

Network Architecture Evolution

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Agenda

1. Drivers & the evolution to a High Leverage Network
2. PSTN Migration Scenario & Approaches
3. Evolution steps in the Session Control
4. Reference Solution Architecture for PSTN Migration
5. Case Studies for PSTN migration
6. Summary

1

Drivers & the Evolution to a High Leverage Network



A demanding market reality for service providers...

Falling revenue from voice services ...

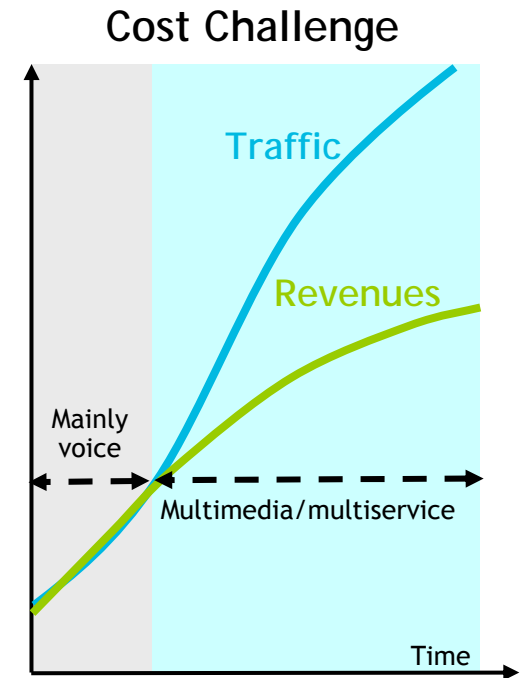
competition from alternative communication means (VoIP, churning to mobile, IM, etc)

Aging TDM voice switches ...

High maintenance cost

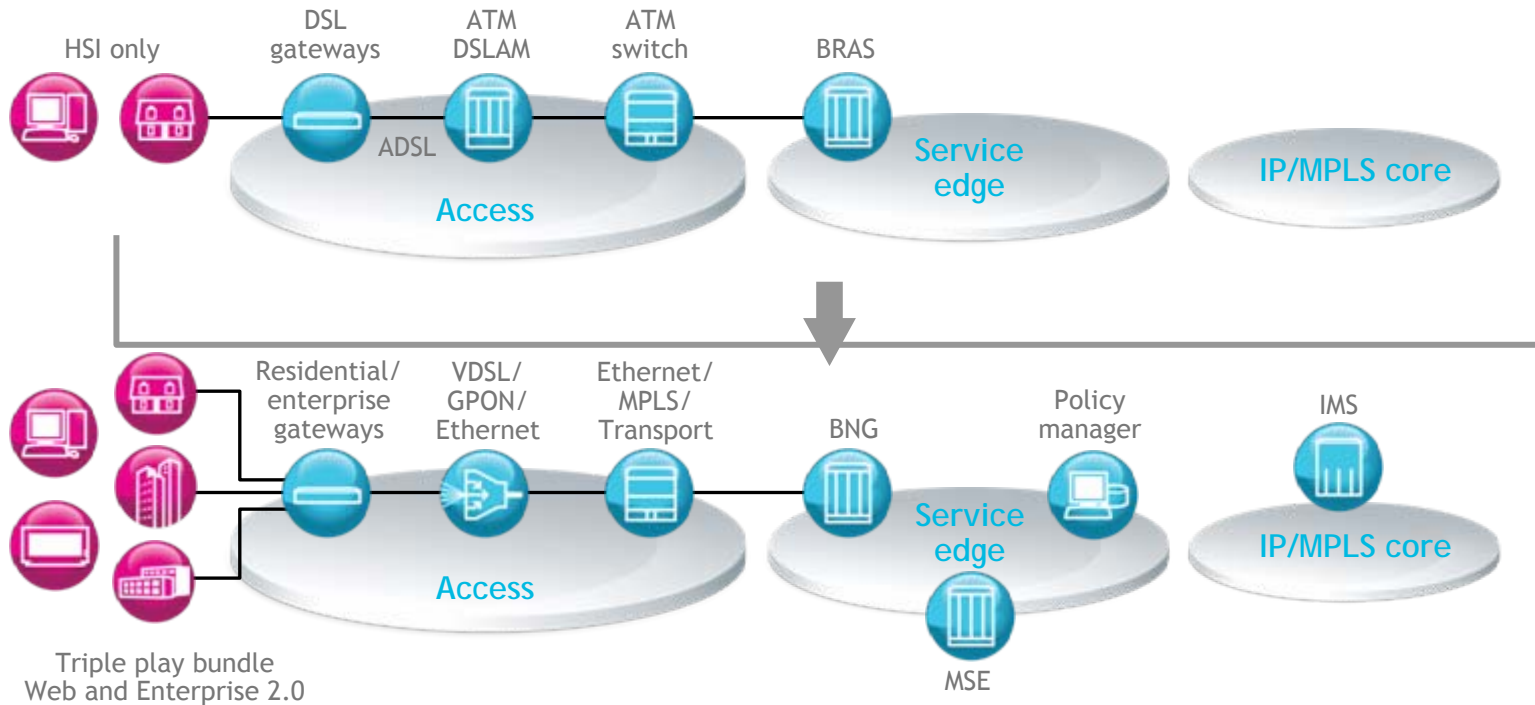
... and users expect more

Simple, innovative, personalized communication across any device, any network, anytime, anywhere



Requires a change from keeping value *in* the network to extracting value *from* the network

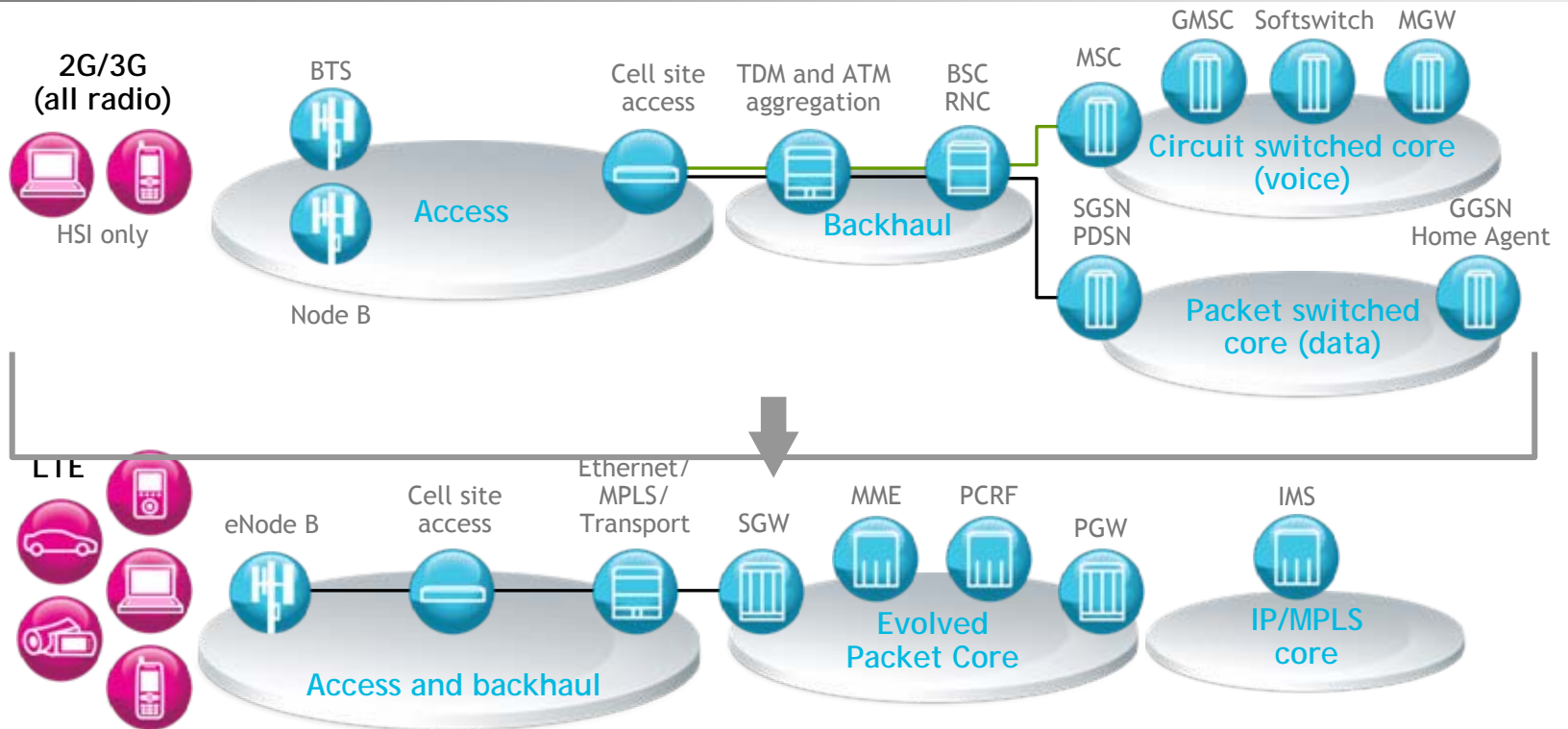
Wireline network transformation



Enhanced residential and enterprise services

- Improves capacity/reach of copper and roll-out of fiber to the most economical-point
- Optimized for IPTV, VoIP, high speed Internet, business VPN services
- New revenue generating opportunities:
 - HDTV, PPV, TSTV and PVR
 - Application Assured business VPN services, Ethernet services

Wireless network transformation

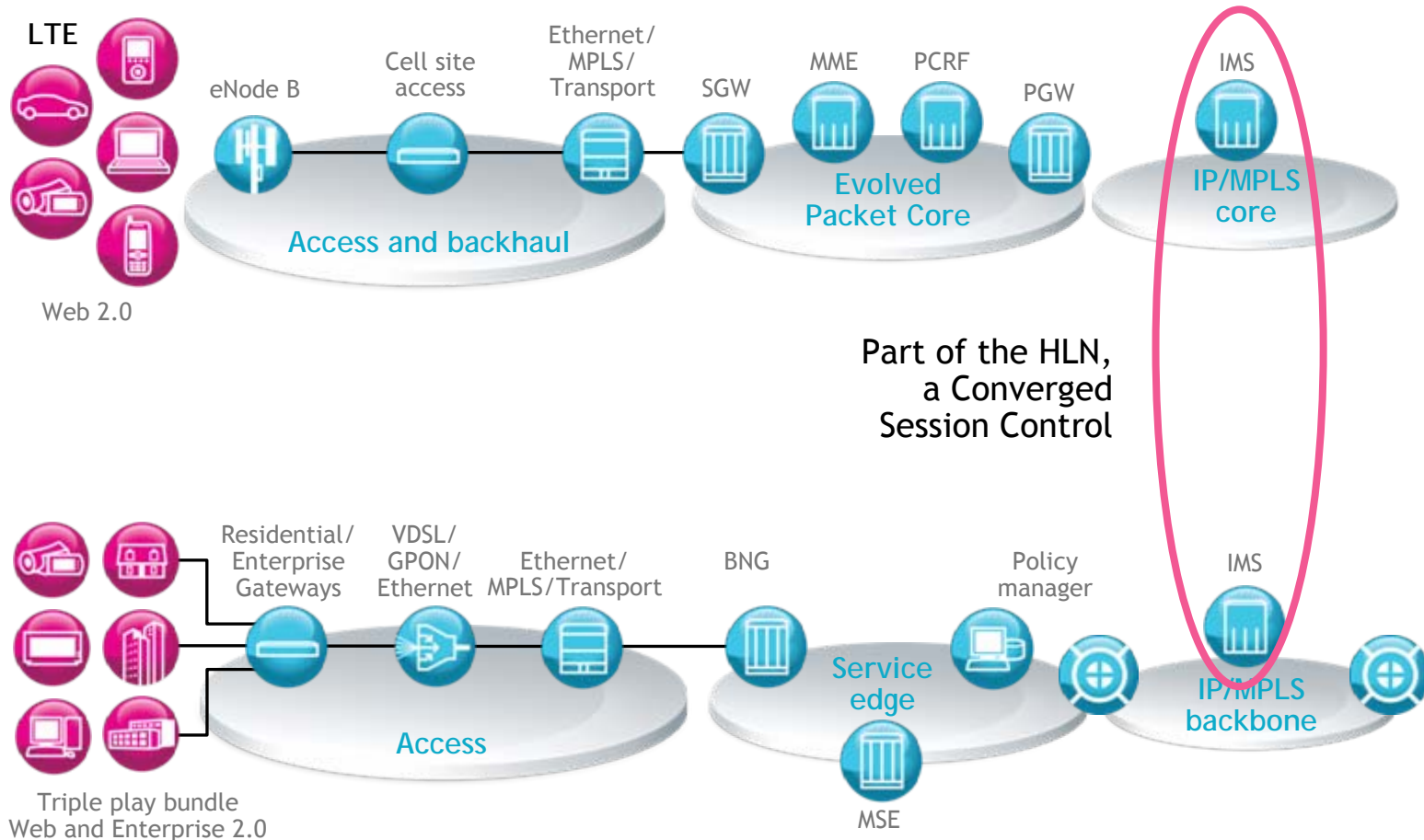


Wireless network transformation

- Ensure smooth evolution to LTE
- Scale backhaul to keep up with growth of data traffic
- Prepare network for growing demand for multimedia services

Service providers are transforming to a High Leverage Network

After the transformation, wireless and wireline networks look very similar . . .



The vision is for IMS to support all types of access, including legacy fixed, legacy mobile, WLAN, and new 4G access, including WiMAX, LTE

2

PSTN Migration Scenario & Approaches



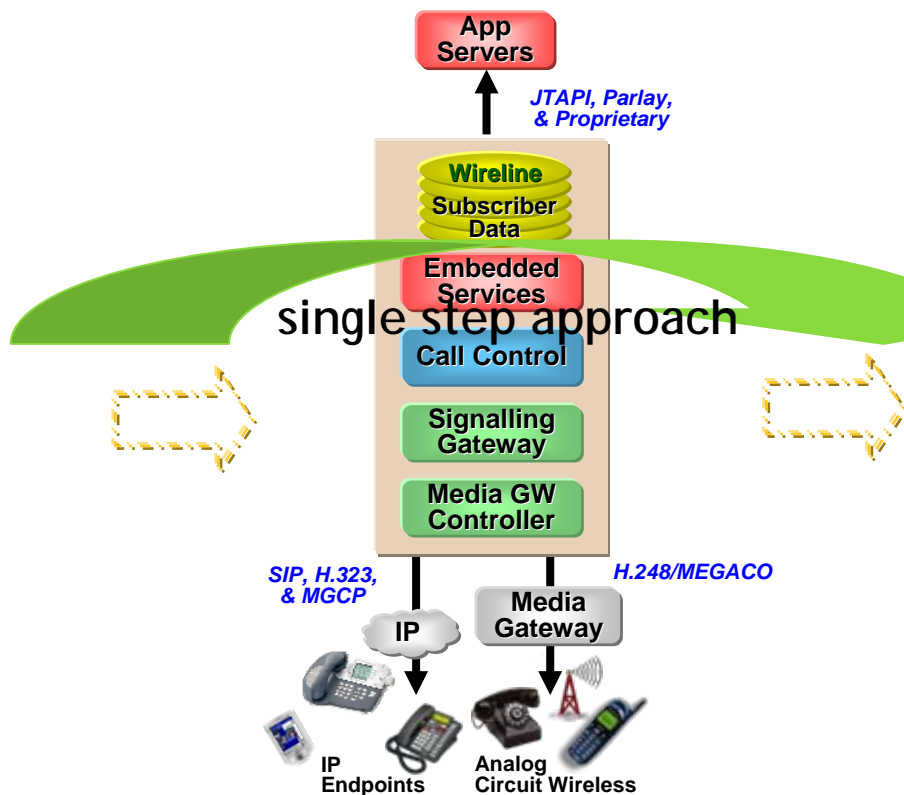
PSTN Migration Scenario:

Final Instead of Transitional Softswitch architecture

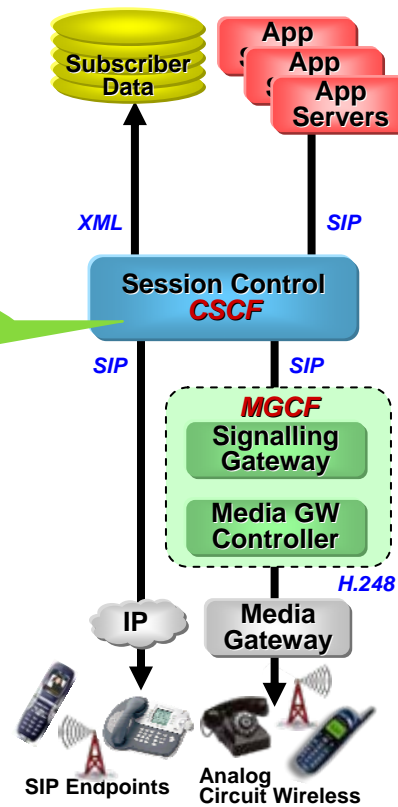
Traditional Switch Model



Consolidated SoftSwitch Model



3GPP/3GPP2 IMS Model



- Limited 3rd party app support
- Custom hardware/software
- No IP Support
- Bearer follows signaling

- + Call control separate from bearer
- + IP and multi-media enabled
- + Commodity hardware and standardized interfaces
- + Better 3rd party application support

- Limited 3rd party API standardization
- 3rd party application interactions limited by embedded services/call model
- Internal element integration limits deployment options

- + Standard interface to multiple 3rd party applications
- + Applications can be "blended" together serially or in parallel for unique combinations
- + Single sign on – into session layer for voice, data, video, etc. applications
- + Common subscriber data leveraged by each application

What is the operator's strategy ?

Alternative 1

- Continue legacy

Alternative 2

- Transform but don't evolve

Alternate 3



- Transform and Evolve



Investment Strategy

Objective

- Invest in the most future proof technology possible in the context of asset lives and revenues possible
- Deploy Converged Core for all types of access network
- Use service control layer to enable subscribers enjoy similar “user experience” across domains
- Invest for ease of operations cost

Strategy

- Invest in one-step approach instead of two step approach
- Use IMS for access agnostic core
- Deploy IMS which makes FMC possible
- All-IP network and common core reduces the OPEX costs

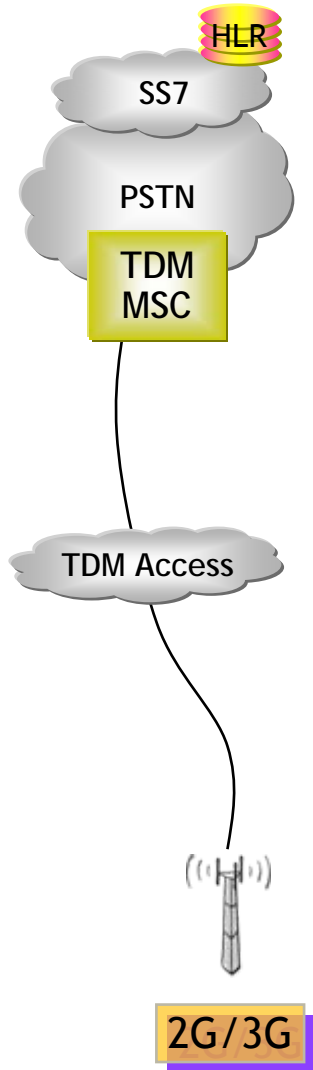
3

Evolution steps in the Session Control *of a High Leverage Network*



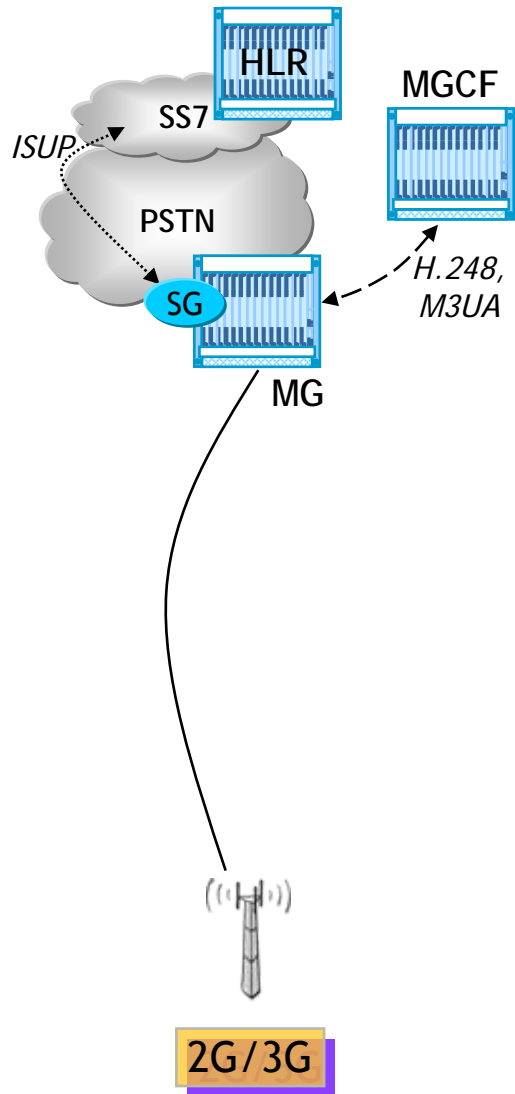
Example of network evolution

Step 1



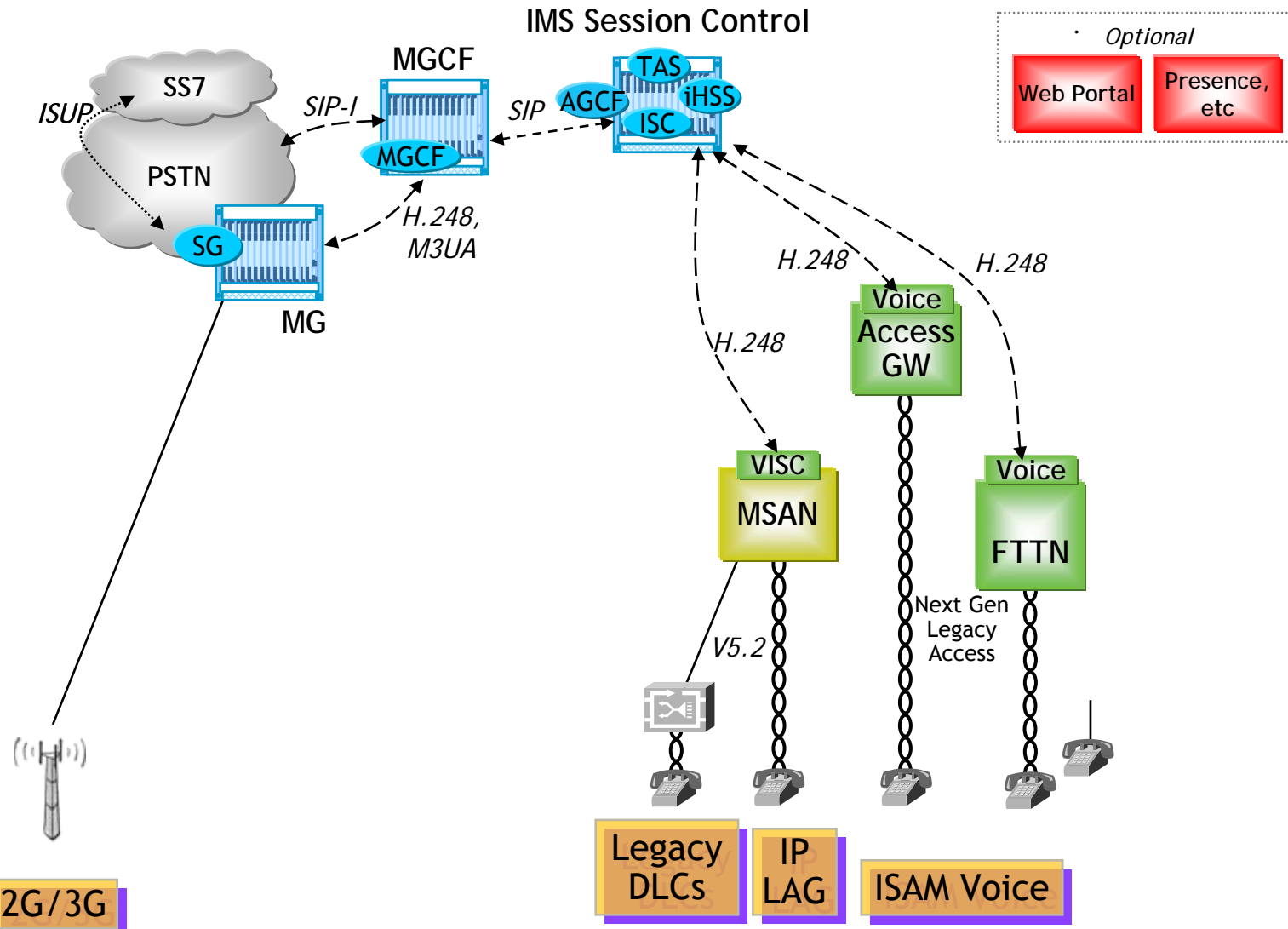
Example of network evolution

Step 2: Add mobile NGN



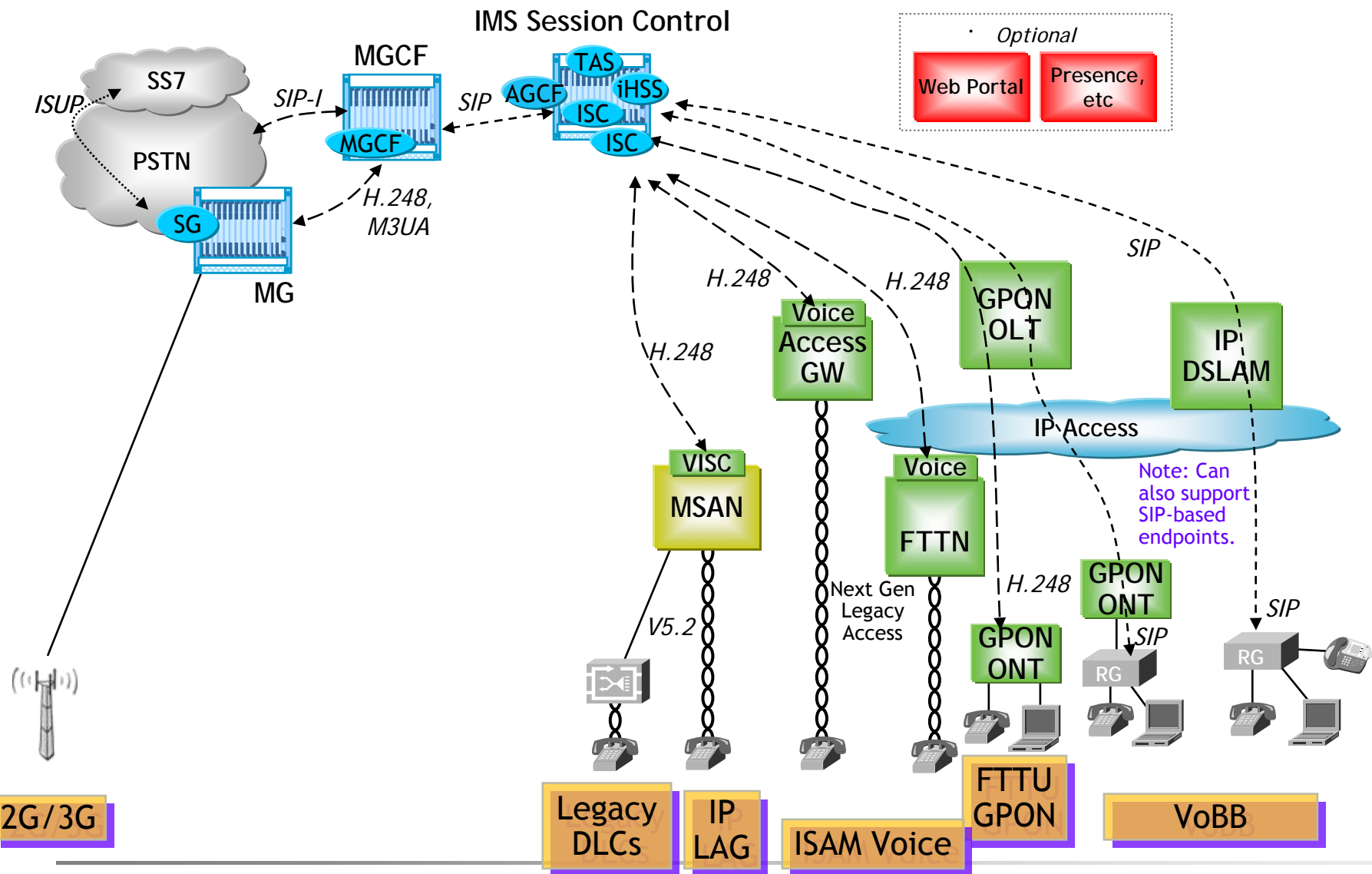
Example of network evolution

Step 3a: Migrate POTS



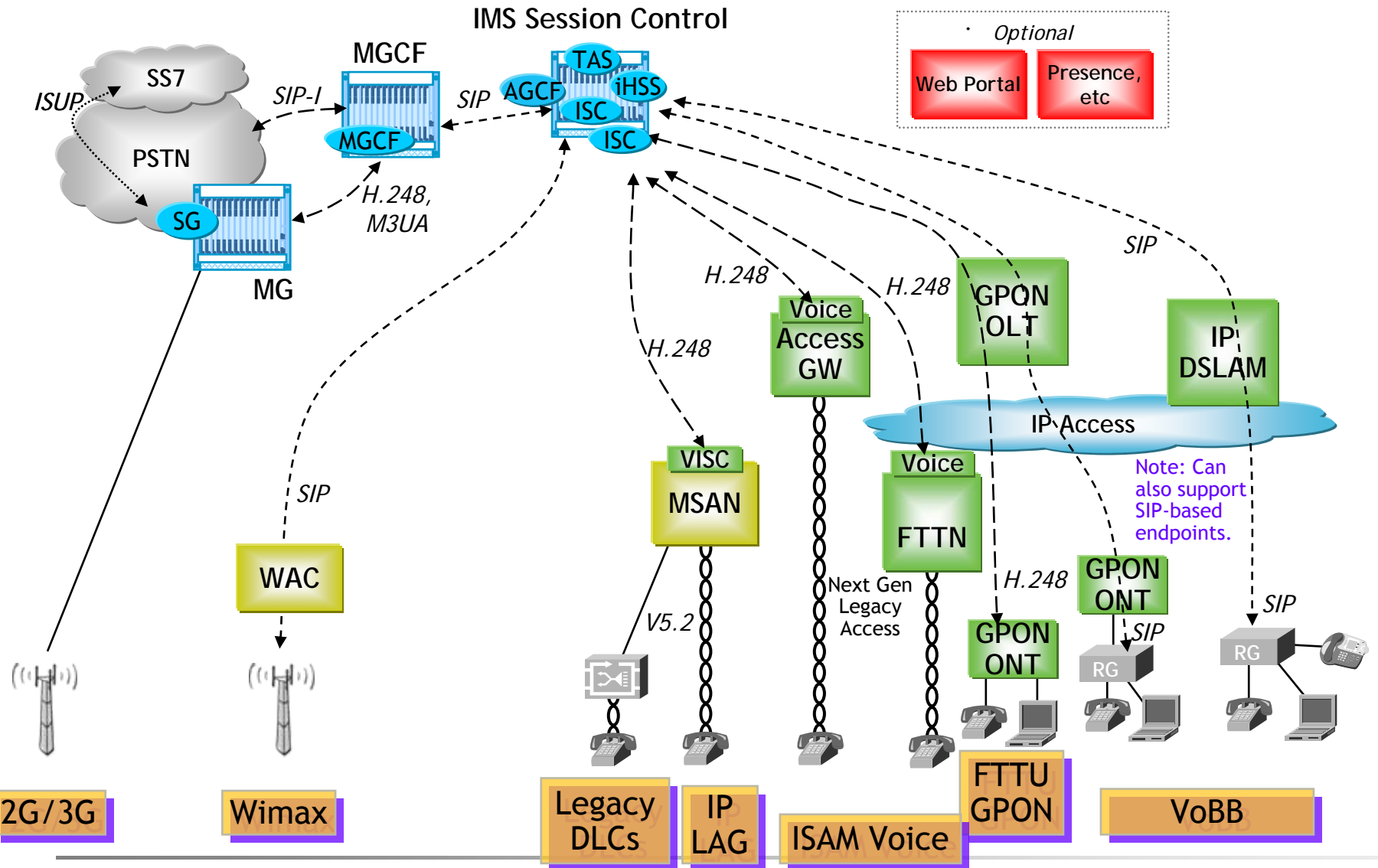
Example of network evolution

Step 3b: VoIP for DSL



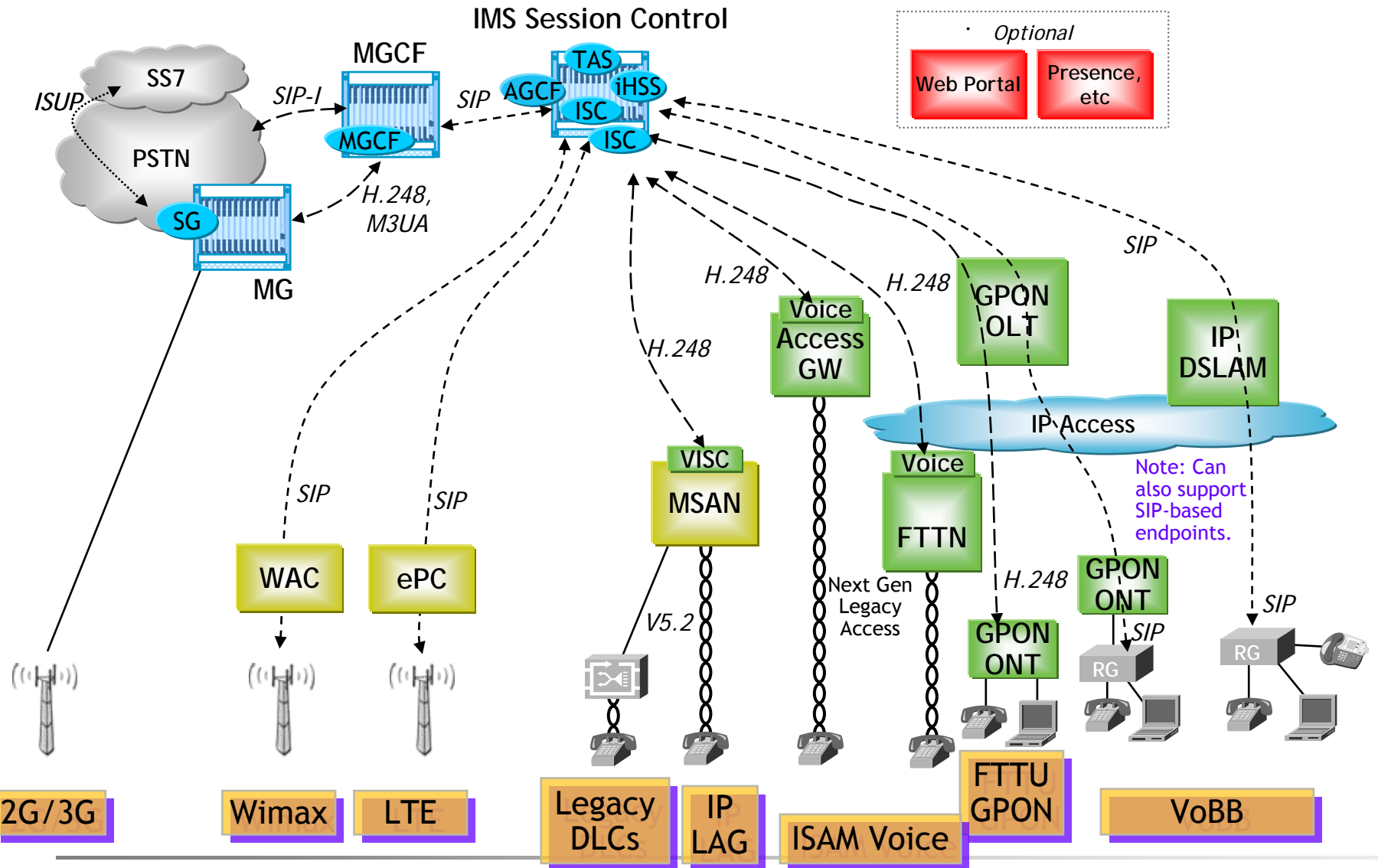
Example of network evolution

Step 4a: Wimax



Example of network evolution

Step 4b: LTE



4

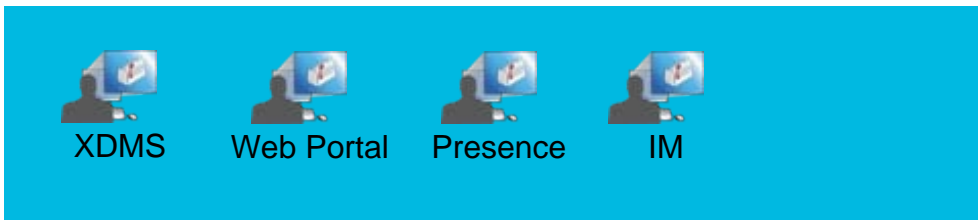
Solution Architecture for *PSTN migration*



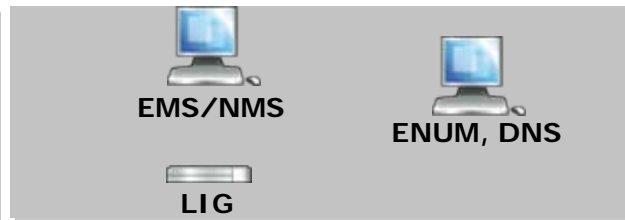
Reference Architecture in NGN/IMS

Standard Functions

Applications

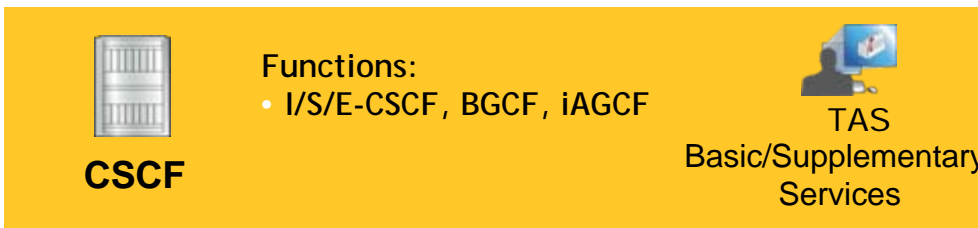


XDMS Web Portal Presence IM



EMS/NMS
LIG
ENUM, DNS

Session control

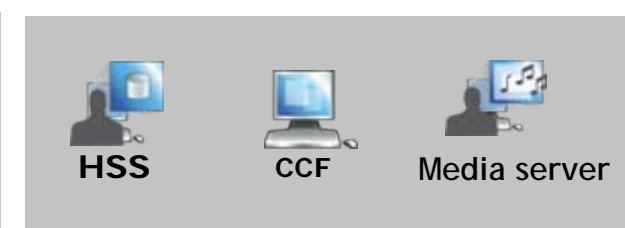


CSCF

Functions:

- I/S/E-CSCF, BGCF, iAGCF

TAS
Basic/Supplementary
Services



HSS CCF Media server


Access

Line Media Gateway




SIP MSAN

Trunk Media Gateway




MGW

IP interconnect border



I-BGF/A-BGF

MGW and controllers



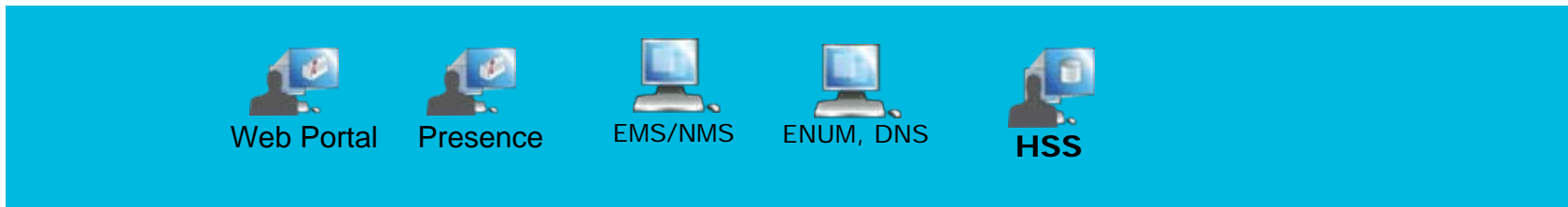
MGCF/SPDF/I-BCF

Clients
CPE
UE



Class 5 PAN INDIA Architecture

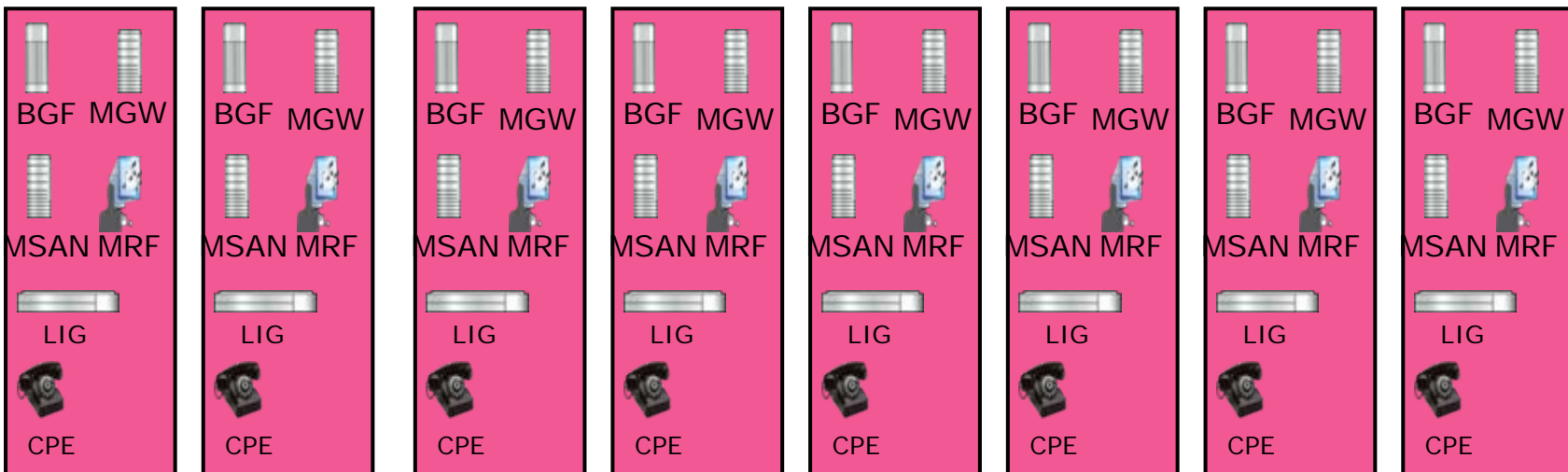
Central



Zonal



Circle



5

Conclusion

Case studies for PSTN migration



Brasil Telecom (Brazil)

Largest IMS deployment in Latin America

Under NDA



Compelling event

- Replacing outdated Class-5 network with IMS solution.
 - 10 large areas, 423 Sites (Class-5 Replacements).
 - Over 600,000 subscribers.
- Major Multi-Unit project valued at millions of dollars
- Alcatel-Lucent's contract signed in March 08.

Benefits:

- Cope with regulatory Number Portability.
- Opex reductions.
- Offer integrated value-added services.

Success Factors:

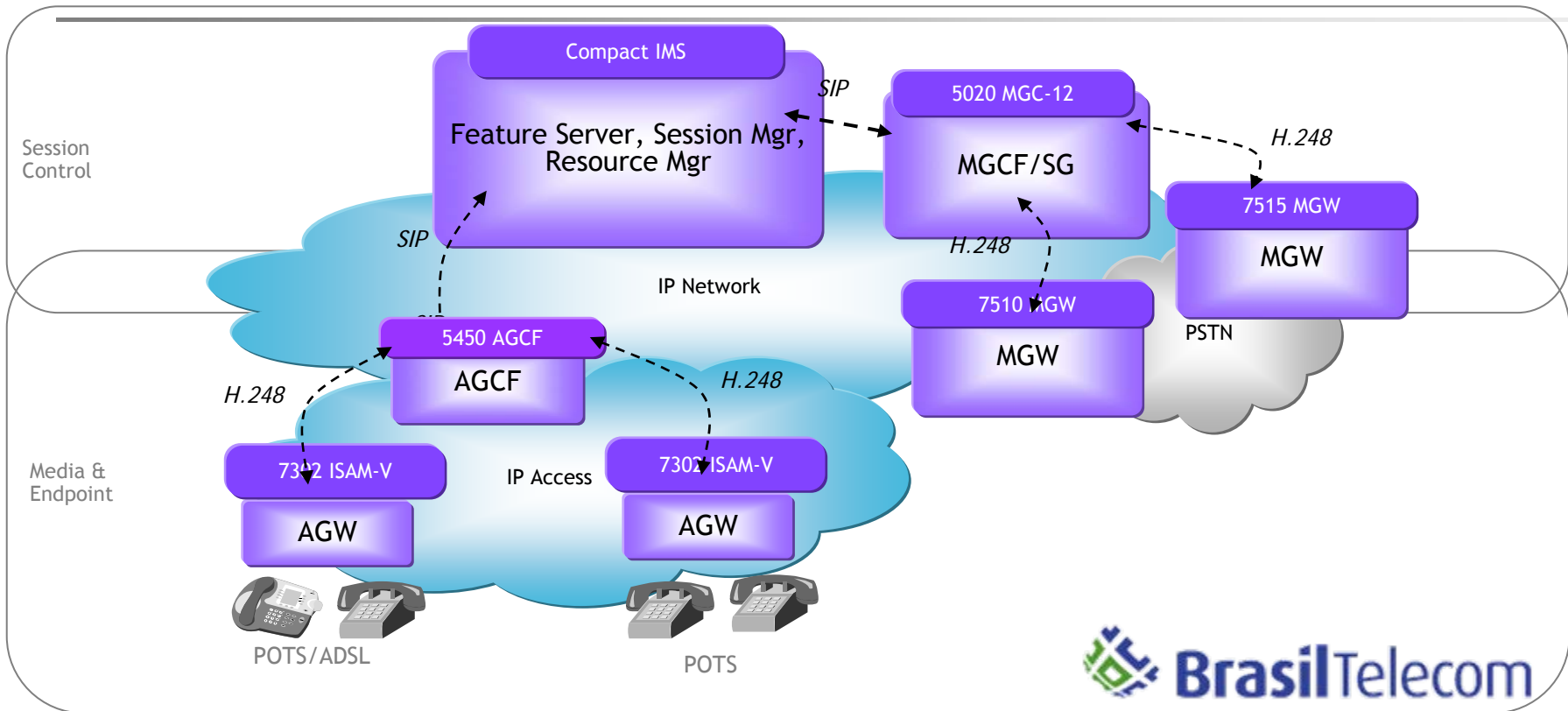
- Innovation offered through our IMS solution
- End-to-end integration
- Long-standing partnership
- Easily evolves, enabling multimedia services
- Alcatel-Lucent's tightly integrated Solution.



Brasil Telecom: Incumbent in Region II of Brazil (41 million people, 25% of GDP) involved in bundled Fixed/Mobile and Broadband services. Subscribers: 8M Fixed, 4M Mobile, 1.6M ADSL.

"With this advanced platform, we will be able to offer new value added services and integrated voice, data and multimedia solutions to our corporate and residential customers"

Brazil Telecom - IMS Based Class 5 Migration



Applications

- Class-5 Replacement, due to obsolescence

**5060 ICS
IMS in a
Box**

Solution

- 5450 ICS
- 5420 CTS
- 5020 MGC-12
- 5450 AGCF
- 7510 & 7515 MGW
- 7302 ISAM-V

Notes

- In addition to the PSTN replacement project they are working on an IMS project.
- They recently purchased the 5060 ICS (ATCA) IMS solution (EOY'08) for their IMS project.

TNZ (New Zealand) IMS Primary Line Voice Program



Compelling event

- Regulatory undertaking that enhance competition
- Aging TDM network
- Declining margins in tradition business

Benefits

- Protect and grow traditional revenues
- Improve operational efficiency (reduced Opex)
- Invest in world-class IP infrastructure
- Develop and grow new service revenues



TNZ incumbent Fixed-Mobile operator with 2M Mobile, 1.6 M Fixed and 1M Broadband subscribers

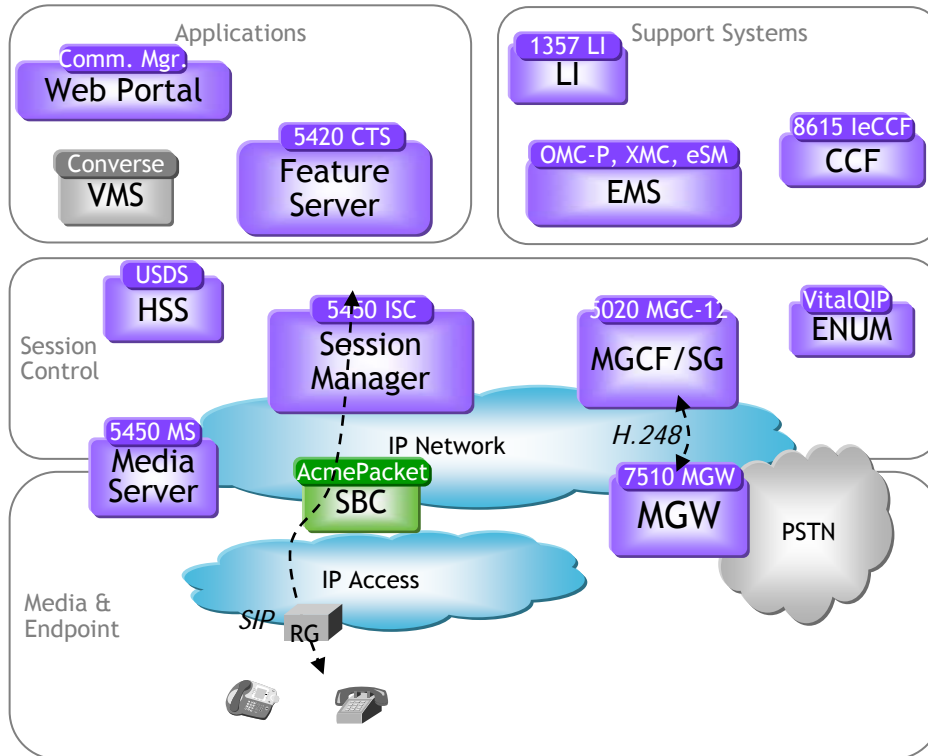
Success Factors:

- Reasonable price offer for an e2e IMS solution
- Existing partnership in both mobile and wireline

"... investment in IMS will allow the development of world leading products that allow our customers to enjoy the very best in voice, video and application services"

*Frank Mount, group chief transformation officer,
Telecom*

TNZ (New Zealand) - Prime Line Voice (VoIP) High Level Architecture ID Card



- Alcatel-Lucent
- ALU Partner
- Other Vendor

Application

- Primary Line Voice (PLV) VoIP in a pull mode (customer willing to migrate to VoIP and buying RGW)
- Start with 25K in 4Q'09 and plan to scale to 1M+
- IP-PBX trunking and PSTN replacement (Push mode) start trial in 2H'09

Status

- Network ready for Service 4Q'08 with IMS R6.1
- Field trial completed in 1Q'09
- Commercial deployment in progress

Notes

- Turnkey project managed by Alcatel-Lucent incl. Design, Installation, Integration, Test, Deployment and operation
- Lot of integration work with OSS/BSS

Service providers around the globe are implementing IMS

“... convergence as a clear focal point ...” Scott Alcott, [Belgacom](#), April 2008

“... with IMS we can grow our services ...” Bill DeMuth, [SureWest Communications](#) - April 2008

“... We’ll be able to “build” an application once ...” Dick Lynch, [Verizon Wireless](#) - April 2008

“... build converged services with design anticipation of IMS ...” Dave Elmendorf, [BT](#) - 2008

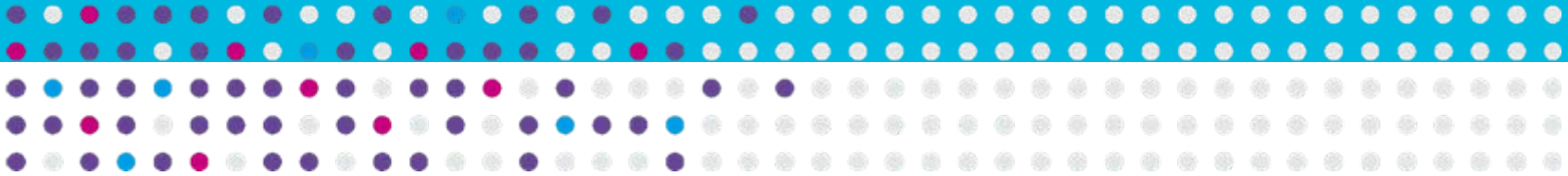
“IMS is a key technology to further develop VoIP ...” Hsieh Chun-Ming, [Chunghwa Telecom](#) - December 2007

“... IMS as ... a future-proof technology ...” Wojciech Lubczyński, [Exatel S.A.](#) - October 2007

“...We adopted IMS to be used as a session layer piece of our architecture.” Siroos Afshar, [AT&T](#) - October 2007

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Summary

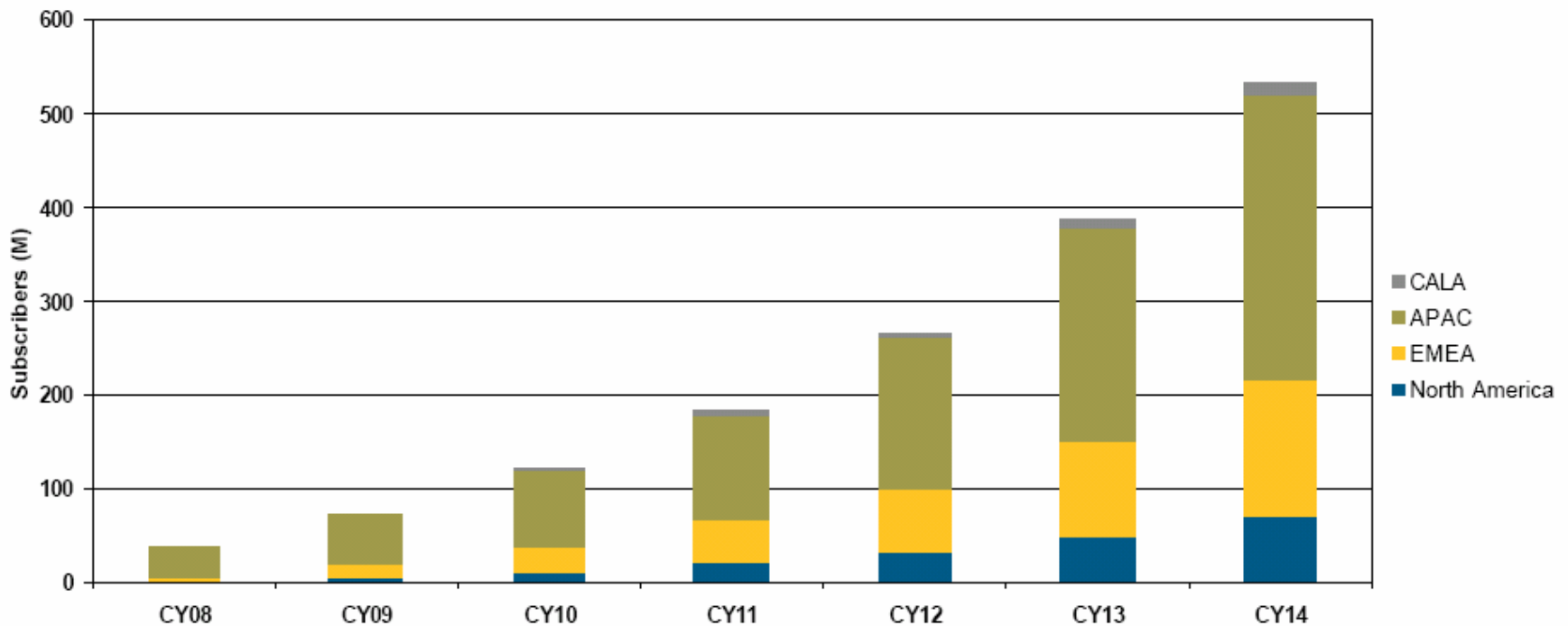


Subs on IMS on the rise

IMS Subs base is expanding

(Infonetics)

- There are currently over 80 IMS networks with commercial services. The majority of these networks are for fixed-line VoIP services.

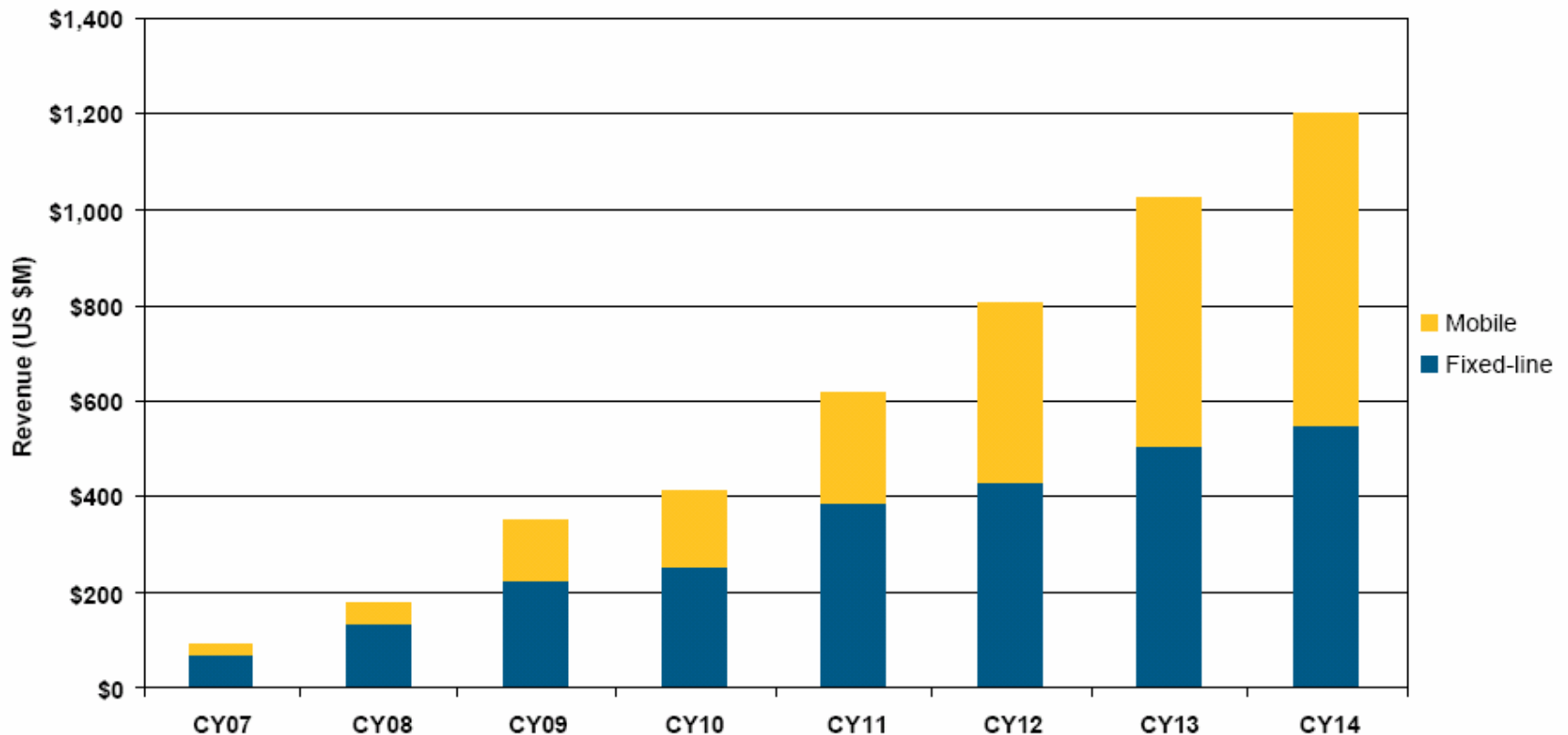


Subs on IMS on the rise - cont.

Dominated by Fixed Line

(Infonetics)

- In 1Q10, the majority of core IMS sales came from fixed line networks (64.2%) rather than mobile deployments. The growth in mobile network IMS revenue will greatly expand in CY12 thru CY14, with a number of mobile operators deploying mobile messaging, RCS and LTE.



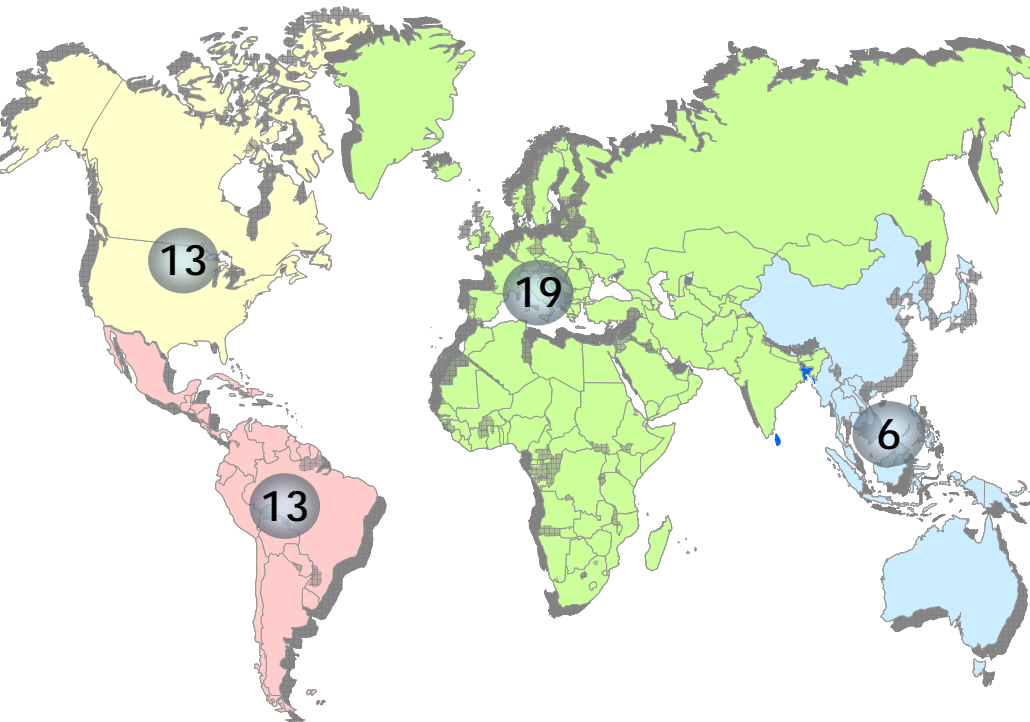
www.alcatel-lucent.com



What is Alcatel-Lucent's Position in the Market?

Strong Customer Experience

61 Customers and Growing!



Consumer VoIP

- *Public:* AT&T, Belgacom, Delta, Exatel, ICE, KPN, North Rock, Sure West, Westelcom
- *Non Public:* Australia, Canada, France, Italy, Mexico, New Zealand, Peru, USA, UK

Class 5 Migration

- *Public:* Oi/Brasil Telecom, Enitel, Manx Tel.
- *Non Public:* Bolivia, Dominican Republic, Guatemala, Mexico, New Zealand, UK

Business VoIP

- *Public:* Belgacom, Exatel, KPN, NWT, Westelcom
- *Non Public:* France, Norway, Thailand, USA

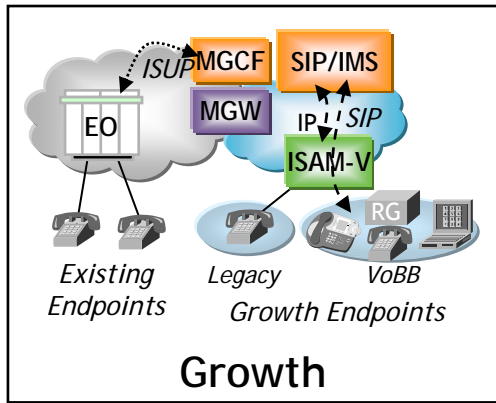
Enhanced Communication Services Mobile

- *Public:* AT&T, Bouygues
- *Non Public:* Australia, France, Ghana, Korea, USA

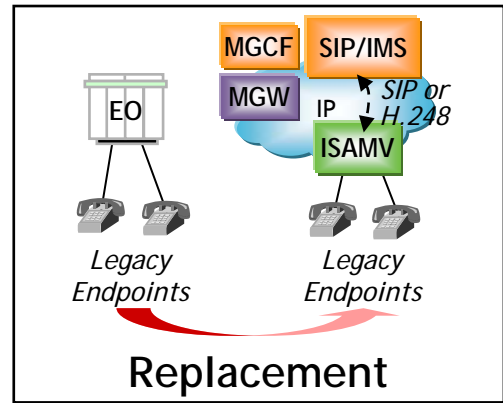
IP Border (Access & Interconnect)

- *Public:* Telenor
- *Non Public:* France, Germany, Italy, USA

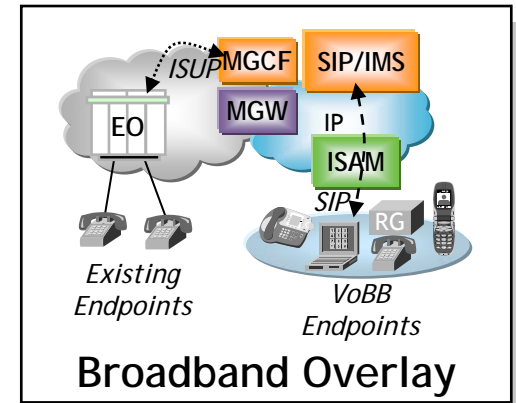
Class 5 Migration Approaches



- Operators in emerging markets are still experiencing line growth
- There are benefits to investing in IP, rather than circuit-based technology (e.g., new services)
- Markets with line growth include Africa, the Middle East, the Commonwealth of Independent States (CIS), and areas in Asia-Pacific



- Some operators are considering replacing their TDM Class 5 switches with IP-based technology
- The goal of this replacement is primarily for operational savings
- Service providers who have advertised this strategy include BT and DT



- Many service providers are investing in an overlay broadband infrastructure for new services
- End-users can be enticed to move their voice to the broadband network as part of bundles with data and video services
- AT&T, KPN and Verizon are examples of operators in this category