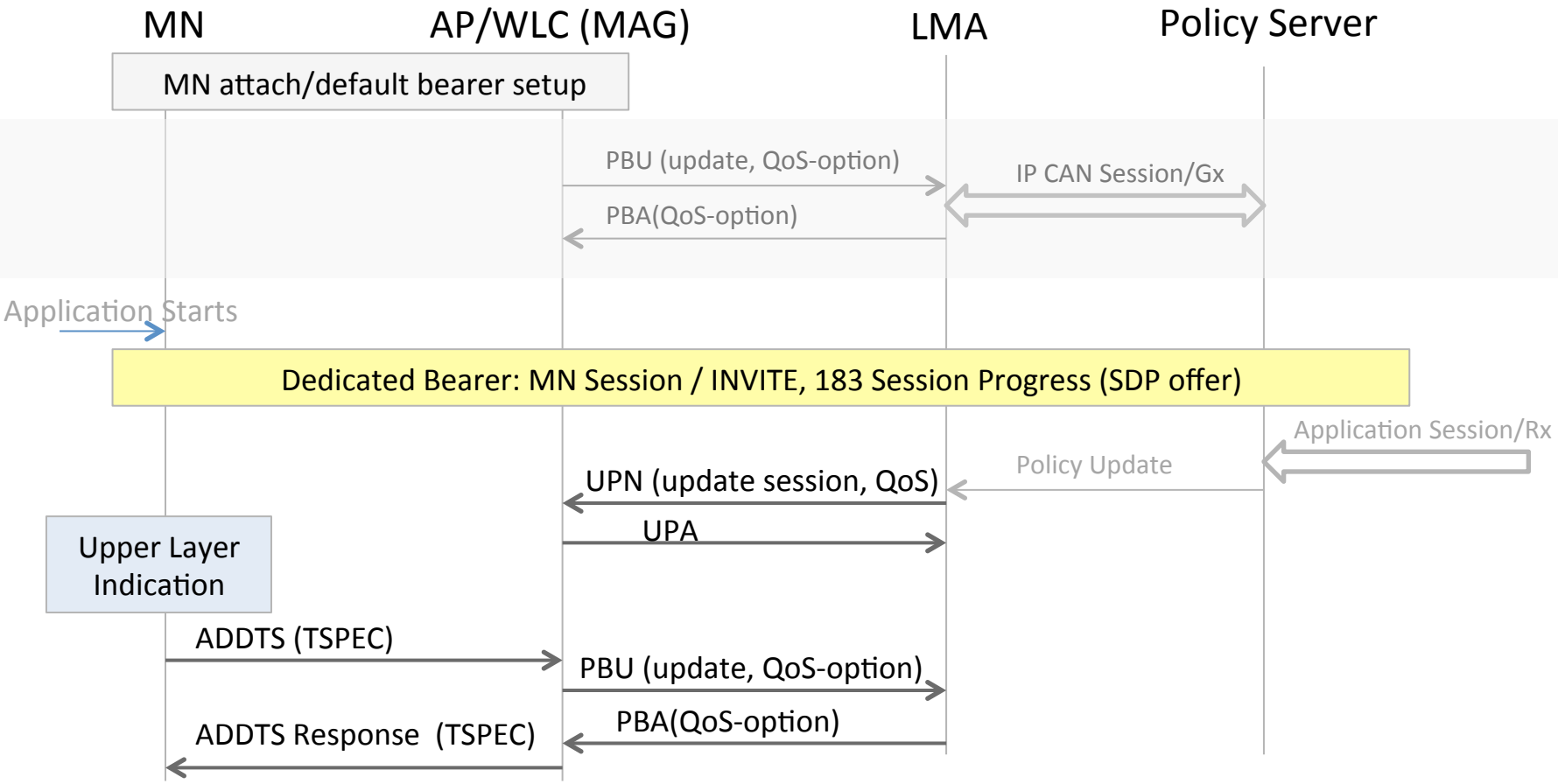


Need support of 802.11aa on AP/WLC and MN.

→ MAG uses PBA with new QoS and associates IP flow/connection id.

→ MAG sends ADDTS Reserve Request

Case C:Hybrid Network init for PMIPv6, user initiated for WiFi



Need support of 802.11aa on AP/WLC and MN.

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→ MAG sends ADDTS Reserve Request

Mapping of Connection Parameters

a) Connection Mapping
   TSPEC includes IP flow/connection id → PMIP session

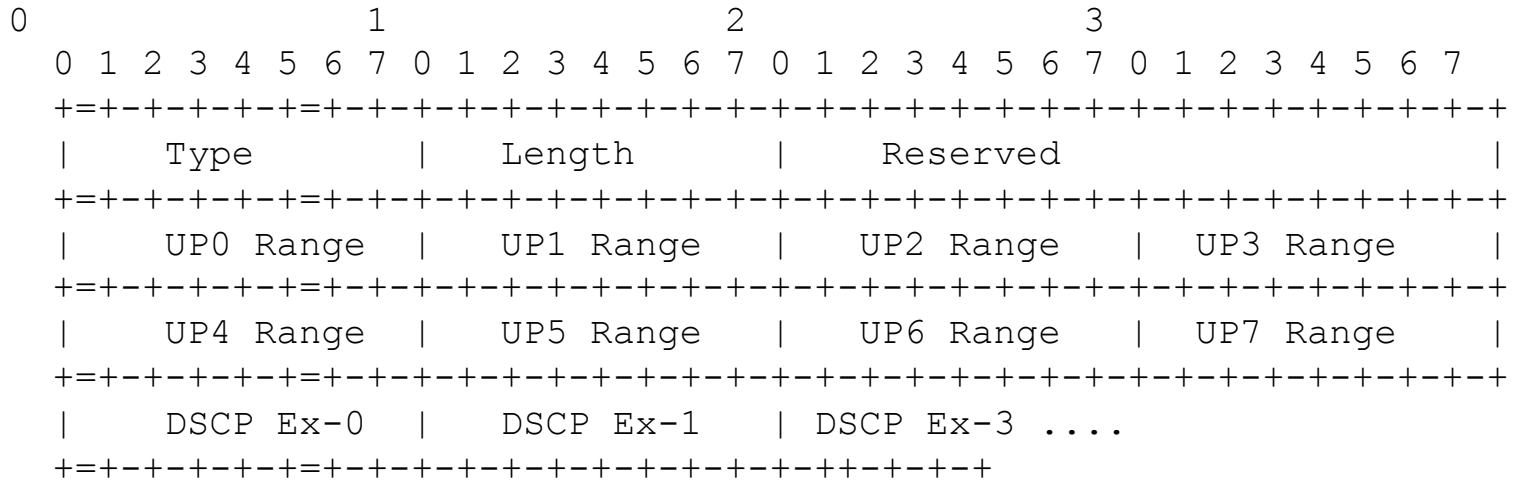
b) QoS Class
   802.11 QoS → 802.1D UP (and PMIP QoS)

c) Bandwidth
   Mean Data Rate *<less than or equal to>* GBR

d) Pre-emption Priority
   ARP may be used in AP/WLC (MAG) to determine which flow to grant resources/tear down flows on congestion (admission control case).

No reservation/ guarantees in WiFi networks.

E2E QoS without Admission Control



- Use DSCP – 802.1D UP mapping defined by GSMA and RFC 4594
- Alternatively,
  use QoS Map set attribute (above figure) for different mappings per user. Map set sent by LMA.

PMIP – 802.11 QoS Mapping
(added 802.1D UP)

QCI	DSCP	802.1D UP	WMM AC	Example Services
1	EF	6(VO)	3 AC_VO	conversational voice
2	EF	6(VO)	3 AC_VO	conversational video
3	EF	6(VO)	3 AC_VO	real-time gaming
4	AF41	5(VI)	2 AC_VI	buffered streaming
5	AF31	4(CL)	2 AC_VI	IMS signaling
6	AF32	4(CL)	2 AC_VI	buffered streaming
7	AF21	3(EE)	0 AC_BE	interactive gaming
8	AF11	1(BE)	0 AC_BE	web access
9	BE	0(BK)	1 AC_BK	e-mail

Table: QoS Mapping between QCI, 802.1D UP, WMM AC

Mapping of QCI/ DSCP → 802.1D UP, WMM AC

IETF next steps

Request for reviews of this draft on mailing list.