



LFN Developer & Testing Forum

ONAP Support for Vertical Industry

R7 Output & R8 Plan

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Introduction

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Executive Summary – Vertical Industry is one of the greatest potential 5G markets. Unlike traditional 2C scenarios, where the consumers of OSS are CSP internal operation staff or BSS system, in 5G area operators need to provide O&M capabilities for potentially multiple vertical industries consumers. This requirement propose to help operators to manage multiple vertical industry networks using ONAP. In R8, it will contain the following scenarios: a) One centralized operator ONAP only manages multiple vertical industry networks established by operators, and b) One centralized operator ONAP manages both vertical industry networks and traditional mobile networks (e.g. slicing).

Business Impact - Vertical industry networks contain various combinations of resources, such as VNFs, PNFs, and service instances. Providing one unified OM platform is the most efficient way to satisfy various vertical industry's requirements. ONAP can be a great automation management platform for 5G vertical industry.

Business Markets - All operators and service providers that want to use ONAP to support the management of vertical industry networks.

Funding/Financial Impacts - Reduce the operation expense while providing Network O&M service for different vertical industries.

R7 PoC: ONAP with Intent for Vertical Industry

Scenario Description:

An e-commerce and smart logistics company A has multiple warehouses in a city and its Warehouse-F is a smart warehouse. Two base stations (BS 1& 2) are deployed to support the connections of AGVs to 5G Network for Warehouse-F. Each base station was pre-configured three cells. Assuming that each cell can support the connections of 100 AGVs.



At normal time, the output volume of Warehouse-F is about 30000 per hour. It requires:

- Active AGV: 300
- Active Cell: 3

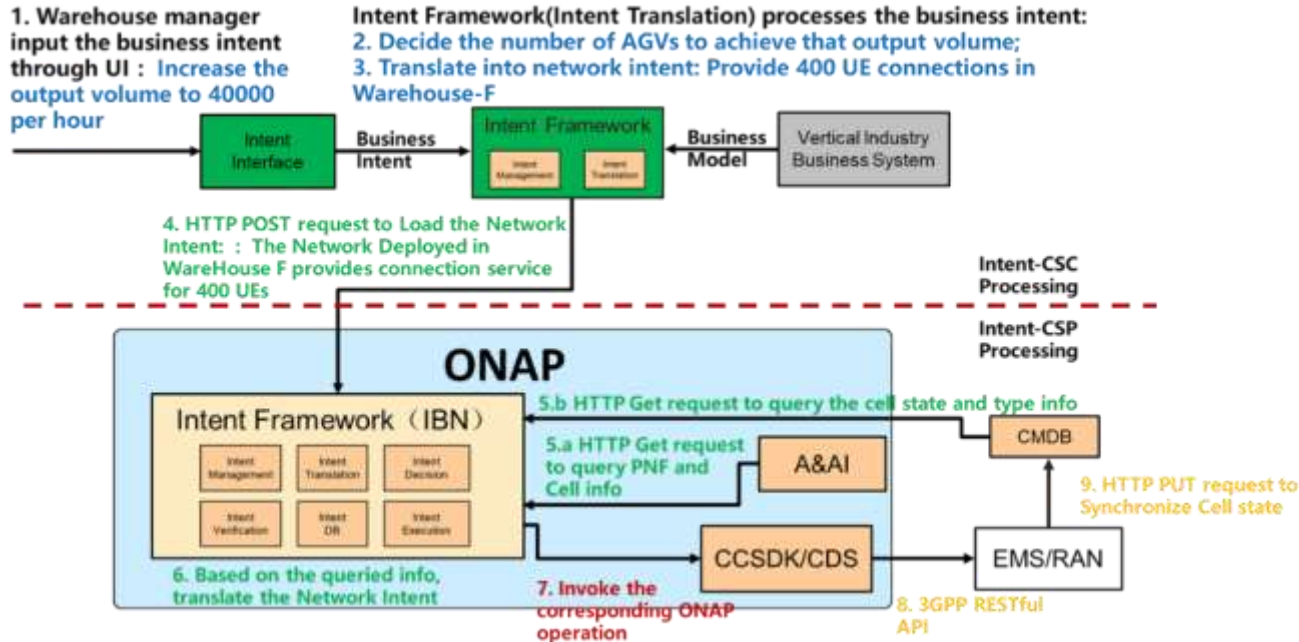


At peak time, the output volume of Warehouse-F is about 40000 per hour. It requires:

- Active AGV: 400
- Active Cell: 4

R7 PoC: ONAP with Intent for Vertical Industry

Scenario Demo:



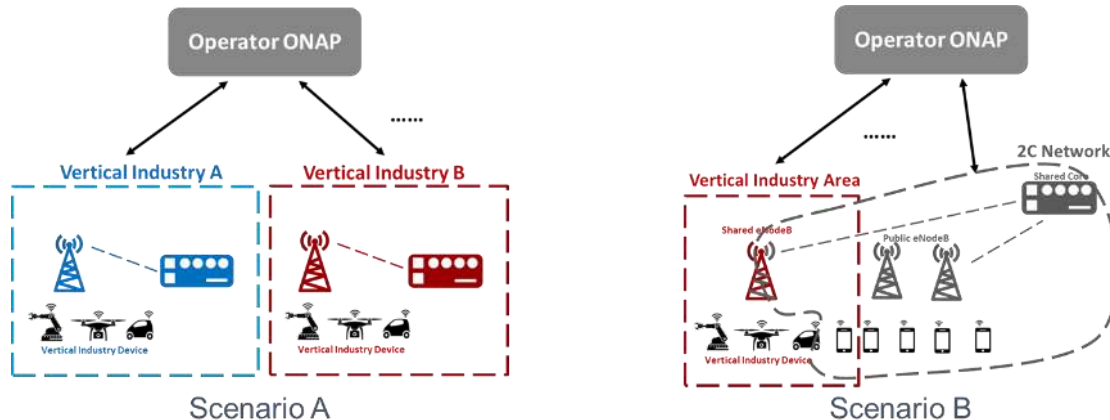
Intent Technology can help vertical industry manage 5G network to satisfy their business needs:

- Vertical industry staffs can be aware of business intent only, and Intent Framework can do intent management at different levels
- To achieve the network intent for the demo, it is easier to use the existing components (such as NRM restful executor in CCSDK/CDS and provisioning MnS simulator in Integration).
- Model-driven is a very good feature in ONAP, such as controller blueprint of CDS and A&AI data model.

R8 Plan: Support for Vertical Industry (Scenarios)

ONAP supporting for vertical industry has two typical scenarios:

- Scenario A: One centralized operator ONAP only manages multiple vertical industry networks. Some medium/large-sized verticals may want operator to help them build separate vertical industry networks. Operator ONAP provides centralized O&M capabilities.
- Scenario B: One centralized operator ONAP manages both vertical industry networks and traditional mobile networks. Some small/medium-sized verticals may rely on operators to deploy necessary network devices in their vertical area and share some network resource with operator network (2C Network). Operator ONAP needs capabilities to manage shared resources and provide O&M services for both.



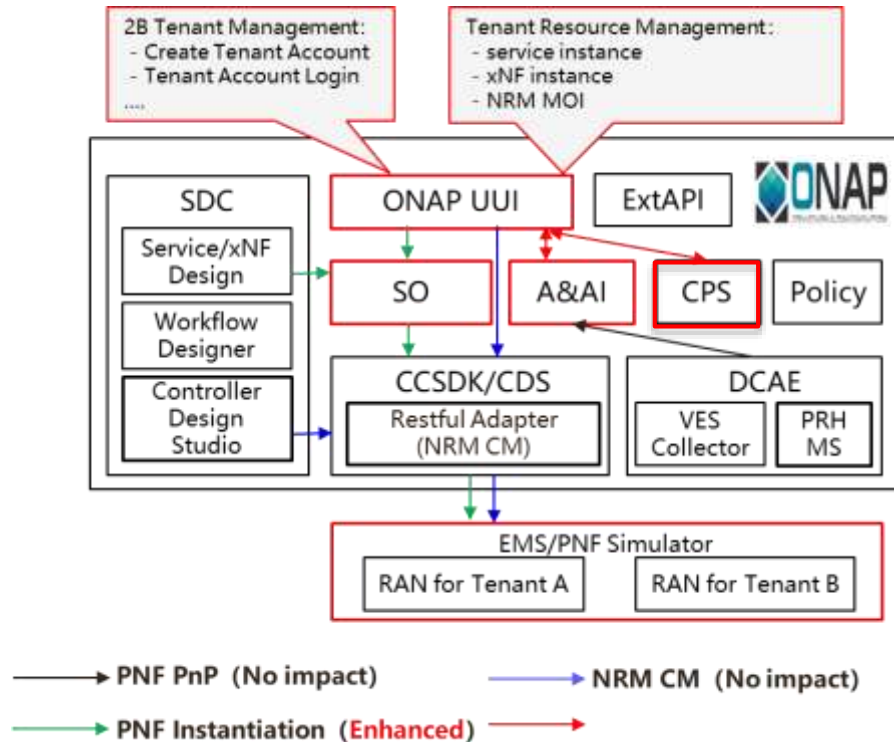
R8 Plan: Support for Vertical Industry (Requirements)

- Tenant management and isolation for Vertical Industry
 - Enhance A&AI Schema for vertical industry tenant, including basic tenant profile:
 - Add schemas for vertical industry tenant profile. Those schemas describe the base info about vertical industry tenant:
 - ◆ vertical industry tenant unique ID info
 - ◆ vertical industry description info
 - ◆ vertical industry location info
 - ◆ relation between resource and vertical industry tenant
 - Enhance the schema for PNF. The PNF schema should include the info which can be used to map the PNF resource to some tenant account (e.g. location info).
 - Isolate resources from different vertical industry tenants. Associate the isolated resources to the corresponding vertical industry tenants.
 - Implement permission control for different vertical industry tenants by leveraging Multi-tenancy in ONAP. For example, in Scenario A, PNF is owned and managed by operator, but vertical industry tenant also has permission to access PNF resource data.

R8 Plan: Support for Vertical Industry (Requirements)

- Provide centralized user interface in UUI for different vertical industry tenants:
 - Allow vertical industry to create tenant account and query/update tenant info.
 - Allow vertical industry to associate the isolated resource to the corresponding tenant.
 - Allow vertical industry tenant to access their own data, including resources and necessary configurations.
- Enhance service instantiation procedure with specified tenant and necessary vertical industry area (aka. specified locations).
 - Adding necessary building blocks or workflows for service instantiation in ONAP SO.

R8 Plan: Support for Vertical Industry (Use Case)



Pre-conditions:

- Create two tenant accounts for vertical industry A and vertical industry B.
- Design and publish Service/PNF/Workflow for vertical industry tenants.
- Design and publish corresponding CDS Blueprint.

Steps:

1. Two vertical industry tenants query the current resource instance separately (None).
2. Operator activate and complete PNF PnP/Instantiation for vertical industry tenant A. During the process, PNF1 will be associated to the tenant account of vertical industry A based on location info automatically.
3. Vertical industry tenant A query the current service/PNF instance (pnf-1).
4. Operator activate and complete PNF PnP/Instantiation for vertical industry tenant B. During the process, PNF2 will be associated to the tenant account of vertical industry B based on location info automatically.
5. Vertical industry tenant B query the current service/PNF instance (pnf-2).
6. Operator implement the NRM configuration for PNF1 and PNF2 (e.g. gNB Function & NRCell).
7. Vertical industry tenant A query the current gNB & Cell MOI info (gNB & Cell MOI info in pnf-1).
8. Vertical industry tenant B query the current gNB & Cell MOI info (gNB & Cell MOI info in pnf-2).



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