

A SIP Perspective on 3GPP

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Overview

- SIP Reminder
- SIP Today and Tomorrow
- Service Creation with SIP
- SIP and 3GPP
- ipDialog's Support for Flexible Endpoints
- Conclusion

Session Initiation Protocol (SIP)

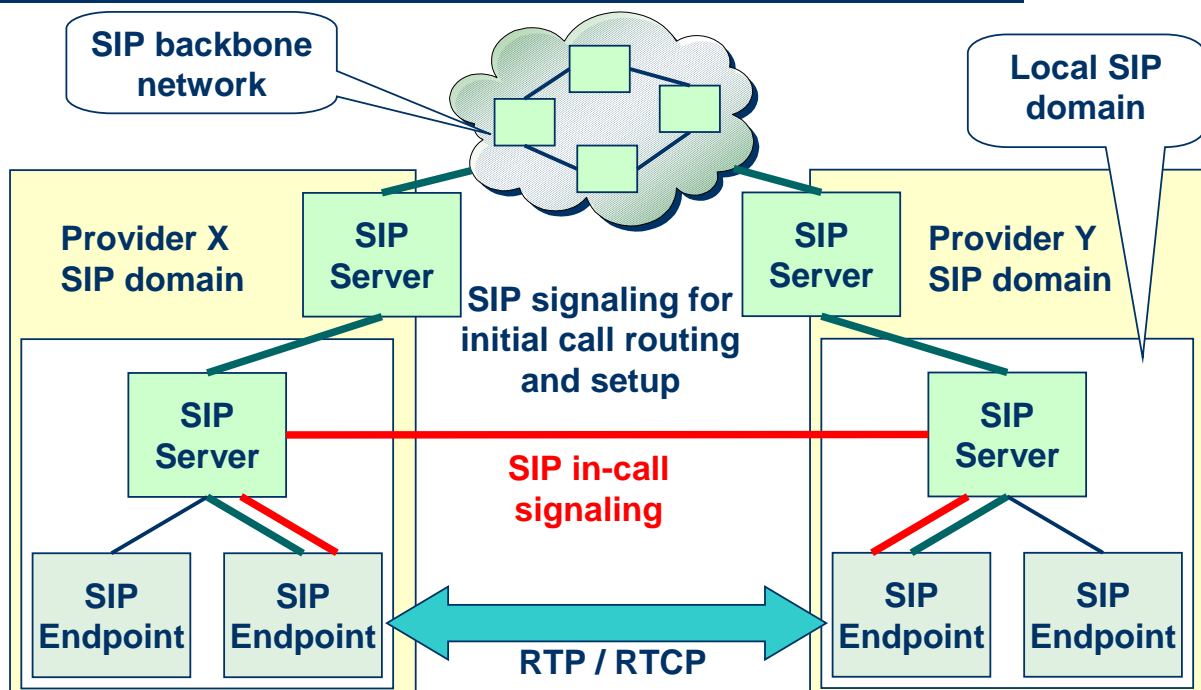
- Initiate, terminate, and modify sessions
 - Multimedia(!) sessions (*not voice-centric!*)
 - Point-to-point and multiparty
- Support for
 - caller and callee authentication / call authorization
 - privacy for call signaling and media streams
 - media path with ensured QoS
 - policy-based control mechanisms
- Hooks for service creation
 - end-to-end principle (“dumb network”)

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Sample SIP System Architecture

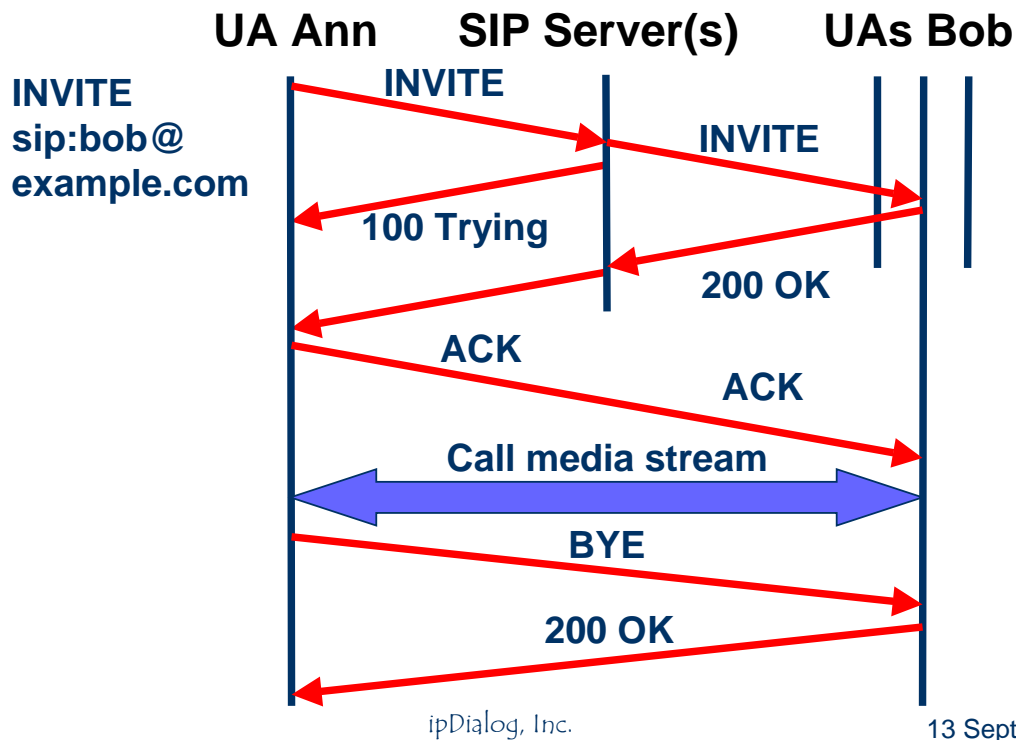


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A Simple SIP Call

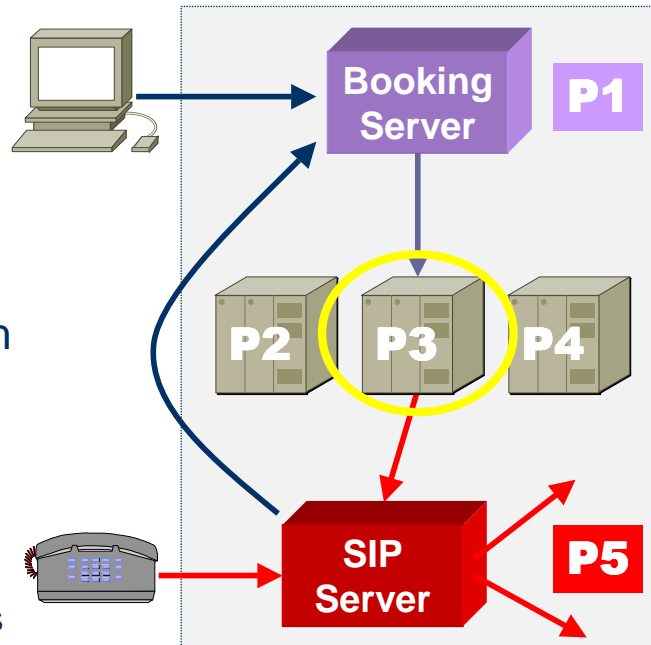


Service Creation with SIP

- Points of Service in SIP
 - Endpoints!
 - SIP Servers (proxies, redirect, location servers, ...)
 - SIP Application Servers
 - Back-to-Back User Agents
- May be located anywhere
 - in the “network”, controlled by the service provider
 - “outside the network”, controlled by third party providers
 - at the “user premises”, controlled by the user
 - and any combination of the above!
- May be combined in a flexible manner

Service Example: Conferencing

- Provider 1 offers highly available conference booking services
 - contracts with 2 – 5
- Providers 2 – 4 offer conference bridges with different capabilities
- Provider 5 offers IP Telephony Services
 - gets value add from P1
 - but also contracts others



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SIP Family Tree: Working Group(s)

- MMUSIC
 - Developed SIP from Feb 1996 to Feb 1999
 - Still takes care of SDP and SDPng
- SIP
 - Initiated in Oslo (Sep 1999) for “load balancing”
 - Look after the base spec + core protocol extensions
- SIPPING
 - Initiated in Minneapolis (Mar 2001) – same reason
 - First meeting at London IETF in Aug 2001
 - Work on applications of SIP: **incl. 3GPP**

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SIP Today

RFC 1889: Real-time Transport Protocol (RTP)

RFC 1890: RTP Profile for Conferencing

RFC 2198: Redundancy for RTP

RFC 2327: Session Description Protocol (SDP)

RFC 2543: Session Initiation Protocol (+ bis-03)

RFC 2824: Call Processing Language Framework (CPL)

RFC 2833: Tones over RTP (“DTMF”)

RFC 2976: The SIP INFO Method

RFC 3050: SIP CGI

RFC 3087: SIP Request-URIs for Service Control

RFC 3108: ATM for SDP

SIP to come (incomplete)

- Reliable Provisional Responses (PRACK)
- Establish preconditions (COMET)
- Events (SUBSCRIBE, NOTIFY)
- SIP (and RTP/RTCP) Extensions for NATs and Firewalls
- Call Control and Conferencing
- Privacy & Security
- SIP MIB
- Interworking: SIP-T, H.323
- Autoconfiguration
- SIP Server Features
- Caller preferences, Call Processing Language
- Also: SIP for Presence and Instant Messaging

SIP and 3GPP

- 3G networks offer two modes of operation:
 - circuits and packets
- Multimedia functionality based on packets
 - IP Multimedia (IM) in the Core Network (CN)
 - (exception: H.324 used for video telephony)
- IM uses SIP for signaling
 - one piece out of a number of IETF protocols
- In the long run, all services shall converge to IP

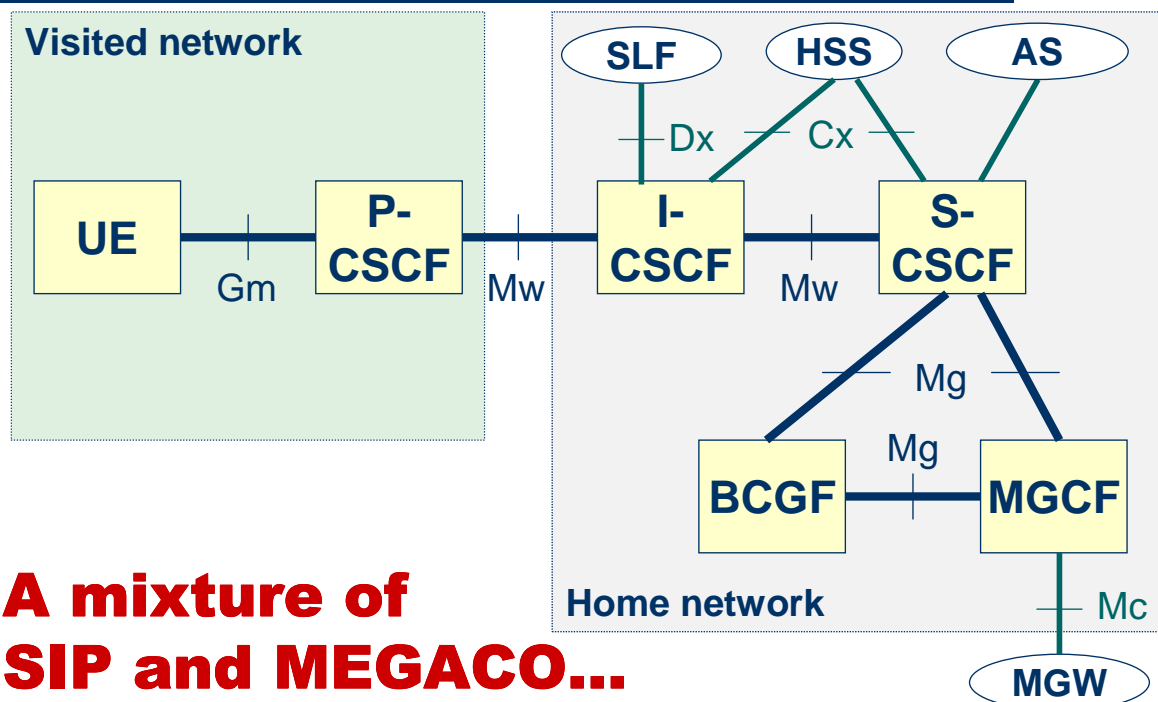
But what does this mean?

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SIP-related Components in 3GPP



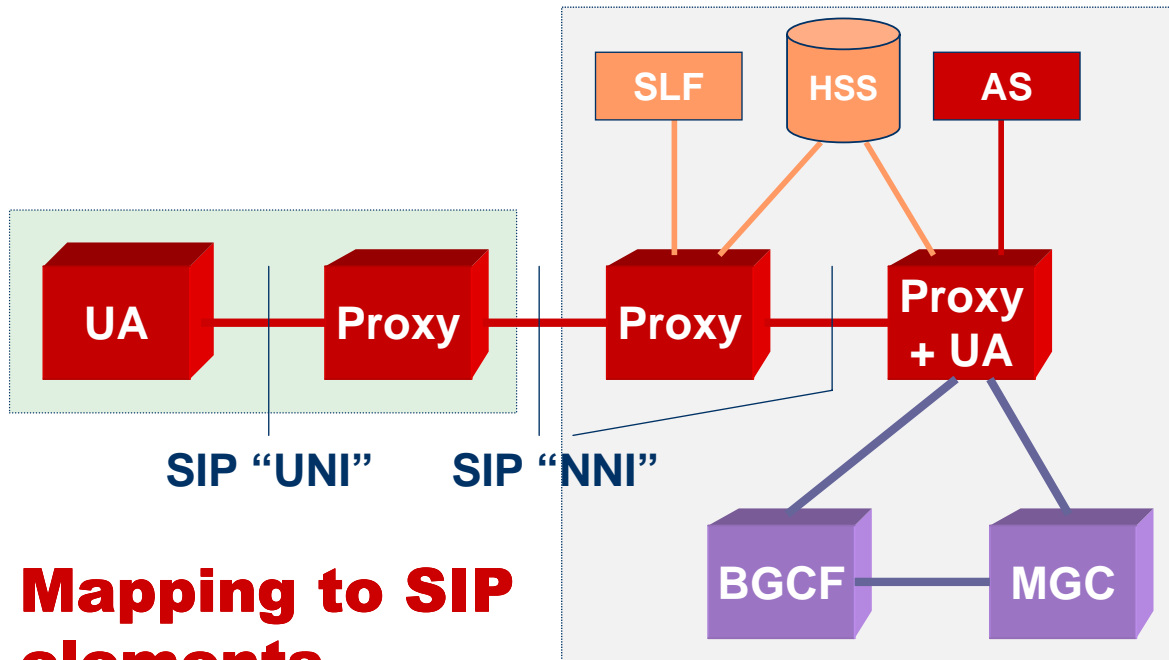
**A mixture of
SIP and MEGACO...**

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SIP Components in 3GPP



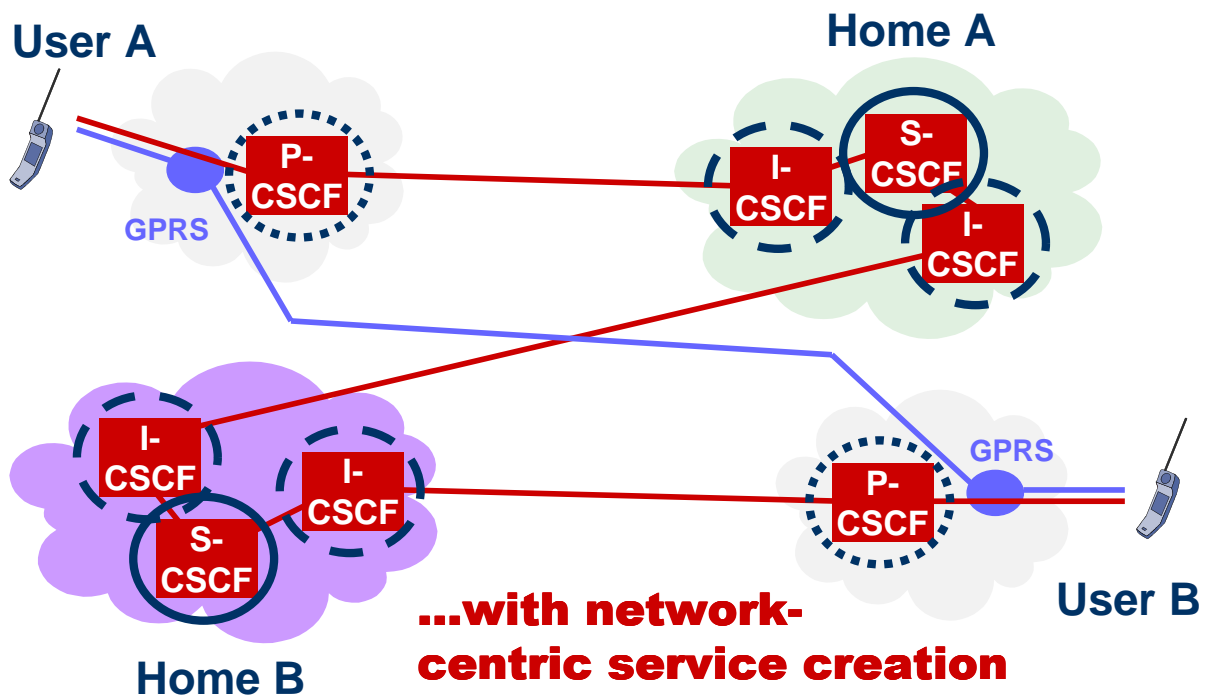
Mapping to SIP elements...

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3G Control and Media Flows



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Service creation in 3GPP

- Protocol building blocks in the network
 - services to be created on top of those
- “APIs” for service providers
 - OSA, CAMEL, ...
- SIP for interfacing to Application Servers
- Numerous standardized services / functions
- Service creation in the network
 - potential for limited outside access

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3GPP Summary

3G is built the *old* way – the telephony way...

- Breaks the IP end-to-end model
- Encourages net-centric service creation
 - built-in limitation of innovation
- Closed architectural model
 - built-in gateways
- Many boxes, many lines, many interfaces
 - quite some complexity to be managed

Success or “yet another ATM”...?

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3GPP - SIP - Dependencies

- Next revision of SIP spec
- Extensions to core spec
 - Reliable provisional responses, state cookies, ...
- Session Timer
- Security and privacy extensions, AAA
- Resource (QoS) management
- Supplementary services
- SIP Events
- Interworking: SIP-T and H.323

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How to deal with these...?

- SIP is defined exclusively in the IETF
- No changes/extensions through 3GPP
 - ensure to have only a single flavor of SIP
- Feed **requirements** into IETF SIPPING WG
 - may include suggested solutions
- SIPPING will react and define solutions
 - awareness of tight 3GPP schedule
- Possibly hand-over work to SIP WG
 - if changes/extensions to the core spec needed

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Enabling SIP Endpoints...

- 3GPP endpoints speak SIP
- Requirement for endpoints:
Light-weight, extensible Protocol Stacks

ipDialog offers:

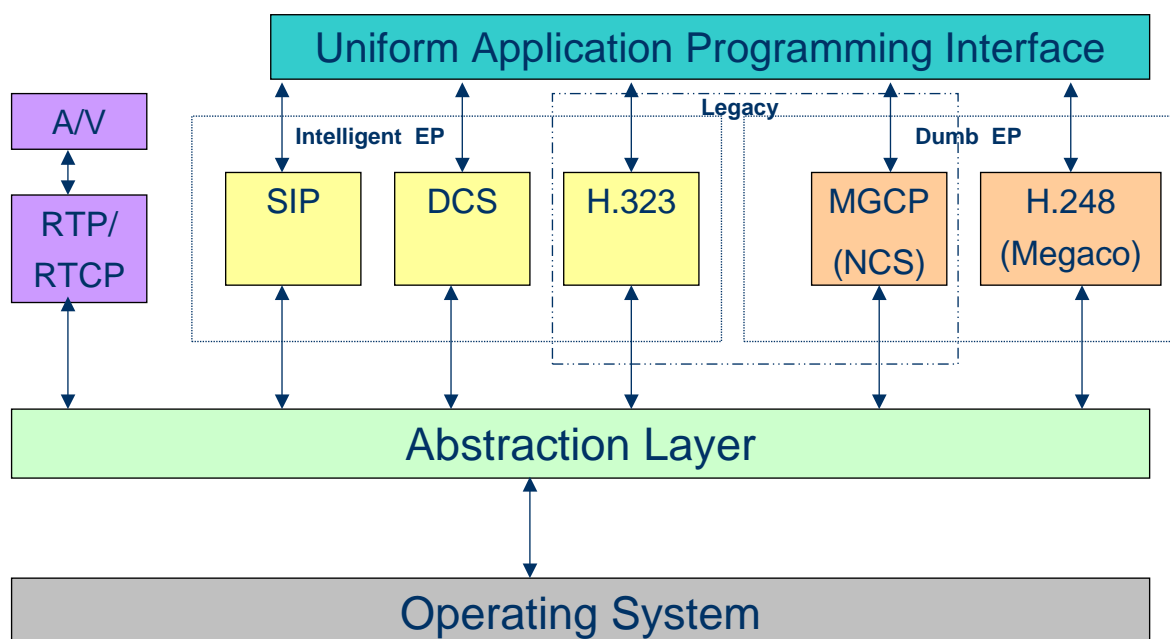
- SIP and MEGACO stacks suitable for 3G
 - flexible, extensible, proven interoperability
- Reference design for endpoints
- Support for Multi-Protocol Environments

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ipDialog Firmware Architecture



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ipDialog Multiprotocol Endpoint



- Hardware reference design
- SIP *and* MEGACO
- Supports autoconfiguration
- Basic phone functions
- SIP URLs and E.164 numbers
- Business feature set in progress
 - simple software updates
- Customization
 - different cases, displays, keypads
 - more sophisticated functionality
- Can “turn” into a 3G endpoint as well!

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Conclusion

SIP standardization progressing rapidly

- An enabling platform for a ubiquitous open environment

But: future-proof specifications take their time

- Possible gains through outside pressure limited
- Isolated outside development is **not an option!**

SIP is the perfect infrastructure for 3G networks

- However, choosing SIP is necessary but not sufficient.
- It also needs to be applied appropriately
- Continued joint efforts between IETF and 3GPP...

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Further Information

<http://www.ietf.org/html.charters/sip-charter.html>

<http://www.greycouncil.com/sipwg>

<http://www.greycouncil.com/sippingwg>

<http://www.cs.columbia.edu/~hgs/sip>

<http://www.cs.columbia.edu/~hgs/sip/sipit>

ftp://ftp.3gpp.org/Specs/Latest_drafts/

<ftp://ftp.3gpp.org/Specs/2001-06/Rel-5>

<http://www.ipdialog.com/>