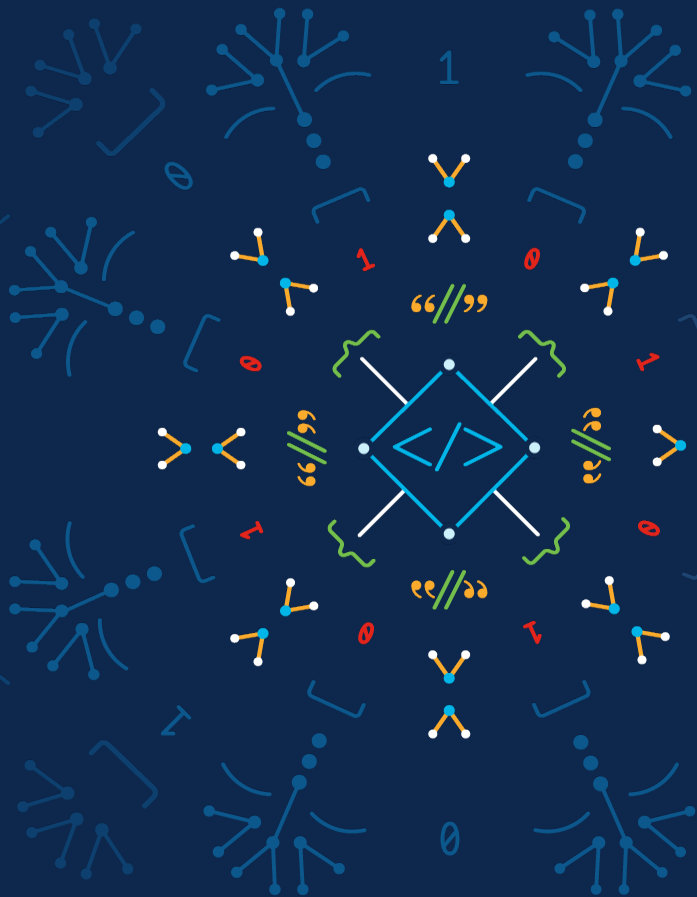


Dish SDN Controller

Reference Architecture and Use Cases

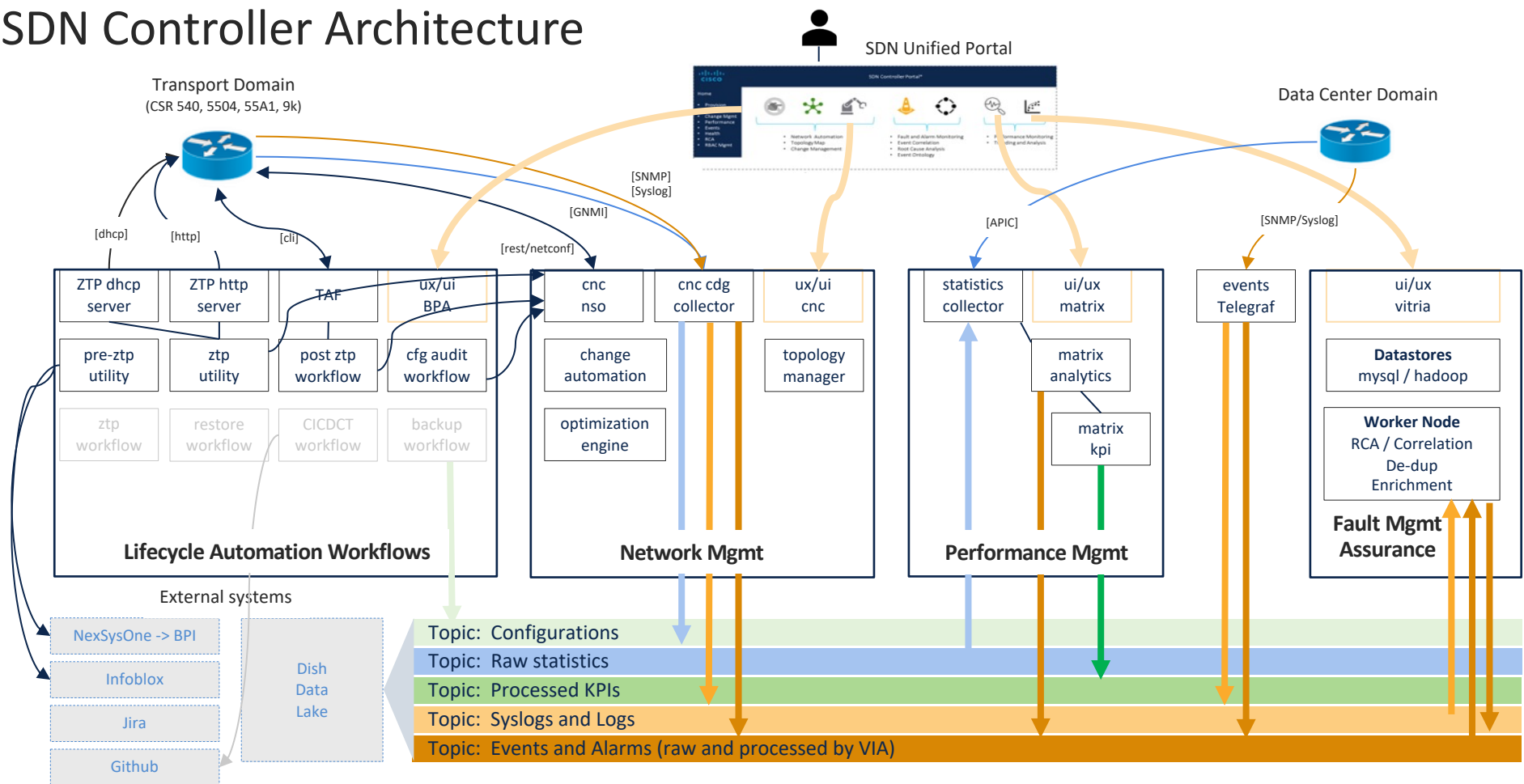
Debashis Kundu, Weigang Huang
Customer Delivery Software Architect
10/2022



Agenda

- SDN-C Architecture
- Automation Solution Overview
- Dish Use Case Deep Dive
 - Close Loop
 - vRouter OS upgrade
 - ZTx
- Overlay Service Config Management

SDN Controller Architecture



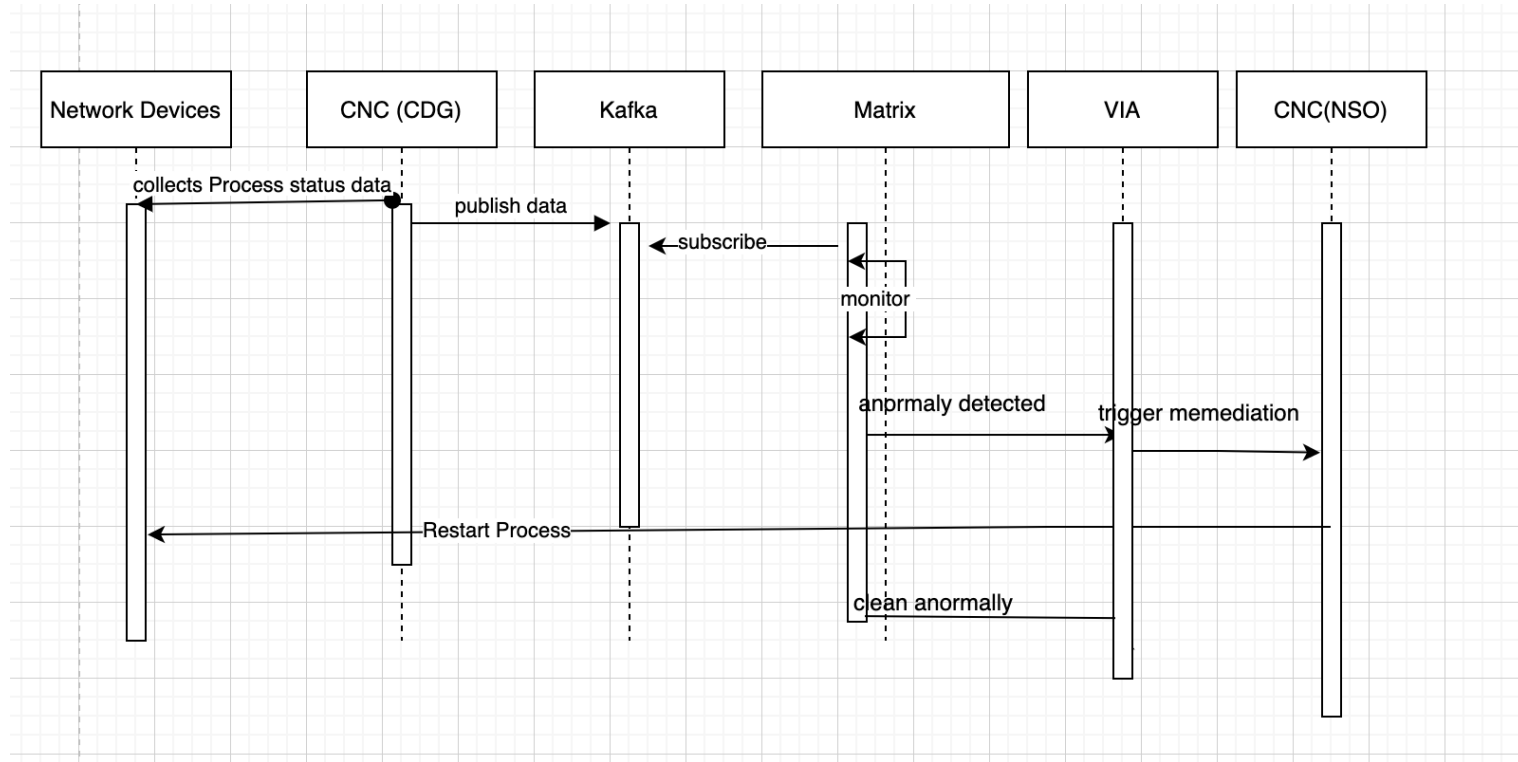
Use Cases (Network Management)

- Topology Manager
- Data collector
 - Distribute to kafka
 - Matrix/VIA consumes data for FM and PM
- CoE for path optimization, NSO for SR-TE, L2/L3 VPN for 5G slicing (WIP)
- Change Automation
 - Device Configuration Management with pre/post checks
 - Device SMU/image management
 - Network remediation (as part of close loop self healing network)

Automation Use Case: Close Loop Remediation

- Dish Requirement: self-healing network
- Combine SDN-C's observability with automation
 - CNC(CDG): telemetry data collection
 - Kafka: streaming/message bus
 - Matrix/VIA: Anomaly/FM detect and remediation trigger
 - CNC(CA and NSO): Remediation action execution
- 14+ close loop use cases defined
 - Example: Memory leak -> process restart

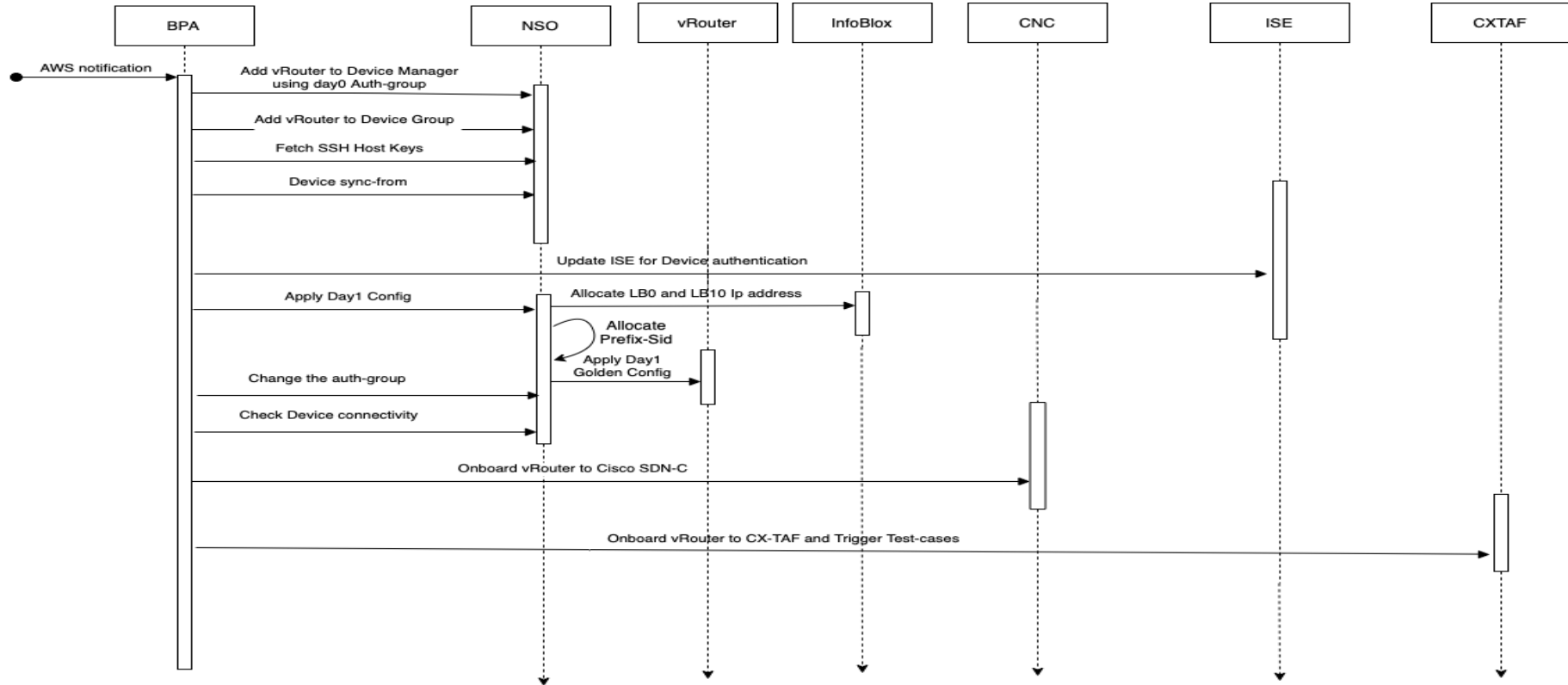
Memory Leak Remediation



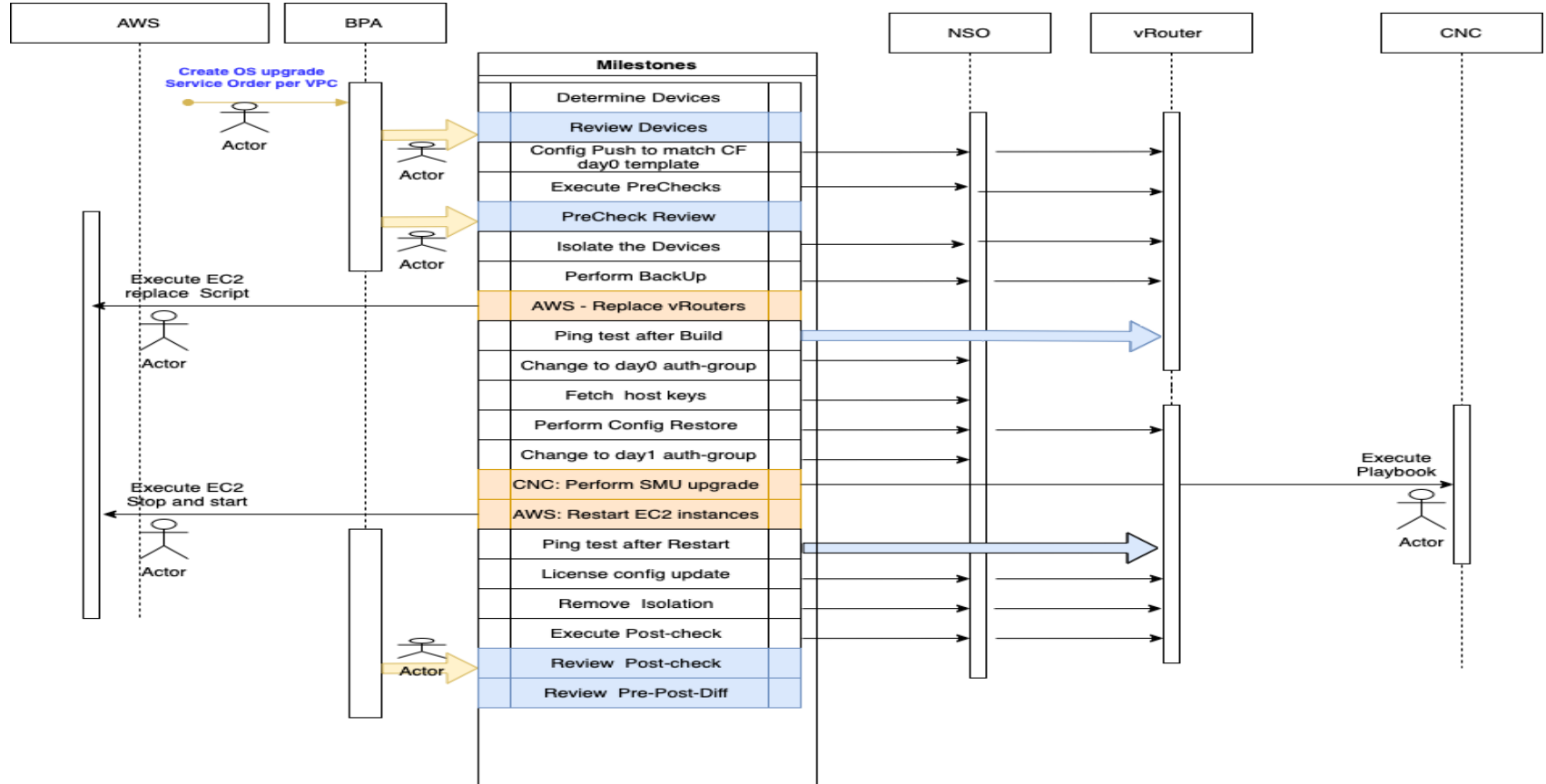
Use Cases (Lifecycle Automation Workflow)

- ZTx - Device onboarding and activation
 - Day1 and day2 config (Overlay config)
- Config Compliance audit and remediation
 - Config-let based audit
- Config Backup to Git
- Device OS upgrade
 - On-prem
 - vRouter
- Device Config life cycle management
 - Mass scale config changes for config template update

Use Case: AWS vRouter onboarding call-flow



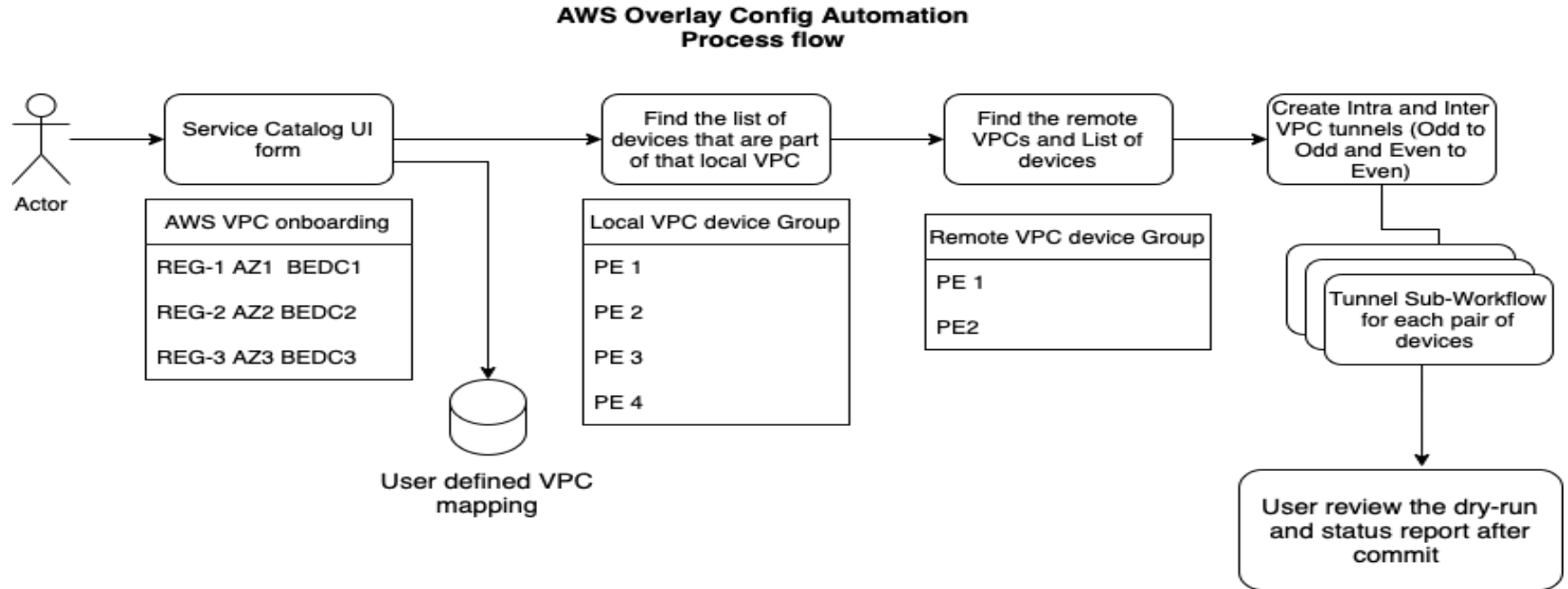
Use Case: AWS vRouter OS upgrade Integration call-flow



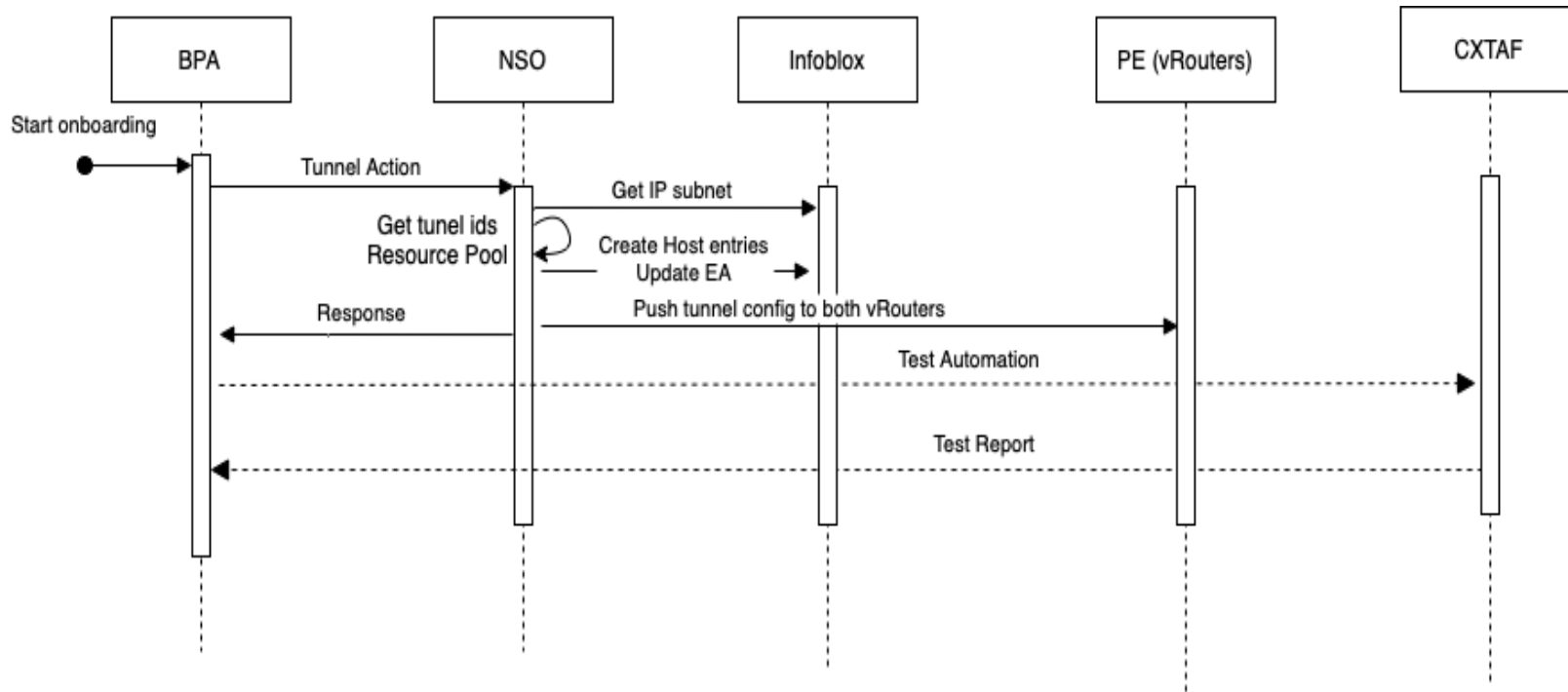
Use Case: Change Automation Play Example (SMU Upgrade)

▼ Pre Maintenance 2/2		
1	Execute show commands on IOS XR/XE device(s)	✓
2	Verify package consistency on router	✓
▼ Maintenance 4/4		
3	Perform DLM node lock on device(s)	✓
4	Install add package(s)	✓
5	Install activate package(s)	✓
6	Install commit package(s)	✓
▼ Post Maintenance 2/2		
7	Verify package in committed list on router	✓
8	Execute show commands on IOS XR/XE device(s)	✓

Use Case: AWS vRouter Overlay Config automation



Use Case: AWS vRouter Overlay Config Call-flow





The bridge to possible