AGENDA

› Current market & future trends
› Fixed mobile substitution
   – smartphones & other challenges for telco networks
› 1000x challenge
› Convergence
› IMS as key enabler
   – basics
   – IMS in fixed networks
   – IMS in mobile networks (VoLTE)
› Cloud (virtualization) for telco services & platforms
**MARKET AND INDUSTRY TRENDS**

**Subscriber growth** is slowing down

**Smart devices** open the door for Internet companies

**Social communities** taking over communication context

**Messaging & data usage** is exploding but voice revenues & price/MB are declining
COMMUNICATION WORLD

› subscriber & traffic trends
› current & future service
› challenges to access and core (switching)
  - more focus on mobile
  - smartphones, now tablets, M2M
› switching
  - evolution: legacy → IN → IMS → cloud / SDN
1000X CHALLENGE

› 1000x mobile traffic growth 2012-2020

› fixed traffic growth 30% Y-Y
  – mainly on fiber
  – subscriptions are growing moderately (<10% Y-Y)

› mobile traffic & subscription are exploding
  – 100% volume increase 2011-2012
  – 80% volume increase 2012-2013
  – smartphones → signaling load
  – tablets → often use WiFi for connection
  – LTE users consume more than 3G/HSPA users
    › the only killer app is speed
KEY ENABLERS FOR 1000x

› architectural change → small cells introduction
  – Heterogeneous Networks
  – carrier grade WiFi offload

› more spectrum
  – carrier aggregation
  – new bands (e.g. 3,5 GHz)

› more efficient technologies
  – HSPA+
  – LTE-Advanced, LTE-B, LTE-C
  – METIS (5G)
iWORLD

iPad2 =
1 Million in 1 day

iPad3 =
3 Millions in 3 days

iPhone5 =
2 Millions in 1 day
FIXED AND MOBILE SUBSCRIPTIONS

This slide contains forward looking statements

Source: Ericsson November 2013
PC-to-PC VoIP, e.g. Skype, is not included
This slide contains forward looking statements
OUR CORE VISION

Places

Persons

Screens

Things

Voice

+ Video

Narrowband

+ 50B

Broadband

PSTN

PLMN

SIP / IP

SIP / IP

SMS

SIP / IP

SMS
CONVERGENCE
Means a lot of different things to different people

› Industry Convergence
  – Telecom / IS/IT / Media/Broadcasting
› Network Convergence
  – Common session control network
  – Common service network
› Service Convergence
  – Seamless multi-media services over different access
› Device Convergence
  – Terminals operating over different accesses
  – Multimedia terminals
› One Company approach
  – One brand
  – One customer interface
  – Bundled offerings
› Common network & operation & processes
Traditionally, the term fixed-mobile convergence (FMC) has been used by the telecom industry when discussing the integration of wireline and wireless technologies. But it is not just about this particular kind of convergence, it is also about convergence between media, datacom and telecommunication industries. Convergence is considered from three viewpoints:

User service convergence;

where there are common user service delivery capabilities with access and device awareness. This means that a multitude of services (person to person, person to content and content to person) can be provided to the same user over different access networks and to different devices.

Device convergence;

common devices supporting several access types, such as CDMA2000, WCDMA, GSM, fixed broadband and WLAN. Device convergence allows multiple applications to be run, reusing the same functions for identification and authentication. Furthermore, the mobile device supports more and more functions in addition to telephony, e.g. Camera, TV/Video and email.

Network convergence;

this implies consolidation of the network to provide different user services, with telecom-grade quality of service, over several access types with an emphasis on operator cost efficiency and support to user service convergence.
User Services

Convenience & Ease of Use

Devices

Always Best Connected

Network

Reliability & Security
DEFINITIONS

› **Ericsson IMS Common System** is based on the IP Multimedia Subsystem (IMS) as defined by 3GPP/3GPP2.

› **Ericsson Instant Talk (EIT)** is the push to talk solution that complies with Push to talk over Cellular (PoC) – built on IMS Common System

› **weShare** is a family name for combinational services (CS+PS) – built on IMS Common System

› **Ericsson IMS Multimedia Telephony** – IP softswitch delivering multimedia telephony and IP Centrex functionality in fixed network – built on IMS Common System

<table>
<thead>
<tr>
<th>Multimedia system</th>
<th>Standard name</th>
<th>Standard org.</th>
<th>Ericsson solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>PoC</td>
<td>IMS</td>
<td>3GPP/3GPP2</td>
<td>IMS Common System</td>
</tr>
<tr>
<td>Combinational services</td>
<td>IMS (work item)</td>
<td>3GPP</td>
<td>weShare</td>
</tr>
<tr>
<td>IP Softswitch</td>
<td>IMS/NGN</td>
<td>3GPP/ETSI-TISPAN</td>
<td>IMS Multimedia Telephony</td>
</tr>
</tbody>
</table>
Horizontal Efficiency

- One common core network for efficiency
- Fast service introduction
- Independent of access – but work needs to be done on application level.
END-USER PERSPECTIVE
A “New Communication Style”

Pre-IMS Communication

1) Decide on communication mode/media
2) Create content
3) Send/call the chosen person
4) Disconnect and reconnect if changing media

IMS Communication

1) See who is available beforehand (presence)
2) See which mode/media to use
3) Contact and create content
4) Change media in real time
IMS AS A BASIS FOR CONVERGENT SOLUTIONS
WHAT IS IMS?

› IMS stands for IP Multimedia Subsystem
› IMS is a network for multimedia sessions and services defined by 3GPP
› IMS is using SIP - Session Initiation Protocol from IETF - Internet Engineering Task Force as the main control protocol
› IMS is one of the key parts of the evolution of the mobile and wire-line communication
IMS – A STANDARDIZED ENABLER

It took 11 years to make IMS what it is:
› 3GPP R99 December 1999
› R5 June 2002 - architecture
› R6 March 2005 – apps & interworking
› R7 March 2007 – DOCSIS & xDSL, IMT, SMS, VCC, ICSI
› R8 Dec 2008 – MMSC, CS, corporate access
› R9 Dec 2009 – procedures modifications, CS interworking (IBCF, TrGW)
› R10 March 2011 – M2M, new logical nodes, new procedures, Service Continuity – Inter Device Transfer, IMS Home (e)NB
› R11, R12, ...

IMS does not standardize specific services, it standardizes the enablers
STANDARDIZATION PATH
STANDARDIZED IMS APPLICATIONS

› Standard setup and implementation
› Work end-to-end between operators, networks and devices
› Known for scalability, availability, performance and interconnect ability
› Appeals to mass market

IMS services being standardized:

— Presence 
— IP Telephony 
— Video 
— File sharing 

— Push-to-talk over Cellular (PoC)
— Instant Messaging (IM)
— Multimedia Ringback*
— IPTV*

* = to be standardized soon
NON-STANDARDIZED APPLICATIONS

› Rapidly leverage market trends
› Flexible and fast TTM
› TTM and interoperability realized through CoSe*
› Offered within local operator or globally
› No standard today, but perhaps in the future

Provided by:
  – Independent application developers
  – Telecom vendor
  – In house innovation by operator

* = IMS Communication Services
The Session Initiation Protocol (SIP) is a text-based client-server protocol for peer-to-peer communication. The design base was HTTP and SMTP. SIP is used to establish, modify and terminate IP multimedia sessions. SIP is able to establish a broad range of IP multimedia sessions:
- Voice and/or video
- Gaming
- Presence and Instant Messaging

SIP messages are either requests or responses. The Session Description Protocol (SDP) is the common body for session initiation. SIP runs on a transport protocol (UDP, TCP, TLS, SCTP)
- UDP and TCP are mandatory. The other transport protocols are optional.

SIP is not:
- transport protocol
- QoS reservation protocol
- gateway control protocol
SIP BASICS (2)

› SIP provides the following functionality:
  - User location
  - User availability
  - User capabilities
  - Session set-up
  - Session management

› SIP does not provide services
  - But it enables the system to provide services and service enablers such as PoC, Presence, Instant Messaging and Multimedia conferencing
SIP METHODS

Core Protocol methods
- INVITE
- ACK
- CANCEL
- BYE
- OPTION
- REGISTER

RFC-3261

SIP methods

Extension Protocol methods
- PRACK (RFC 3262)
- REFER (RFC 3515)
- SUBSCRIBE (RFC 3265)
- NOTIFY (RFC 3265)
- INFO (RFC 2976)
- UPDATE (RFC 3311)
- PUBLISH (RFC 3903)
- MESSAGE (RFC 3428)
### SDP – SESSION DESCRIPTION PROTOCOL

- **the body in SIP message**

<table>
<thead>
<tr>
<th>Request Method</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INVITE</strong> sip:<a href="mailto:UserB@there.com">UserB@there.com</a> SIP/2.0</td>
<td><strong>SIP/2.0 200 OK</strong></td>
</tr>
<tr>
<td><strong>Via:</strong> SIP/2.0/UDP here.com:5060</td>
<td><strong>Via:</strong> SIP/2.0/UDP here.com:5060</td>
</tr>
<tr>
<td><strong>From:</strong> BigGuy <a href="">sip:UserA@here.com</a></td>
<td><strong>From:</strong> BigGuy <a href="">sip:UserA@here.com</a></td>
</tr>
<tr>
<td><strong>To:</strong> LittleGuy <a href="">sip:UserB@there.com</a></td>
<td><strong>To:</strong> LittleGuy <a href="">sip:UserB@there.com</a>;tag=65a35</td>
</tr>
<tr>
<td><strong>Call-ID:</strong> <a href="mailto:12345600@here.com">12345600@here.com</a></td>
<td><strong>Call-ID:</strong> <a href="mailto:12345601@here.com">12345601@here.com</a></td>
</tr>
<tr>
<td><strong>CSeq:</strong> 1 INVITE</td>
<td><strong>CSeq:</strong> 1 INVITE</td>
</tr>
<tr>
<td><strong>Subject:</strong> Happy Christmas</td>
<td><strong>Subject:</strong> Happy Christmas</td>
</tr>
<tr>
<td><strong>Contact:</strong> BigGuy <a href="">sip:UserA@here.com</a></td>
<td><strong>Contact:</strong> LittleGuy <a href="">sip:UserB@there.com</a></td>
</tr>
<tr>
<td><strong>Content-Type:</strong> application/sdp</td>
<td><strong>Content-Type:</strong> application/sdp</td>
</tr>
<tr>
<td><strong>Content-Length:</strong> 147</td>
<td><strong>Content-Length:</strong> 134</td>
</tr>
</tbody>
</table>

#### Payload

```
v=0
o=UserA 2890844526 2890844526 IN IP4 here.com
s=Session SDP
c=IN IP4 100.101.102.103
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

```
 receive RTP G.711-encoded audio at 100.101.102.103:49172
```
SIP SESSION EXAMPLE

Transaction 1
- INVITE
- 100 Trying
- 180 Ringing
- 200 OK
- ACK

Transaction 2
- BYE
- 200 OK
THE CORE OF IMS
Combining the best of two worlds

Open, flexible service development ability of the Datacom industry

Performance and scalability characteristics of the Telecom Industry Solutions

Standardized, end-2-end services that are interoperability tested
INTRODUCING SOFTSWITCHING

Reduced costs, voice emulation

- Fixed and mobile Softswitching
- PSTN Emulation
- Handles call control

- Media Gateways
- Performs local switching

- IP transport network

Fixed access
Mobile access

Controls
Connectivity

Other PSTN/ISDN Network
TDM
Server
IP/MPLS Network
Media Gateway
TDM
TDM
TDM
INTRODUCING IMS
Increased revenues, voice simulation

- Fixed and mobile IMS
- PSTN Simulation
- Range of IP services with telecom grade

Control

Connectivity

SIP

IP/MPLS Network

Fixed access

Mobile access
INTRODUCING IMS
Increased revenues, voice simulation

- Presence
- IP & Video Telephony - fixed and mobile
- Push to talk - a multimedia component
- weShare - sharing while talking
- IP Centrex - complete enterprise solution
- Converged services…

Fixed access  Mobile access
FUTURE OF CONVERGED ALL-IP
Cost optimization and speed of introduction

• Subscriber migration enabled by IP Telephony
• Subscriber migration enabled by IP Telephony

Control

Connectivity

Fixed access
Mobile access

IP/MPLS Network

Fixed Server
Mobile Server
IMS
Media Gateway
Media Gateway
Media Gateway
Media Gateway
IMS OVERVIEW

› IMS is a horizontal architecture for offering IP Multimedia Applications

› IMS is defined in 3GPP/3GPP2 standard, Embraced in TISPAN

› The IMS architecture is based on the SIP-protocol for call-control in all IP-networks

› IMS supports different accesses, such as:
  - WCDMA, GPRS,
  - CDMA2000,
  - Wire-line Broadband
  - WLAN
  - WiMAX
  - Cable

Ericsson IMS Solutions
- IMS Push to Talk
- IMS weShare
- IMS Multimedia Telephony
- IMS Video Telephony
- IMS Messaging
- IMS Studio

Application Servers
- IMS PTT AS
- Centrex Server
- IMS AS

IMS Common System
- IMS Enablers
  - PGM
  - PS
  - IMS
  - Conf.
  - SDS

IMS Core
- HSS
- IPWorks
- CSCF
- MRFC
- A-SBG
- MRFP

Support Systems
- OSS
- EMA
- Multi Mediation
- ADC

Interworking
- MGC
- MGW

Advice, Integrate and Manage
IMS Client
- ICP
LTE is PS-only, no CS.
Telephony over LTE is VoIP!
VoLTE Architecture

- **VoLTE, Voice over LTE**
- **E-UTRAN**
- **EPC, Evolved Packet Core**
- **EPS, Evolved Packet System**
- **IMS**

**Components:***
- **eNodeB**
- **e-Uu**
- **S1-MME**
- **S1-U**
- **SGi**
- **Gx**
- **Rx**
- **S6a**
- **Mw**
- **Gb**
- **Gb**
- **Cx**
- **Sh**
- **ISC**
- **HSS**
- **MMTel AS**
- **PCRF**
- **S&P GW**
- **P-CSCF**
- **I-/S-CSCF**
- **MME**
- **IWF**
- **Term NW**

**Abbreviations:**
- **VoLTE**
- **LTE**
- **E-UTRAN**
- **EPC**
- **EPS**
- **IMS**
IMS MULTIMEDIA TELEPHONY

ARCHITECTURE AND NODES
IMS OVERVIEW

› IMS is a horizontal architecture for offering IP Multimedia services

› IMS is defined in 3GPP/3GPP2 standard, Embraced in TISPAN

› The IMS architecture is SIP-based for call-control in all IP-networks

› IMS supports different accesses
IMS MULTIMEDIA TELEPHONY SOLUTION OVERVIEW

**Multimedia Telephony Services**
- IP centrix and Residential services

**Presence**
- Presence Server

**Network & Services Management**
- Network Assurance
- Network Provisioning
- User and Service Management
- Charging Mediation
- DNS / ENUM

**Control Layer**
- CSCF: Call Session Control Function
- HSS: Home Subscriber Server
- MGCF: Media Gateway Control Function
- SG: Signalling Gateway
- MG: Media Gateway
- A-SBG: Access Session Border Gateway
- N-SBG: Network Session Border Gateway
- Other operators: SIP and H.323

**Connectivity Layer**
- IP Backbone
- PSTN/PLMN
- TDM
- MG
- ISUP
- H.248
- RTP
- SIP
- Diameter

**Application Layer**
- IP PBX
- LAN
- IAD
- Legacy PBX
- ICS
- SIP
- SIP/H.323
CONNECTIVITY LAYER

› Access Session Border Gateway (A-SBG)
  - User-to-Network Interface (UNI)
  - Interfacing SIP and IP network

› Network Session Border Gateway (N-SBG)
  - Network-to-network interface (NNI)
  - Handles inter-domain inter-working between SIP networks and SIP or H.323 networks

› MGW – Media Gateway for break out calls to PSTN
CONTROL LAYER

› Call Session Control Function (CSCF)
  - Referred to in standard as a SIP server
  - Core node handles session establishment, modification and release of IP multimedia sessions

› Home Subscriber Server (HSS)
  - Evolution of the Home Location Register (HLR) and Authentication Centre (AUC)
  - Stores the Service Profile

› Media Gateway Control Function (MGCF)
  - Gateway between SIP and ISUP. Controls the MG.
APPLICATION LAYER

› Multimedia Telephony Services
  – Centrex Services Application Server (CS-AS)
    › Provides personal and group services
    › Integrated web server, database and service engine
  – Centrex Services Conference Server (CS-CS)
    › Media resource handling including booking and set up of multi-party conferencing
  – Media Server (CS-MS)
    › Provides media resources
    › IVR, service announcements and DTMF interaction

› Presence Server (PS)
  – Collect, manage and distribute user and service status information in real-time
  – Presence status such as mood, current situation and location
Network and Service Management

- Network Assurance/Network Provisioning
  - MN-OSS use as centralized management
  - Fault, Configuration, Performance and Security administration

- User and Service Management
  - Provisioning services for IP Centrex and Residential subscribers
  - Self-administration and provisioning for IP Centrex and Residential users

- Charging Mediation
  - Collects charging information from the individual nodes
  - Processes CDRs that is forwarded to external billing systems

- DNS/ENUM servers
  - Translation between public identifiers of the user
  - Alphanumeric name to IP address translation
IMS AND SERVICE ENABLERS

Ericsson IMS

Solutions
- IMS Push to Talk
- IMS weShare
- IMS Multimedia Telephony
- IMS Video Telephony
- IMS Messaging
- IMS Studio

Application Servers
- IMS PTT AS
- Centrex Server
- IMS AS

IMS client
- ICP

IMS Common System
- PGM
- IPWorks
- IMSIM
- Conf.
- SDS

IMS Enablers
- HSS
- CSCF
- MRFC
- MRFP
- A-SBG
- N-SBG
- MGC
- MGW

Support Systems
- OSS
- EMA
- Multi Mediation
- ADC

Advice, Integrate and Manage

IMS Core

IMS Multimedia Telephony
IMS WeShare
IMS Studio
WHAT IS PRESENCE?

› Presence can be used to enhance applications
› For each user presence attributes can be defined, e.g.
  - Availability
  - Location
  - Mood
  - Maintenance status of a machine
  - Terminal and capability

› Presence data is stored in a presence server
› Presence data is updated manually by the user and/or automatically by the network or applications in the network

Applications e.g. PTT, voice, IM etc.
PRESENCE: OVERVIEW OF OPERATION

1. SUBSCRIBE
2. OK + NOTIFY
   (presentity is offline)
3. SUBSCRIBE
4. OK + NOTIFY
   (presentity is offline)

Will

Wanda
PRESENCE: OVERVIEW OF OPERATION

1. PUBLISH
2. OK
3. NOTIFY
4. OK
5. NOTIFY
6. OK

Presentity        Presence server        Watchers

Peter            Will                   Wanda
Kick-start towards IMS with IP Centrex and Residential services.
FEATURES

› Call Functions
› Portal Dial-in
› Conferencing
› Messaging services
› Voice, video mail
› E-mail
› Call Centre support
› Auto Attendant
› VPN
› Personalization
› Business Trunking
### Features in IMS Multimedia Telephony

#### Personal Services
- Anonymous Call Rejection
- Auto Callback
- Automatic Hold/Retrieve
- Blind Call Transfer
- Busy Lamp Field
- Call Forwarding Always
- Call Forwarding Busy
- Call Forwarding No Answer
- Call Forwarding Remote Access
- Call Forwarding Selective
- Call Return
- Call Screening by Digit Patterns
- Call Transfer with 3-Way Consultation
- Call Transfer with 3rd Party consultation
- Consultation Hold
- Call Waiting
- Calling Line ID Blocking
- Calling Line ID Blocking Per Call
- Calling Line ID Blocking Override
- Calling Line ID Delivery
  - Internal / external
- Calling Line ID Delivery per call
- Calling Party Category
- Custom Ringback User

#### Group Services
- Account Codes
- Attendant Console
- Authorization Codes
- Auto Attendant
- Barge in Exempt
- Call Intercept
- Call Park
- Call Pick-Up
- Calling Group ID Delivery
- Calling Plan Forwarded/Transferred
- Calling Plan – Incoming
- Calling Plan – Outgoing
- Conferencing
- Enhanced Outgoing Calling Plan
- Configurable Extension Dialing
- Configurable Feature Codes
- Configurable Feature Codes Prefix
- Configurable Time Zones
- Custom Ringback Group
- Department Admin Layer
- Directed Call Park
- Directed Call Pickup with Barge in
- Hunt Groups
- Instant Conferencing
- Instant Group Call
- Loudspeaker Paging
- Music on Hold
- Music on Hold
- Resource Inventory reporting
- Series Completion
- Simultaneous Ring – Group
- PBX Dialing Transparency
- Voice VPN
- Voice Portal

#### Messaging Services
- Voice Mailbox Integration
- Voice Message Call back
- Voice Messaging Personal
- Voice Messaging Notification
- Voice Messaging to e-mail
- Voice Message Waiting Indication
- Outgoing Message Waiting Indication
- Third Party Voicemail MWI
- Voicemail configuration

#### Call Attendant Services
- Attendant Console
- Auto Attendant
- Dial by extension
- Dial by name
- Record greetings remotely
- Night Service
- Transfer to operator

#### Call Manager
- Express Call Manager
- Personal Web Portal
- Group Web Portal
- Phone lists
  - Group
  - Personal
  - Call Log
- Printable Group Directory
- miPA and miRECEPTION

#### Call Distribution
- Call Queuing
- Multiple policies
- Music on Hold
- Overflow
- Night Service
- Statistics

#### Directory Services
- LDAP Directory Integration
- Outlook Integration

---

**Multimedia Services**
- Video Telephony
- Presence
- Buddy Lists
- Emoticons (smileys)
- Instant Messaging

**Legal Intercepts**
- Emergency Call
- Malicious Call Tracing
- Local Number Portability
- Operator Initiated Call Barring
- Charging mediation

**Service Provider and Enterprise Services**
- Business Trunking
- Call Processing Policies
- Configurable Default FAC
- Large Enterprise Support
IMS IN MOBILE NETWORKS
DEPLOYMENT OF MSS

Service Layer

Common support functions

Applications & Content

Control Layer

Connectivity Layer

Internet

GGSN

SGSN

Common IP Core

MGW

MSC-S

PLMN

2/3 G access

BSC

RNC
MSS & IMS INTERWORKING

Service Layer
- Common support functions

Control Layer
- IMS
- MSC-S

Connectivity Layer
- GGSN
- SGSN
- MSG
- BFRAS
- BEAS
- MSG
- SGSN

Internet
- Common IP Core

Applications & Content
- Internet
- PLMN
- MGW

Wireline access
- PSTN access
- IP BB access

UMA

2/3 G access
- BSC
- RNC
- PSTN access
- IP BB access
MSS & IMS ON ONE PLATFORM

Service Layer
- Common support functions

Control Layer
- Applications & Content
  - IMS
  - MSC-S

Connectivity Layer
- Internet
- GGSN
- Common IP Core
- SGSN
- BRAS
- MSG
- PLMN
- MGW
- IP BB access
- PSTN access
- Wireline access
- UMA
- BSC
- RNC
- 2/3 G access
- PSTN access
- Wireline access
- UMA
- BSC
- RNC
- 2/3 G access
ERICSSON IMS MID TERM ARCHITECTURE

Based on IETF, 3GPP, OMA and TISPAN specifications
Call Flows
REGISTRATION TO THE NETWORK

1. Bearer Level Registration: GPRS
2. PDP Context Activation
3. P-CSCF Discovery
4. Application Level Registration
The I-CSCF finds the S-CSCF allocated to this user or selects a new S-CSCF for this user.

The I-CSCF contacts the HSS to find the S-CSCF serving this subscriber.

The S-CSCF challenges the subscriber.

The P-CSCF finds the I-CSCF with the help of DNS.

The S-CSCF downloads the authentication vector for this subscriber from the HSS.

A UE initiates a SIP Registration including his public user ID and his private user ID.

Subscriber

A UE initiates a SIP Registration including his public user ID and his private user ID.
The I-CSCF contacts the HSS to find the S-CSCF serving this subscriber. The S-CSCF authorizes the registration and informs the subscriber. The S-CSCF informs the HSS that this S-CSCF is serving the subscriber. The HSS sends the S-CSCF the service profile. The S-CSCF informs the other Application Servers about the user's registration. The I-CSCF finds the S-CSCF allocated to this user. The P-CSCF finds the I-CSCF with the help of DNS. The UE calculates the credentials and re-initiates the SIP Registration.
The I-CSCF fetches from the HSS the address of the S-CSCF that is serving subscriber B. The I-CSCF routes the message to the originating S-CSCF. The P-CSCF is the first point of contact in the IMS for the subscriber. It forwards the INVITE request to the I-CSCF. The S-CSCF in Home B performs service invocation for subscriber B. It forwards the INVITE to the P-CSCF and UE. The S-CSCF in Home A performs service invocation for subscriber A. The S-CSCF finds the entry point in Home B. The HSS returns the address of the S-CSCF serving subscriber B. Subscriber A initiates a SIP invitation including the SIP URI of subscriber B.
IMS and QoS
E2E QoS on Different Levels

Application end-to-end QoS

3GPP QoS (e.g. Streaming)

Ext. Network QoS

RAN QoS

CN QoS

GERAN
UTRAN

Core
Network

Internet/
Intranet
QoS Basics – PDP Context Activation/Modification

- **Create/Update PDP Context**
- **QoS Parameters**
- **BSS PFC/RAB Negotiations**
- **QoS Requested**
- **QoS Negotiated**
- **Insert Subscriber Data**
- **Activate/Modify PDP Context Request**
- **Activate/Modify PDP Context Accept**
- **QoS Subscribed**
- **Network Policy**
- **MRF**
- **HLR**
- **SGSN**
- **GGSN**
IMS platforms
IMS PLATFORMS

› The IMS Core including CSCF, MRF, and HSS are based on Ericsson Telecom Server Platform – TSP
› Blade technology (Integrated Site architecture) will be introduced for SBG (IMS R4) and MGCF/MGW, MRF
TSP ARCHITECTURE

- C++ API
- Java API

- Signaling
- Node Management

- TelORB Clusterware
- DICOS
- Linux OS

- Processor
- Processor
- Processor
- Processor
- Processor

- GEM, SCB, GESB
... provides for an IMS network in a box