



Group communications and APEX

midterm presentation

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Overview



- Introduction
- Task Specification
- Work Schedule
- What is APEX? How does it work?
- APEX and group communications
- Progress report



Task Specification

- explore the APEX standard
- map its capabilities for group communications:
 - ◆ unicast
 - ◆ broadcast
 - ◆ reliable broadcast
- create a tutorial for simple integration in applications for the laboratory



Work schedule

- explore the APEX and BEEP specifications
- find existing implementations
- compare these implementations to find out which implements the standard at best
- test the APEX implementation in context with group communications
- design an application using and illustrating the APEX implementation and its properties
- write a tutorial for simple integration in applications



What is BEEP? – Historical

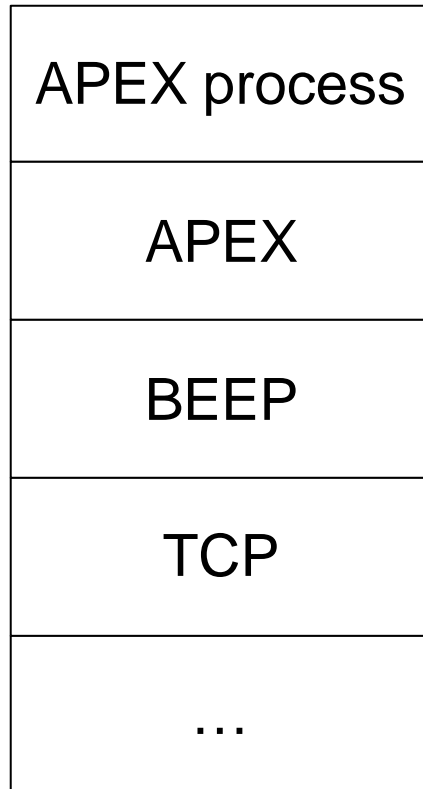
During the last twenty years:

- many protocols solved the same problems:
 - ◆ encryption negotiation
 - ◆ data transfer
 - ◆ error reports
- increasing complexity of networks:
 - ◆ firewalls
 - ◆ network address translation (NAT)
 - ◆ dynamic IP address assignment

rare reuse of protocols in applications!



BEEP / APEX Architecture

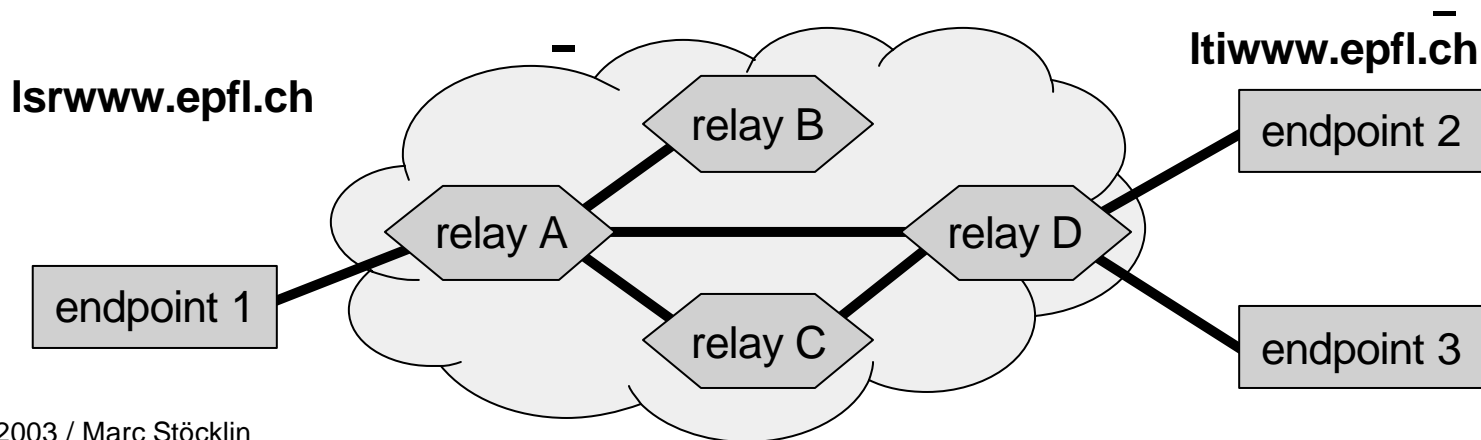


Block Extensible Exchange Protocol Application Exchange Protocol

- APEX process: an application which uses APEX
- APEX lies on top of BEEP (as a BEEP profile) which is responsible for i.e.
 - connection establishment
 - transport
 - authentication

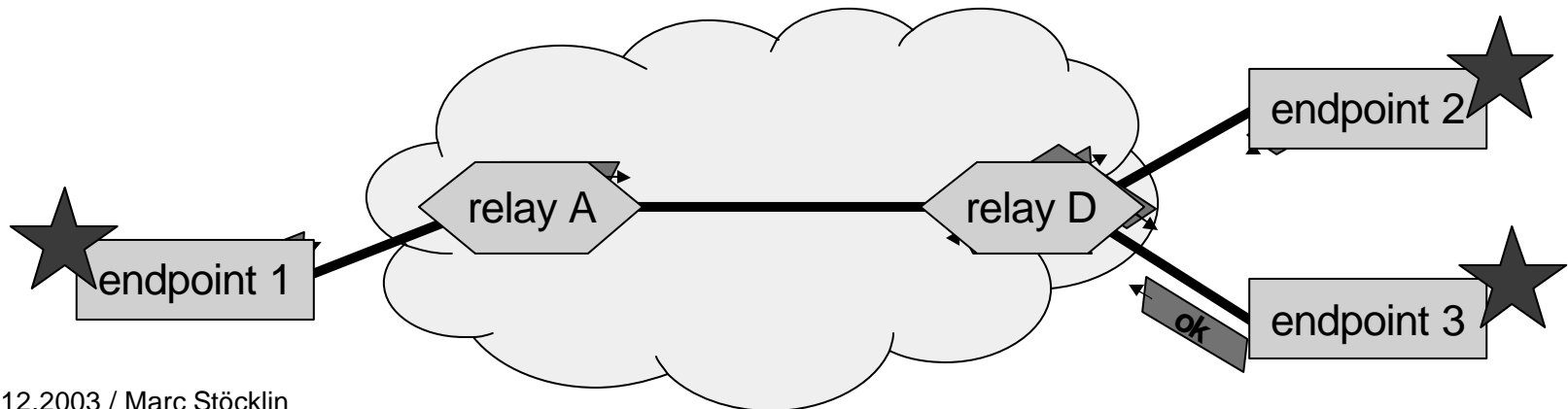
APEX Mesh Architecture

- **endpoint:** process / application which initiates new messages and receives messages from other endpoints
- **relay:** process which accepts messages and relays them to appropriate processes
- **administrative domain:** unique defined domain in which are placed endpoints and domains



An APEX Operation

- an operation is invoked by an application
- the endpoint sends an operation to a relay it is attached at
- the relay sends the operation to an appropriate relay or an attached endpoint
- the endpoint passes the operation the its application



Finding existing implementations

- incomplete and non-standard implementation in Java:
Michael J. Riggio / Temple University NetLab (USA)

IMPP Implementation with APEX

- limited implementation in object oriented C
Jon Hollström, Per Nordlinder / Umeå University (S)

APEX Implementation for the RoadRunner Toolkit

APEX Workgroup Newsgroup

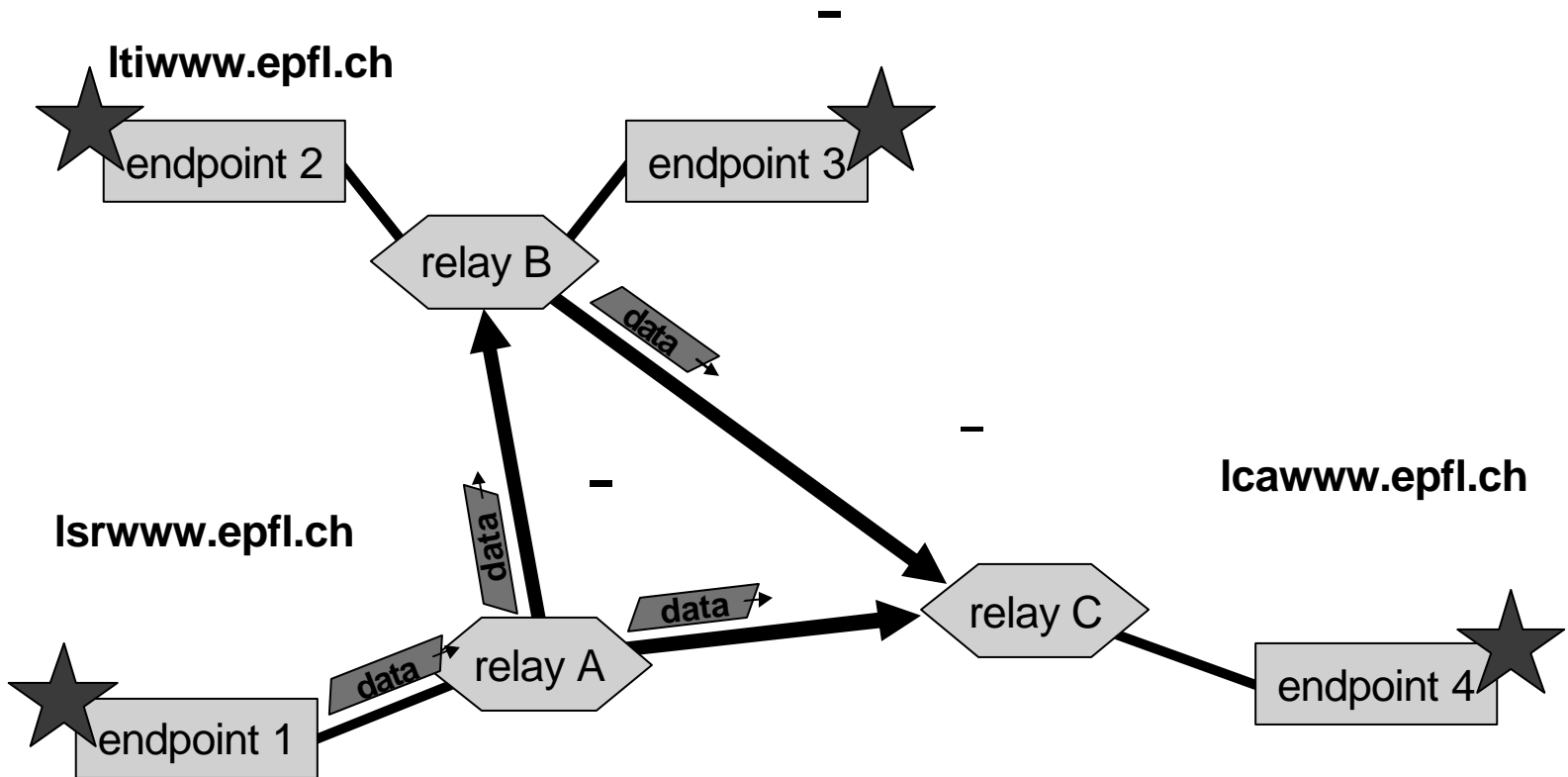


- **Is there actually real activity going on with APEX?**
- **Marshall T. Rose, co-author of APEX:**
... about a year ago it became clear to me that the only "killer app" on the horizon for apex was going to be instant messaging, and that field is regrettably too cluttered to support another entry ... if apex had come out 3 years earlier, ... , then i'd certainly be busy working on a couple of apex implementations.

Source: <http://news.gmane.org/gmane.ietf.apex>

design a basic APEX implementation in Java
integrate a 'group communications' service

Reliable Broadcast in APEX





Work schedule – Progress

- explore APEX and BEEP specifications
- find existing implementations and analyze them
- design a basic APEX implementation
 - ◆ work out basic structure (interfaces, hierarchy)
 - ◆ explore and send simple messages over BEEP
 - ◆ connection, session, channel management
 - ◆ APEX Core Service implementation
 - ◆ BEEP+XML and MIME parsing
 - ◆ exception management
 - ◆ design status lookups and message tables
 - ◆ define group / implement communication service
- design an application using the implementation
- write a tutorial for a simple integration in applications

Questions

