Congestion Avoidance Through Admission Control

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Synopsis

Introduction

Real-Time Performance Guarantees and Admission Control Tests

Real-Time Channel Administration Protocol
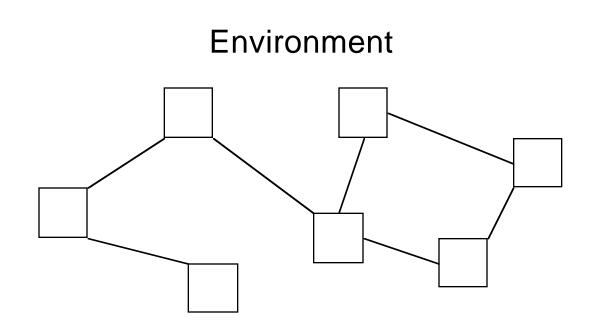
Introduction

Problem: Network congestion creates

    Increased end-to-end delay

    Increased delay jitter

    Packet losses due to buffer overflow

Solution: Admission control at channel establishment time using a worst-case analysis

Environment

Internetwork with store-and-forward nodes in an arbitrary topology

Links either physical links or subnetworks ("logical links") with boundable delay and delay jitter

Loss rate on links is low

Scheduling discipline
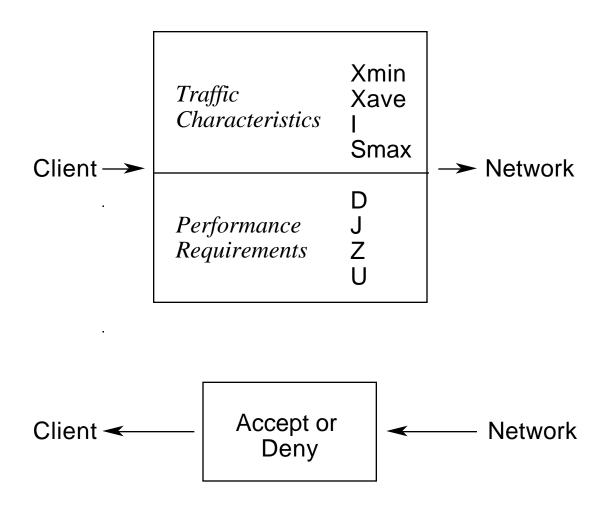
Multi-class Earliest Due Date

Hierarchical Round Robin

Others

Real-Time Performance Guarantees

D   End-to-end delay

Z   Statistical delay bound probability

J   End-to-end delay jitter

W   Buffer "no drop" probability

Real-Time Channel: A connection with performance guarantees

Real-Time Performance Contract

Traffic Characteristics	Xmin Xave I Smax
Performance Requirements	D J Z U

Client → [ ] → Network

Client ← **Accept or Deny** ← Network

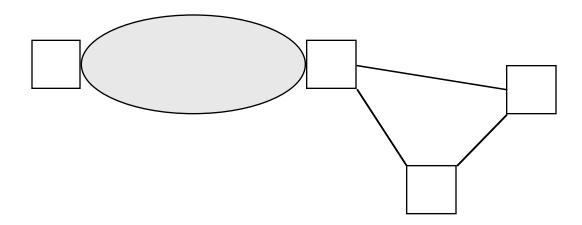# The Real-time Channel Administration Protocol (RCAP)

Channel setup and teardown for real-time channels

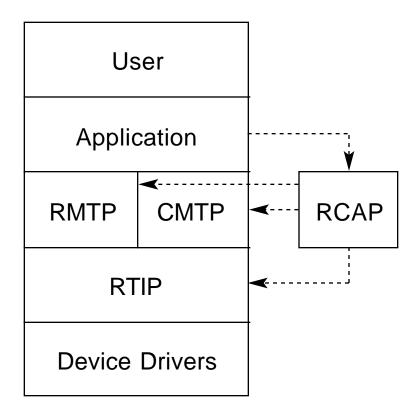Admission control tests at connection establishment

Hierarchical approach to internetworks

Network-specific algorithms for guarantees across subnetworks

Hide details from end-to-end establishment

The Tenet Real-Time Protocol Suite

RCAP: Real-time Channel Administration Protocol

RMTP: Real-time Message Transport Protocol

CMTP: Continuous Media Transport Protocol

RTIP: Real-Time Internet Protocol

Tenet Real-Time Protocol Suite Status

Summer 1991   Design of suite completed

Fall 1991   RTIP, RMTP, CMTP completed

Spring 1992   RCAP complete
Suite implementation on FDDI
Suite implementation on XUNET II

Future   Different performance guarantees
Flexibility with existing guarantees

Conclusion

By the use of admission control tests, we can guarantee network performance and avoid congestion.

Developed performance guarantees and tests to ensure that guarantees are valid under all conditions.

Real-time Channel Administration Protocol under development to implement admission control tests.