

IMS Solution for Converged Wireless & Wireline Services



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Architects of Next Generation Convergence

What are we saying today ...

Convergence

- End Users: LifeStyle Blended Services simplifying life and improving productivity

NGN

- Service Providers: Building The Network that will bring LifeStlye blended services to both wireline and wireless subscribers

IMS (IP Multimedia Subsystem)

- Solutions: The Standards that define the NGN and enables LifeStyle blended services

Accelerate™

- Lucent: A Brand for delivering Convergence, NGN and LifeStyle Blended Services

Agenda

- **Market Drivers for Convergence**
- **IMS Standards and Architecture**
- **Example IMS Products**
- **An IMS Business Case for Mobile Operator**
- **Conclusion**

Market Driver: End User Service Requirements

Seamless Communications !

- Users want access to their communications and entertainment services from many places...
 - Home, office, on-the-go
- ...using several different devices...
 - PC, telephone, mobile phone, new multifunctional device
- ...without having separate accounts
 - Single sign-on, common contacts, information/content delivery
- New family of intelligent, interactive, location-based broadband services
 - Anytime, anywhere access to messages, contact lists, calendars and conferencing
 - Live video to handheld devices
 - Mobile access to speech-enabled web services



End users demands *Lifestyle* seamless blending across wireline/wireless
... Service provider's network and business model must evolve

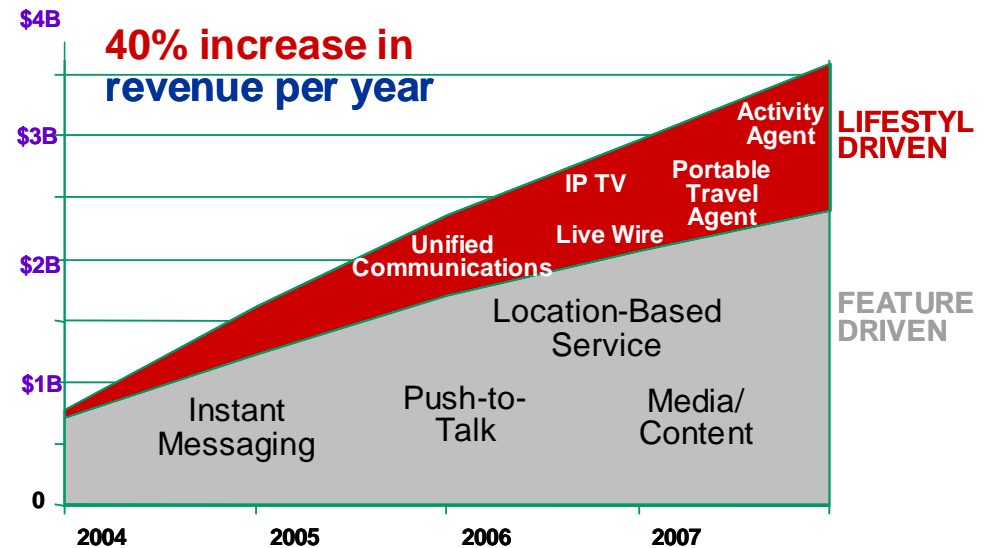
Market Driver: Service Provider Challenges

Top Line Growth and Providing Value Added Services

- **Revenue Replacement:** Need to offset decline in traditional revenue
- **Revenue Expansion:** Subscriber base increases rapidly but ARPU remains flat. Need to increase revenues from new services
- **Customer Relevance:** Address user's 'blended lifestyle' requirements for telecom services
- **Quicken Speed to Market Cycles:** Need to rapidly introduce profitable services and bundled service offers
- **Operational Efficiency:** Requirement to operate their networks more efficiently

... Top line growth, New services ...

ARPU increases with Lifestyle services



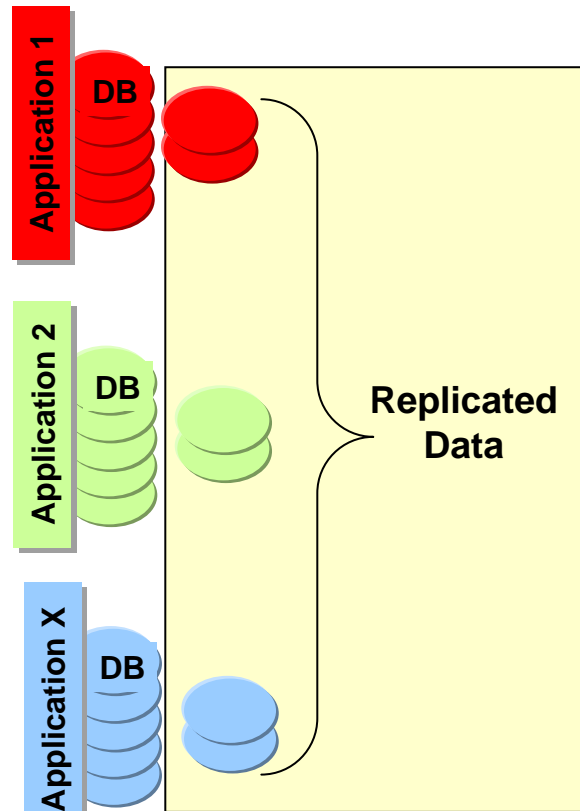
Source: Lucent Primary Market Research and Modeling, 2004

Lifestyle services help the operator maintain relationships with subscribers, regardless of how they access services

Market Driver : Single, Common Subscriber Database

CHALLENGE

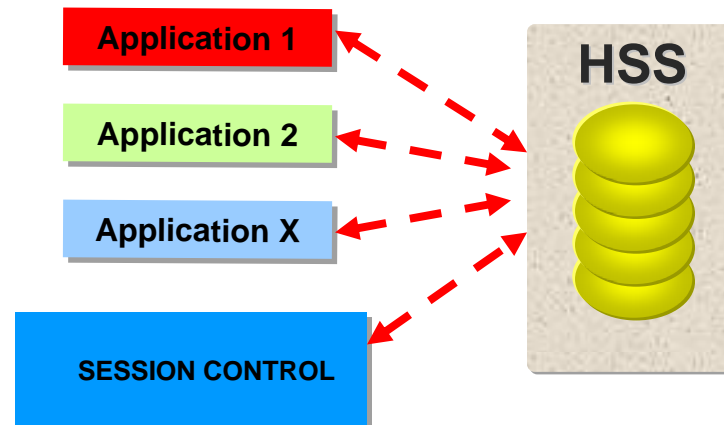
- Data replicated across applications
- Multiple Instances of user data
- Maintenance Issues



Now

VALUE

- Common user data defined once and shared by all applications
 - Reduces CAPEX/OPEX
- Supports QOS Policies
- Proven, reliable Lucent SD-HLR product
- Scalable distributed high capacity model
- Eases application integration

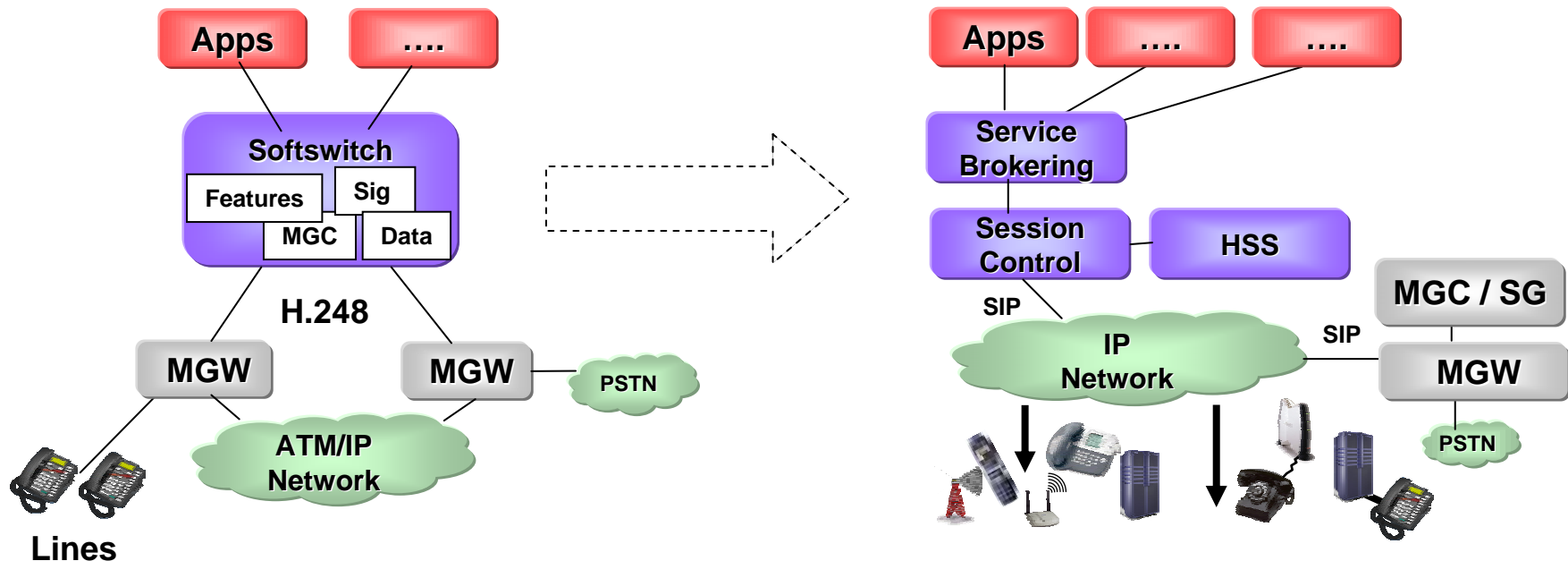


IMS

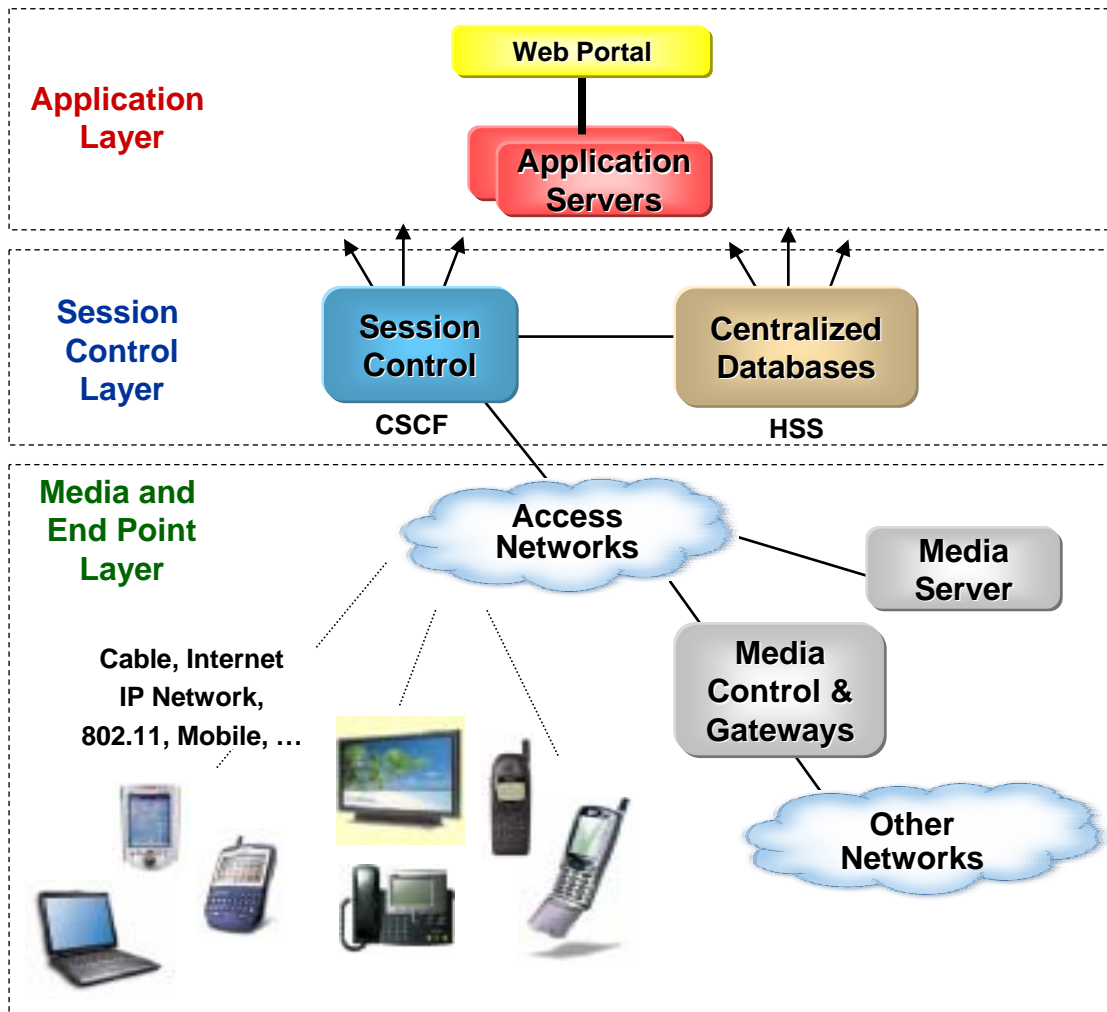
From Softswitch to Convergence

IMS Brings distribution ... Blended services ...

- Softswitch paradigm splits signaling from bearer, IMS further distributes functionality with focus on next generation services (session, subscriber database, applications, PSTN interface)
- IMS maps into layers with intelligent grouping of capabilities within layers
- Intelligent distribution of functionality allows for a modular system which allows for both highly integrated and highly distributed systems
- Well defined application interfaces and Service Broker enables ultimate flexibility in service coordination, service blending, and multi-session services
- Focus is on convergence: Common infrastructure supporting voice, data, multimedia and other applications for both wireline and wireless
- Supports roaming between networks, access, endpoints with consistent services



IMS – An Industry Standard



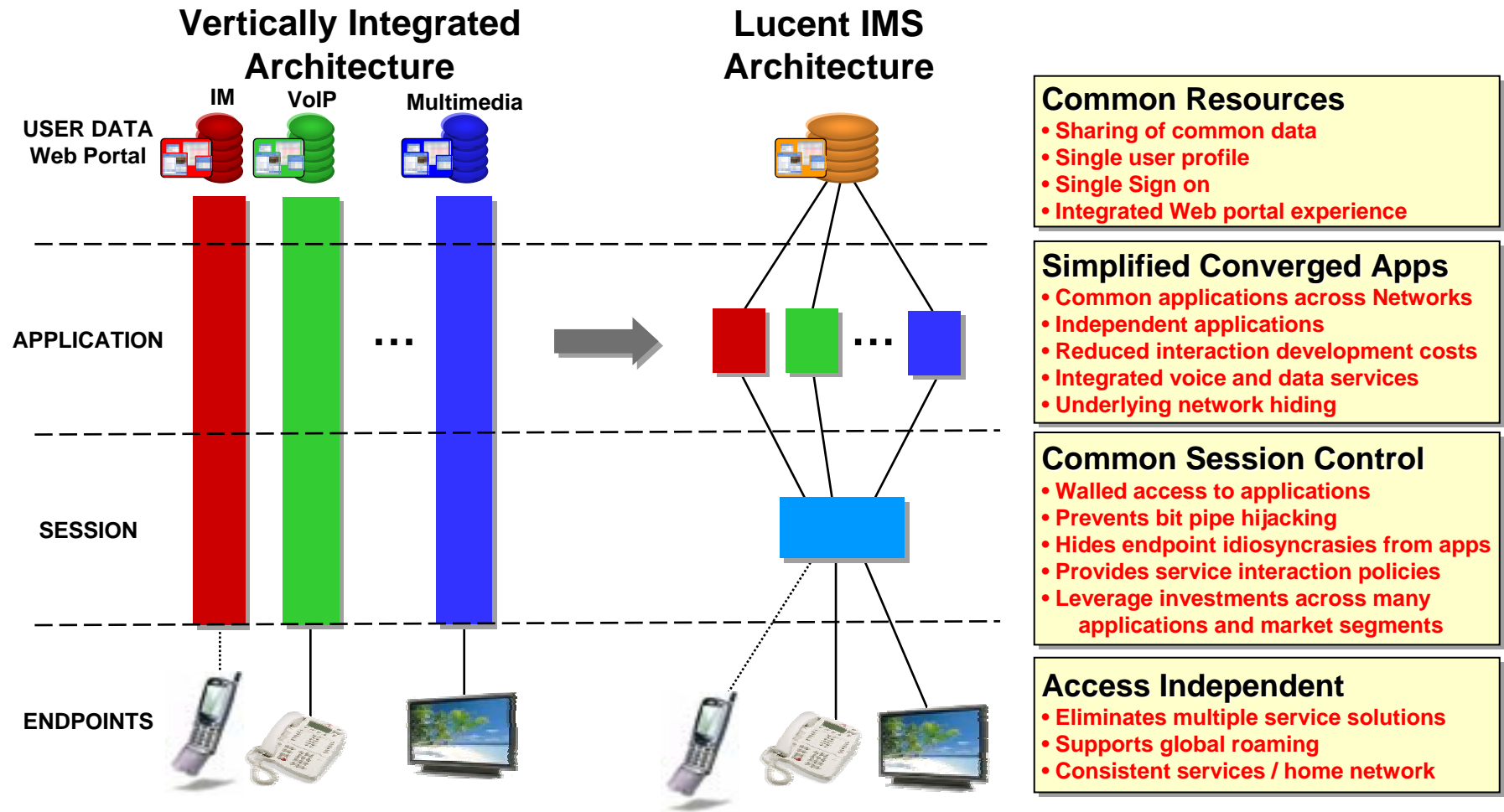
IMS IS:

- A VoIP Telephony and Multimedia Services Architecture
- Defined with Open Standard Interfaces -> 3GPP and 3GPP2
- Based on IETF Protocols (SIP, RTP, ..)
- Designed for Both Wireless and Wireline Networks
- A Solution for Service Transparency
- Capable of Interworking with PSTN and Legacy IN Based Services

CSCF – Call Session Control Function
HSS – Home Subscriber Server

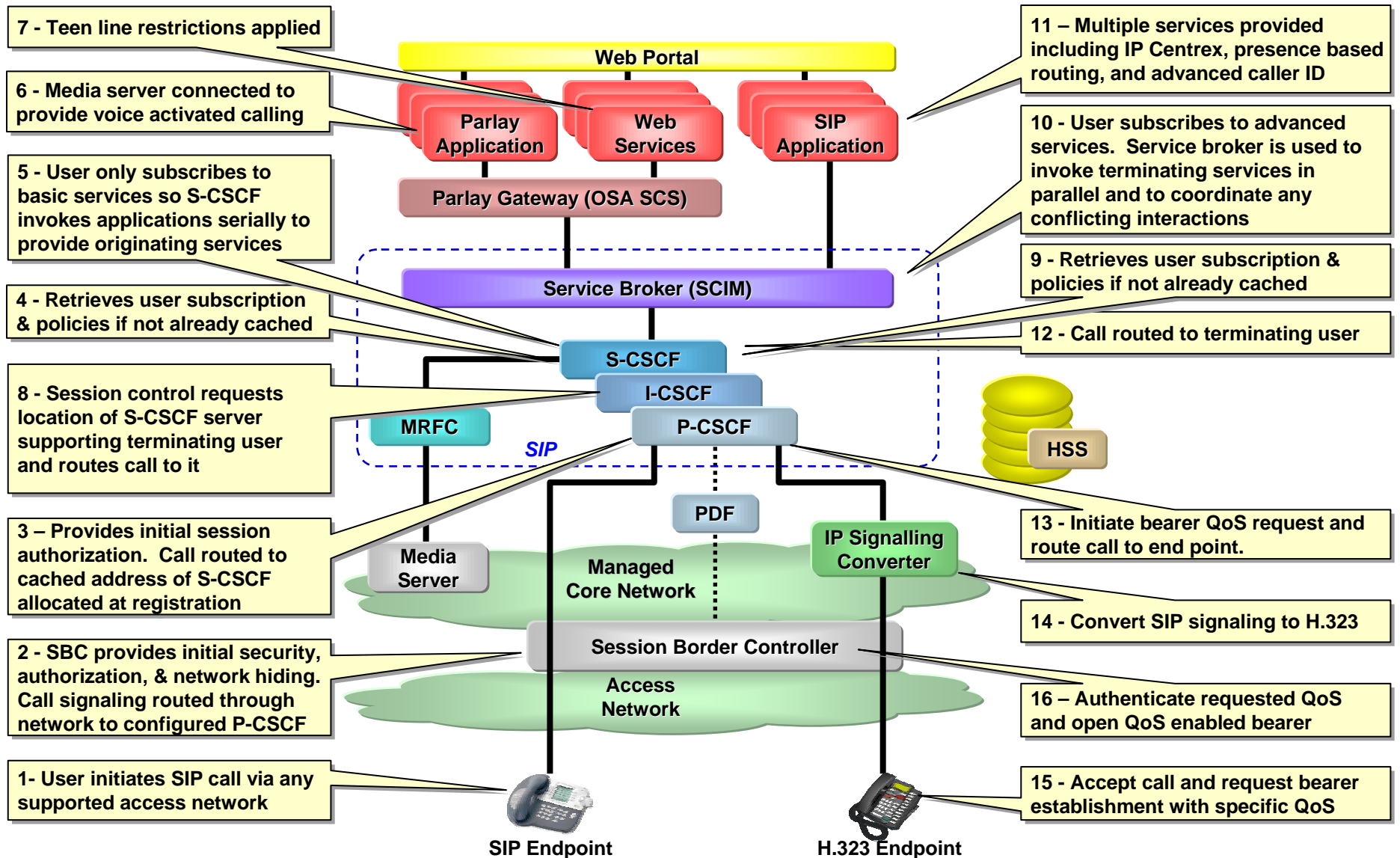
**IMS Seamlessly brings the Network to You
Always on ... Any Device ... Any Service**

Layering of IMS Solution

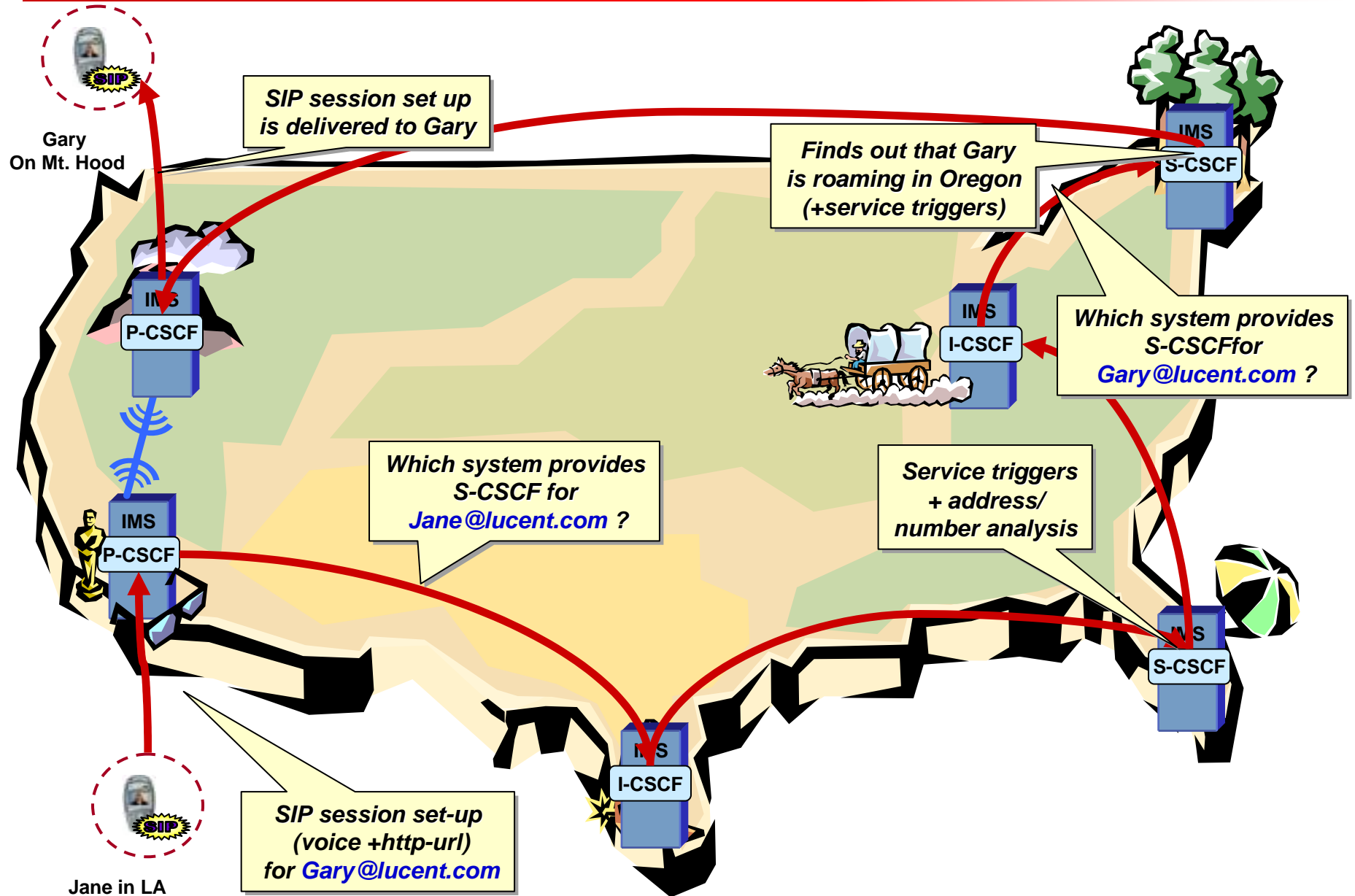


Converged services providers can build and launch services faster, efficiently adapting to market changes

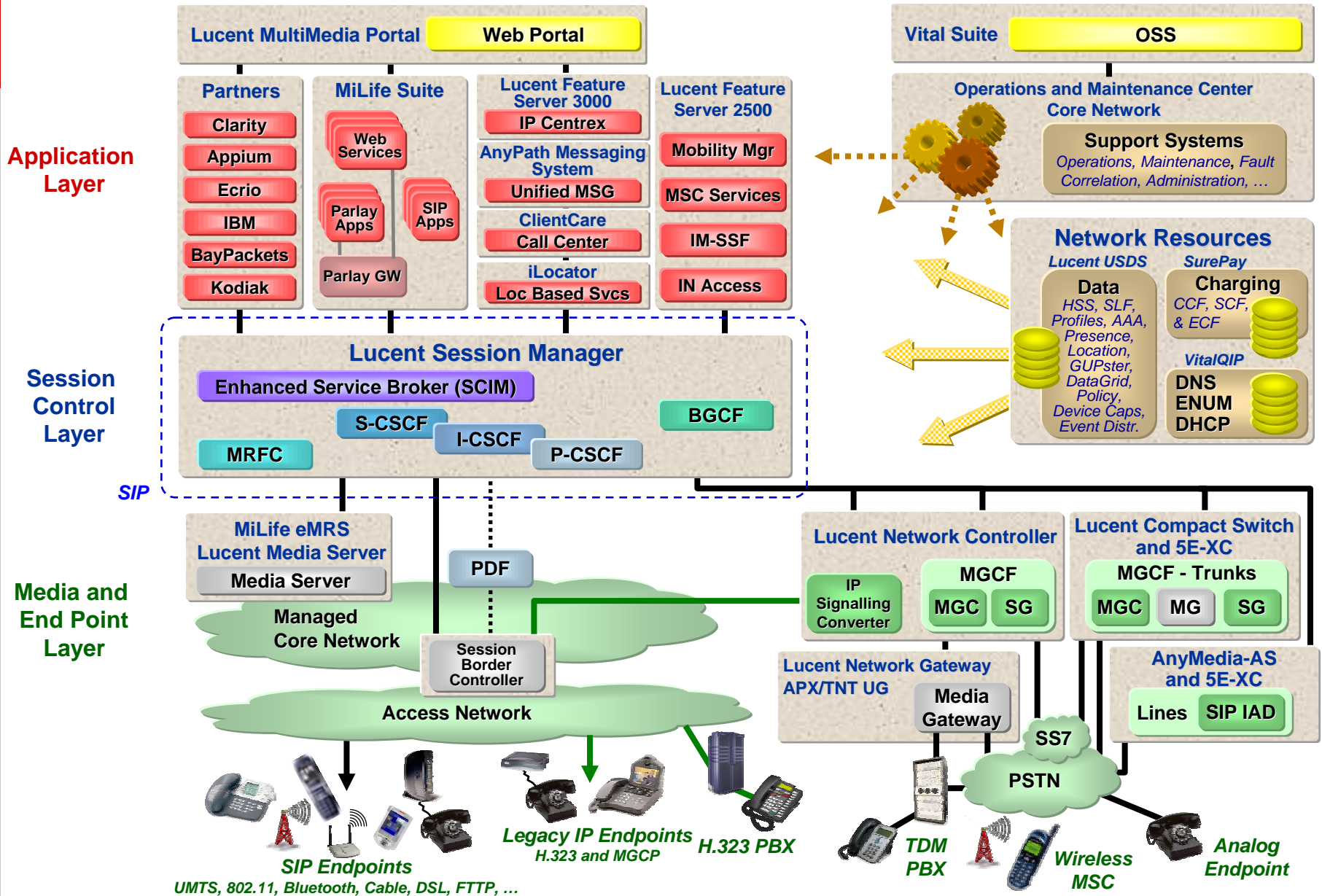
IMS Network Elements and Integrated Services Scenario



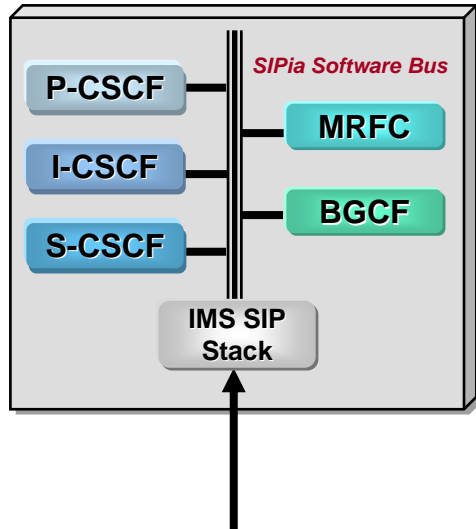
Geographically Distributed IMS Scenario



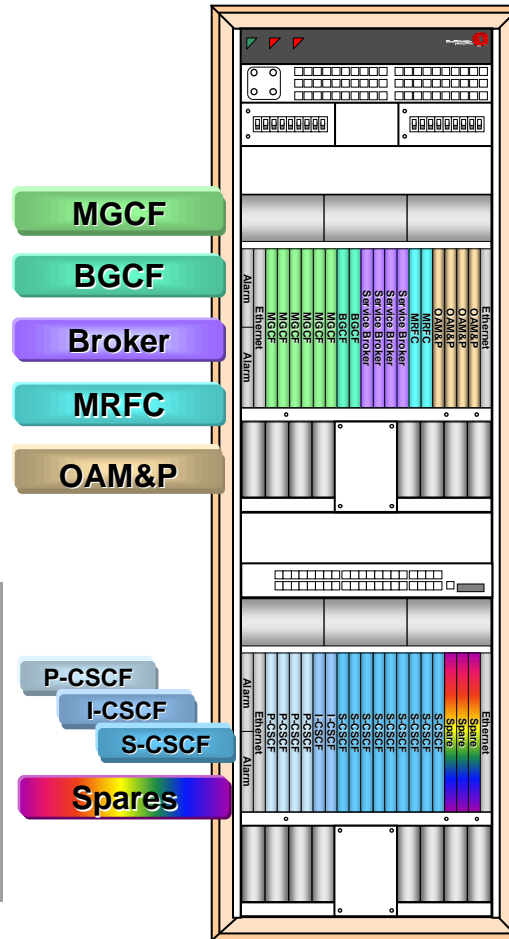
Lucent IMS Solutions Portfolio



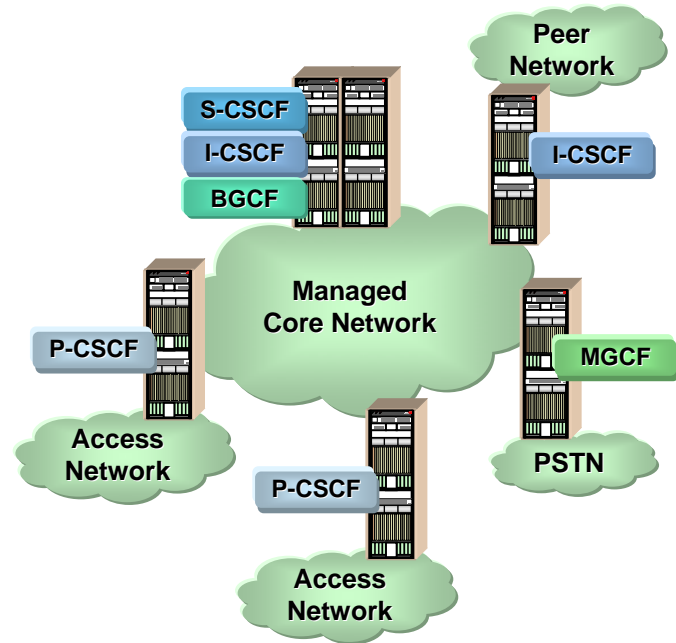
Flexible Network Configuration



- **Flexible Board Level Integration**
 - 1 or more IMS components per board
 - Common SIP stack across components
 - Lucent SIPia software bus provides post parsed messaging and advanced transaction services
 - Internal communications via SIPia bus
 - Enhanced performance across components
 - Allows for small scale lab trials



- **Flexible Cabinet Level Integration**
 - Common board hardware
 - Static and dynamic component configuration
 - Common pool of spares
 - 1 or more IMS components per board
 - SIPia bus configurable across boards
 - Easy incremental board and cabinet growth
 - Allows for single cabinet deployments



- **Flexible Network Deployment**
 - Scalable hardware and software
 - Supports efficient network topologies
 - Geographic redundancy
 - Allows for large scale deployments

Bell Laboratories Innovation for IMS

- **Service Broker**
 - IMS only defines very basic serial service invocation, there is a need to allow more complex interactions between applications
- **Network Routing Engines**
 - IMS utilizes the underlying IP network, there is a need to allow higher level service routing decisions, e.g., capacity, least cost, service agreements, ...
- **Policy Engines**
 - IMS only defines basic subscriber information, there is a need for high speed real-time static and dynamic policy decisions both for subscriber services but also for network element interactions
- **Data Grids**
 - IMS only defines central storage of subscriber data, there is a need to centrally store and manage element specific configuration and provisioning information
- **True Redundancy at Hardware and Software Levels**
 - Lucent experience in developing fault-tolerant systems is integrated into our solution, e.g., redundancy managers, asserts, audits, ...



IMS Modeling For An European Mobile Operator

What the Mobile Operator wants to know ...

- Quantify value of evolving from a UMTS Release 99/4 network to an IP Multimedia network through the deployment of a 3GPP IMS solution.
- Quantify advantages of IMS solution over Non-Integrated solution.
- Study performed over a 7 year period using as example a large European market with a total of 4M IMS subs

Methodology:

- A set of services was selected:
 - PTT, Instant Multimedia Messaging, Interactive Gaming, Location Services, Audio and Video Streaming, Video telephony, Rich Voice.
- A service/user model was developed to characterize BW requirements.
- Model was used to compute traffic requirements, CapEx, OpEx and revenues per service.

Example Applications

Application	Characteristics	Market Segment
Push-to-Talk (PTT)	<ul style="list-style-type: none"> • One-way Person-to-person(s). • CoS: Streaming 	<ul style="list-style-type: none"> • Mainly consumers due to lack of managed QoS
Instant Multimedia Messaging (IMM)	<ul style="list-style-type: none"> • One-way Person-to-person(s). • CoS: interactive 	<ul style="list-style-type: none"> • Consumers, enterprise users.
Interactive Gaming	<ul style="list-style-type: none"> • Person-to-person, Person-to-machine. • CoS: interactive 	<ul style="list-style-type: none"> • Mainly consumers.
Location Services	<ul style="list-style-type: none"> • Person-to-machine. • CoS: interactive. 	<ul style="list-style-type: none"> • Consumers, enterprise users
Video/Audio Streaming Services	<ul style="list-style-type: none"> • Person-to-person, Person-to-machine. • CoS: Streaming. 	<ul style="list-style-type: none"> • Mainly consumers

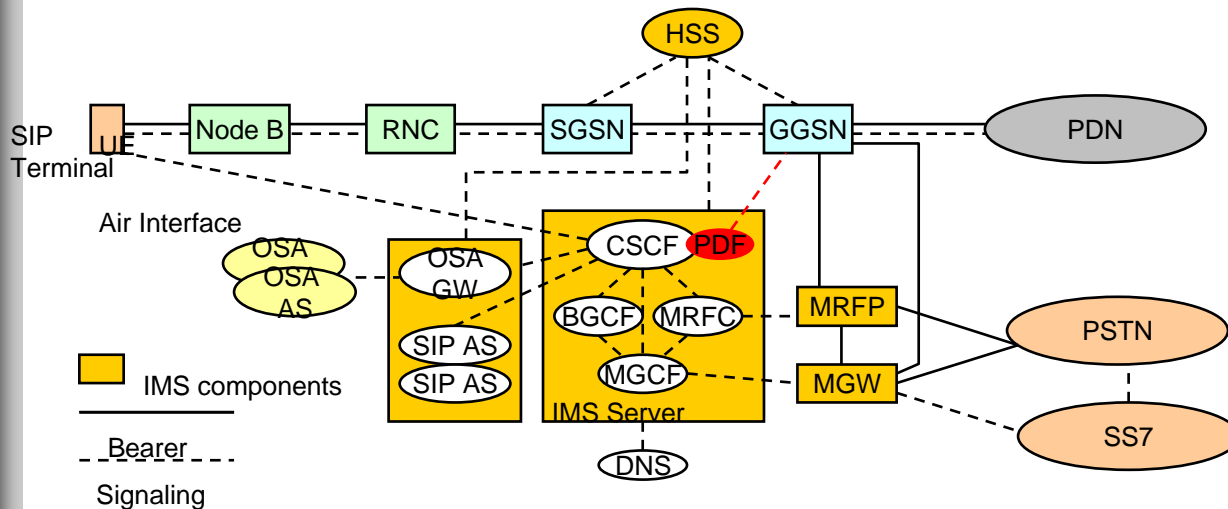
IMS Services

- Work started over a year ago when there was little or no market information on SIP-based multimedia services.
- Bell Labs conducted detailed research to properly model services.

IMS Network Elements, Service Characterization & Modeling

	BW Required (bps)	Session Time (secs)	Connection Time	Messages per Session	Bytes per session	CoS
Video Streaming	22,954	30	100%	n.a.	86,080	Streaming
Audio Streaming	6,991	60	100%	n.a.	52,431	Streaming
Interactive Gaming	20,200	300	50%	n.a.	378,750	Interactive
PTT	20,200	60	50%	n.a.	75,750	Interactive
Location Services	8,000	n.a.	n.a.	2	20,000	Interactive
IMMM	7,752	n.a.	n.a.	3	29,070	Interactive
PTTE	20,200	60	50%	n.a.	75,750	Conversational
Video Telephony	42,400	60	100%	n.a.	318,000	Conversational
Rich Voice	27,952	60	100%	n.a.	209,640	Conversational

Service Model

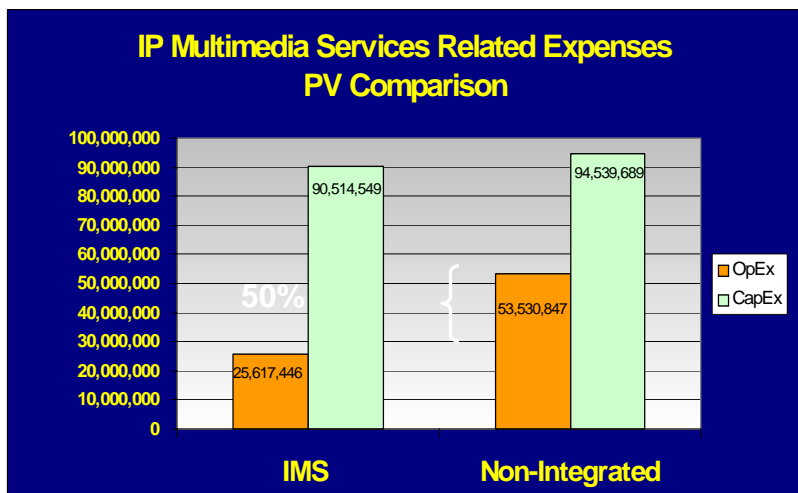
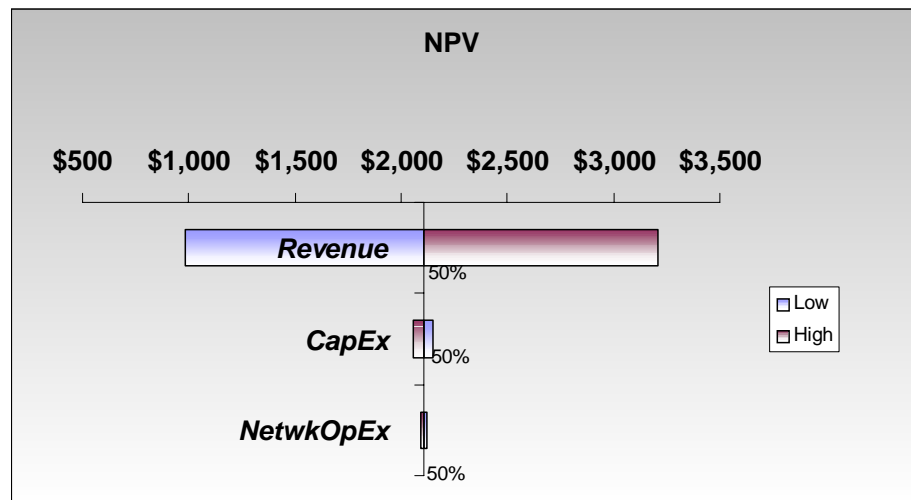
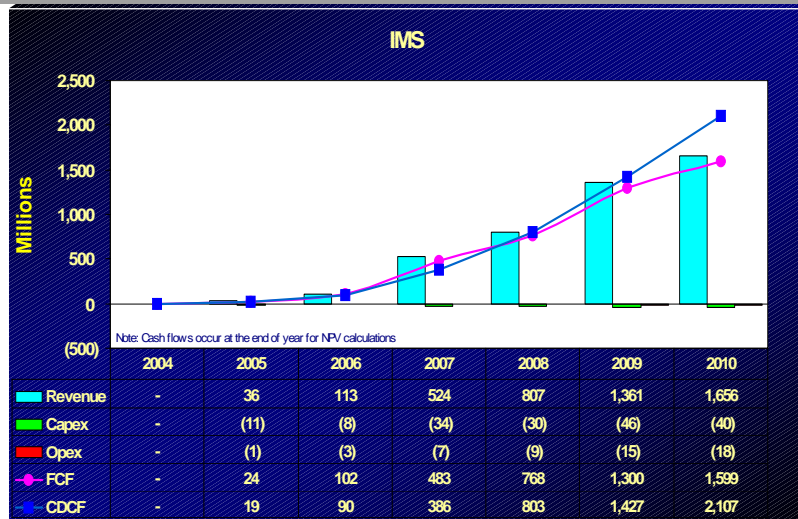


Network Architecture

- BL Team researched 3GPP standards in depth and LT product plans to understand architecture, behavior, and technical advantages of IMS solution.
- Developed network model to properly compute CapEx for IMS solution.

IMS Modeling – Summary of Results

- IMS has the potential to bring in large revenues with relatively small investment.
- Revenue has biggest impact on NPV.
- NPV was still positive even with a 50% reduction in revenue or a 50% increase in CapEx or OpEx.



- IMS can bring significant savings in OpEx when compared to non-IMS solutions.
- Provisioning of new customers is the **biggest factor** affecting savings.

Conclusion

- **Convergence is driven by end user demand for Lifestyle services and service provider's challenge to grow top line revenue**
- **IMS provides a convergence next-step evolution of softswitch technologies**
- **IMS has industry mindshare and momentum – consolidated and maturing standards**
- **The IMS Services Architecture Solution brings true converged wireline/wireless architecture for multimedia applications, fosters and promotes the introduction of new services**