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Mobile Arts Company
Presentation

- Mobile Arts provides real-time voice/text messaging and positioning telecom products to international GSM/3G operators, e.g.
  - SMS centre
  - Voice mail system
  - GPS positioning system
- Mobile Arts has offices in Stockholm (HQ), Birmingham, Moscow, Zagreb, Beijing, Atlanta
- Mobile Arts uses Erlang/OTP as development environment
- Mobile Arts has taken part in all CS projects since 2005
- Each year, several CS students have continued the CS project by a Master Thesis at Mobile Arts
- Quite a few former CS students are now employed at Mobile Arts
Telecom
Key characteristics

▸ Large systems
  ✓ Millions of users per system, very often 30-50 million users per system

▸ Real time services
  ✓ Minimal latency, usually less than 280 ms end-to-end

▸ Resilience
  ✓ 24/7/365 service, more than 99,9995% yearly availability

▸ Standardized interworking protocols
  ✓ Enabling roaming subscribers in multi network/operator/supplier environment
  ✓ Main standarization forums: 3GPP, IETF, ITU, (OMA)
IMS Video Call Service

Basics

- IMS Video Call Service is a real-time point-to-point service
- Protocols:
  - Call control: Session Initiation Protocol, SIP
  - Media: Real Time Protocol, RTP
  - Video codec: ITU H.263 (QCIF, CIF, 4CIF) and/or MPEG-4 (part 10) (depending on the capabilities of the chosen Video Client)
- Project: Implement a Video Mail Service (ViMS) according to the new 3GPP standards for Internet Multimedia Subsystem (IMS)
- The 3GPP IMS standard has further sub-divided the Server into a number of entities:
  - Call Session Control Function, CSCF
  - Home Subscriber Server, HSS
  - Application Server, AS
  - Media Gateway, MG
  - ITU H.248 as MG control protocol
IMS Video Mail Service (ViMS)
Network Context

User

HTTP

ViMS Web Server (WS)

ViMS Application Server (AS)

Mini-HSS

Sh / Diameter

Cx: REGISTER / Diameter

SIP Call

Calling Video Client (PC)

DNS/DHCP

SIP DB

Internal

Internal

Subscriber DB

Logging DB

VA

ViMS Media Gateway (MG)

Mail Server

SMTIP

RTP Media

H.248

Clip DB

Streaming

Called Video Client (PC)
IMS Video Mail Service (ViMS)

Included IMS entities

- **ViMS Application Server (AS)**
  - Terminating SIP protocol
  - Handling codec negotiation
  - Storing Video Clip Data Base
  - Storing Subscriber Data Base (SDB)
  - Storing Log Data Base (LDB)
  - Handling ViMS supplementary services

- **ViMS Media Gateway (MG)**
  - Terminating Real Time Protocol (RTP) for media
  - Performing any trans-coding needed (different codecs)
  - Interworking with ViMS AS via:
    - ITU H.248 protocol
    - Video Clip streaming

- **ViMS Web Server (WS)**
  - User Web portal for management of subscriber data and log data

- **ViMS AS, WS and MG are implemented on a separate Linux server**
  - If needed, Mobile Arts can provide a HP Proliant DL 160 G5
IMS Video Mail Service (ViMS) Environment

- IMS capable Video Client (PC) as subscriber premises equipment
  - Camera
  - IMS video client software in PC
  - Sourced from some 3rd party supplier

- Call Session Control Function (CSCF) handles subscriber registration, message/call routing, triggering, etc
  - Mini-CSCF implementation needed (for the ViMS needs only)
  - Can be co-located with ViMS server

- Home Subscriber Server (HSS) contains generic subscriber info
  - Sh/Diameter interface is used to get notification on subscriber register
  - Mini-HSS implementation needed (for the ViMS needs only)
  - Can be co-located with ViMS server

- DNS/DHCP
  - Sourced from some 3rd party supplier (e.g. UU)
IMS Video Mail Service (ViMS)

Features

- Basic SIP call handing
- Basic SIP and Cx registration
- Basic Sh notification of subscriber registration
- Basic SIP Instant Messaging (IM) for subscriber notification
- Basic RTP handling for Video with codec support according to chosen Video client (PC)
- IM related supplementary services (underlined = mandatory)
  - Centralized Video Mail Clip store while absent receiver
  - Receiver defined ViMS preferences in Subscriber Data Base (SDB)
  - Receiver defined Notify IM for missed/received Video Call/Mail
  - Receiver retrieval of missed/received Video Call/Mail info from Logging Data Base (LDB)
  - Receiver defined Delivery Receipt (DR) to sender at Notify IM delivery/discard
  - Receiver defined Delivery Receipt (DR) to sender at Video Mail retrieval/discard
  - Receiver defined Email Copy (EC) of received Voice Mail
  - Receiver defined Forwarding (FWD) of received Video Mails to another receiver
  - Others ... up for grabs!

- User Web Server (WS) management of:
  - ViMS preferences in SDB
  - Missed Video Call logs in LDB
  - Received Video Mail logs in LDB
IMS Video Mail Service (ViMS)
Separating originating and terminating calls
IMS Video Mail Service (ViMS)

IMS Document References

- **3GPP** ([www.3gpp.org](http://www.3gpp.org))
  - 3GPP TS 22.228, Service requirements for the Internet Protocol (IP) multimedia core network subsystem (IMS); Stage 1 (Release 7)
  - 3GPP TS 22.340, IP Multimedia Subsystem (IMS) messaging; Stage 1 (Release 7)
  - 3GPP TS 23.228, IP Multimedia Subsystem (IMS); Stage 2 (Release 7)
  - 3GPP TS 24.228, Signalling Flows for the IP Multimedia Call Control based on SIP and SDP; Stage 3 (Release 7)
  - 3GPP TS 24.229, IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (Release 7)
  - 3GPP TS 24.247, Messaging using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3 (Release 7)
  - 3GPP TS 26.114, Media Handling and Interaction (Release 7)
  - 3GPP TS 29.228, IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling Flows and Message Contents (Release 7)
  - 3GPP TS 29.329, DNS procedures, Stage 3 (Release 7)
  - 3GPP TS 29.328, IP Multimedia Subsystem (IMS) Sh interface; Signalling flows and message contents (Release 7)
  - 3GPP TS 29.329, Sh interface based on the Diameter protocol; Protocol details (Release 7)

- **IETF** ([www.ietf.org](http://www.ietf.org))
  - RFC 2916, E.164 number and DNS
  - RFC 3261, SIP: Session Initiation Protocol
  - RFC 3428, Session Initiation Protocol (SIP) Extension for Instant Messaging
  - RFC 3550, RTP
  - RFC 3761, E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application (ENUM)
  - RFC 4629, RTP Payload Format for ITU-T Rec. H.263 Video
  - RFC 3016, RTP Payload Format for MPEG-4 Audio/Visual Streams