

Service Models Explained

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Goal and Motivation

Goal:

- Discuss the scope and purpose of service models within the IETF.
- Clarify the role and position of the service model in the SDN architecture

Motivation:

- Considerable number of YANG data models are used to model devices, e.g., configuration data and operation state
- A small number of YANG models are used to model services (for example, the L3VPN Service Model produced by the L3SM working group)
- Not everybody understand the difference between the device model and service model
- clarify what a service model is not, and dispells some common misconceptions.



Terminologies

Network Operator: a company who owns a network that provides internet connectivity and service.

Customer: Someone who purchase connectivity and other service from a network operator, e.g. the one who operate enterprise network or data center

Service: A service is some form of connectivity between customer sites and the Internet or between customer sites across the network operator's network and across the Internet.

Data Model: model managed objects at a lower level of abstraction and include more details about managed objects.

Service Model: a specific type of data model and describe basic and core service characteristics parameters in a network agnostic way. It can be used by human or a software component to configure or request a service.

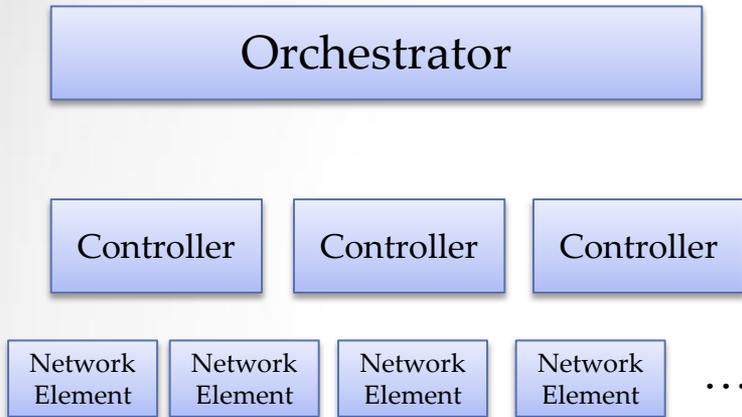
Using the Service Model

- Service models are used on the interface between customers and network operators
 - IETF adopts YANG data modeling language in [RFC6020] to model the service
 - Communication protocol used to exchange service model
 - NETCONF/RESTCONF or API
 - Encoding format used to exchange service model
 - XML/JSON or any other human readable format or machine readable format
- network operator maps the service request into configuration and operational parameters that control one or more network to deliver the requested services



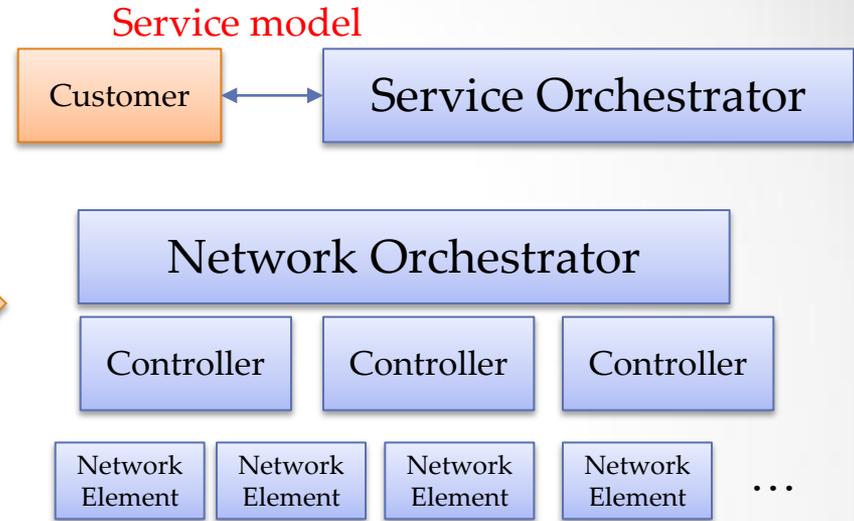
Service Models in an SDN Context

Traditional SDN architecture



- Network elements are programmed by a component called a Controller
- Controllers are instructed by an Orchestrator that has a wider abstract view of the whole of, or part of, a network.

Extended SDN architecture



- Splitting the orchestration function between a "Service Orchestrator" and a "Network Orchestrator"
 - The behavior and functions that a customer requests and the technology that the network operator has available to deliver the service can be separated
 - Service Orchestrator can be network agnostic while Network Orchestrator can be network aware.
 - Service Orchestrator and Network Orchestrator can be operated by different organization.
- The split between control components that exposes a "service interface" is present in many figures showing extended SDN architectures, e.g., RFC7426, RFC7491

Misconception Clarification

- Service in the service model is not “Foo as a service”.
- Network operation is not part of the Service model
 - Expose no details of technology or network resources used to provide the service
 - E.g., point-to-point virtual link connectivity provided by a network tunnel
- The service model might be used between service orchestrator and network orchestrator
 - The service orchestrator should map service model to data model with protocol parameters and device configuration parameters
 - Two model are usually not same.
- Commercial terms are generally not a good subject for standardization.
- Service Level Agreements (SLAs) have a high degree of overlap with the definition of services present in service models
 - SLAs typically include a number of fine-grained details about how services are allowed to vary, by how much, and how often
 - Link with commercial terms

Further Concepts

- Service models should generally be technology agnostic
 - But some technologies reach the customer site do need to be specified
 - Bearer type used between customer equipment and network operator's equipment
 - OAM protocol or routing protocol used between customer equipment and network operator's equipment
- Relation with Policy
 - The policies within a service model are limited to those over which a customer has direct influence, but which are acted on by the network operator.
 - The policies within a service model should be extensible to allow policy component to be added and associated with the service
 - Add the policies that express desired behavior of services on occurrence of specific events
 - This kind of policy is Close to SLA definition
 - Common to all network operator's offering
 - Ad Policies that describe who at a customer may request or modify services (that is, authorization)

Further Concept

- Operator-Specific Features
 - a common description of the services that they offer to their customers should be agreed
 - Standardized model can be developed
 - Operator specific feature can be augmented from standardized model
- Supporting Multiple Services
 - Network operators can offer multiple different services to their customers
 - It is implementation and deployment specific on whether all service models are processed by a single Service Orchestrator or each model is processed by a separated service orchestrator

Q&A

THANK YOU