

The Real-Time Channel Administration Protocol

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Synopsis

Service Description

Real-Time Guarantees

Features of RCAP

- Channel Establishment

- Channel Teardown

- Channel Status

Implementations

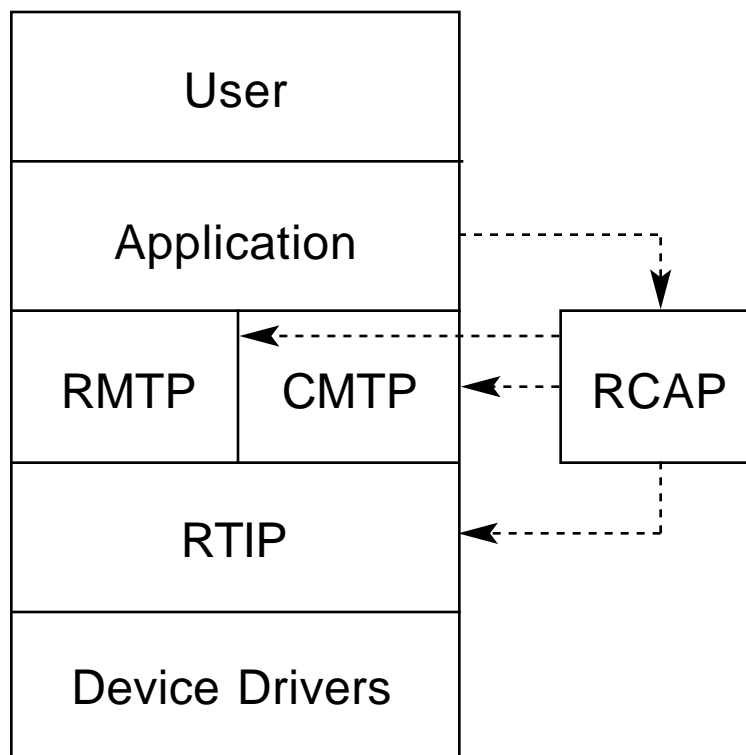
- Local Area Testbed

- XUNET 2

Status, Plans, and Future Work

Service Description

Administration (control) for data delivery services
in the Tenet Real-Time Protocol Suite



Channel establishment with admission control

Channel teardown

Status reporting

Real-Time Performance Guarantees

D End-to-end delay bound

Z Statistical delay probability bound

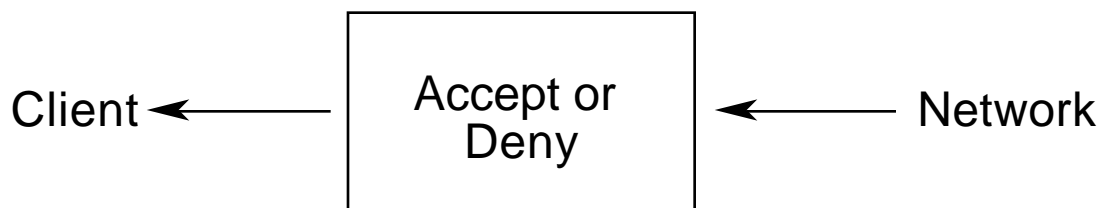
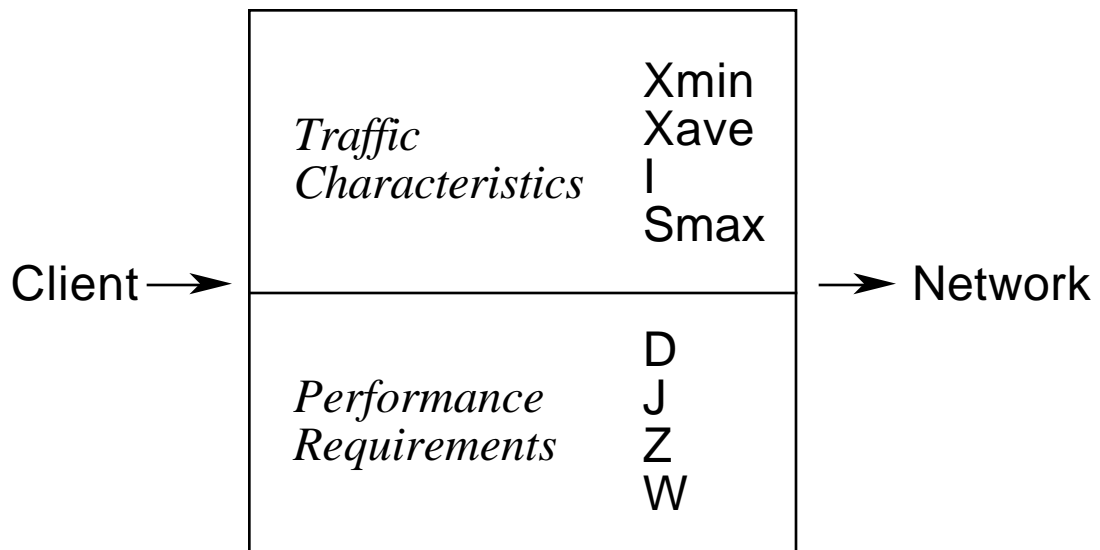
J End-to-end delay jitter bound

W Buffer “no drop” probability bound

Real-Time: Performance guarantees

Real-Time Channel: A (simplex unicast)
connection with performance guarantees

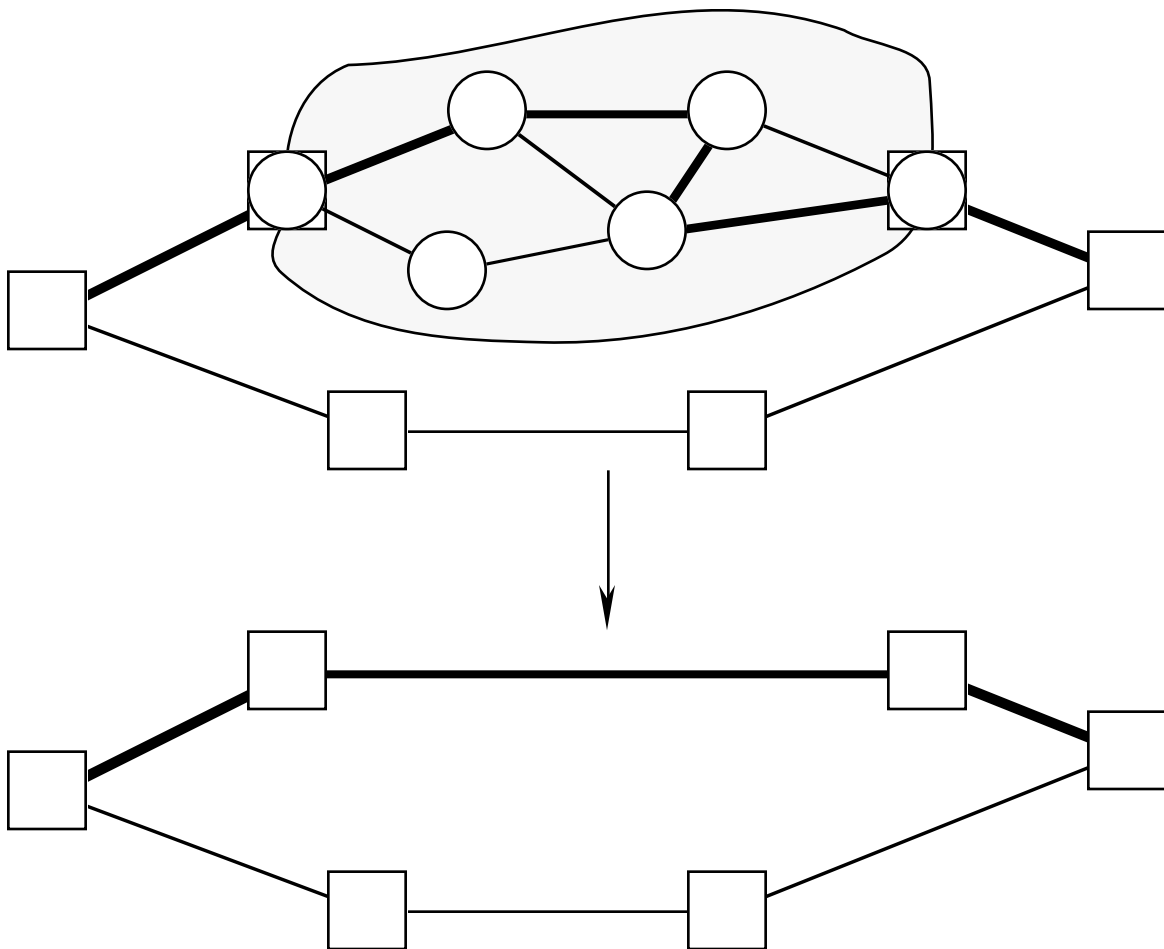
Real-Time Performance Contract



Features of RCAP

Admission control

Hierarchical approach to internetworks



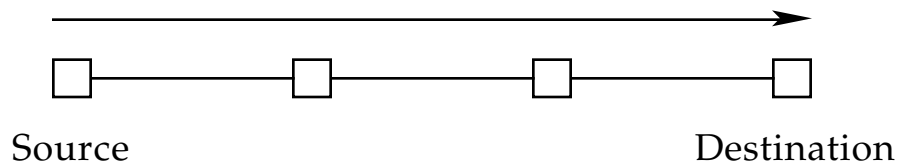
Control messages passed between adjacent entities

Separation of control and delivery mechanisms

Channel Establishment

One round trip along channel path

Forward Pass

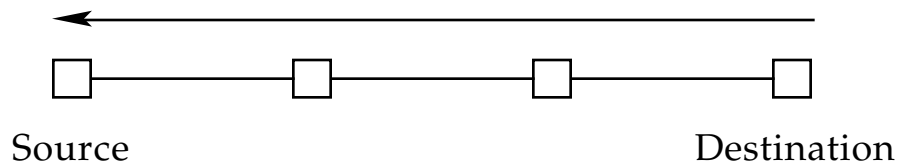


Admission control tests

Routing

Tentative resource reservations

Reverse Pass

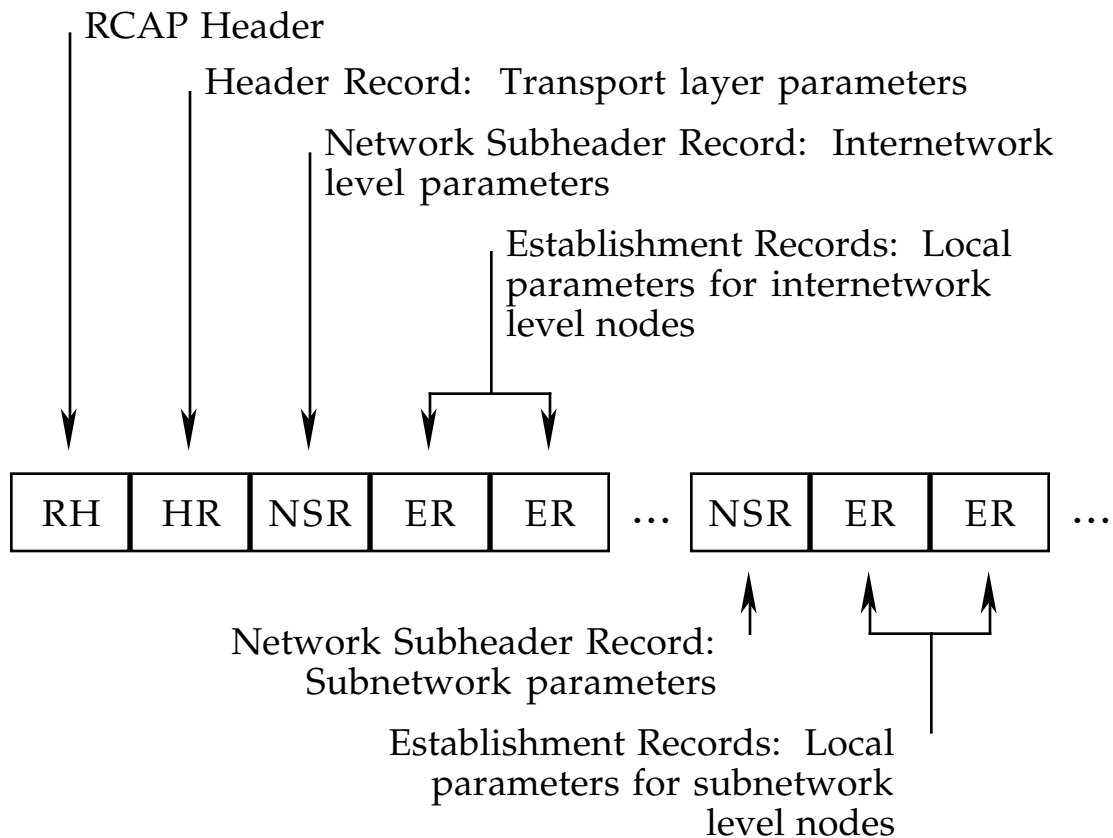


Relaxation of reservations if possible

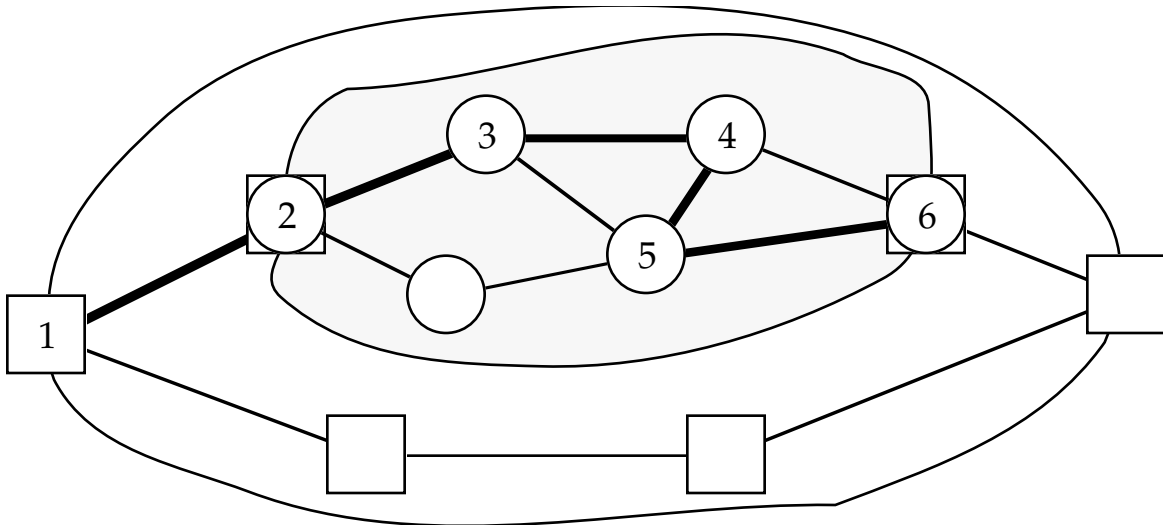
Reservations confirmed

Channel established

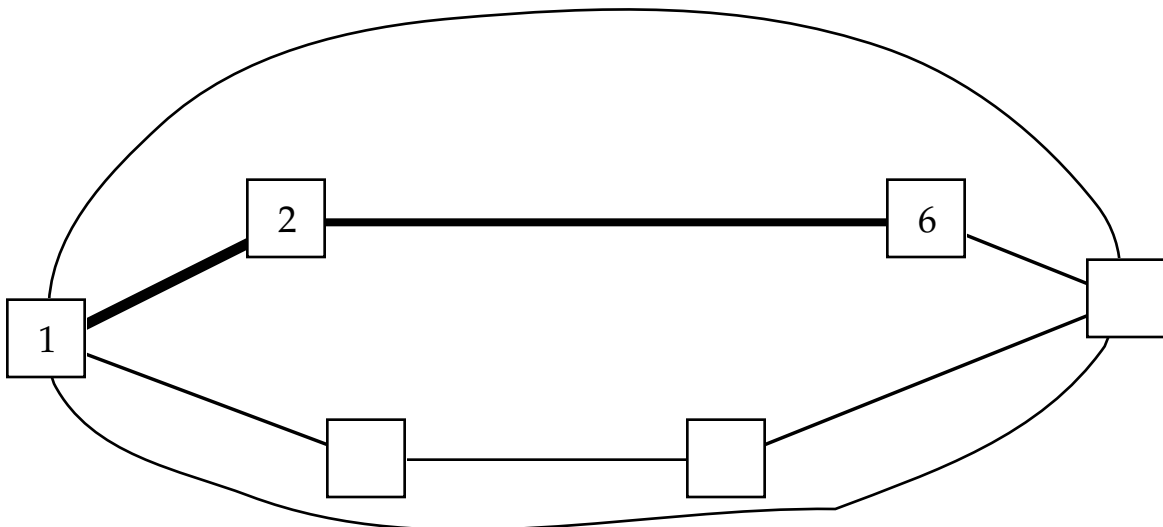
Structure of a Channel Establishment Message



Abstraction in an Internetwork



RH	HR	NSR	ER	ER	NSR	ER	ER	ER	ER
			1	2		3	4	5	6



RH	HR	NSR	ER	ER	ER
			1	2	6

Channel Teardown

Application-initiated

Initiated by either source or destination application

Resources released along route

State and routing information discarded

System-initiated



Initiated by any node along path in response to failures in network

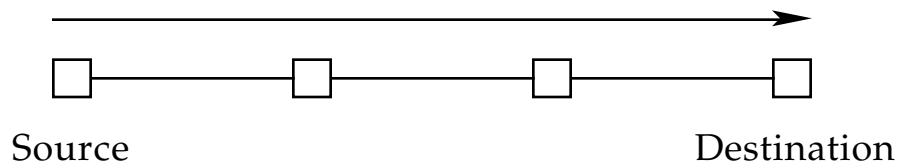
Resources released along route

State and routing information discarded

Channel Status

One round trip along channel path

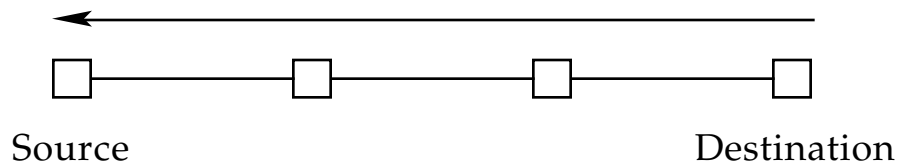
Forward pass



Nodes add status information to RCAP control message

No subnetwork abstraction: status for lower-level nodes retained

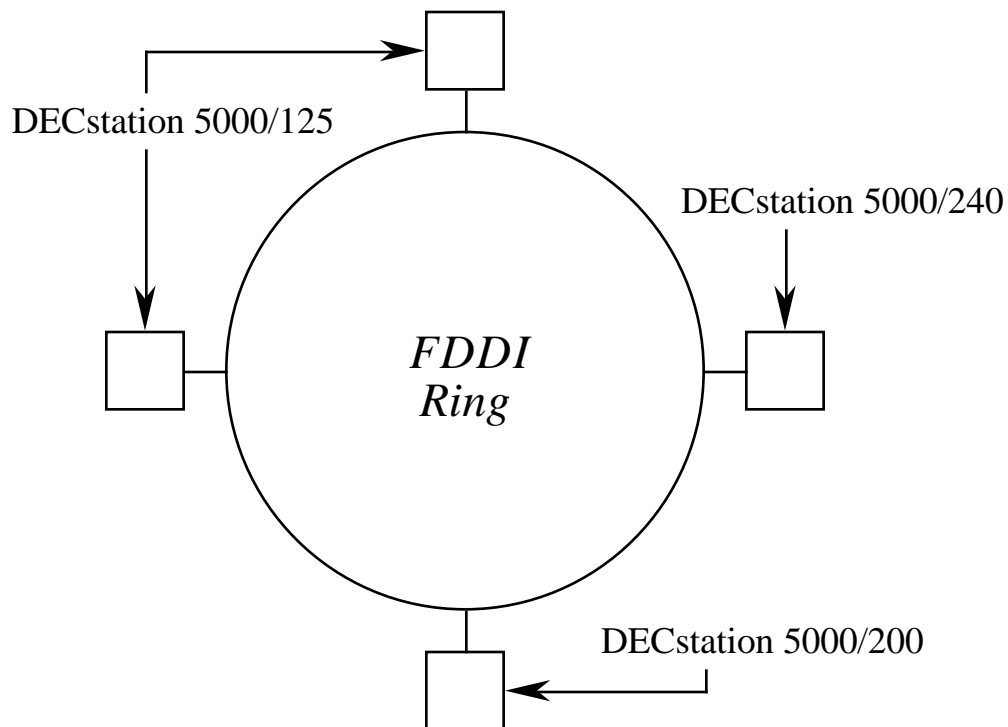
Reverse pass



Nodes return status report to source unchanged

Implementation

Local Area Testbed



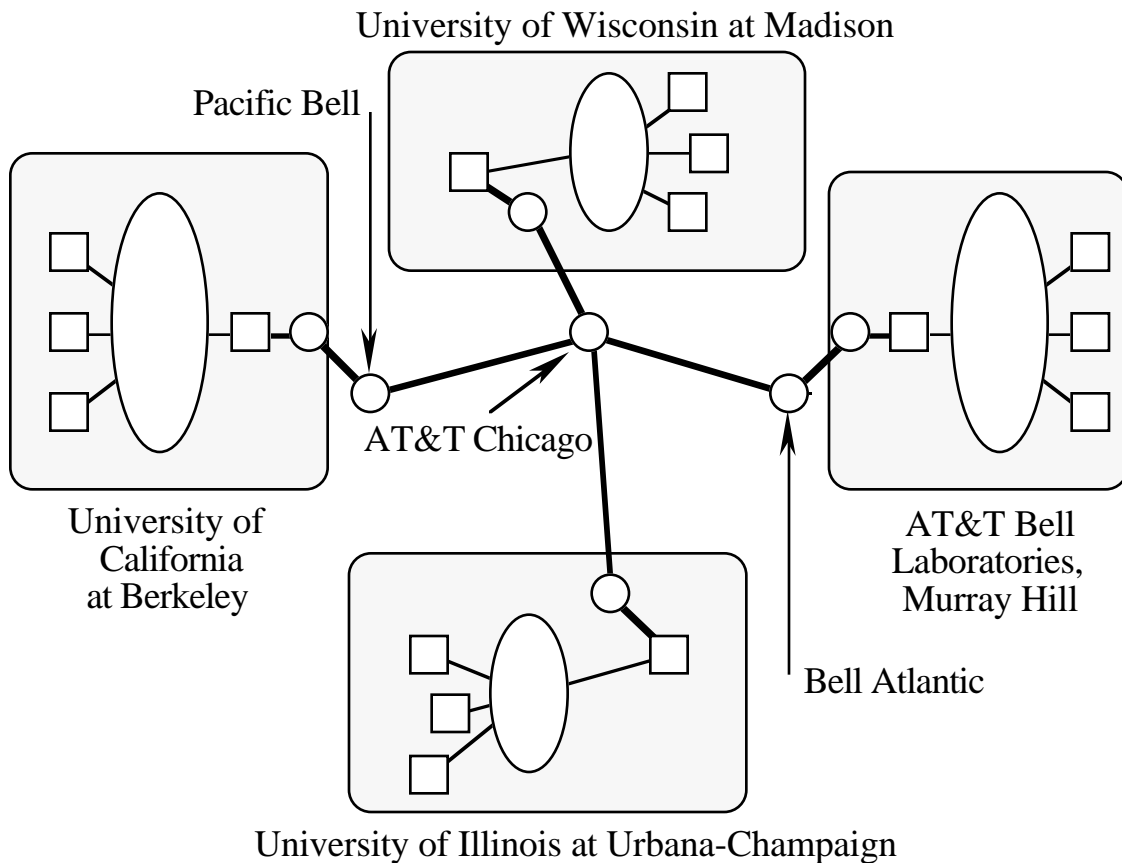
A simple environment for testing

Goal: Find out how well RCAP really works

Can we really make real-time performance guarantees work?

Implementation, Continued

XUNET 2



A heterogeneous wide-area internetwork

Goal: Test channel administration in an internetwork

How well does the hierarchical view work?

Status

Local implementation supporting RMTP/RTIP
“almost done”

Plans

Finish local testbed implementation

Support for continuous media (CMTP)

XUNET 2 implementation

Future Work

New channel models (simplex multicast)

A routing scheme

Re-routing of channels

Modification of channels

Dialog between applications and RCAP