IT 4505
Section 3.6

Quality of Service

3.6.1 VoIP - Voice over Internet Protocol

- VoIP (Voice over Internet Protocol), sometimes referred to as Internet telephony, is a method of digitizing voice, encapsulating the digitized voice into packets and transmitting those packets over a packet switched IP network.

Voice over IP - the basics

- Most implementations use H.323 protocol
  - Same protocol that is used for IP video.
  - Uses TCP for call setup
  - Traffic is actually carried on RTP (Real Time Protocol) which runs on top of UDP.

VoIP Protocols

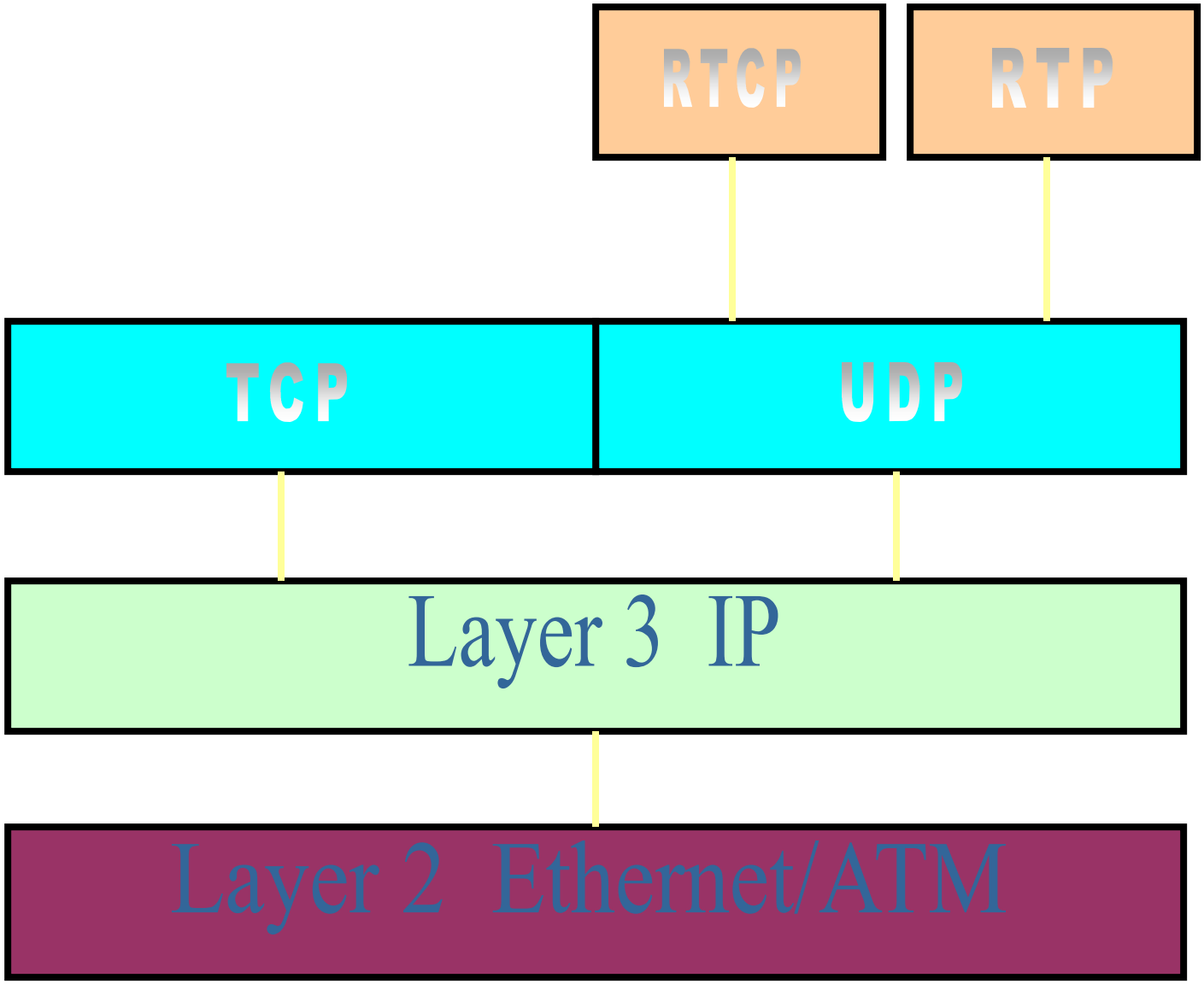
- H.323 Multimedia Standard
  - H.225 RAS - Registration, Admission, Status
  - Q.931 - Call Signaling (Setup & Termination)
  - H.245 - Call Control (Preferences, Flow Control, etc.)
  - Lots of G.7XX CODECS for audio
- SIP – Session Initialization Protocol
  - Covered in next presentation

Here's how it stacks up:

H.323	Multimedia Protocol
H.225	Call setup & Control – RAS (Q.931)
H.235	Security & Authentication
H.245	Call negotiation, capability exchange
H.450	Other supplemental Services
H.246	Circuit Switched Network Interop.
H.332	Conferencing
H.26X	Video CODECS
H.7XX	Audio CODECS

How they fit in: The ISO Model

ISO Model Layer	Protocol or Standard
Presentation	Applications / CODECS
Session	H.323 & SIP
Transport	RTP / UDP / TCP
Network	IP – Non QOS
Data Link	ATM, FR, PPP, Ethernet



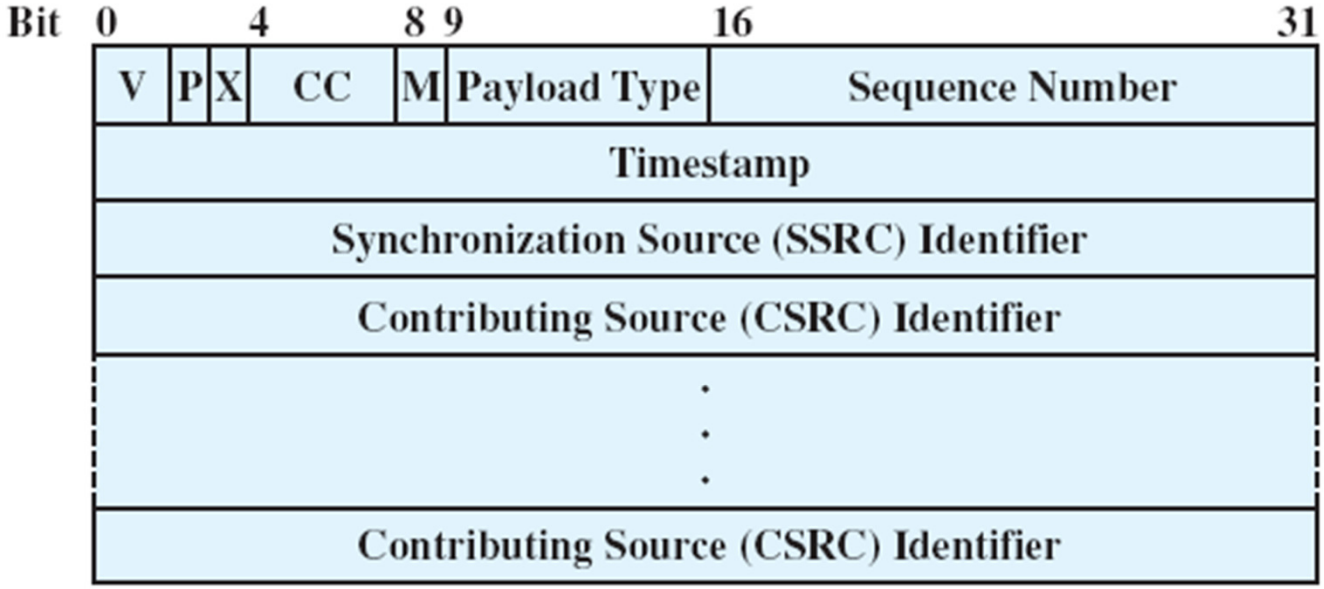
3.6.2 RTP - The Real-time Transport Protocol

- RTP data transfer protocol is used only for the transmission of user data.
- The basic function of RTP is to multiplex several real-time data streams onto a single stream of UDP packets.
- The RTP format contains several features to help receivers work with multimedia information.
- RTP has no acknowledgements.
- RTP payload may contain multiple samples.
- RTP provides a header field in which the source can specify the encoding.
- Timestamp facility for many real-time application.

Example: a single audio stream may be encoded as 8-bit PCM samples at 8 kHz using delta encoding, predictive encoding, GSM encoding,MP3 encoding, and so on.

RTP Cont.

RTP Header



V = Version
P = Padding
X = Extension
CC = CSRC count
M = Marker

RTCP—The Real-time Transport Control Protocol

- RTCP operates in a multicast fashion to provide feedback to RTP data sources as well as all session participants.

- RTCP provides feedback on the quality of data distribution. Because RTCP packets are multicast, all session members can assess how well other members are performing and receiving.

END OF THE SECTION 3