Enabling Virtual Transport Network Service

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OIF OPTICAL INTERNETWORKING FORUM

Outline

- Network and emerging usage
- Virtual Transport Network Service (VTNS)
- Use cases
- OIF role
- Challenges

Verizon Approach

- **Automation**
- **Virtualization**
- **SDN**
- **Increased use of open source software and commodity hardware**
- **Flexible architecture**

  Ensures Verizon is not locked into a single technology or strategy

Verizon Approach (cont.)

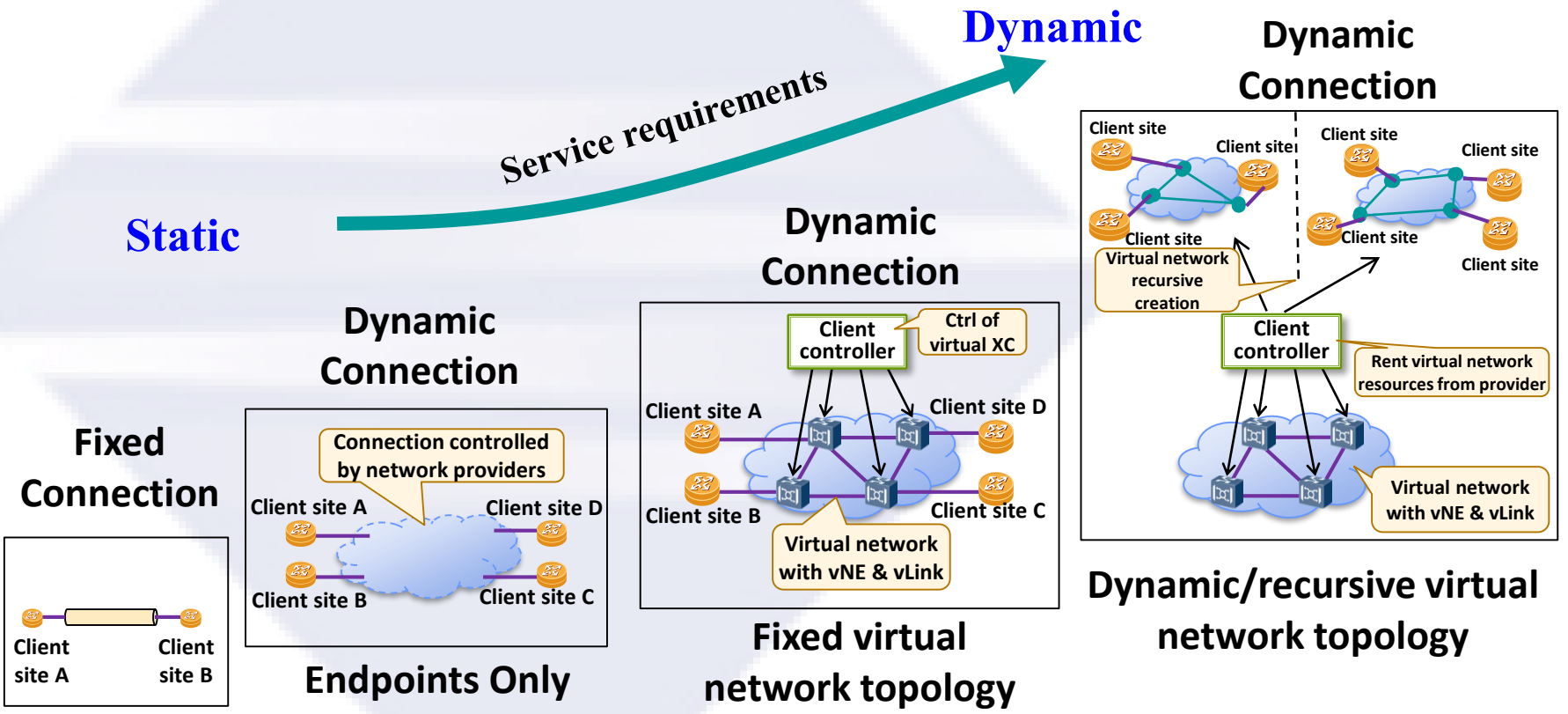
- **Develop Vendor Ecosystem**
  - **Leverage knowledge of some of our key suppliers**
  - **Manage and coordinate SDOs**

Virtualization

- Sharing of Transport Network Resources
  - No dedicated resources
  - Dynamically allocated
- Isolating traffic between different services
  - Limited to service endpoints
- Exposing control at abstract level
  - Varying levels

Virtual Network Service Definition

- Take advantage of virtualization in SDN
- Offer customers controllable network slice



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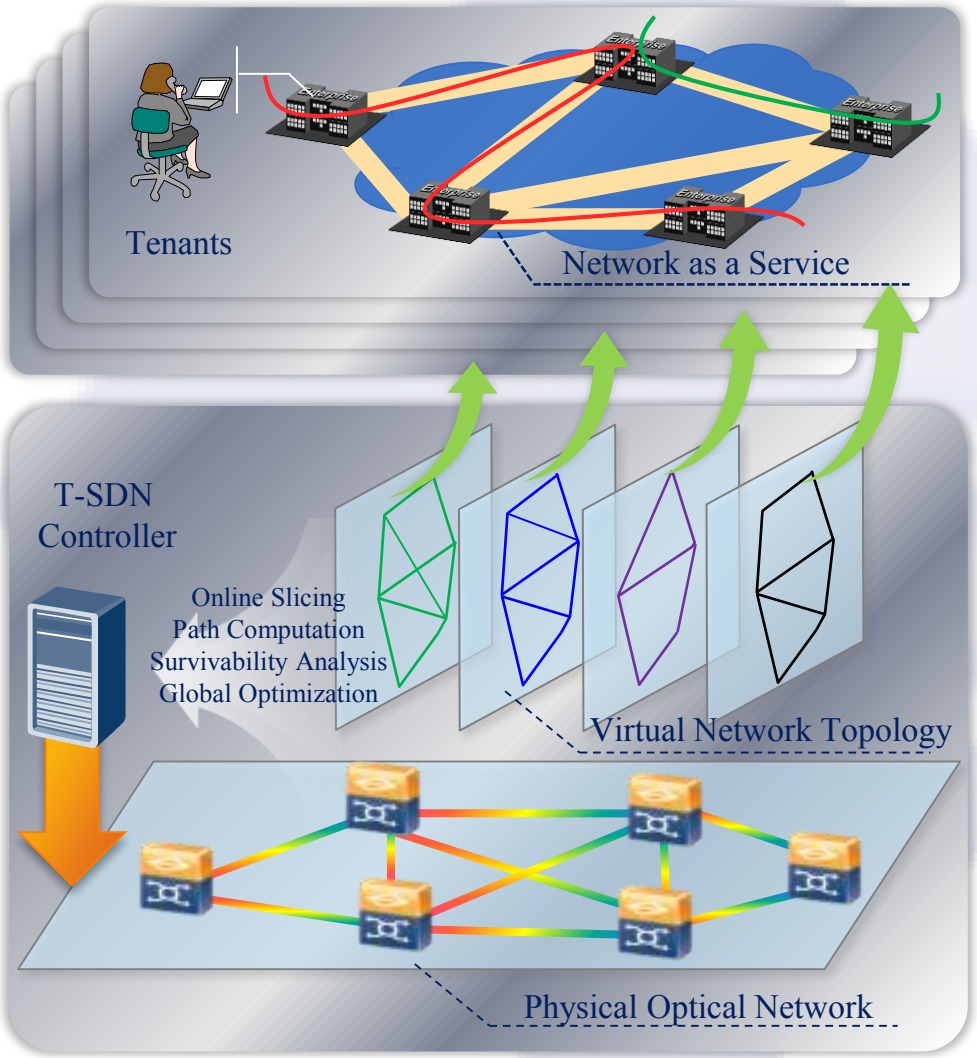
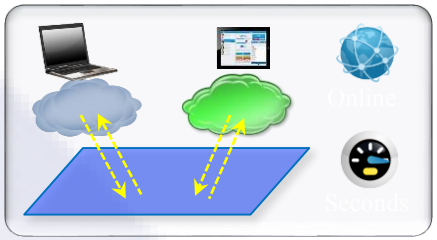
Benefits

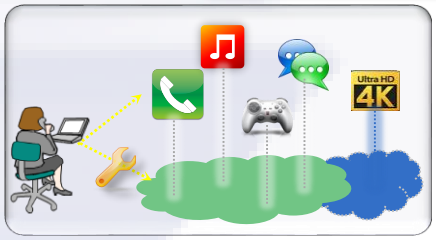


Real Time



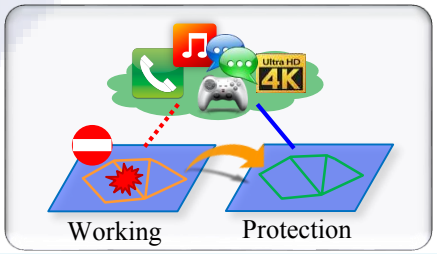
- Request On Line
- Real-time planning
- Real-time setup

Resilient



- Autonomous Control
- Dynamic expansion
- Optimization

Robust



- Multi-level SLA
- Recovery
- Network migration

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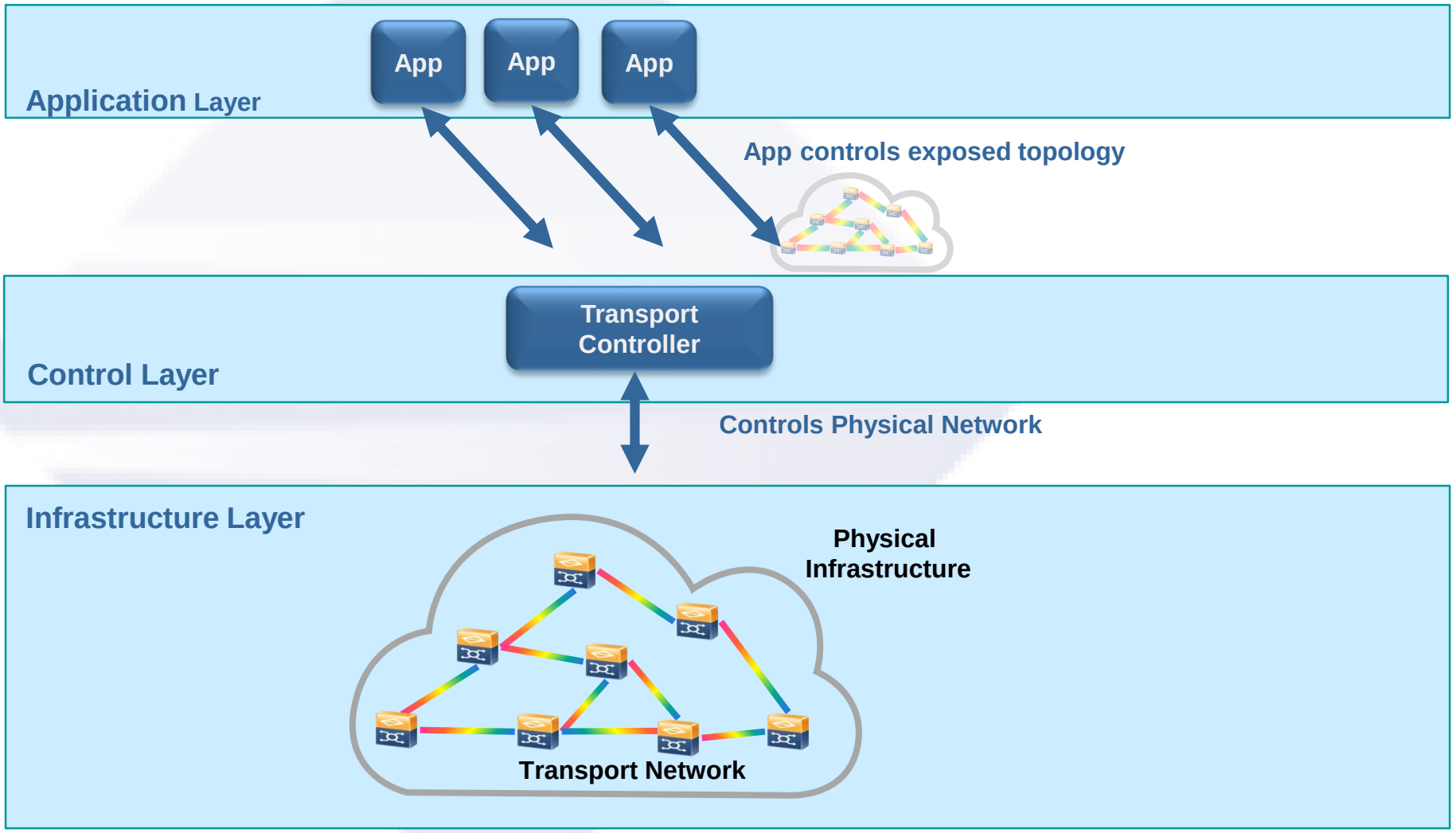
Today's Model for SDN-Enabled Transport Network



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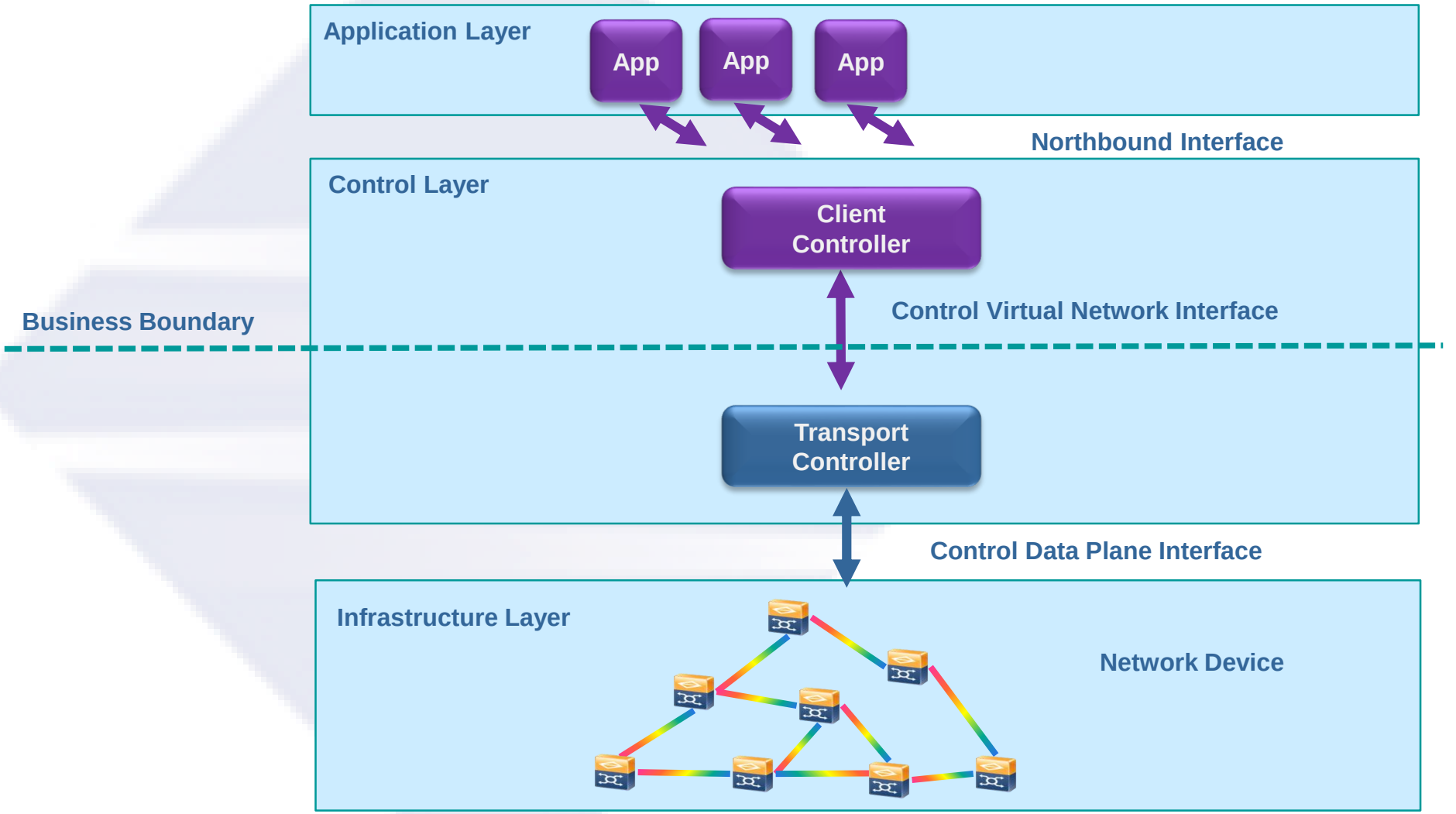
SDN Control & Network Virtualization



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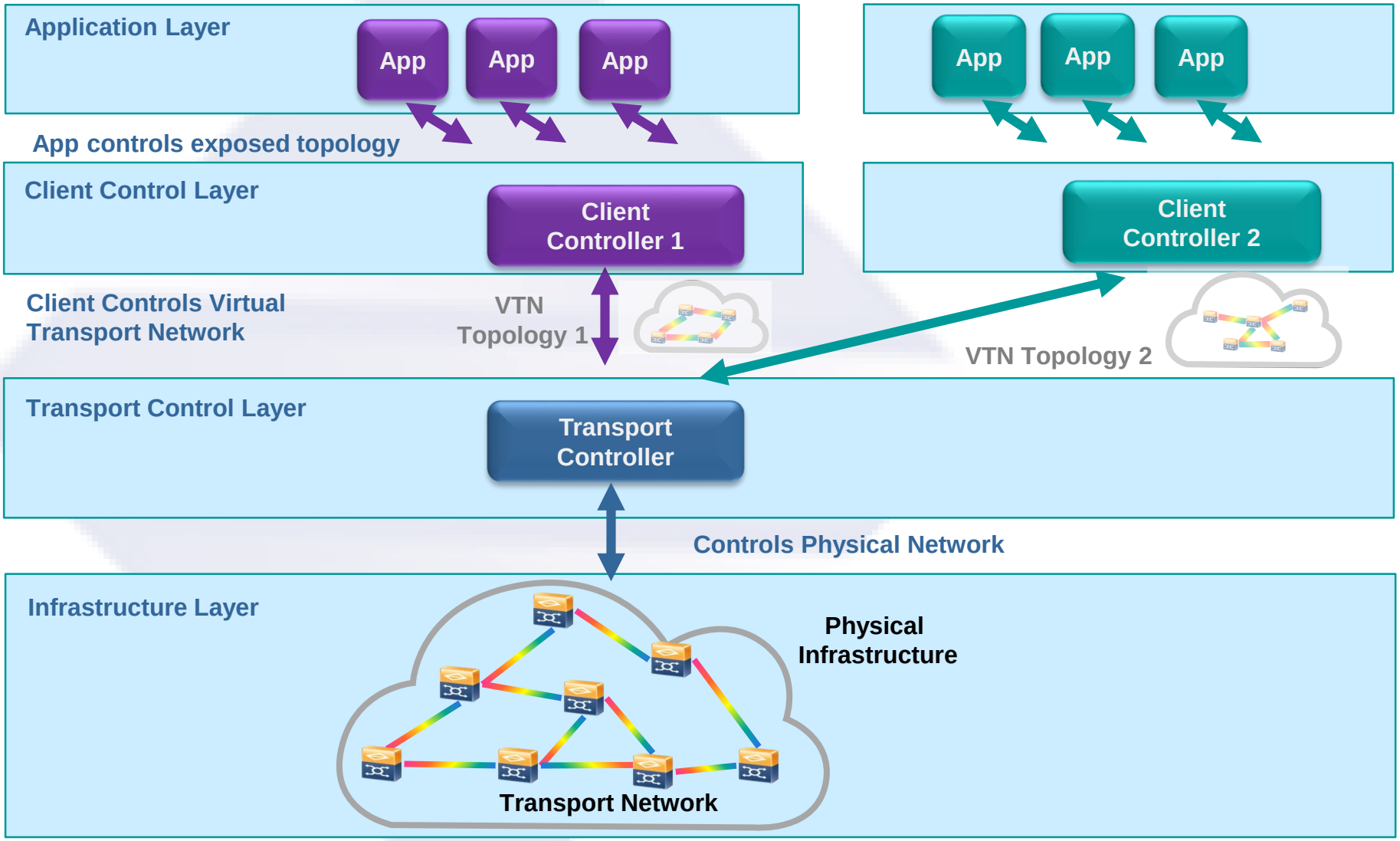
Introducing the Client Layer Control



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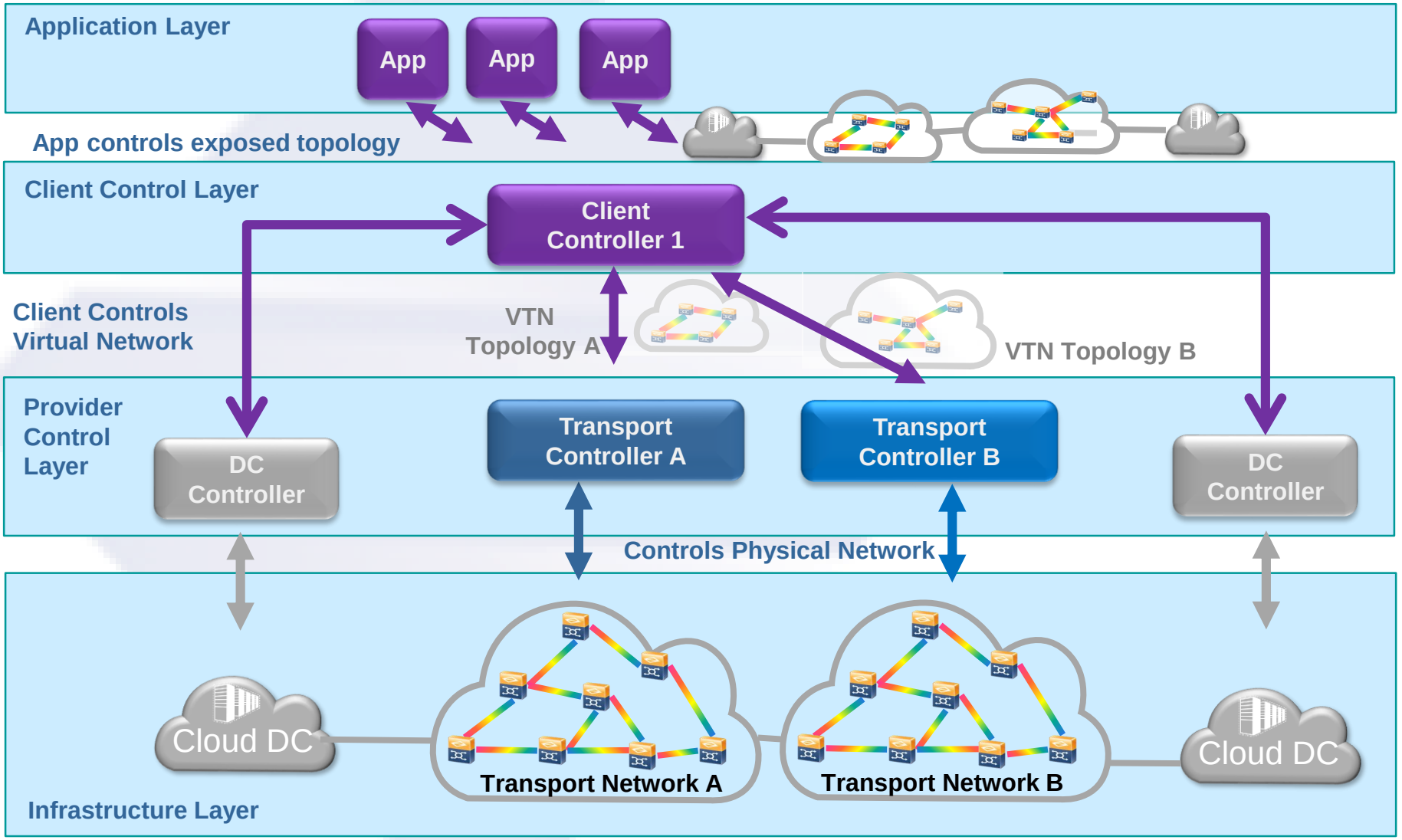
Enables Transport Network as a Service



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Transport Network Virtualization Use Cases

- **Private Cloud**
  - **More dynamic optical tunnels on-demand**
- **Data Center Interconnect (DCI)**
  - **Integrate transport network with DC orchestration**
- **Integrated Packet and Optical Network**
  - **Reconfigure optical domain based on IP**

What is OIF defining?

- **Service Attributes**
- **Service Capabilities**
- **Recovery Requirements**
- **OAM Requirements**

Harmonize Services Definitions for all players, i.e.
Transport Network Services
- **Providers**
- **Users**
- **Equipment/SW Vendors**

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Service Attributes

- **Service**
  - **ID / name**
  - **Service End Points**
  - **Type of Service**
- **Topology**
  - **ID / name**
  - **Service Level Agreement**
- **Connection**
  - **Type of Connection**
  - **TE Parameters**
  - **Traffic Matrix**
  - **Scheduling**
  - **Service Level Agreement**

Service Capabilities

- **Connection – Is the customer allowed to**
  - **Create**
  - **Delete**
  - **Modify**
  - **Query**
  - **Receive automatic status updates?**
- **Topology – Is the customer allowed to**
  - **Create**
  - **Delete**
  - **Modify**
  - **Query**
  - **Receive automatic status updates?**

Challenges

- Operational simplicity
  - On-board new clients rapidly
- Differentiated service delivery
  - Automate resource allocation on the fly
- Scalability
  - Support X transactions per hour
- Security
  - Service isolation and authentication per client
- Continuous Availability
  - Disaster avoidance / recovery
- Current transport business model
- Migration Path
- Many SDOs, Open source activities
- Common Information Model

Summary

- **Changing networking paradigms**
- **Operational issues**
- **Role of SDOs**
- **Monetizing network**