CS Project 2011
GSM Call Service

September 2011

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Mobile Arts Company
Presentation

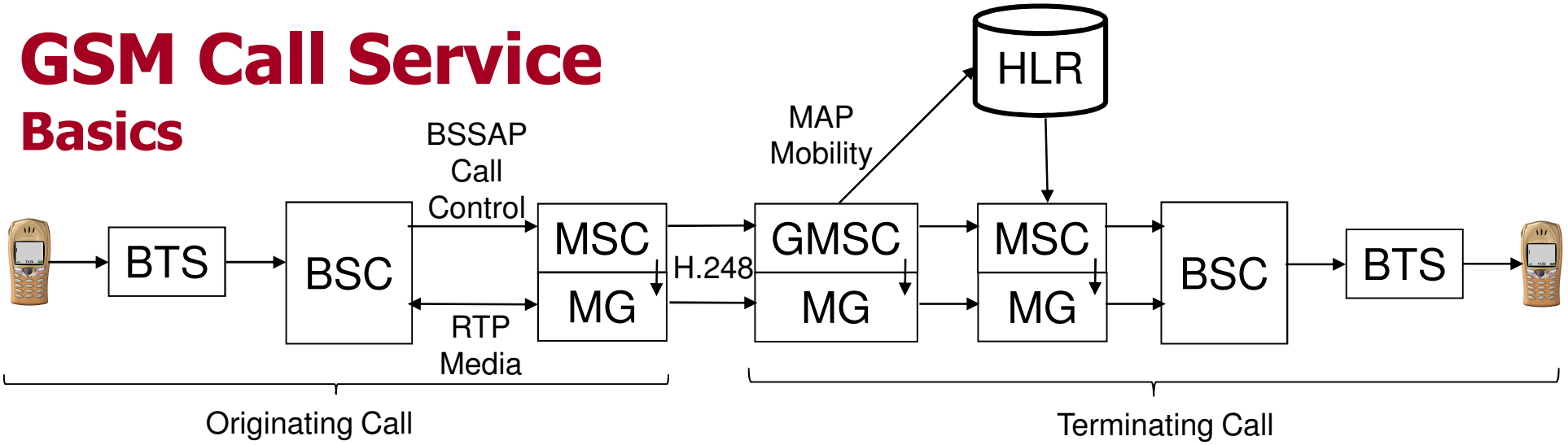
- Mobile Arts provides real-time voice, text messaging and positioning telecom products to international GSM/3G/4G operators, e.g.
  - ✓ SMS centre
  - ✓ Voice mail system
  - ✓ GPS positioning system
- Mobile Arts has offices in Stockholm (HQ), Birmingham, Moscow, Zagreb, Bejing
- Mobile Arts uses Erlang/OTP 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

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 standardization forums: 3GPP, IETF, ITU, OMA

GSM Call Service
Basics



- Protocols:
  - ✓ Mobility: Mobile Application Part, MAP
  - ✓ Call control: Base Station System Application Part, BSSAP
  - ✓ Media: Real Time Protocol, RTP
  - ✓ Codec: Any (Transparent)
  - ✓ MG control protocol: ITU H.248
- Project: Implement a GSM Call Service according to existing 3GPP standards
- Baseline:
  - ✓ Base Transciever Station, BTS: existing
  - ✓ Base Station Controller, BSC: from Open-BSC project (& Mobile Arts thesis projects)
  - ✓ (Gateway) Mobile Service Switching Centre , (G)MSC: from CS-10 project (GSM SMS)
  - ✓ Home Location Register, HLR: from Mobile Arts HLR
  - ✓ Media Gateway, MG: from CS-09 (IMS Video Mail Service)

Mobile Arts

GSM Call Service
Project characteristics

- Large System Architecture
  - ✓ A wide-spread call service implementation requires proper architecture
- Baseline reuse
  - ✓ Baseline implementation is reused and updated as needed
- Distributed project structure
  - ✓ Responsibilities are distributed upon several co-ordinated teams
- Understanding of telecom standards
  - ✓ Telecom standards are to be implemented

GSM Call Service
Document References

- 3GPP, Release 7: http://www.3gpp.org
  - ✓ TS 23.002, Network Architecture
  - ✓ TS 23.003, Numbering
  - ✓ TS 23.018, Basic Call Handling
  - ✓ TS 24.008, Radio Layer 2, Stage 3
  - ✓ TS 29.002, MAP
  - ✓ TS 43.051, GERAN Stage 2 Description
  - ✓ TS 48.008, MSC-BSS Layer 3
- ITU: http://www.itu.int/ITU-T
  - ✓ Q.763-764, ISUP
- IETF: http://www.ietf.org
  - ✓ RFC 3550, RTP