

# Topic 13.1 – Background of VoIP (Voice over IP)

# Introduction to VoIP:

- VoIP (Voice over IP) enables voice communication over IP networks
- Uses the Internet instead of traditional telephone lines
- Supports voice, video, and multimedia communication

**When a VoIP system is layered on the top of an IP network, risks is associated with both which are defined:**

- Since most of the VoIP systems are server-based and rely on common operating systems...
- IP-based voice protocols provides low-cost, advanced end-user features...

# Components of modern enterprise IP-based phone/video system:

1

1. Call control elements  
(Call agents)

2

2. Gateways and  
Gatekeepers

3

3. Multi-Conference  
Units (MCUs)

4

4. Hardware endpoints

5

5. Soft clients and  
software endpoints

6

6. Contact center  
components

7

7. Voicemail systems

# VoIP Protocols

List of commonly used Protocols:

- COPS(Common Open Policy Service)
- H.245
- H.248 (Megaco)
- XMPP(Extensible messaging and Presence Protocol)
- MGCP(Media Gateway Control Protocol)
- SIP (Session Initiation Protocol)
- Used for: Call Start, End, Hold, Transfer
- H.323
- DiffServ (DS)
- SCCP(Signaling Connection Protocol Part)
- SDP(Session Description Protocol)
- RTP(Real time Transport Protocol) / RTCP (Real-time Transport Control Protocol)/ RTSP(Real-time Streaming Protocol)
- SRTP(Secure Real-time Transport Protocol)
- IAX (Inter -Asterisk eXchange)/ IAX2(Inter -Asterisk eXchange Version 2)
- T.38 and T.125
- ISDN(Integrated Services Digital Network)
- SS7 (Signaling System No.7)and SIGTRAN
- SMS(Short Message Service)

# Telephone Switching Classes:

- **Class 1** – International calls
- **Class 2** – Regional calls
- **Class 3** – Major city centers
- **Class 4** – Local cities
- **Class 5** – Subscribers / end users
- **PBX** – Local private switching

# Below these classes – PBX / Key System

Level defined below these classes were considered a PBX or key system...

- **PBX (Private Branch Exchange)**
- **Key systems**

- The portability of IP and flexibility of VoIP have allowed enterprises.
- The main drivers of VoIP technology are:

1. Cost Saving

2. Structured Cabling Cost Reduce

3. Advanced Features

# Security Risks in VoIP:

Inherits IP network vulnerabilities

Risks include eavesdropping and call hijacking

Security is a major concern