Ericsson NGN Solution

Presentation to ALTTC on BSNL Network Modernization

August 26, 2006

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Agenda, August 26

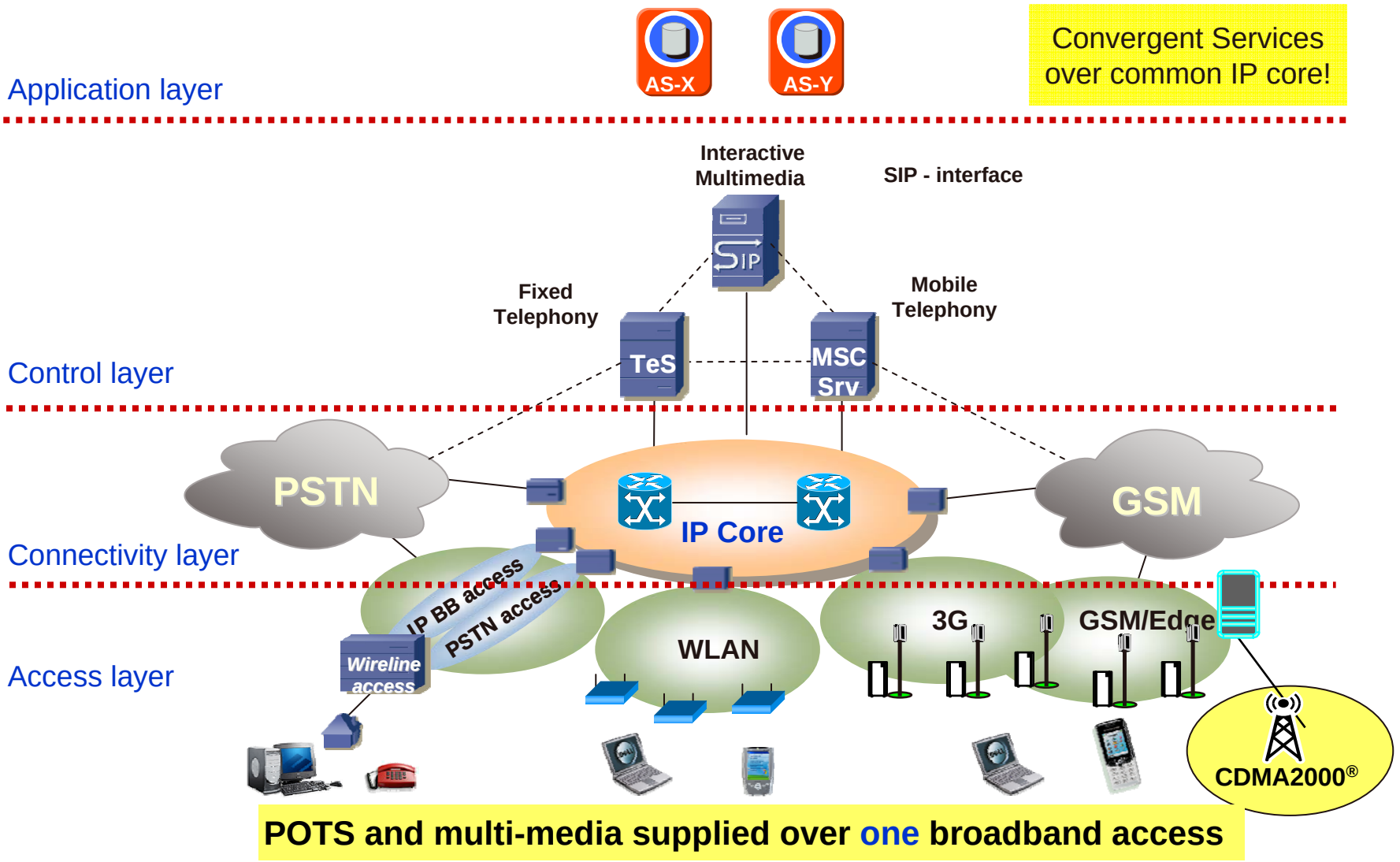
- Ericsson NGN – overview
  - Ericsson's strategy
  - Next generation network architecture
  - Engine The Soft Switch Solution for Telephony and Multi-media
- NGN Solution – ToIP
  - Signalling protocols, compression, interoperability and standards
  - Key issues for Network design – capacity, redundancy , design and dimensioning
  - Carrier class Telephony over IP – just VoIP not good enough
  - Customer Cases
  - Recommendation for BSNL

Ericsson NGN - overview

- Ericsson's strategy
- Next generation network architecture
- Engine – The Soft Switch solution for telephony and multi-media

Ericsson's converged systems architecture

Layered architecture based on 3GPP



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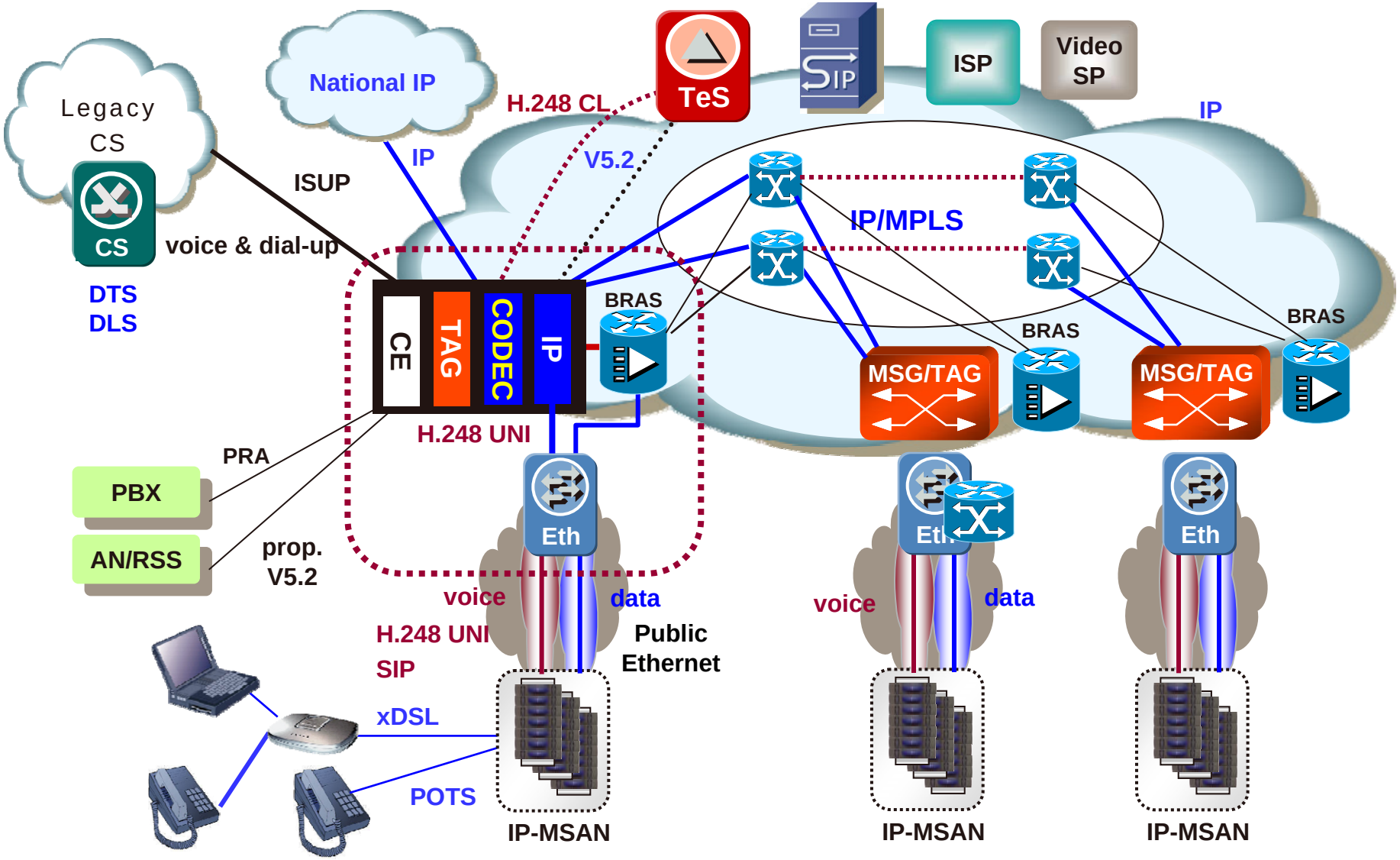
Network overview – voice and data



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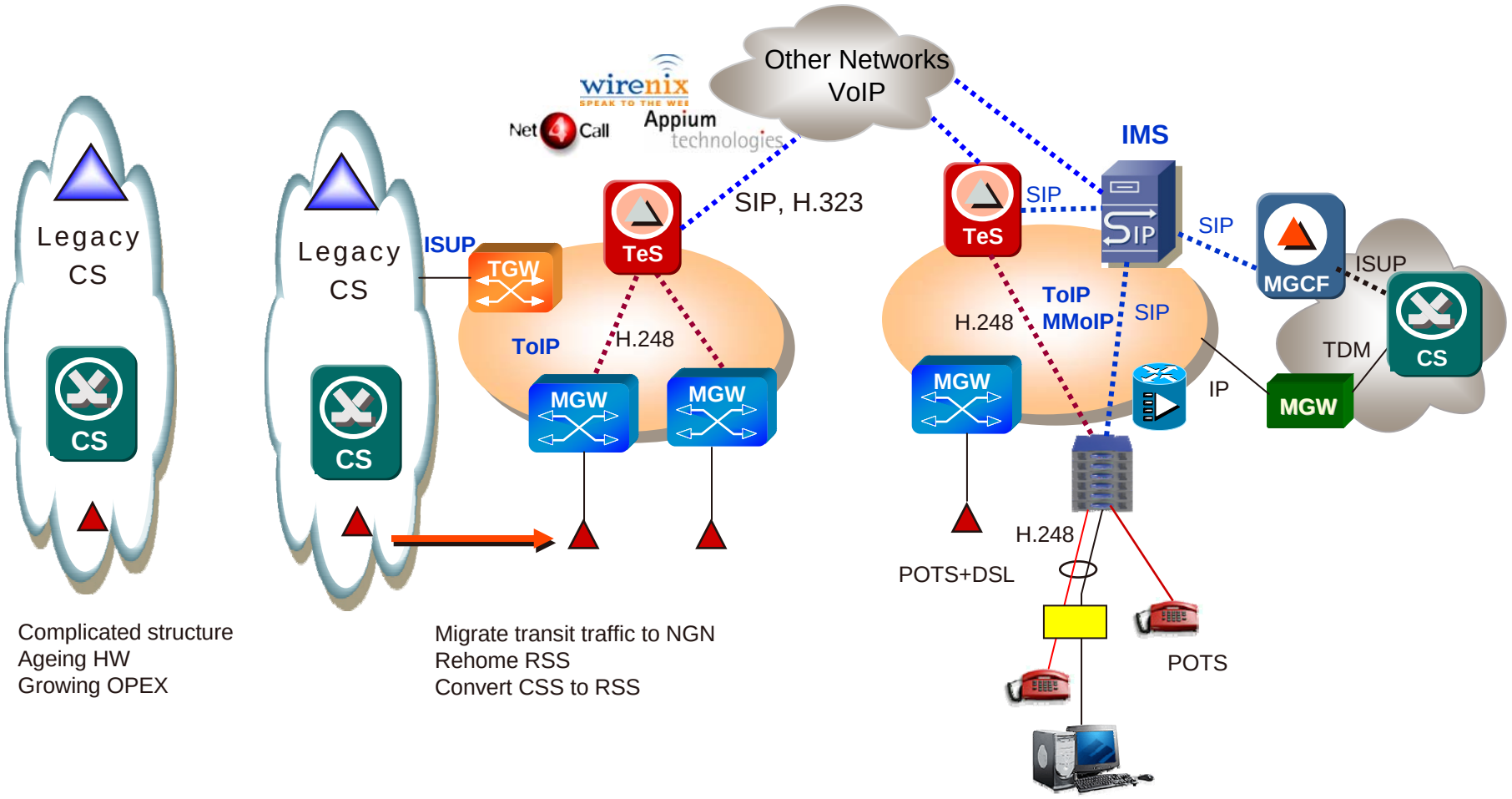
Evolution of telephony and multi-media services

Current CS/TDM

Introduction ToIP

BB and multi-media services
Continued migration class 4 and 5 traffic



Complicated structure
Ageing HW
Growing OPEX

Migrate transit traffic to NGN
Rehome RSS
Convert CSS to RSS

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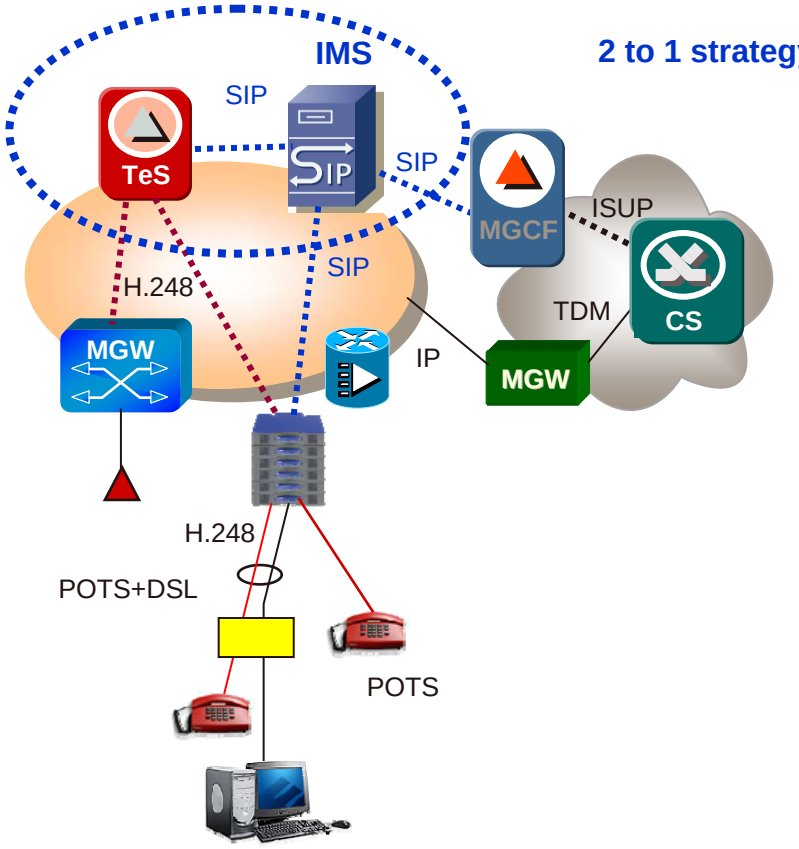
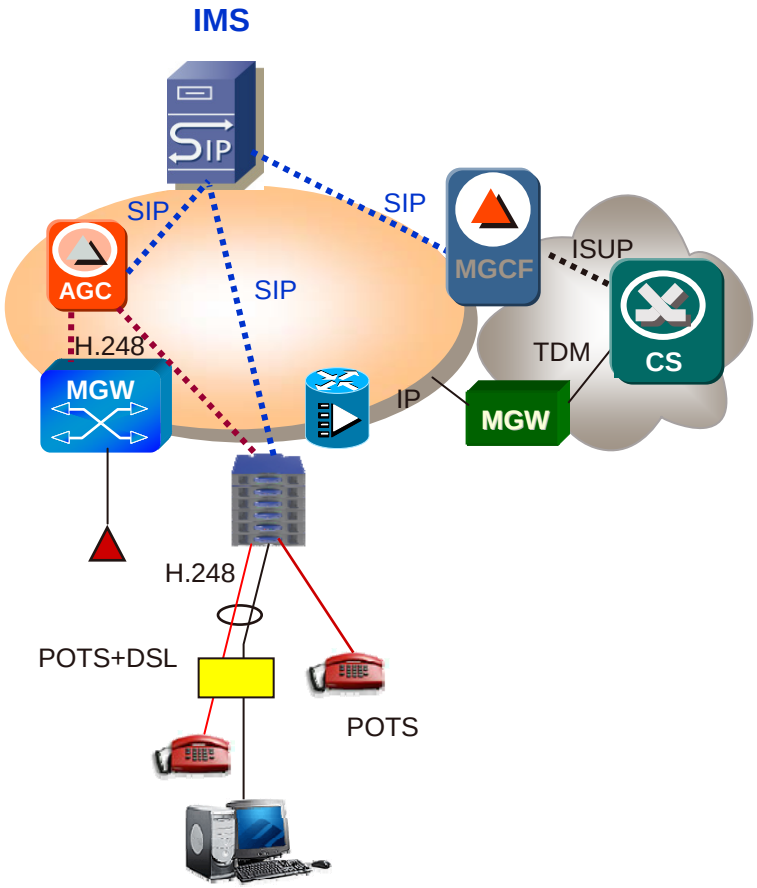
Evolution of telephony and multi-media services

BB and multi-media services
Continued migration class 4 and 5 traffic



2 to 1 strategy

BB and multi-media services
Continued migration class 4 and 5 traffic



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Wireline IMS architecture

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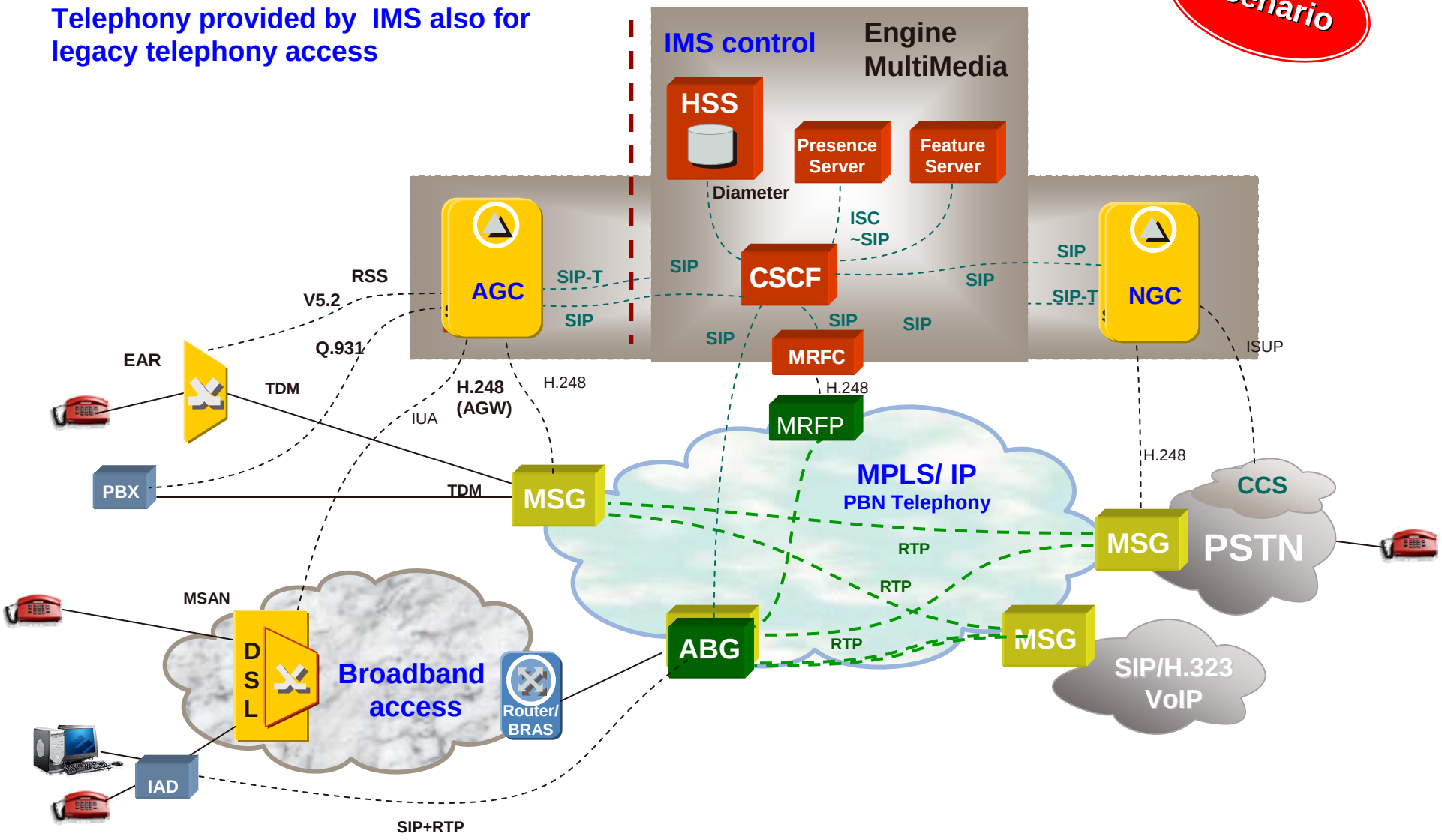
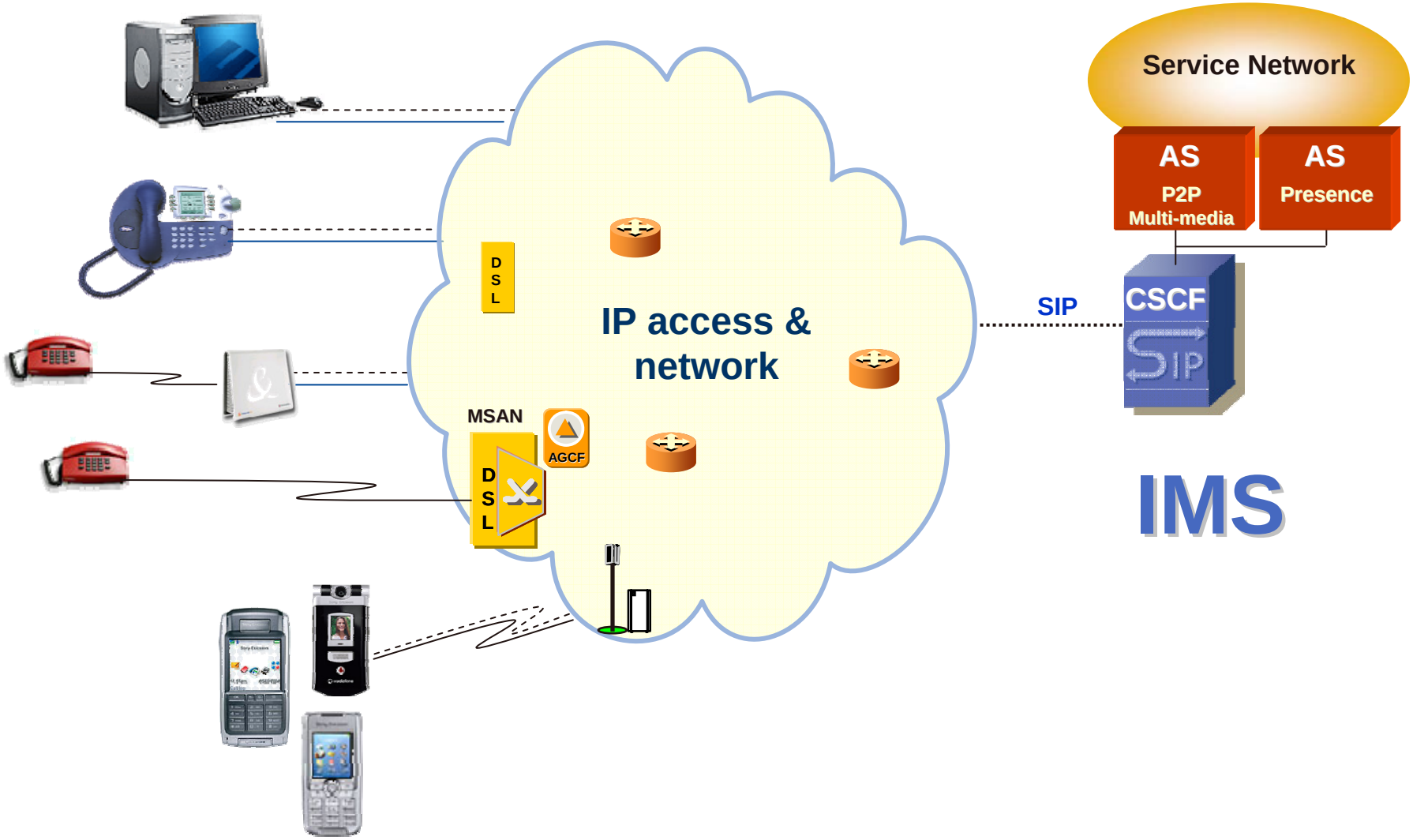
Scenario

Telephony provided by IMS also for legacy telephony access



Evolved telephony based on IMS



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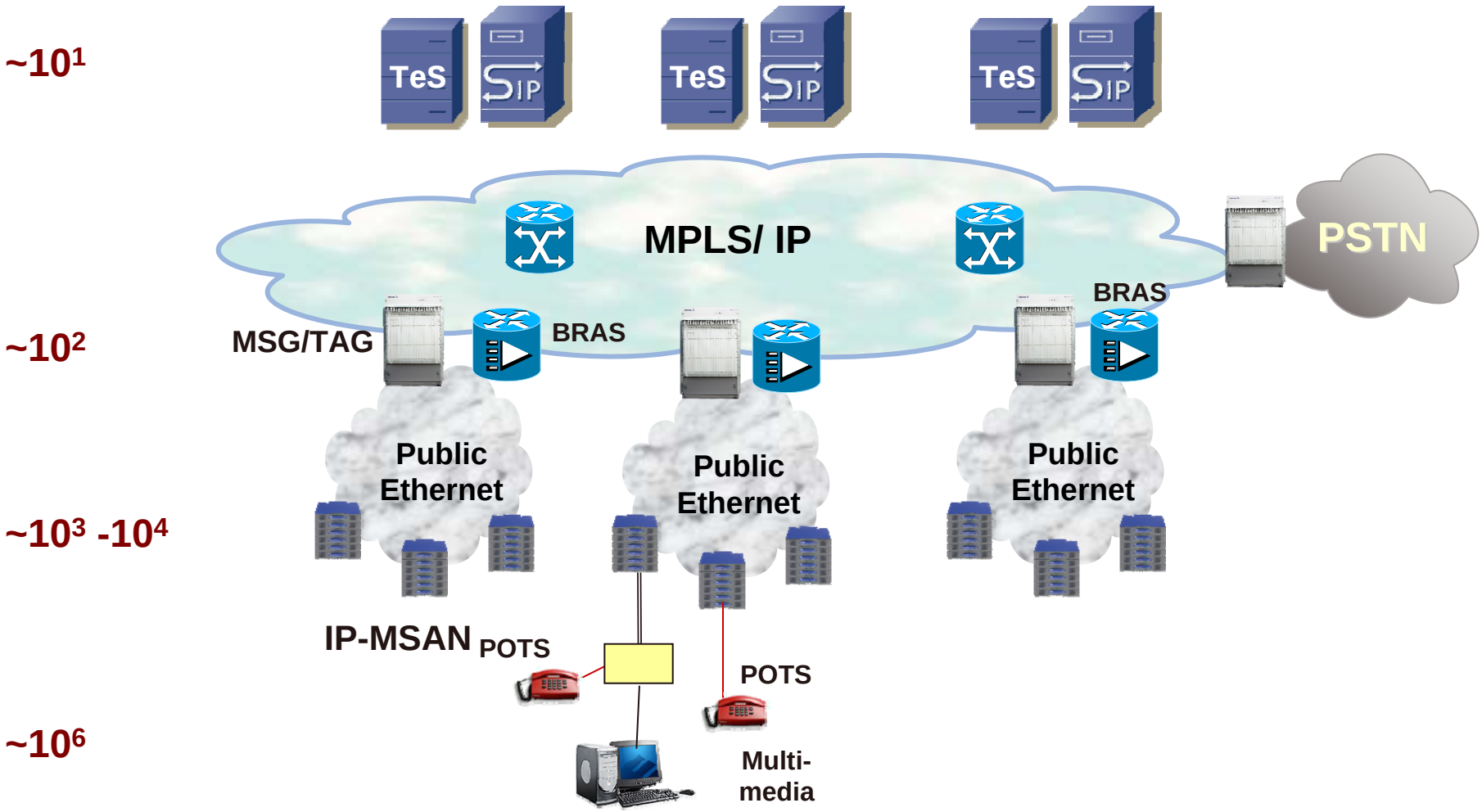
New wireline architecture



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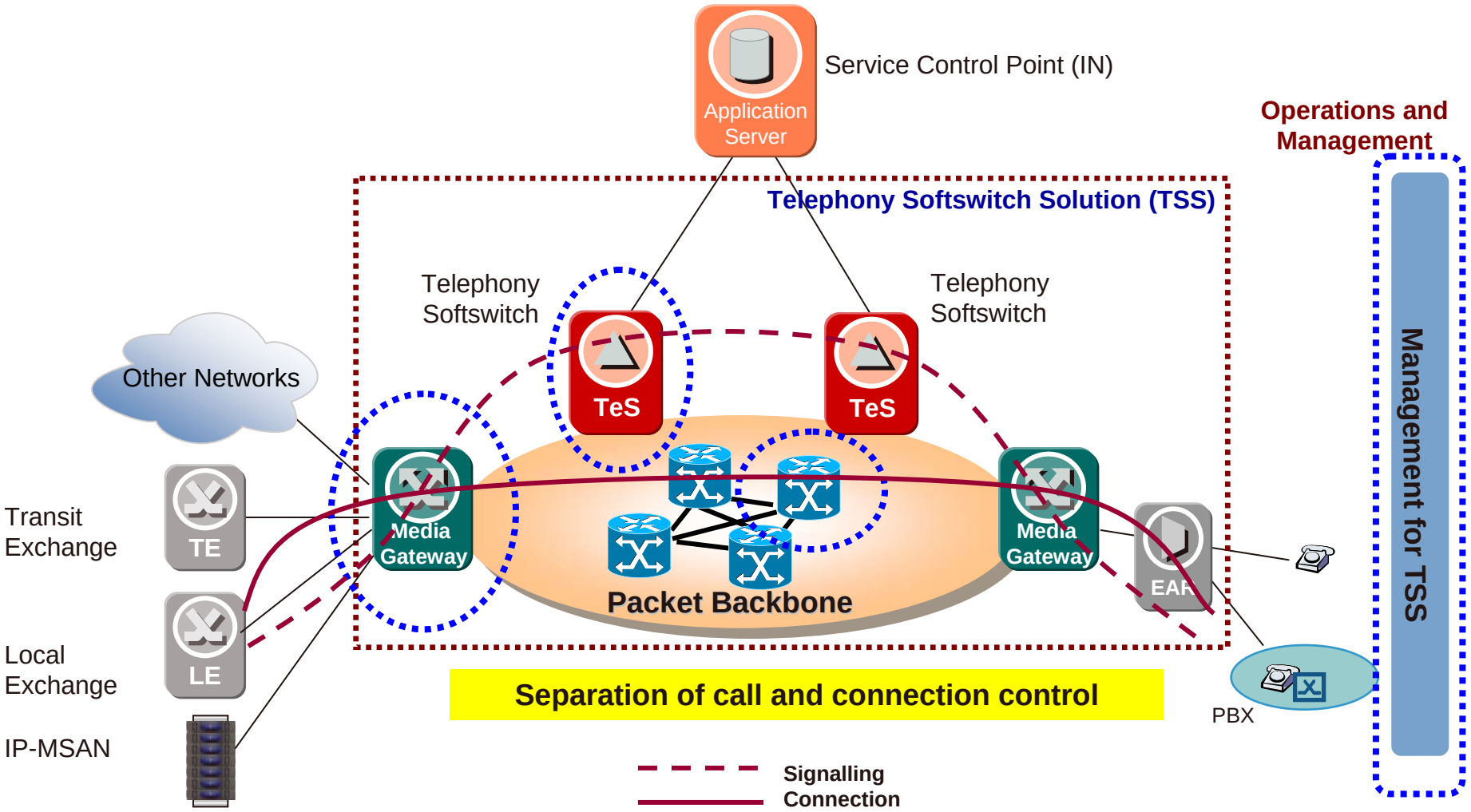
Engine

The softswitch solution for telephony and multi-media

Engine Integral - Telephony Softswitch Solution

Solution overview and main building blocks



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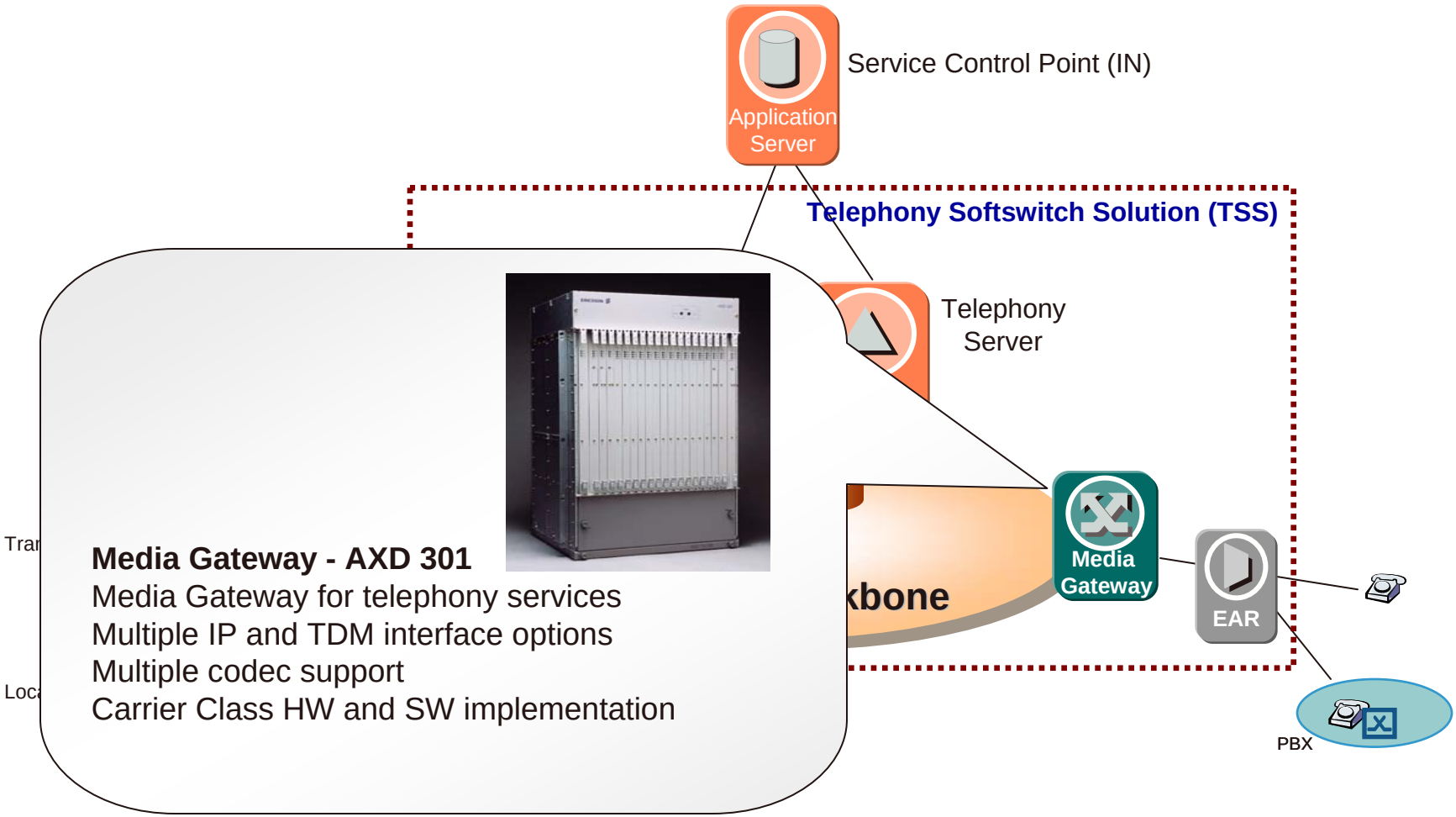
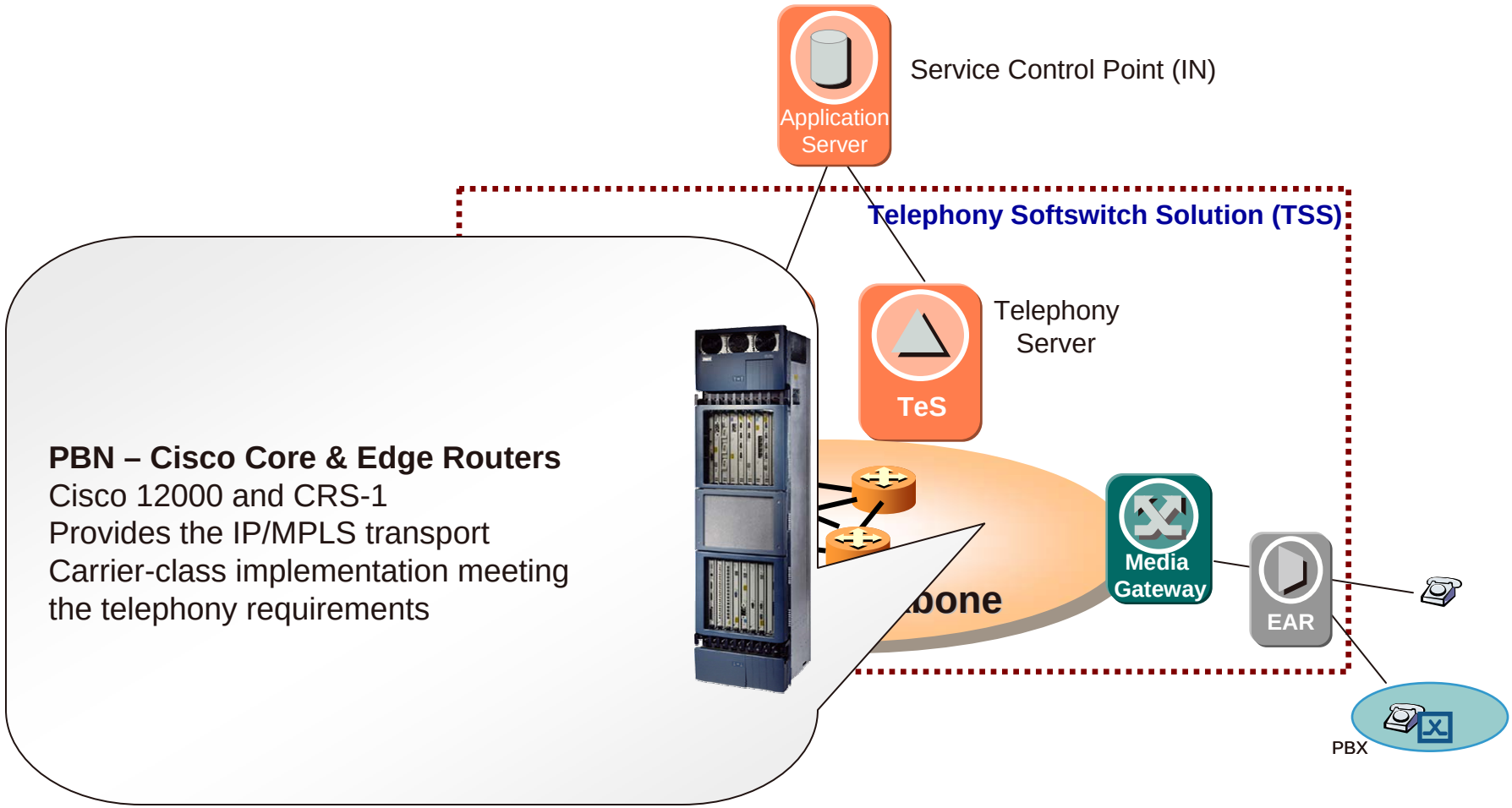
Softswitch – Telephony Server (TeS)

Telephony Server (TeS)
Engine Integral Softswitch
Call control & call logic
Uses proven Technology
Global Class 4 and Class 5 feature set
Carrier Class HW and SW implementation

Media Gateway – AXD 301

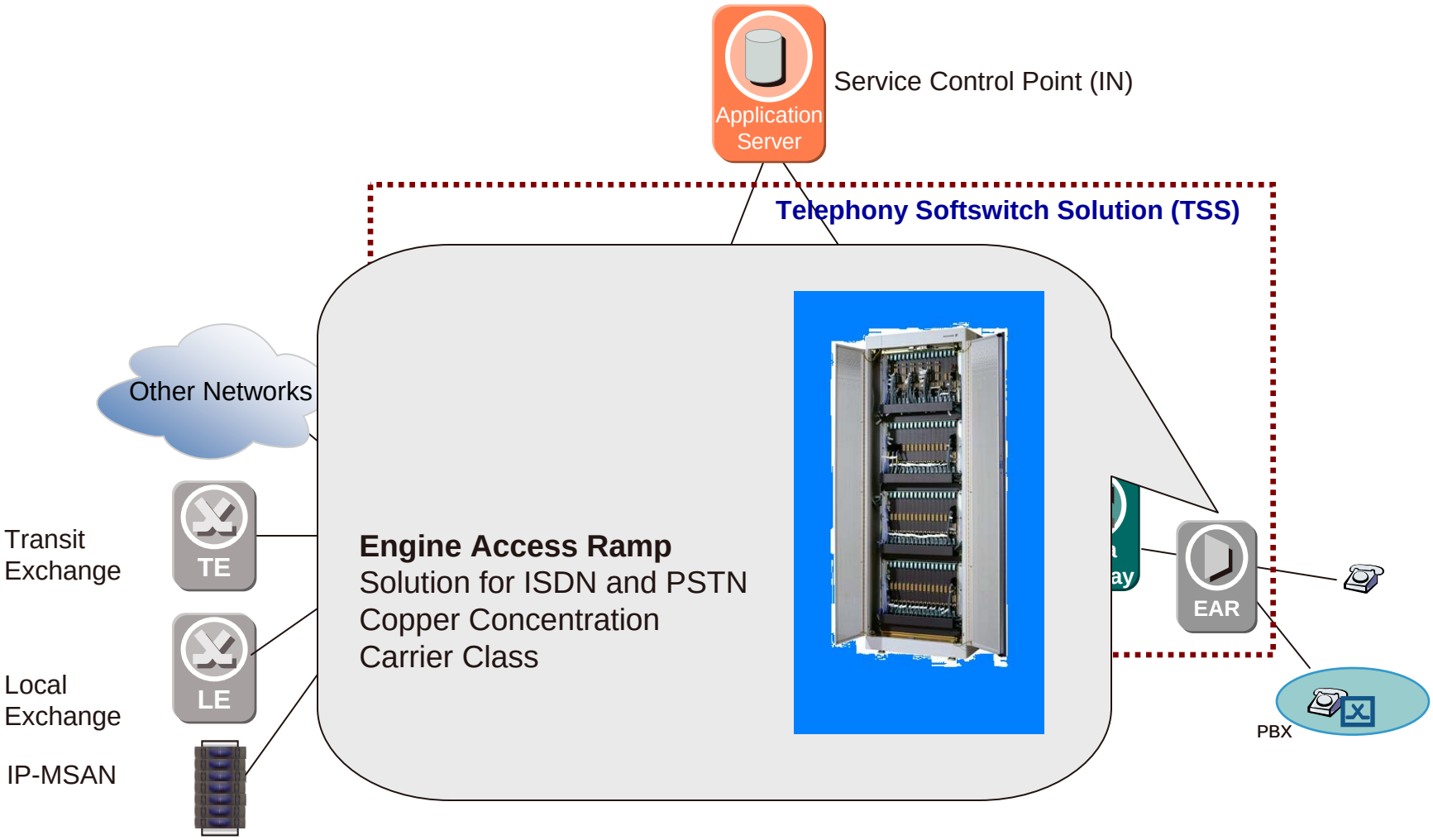


PBN – Cisco IP Core and Edge Technology

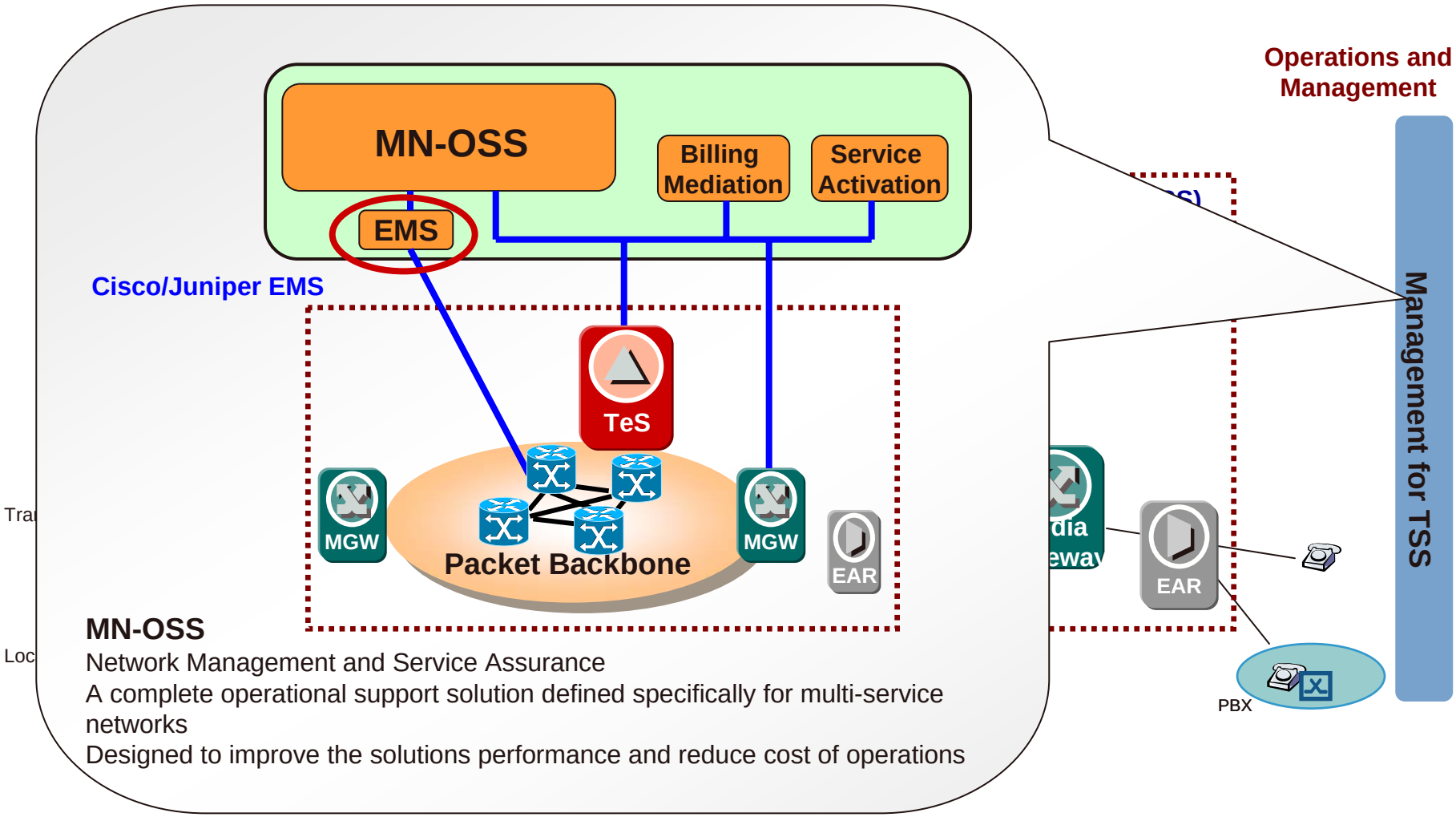


PBN – Cisco Core & Edge Routers
Cisco 12000 and CRS-1
Provides the IP/MPLS transport
Carrier-class implementation meeting the telephony requirements

PSTN access node - Engine Access Ramp (EAR)



Operations and Management – MN OSS



MN-OSS

Network Management and Service Assurance

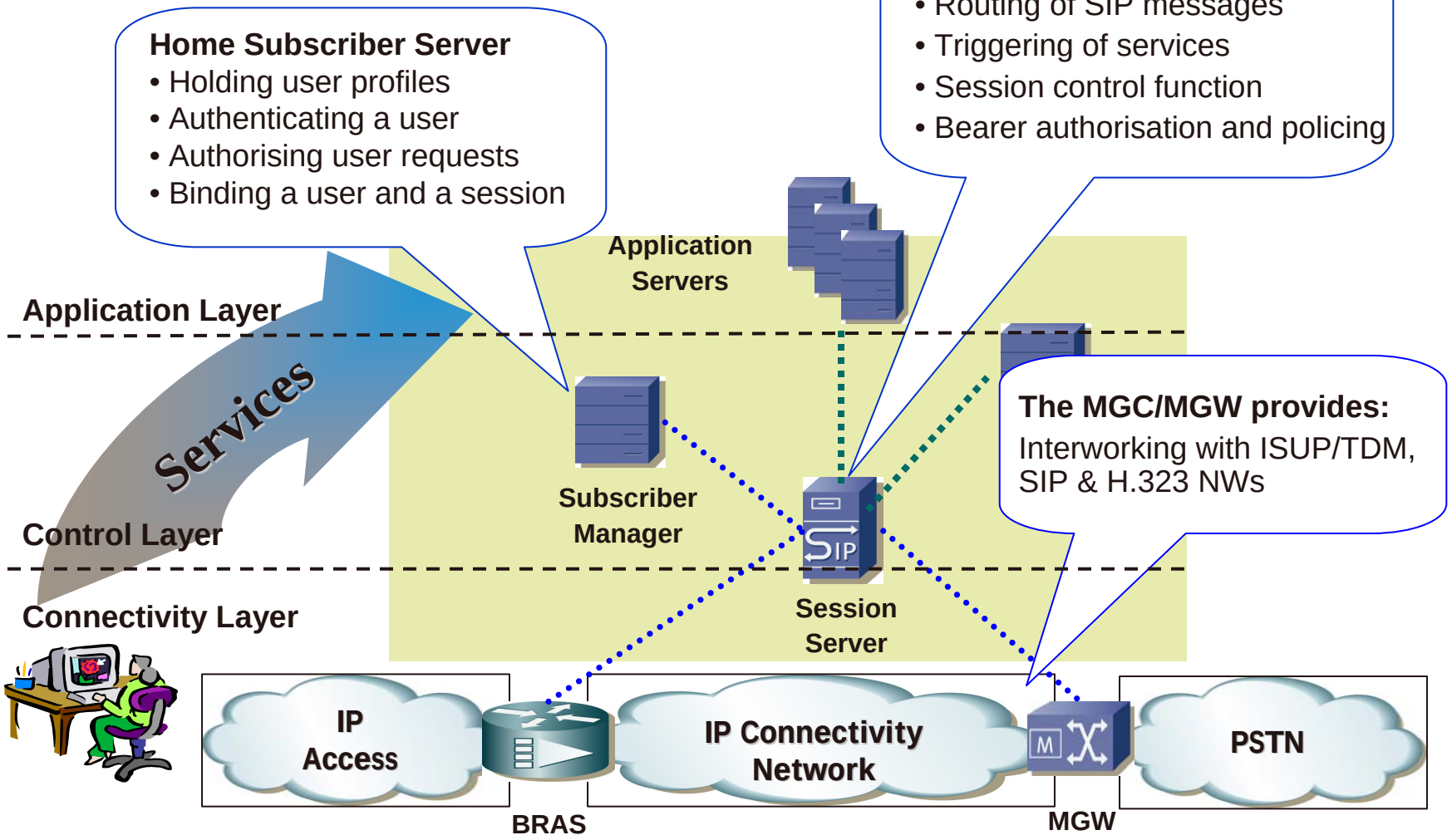
A complete operational support solution defined specifically for multi-service networks

Designed to improve the solutions performance and reduce cost of operations

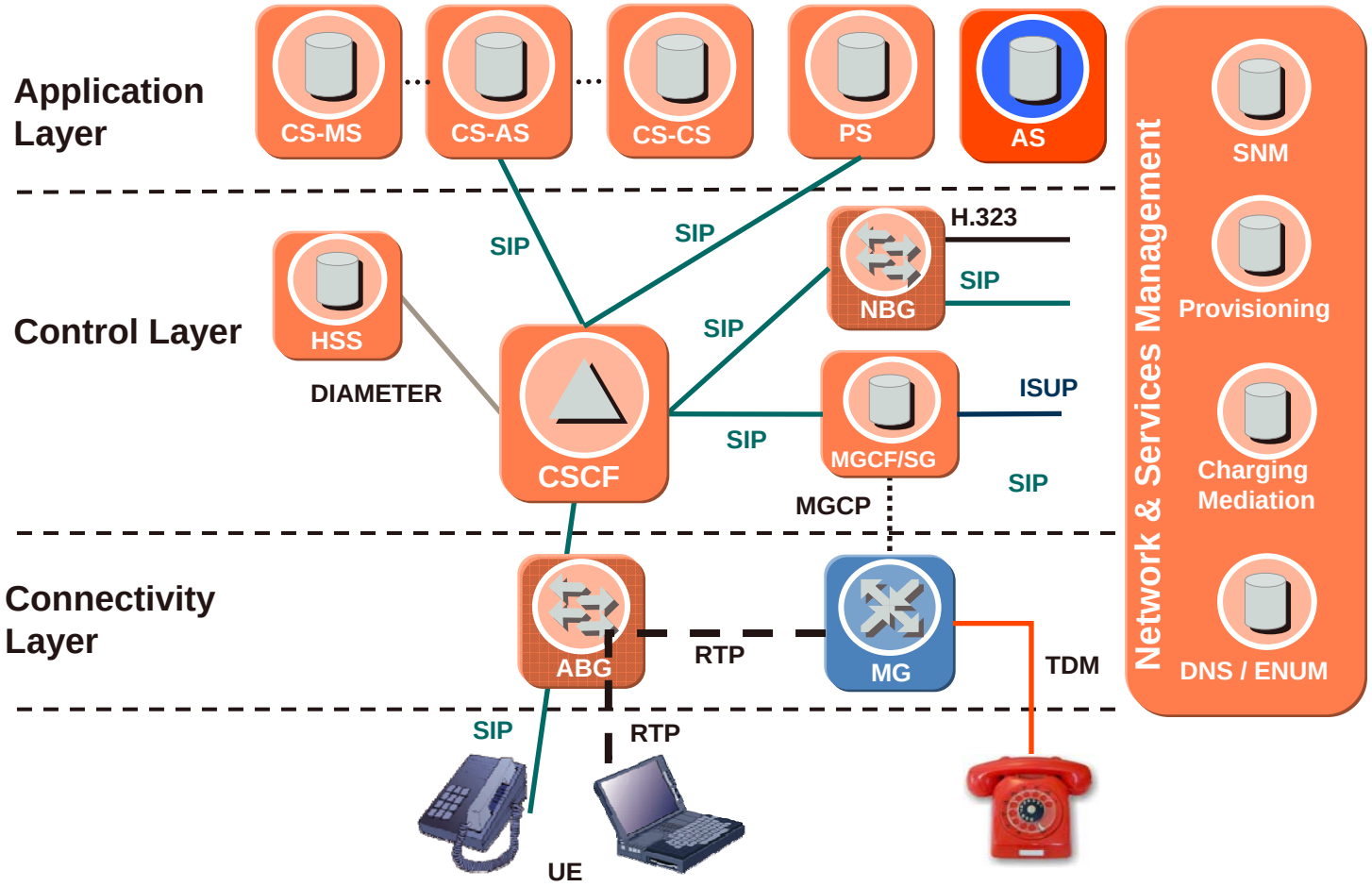
Engine Multi-Media Softswitch Solution

Engine Multi-Media network solution

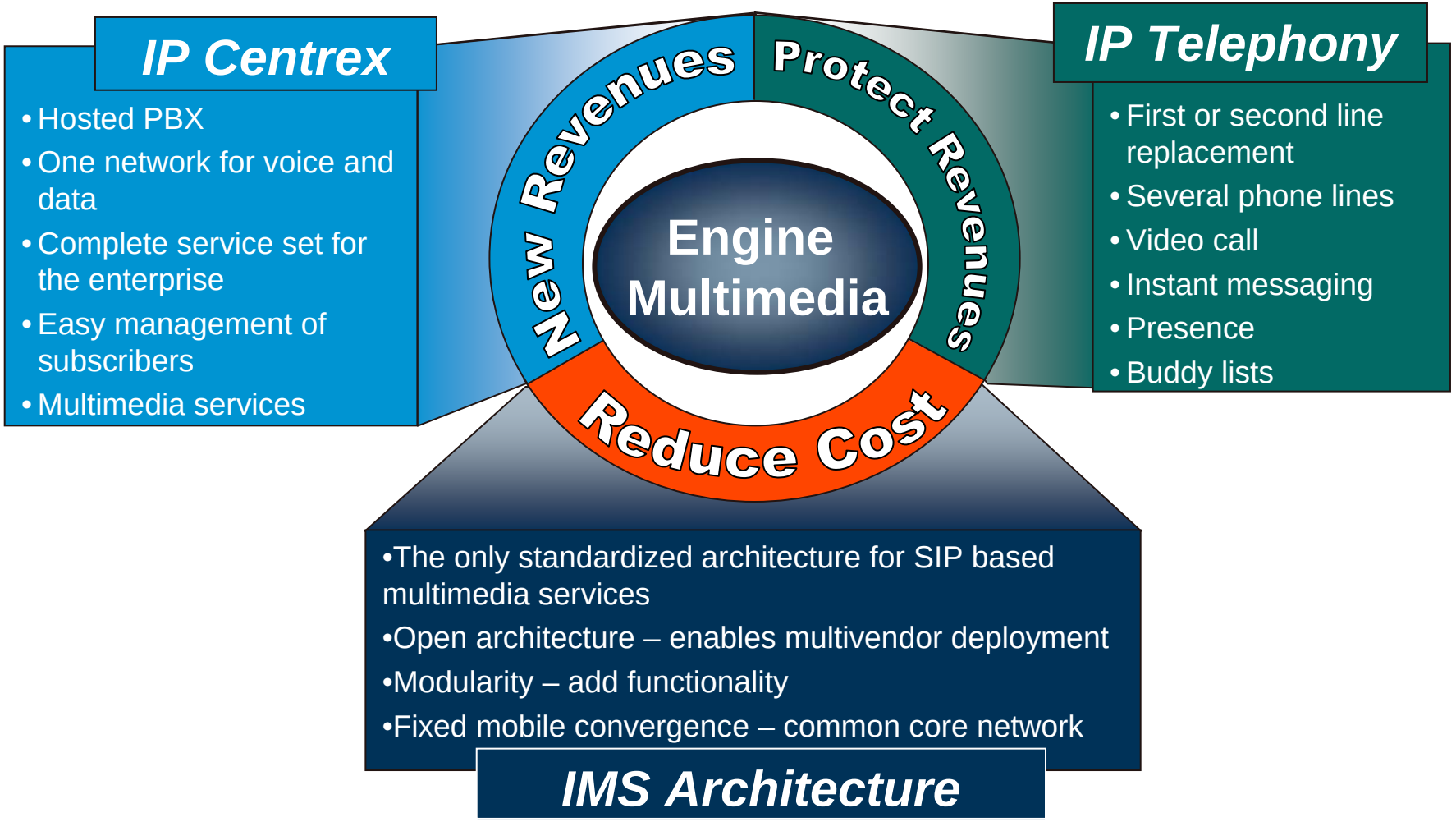
3GPP architecture based om IMS



Engine multi-media solution - 3GPP architecture
Detailed view



Value of Engine Multimedia



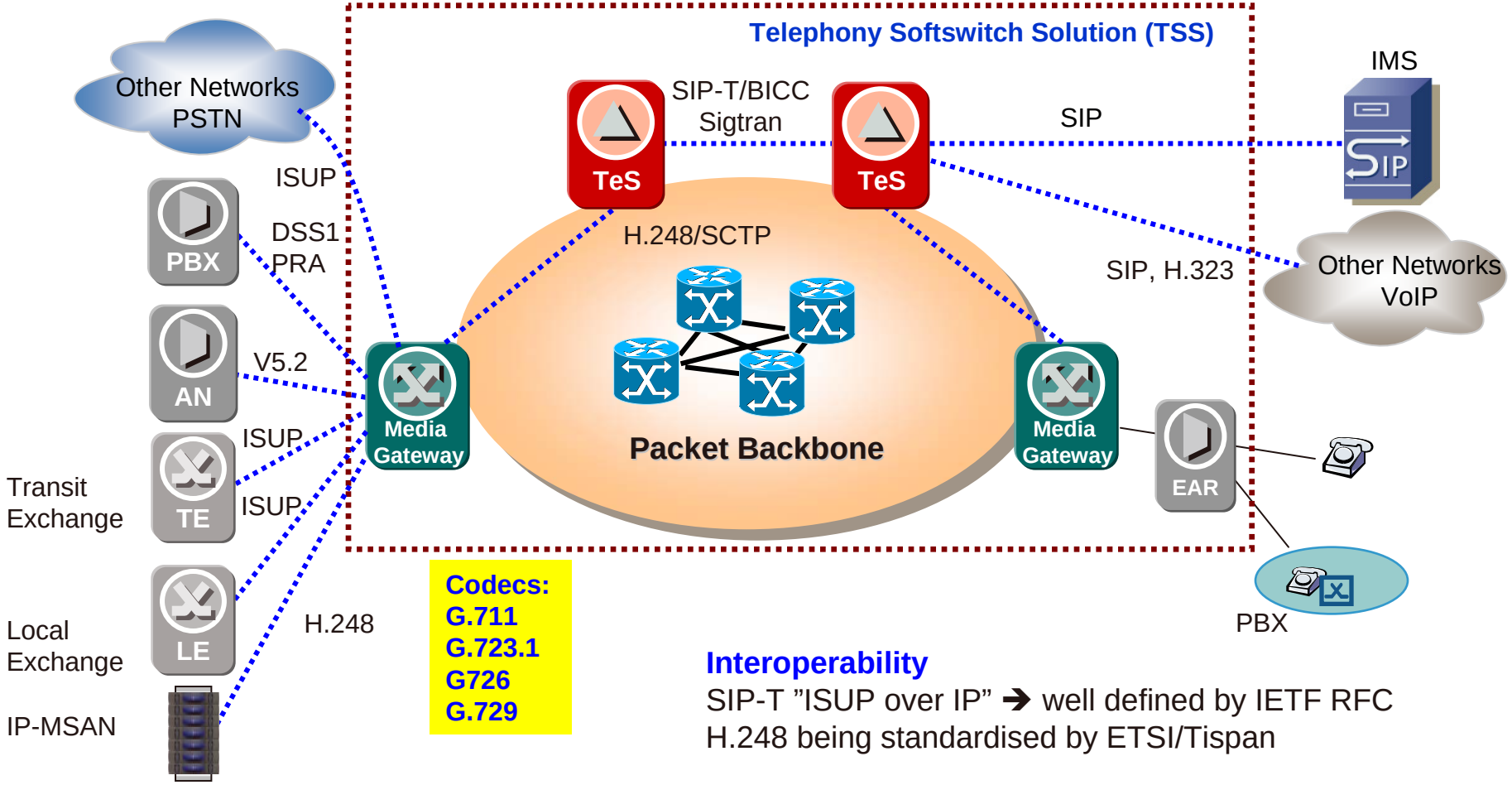
NGN Solution – ToIP

- Signalling protocols, compression, interoperability and standards
- Key issues for Network design – capacity, redundancy , design and dimensioning
- Carrier class Telephony over IP – just VoIP not good enough
- Customer cases

Signalling protocols, compression, interoperability and standards

Signalling overview in Telephony Softswitch Solutions

Basic operation



Interoperability

SIP-T "ISUP over IP" ➔ well defined by IETF RFC

H.248 being standardised by ETSI/Tispan

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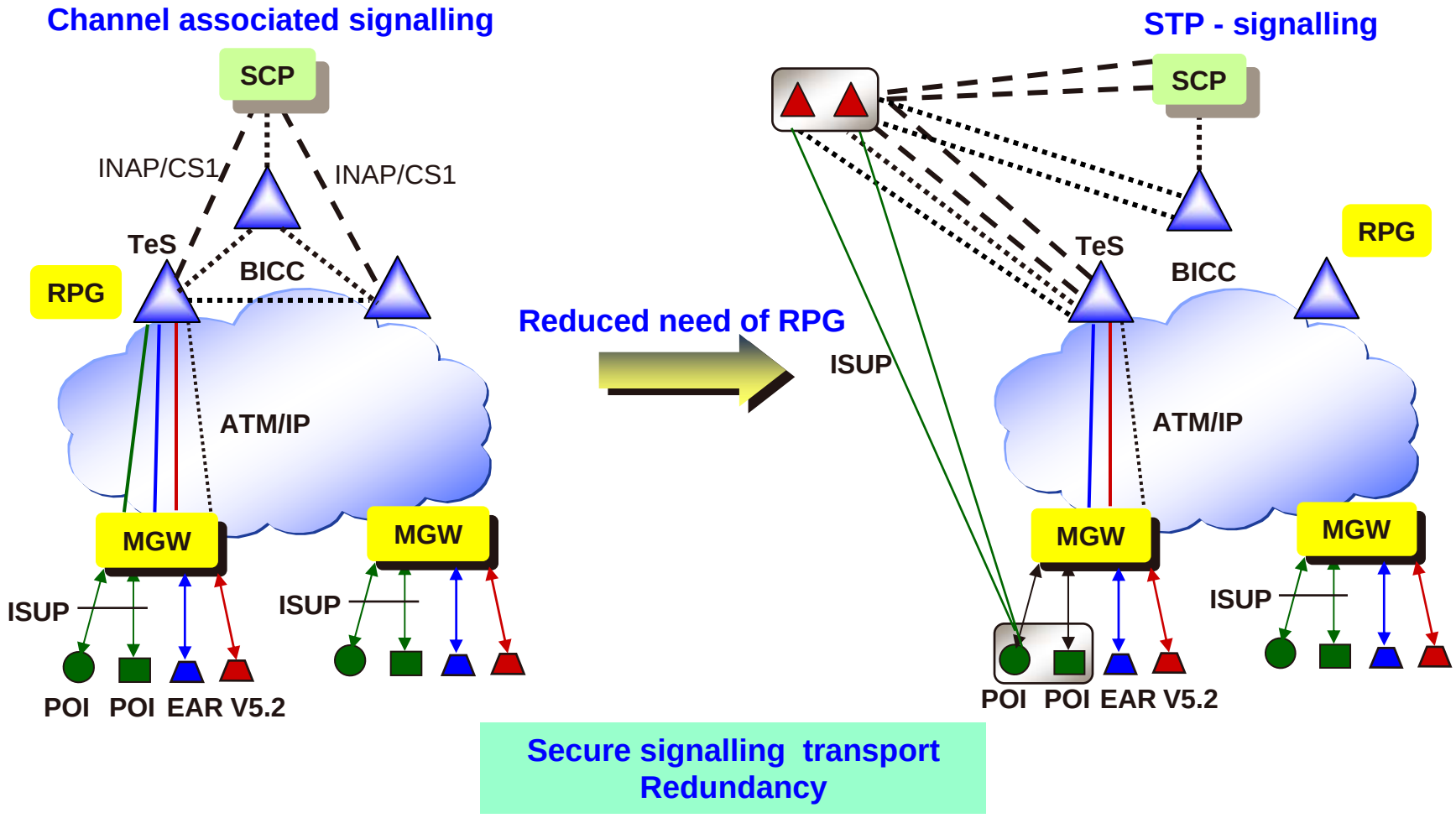
ISUP signalling – two basic alternatives



Secure signalling transport Redundancy

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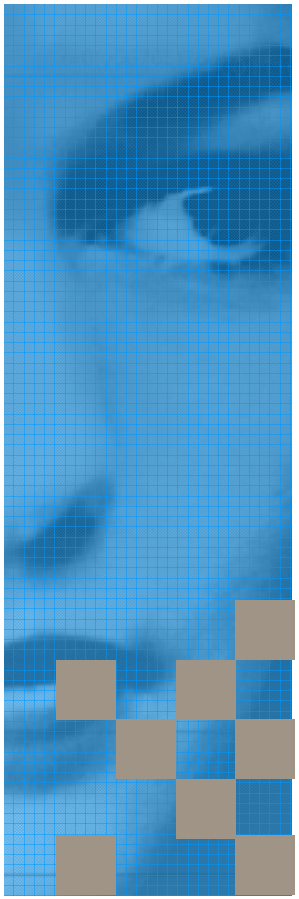
Ericsson's view on signalling in NGN

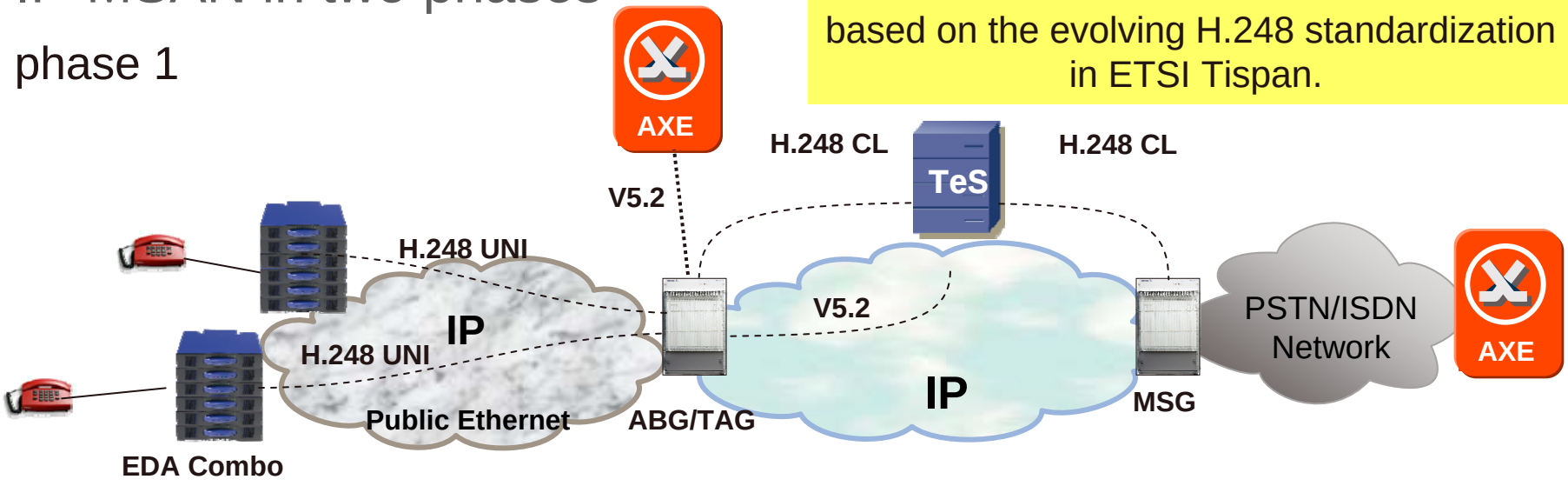


- SIP-T or BICC for interconnect with other telephony softswitches (Sigtran)
- H.248/SCTP for gateway control
- H.248 access signalling for POTS and SIP for multi-media over a common broadband access.
  - Operators see H.248 as the "next-gen. V5.2" for VoIP
  - Based on operator feedback Ericsson has decided to implement H.248 signaling for POTS, rather than "SIP"
- IP-MSAN (AGW) controlled by H.248 (ETSI Tispan)
  - Implementation in two phases

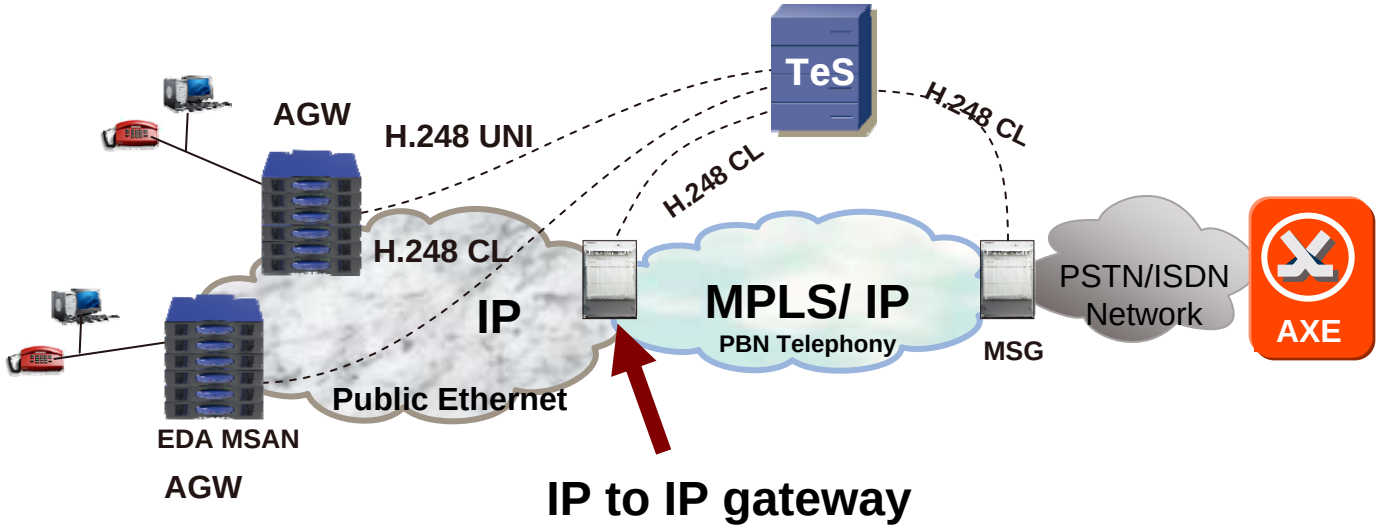
IP-MSAN in two phases

based on the evolving H.248 standardization in ETSI Tispan.

phase 1



phase 2



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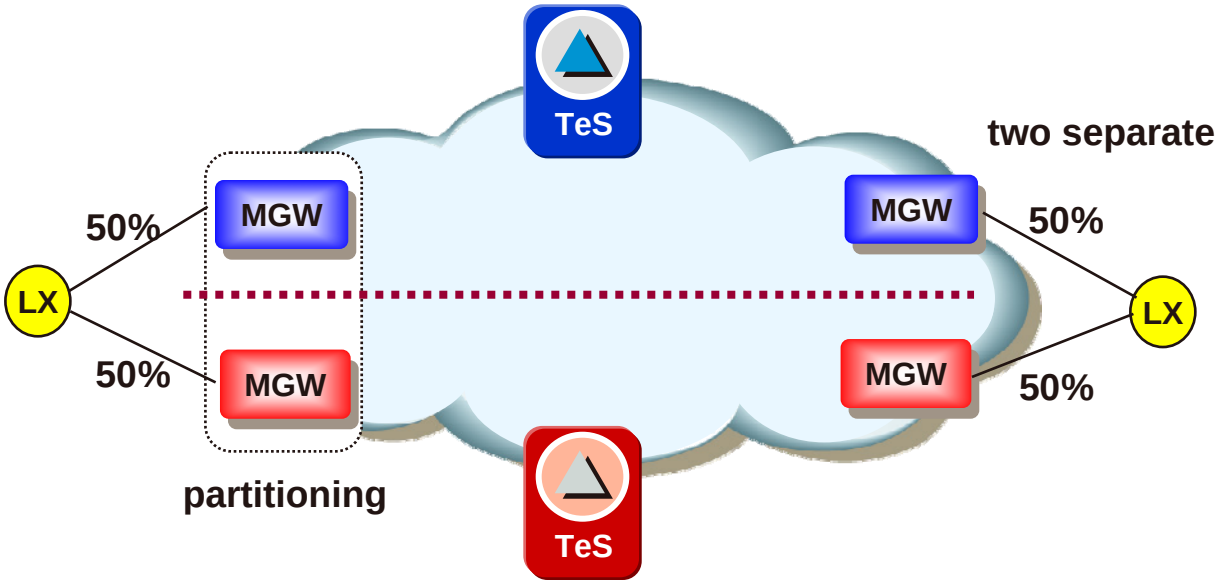
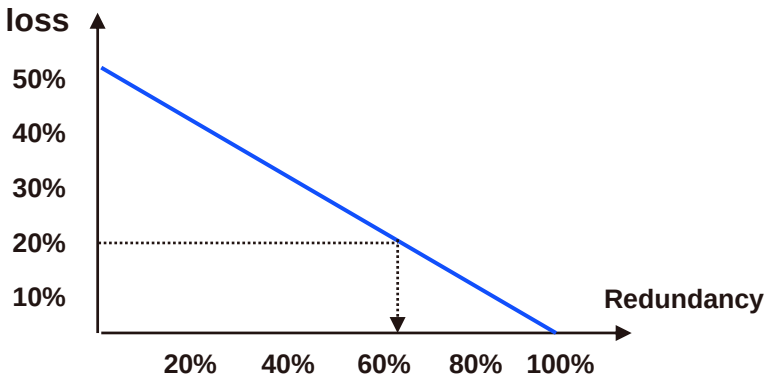
Key issues for Network design

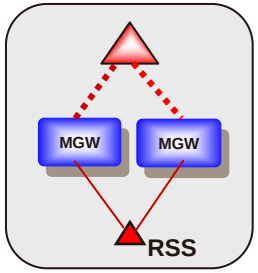
Capacity
Redundancy
Design
Dimensioning

Redundancy for transit applications





Redundancy for local applications
Two options



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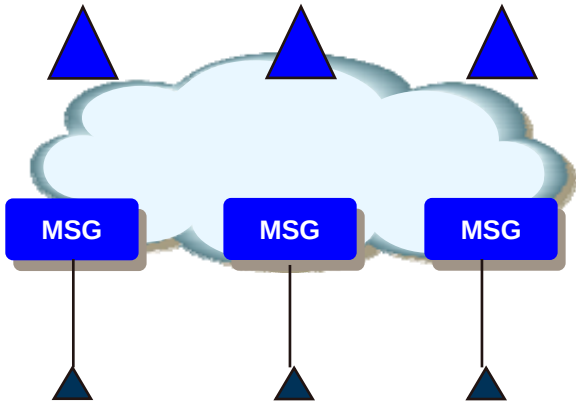
Dual-homing

Option 1: N+1

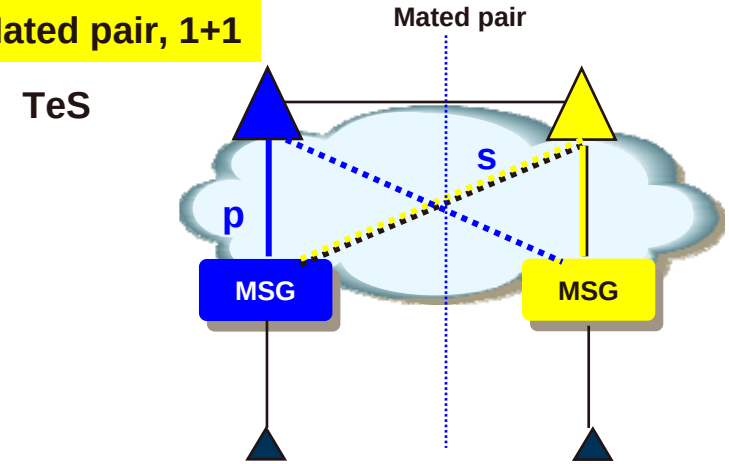


"Cold" stand-by N+1 protection

Advantages

- Cost-efficient, 1 redundant TeS can support may working TeS

Option 2: Mated pair, 1+1



"Hot" stand-by 1+1 protection

Advantages

- Hot stand-by, no traffic disturbance in case of a failure

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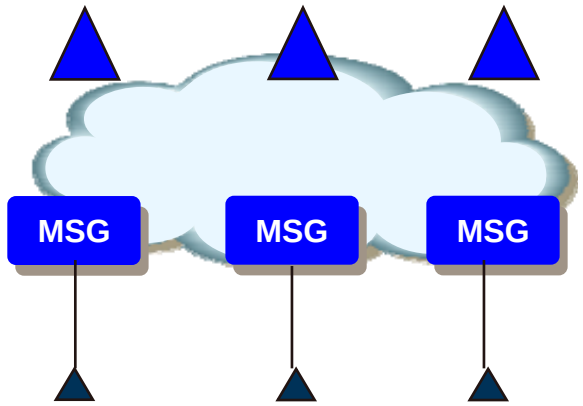
Redundancy for local applications

Two options

Option 1: N+1



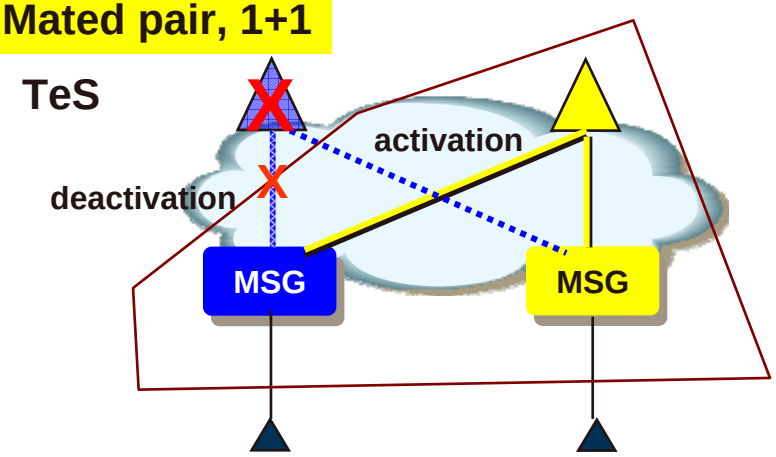
TeS

"Cold" stand-by N+1 protection

Advantages

- Cost-efficient, 1 redundant TeS can support may working TeS

Option 2: Mated pair, 1+1

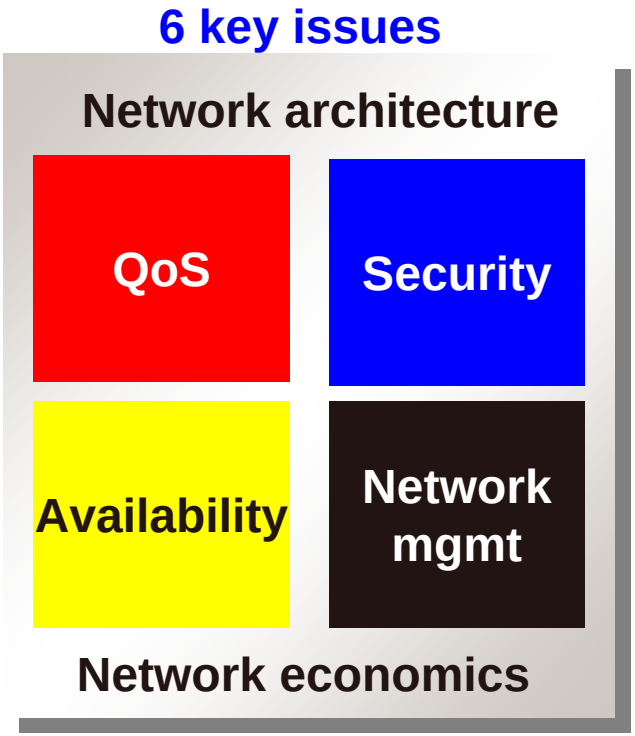


"Hot" stand-by 1+1 protection

Advantages

- Hot stand-by, no traffic disturbance in case of a failure

It is not only about IP – it is about carrier-class IP



Guiding principles

Network architecture

- Multi-service, Multi-vendor
- Support MPLS/Pure IP
- Several hundreds MGW

QoS

- Mouth-to-ear delay < 150 msec
- Voice packet loss < 1%
- MOS-value > 4

Availability – better than "5 nines"

- Back-up links
- Link restoration time < 1 sec

Security

- Protect the telephony nodes from different kinds of attacks

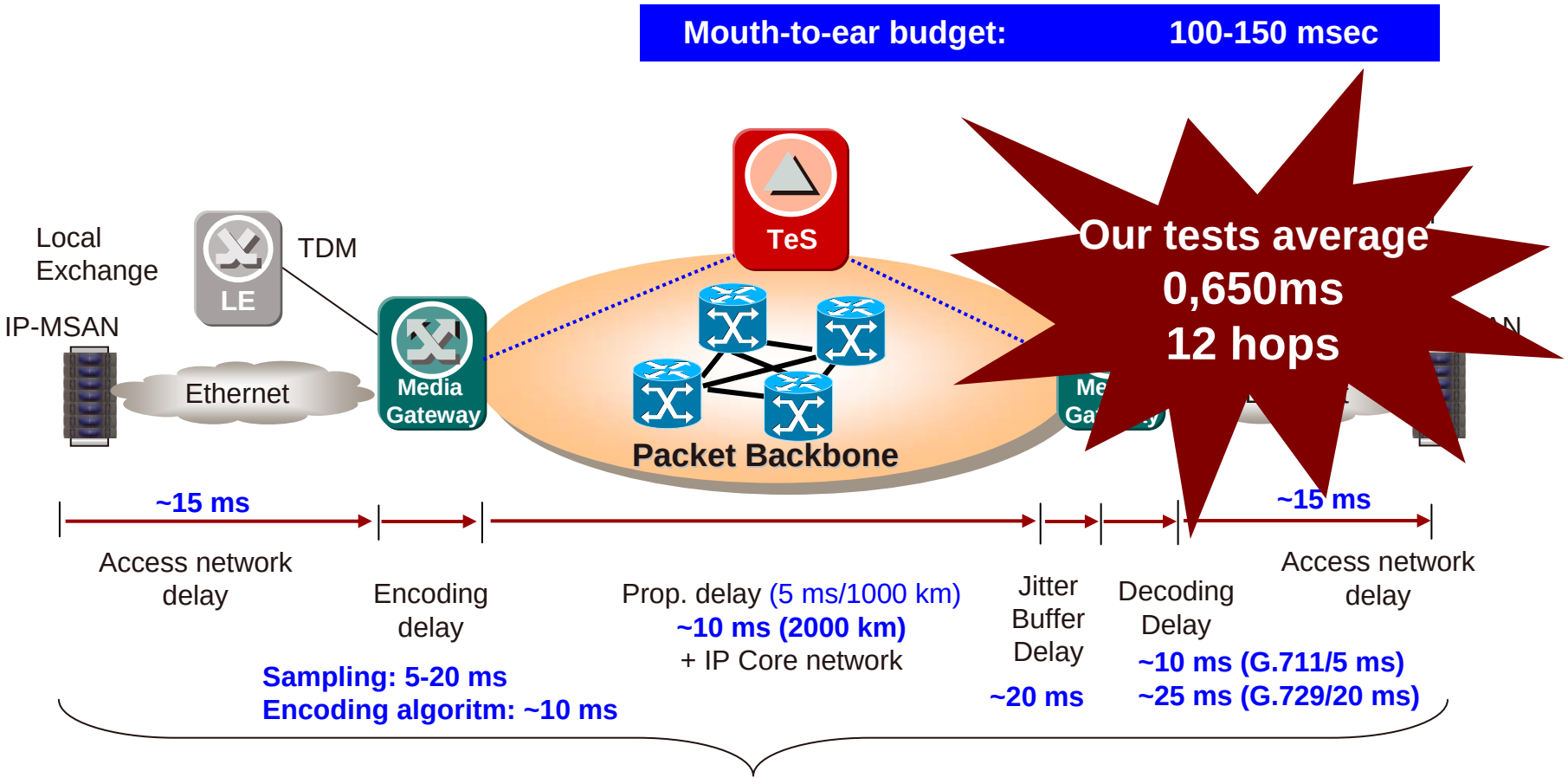
Management

- Proactive monitoring of voice traffic in IP network

MOS=Mean opinion score

Carrier class IP is about **network design** and **management**!

Delay budget

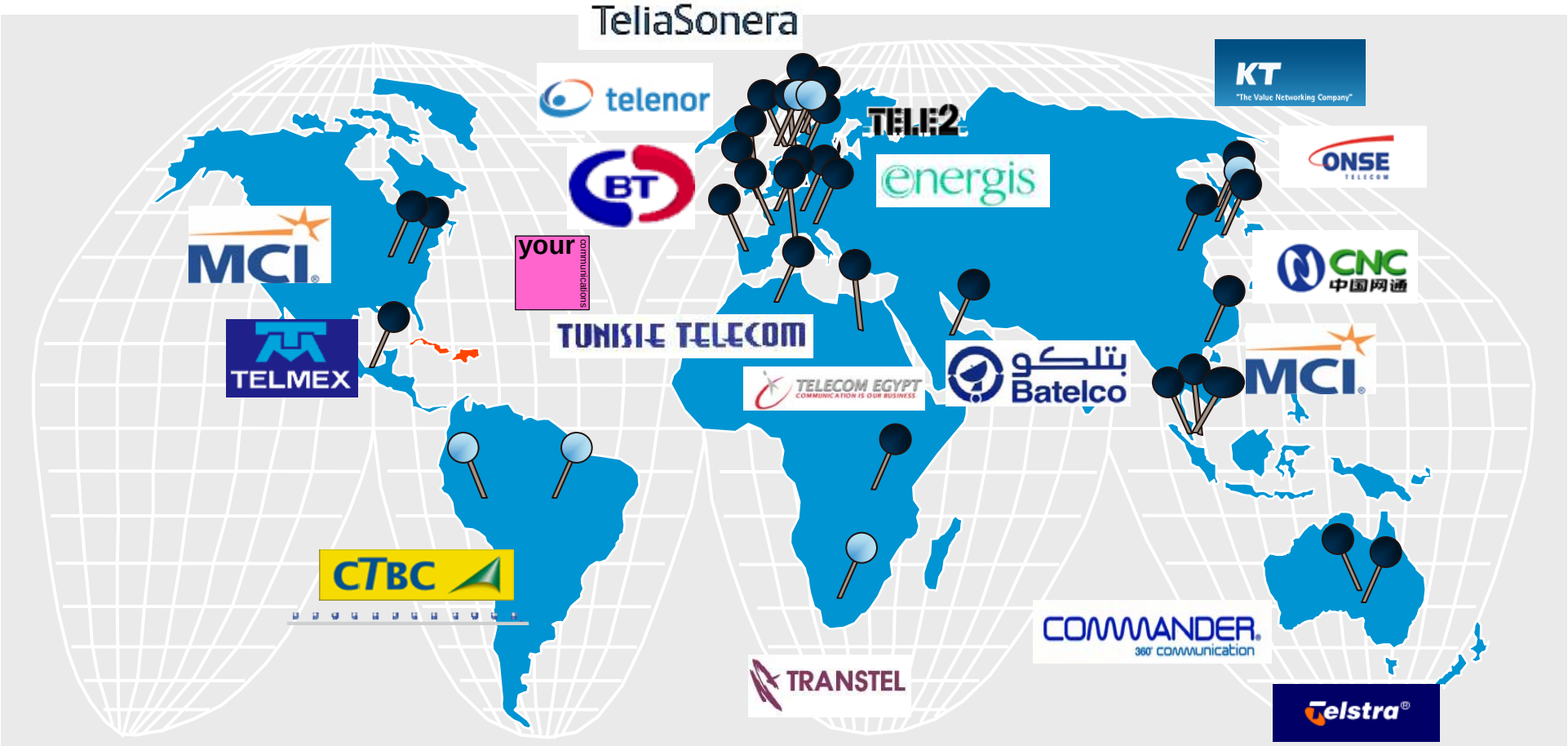


Delay contribution from IP-core network could safely be ignored

Allow longer sampling time – if voice quality MOS>4

Engine Softswitch Networks

	Contracted	In Service
Softswitches	103	69
Media Gateway	316	223
Customers	33	24



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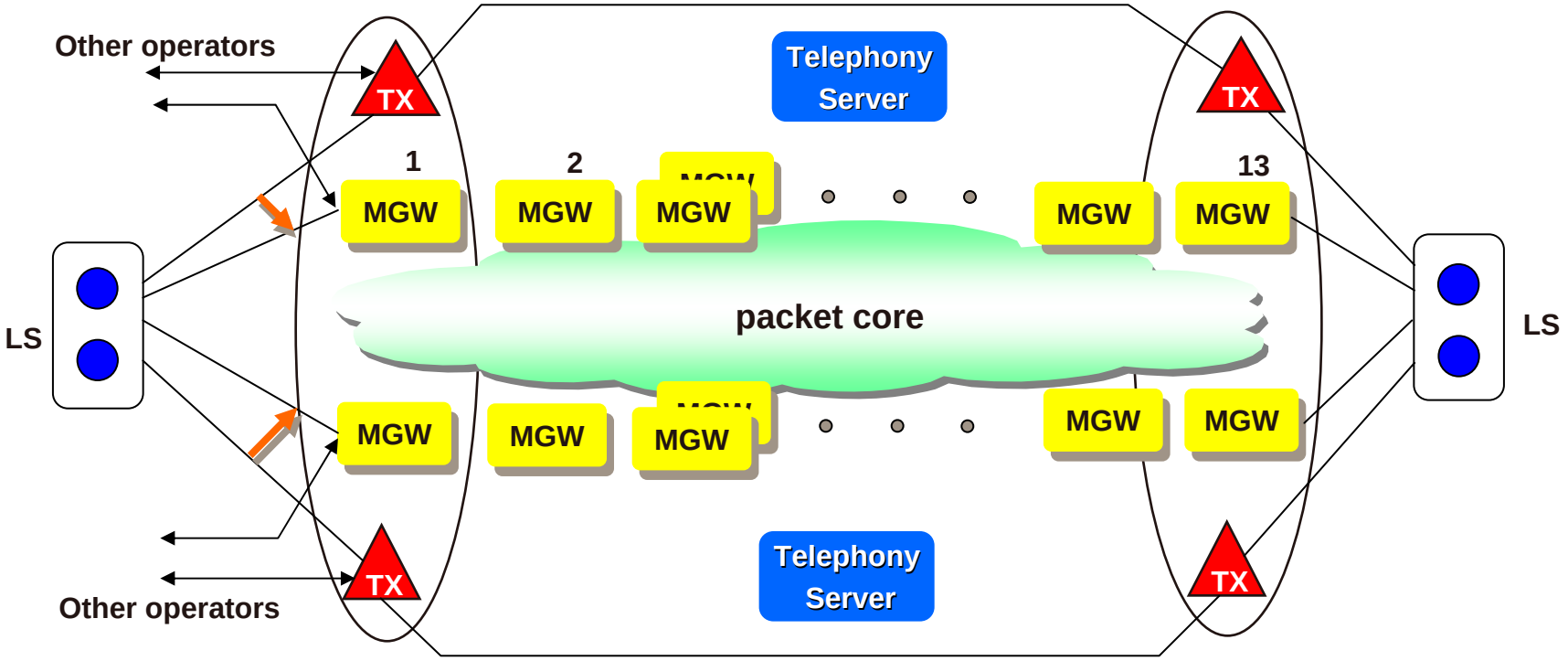
Network development - Phase 1

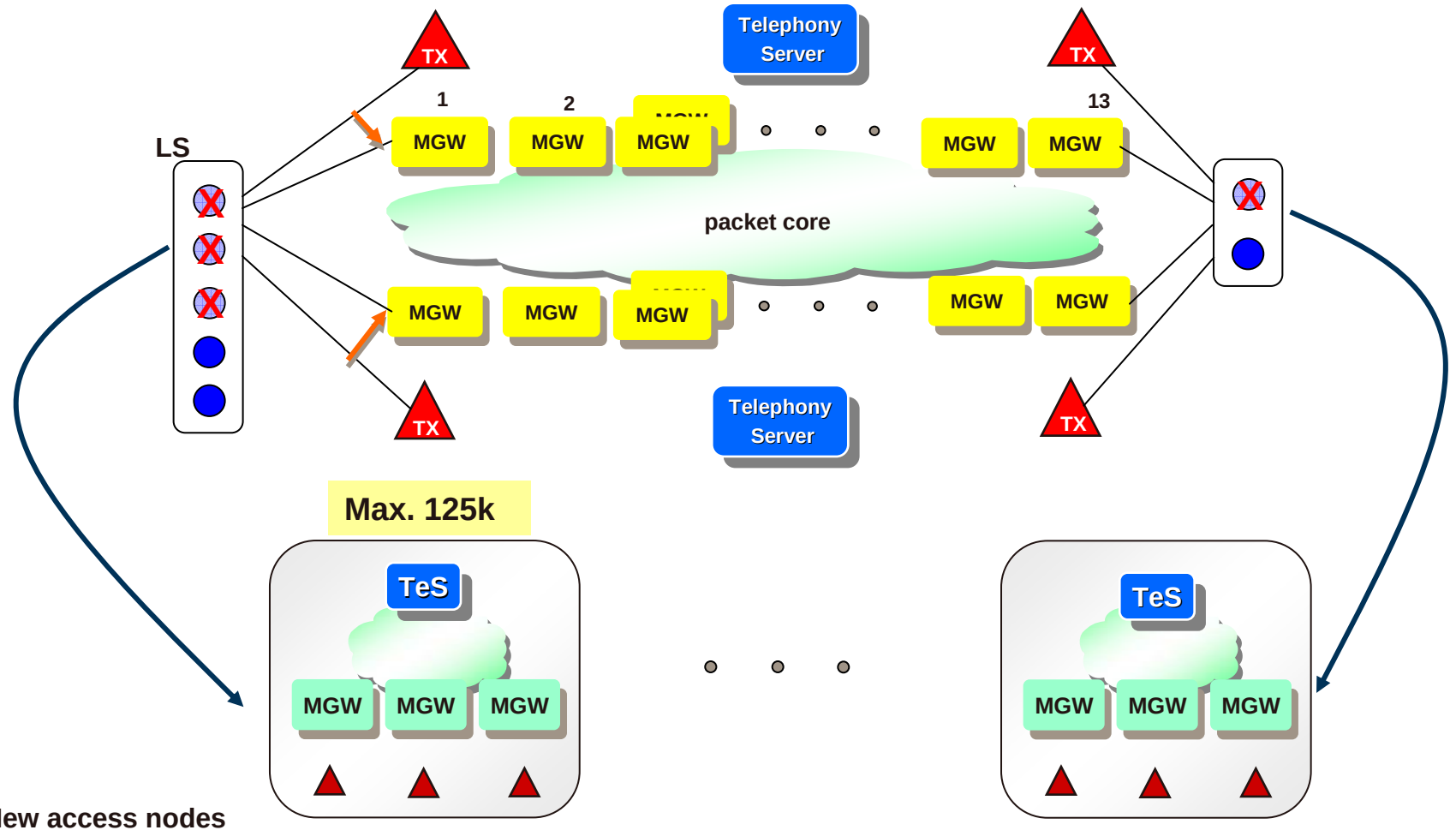
ENGINE for the growing interconnect traffic to other operators



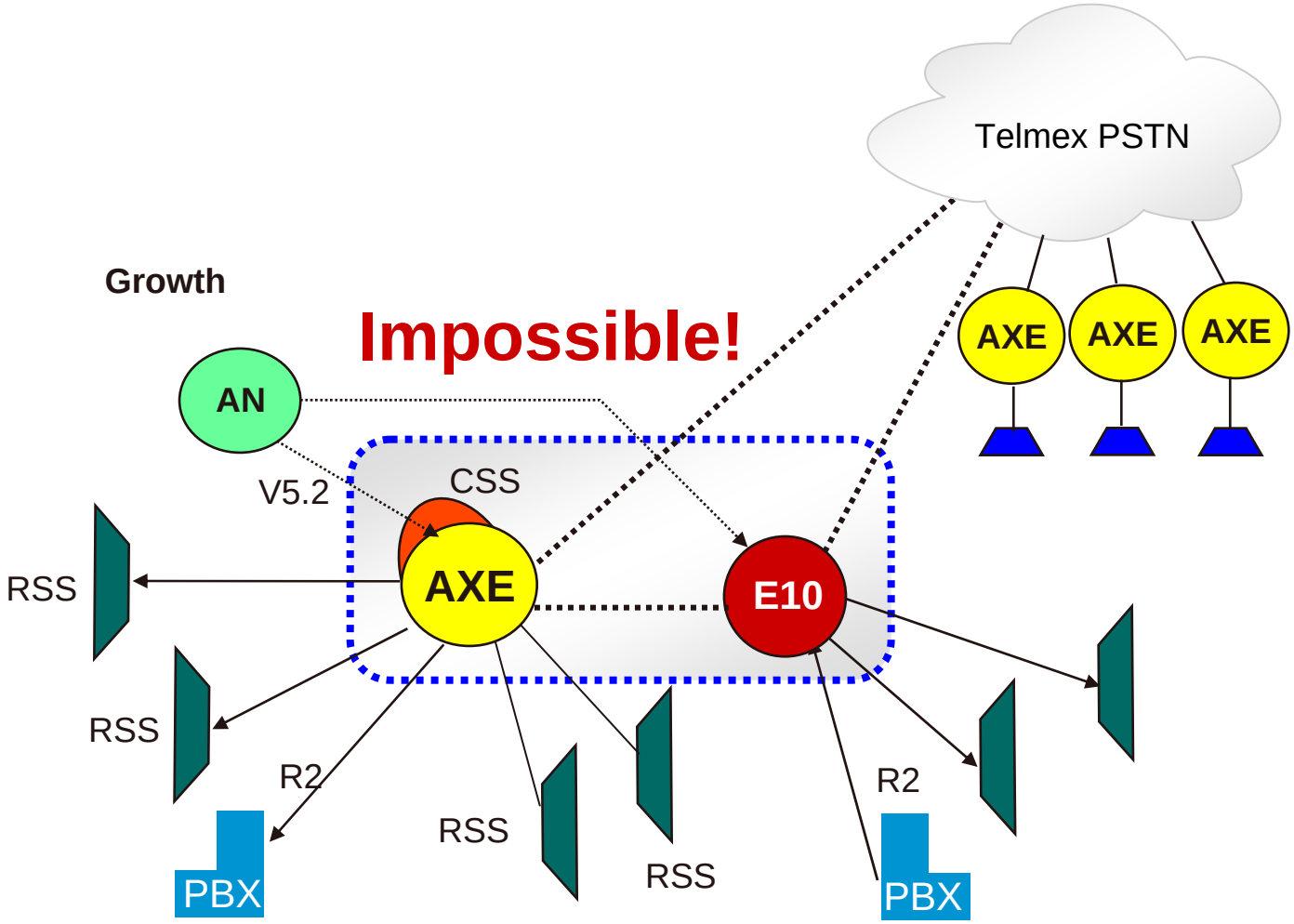
4000 E1 → **2 Tes**
26 MGW

Network development - Phase 2

Replacement of analogue local switches

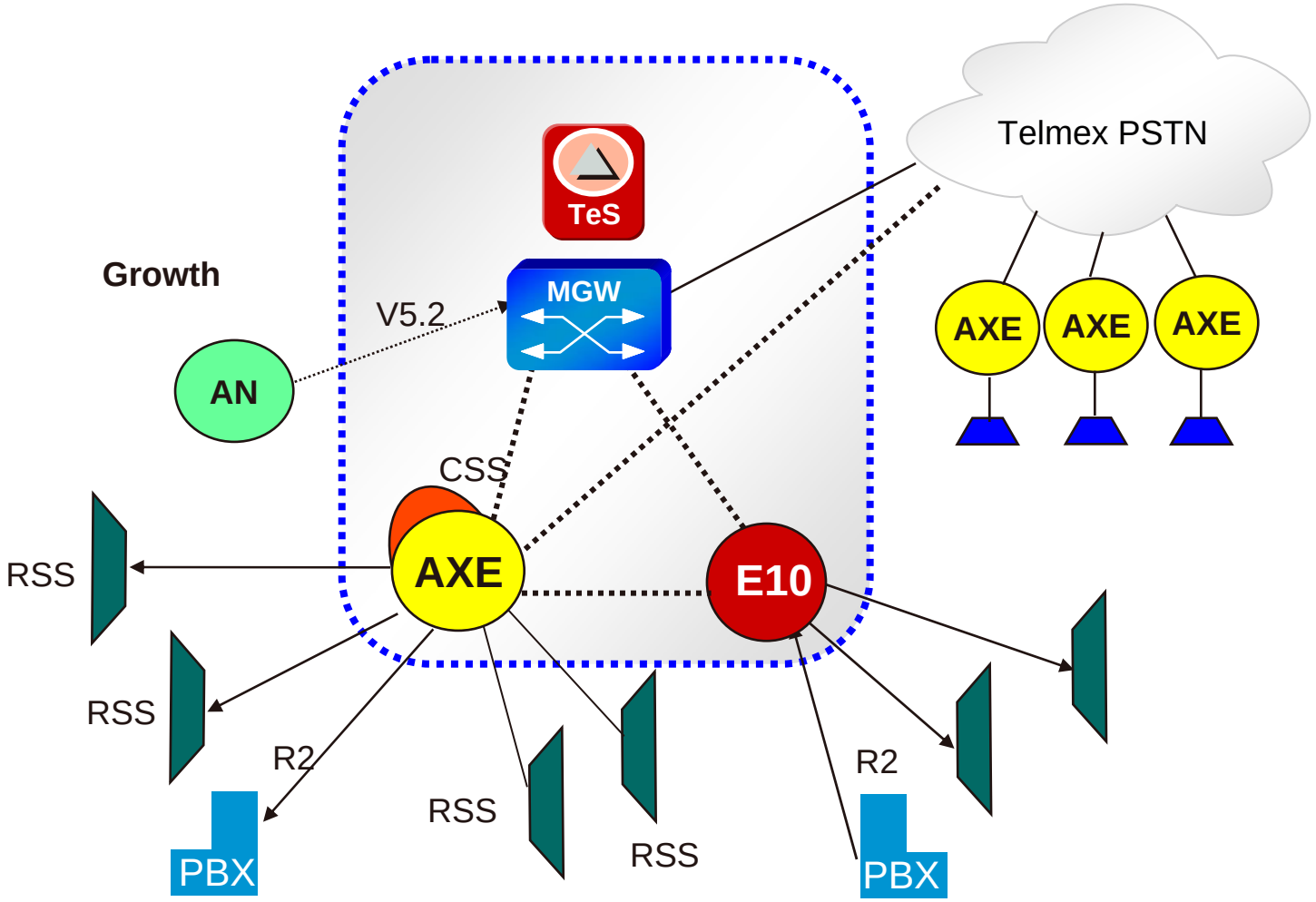


ENGINE in Mexico
Starting point



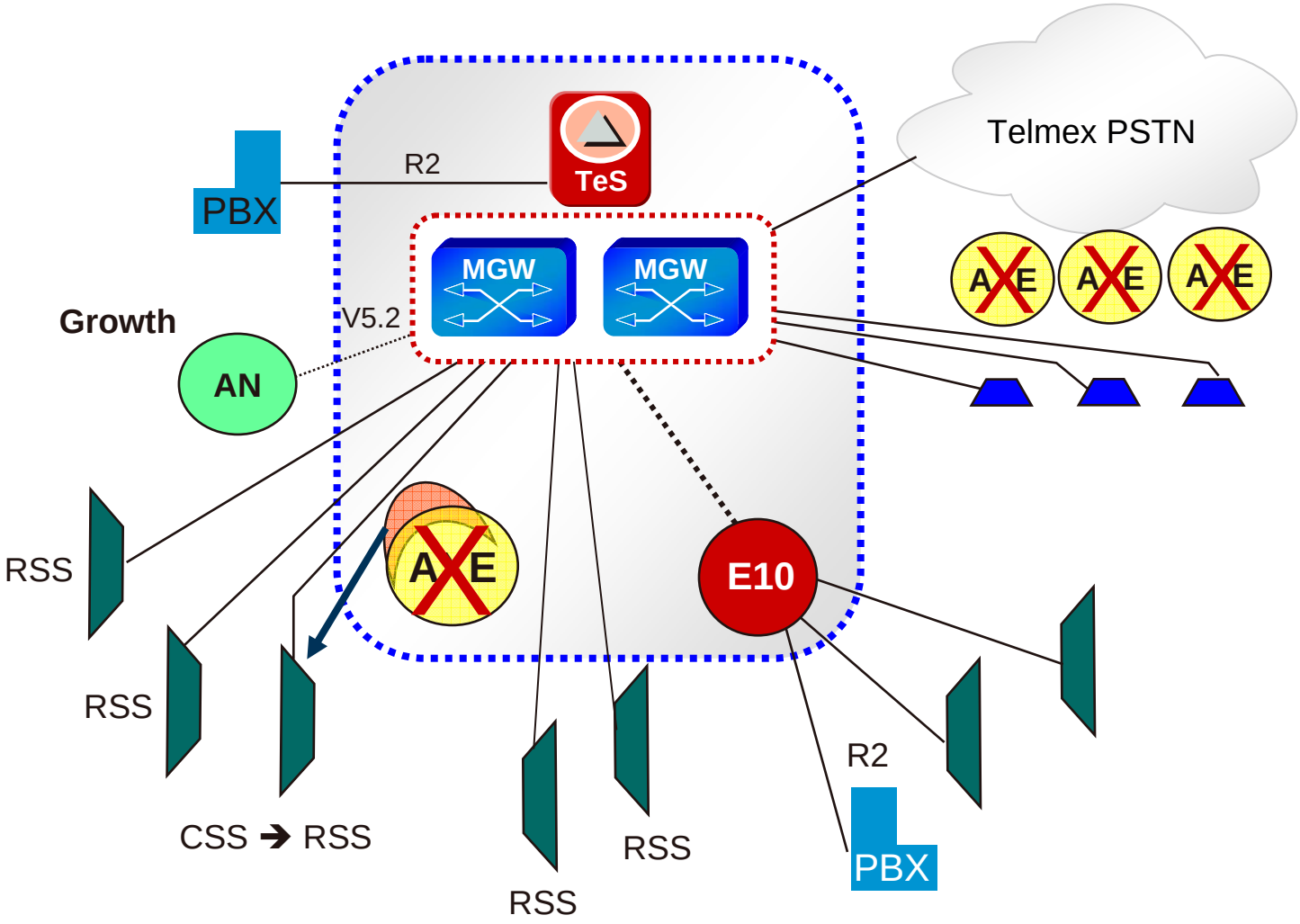
Engine in Mexico

Step 1 – introduce Engine softswitch



Engine in Mexico

Future steps – expansion and network consolidation



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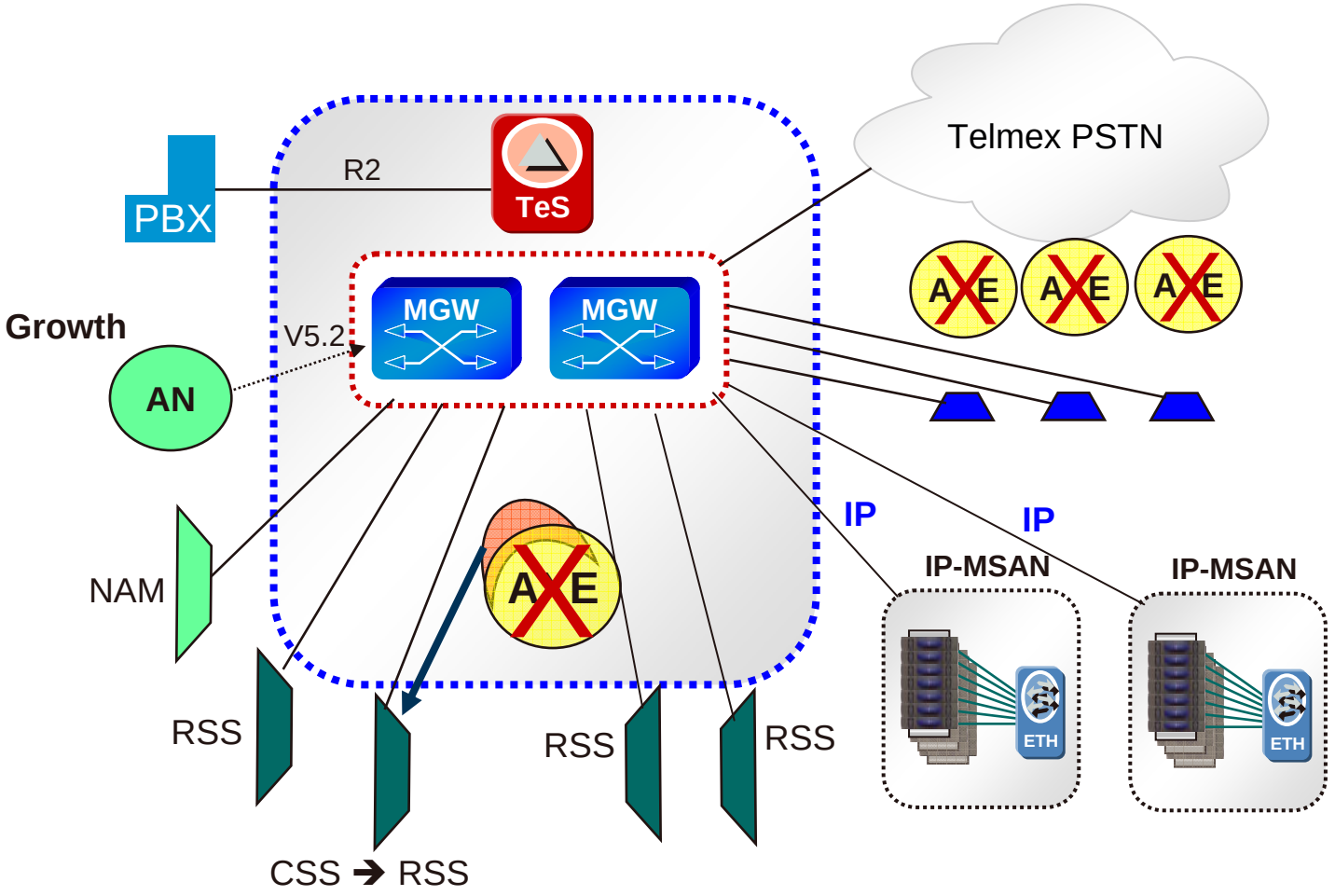
Engine in Mexico

Future steps – grow with IP-MSAN



Growth with IP-NAM´s, reduced OPEX through node reduction

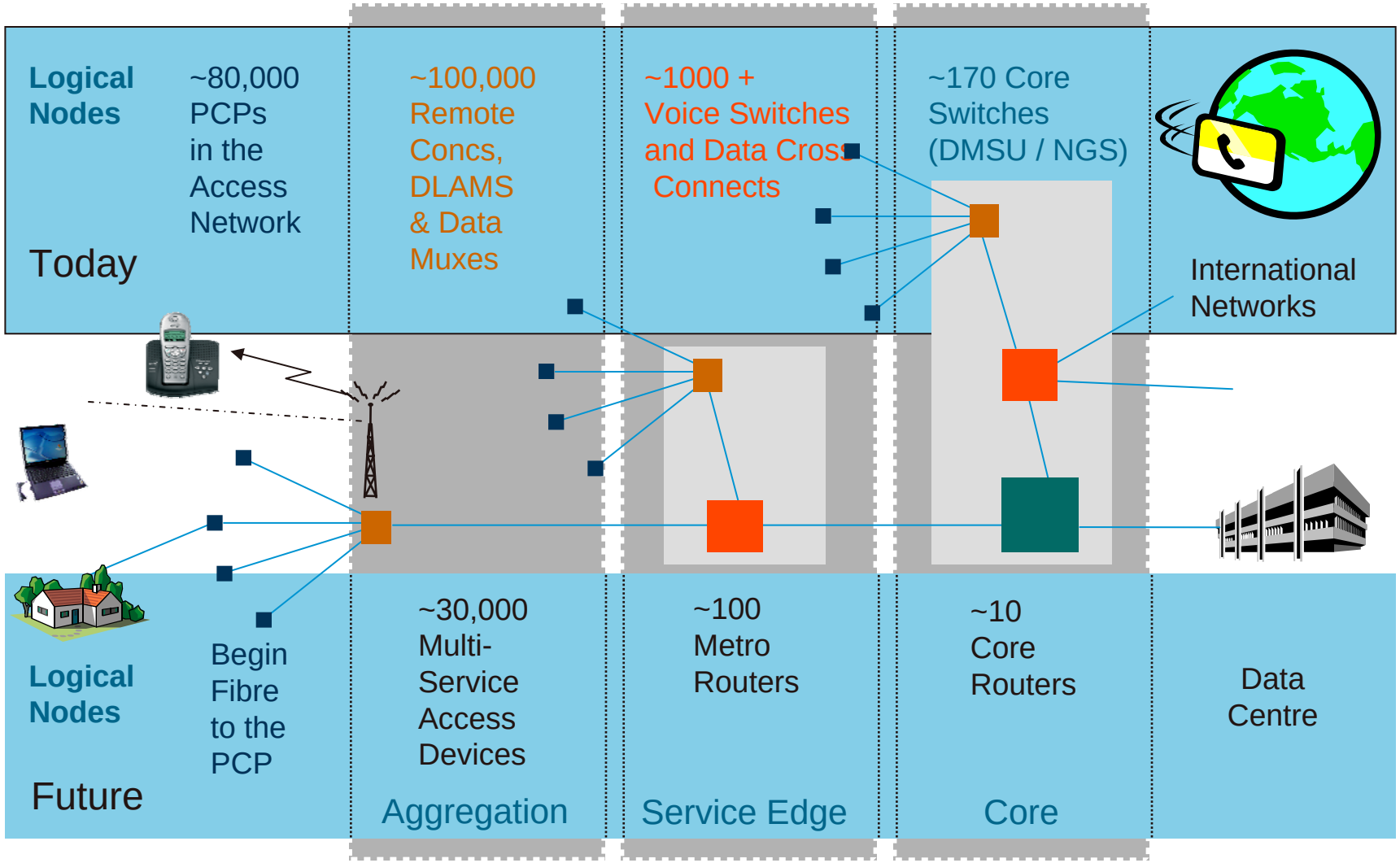
BT 21C aims

- Revolutionise customer experience
  - Make it easier to buy and use services
  - Enable customers
- Deliver innovative products more rapidly
  - Rapid service creation & implementation
  - With more people creating new services
- Make it simpler to deliver and maintain service
  - Process, systems & network automation
- Transform the cost base of the Company
  - Enabler of whole life cost reduction (Capex & Opex)

What is the overall architecture?

- A converged network based on IP and an MPLS core
- An Intelligence layer that is mobile enabled based on 3GPP concepts
- OSS systems controlling the complete network
- An open applications layer

21st Century Network structure vision



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Network areas & Selected partners

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I-Node	ERICSSON	
Core	Cisco Systems	Lucent Technologies Bell Labs Innovations
Transmission	ciena	Huawei Technologies
Metro	ALCATEL	Cisco Systems SIEMENS
Access	FUJITSU	Huawei Technologies

Recommendation for BSNL Network

“Rome was not built in a day”

Recommendations for BSNL Network

- Introducing NGN (TSS) Solution in International Gateway , Class 4 and Tandem Network.
- Migration of BSNL Local Access Nodes (RSS & V5.2 Nodes) to TSS based Network .
- Strengthening the IP access and IP Core Network.
- Increasing the Broadband Penetration.
- Introducing IMS Solution in Class A and Class B cities seeking Multimedia application.
- Evolving the mobile network under IMS umbrella providing feature transparency and true Fixed Mobile Convergence.