Services Over IP

IMS Architecture Overview

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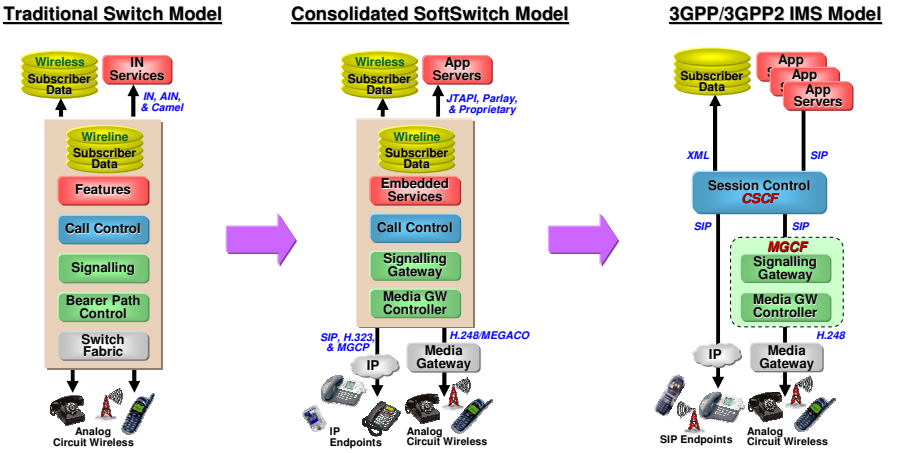
Agenda

- Evolution of Softswitch Architecture
- What is IMS ?
- Standards Efforts
- IMS Benefits
- The IMS Service Architecture
- Role of the Softswitch
- Deployment Options
- Conclusion

Evolution of the SoftSwitch



– 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

+ Further decomposition / deployable elements
+ Flexible data driven session control
+ Standardized SIP interfaces
+ Standardized, flexible, application support
+ Common subscriber data

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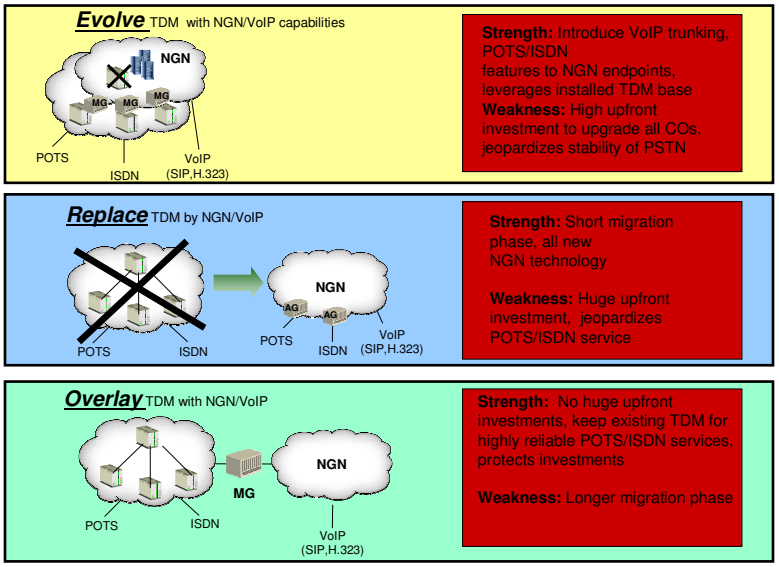
NGN Migration Options



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Next Generation VoIP Services Architecture

- **Historically next generation network technology has been driven by standards bodies and industry forums (e.g. AIN, DSL, FTTP..)**
- **Standards help speed the deployment of next generation technology**
  - Multiple vendors address service provider's needs (price competition)
  - Allows vendors to sell the same product to multiple customers
- **VoIP service architecture standards organizations:**
  - IETF develops protocols not services architecture
  - ETSI, 3GPPs, Parlay Forum propose IMS VoIP service architecture
  - ATIS has recognized the need for VoIP standards including the services architecture issue

What is IMS?

- **An IP multimedia and telephony core network**
- **IMS is defined by 3GPP and 3GPP2 standards organizations**
- **Based on IETF (internet) protocols**
- **IMS applies equally well to wireless and wireline access carriers**
  - Supports IP to IP sessions over cable, DSL, 802.16, 802.11, CDMA packet data, GSM/EDGE/UMTS packet data, etc.
- **Equivalent to IP telephony systems being invented by some operators such as Verizon wireline. Both use IETF protocols. But IMS is standards-based.**

The IMS Vision: Access-Independent, Services-Enabled Network

IMS will enable a wireless operator to be a true converged ***service*** provider, with services that work regardless of how they are accessed by the user.

IMS Standards

- **3GPP and 3GPP2**
  - Have both defined the IP Multimedia Subsystem (IMS)
  - The harmonization effort has kept the definitions as similar as possible.
- **IETF - Internet Engineering Task Force**
  - Provide the definitions for SIP, SDP and other protocols underlying IMS
  - IMS is driving some of the work in IETF
- **ANSI - American National Standards Institute**
  - Provides protocol definitions used by IMS
  - T1.679 covers interworking between ANSI ISUP and SIP
- **ITU - International Telecommunication Union**
  - Provides protocol definitions used by IMS as part of comprehensive NGN effort
  - H.248 for media control
  - Q.1912.SIP covers interworking between ITU-T ISUP and SIP (3 Profiles)
- **OMA - Open Mobile Alliance**
  - Defining services for IMS architecture, e.g. Instant Messaging, Push-to-Talk
- **ETSI - European Telecommunications Standards Institute**
  - TISPAN - TISPAN is merger of TIPHON (VoIP) and SPAN (fixed networks)
  - Agreement on reuse of 3GPP/3GPP2 IMS in comprehensive NGN plans
- **ATIS - Alliance for Telecommunications Industry Solutions**
  - Addressing end-to-end solutions over wireline and wireless
  - Nearing agreement to use 3GPP/3GPP2 IMS

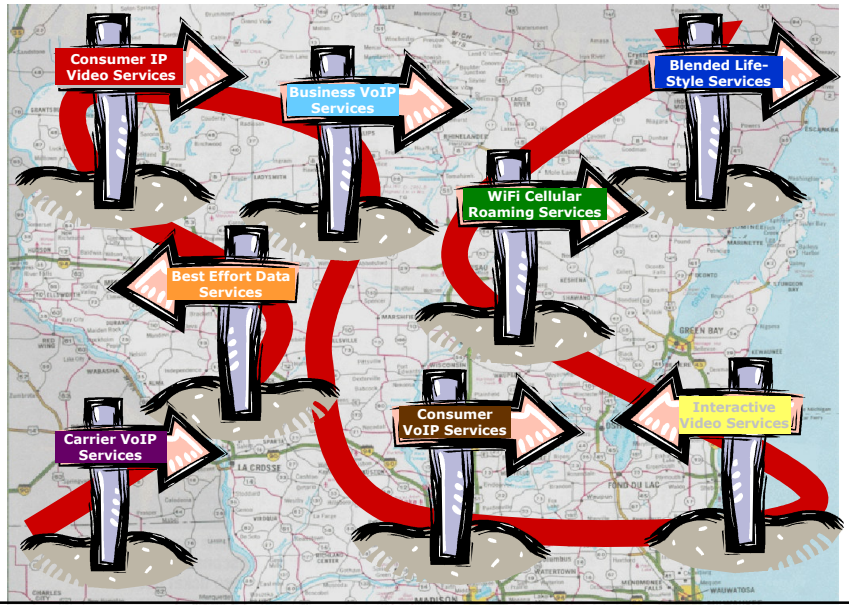
IMS Benefits for End-Users

- Common contacts and buddies across multiple services
  - Enterprise lists, personal lists
  - Lists can be enhanced with capability indicators (e.g., PTT, gaming, IM, voice, picture-phone buddies)
- Ability to use multimedia information to enrich communication
  - Text/Pictures/Video/Audio, schedule, presence, availability, location information can be sent and received during a voice call
  - Visual “automated attendant” can speed navigation through call centers
  - Services are not limited by voice and data separation as they are today
- Enables data applications to be enriched with voice
  - E.g., enhance online shopping experience with real-time conversation with a sales rep.
  - Gamers can talk to each other during play
- Predictable interactions between multiple services
  - Operator can set reasonable defaults for service interactions so that ease of use and service quality is maximized
  - Subscribers can set policies on how they want their services handled, e.g. my boss can interrupt a phone call with a PTT, but not my child

IMS Benefits for Service Providers

- Retain ownership of the subscriber and their services
  - Provide better quality, more integrated services than IP service providers
  - Avoid migration of value to the client device (e.g. Nokia strategy)
- Differentiate services from competition and sell more services
  - Home control means that services and call control are provided by the home server in the home network even when the user roams
  - Enables easy to use, custom blended service bundles to better address target market segments and increase “stickiness” of service (reducing churn)
  - Visual user interfaces facilitate discovery of new cool services
- Provide transparent services across multiple access methods
  - Wireless, broadband, 802.11, …
- More cost-effectively bring new services to market
  - Reduce startup costs of new services by leveraging common applications infrastructure (media servers/gateways, presence, subscriber databases, …)
  - Enables central location of applications, enabling rapid deployment of new services across large regions

Road to IMS



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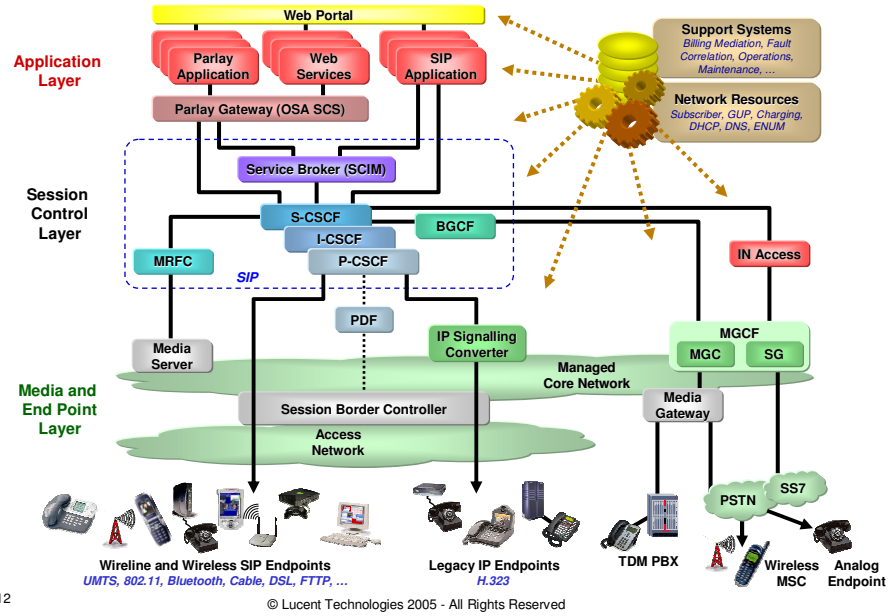
IMS Service Architecture



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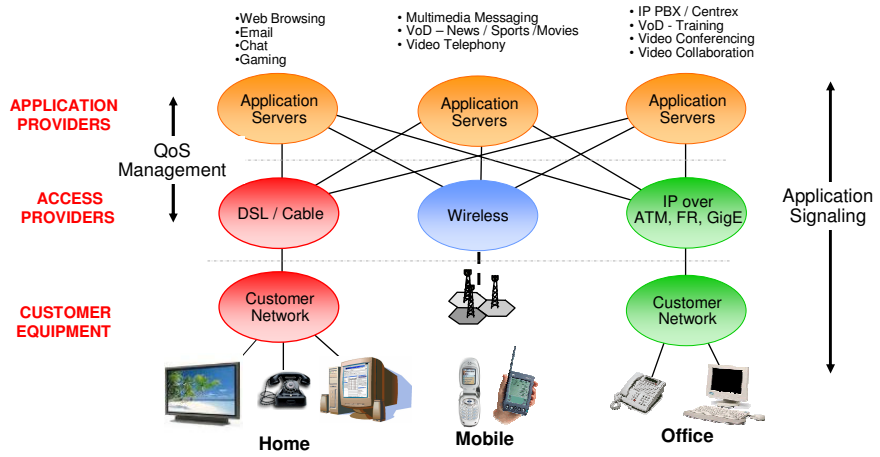
Delivering Blended Services



- Applications access agnostic
- Converged / blended applications are enabled
- QoS managed across voice and video services

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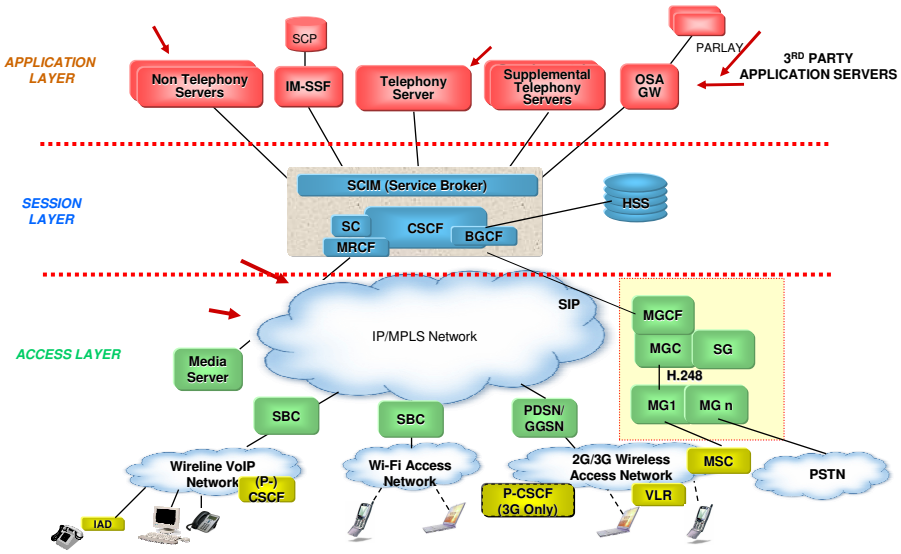
VoD – Video on Demand

Role of Softswitches in IMS Architecture



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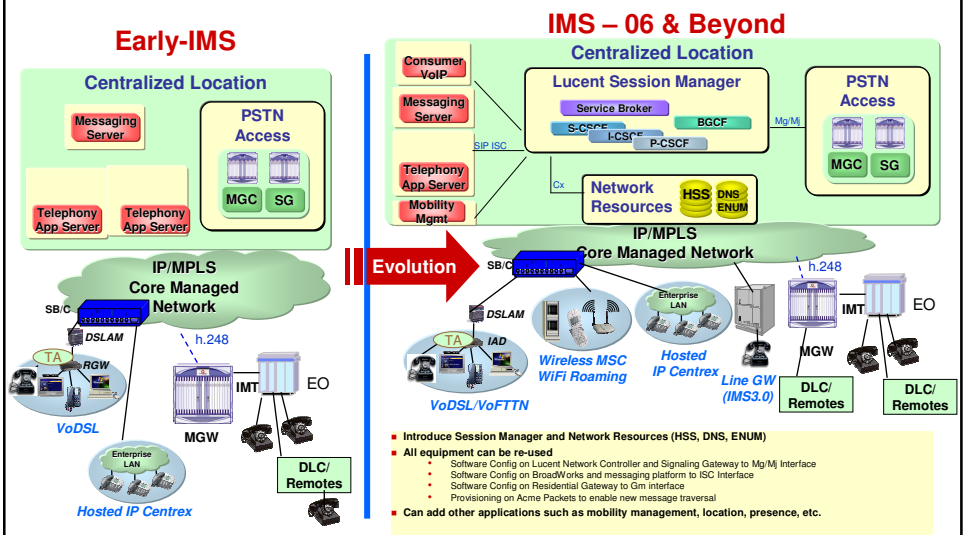
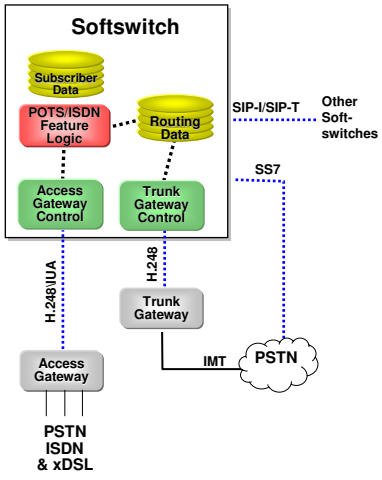
Graceful Evolution to IMS



- Introduce Session Manager and Network Resources (HSS, DNS, ENUM)
- All equipment can be re-used
  - Software Config on Lucent Network Controller and Signaling Gateway to Mg/Mj Interface
  - Software Config on BroadWorks and messaging platform to ISC Interface
  - Software Config on Residential Gateway to Gm interface
  - Provisioning on Acme Packets to enable new message traversal
- Can add other applications such as mobility management, location, presence, etc.

Softswitch-based PSTN Replacement

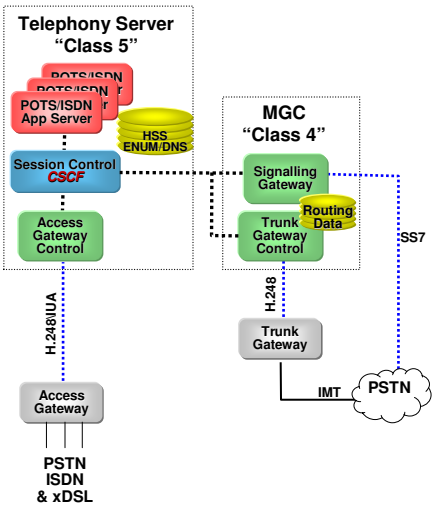


- **Strenghts:**
- POTS/ISDN feature transparency through re-use of TDM feature logic
- Early availability
- Most (classic-TDM) vendors supporting this model

- **Weaknesses:**
- Reduced scalability when growing network to multiple softswitches
- Requires E.164 routing tables in each softswitch to locate end users
  ➔ OPEX
- Likely no support of geographical redundancy
- Can not re-use OAM&P mechanisms/technology from IMS
  ➔ need for dedicated OAM&P solution
- Intrinsic complexity to evolve to or align with IMS

Combines "Class 5" and "Class 4" functions in monolithic entity

IMS-based PSTN Replacement

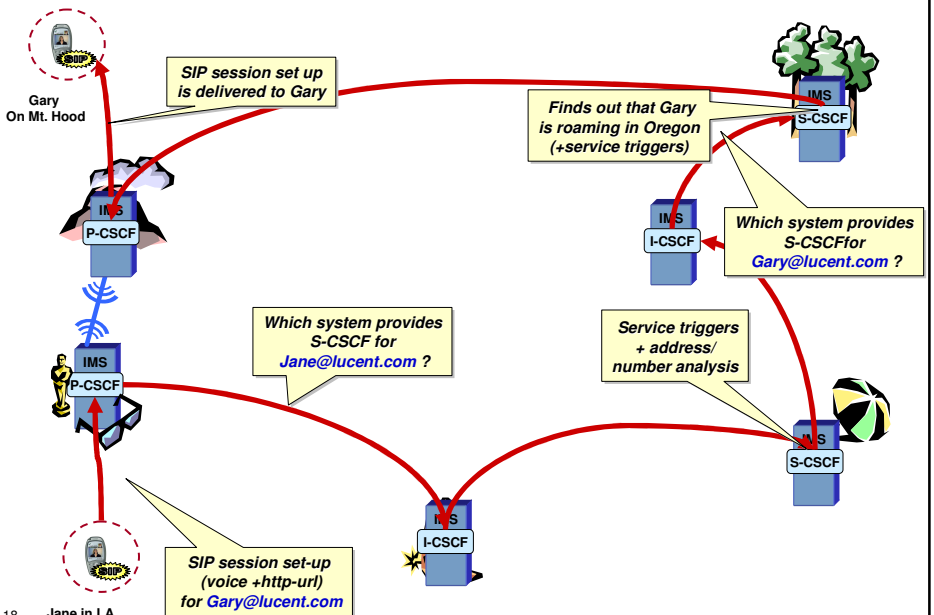


- **Strengths:**
- Separation of "Class 5" functions from "Class 4" functions
- Highly scalable
  - Class 5: add POTS/ISDN App. Servers
  - Class 4: add Trunk Gateways + MG Controllers
- No need to create "E.164 routing mesh" between softswitches
- Telephony Server using ENUM/DNS to locate end-users (no need for distributed E.164 routing tables)
- Geographical redundancy from IMS architecture
- Leverage technology commonalities with IMS

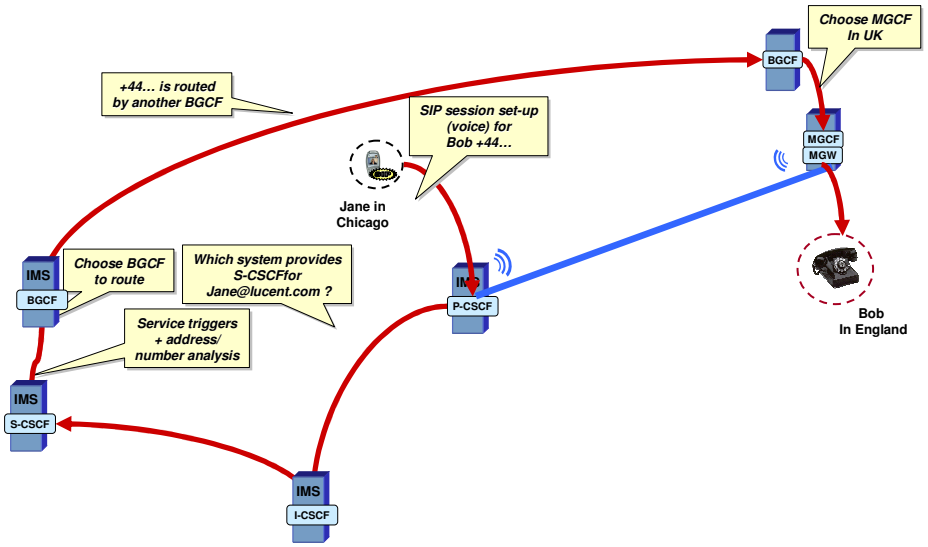
- **Weaknesses:**
- Still being standardized (ETSI TISPAN)
- SIP extensions required to provide full POTS/ISDN feature transparency

Separation of functions through distributed IMS architecture

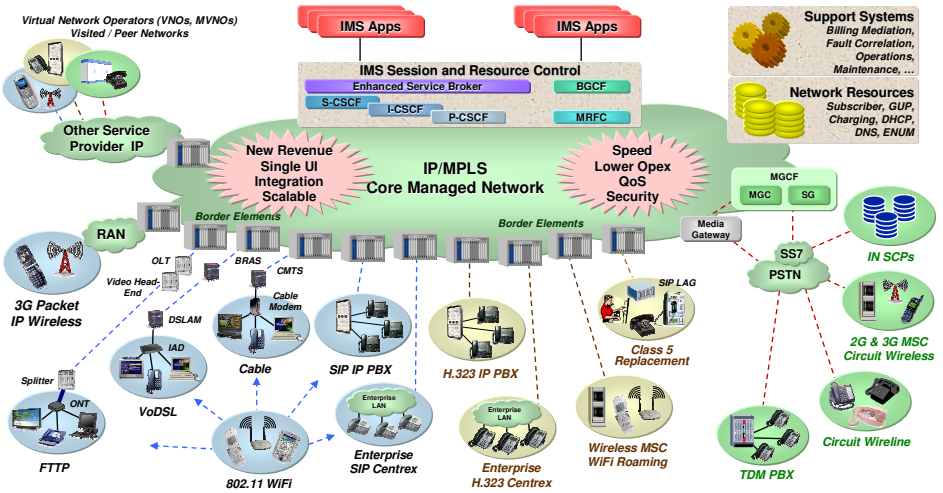
Geographically Distributed IMS Scenario - 1



Geographically Distributed IMS Scenario - 2



Tying it all together – Deliver Any Application to Any Endpoint



Conclusion

The IMS Services Architecture Solution Brings:

- **True converged Wireline/Wireless architecture for multimedia applications**
  - Access agnostic to multimedia applications
  - Home control allows service differentiation and promotes roaming
  - Common IMS network for voice and data allows for integrated multimedia services
- **Investment protection**
  - Walled session control avoids becoming a bit pipe
  - Based on existing and emerging standards we are helping to define
- **Product and service differentiation through managed network features**
  - Highly adaptable bandwidth management and security
  - Guaranteed and adjustable QoS to meet individual customers needs
  - Supports value bearing attributes for NGN applications
- **Common multi-market segment applications and databases**
  - Same applications & customer data available regardless of access method
- **Fosters and promotes the introduction of new services**
  - Allows the integration of disparate applications by carrier instead of supplier

Thank You.

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