The Architecture of Realtime Network Protocols - Tenet Suite 2

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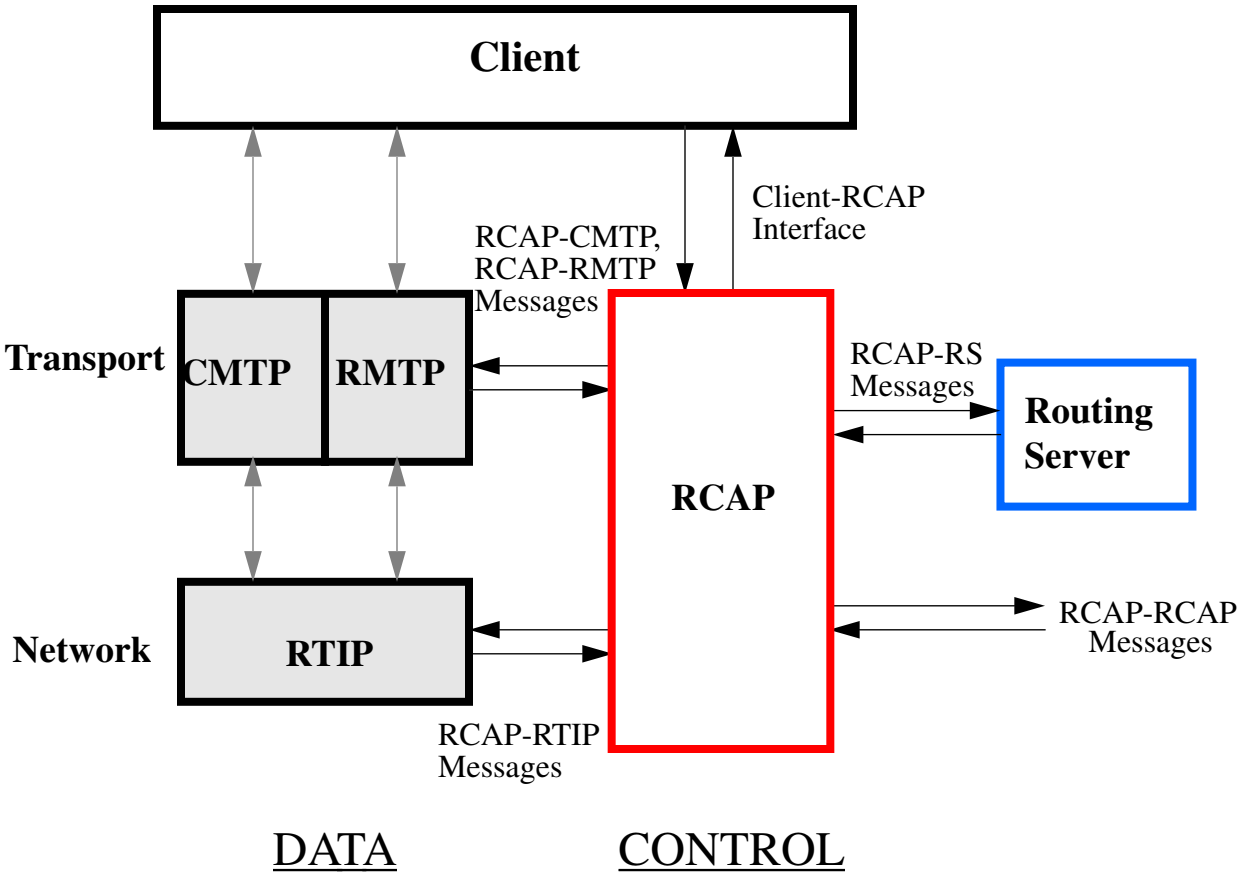
Outline of this Talk

- Background Context
- Our Approach
  - Suite 2 of the Tenet Protocols
  - RCAP Modules
- An Example
  - Channel Establishment
- Summary

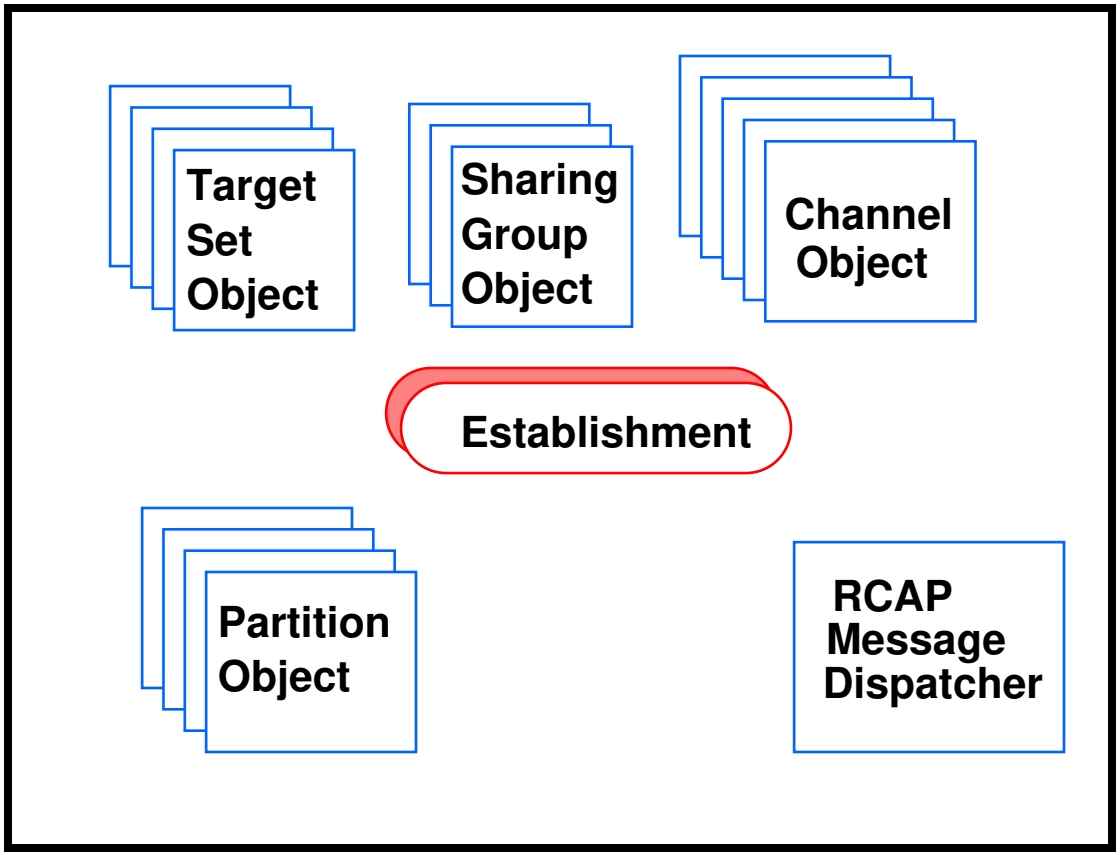
Background Context

- Work in Progress
- Scheme 2 - Design of Algorithms
- Suite 2 - Next Step
  - Implementation
  - Testing and Measurements

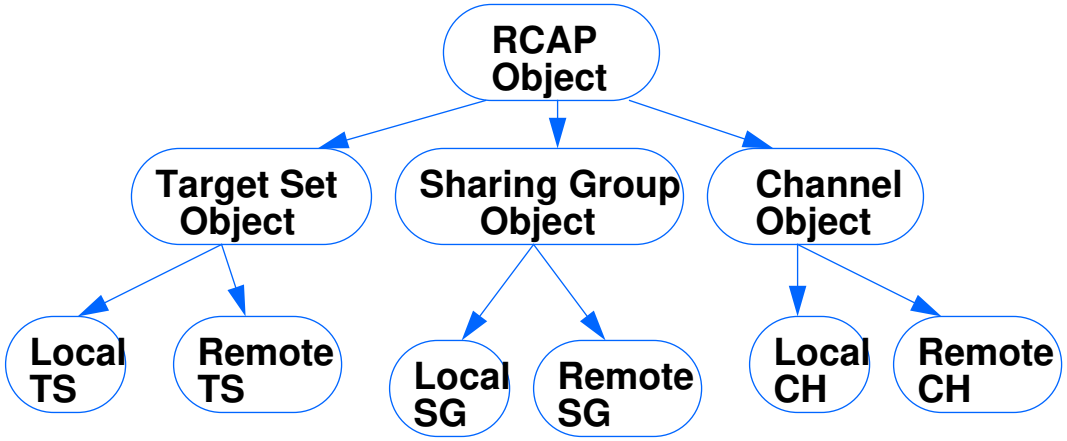
Suite 2 Block Diagram



RCAP Architecture



Object System



- Clean Design
- Supports Location Independence
  - Remote Object: -> requests to Local Object
  - Local Object: Service Local & Remote Requests

Target Set Object

- Target set management
- Coordinates JOIN of a destination
  - Adds dest to TS Object Data
  - Initiates channel establishment
  - Retains connectivity information
- Coordinates LEAVE of a destination
  - Initiates teardown of links serving destination
  - Removes dest from TS Object Data
  - Updates connectivity information
- Services Queries on Membership and Connectivity
- Note: TS Object manages concurrent requests for JOIN and ESTABLISH

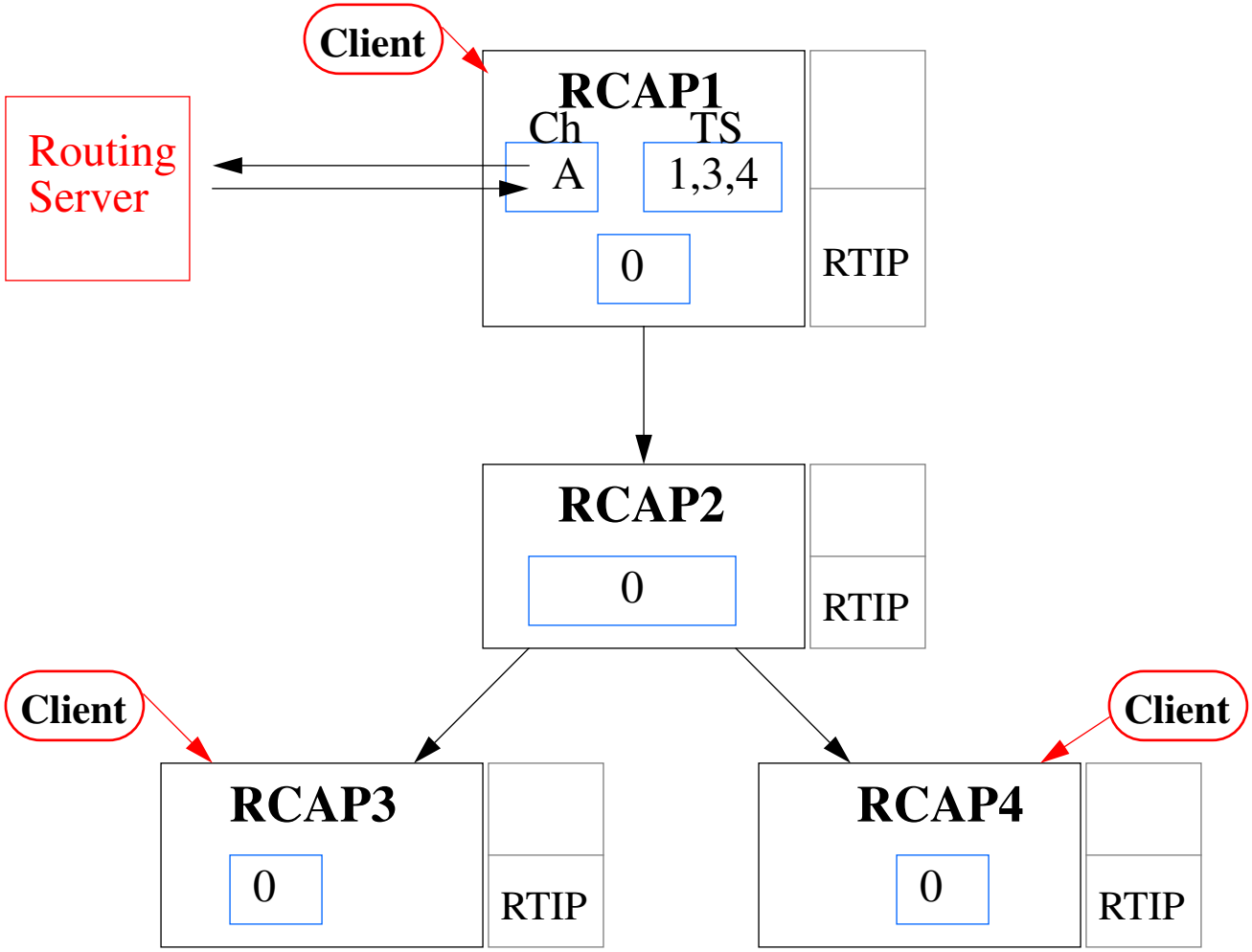
Partition Object

- Subdivide Network into Virtual Subnetworks
- Can support Advance Reservation
- Manages Resources for a Partition (Link and CPU)
  - Delay Bound
  - Processing Power
  - Buffer Space
- Methods of a Partition Object:
  - Admission Control
  - Resource Allocation & Relaxation
  - Advance Reservation
  - Dynamic Traffic Management

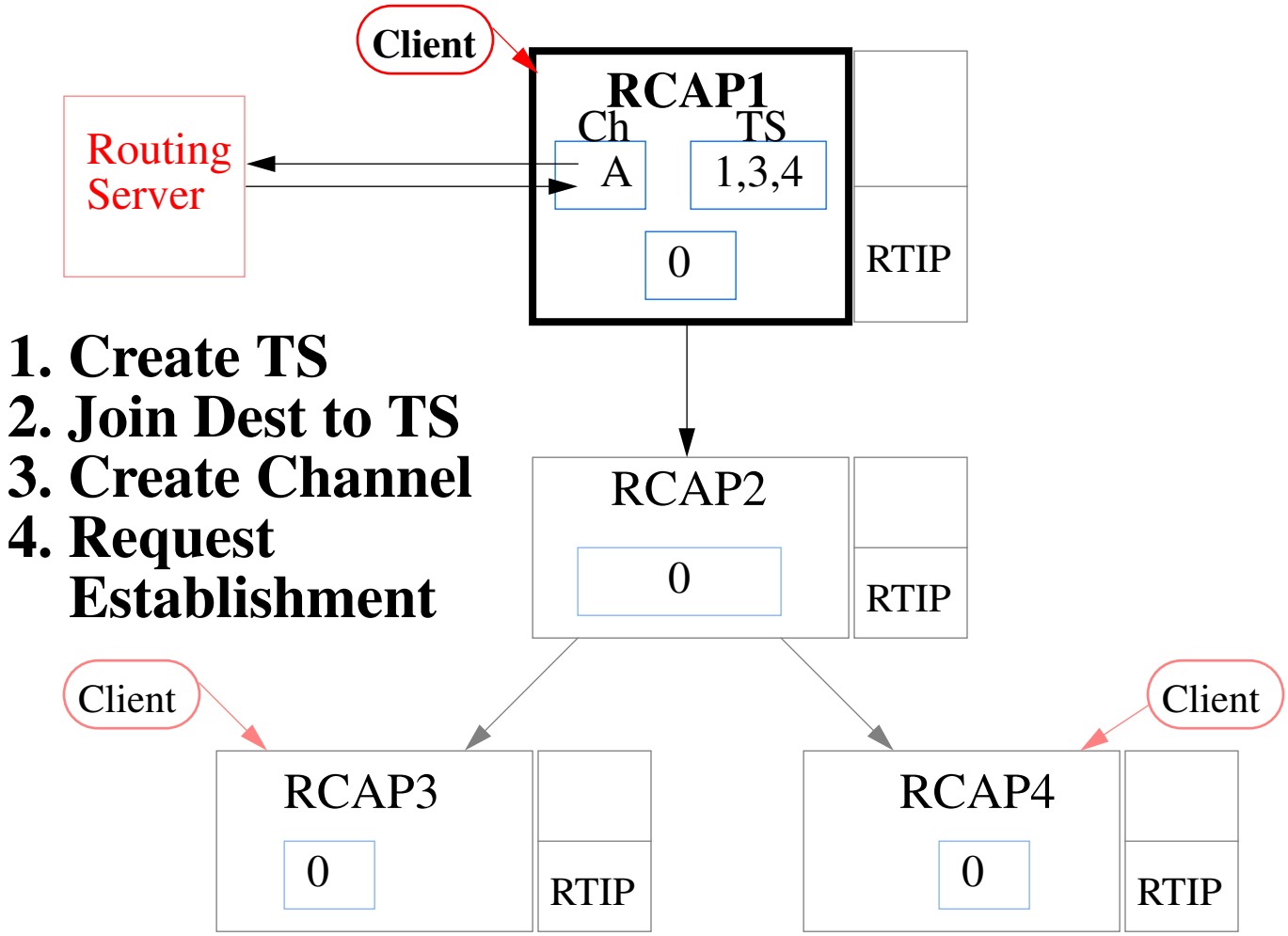
Establishment

- Partition System Calls:
  - Admission Control
  - Resource Reservation
  - Relaxation (backwards pass)
- Successful Establishments and Joins:
  - Report TS and Channel Objects
  - Report to Routing Module
  - Report Rate Control Information to RTIP (RealTime Internet Protocol)

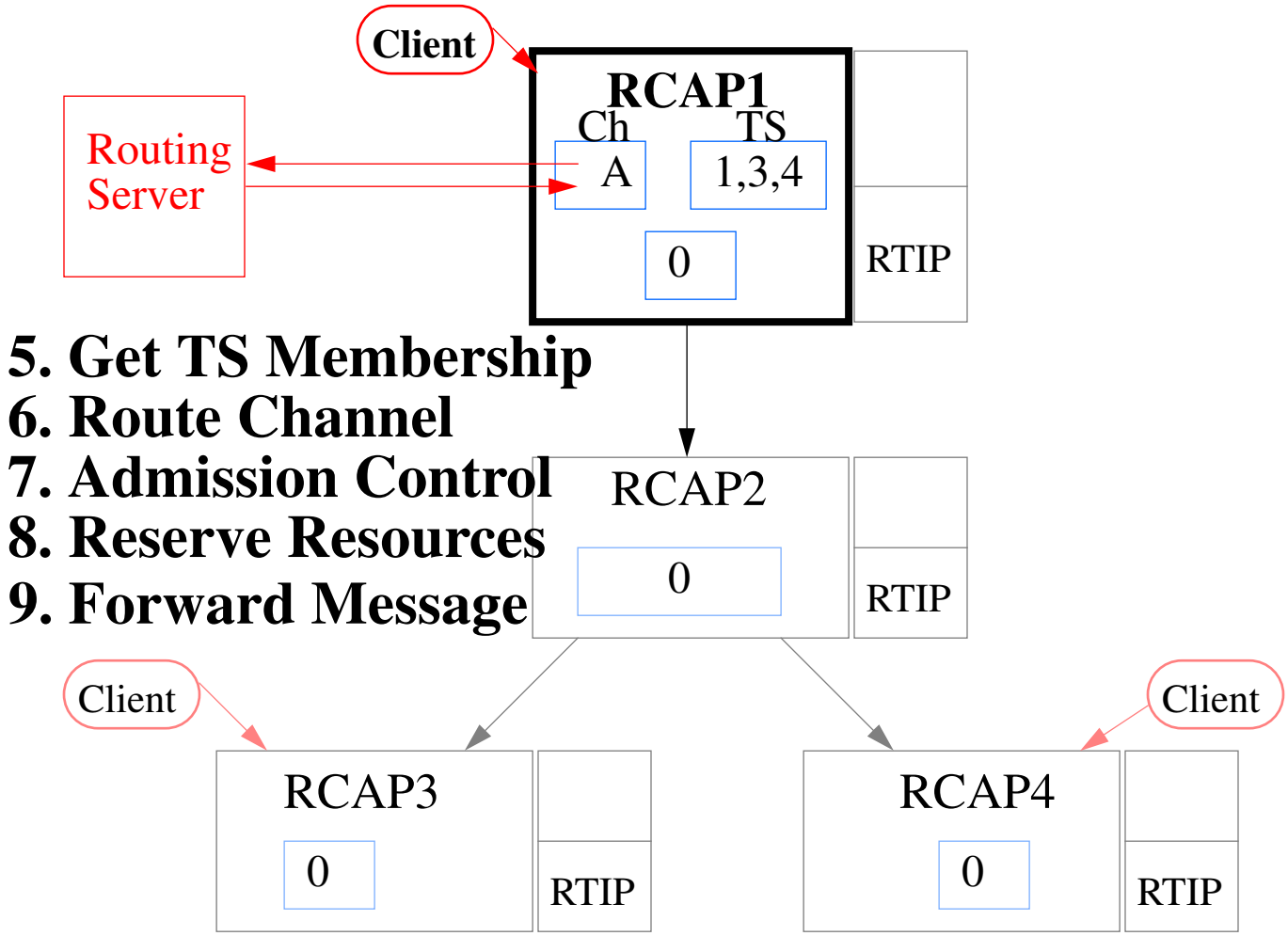
Steps In Channel Establishment



Steps in Establishment

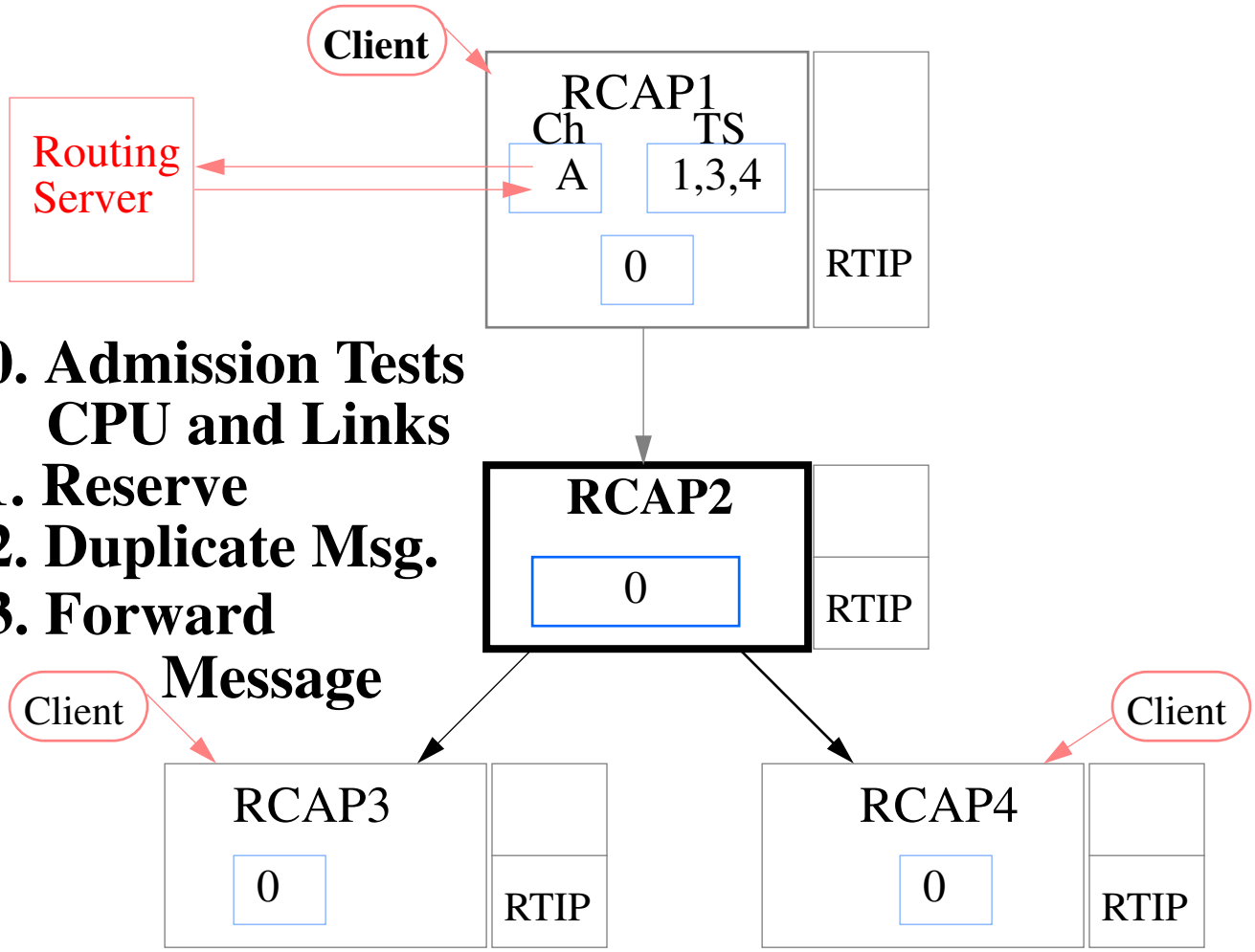


Steps in Establishment



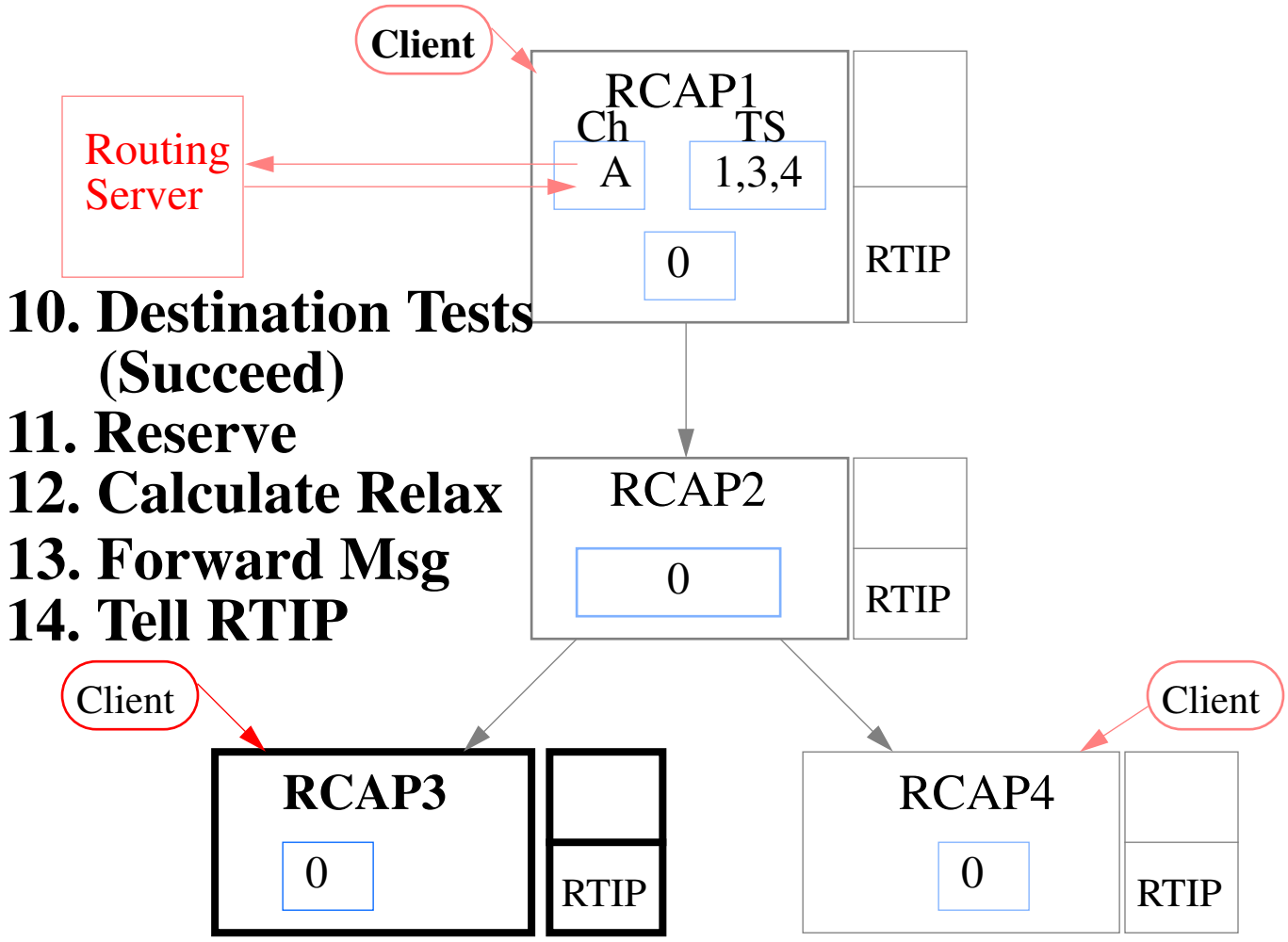
5. Get TS Membership
6. Route Channel
7. Admission Control
8. Reserve Resources
9. Forward Message

Steps in Establishment



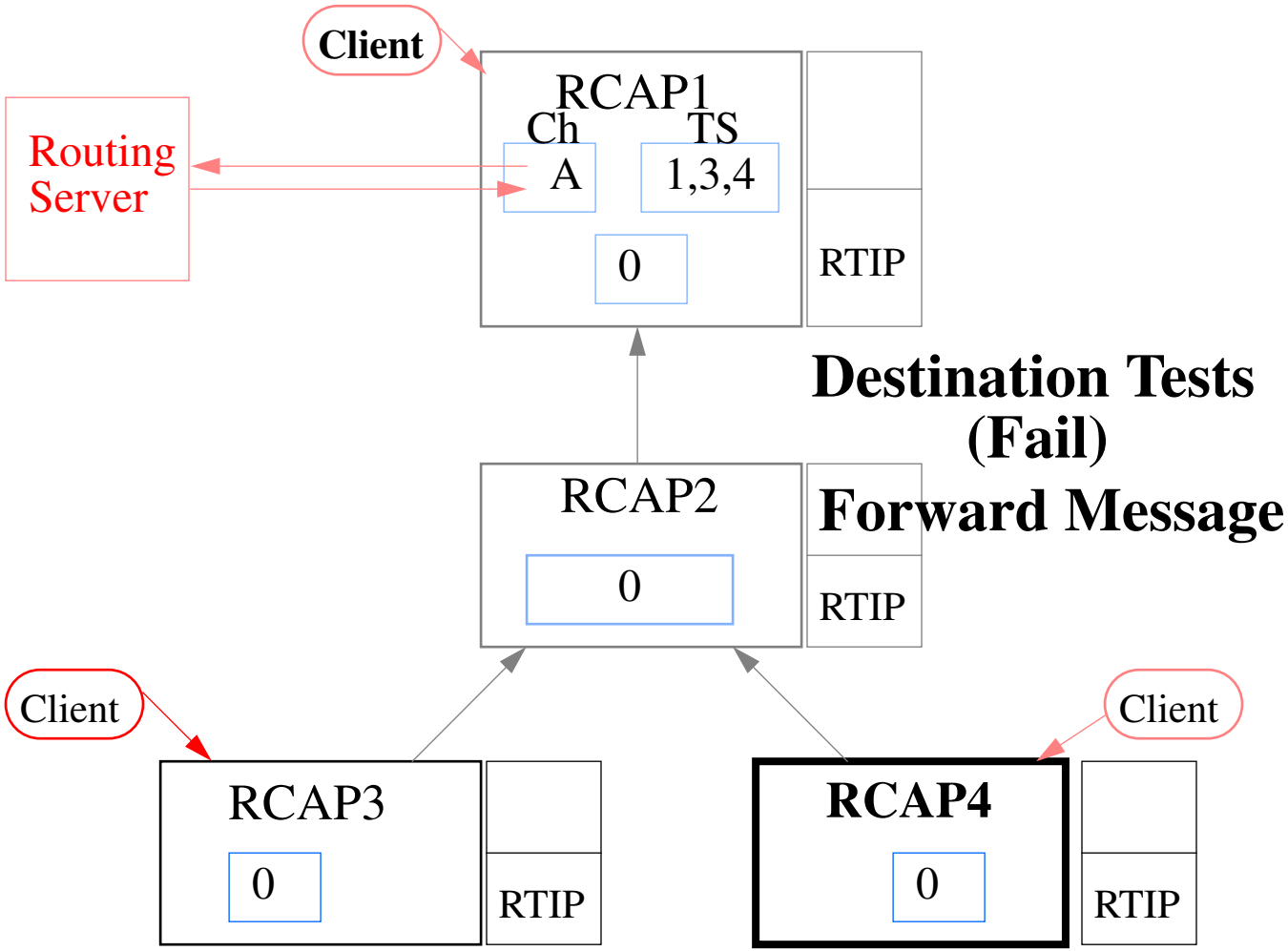
10. Admission Tests
    CPU and Links
11. Reserve
12. Duplicate Msg.
13. Forward
    Message

Steps in Establishment



10. Destination Tests (Succeed)
11. Reserve
12. Calculate Relax
13. Forward Msg
14. Tell RTIP

Steps in Establishment



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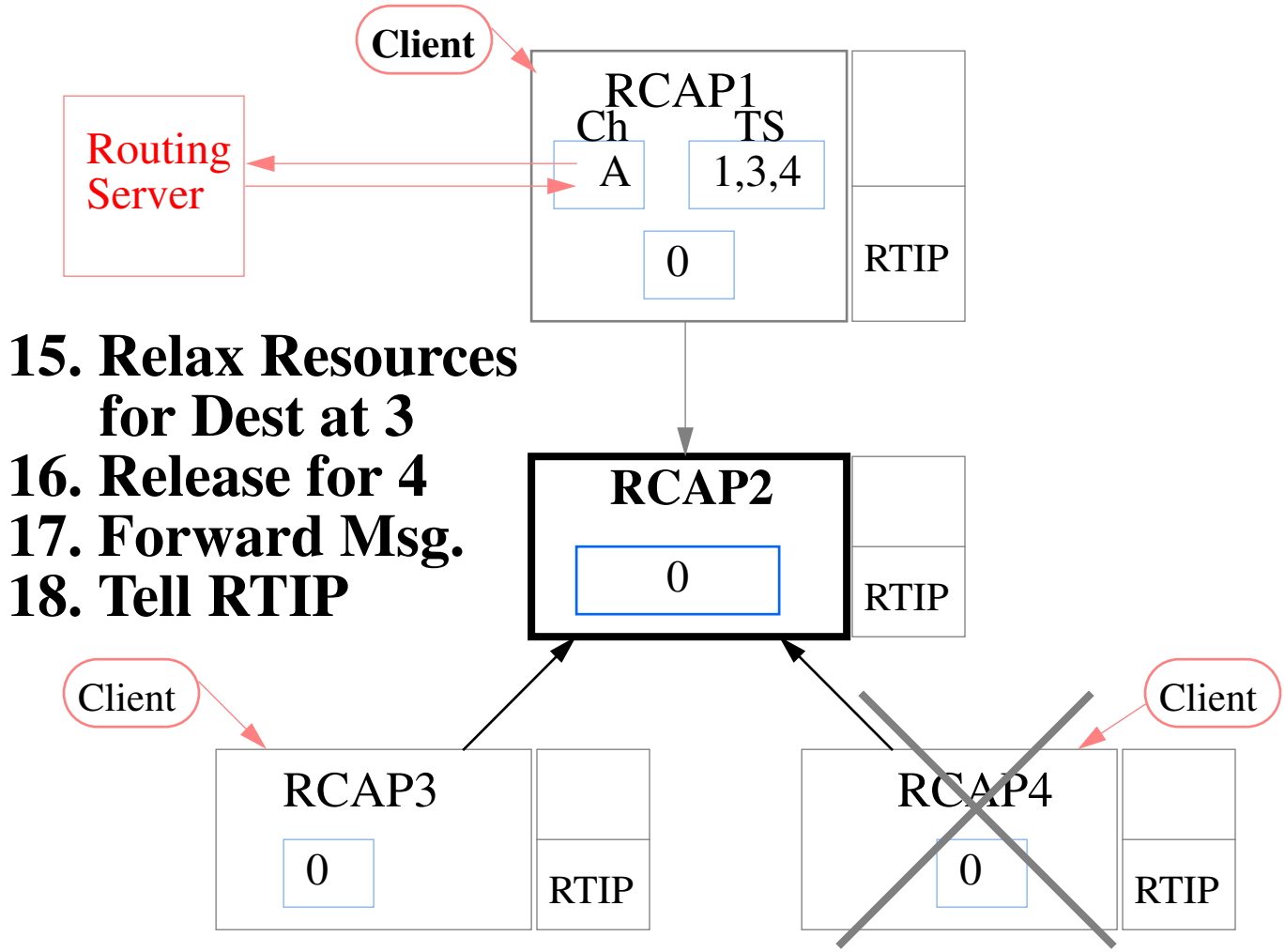

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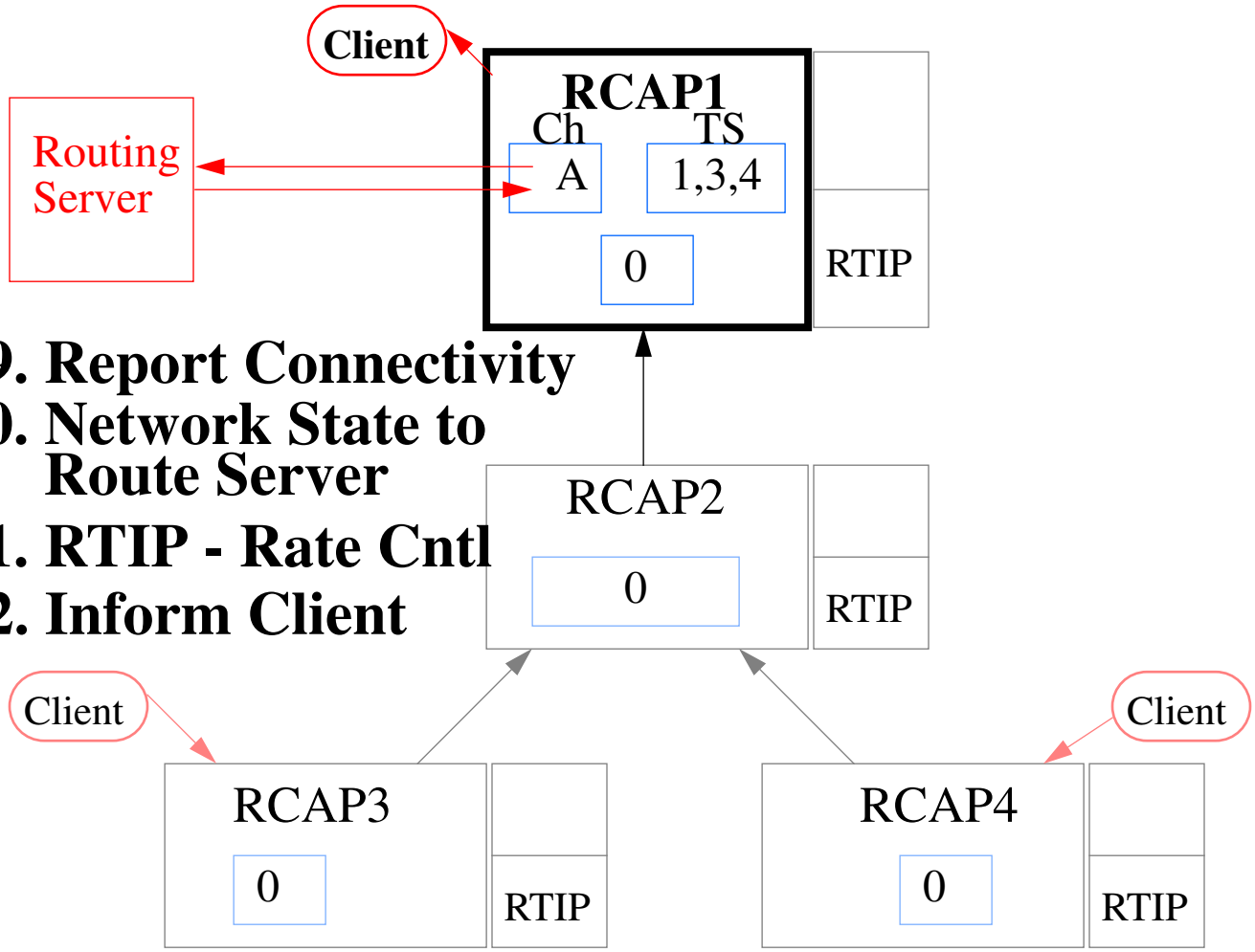

19. Report Connectivity
20. Network State to Route Server
21. RTIP - Rate Cntl
22. Inform Client

Summary

- Scheme 2: Algorithms
- Suite 2: Implement into a New Suite of Protocols
- Redesign of RCAP - Channel Administration Protocol
- Object Oriented Approach
  - Allows for Easier Support Framework
- Goal: Testing and Measurement of Our Ideas