

The Real-Time Channel Administration Protocol

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Synopsis

Service Description

Motivations

Features of RCAP

Channel Establishment

Channel Teardown

Channel Status

Service Description of RCAP

Channel Administration for the Tenet Real-Time Protocol Suite

Channel Setup

Channel Teardown

Channel Status

Tenet Data Delivery Protocols

Real-Time Message Transport Protocol (RMTP)

Continuous Media Transport Protocol (CMTP)

Real-Time Internet Protocol (RTIP)

Motivations in the Design of RCAP

Real-Time Channels

Explicit Setup and Teardown of Communication Channels

Reservation of Critical Resources

Diversity of Requirements

Message-Based vs. Continuous Media

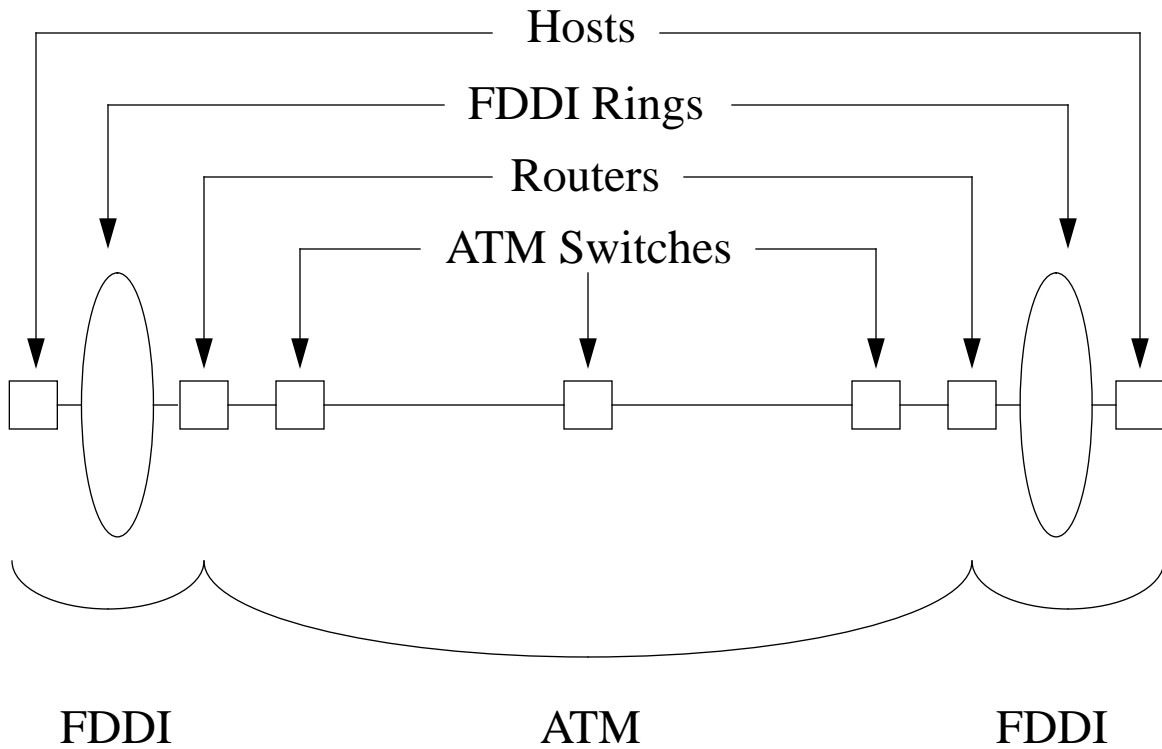
Deterministic vs. Statistical Guarantees

Performance Requirements

Traffic Patterns

Motivations in the Design of RCAP

Internetworking Topology



Features of RCAP

Hierarchical Design

Level 0: End-to-End

Level 1: Internetworking

Level 2: Subnetworks (network-specific)

Abstraction of Lower-Level Details

Communication with RTIP, RMTP, and
CMTP

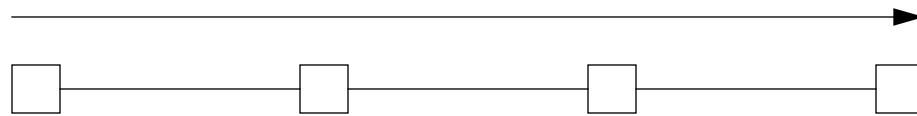
Separation of Control and Delivery
Mechanisms

Message-Passing Between Entities

Channel Establishment Using RCAP

One Round Trip Along Channel Route

Forward (`establish_request`)

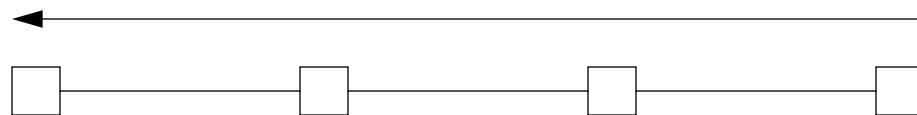


Admission Control Tests

Routing

Tentative Resource Reservations

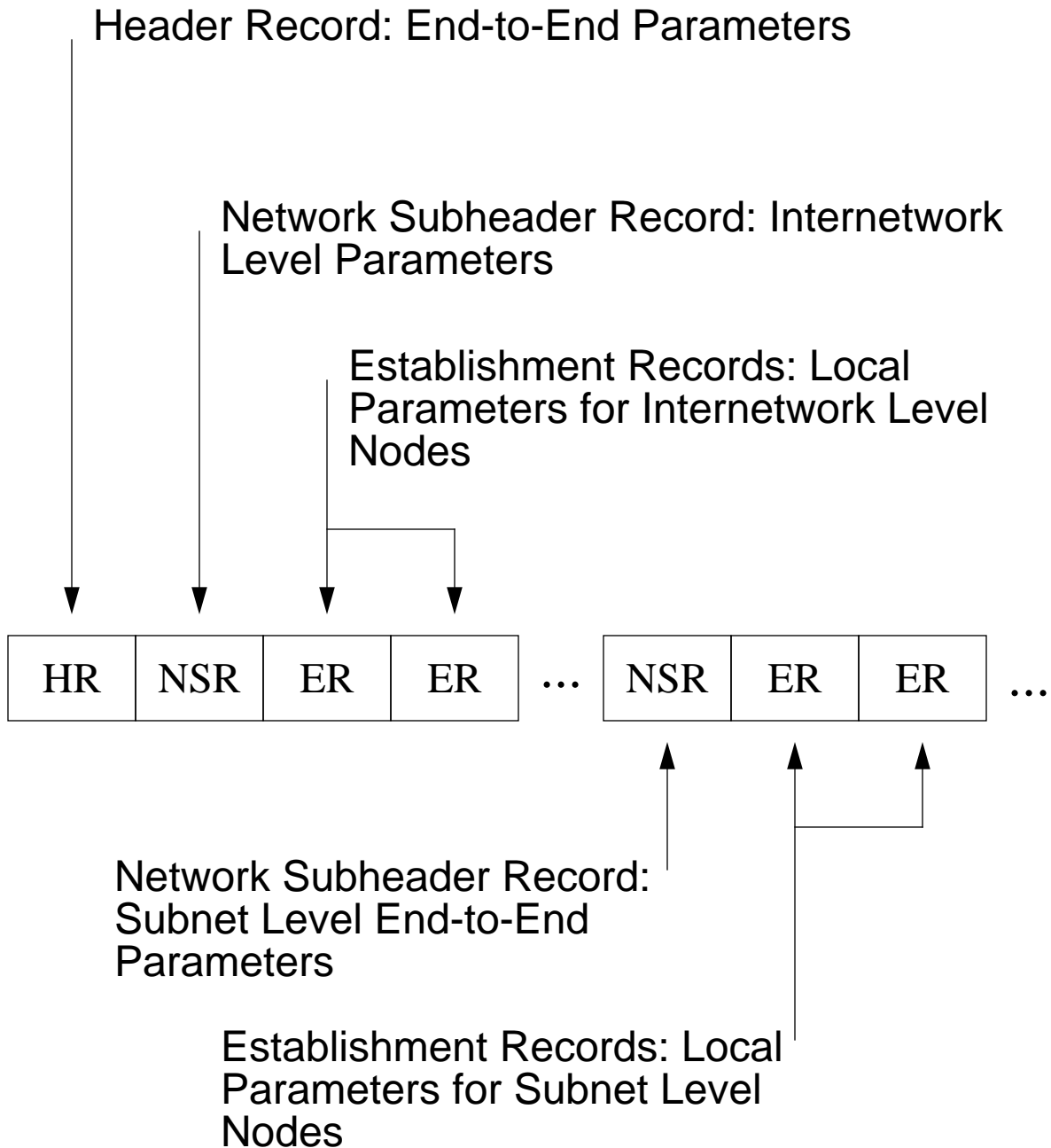
Reverse (`establish_accept`)



Reservations Confirmed

Channel Established

Channel Establishment Using RCAP



Channel Establishment Using RCAP

Header Record for Establishing an RMTTP Channel

0	8	16	24	31
hr_length		level_count		
protocol	subprotocol	rtip_opt	<i>reserved</i>	
xmin				
xave				
I				
smax				
D				
J				
Z				
W				
U				
type	rmtt_opt	user_control_length		
user_control bytes...				

Channel Establishment Using RCAP

Network Subheader Record for the Internetwork Level

0	8	16	24	31
level_length		er_count		
nsr_length		<i>reserved</i>		
xmin				
xave				
I				
smax				
D				
J				
Z				
W				
U				
type	<i>reserved</i>			
Dcumul				
Drelax				

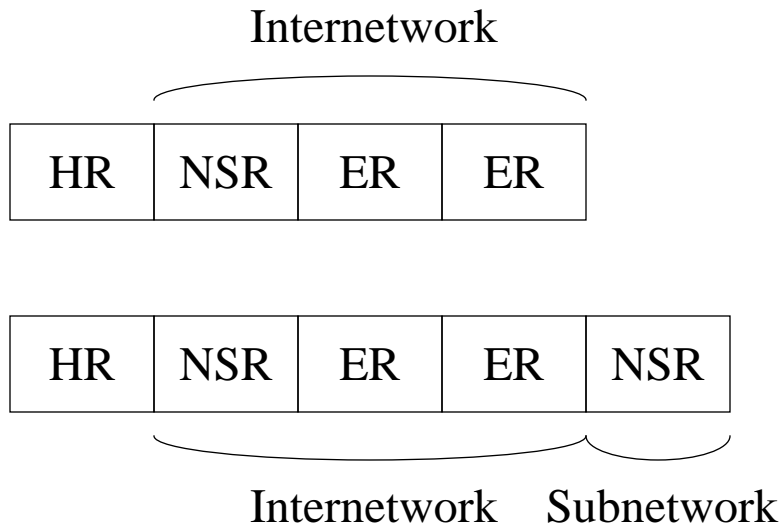
Channel Establishment Using RCAP

Establishment Record for the Internetwork Level

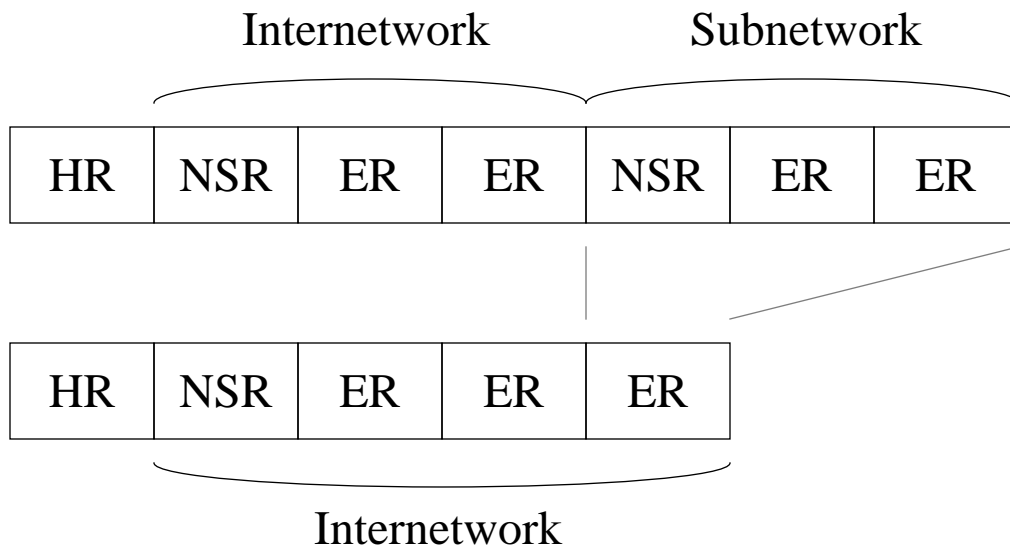
0	8	16	24	31
er_length		er_number		
node_address				
dl				
dn				
j				
z				
w				
u				
B				
b				
f_ip				
f_lcid		f_ifn		
b_ip				
b_lcid		b_ifn		
dcumul				
drelax		<i>reserved</i>		

Channel Establishment Using RCAP

Entrance to a Subnetwork (forward pass)



Exit from a Subnetwork (forward pass)

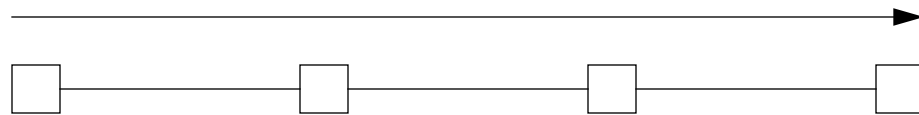


Channel Teardown Using RCAP

User-Requested Channel Teardown

Initiated by Source or Destination

Request (`close_request`)



Resources Released Along Route

Confirmation (`close_confirm`)



State and Routing Information Discarded

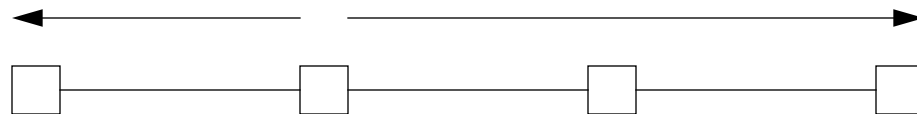
Channel Teardown Using RCAP

Error Forcing Channel Teardown

Initiated by Any Node Along Path

Real-Time Control and Management Protocol
(RTCMP)

Request (`close_request`)



Resources Released along Route

Confirmation (`close_confirm`)



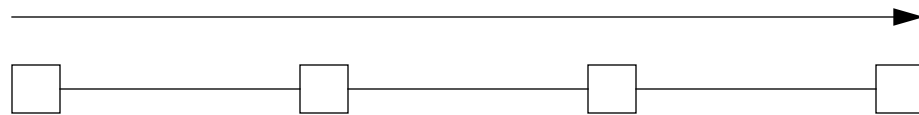
State and Routing Information Discarded

Determining Channel Status Using RCAP

One Round Trip Along Channel Route

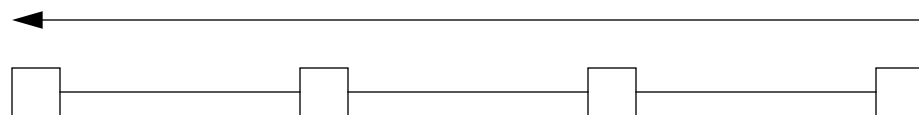
Initiated by Channel Source

Forward Pass (`status_request`)



Nodes add Status Information to Status Request RCAP Control Message

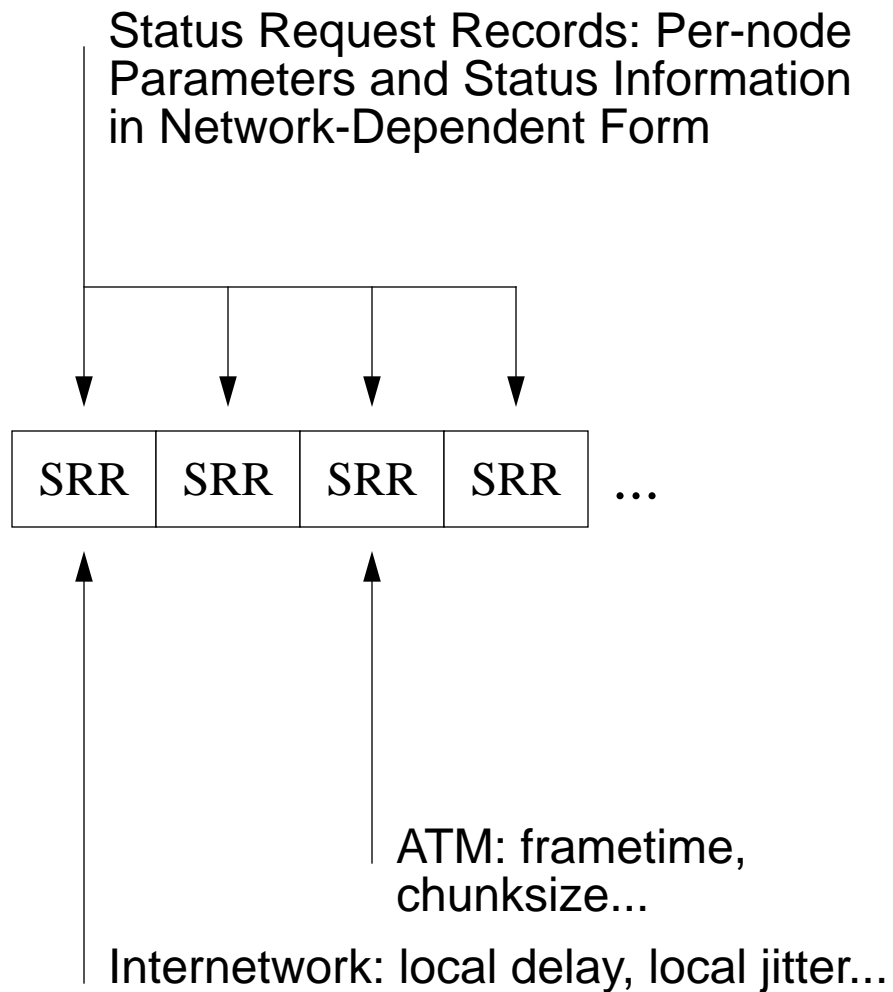
Reverse Pass (`status_report`)



Nodes Return Status Report to Source
Unchanged

Status for Subnetwork Nodes is Retained

Determining Channel Status Using RCAP



Determining Channel Status Using RCAP

Status Request Record for the Internetwork Level

0	8	16	24	31
srr_length		srr_type		
node_address				
d				
j				
z				
w				
u				
buffers				
state		<i>reserved</i>		

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