



The Global
IP Communications
Industry Event!™

Sept. 11-14 • Boston Convention & Exhibition Center

Lessons Learned in IMS – 3:00pm Sept 12, 2006



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Lessons Learned – Applying IMS to the PSTN

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Applying IMS to the PSTN

- Incumbents (IOCs) and challengers (CLECs)
- Network renewal and new network builds
- (Almost) universal adoption of distributed, VoIP-based networks to deliver PSTN services
- IMS appeals in PSTN migration because it:
 - Comprises most comprehensive VoIP standards to date
 - Provides platform for faster deployment of new services
 - Expands scope of services beyond pure telephony
 - Promises convergence of fixed and mobile networks

Lessons Learned Applying IMS to the PSTN

- **Managing voice quality in the IMS**
- **Emulating PSTN services in the IMS**
- **Mastering intelligent endpoints in the IMS**
- **Building user interfaces to IMS applications**

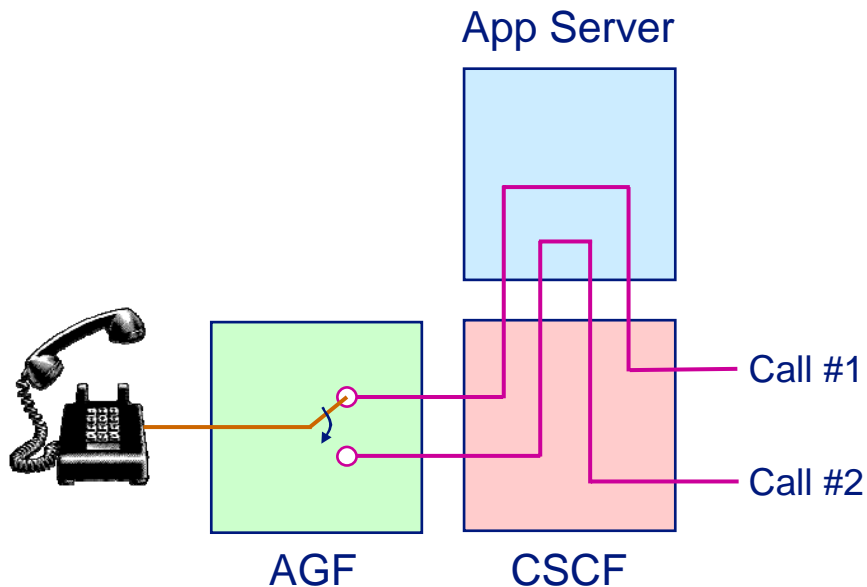
VoIP Just Works – Most of the Time

- Voice quality problems are rare, but can consume a lot of support resource
- Need to collect voice quality data
 - Packet loss, jitter, round-trip delay (RTCP)
 - Burst metrics, signal/noise metrics, MOS (RTCP XR)
 - Border elements and VoIP endpoints are critical collection points
- Summarize statistics by network link
 - Trend analysis, threshold alarm reporting
- Store statistics for every call
 - Trouble-shooting, problem verification
- Bottom line: voice quality needs managing!

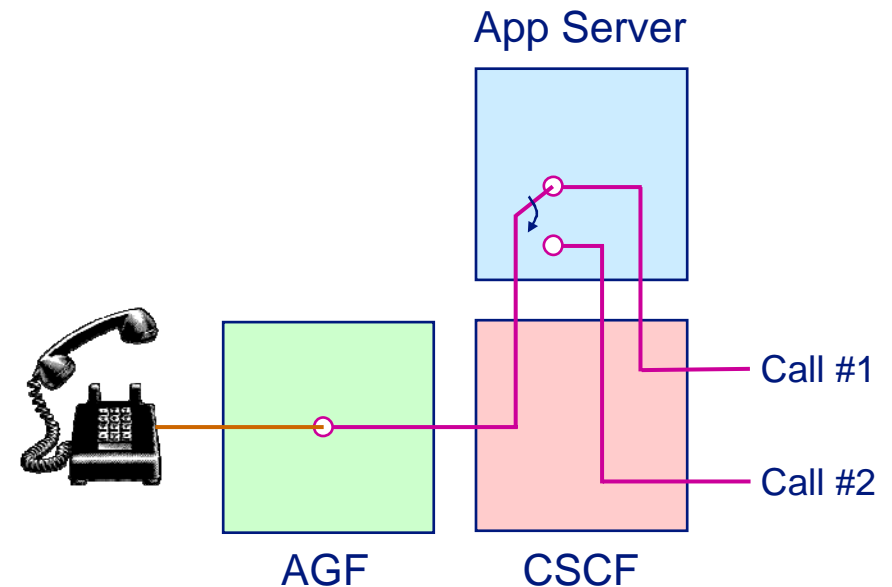
PSTN Services via SIP – Not as Easy as it Looks

- Traditional softswitch architecture addressed legacy by design
 - Maps legacy signaling (SS7 ISUP) to device control (Megaco)
- IMS means mapping everything to SIP
 - Peer-to-peer protocol that assumes intelligent endpoints
- Adaptation Gateway Function performs SIP-POTS mapping
 - Implemented in e.g. Broadband Loop Carriers
- Multi-party call services introduce some challenges:
 - Call Waiting
 - Call Transfer
 - Three-Way Calling

Multi-Party Call Services – SIP Mapping Models



- ✓ Standard SIP signaling
- ✗ AGF needs DSP to do mixing on three-way calls
- ✗ Per-subscriber provisioning needed in AGF



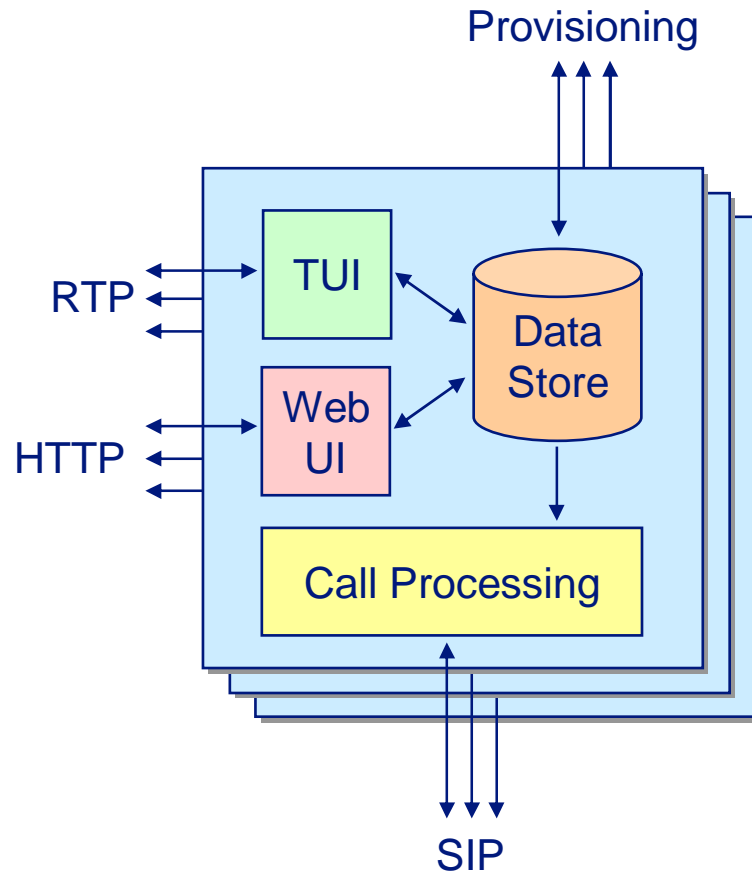
- ✓ AGF doesn't need to do mixing
- ✓ No per-subscriber provisioning needed in AGF
- ✗ Non-standard SIP signaling (hook flash, call waiting info)

Mastering Intelligent Endpoints

- Numerous configuration options
 - Configuration management is challenging
 - Need for a provisioning server to automate
- Service logic varies from one phone to another
 - E.g. Do Not Disturb hard key:
 - Vendor A phone responds to INVITE with 480 Temporarily Unavailable
 - Vendor B phone responds to INVITE with 302 Moved Temporarily and forwarding target per local config
- Each model of phone involves a learning curve for both application vendor and service provider
- Is this really better than network-based service logic?

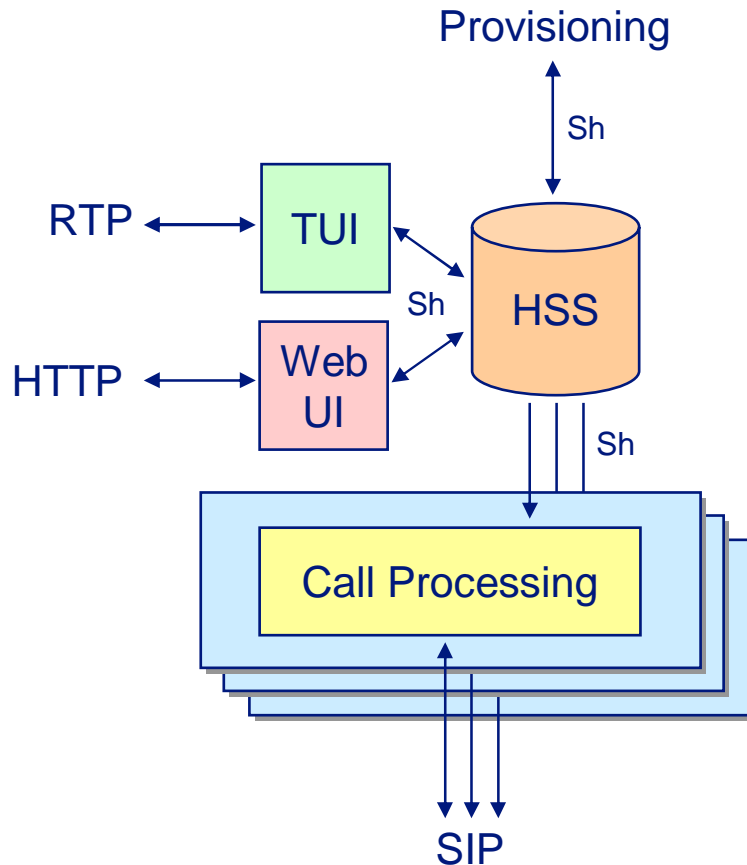


Pre-IMS Application Server Architecture



- Each app server is self-contained
- Multiple proprietary provisioning interfaces
- Multiple access numbers for telephone user interface
- Multiple Web interfaces
 - Separate login
 - Different look and feel
 - Little or no cross linkage
- No sharing of application data

App Server Architecture Enabled by IMS



- Home Subscriber Server holds all application data
- Single provisioning interface, implementing Sh standard
- Single unified telephone user interface
- Single unified Web UI
 - Single sign-on, consistent look-and-feel, fully linked navigation
- All app data is shareable
 - Presence, contact list, schedules

Lessons We've Learned

- **Managing voice quality is essential**
 - Not an issue specific to IMS, but can't be neglected
- **IMS has great value to PSTN migration**
 - But mapping PSTN services to SIP introduces challenges
- **Intelligent endpoints are a mixed blessing**
 - Potential for fully standards-based hosted business VoIP services
 - But managing configuration and service logic is not easy
- **IMS architecture for applications is a breakthrough**
 - Applications come out of their silos
 - Potential for greatly enhanced user experience
 - System integration challenge hasn't gone away, just moved