



R8 E2E Network Slicing use case

Use Case Overview & Description

This use case intends to demonstrate the modeling, orchestration, assurance and optimization of end-to-end network slices, including RAN, Transport and Core slice sub-nets. This use case shall support different deployment scenarios of the Slice Management & Orchestration functions through a modular architecture and standards-based interfaces.

Use Case Key Information

TOPIC	DESCRIPTION	WIKI PAGE
Requirements Proposal	This is a link to the requirements proposal made on the Requirements Sub-committee	E2E_Network_Slicing_vF2F_rqmts_v_1.0.pptx
Architecture S/C info	Information on the Architecture sub-committee presentation	<div> ONAPARC-665 - (Honolulu-R8) - UC - E2E Network Slicing use case requirements for Honolulu release CLOSED</div> E2E_Network_Slicing_ArchCom_Review_v1.0.pptx Wiki page: E2E Network Slicing use case: Honolulu Architecture Review
Prior Project "Base" Wiki	Link to the Guilin release page for this use case	E2E Network Slicing Use Case in R7 Guilin NSMF and Common NSSMF
Requirements Jira (REQ-###) Ticket	Link to the REQ Jira ticket for this use case	<div> REQ-440 - E2E Network Slicing use case requirements for Honolulu release DONE</div>
Key Use Case Leads & Contacts	USE CASE LEADS: LIN MENG , Swaminathan Seetharaman USE CASE KEY CONTACTS: LIN MENG , Swaminathan Seetharaman , Henry Yu , Milind Jalwadi Borislav Glizman	
Meetings Register & Recordings	Link to Use Case Team meetings	<ul style="list-style-type: none">• Recent: E2E Network Slicing Use Case ONAP Weekly Meetings• Older: E2E Network Slicing Use Case ONAP Weekly Meetings (Jun - Nov 2020)

BUSINESS DRIVER

Executive Summary: 5G Network Slicing is one of the key features of 5G. The essence of Network Slicing is in sharing network resources (PNFs, VNFs, CNFs) while satisfying widely varying and sometimes seemingly contradictory requirements to different customers in an optimal manner. Same network is expected to provide different Quality of Experience to different consumers, use case categories and industry verticals including factory automation, connected home, autonomous vehicles, smart cities, remote healthcare, in-stadium experience and rural broadband. An End-to-End Network Slice consists of RAN, Transport and Core network slice sub-nets. This Use Case intends to demonstrate the modeling, orchestration and assurance of a simple network slice (e.g. eMBB). While 3GPP standards are evolving and 5G RAN and core are being realized, this Use Case will start with realizing an E2E Network Slice with a simple example of a 5G RAN, Core and Transport Network Slice sub-nets. It will also align with relevant standard bodies (e.g., 3GPP, ETSI, TM Forum) as well as other open initiatives such as O-RAN where relevant, [w.r.to](#) both interfaces as well as the functional aspects.









Business Impact: Network Slicing is a feature that almost every service provider will leverage. It allows a service provider to improve their network efficiency by maximizing the network throughput more tailored to each user's use of the network. It is seen as an imperative for efficient and optimal use of their network. This will be particularly relevant as 5G is expected to have upwards of 10,000x the traffic load over 4G and 20GB peak data rates.

Business Markets: Network Slicing, for this use case, is specifically aimed at a 5G access, core and transport. In the future, this might be extended to other domains or applications such as fixed-wireless convergence, Wi-Fi access, all aspects of transport including fronthaul, or unified network management orchestration. Network Slicing functionality is what almost every wireless service provider will inevitably find valuable. The concepts and modeling work being done for Network Slicing will find applications in other areas as well. ([Industries](#)) Some applications and industries such as smart cities, remote maintenance, video streaming vs life-saving first-responder type applications will demand different requirements from Network slicing. ([Markets/Regions](#)) There are no regional specific aspects to Network Slicing.

Funding/Financial Impacts: Network slicing engenders the optimal use of resources for a Network. Thus, this represents OPEX savings for a service provider.

Organization Mgmt, Sales Strategies: There is no additional organizational management or sales strategies for this use case outside of a service providers "normal" ONAP deployment and its attendant organizational resources from a service provider.

Development Status

PRO JECT	PTL	User Story / Epic	Requirement
A&AI	William Reehil	 AAI-3224 - AAI impacts for E2E Network Slicing use case in Honolulu CLOSED	Minor impacts related to NSSTs, Slice Profile attributes, etc.
AAF	Jonathan Gathman		No impact foreseen
APPC	Takamun e Cho		No impact foreseen
CLAMP	Gervais-Martial Nguoko		No impact foreseen
CC-SDK	Dan Timoney	 CCSDK-2988 - CCSDK support of Network Slicing in Honolulu CLOSED	CDS impacts related to initial configuration of Core NSSI NFs, reconfiguration during Core NSSI reuse as well as due to Closed Loop actions. Potential impacts for RAN Slicing.
DCAE	Vijay Venkatesh Kumar	 DCAE GEN2-2524 - DCAE Impact for E2E Network Slicing in Honolulu release CLOSED	<ul style="list-style-type: none"> Enhancements in Slice Analysis MS Enhancements in DES Completion of KPI Computation work (PM Mapper or New MS)
DMAaP	Mandar Sawant		No impact foreseen
External API	Adrian OSullivan	 EXTAPI-450 - EXT-API impacts for support of TMF 628 APIs for KPI monitoring CLOSED	Modernized TMF 628 API support for KPI Monitoring (<i>Stretch goal</i>)
HOLMES	Guangrong Fu		No impact foreseen
MODELING	Hui Deng	 ONAPMODEL-32 - Modeling enhancements for E2E Network Slicing in Honolulu release CLOSED	Enhancements related to endpoints, Slice Profile Service Profile mapping, etc.
Multi-VIM / Cloud	Bin Yang		No impact foreseen
OOF	krishna moorthy	 OPTFRA-872 - OOF enhancements for E2E Network Slicing in Honolulu CLOSED	Impacts related to NST selection, endpoints, slice profile decomposition, etc.
OOM	Sylvain Desbureau		No impact foreseen
POLICY	Jim Hahn		No impact foreseen
POR TAL	Sunder Tattavara da		No impact foreseen
SDN-C	Dan Timoney	 SDNC-4415 - SDN-C (SDN-R) support of E2E Network Slicing in Honolulu CLOSED	Initial configuration of RAN NSSI, reconfiguration during NSSI reuse, RAN NSSI termination, Closed Loop actions. In addition determination of RAN resources, A1 interface support for Network Slicing
SDC	Christophe Closset		No impact foreseen
SO	Seshu Kumar Mudiganti	 SO-3384 - SO Impacts for E2E Network Slicing in Honolulu CLOSED	Enhancements in NSMF, RAN/Core/TN NSSMF functionality in SO
VID	Ikram Ikramullah		No impact foreseen

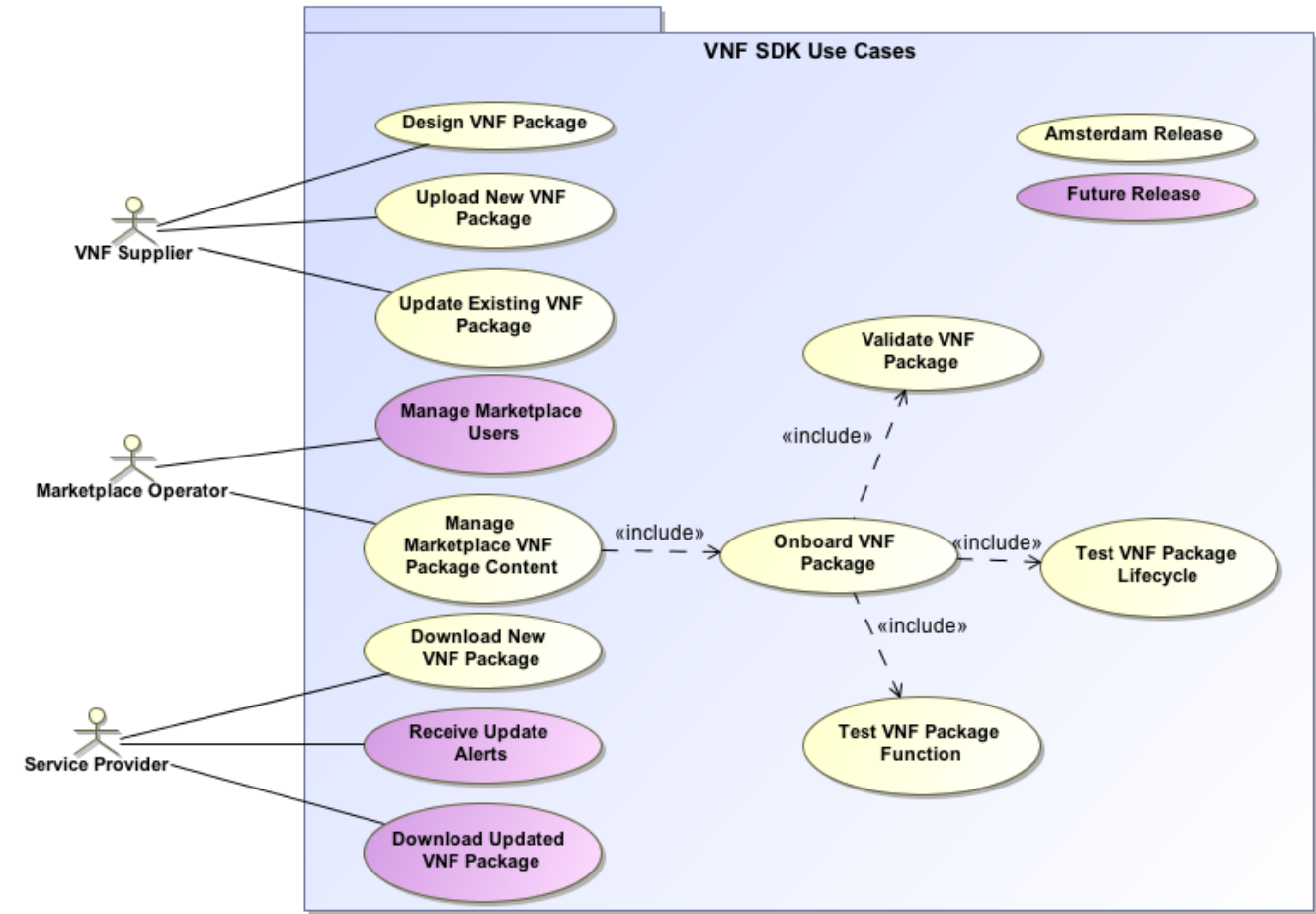
VF-C	Yuanhong Deng		No impact foreseen
VNF RQTS	Steven Wright		No impact foreseen
VNF-SDK	Weitao Gao		No impact foreseen
CDS	Yuriy Malakov	See CCSDK	See CCSDK impacts
U-UI	Tao Shen	USECASEUI-504 - U-UI impact for E2E Network Slicing in Honolulu CLOSED	Endpoint related enhancements
CPS	Toine Siebelink	CPS-168 - xNfProxy Minimum Viable Product for E2E Network Slicing CLOSED	Use of CPS instead of Config DB. Originally CPS-94 - CPS enhancements for E2E Network Slicing use case in Honolulu CLOSED was created and was later replaced by CPS-168.

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

TESTING

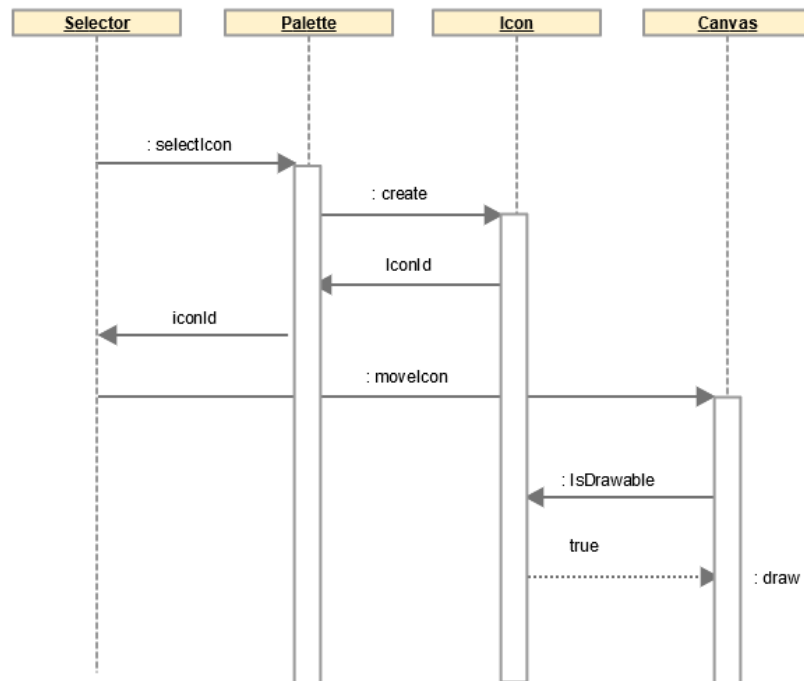
Current Status

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****

Summary Sequence Diagram



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
Feb 02, 2021	Presentation given at LFN DDF Recording (including Guilin demo for Option 2)	E2E_Network_Slicing_vF2F_v1.0.pptx E2E_Network_Slicing_LFN_Feb_2021.mp4
Dec 08, 2020	Presentation given to ArchCom	E2E_Network_Slicing_ArchCom_Review_v1.0.pptx
Dec 08, 2020	Presentation given to ETSI ZSM	ONAP_Network_Slicing_Overview_ETSI_ZSM_v1.0.pptx
Nov 12, 2020	Presentation given at Use case realization call	E2E_Network_Slicing_Usecase_Realization_Call_2020_11_12_v1.0.pptx
Oct 14, 2020	Presentation given to Requirements Sub-Committee during the LFN vF2F for Honolulu requirements	E2E_Network_Slicing_vF2F_rqmts_v_1.0.pptx

Oct 13, 2020	<p>Presentation given at LFN vF2F on Honolulu requirements & Roadmap (in detail).</p> <p>Recording: See here.</p>	E2E_Network_Slicing_vF2F_v1.0.pptx
May 11, 2021	Presentation given at LFN Honolulu Webinar	LFN_webinar_Network_Slicing_v2.0.pptx