DevOps in Service Chains and 5G Network Slices

ETSI OSM PoC #1
Telenor, Arctos Labs, Intel, Netrounds, RIFT.io
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ESTI OSM PoC #1 Participants

- Service Provider sponsor:
  - telenor

- Vendors involved:
  - Intel
  - netrounds
  - RIFT.io

- Open Source MANO Release ONE:

- System Integrators involved:
  - ARCTOS LABS
Ensuring good customer experience is a top priority for service providers.

But - networks are becoming more complex with more frequent changes.

“How do you ensure the service you are delivering is meeting the quality that the customer expects?”

- Heavy Reading, recent OSS/BSS Transformation article
PoC Drivers

1. **Design time:** End-to-end validation required when building new service chains
   - Prior to publishing NSDs to the catalog

2. **Run time**
   1. The chain must be activation tested as part of the fulfilment process.
   2. Prior to customers are on-boarded
   3. The chain must be constantly monitored that it provides its functionality according to SLAs
      1. Prior to customers detecting issues

3. **Frequent changes** will occur to service chains during the life-time
   1. No time to manually test and validate that changes will not break anything
   2. Testing has to be programmable and automatable

4. **Assurance capabilities must be designed** into the lifecycle management of every service chain
PoC Overview – What If You Could?

Validate the SLA
- At time of deployment
- Before handing over to customer
- Deliver birth certificates

Discover Issues Earlier
- Get insight of service quality from end-users’ view
- Get guidance when prioritizing issues

Resolve Problems Faster
- Understand at which layer problems occur
- Understand which parts of the network are affected

Collecting counters from your infrastructure will not solve the above
PoC Overview – Active Testing Enables

Validate the SLA
• Generate real world traffic – before end users
• Deliver birth certificates to stakeholders

Discover Issues Earlier
• Generate multi-layer traffic from end user locations
• Monitor active traffic with second resolution

Resolve Problems Faster
• Use remote testing capabilities
• Automate advanced test scenarios
• Test across layers, services and domains

Active test traffic is required to achieve the above
• What is service assurance?

Functionality, characteristics as seen by client

VNF VNF VNF

Traffic

Only aggregating NFVI KPIs from the VNFs to the Network Service does not tell how the service is working:
- No traffic before customers are using it, too late
- No service KPIs

Active tests at the service layer
Assuring Expected QoS Levels with Active Measurements
PoC Architecture and Demo Flow
PoC Architecture

Orchestration

Netrounds Control Center

UI

API

Test Orchestration

VNF vTA1

VNF1

VNF2

VNF3

VNF vTA2

NFVI Compute Host

Intel NFVI

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PoC Architecture – Key Details

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NSD Design

Orchestrate Virtual Test Agents as part of NS orchestration

Active test traffic part of NSD Instantiation

Continuous NS monitoring after instantiation
PoC Demo Flow
Slice Instantiation
PoC Demo Flow

1. Onboard VNFs and design NS packages
2. Onboard images/VMs
3. Instantiate NS
4. Start VNFs/vTAs + Stitch chain
5. VTA call home

Use OSM’s NSD Primitives
6. Service Instantiated
7. Run activation test
8. Start Active Monitoring
9. Read Network Service SLA Status

XML-RPC

RIFT.io

Orchestration

Open Source MANO

Netrounds Control Center

VNF vTA1
VNF1
VNF2
VNF3
VNF vTA2

NFVI Compute Host

Intel NFVI
Activation Testing Execution
Tests and Monitoring

Passed Activation Tests

Ongoing Monitoring
Detailed Activation Test Reports

MWC Demo Slice1 Activation Test - 0

Resp. time min (ms) | Resp. time avg (ms) | Resp. time max (ms) | SLA | ES total | ES timeout | ES response
--- | --- | --- | --- | --- | --- | ---
0.22 | 0.3 | 0.35 | 30s (100%) | 0s (0%) | 0s (0%) | 0s (0%)

10:20:30.2 - mn_Netrounds_vntd_2_zeh1 (IPv4)

Graphs

1.2.2 HTTP
Test agents
Clients: mn_Netrounds_vntd_2_zeh1 (IPv4)
General
URL: https://www.mobileworldcongress.com
Time between requests (s): 1.0
Thresholds for errored seconds (ES)
Ongoing Active Monitoring
• Needed “proxy” VNF in order to represent NS
• as first class citizen. NS can not have stand-alone monitoring parameters.
OSM Launchpad: Real-time SLAs
Key PoC Takeaways
Key PoC Takeaways

1. 5G network slice deployments require different, critical SLAs that must be met depending on slice use case.

2. Active service testing and monitoring that is orchestrated, fully automated and provides DevOps flexibility is needed.

Arctos Labs, Netrounds and RIFT.io have developed **ETSI OSM PoC #1** with Telenor on Intel Architecture to showcase solution.
Thank you!

Please feel free to reach out to PoC team at kaela.loffler@netrounds.com should you have any further questions.