

RSVP als generelles Signalisierungsprotokoll

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generelles
Signalisierungs-
protokoll

Outline

QoS in the Internet

RSVP

Performance

Generalized RSVP

Application
Scenarios

Market Managed
Multi-service
Internet (M3I)

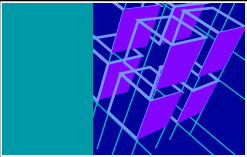
Summary &
Conclusions

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Outline

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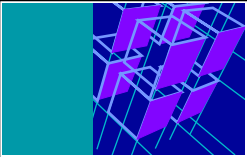
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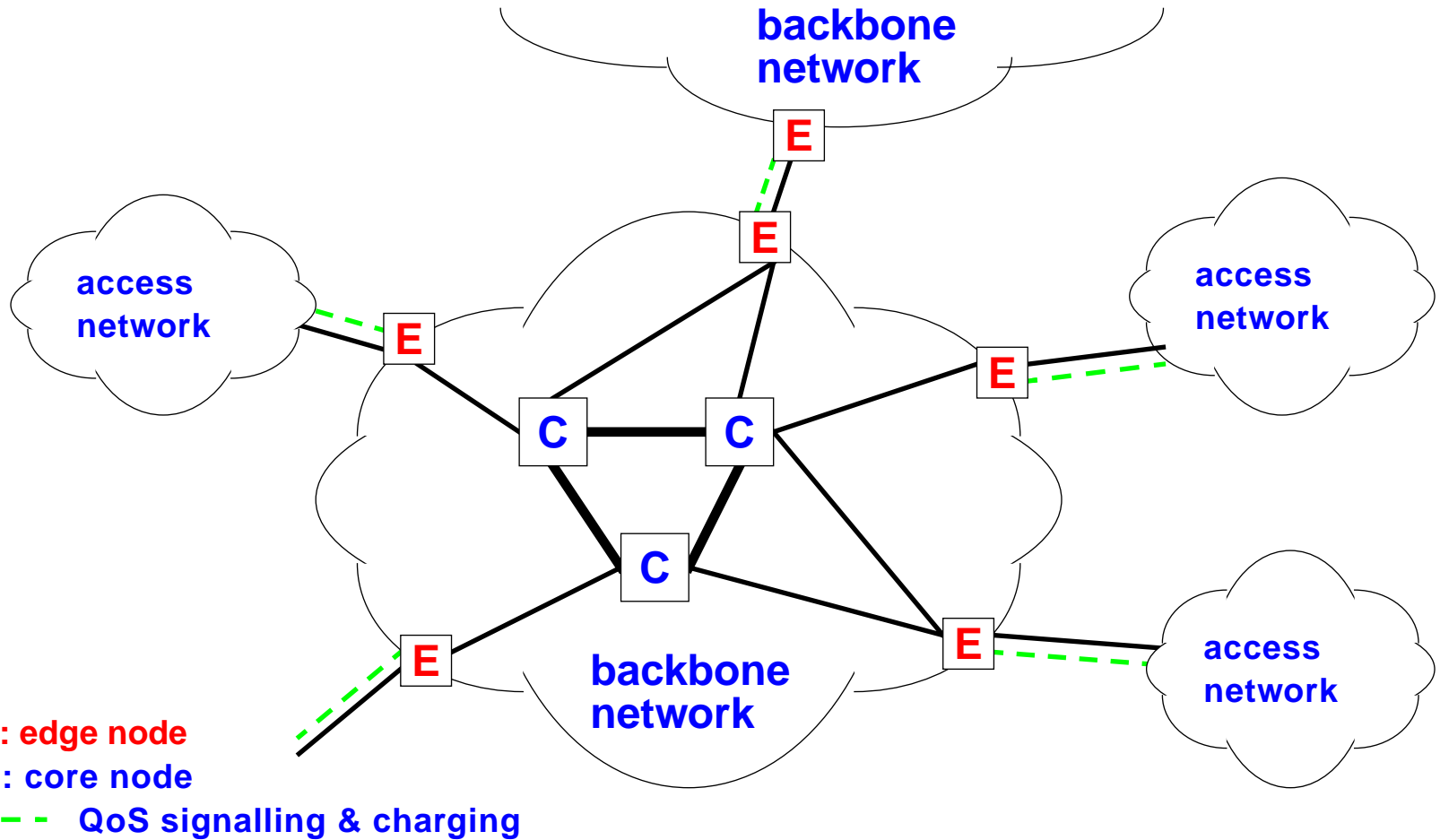
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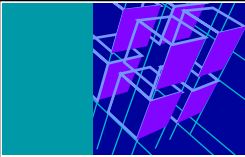
Admission Control at Edge Nodes

Performance of Edge Nodes?

Flexibility of QoS Signalling?

Outline





RSVP

IntServ's signalling protocol **ONLY?**

Features

- **high flexibility (heterogeneity, multicast)**
- **robustness**
- **decoupled from services**
- **decoupled from routing**

...result in a certain complexity.

⇒ **RSVP as General Signalling Protocol**

- **bandwidth broker signalling**
- **per-flow signalling**
- **security signalling**
- **etc.**

⇒ **Extensions needed**

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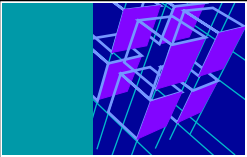
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Performance

Performance Comparison: ISI, basic KOM, tuned KOM

- 450 Mhz Pentium III
- standard PC hardware, FreeBSD 3.4
- cost: ~600 Euros + ~50 Euros per NIC

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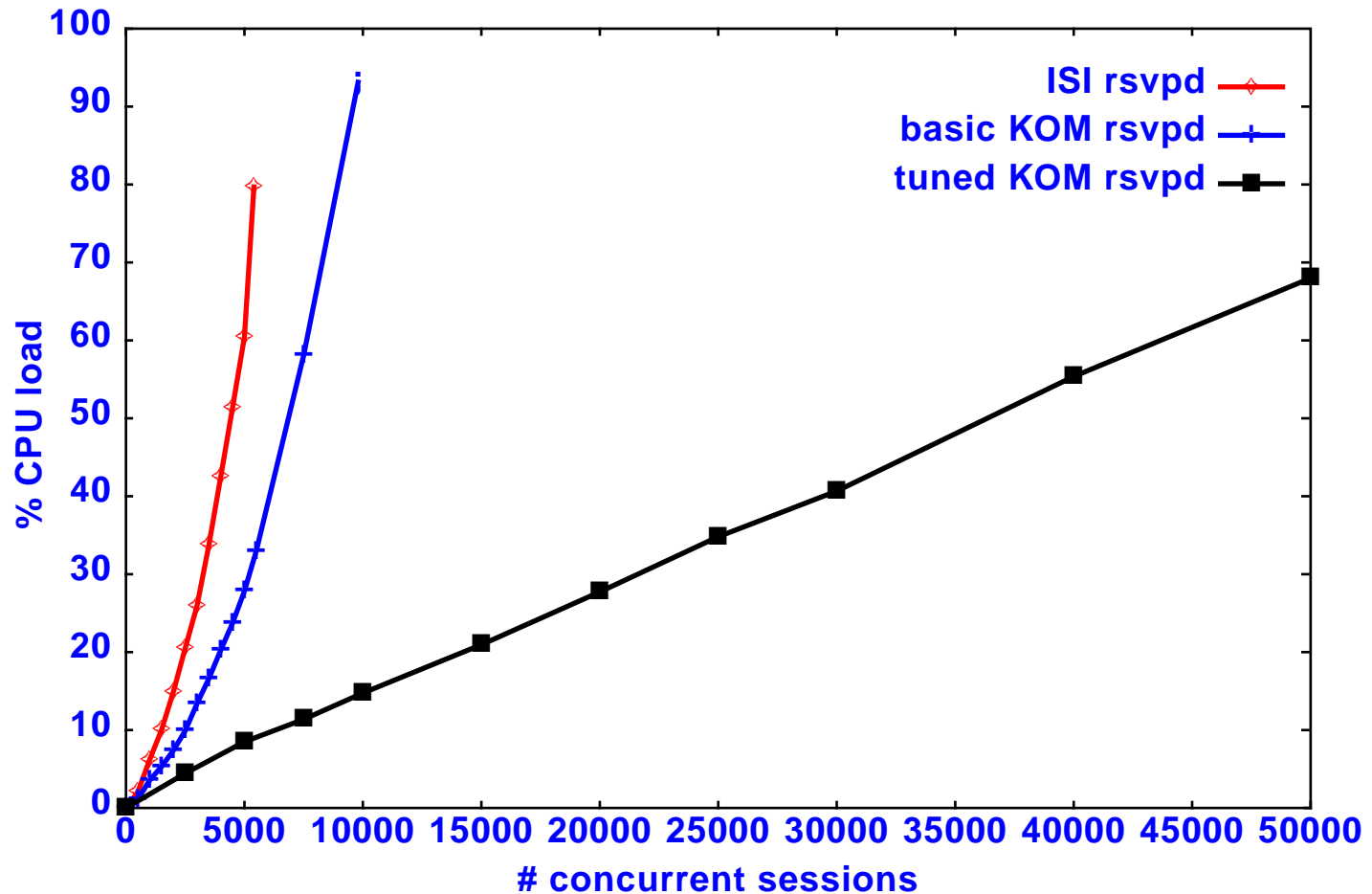
Generalized RSVP

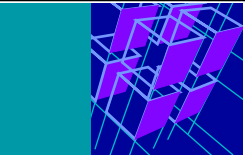
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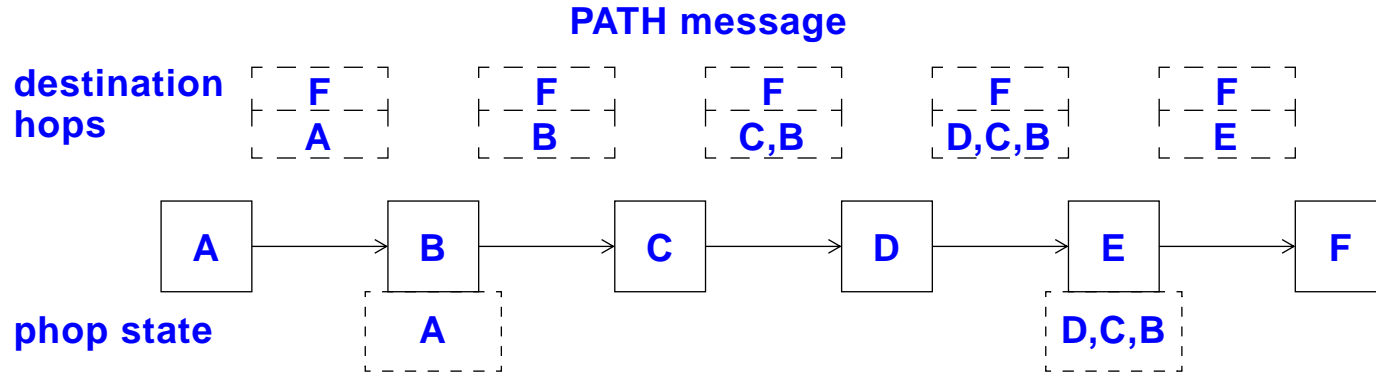




Generalized RSVP

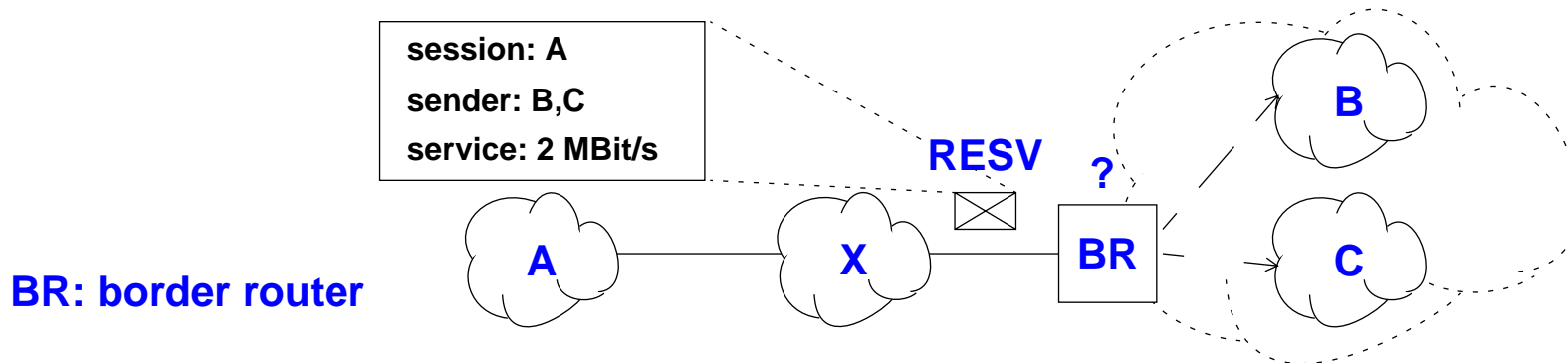
Hop Stacking (sink-tree based reservation aggregation)

- stateless PATH messages



Compound Prefix Addresses

- network addresses, CIDR prefixes
- multiple addresses
- scoping style



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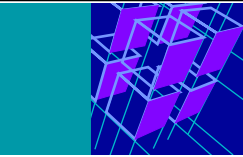
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Generalized RSVP (2)

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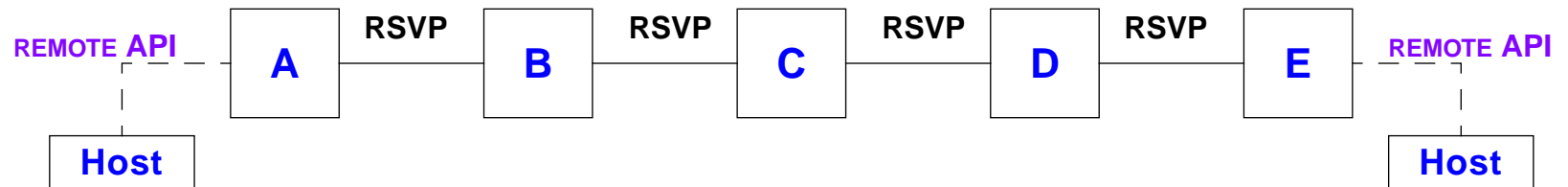
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Remote API

- reduced complexity for end systems
- Δ RSVP, size of executables: ~100K
- Δ RSVP, runtime memory: ~200K (at ~2000K total allocation)
- no attempt for specific optimization, so far

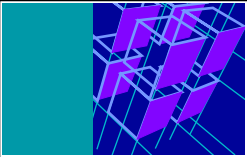


Oneway Reservations

- simplified usage
- reduced signalling effort
- new message type: PathResv

Duplex Reservations

- new object: DUPLEX (sender's receiving port and vice versa)
- further simplified usage, reduced signalling effort



Application Scenarios

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DiffServ

- **see IETF ISSLL work**
- **Bandwidth Broker**
 - communication via COPS, or
 - forwarding of RSVP messages
 - aggregation needed

⇒ **RSVP allows for decentralized or centralized admission control.**

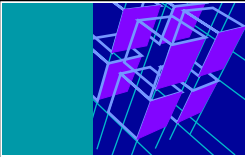
- **hierarchies of bandwidth brokers**

Inter-Domain Trunk Signalling

- **see BGRP and its analysis (cf. Pan & Schulzrinne)**
- **RSVP + Refresh Reduction + Prefix Addressing + Hop Stacking**
- **Advantage: Homogeneous Protocol & Interface**

Others

- **Edge Admission Control + ECN-priced subnet (cf. Kelly)**
- **RSVP seems well feasible**



Market Managed Multi-service Internet (M3I)

EU 5th Framework, Programme IST, Project 11429

"Load Management through Market Mechanisms"

- **HP Labs, AUEB (Athens), TUD, BT Research, ETH Zürich, Telenor**

General System Architecture

- **network layer**
- **pricing mechanisms, especially price communication**
- **charging and accounting system**

HCI experiments

Scenarios

- **market management at packet level**
 - ECN pricing á la Kelly
 - agent-based dynamic price reaction at end systems
- **market management at flow level**
 - RSVP auctions
- **combination**
 - synthesize predictable service from ECN-priced best-effort
 - RSVP over ECN
- **etc.**

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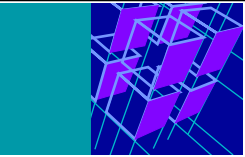
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General QoS Signalling

- **accommodates heterogeneity and uncertainty**
- **applicability of RSVP**

RSVP

- **good performance**
- **significant potential for further performance gains**
- **extensions for increased applicability**
 - scalability: hop stacking, CIDR addresses
 - simplicity: oneway (duplex), remote API
- **BUT: maybe the child needs a new name!**

Further Work

- **integration of QoS subnet technologies**
 - DiffServ
 - ECN-priced best-effort
 - goal: elaborated testbed
- **see <http://www.kom.e-technik.tu-darmstadt.de/rsvp/>**
- **see <http://www.m3i.org/>**