

# A Framework for Automating Service and Network Management with YANG

[draft-ietf-model-automation-framework-00](#)

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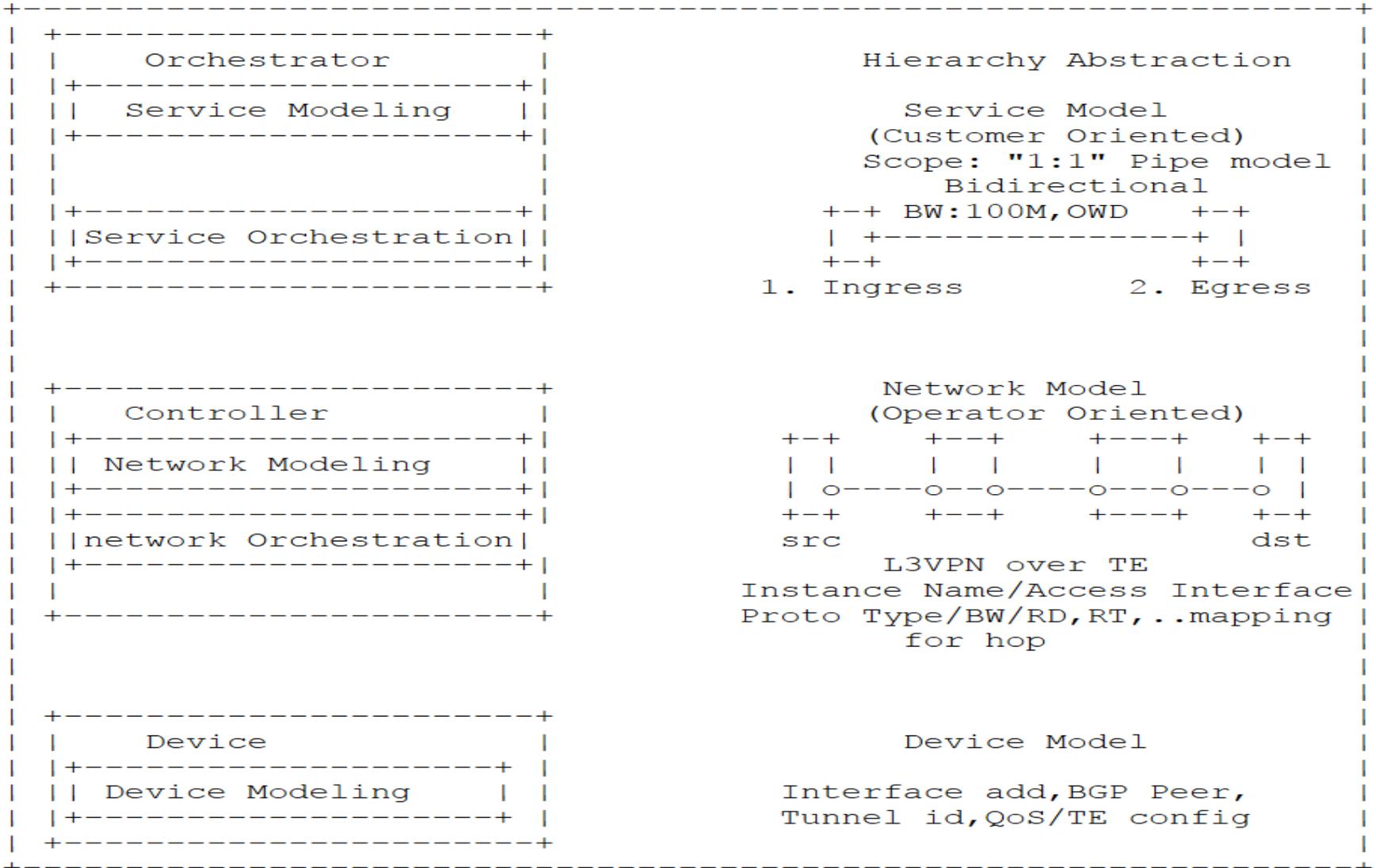
# Introduction

- Discuss YANG model architecture from a network provider perspective for service and network management automation
  - Guidance on how models at different level interconnect and glue together for service delivery and fulfillment
- Articulate common functionality and Concept to be used by multiple models and help operationalizing YANG-based model.
- Exemplify how YANG model put together for service delivery and service assurance

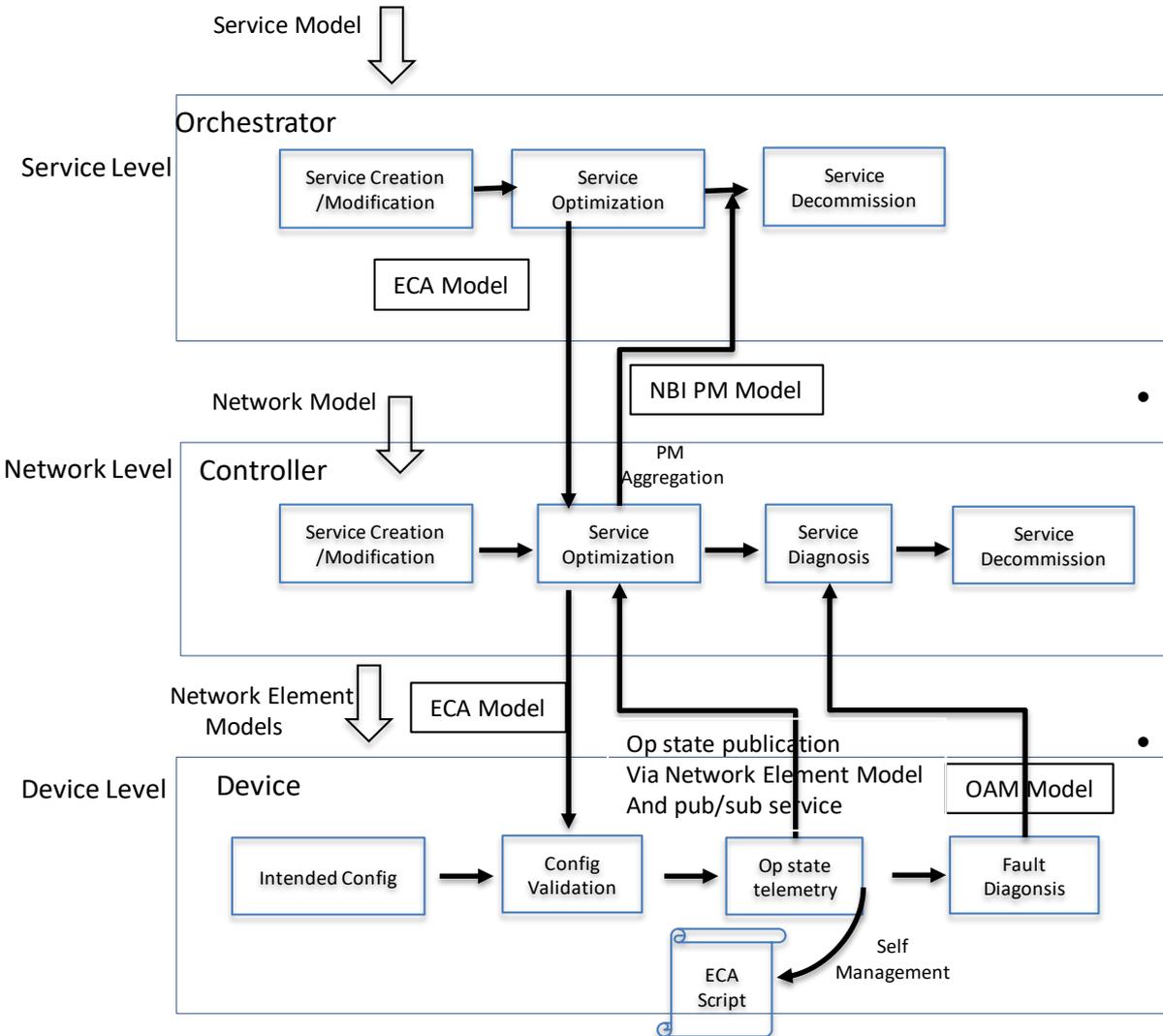
# Current Status

- This YANG model framework draft was adopted in November 11.
  - **draft-ietf-model-automation-framework-00**
- Changes in latest version 00 WG draft
  - v00 – v06
  - v06 - v05
    - Move IETF defined YANG data model standard survey to Appendix.
    - Distinguish how the YANG models are discovered from how YANG models are integrated.
    - Generalize the architecture based on discussion in opsawg session
    - Polish Usage examples.
    - Address terminology consistency issues.
    - Other editorial changes.

# Model Layering and representation



# Model Automation Architecture Overview



## Service lifecycle automation:

- Service Creation/Modification/Deletion
- Service Maintenance
  - Service Assurance
  - Service Diagnosis

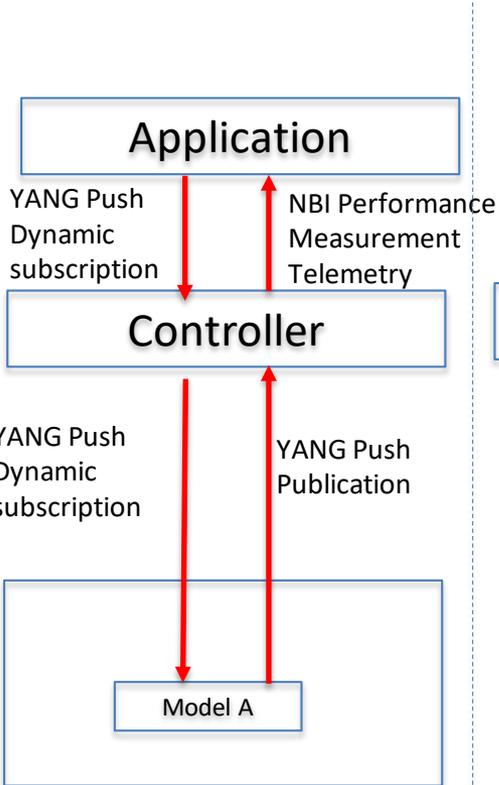
## Closed loop Network management and Network Self Management

- Pub/Sub, e.g., YANG Push
- ECA Policy Management
- NBI Telemetry PM

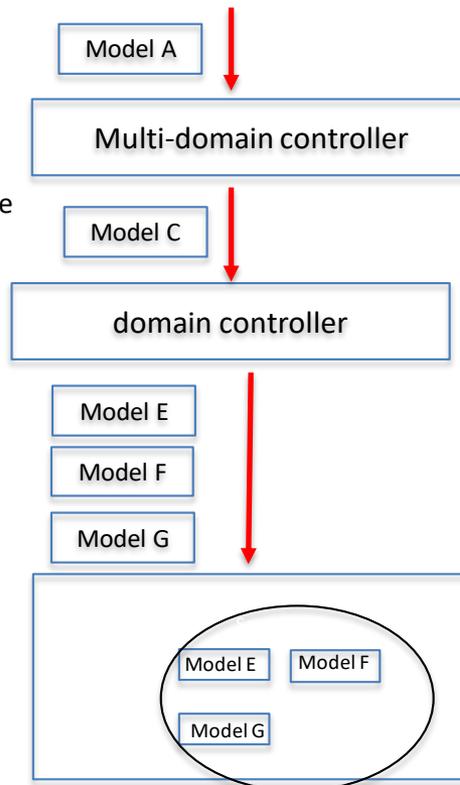
## Different level model translation

- Service to network level
- Network level to device level

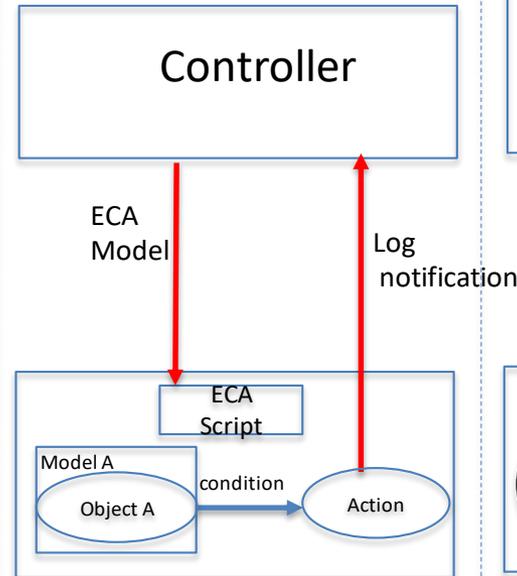
# Interaction between YANG models



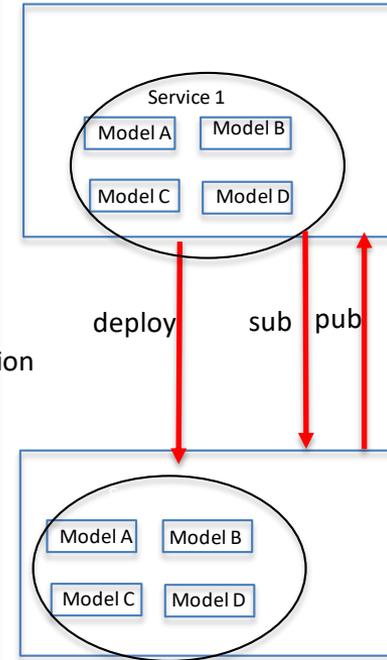
Example A. Interaction between Network Element model And Telemetry model



Example B. Cross layer interaction between service model and network model or between network model and device model

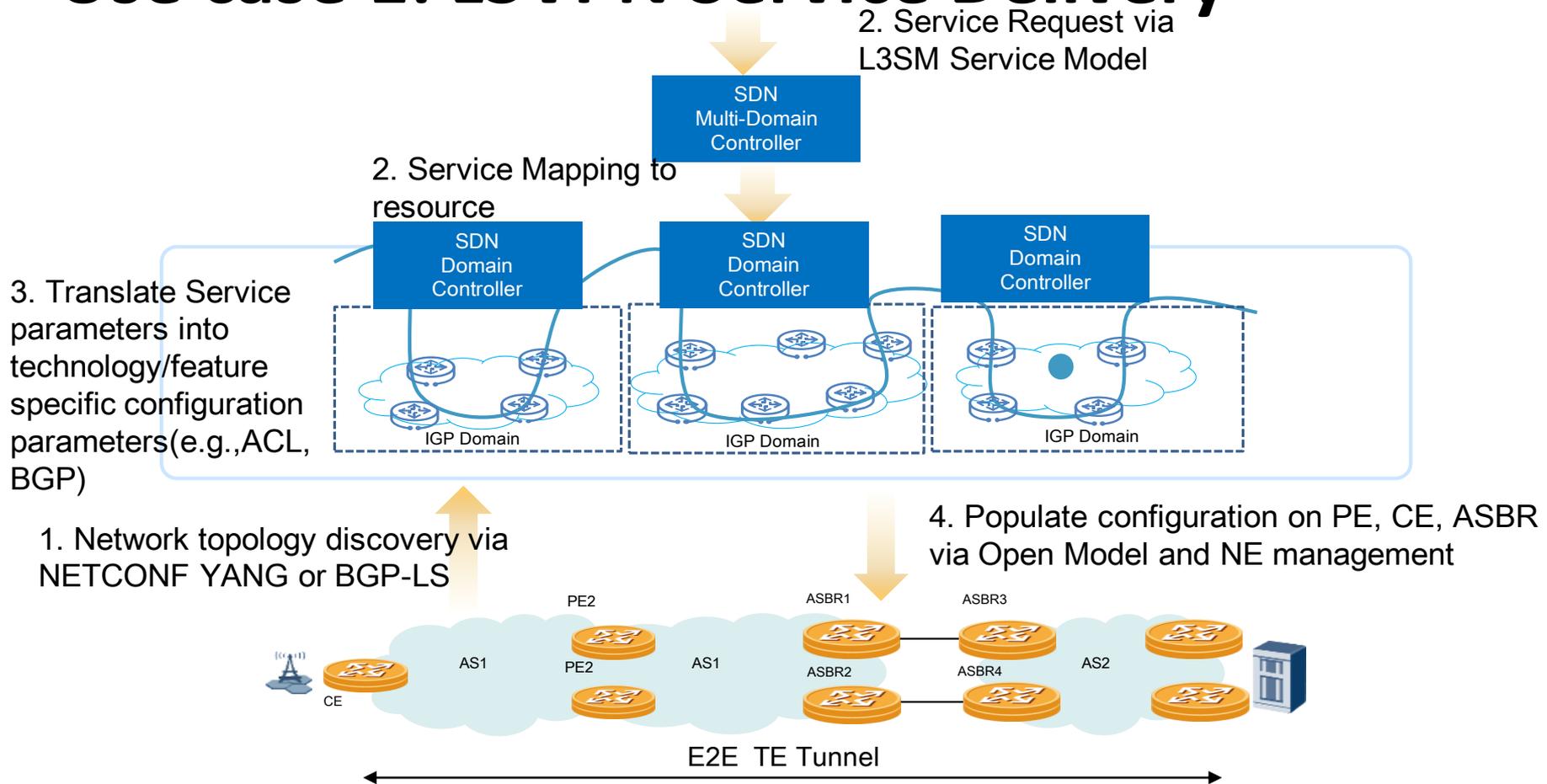


Example C. Interaction between Network Element model And ECA Policy Model



Example D. Interaction between Network Element models Via schema Mount

# Use case 1: L3VPN Service Delivery



## Key Elements:

- Service Creation and Modification
- Service to Resource mapping
- Intent based service requirements and characteristics on connectivity service (bandwidth, latency, packet loss, jitter, etc.).

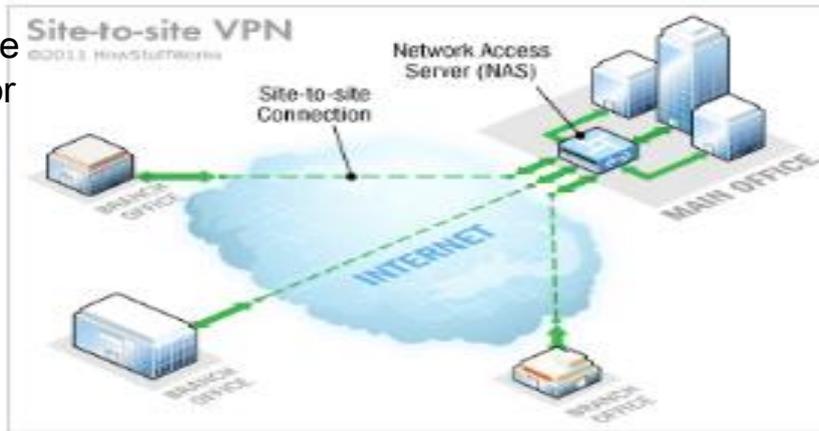
## Key Value:

- Service Agility, facilitate service delivery, Rapid deploy of new service, reduce TTM

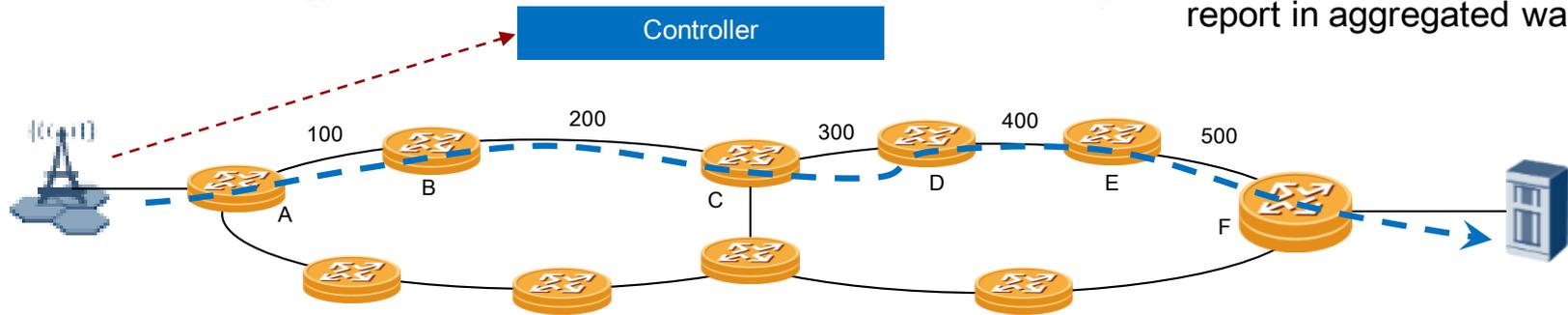
# Use case 2: Real Time VPN Service Monitoring

- 2 Monitor per tunnel network performance via pub/sub model or on demand RPC retrieval model

Node C
Node E
Link 500
VPN



- 3 Optimize network based on VPN service performance monitoring
- 1 Measure per link network performance in the underlying network using MPLS loss and delay measurement method and report in aggregated way.



## Key Elements:

- Augment Network Topo model [RFC8345] with service topo info at network level, site role info at node level and performance measurement info at link level
- Establish the relationship between underlay topology and VPN service topology and bind the VPN service to the tunnel (e.g., SR-TE tunnel)

## Key Value:

- Provide end to end Service Quality Assurance,
- Provide Network visibility and Easy troubleshooting

# Use Case 3: Closed Loop Network Optimization

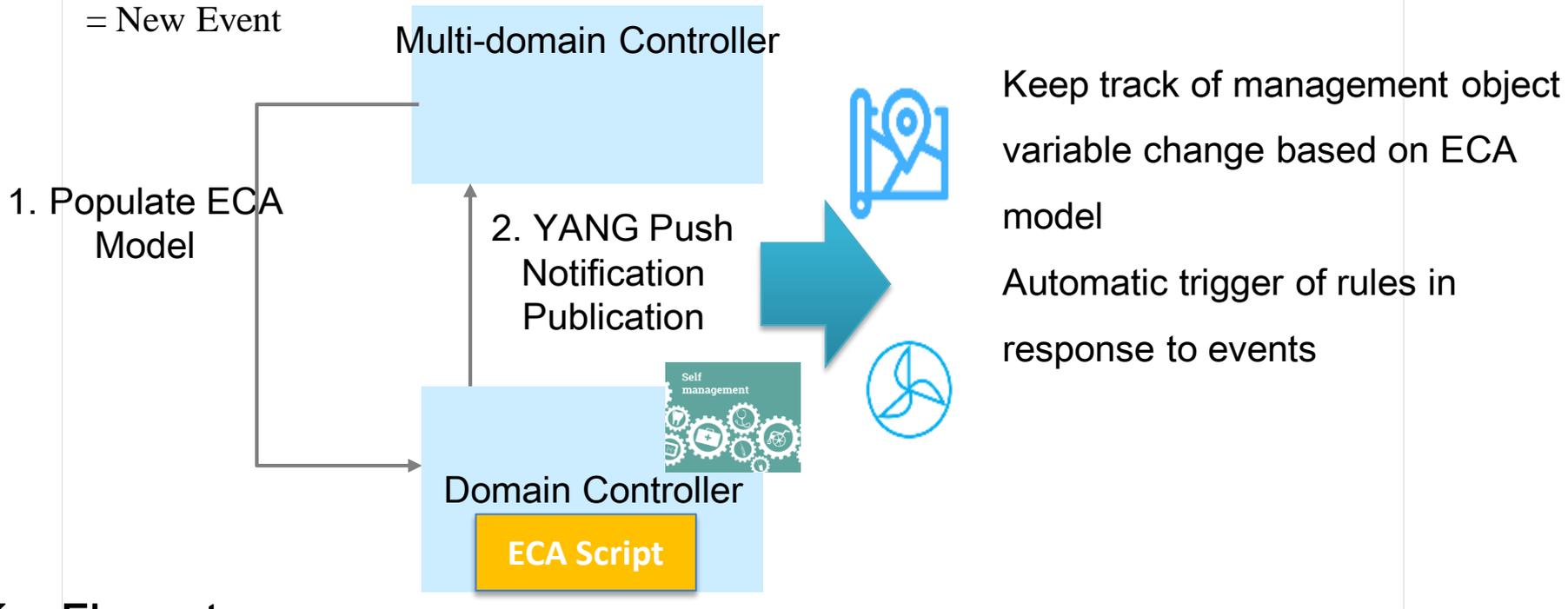
Event: management object state change

Condition:  $A+B > C$

Action = Set Value

= Alarm Notification

= New Event



## Key Elements:

- Common Network ECA Policy Model

## Key Value:

- Provide full lifecycle closed loop Self Service Management
- Facilitate Network re-optimization and troubleshooting, service diagnosis

# Way Forward

- Solicit further feedback on this Framework;
- Keep on polishing and Address issues raised in the meeting if there is any.