ERICSSON

Voice over IPv6 -
an IP Telephony Prototype

The work described here is a contribution to the 6INIT project under the European 5th framework program IST

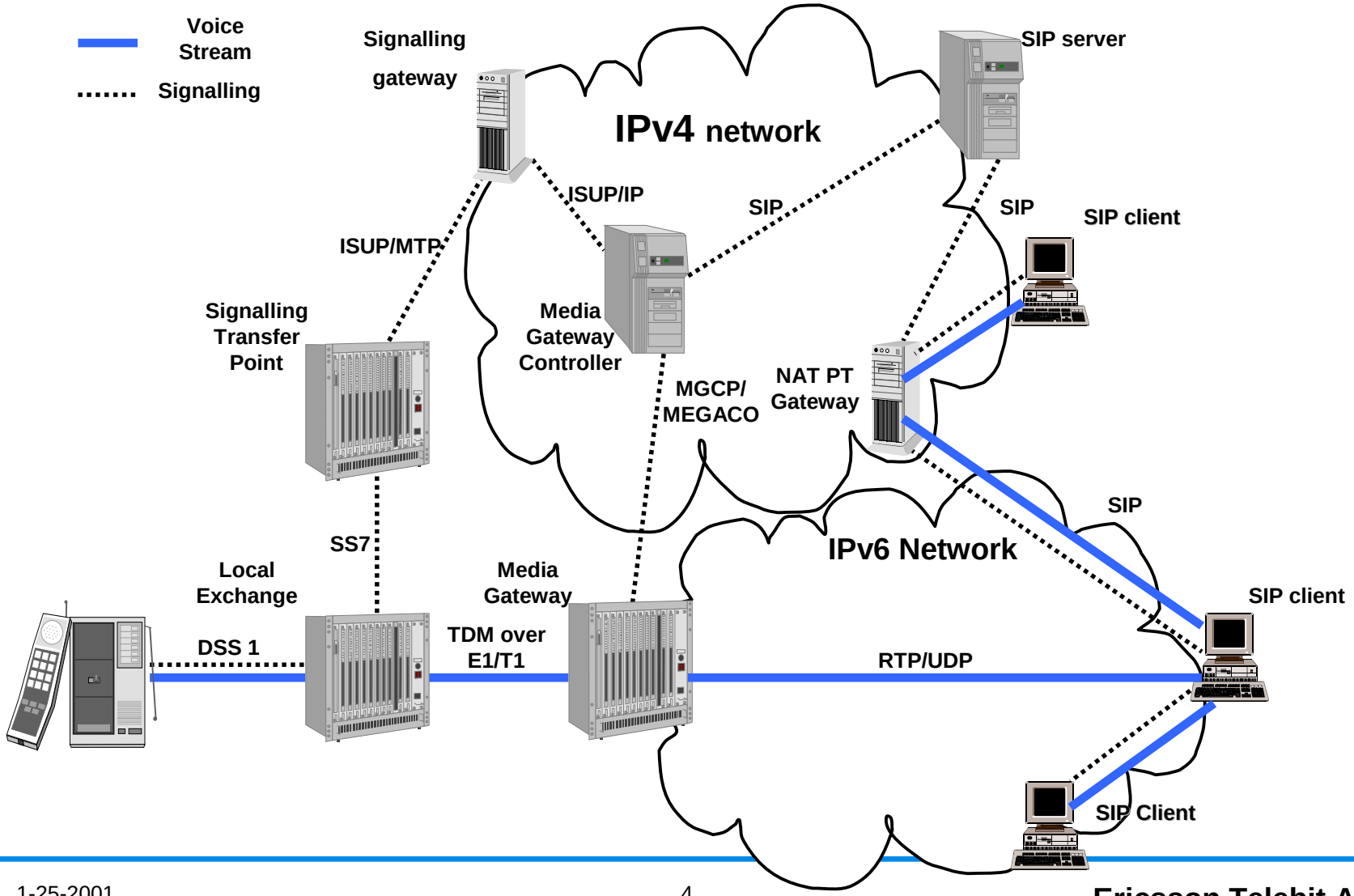
Project Background

- IP Telephony is interesting because:
  - Network Integration
    - IP Networks provide separation between a generic network and it's specific application. Voice, Fax, Video all have the same network format - the endpoint contain the functionality.
    - New services can be added without changing the network.
  - Potential "killer application" for IPv6
    - The enormous number of IP addresses required to connect billions of terminals **demands** IPv6.

VoIP Architecture

- IETF Distributed Gateway Approach
  - **Signalling gateway**: Termination point for switched circuit network signalling
  - **Media gateway controller**: Call control intelligence (Call Agent); signalling adaptation; interface to LS, AAA services, policy management, etc.
  - **Media gateway**: Media adaptation at the boundary of a PSTN and IP network; transcoding, echo cancellation, silence suppression, RTP “proxy” function, compression, etc.

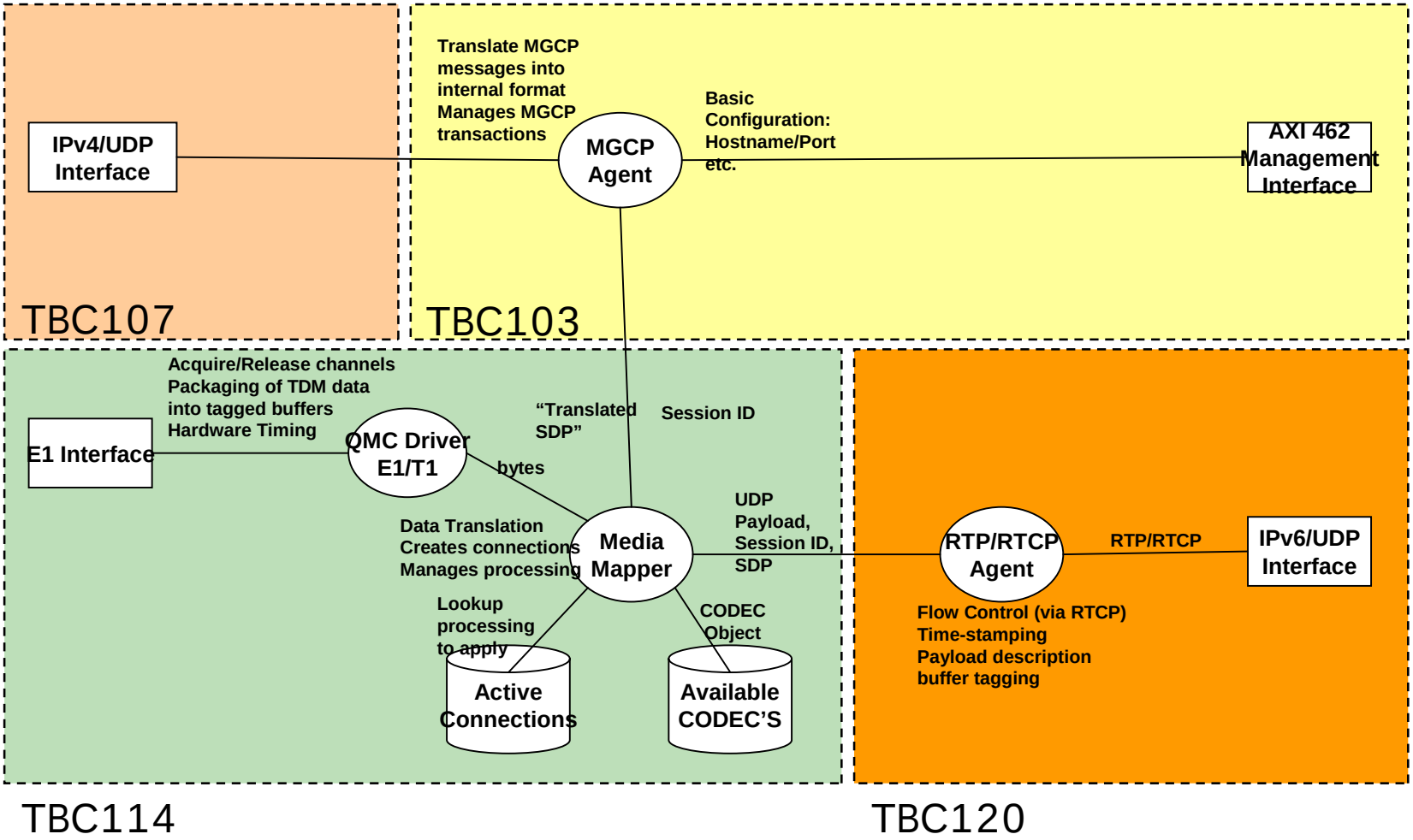
VoIP Architecture



Why a Distributed Architecture

- Lack of success with proprietary systems, mainly due to the size and complexity of the task.
- The distributed architecture allows the ”IP Telephony” problem to be broken down into well-defined problem areas of, f.ex. ”Switching”, ”Routing”, ”Media Processing” etc.each of which may be solved independently.
- More sub-system vendors may enter the market, making access to IP technology easier, safer and cheaper for implementers
- Scalability - it is often easier to add more “boxes” than trying to improve performance of a single unit.

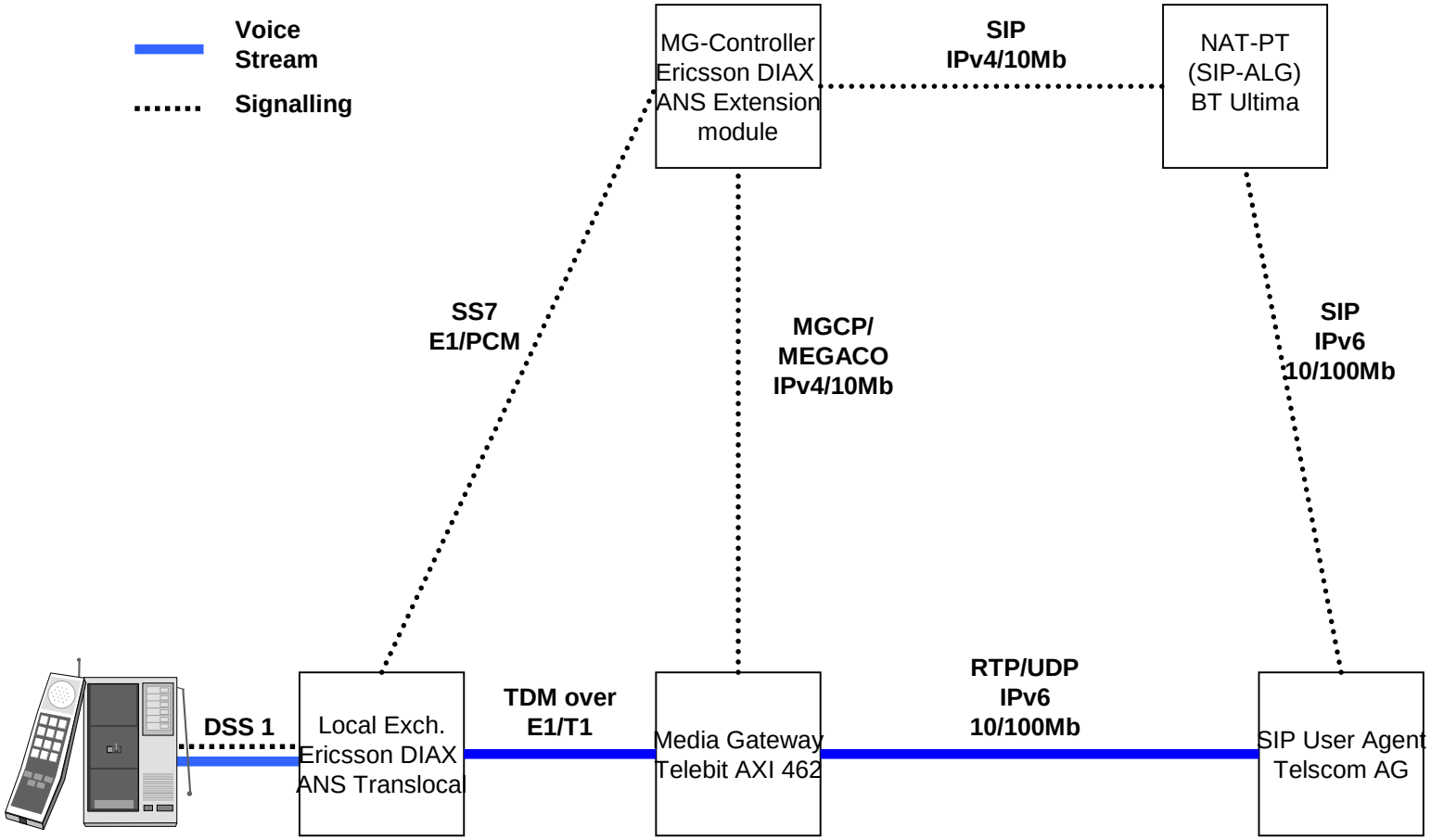
MG - Software Architecture



Architecture implementation

- **Challenges**
  - The application must be able to evolve with the Internet environment. At the moment MEGACO is replacing MGCP, while SIP may become dominant.
  - The encoding(s) used for VoIP conversations are very dynamic - new protocols must be capable of being “slotted in” to the MG without redesign.
  - The encoding used for VoIP may even change during a session - for example when handling a fax call.
  - Additional capabilities such as encryption, media stream mixing, multimedia conferencing will need to be added.
  - Resources must be balanced between f.ex. CPU power and Network Bandwidth.
- **A loosely-coupled, Data-Driven, Distributed software architecture is believed to be the answer to these problems - for now.**

6INIT Trial Configuration



Goals of 6INIT trials

- Demonstrate call signalling across network boundaries
  - Handle voice call from PSTN network
  - Handle voice call from SIP client
  - Handle common failures (destination Busy, caller hung up etc.)
- Demonstrate VoIP processing
  - Correct processing of at least G.711 and GSM payload formats
  - Successfully modify an active connection
  - Handle at least two simultaneous calls

6INIT Success scenarios

- Transfer of Knowledge to Ericsson Telebit AS
  - Implement a Media Gateway of sufficient quality to be used as a ”technology demonstrator” on the Ericsson AXI 820 Router hardware platform.
  - Use the Media Gateway as part of an experimental network to gain experience with how IP media streams use the network.
- Build relationships with other players in the emerging IPv6 Networking market.

References

- IPv6 Information:
  - 6INIT project home page: http://www.6init.org/
  - IETF home page: http://www.ietf.org/
  - IPv6.org's homepage: http://www.ipv6.org/
- IP Media information:
  - University of Southampton: http://www.ipv6.ecs.soton.ac.uk/
  - Robust Audio Tool home page: http://www-mice.cs.ucl.ac.uk/multimedia/software/rat/
  - Ogg/Vorbis project home page: http://www.vorbis.com/
- IPv6 Equipment:
  - Ericsson Telebit A/S: http://www.ericssontelebit.com/
  - Ericsson DIAX ANS product family: http://www.ericsson-diax.dk/ans
  - BT Ultima IPv6 Access home page: http://ultima.ipv6.bt.com/