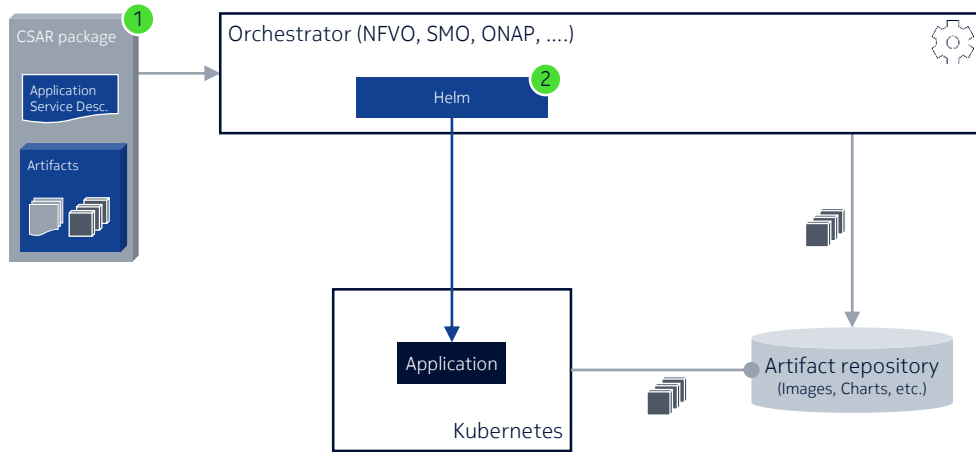


K8S Application Service Descriptor and Packaging

João Martins, Tinh Nguyenphu, Ben Cheung, Marge Hillis: Nokia
Marian Darula, Byung Woo Jun, Shah Nawaz Khan, Joey Moloney: Ericsson

2021-05-21

Proposal



The proposed solution:

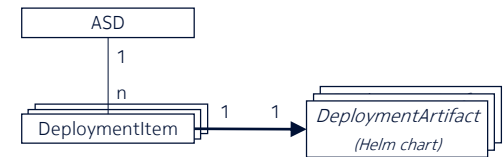
1. Use CSAR packaging for bundling metadata and cloud-native artifacts in a single package. Describe the application using a lightweight, ETSI-compatible Application Service Descriptor.
2. Choose Helm v3 as the primary cloud-native tool to embed in the orchestrator.

Descriptor proposal

Application Service Descriptor

Attribute	Qualifier	Cardinality	Content	Description
asdId	M	1	Identifier	Identifier of this ASD information element. This attribute shall be globally unique. The format will be defined in the data model specification phase.
asdSchemaVersion	M	1	Version	Specifies the version of the ASD's schema (if we modify an ASD field definition, add/remove field definitions, etc.)
asdProvider	M	1	String	Provider of the AS and of the ASD.
asdApplicationName	M	1	String	Name to identify the Application Service. Invariant for the AS lifetime.
asdApplicationVersion	M	1	Version	Specifies the version of the Application (so, if software, DeploymentArtifacts, ASD values, ... change, this changes)
asdApplicationInfoName	M	0..1	String	Human readable name for the Application service. Can change during the AS lifetime.
asdInfoDescription	M	0..1	String	Human readable description of the AS. Can change during the AS lifetime.
asdExtCpd	M	0..N	tbd	Describes external interface(s) exposed by this AS enabling connection with a VL. (Similar to VnfExtCpd on VNF-D, but only describing L3 and above interfaces, since K8S can't do <L3)
extraServiceRequirements	M	0..N	tbd	(include here Kubernetes NFDs) <- a flat list from Helm charts
enhancedClusterCapabilities	M	0..N	tbd	Describes expected capabilities of the target Kubernetes cluster to aid placement of the application service on a suitable cluster. Examples of capabilities are: required networking characteristics, Kubernetes API extensions or quantifiable node specific resources. This attribute can contain information complementing information provided in the referenced DeploymentArtifacts. Note: Modeling of enhancedClusterCapabilities is subject to standardization but is ffs. Alignment between O2-IMS and O2-DMS of these values is required.
deploymentItems	M	1..N	DeploymentItem	Deployment artifacts (see next slide)

As an alternative to “parent” or “umbrella” charts, we propose a means to structure and sequence multiple Helm charts that is easily expressed inside the ASD, using the DeploymentItem construct (see also next slide).



DeploymentItem proposal

In order to support complex applications that require multiple artifacts (like Helm charts) to be installed in a particular order, the orchestrator must support an easy method of chaining these artifacts – including dependency relationships.

As show, items are given a deployment order. Items with the same order are deployed in parallel; items in different orders are deployed in sequence.



Attribute	Qualifier	Cardinality	Content	Description
deploymentItemId	M	1	Identifier	The identifier of this deployment item
artifactId	M	1	Identifier (reference to)	Reference to a DeploymentArtifact
deploymentOrder	M	0..1	Integer	Specifies the deployment stage that the DeploymentArtifact belongs to. A lower value specifies that the DeploymentArtifact belongs to an earlier deployment stage, i.e. needs to be installed prior to DeploymentArtifact with higher deploymentOrder values.
lifecycleParameters	tbd	tbd		List of parameters that can be overridden at deployment time (e.g. values for values.yaml in the chart this item references)

ETSI-compliant packaging



The proposal for packaging is to continue to rely on CSAR.

Recommend to standardize:

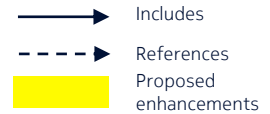
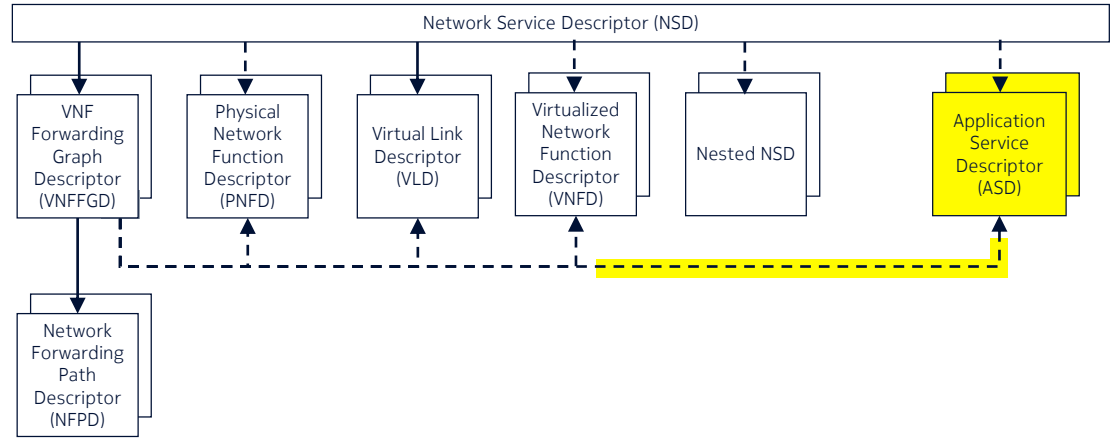
- a) The Packaging of containerized applications, the ASD itself, and the usage of ASD as a top-level artifact for a CSAR.
- b) The use of Helm as the cloud-native artifact for describing (pieces of) the application
- c) Adopt SOL004, adding the possibility to include an ASD instead of a VNFD as a top-level artifact

ASD with NSD (optional)

Containerized Application Service Descriptor

The ASD is a descriptor with the minimum information for the NFVO, and pointers to K8S-native tooling for the LCM implementation. Can describe a complete NF, or parts of a NF.

If needed, NSDs can be used to perform this composition, by referring to multiple ASDs; just like they are used today to describe complex multi-VNF services today.



NOKIA

