ESnet

TNC24, Rennes, France

Going Beyond Network Automation Towards Service Orchestration

Scott Richmond

Orchestration and Core Data Group Lead

Chris Cummings

Full Stack Network Automation Engineer

Agenda

- Defining Network Automation and Service Orchestration
- Comparing and Contrasting the two concepts
- Real world examples

Network Automation and Service Orchestration

Definitions

Network Automation

“Automatically perform tasks related to the configuration, management, and operation of network devices, reducing manual intervention, enhancing efficiency, providing feedback to the inputs, and minimizing errors”

Service Orchestration

“Automated coordination and management of diverse network and IT services to ensure their seamless integration, provisioning, and ongoing lifecycle management”

Network Automation Overview

- ***Scope*** is ***narrowly*** focused on automation of network-specific processes
- ***Domain*** is on ***individual tasks*** related to configuration, management and ongoing operation of network devices
- ***Goal*** is to ***reduce*** manual intervention and ***reduce*** errors

Service Orchestration Overview

- ***Scope broadly*** involves Networking and IT services that are Networking adjacent
- ***Domain*** is ***diverse*** services across several IT domains
- ***Goal*** is to ensure ***integration***, ***provisioning***, and ***ongoing optimization*** in the broader IT infrastructure

Key Differences

- ***Scope*** - Automation is narrow, Service Orchestration is broad
- ***Domain*** - Automation is focused on a specific domain, Service Orchestration is multi-domain
- ***Goals*** - Automation is about consistency and efficiency, Orchestration is about integration, provisioning and optimization across domains

Real World Examples

Network Automation Examples

- Applying maintenance mode metrics to a core link
- Generating DNS records for router interfaces
- Rendering network device configuration via templates
- Updating documentation system via network discovery

Service Orchestration Workflow Examples

- Provision a Core Link between routers
- Deploy a L2VPN between multiple sites
- Provide Internet Transit

Core Link Orchestration Cookbook

1. Plan physical connection information
2. Calculate routing metric
3. Reserve Ports in DCIM/NRM
4. Reserve IPs in IPAM
5. Create DNS Records
6. Render/apply configuration
7. Update documentation system
8. Update network monitoring system
9. Run automated testing

L2VPN Orchestration Cookbook

1. Receive customer request
2. Route approvals internally
3. Plan physical connection information
4. Reserve Ports in DCIM/NRM
5. Render/apply network config
6. Update documentation system
7. Update network monitoring system
8. Update billing system
9. Notify customer of completion

Internet Transit Orchestration Cookbook

- Receive customer request
- Route approvals internally
- Plan physical connection information
- Reserve Ports in DCIM/NRM
- Reserve peering IPs in IPAM
- Gather route registry information
- Render/apply network config
- Update network monitoring system
- Update billing system
- Notify Customer

Benefits of Both

- Orchestration ***builds*** on existing automations
- You don’t need everything automated to orchestrate it!
- Sometimes, it’s not worth orchestrating things! (***yet***)

NREN Tools for Service Orchestration

- Workflow Orchestrator
- Lightweight Service Orchestrator

Conclusion

Summary

- Network Automation is good - we need more of it!
- Service Orchestration is the next level that includes Automation!

Check out our community hub!

Wed, Thurs 1000-1030

https://workfloworchestrator.org/