

R10 5G SON use case

Use Case Overview & Description

The objective of this case is to develop an ONAP-based SON platform using the ONAP Optimization Framework (OOF). The use case focuses on the various information models and flows/interfaces between components to enable various SON functions to be realized. It also focuses on platform enhancements such as enhancements to the Control Loop framework (e.g., Control Loop Co-ordination, different types of targets for Control Loops, etc.), enabling ML-based SON, etc.

Use Case Key Information

TOPIC	DESCRIPTION	WIKI PAGE
Requirements Proposal	This is a link to the requirements proposal made on the Requirements Sub-committee	ONAP_OOF_SON_R10_Requirements_2021117_v1.1.pptx
Architecture S/C info	Information on the Architecture sub-committee presentation	Wiki page
Prior Project "Base" Wiki	Link to the Honolulu release page for this use case	R8 5G SON use case
Requirements Jira (REQ-###) Ticket	Link to the REQ Jira ticket for this use case	 REQ-1042 - 5G SON use case enhancements for Jakarta release DONE
Key Use Case Leads & Contacts	USE CASE LEAD: N.K. Shankaranarayanan , krishna moorthy USE CASE KEY CONTACTS: N.K. Shankaranarayanan krishna moorthy	
Meetings Register & Recordings	Link to Use Case Team meetings.	<ul style="list-style-type: none">Recent: SON use case meetingsOlder: OOF-SON Meetings

BUSINESS DRIVER

Executive Summary

SON (Self-Organizing Networks) functionality is an essential part of existing 4G mobility networks, and will be even more critical for 5G. SON enables automation to improve network performance and efficiency, improve user experience, and reduce operational expenses and complexity. The objective of the OOF-SON (new name for OOF-PCI) use case is to develop an ONAP-based SON platform using the ONAP Optimization Framework (OOF). We have taken a phased approach since SON is complex, and SON for 5G is still evolving. We started with the Physical Cell Identity (PCI) optimization SON use case in Casablanca, then added some centralized Automated Neighbor Relations (ANR) aspects in Dublin. In Frankfurt, we addressed some enhancements such as basic CM-notify handling (as preparation for O-RAN alignment), adaptive SON, etc. In Guilin, we introduced use of AI/ML by onboarding an offline-trained ML-model to ONAP which will provide additional inputs to PCI optimization based on historical PM data, and stabilized the functionality in Honolulu. In Istanbul, we will align FM messages with relevant standards, move to new 3GPP NRM-based yang models and leverage CPS for RAN configuration.

Business Impact

SON is an essential feature in mobility networks, and relevant to every operator. Any ONAP-based network deployment for 5G will benefit from an ONAP-based SON solution, which provides a disaggregation of SON functions into modules aligned with the ONAP architecture. Operators and vendors will both benefit from the ability of vendors to bring best-in-class solutions to each module, while leveraging the benefits of a community-supported open platform. This will enable faster development of innovative solutions. The approach taken could very well be evolved to address SON use cases whose scope extends beyond just the RAN.

Business Markets

SON for 5G is relevant to all 5G operators and markets.



Funding/Financial Impacts

SON functions reduce Opex since the automated self-organizing functions are an efficient approach to continuously optimize network configurations to improve performance and respond to network conditions.

Organization Mgmt, Sales Strategies

There are no additional organizational management or sales strategies for this beyond whatever is required for ONAP deployment to support 5G.

Development Status

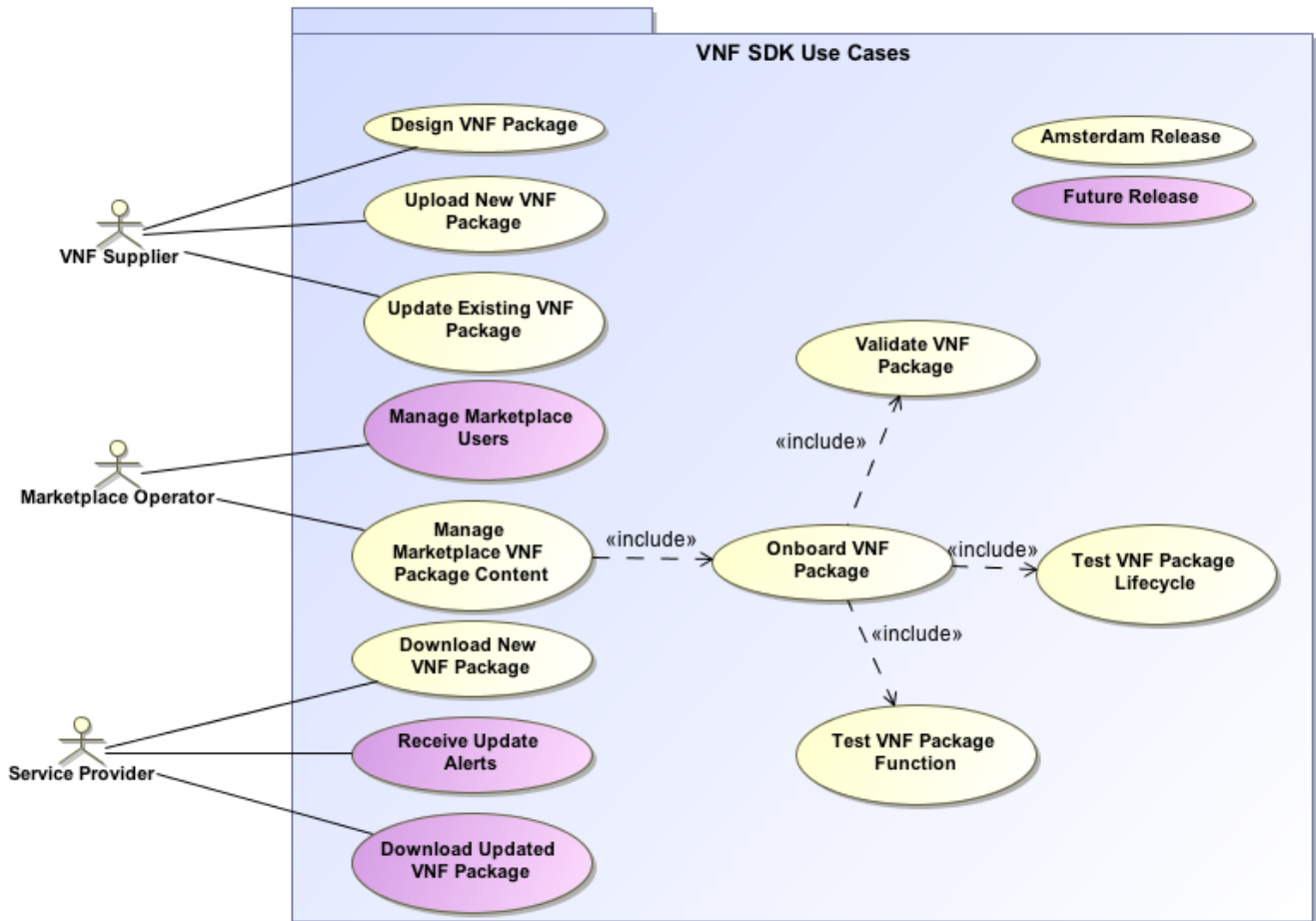
PROJ CT	PTL	User Story / Epic	Requirement
A&AI	William Reehil		No impact
AAF	Jonathan Gathman		No impact
APPC	Takamune Cho		No impact
CLAMP	Gervais-Martial Ngueko		No impact
CC- SDK	Dan Timoney	 CCSDK-3532 - CCSDK Enhancements for 5G OOF SON use case in Jakarta release CLOSED	(Carryover work): Incorporate new Yang model in edit-config to RANSim. Stretch goal for processing CMNotify update.
DCAE	Vijay Venkatesh Kumar	 DCAE2-2986 - DCAE impacts for 5G OOF SON use case in Jakarta release CLOSED	Develop stdDefined VES message formats for FM/PM/CM. Stretch goal to modify SON-Handler MS and RAN-Sim for FM/PM.
DMaaP	Fiachra Corcoran		No impact
Extern al API	Adrian OSullivan		No impact
HOLM ES	Guangrong Fu		No impact
MODE LING	Hui Deng		No impact, CPS related modeling aspects will be covered by CPS project
Multi- VIM / Cloud	Bin Yang		No impact
OOF	krishna moorthy		No impact
OOM	Sylvain Desbureaux		No impact
POLICY	Jim Hahn		No impact
PORT AL	Sunder Tattavarada		No impact
SDN-C	Dan Timoney		No impact
SDC	Christophe Closset		No impact
SO	Seshu Kumar Mudiganti		No impact
VID	Ikram Ikramullah		No impact
VF-C	Yuanhong Deng		No impact
VNFR QTS	Steven Wright		No impact
VNF- SDK	user-67d6f		No impact
CDS	Yuriy Malakov		No impact
CPS	Toine Siebelink		Models, and interface to store/retrieve OOF SON use case related data

List of PTLs: [Approved Projects](#)

*Each Requirement should be tracked by its own User Story in JIRA

USE CASE DIAGRAM

Use cases define how different users interact with a system under design. Each use case represents an action that may be performed by a user (defined in UML as an Actor with a user persona).



Use Case Functional Definitions

Use Case Title	Title of the Use Case
Actors (and System Components)	The list of Actors and System Components that participate in the Use Case
Description	Short overview of the Use Case
Points of Contact	Authors and maintainers of the Use Case. Use Case Lead, Key Use Case members and code contributors.
Preconditions	A list of conditions that are assumed to be true before the Use Case is invoked Includes description of Information Consumed
Triggers / Begins when	Describes the trigger for beginning the Use Case
Steps / Flows (success)	Describes the sequence of steps and interactions that occur during the Use Case (may include: description, data exchanges, functionality, state changes) Interaction diagrams may be included or referenced
Post-conditions	The expected results of the execution of the Use Case Includes description of Information Produced

Alternate / Exception Paths	<i>Description of any exceptions or special process that could occur during Use Case</i>
Related Use Cases	<i>List of the Use Cases referenced by this Use Case</i>
Assumptions	<i>Describes any assumptions that are made for this use case</i>
Tools / References / Artifacts	<i>List of any tools or reference material associated with this Use Case as well as any JIRA trace-ability.</i> List of any associated diagrams or modelling artifacts associated with the Use Case

TESTING

Current Status

1. Testing Blockers
2. High visibility bugs
3. Other issues for testing that should be seen at a summary level
4. Where possible, always include JIRA links

End to End flow to be Tested

****This should be a summary level Sequence diagram done in Gliffy****

Test Cases and Status

1	There should be a test case for each item in the sequence diagram	NOT YET TESTED
2	create additional requirements as needed for each discreet step	COMPLETE
3	Test cases should cover entire Use Case	PARTIALLY COMPLETE

Supporting Files

Date	Description	File
Mar 29, 2021	Presentation given to Requirements Sub-committee	ONAP_OOF_SON_R10_Requirements_2021117_v1.1.pptx
May 21, 2021	Yang models and CPS APIs for SON (links)	SON Yang Models and CPS APIs CPS APIs CPS 5G-SON APIs
	ArchCom	Add file
Nov 3, 2021	ITU-T FG AN presentation on SON Use Case	FGAN-I-155_att.pptx