ONAP "VNF Developer" Experience

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ONAP Developer Forum

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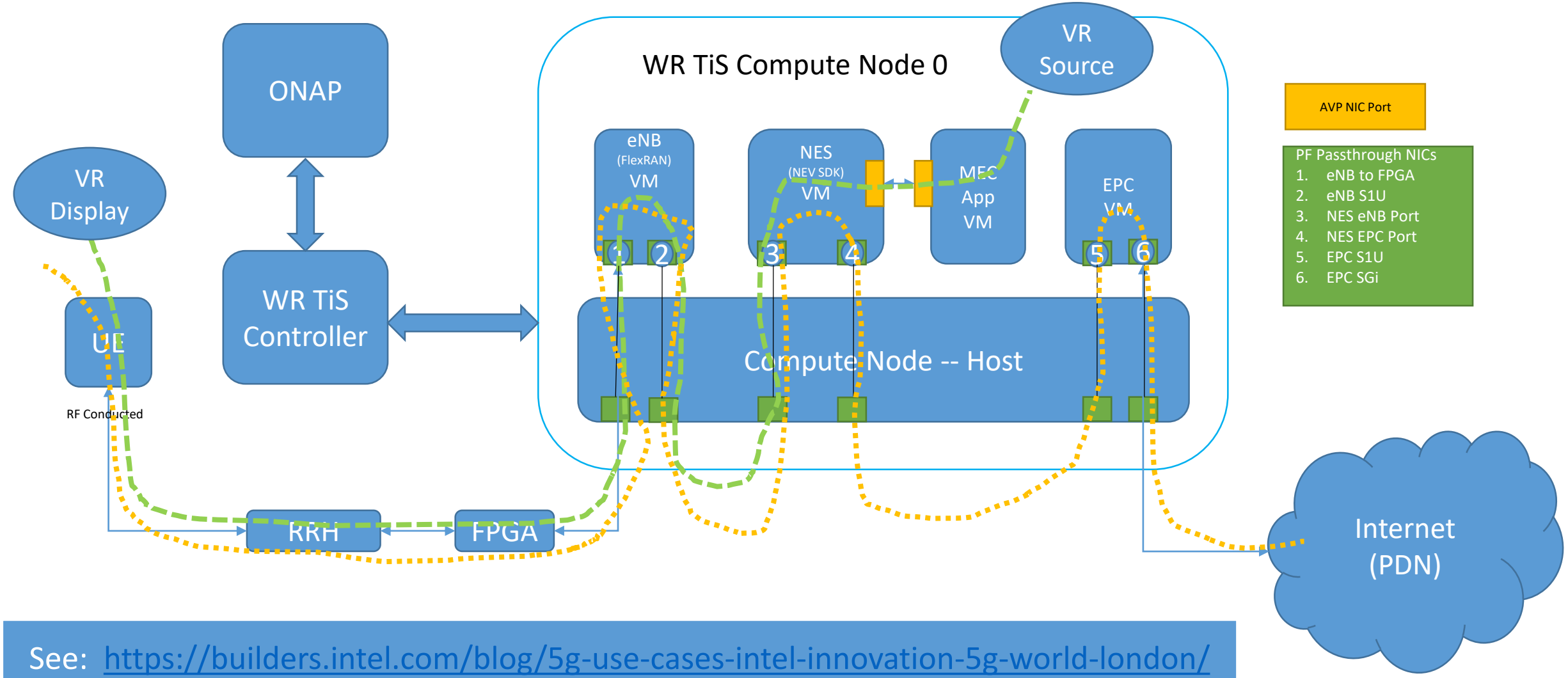
Context

- We have VNFs
  - Reference platforms – e.g. FlexRAN, NEV SDK, etc.
- We have ONAP experience
  - Contributions to Amsterdam and Beijing

- The Goal:
  - Demonstrate the reference FlexRAN VNF orchestrated with ONAP
    - VNF Packaging
    - ONAP Onboarding
    - Service Creation
    - Orchestration

More challenging than expected

End to End Demonstration Setup



See: https://builders.intel.com/blog/5g-use-cases-intel-innovation-5g-world-london/

Outline of the FlexRAN Orchestration Solution

- Create: ONAP Service
  - Heat template
  - Single VM
    - Networks preconfigured
    - Other parameters part of the Heat template
  - Cloud-init for handling configuration and startup of the application
- Out of scope
  - PNF or VNF ?
  - HPA (still under development in Beijing release)
  - Events (e.g. VES)
  - LCM

Key Milestones along the Way

- Infrastructure Setup
- VNF Packaging
- Onboard the VNF package
- Service creation
- Service orchestration

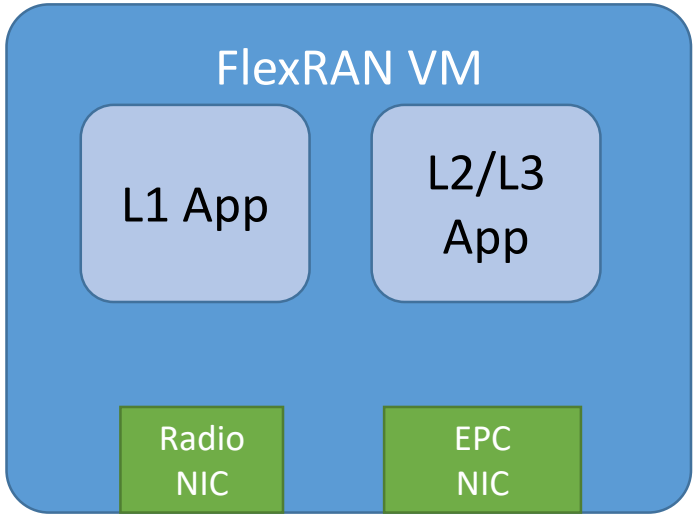
Infrastructure Setup - VIM

- VNF already being demonstrated WindRiver TiC
- Trickiest part - setting up our own instances in the lab
- Some planning is required
  - Networks for the use case
  - Networks for management
  - Access to Internet, VNFs
  - Dealing with proxies
  - Multiple users?
  - Cloud-init

Moderately challenging
Skills: Infrastructure planning, setup, VIM, ONAP

VNF Packaging

- Heat template
  - Follow ONAP conventions
- ONAP Management
  - Used cloud-init support instead of LCM
- Parameters
  - E.g. # antennas, Application configuration



Not hard - but, it was fairly simple
Skills: VNF Packaging Requirements, Modeling, Heat (cloud-init), (or TOSCA)

Infrastructure – ONAP Installation

- Started with OOM installation of Amsterdam
- Tricky to install
  - Pulling scripts from JIRA
  - Sequencing - Pods not always working after “up”
    - E.g. SDC always came up unhealthy – needed to be restarted → VNC Portal
- Extra – for the demo, we moved our ONAP installation around
  - Proxy settings
  - Internet access

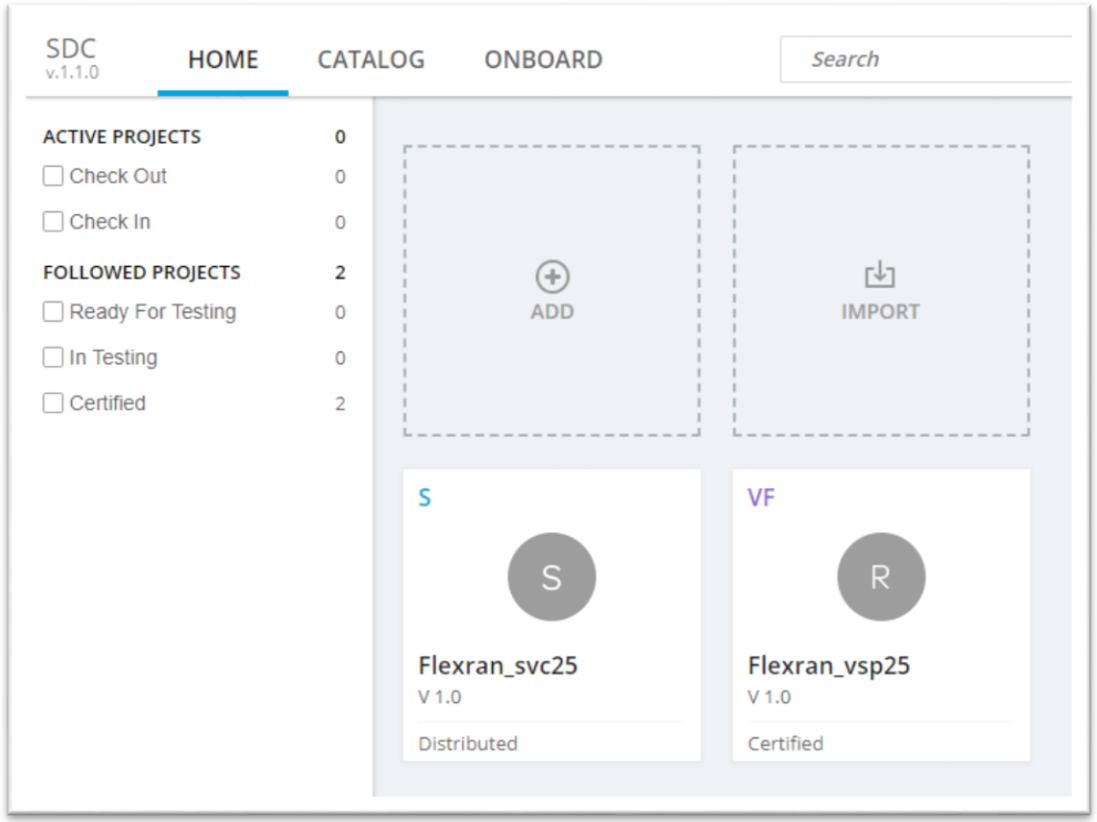
Challenging

Skills: REST, Kubernetes, Rancher, Helm, docker, ONAP internals

Suggestions: common logging, use of K8s, Postman collections

VNF Package Onboarding

- Pretty much followed posted demos from Amsterdam
- DataModel ?
  - VLM
  - VSP
  - VF
- Some of the steps felt extraneous



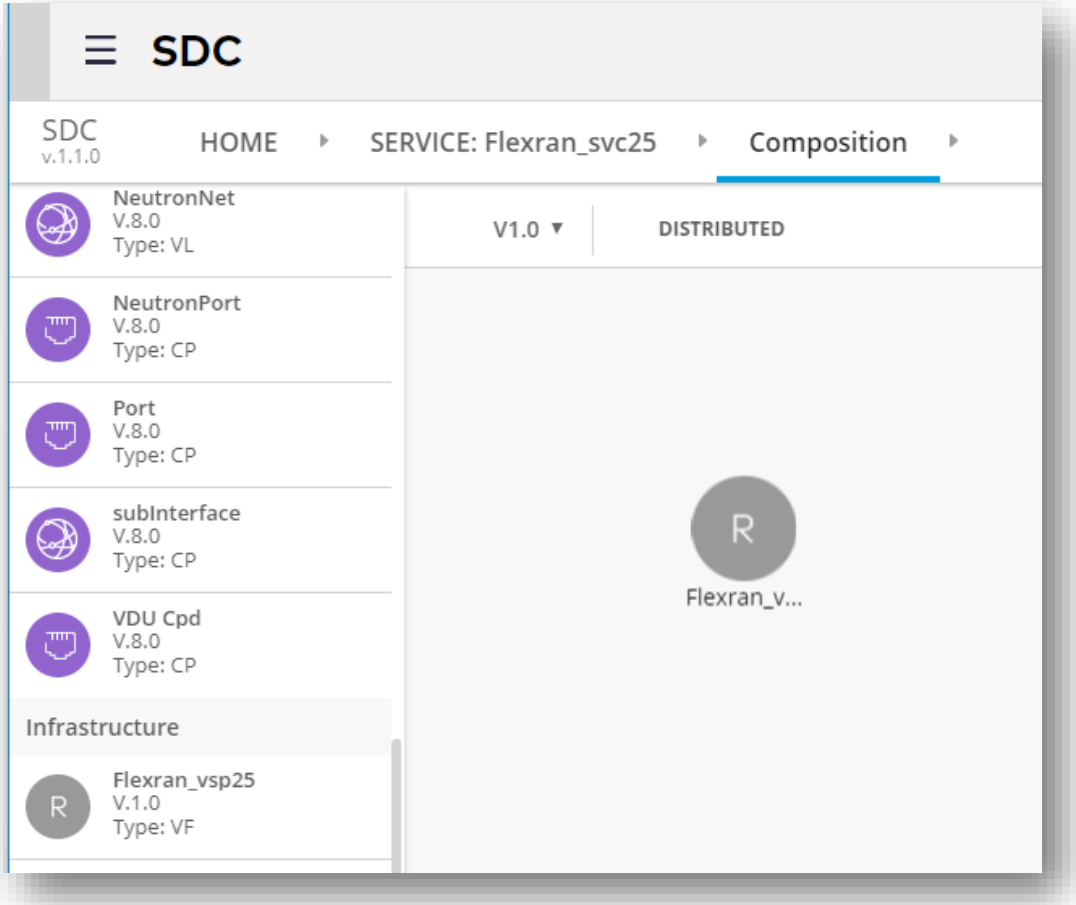
Easy

Skills: VNF models

Suggestions: Documentation, streamline flow, UI

Service Creation

- Again – followed the demos
- Pretty easy – not a complex service
- Confusions:
  - Effect of choices along the way?
    - E.g. generic network function, L1-L3, etc.
- Sticking Point – Service Distribution
  - It said it worked – but it didn't (or wasn't complete)
  - Debug was challenging – fixed by re-installing



Service Creation – Easy; Distribution - Challenging

Skills: Kubernetes, docker, ONAP internals

Suggestions: Unknown errors? Documentation

Service Orchestration – Initial Preloads

- Cloud Region
- Service Type
- Customer
- Confusions:
  - Service Type
  - In some cases, demo scripts set up some of these things

Moderately Easy
Skills: REST, json, ONAP Data Model
Suggestions: Documentation, Postman collections

Service Orchestration

- How to do it? Postman MSO, VID, … ?
- Found the VID to be the easiest way to go (first success)
  - Service Instance creation – with VID ☺
  - VNF instance creation – with VID ☺
  - SDNC preload with ODL apidocs ☹
    - We scripted eventually, but why?
  - VF Module creation – with VID ☺
- Lot's of cutting/pasting
  - Scripting reduced it a bit
  - How to know this bit of one thing goes to that bit of another thing?
- Bugs – had to restart an mso docker container occasionally, etc.

Challenging

Skills: REST, Kubernetes, docker, ONAP internals

Suggestions: common logging, use of K8s, Postman collections

ONAP features and capabilities not fully exercised …

VNF LCM

- Seemed like a good way to support:
  - Specific application selection/configuration
  - Start/stop of applications
  - Etc.
- Recommended to start with cloud-init

- Started looking into this on the side / in parallel
  - Starting with an OpenStack action
  - Haven’t got it working yet

Events

- VNF did not generate ONAP-ready events
- Amsterdam OOM – no DCAE support anyway
- What we did do:
  - Used the VES evel library to create some events:
    - Detect L1 or L2 application crash
    - Heartbeat

HPA

- FlexRAN requires HPA
  - CPU pinning
  - Hugepages
  - PCI pass-through
  - Etc.

- Too soon to test with Amsterdam
  - Addressed with Flavors

Beijing Release

- Needed for some of the features – but postponed trying until the release
- Attempts to install have commenced

Misc

- SDNC, APPC Directed Graphs
  - We saw these being used with the vCPE use case
  - This use case didn’t need – where to start if it did?
- Service Workflows
  - Can you make your own?
  - How to know which one is being used / how to pick?

BKMs

- Get help from someone who's done it before
  - Community, partner, online resources
- Expect to spend some time
  - Developing the various skills
  - Learning ONAP internals

Enhancements

- Clear, detailed documented examples would be great
  - There's high level architecture
  - Detailed API docs exist – how to use not always clear
  - All the steps laid out, not embedded in automated scripts
- Documentation
  - Readthedocs – quickly goes out of bounds (?)
    - Ecomp references
    - Wiki pages

Thank You

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