



# **Media Gateway Controller - open architecture**

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# Main topics

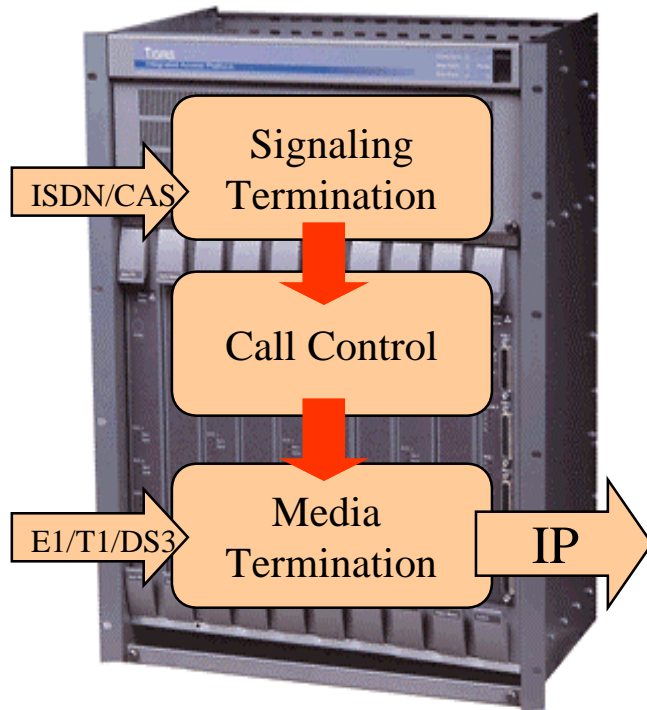
- **Why telecom and datacom converge**
  - **From monolithic to a decomposed architecture**
  - **SS7 stack, what is signalling**
  - **Bearer and call control separation**
  - **Gateway concept**
  - **Standardisation: IETF, MSF**
  - **What is the Media Gateway Controller we develop**
  - **Implementation strategy in our current project**
  - **What is the competence that we need?**
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# Why telecom and datacom converge

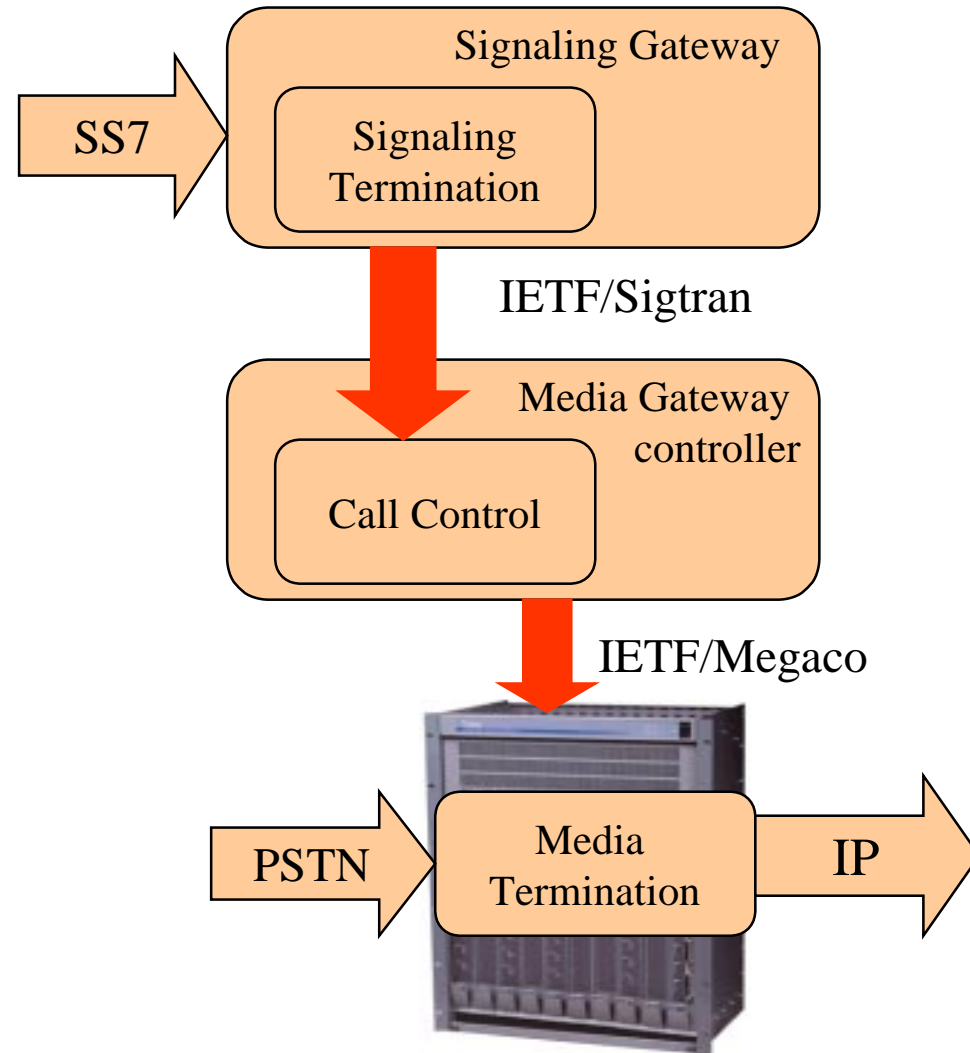
- **Price erosion**
  - **Explosive need of new capacity in the network**
  - **Need of better connectivity between the different networks**
  - **New features are needed**
  - **Datacom vendors like Cisco want to enter to classical telecom market with new solutions**
  - **Telecom Ericsson, Nortel, Lucent want to be players also in datacom or at least in the area where they meet**
  - **New technology is being introduced to telecom that was first introduced in the datacom side**
    - **Anything (network signalling and media) on IP**
    - **Decomposed architecture (compare with mainframes/PC industry)**
    - **New faster moving standardisation foras originating from the IP side**
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# Evolution of Access Equipment

Today



Tomorrow

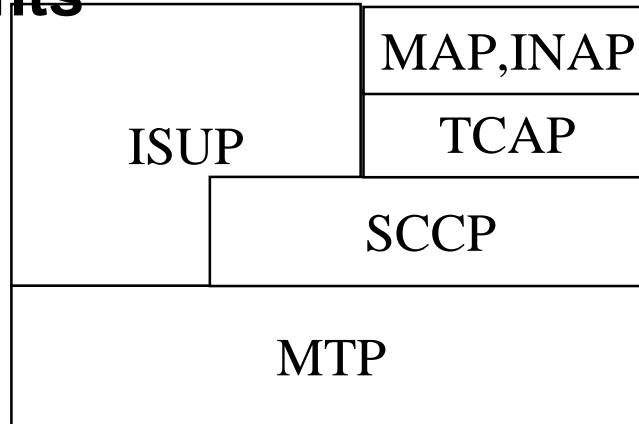


## **Some of the key assets of telecom vendors in the converged telecom/datacom arena**

- **Experience in build realtime, extremely fault tolerant and responsive systems**
  - **Call and session control for voice**
  - **Experience of telecom applications**
  - **Experience of signalling**
    - **Signalling between a local exchange and a telephone when there is an incoming call (UNI signalling)**
    - **Signalling between a transit exchange and an IN node for routing a 800 call (database lookups)**
    - **Signalling between a mobile exchange and a Home Location Register when a mobile node moves from one area to another (database modification)**
    - **Signalling between two exchanges for setting up a call route between them (NNI signalling)**
  - **No signalling = no real-time data transfer!**
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# What is SS7?

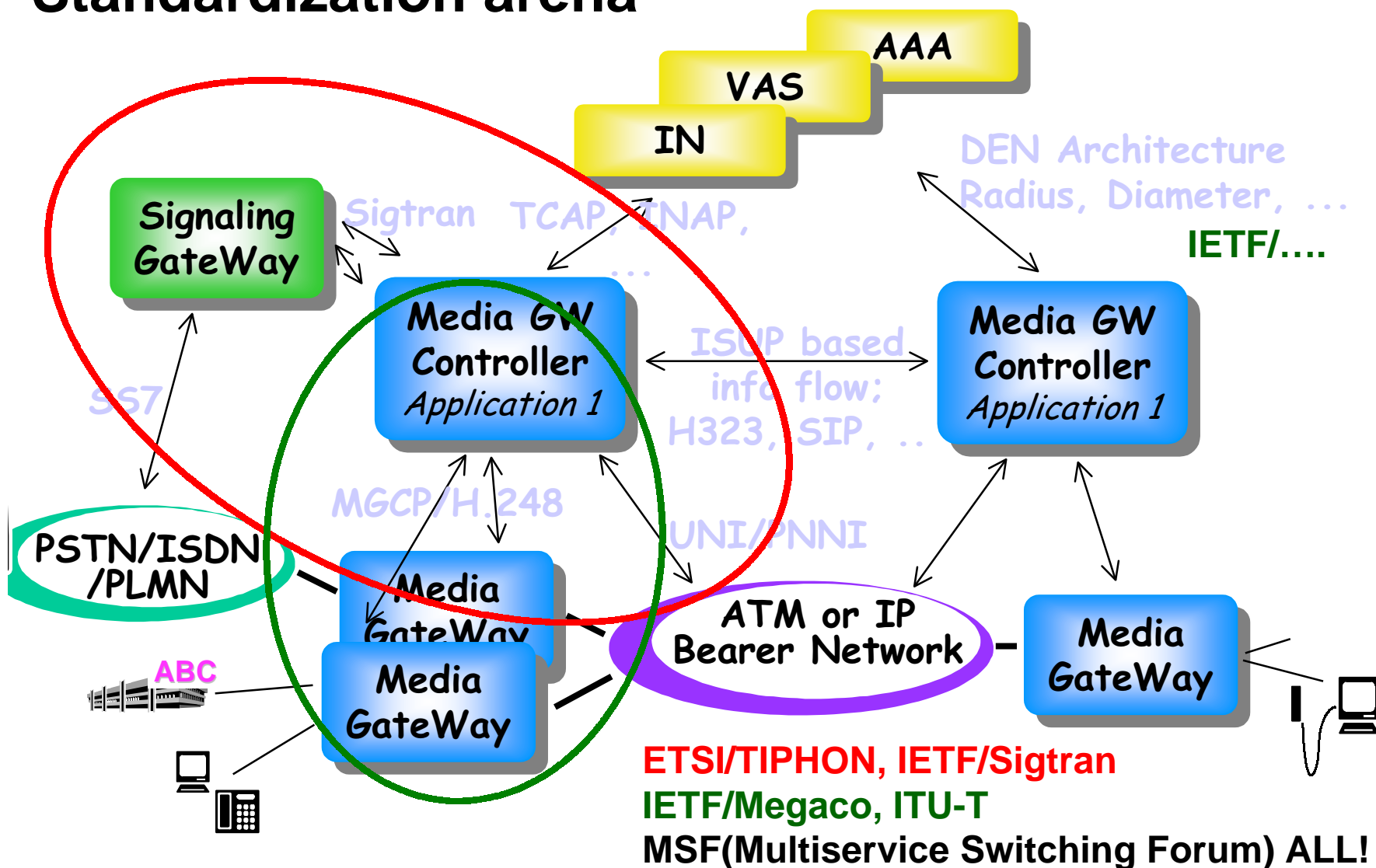
- **Signalling System No. 7 - The standard way for transport of signalling information in today's circuit switched networks**
- **Division into User Parts (e.g. ISUP) for call-oriented information and Application Parts (e.g. MAP) for non-call-oriented information**
- **National variants**



# Network to Network signalling (NNI)

- **Call control** is exchange of application level information, such as a setup message for routing a telephone call from one user's terminal to another. Typical information for call control is the address of the receiver (e.g. telephone number)
- **Bearer control** is the exchange of network level information, such as establishing a connection for transport of data between two nodes. Typical information for bearer control is properties (e.g. Quality of Service parameters) of the connection
- **Device control** is the exchange of information between a controller node and traffic node. Typical information for device control is “please connect interface A to interface Z for a telephone call”

# Standardization arena

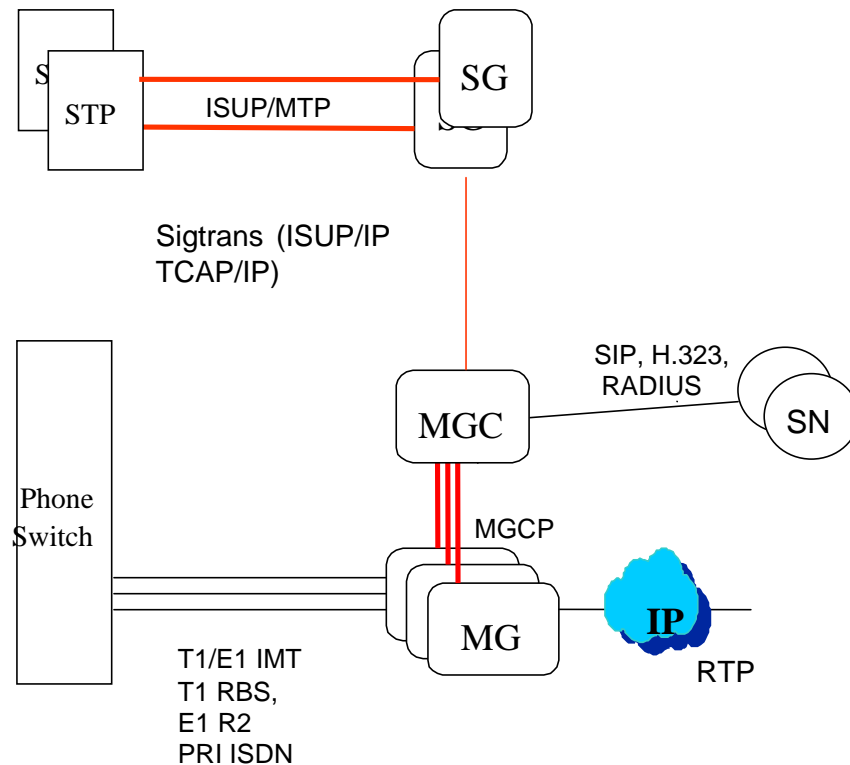




# **The new MGC/MG architecture**

- **The architecture is standardised by the Multiservice Switch vendor Forum (MSF)**
- **The aim is to create a generic, well-specified protocol for use between any MGC and any MG**
- **Candidates are:**
  - **MGCP (and Megacop) as standardised by IETF Megaco**
  - **H.GCP as standardised by ITU-T SG.16**
- **Current status:**
  - **MGCP is becoming a de facto standard, with a lot of vendors already supporting it**
  - **Megacop is perceived as very complex while it is designed to solve all problems of the world for many different networks...**

# ASE: ONG Architecture - Packet-based, Multi-Service Access Network



1. Phone Switch / SS7 Signaling Nodes (STP)
2. Signaling Gateway (SG)
  - MTP Termination
3. Media Gateway Controller (MGC)
  - Signaling (ISUP, PRI, CAS)
  - Call Control
  - MGCP (device control)
  - SIP (Inter MGC)
4. Media Gateway (MG)
  - Media Conversion
  - IP Cross Connect
5. Service Nodes (SN)
  - SIP Server/Client
  - Policy Server
  - AAA Server
  - H.323 Gatekeeper
  - VPN Service Manager
  - CDR Collector/ Billing
  - VPSM

**The two major features:**

- **SS7 connectivity for the media gateway (TIGRIS)**
- **PSTN Voice over IP gateway**

# CASE: Media Gateway Controller (MGC)



The Media Gateway Controller handles call control and instructs Media Gateways using MGCP or H.248 protocol.

- **Based on Open Platform**
  - Sun Microsystem's platform
  - Up to 4 Ultra-SPARC II 300 Mhz with 256M RAM (2GB max)
- **Fault Tolerant Architecture**
  - Hardware utilizes SUNft1800
- **Software**
  - ISUP Handling (International and National ISUP variants)
  - Call Control
  - Device Control
  - Charging/Billing
  - SIP and H.323 client

# Signalling protocols for Voice over IP

## ● H.323

- A family of protocols (H.225, H.245, RAS, H.450.x used for signalling)
- Standardised by ITU-T SG.16 and ETSI Tiphon
- Philosophy: Redesign the telephony network on IP

## ● SS7 over IP

- Philosophy: Connect incumbent network nodes with an IP bearer
- Standardised by ITU-T SG.11 and IETF Sigtran

## ● SIP

- Native TCP/IP protocol, designed for any type of multimedia (e.g. VoIP) sessions
- Standardised by IETF Mmusic

## **CASE: What competence we expect in design**

- **C++ (required)**
- **Experience of some open source C++ component libraries, e.g. ace**
- **Object oriented design**
- **Experience of real time systems**
- **Understanding of IETF**
- **Knowledge of SIP, H323, ISUP, Radius**
- **ASN.1, SNMPv3,**
- **Knowledge of using parsers, lex, yacc..**
- **English!**

## **CASE: Some statements of my own**

- **There are people working in, Madrid, Karstadt, Jorvas, Santa Barbara in this project**
- **Only in English - Even between finns (the mails may get forwarded to our foreign friends**
- **Interesting ways of working - 10 hours time difference between Jorvas and Santa-Barbara**
- **If you want to travel, you definitely can, just pick up a suitable task**
- **Very tempting work, great to be in setting the new solutions that will eventually replace PSTN**

# References

IETF

[www.ietf.org](http://www.ietf.org)

MSF

[www.msforum.org](http://www.msforum.org)

The SIP home page

[www.cs.columbia.edu/~hgs/sip](http://www.cs.columbia.edu/~hgs/sip)

The Future of IP Signalling,

presentation by Leif Björklund,

Ericsson Finland

Network gateway

presentation by Timo Äijälä

Ericsson Finland