Abstraction and Control of Transport Networks
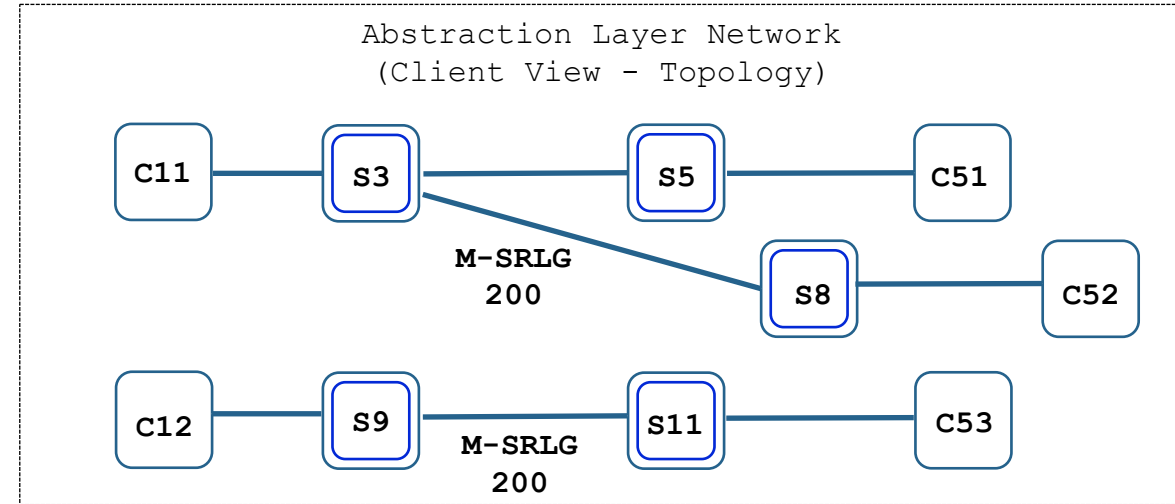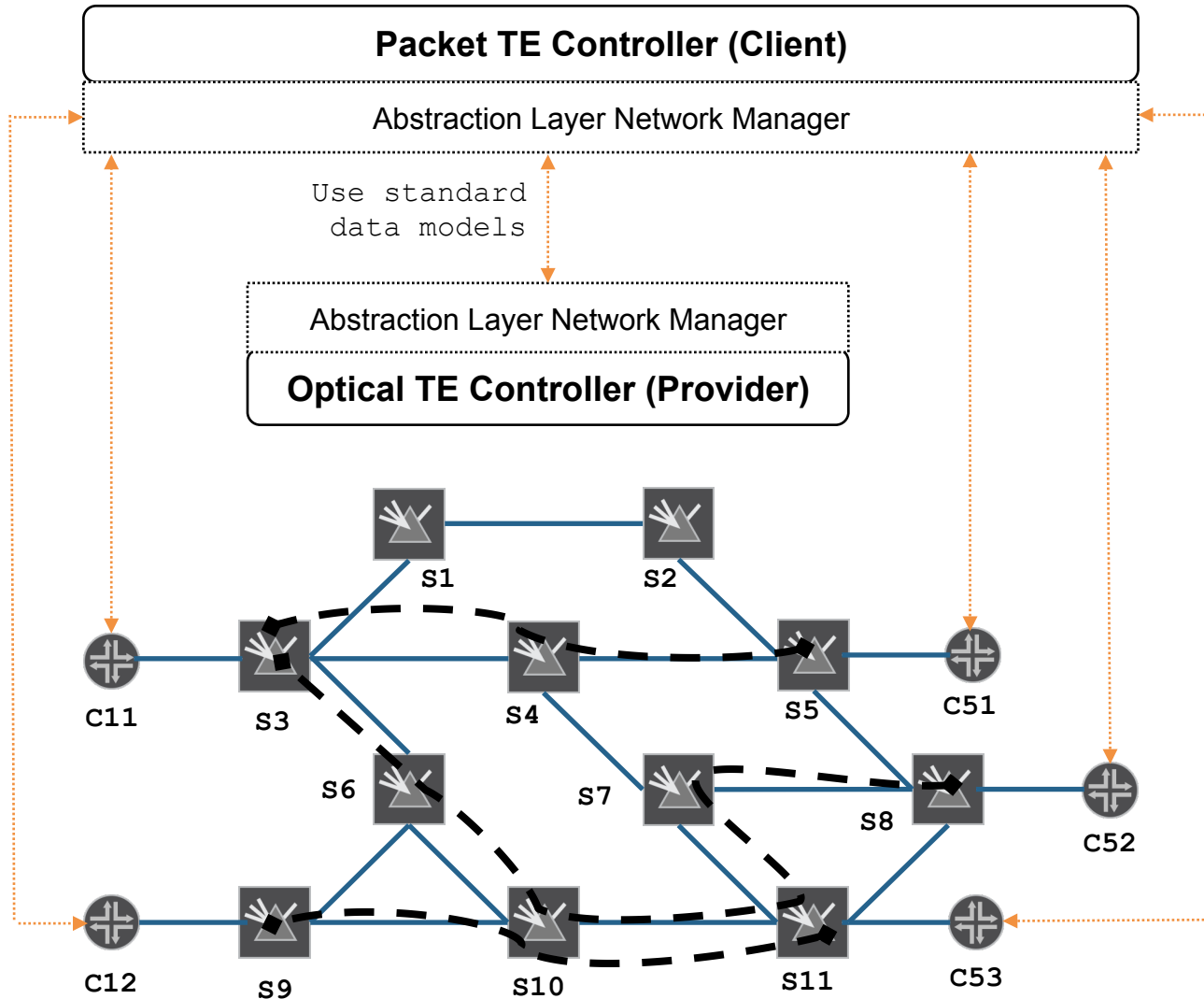
A practical approach

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Architecture

- Hierarchical:
  - Two entities: Client Controller & Provider Controller
    - No fundamental differences between the two
    - Each can play the opposite role
  - Single interface between the two controllers
  - Models supporting the interface
    - Abstract TE Topology
    - Service manipulation
    - Service OAM
    - Policies

Example

Abstract TE Topology Model

- draft-liu-yang-abstract-te-topo
- Allows for the provider to present network TE topology in abstract way on per-client basis
- Abstract TE topology presented to the client is completely decoupled from actual TE topology (as known to provider)
- Could be customized or even fully defined by the client

    - Customized TE topology as a service
    - Only client knows how the topology should look like to be useful
    - Requirements may change over time, may depend on time

Abstract TE Topology Model (Cont..)

- Each element and topology as a whole may include time scheduling attributes

- Model captures overlay-underlay relationships for nodes and links

- Nodes could be blocking/asymmetrical (may include connectivity matrix attribute)

- Abstract TE topology updates could be sent incrementally

Service Data Model

- Will allow for the client to manipulate provided transport services (set up, modify, replace, delete, etc.) expressed in terms of abstract TE topology

- Multi-service operation may be requested in a single request that may include global optimization objectives and inter service diversity requirements

- Will define various notifications sent to the client (on per-service basis):

    - provisioning, hardware, power equalization failures

    - fiber cuts

    -restoration/reversion attempts status

    - etc.

OAM Data Model

- Will allow for the client to monitor and troubleshoot provided transport services

Policy Data Model

- Will allow setting client specific policies, profiles, templates, defaults, etc.

Thank You