

The Tenet Real-Time Protocols for Multimedia Data

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15 October 1993

Synopsis

The Tenet Approach

The Tenet Real-Time Protocol Suite

The Infopad Environment

The Tenet Approach

Network applications, especially multimedia services, require guaranteed network performance.

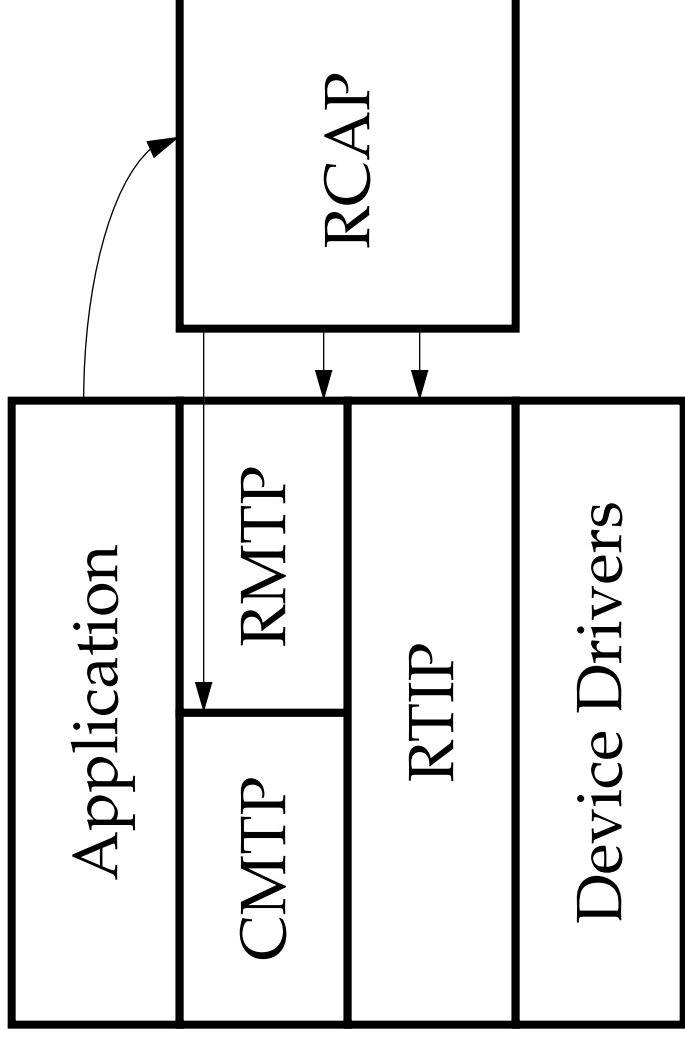
Guarantees

- Delay
- Throughput
- Delay jitter
- Loss due to network congestion

“Real-Time” = “Guaranteed Performance”

- **Connections (virtual circuits)**
 - Handle different client requirements
 - Protection between different conversations
- **Admission control**
- **Proactive resource allocation**
 - Network resources (e.g. bandwidth) allocated to individual connections

The Tenet Real-Time Protocol Suite



RCAP: Real-Time Channel Administration Protocol

RTIP: Real-Time Internet Protocol

RMTP: Real-Time Message Transport Protocol

CMTP: Continuous Media Transport Protocol

The Real-Time Internet Protocol

Packet Delivery Service

- Simplex, unicast connections
- Sequenced
- Unreliable

Guaranteed performance

The Real-Time Message Transport Protocol

Message Delivery

- Simplex, unicast connections
- Uses RTP packet delivery service
- Fragmentation and reassembly of large messages (multiple network packets)
- Rate-based flow control at sender

The Continuous Media Transport Protocol

“Continuous Media” applications (e.g. audio, video) transmit data at regular intervals.

Stream Data Unit Delivery

- Simplex, unicast connections
- Uses RTP packet delivery service
- Traffic characterization oriented toward periodic traffic
- Implicit initiation of data transfer

The Real-Time Channel Administration Protocol

Channel Administration

- Channel establishment with admission control
- Channel teardown

Similar in function to ATM signalling protocols

Implementations

Completed Implementations

- Tenet local testbed (FDDI)
- Sequoia 2000 network (FDDI, T-1)

Implementations in Progress

- XUNET II (FDDI, ATM/DS-3)
- HIPPI

Future Plans

- Infopad backbone network

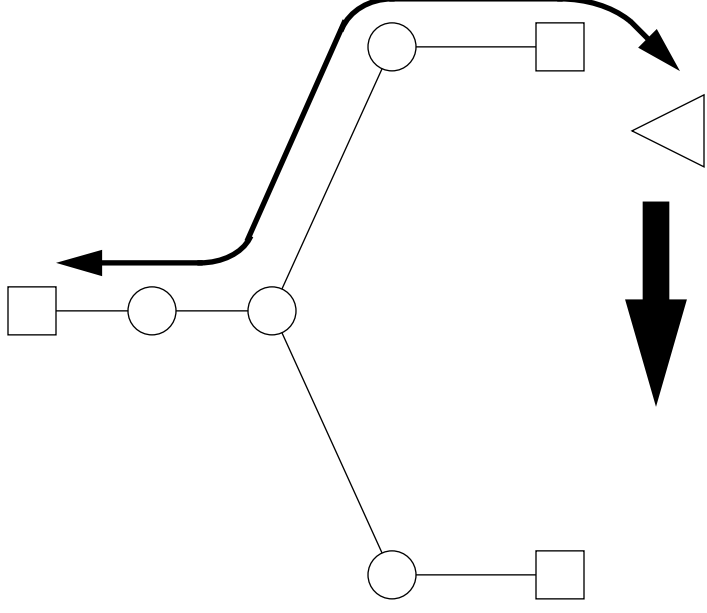
The Future: The Infopad Environment

Mobility and network connectivity

Changing network environment

Mobility

How to maintain network connections when a mobile host (e.g. Infopad) moves?



Life in a Changing Network Environment

A user moving may mean different network conditions of:

- End-to-end delay
- Bandwidth
- Reliability
- Network resources

Question: How to modify real-time guarantees to accommodate changing network conditions?