


Configuration Persistence Service (CPS) for R8 Honolulu

Use Case Overview & Description

The Configuration Persistence Service is a Common Data Layer Service providing database functionality to persist network element run-time information. CPS will perform key DB operations such as syncing data with xNFs. CPS enables OSS configuration, optimization and E2E LCM operations. It will be a new Platform Component in R8.

State Management DB (Bell) project is aimed at tracking states of network elements in a network.

Use Case Key Information

TOPIC	DESCRIPTION	WIKI PAGE
Requirements Proposal	This is a link to the requirements proposal made on the Requirements Sub-committee	Honolulu release - functional requirements proposed list
Architecture S/C info	Information on the Architecture sub-committee presentation	
Prior Project "Base" Wiki	Link to the "base" wiki for the Use Case, or work from a prior release.	Configuration Persistence Service Project
Requirements Jira (REQ-###) Ticket	Link to the REQ Jira ticket for this use case	 REQ-427 - Configuration Persistence Service in R8 DONE
Key Use Case Leads & Contacts	USE CASE LEAD: Toine Siebelink (PTL) USE CASE LEAD (State Management work): Bruno Sakoto USE KEY CONTACTS:	
Meetings Register & Recordings	Link to Use Case Team meetings.	Configuration Persistence Service Meeting Notes & Recordings
	CPS team meetings 2021	Configuration Persistence Service Meeting Notes & Recordings 2021
Architectural Issues & Decisions		Issues decisions and assumptions

BUSINESS DRIVER

This section describes Business Drivers needs. These business drivers are presented on the Requirements Sub-committee and should also be put into the release requirements sub-committee page.

EXECUTIVE SUMMARY - The Data Persistency Service is a new platform component that is designed to serve as a data repository for Run-time data that needs to be persistent. As a stand-alone ONAP component, this project provides data layer services to other ONAP platform components and use cases that require persistent configuration or operational data. The R6 development will be enhanced as well.

BUSINESS IMPACT - The ability for service operators to visualize and manage data in a RAN network (PNFs, VNFs, and logical constructs) with ONAP is a critical business function because they are key Life Cycle Management (LCM) and OA&M operations. The project has business impacts to enhance the operation of data-handling within ONAP by providing efficient data layer services.

BUSINESS MARKETS - This project applies to any domain (wireless, transport, optical, and wireline) that ONAP may manage. It is not a market or geographical specific capability. It is expected that scaled ONAP installations such as Edge & Core ONAP deployments will also deploy the database across each installation.

FUNDING/FINANCIAL IMPACTS - This project represents a large potential Operating Expense (OPEX) savings for operators because of the ability to configure networks saving time and expenses.

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

PROJECT	PTL	User Story / Epic	Requirement
A&AI	William Reehil		

AAF	Jonathan Gathman		
APPC	Takamune Cho		
CLAMP	Gervais-Martial Ngueko		
CC-SDK	Dan Timoney		
CPS	Toine Siebelink	 REQ-427 - Configuration Persistence Service in R8 DONE	
DCAE	Vijay Venkatesh Kumar		
DMaaP	Mandar Sawant		
External API	Adrian OSullivan		
HOLMES	Guangrong Fu		
MODELING	Hui Deng		
Multi-VIM / Cloud	Bin Yang		
OOF	krishna moorthy		
OOM	Sylvain Desbureaux		
POLICY	Jim Hahn		
PORTAL	Sunder Tattavarada		
SDN-C	Dan Timoney		
SDC	Christophe Closset		
SO	Seshu Kumar Mudiganti		
VID	Ikram Ikramullah		
VF-C	Yuanhong Deng		
VNFRQTS	Steven Wright		
VNF-SDK	Weitao Gao		
CDS	Yuriy Malakov		
End to End Network Slicing (Use Case)	Kamel Idir Swaminathan Seetharaman		
OOF SON (PCI) Use Case	Swaminathan Seetharaman N.K. Shankar Lin Meng		

List of PTLs: [Approved Projects](#)

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

SUPPORTING FILES

Supporting files for R8 CPS

Description	File
CPS slides for DDF 15 Oct 2020	ConfigurationPersistenceSvcDDF_202010Oc14v12.pptx
CPS Concepts	CPS Concepts_202010Oc22v3.pptx

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).

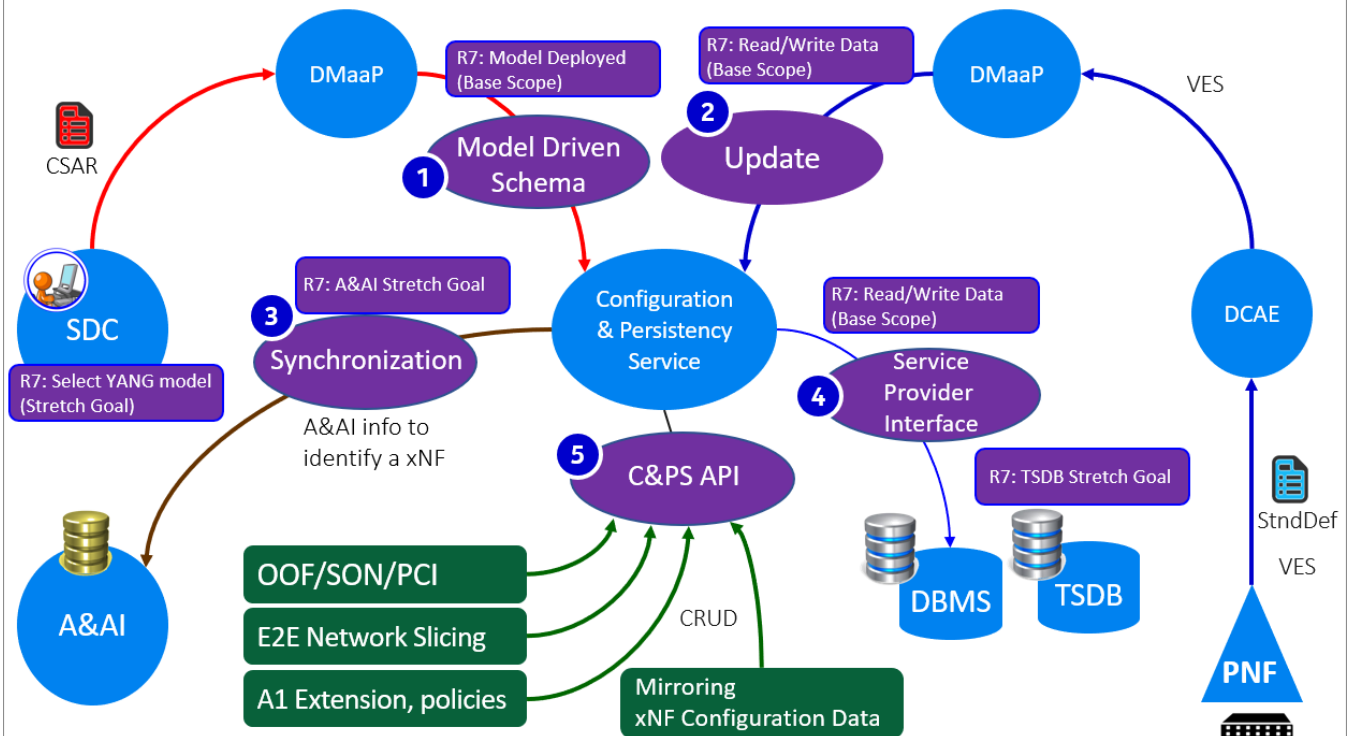
R7 Model Driven C&PS PoC



Use case

Component

Work required



THE LINUX FOUNDATION

ONAP

Use Case Functional Definitions

Use Case Title	Configuration Persistence SERVICE
Actors (and System Component s)	SDC, A&AI, C&PS, Use Cases (PCI, E2E NS, A1E, Mirror), DBMS, TSDB, xNF, DCAE, DMaaP

Description	<p>Configuration Persistence Service is a platform component that is designed to serve as a data repository for Run time data that needs to be persistent. It is characterized by the following.</p> <p>DATA REPOSITORY - The types of data that is stored in the Run-Time data storage repository for:</p> <ol style="list-style-type: none"> 1. CONFIGURATION PARAMETERS - These are configuration parameters that are used by xNFs during PnP, installation, commissioning. 2. OPERATIONAL PARAMETERS - These are parameters that are derived, discovered, computed that are used by xNFs during run time AFTER the xNF becomes operational i.e. AFTER it has "booted up", been installed, configured. These operational parameters are Exo-inventory information, meaning it is information that doesn't belong in A&AI. 3. NETWORK ELEMENT POLICY INFORMATION - NE policy type information used by micro-service. 4. APPLICATION INFORMATION - Information related to operational parameter. <p>DATA LAKE - Architecturally, the Configuration Persistence Service is designed to be a common services data layer which can serve as a data lake to other run time entities (ONAP components or external tools).</p> <p>CPS FUNCTIONS - The Configuration Persistence Service enables functionality to be performed by other entities. It will ENABLE the capability of another components or external tools within/or external to ONAP to perform the functions.</p> <ul style="list-style-type: none"> • CONFIGURATION MANAGEMENT FUNCTIONS - Enables OSS configuration, optimization, and LCM operations. • SYNCING - The Configuration Persistence Service enables the ability to sync data between initial and delta changes ONAP & the xNFs. • DATA RECOVERY - It will allow for the recovery of data once a source of truth is defined. • UPDATES - It will allow for updates, delta changes, and incremental updates to be performed. • DATA HISTORY - See a history of changes in data including versioning of the data, updates, roll back, restoration, and time series management. • AUDITING - Auditing of parameters against a "golden" template. It itself stores & provides the data for auditing. Consistency checks. • ROLL BACK - It will allow for rollback back of entire DB to "save points" or recovery points. • RESTORATION - It will allow for the recovery and restoration of data records to a fall back point. • ACCESS CONTROL - A security topic, which allows the definition of policies, of who and what they can update. • TOPOLOGY TRAVERSAL - It will enable the ability for something to traverse the relationship between data elements. • MODEL ADAPTION - Allows for the adaptation or transformation of models from other sources (e.g. ORAN or 3GPP models)
Points of Contact	<p>Use Case Lead: Benjamin Cheung Tony Finnerty Joanne Liu Rudel</p> <p>Key Use Case Members: Toine Siebelink Bruno Sakoto theodore johnson</p> <p>Code Contributors: (same as above)</p>
Preconditions	<p>DEPLOYMENT - The C&PS container/project is deployed and up and running.</p> <p>AUTHENTICATION - Authentication is performed by C&PS to allow access and interaction with other ONAP platform components.</p>
Triggers / Begins when	<p>(See "Flow Step" for Design Time Activities, and Initial Database Setup below in the Steps/flows)</p>

Steps / Flows (success)	Steps in Basic Operation and setup of C&PS.	
	SETUP FLOW STEP	SETUP STEP DESCRIPTION
	(1) STND DEFINED VES UPDATE	<p>(1) Standard defined VES event comes in through VES event, VES listener.</p> <p>This is then published onto DMaaP and C&PS get for that topic, namespace 3GPP_Configuration to write updates to the C&PS Database.</p> <p>Information coming into the C&PS via Stnd-Defined VES need to be "mapped" to the appropriate xNF and record.</p>
	(2) A&AI SYNCHRONIZATION	<p>(2) A&AI Updates are made in order to update the existing xNF in the system</p> <p>if a xNF is created or deleted the corresponding records in C&PS DB need to be created/deleted.</p> <p>A&AI publishes onto DMaaP when an A&AI event occurs which updates the active xNFs available to the network.</p>
	(3) MICRO-SERVICE UPDATE	(3) Micro-services can update information in C&PS DB
	(4A) ONAP PLATFORM COMPONENT INTERACTIONS	(4A) Other ONAP platform components such as the controllers might read or write information into the C&PS DB.
	(4B) EXTERNAL ENTITIES	(4B) External entities can interact with the C&PS DB through External API
	DESIGN TIME ACTIVITIES (SD&C) (SETUP)	(Design time), (Setup DB) Yang Model development E.g.: ORAN specification Yang Model in line with 3GPP. SQL structure.
	INITIAL A&AI GETALL (SETUP)	Initial A&AI GetAll nodes is used to setup the existing xNFs that exist in the system
	INITIAL DATABASE SETUP (Run Time)	The C&PS Database is initially setup.
	RUN-TIME OPERATION	RUN-TIME DESCRIPTION
	SDC CSAR LISTENER (SETUP)	The C&PS project listens for the Service CSAR packages which contain the schemas for resources associated with those services.
Post-conditions	SETUP OF C&PS - C&PS database is setup with initial schema	
	RUN-TIME OPERATION OF C&PS - the above run-time types of actions/operations (1) - (4A/B) above in the flow steps results in updates of C&PS or the interacting entity successfully retrieving information from C&PS DB.	

Alternate / Exception Paths	The following describes error cases or conditions for each of the flow steps above:	
	SETUP FLOW STEP	EXCEPTIONS / ALTERNATE / CORNER CASES / ERRORS
	(1) STND DEFINED VES UPDATE	Inability to get VES event from namespace DMaaP Bus Errors within the Stnd-Def VES event
	(2) A&AI SYNCHRONIZATION	Inability to perform A&AI Event update Errors in A&AI Event Update
	(3) MICRO-SERVICE UPDATE	Inability of micro-service to update C&PS DB Errors in C&PS DB Update
	(4A) ONAP PLATFORM COMPONENT	Inability of component to update C&PS DB Errors in C&PS DB Update
	(4B) EXTERNAL ENTITIES	Inability of entity to update C&PS DB Errors in C&PS DB Update Errors in API/interface interaction problem.
	DESIGN TIME ACTIVITIES (SD&C) (SETUP)	Problems in SD&C
	INITIAL A&AI GETALL (SETUP)	Inability to perform A&AI GetAll Errors in A&AI GetAll
	INITIAL DATABASE SETUP (Run Time)	YANG models, schema setup problems Setting up the C&PS DB errors.
	RUN-TIME OPERATION	EXCEPTIONS / ALTERNATE / CORNER CASES / ERRORS
	SDC CSAR LISTENER (SETUP)	If the SDC CSAR package is irretrievable from DMaaP. If there is an Error in the SDC CSAR package
Related Use Cases	These are associated use cases or requirements depending on CPS	
	Use Case	Link or Description
	OOF SON PCI Use Case	The OOF SON PCI is a 5G RAN Wireless use case spanning R3 through R7 and beyond: R7 OOF SON Use Case
Assumptions	End to End Network Slicing	E2E Network slicing is a 5G RAN Wireless application E2E Network Slicing Use Case in R7 Guilin
Tools / References / Artifacts		

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
4	Test Cases should include enough detail for testing team to implement the test	FAILED