ONAP CNFO
orchestration of the Containerized Network Functions

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CNFO - Summary for the requirement subcommittee

Executive Summary - Provide CNF orchestration support through integration of K8s adapter in ONAP SO

- Support for provisioning CNFs using an external K8s Manager
- Support the Helm based orchestration
- leverage the existing functionality of Multi cloud in SO
- Bring in the advantages of the K8s orchestrator and
- Set stage for the Cloud Native scenarios

Owners: Lukasz Rajewski (Orange) , Seshu Kumar M (Huawei), Srini A (Intel).

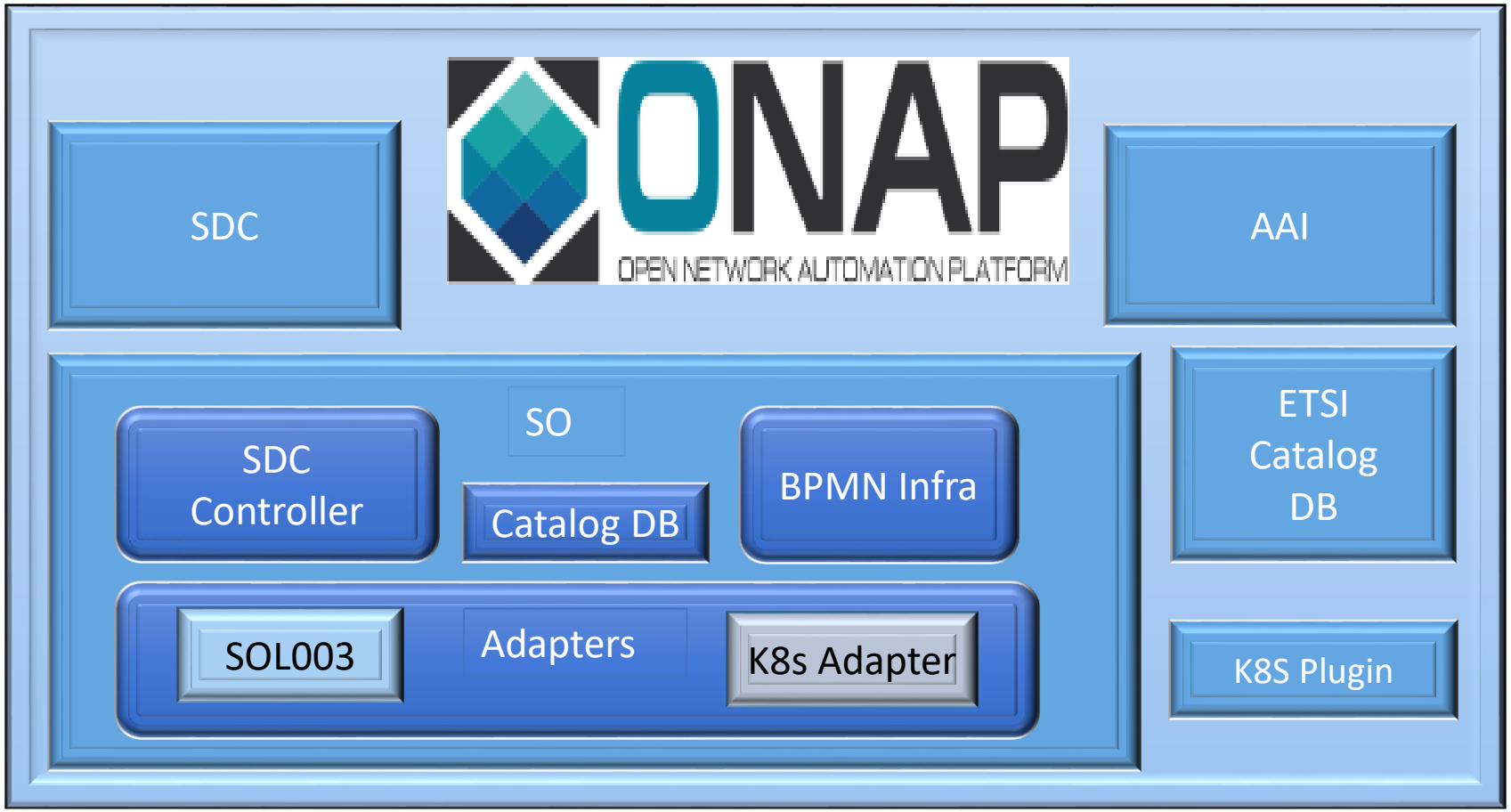
Business Impact - Enables operators and service providers to orchestrate CNFs based services along with the VNFs and PNFs

Business Markets - All operators and service providers that are intended to use the CNFs along with PNFs / VNFs

Funding/Financial Impacts - Reduction in the footprint of the ONAP for CNF support.

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

ONAP CNF Orchestration – Impacted Components - Guilin



External (S)VNFM

Model to drive the flows

- SDC to denote the flow of which VNFM should be used- similar to Orch Type
- Information model – optional
- Need to investigate the best place to have the meta data, we can perhaps use the existing fields

SDC:
On-board the helm and process it as an artifacts of the CSAR to be distributed

- ✓ On-board Helm Charts
- ✓ Resource model to include type
- ✓ (Design CNFs over helm)
- ✓ Distribute them

SO:
Wont consume the Helm by itself but parse it and push it forward to other ONAP components

- ✓ Parse the CSAR, extract helm
- ✓ SOL003 adapter enhancements
- ✓ New K8s Adapter (Interface to K8s Proxy)
- ✓ (Model driven workflow)

K8s plugin :

- ✓ Separation from MultiCloud
- ✓ Perhaps call it as **K8s Proxy**
- ✓ Support new API for the SO interaction

AAI:

- ✓ Persist the Service instance
- ✓ (Persist CNF as a resource)

ETSI Catalog DB:

- ✓ Persist the ETSi VNFM data (IFA-29 and IFA-40)
- ✓ Persist Images

ONAP - ETSI model Alignment

E2E Service

Network Service

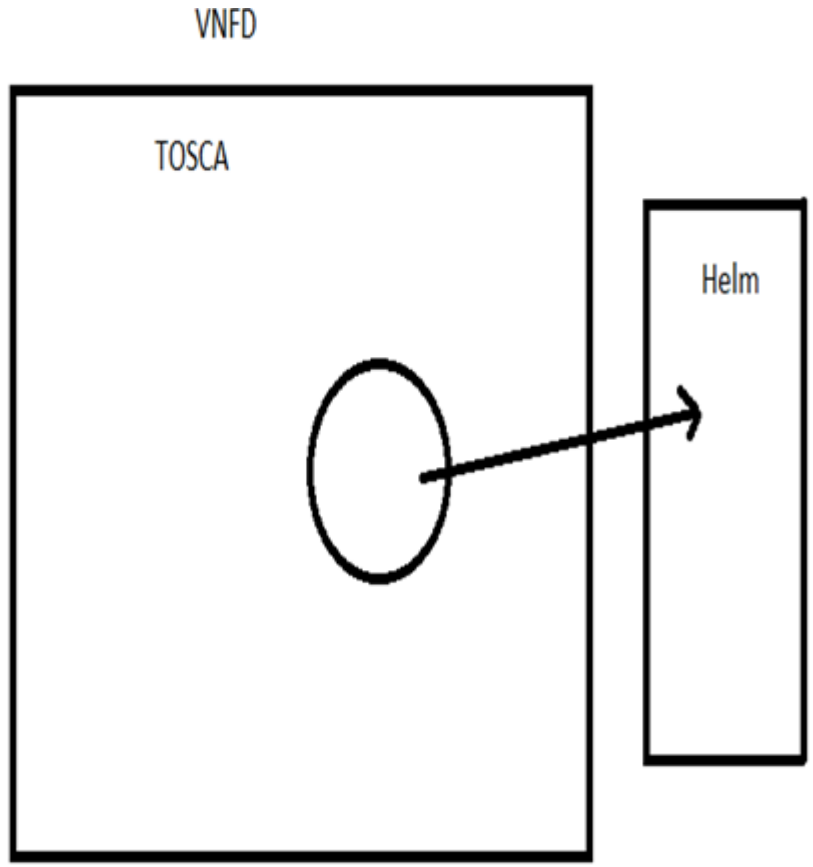
VNF | PNF | CNF?

ETSI model to be discusssed

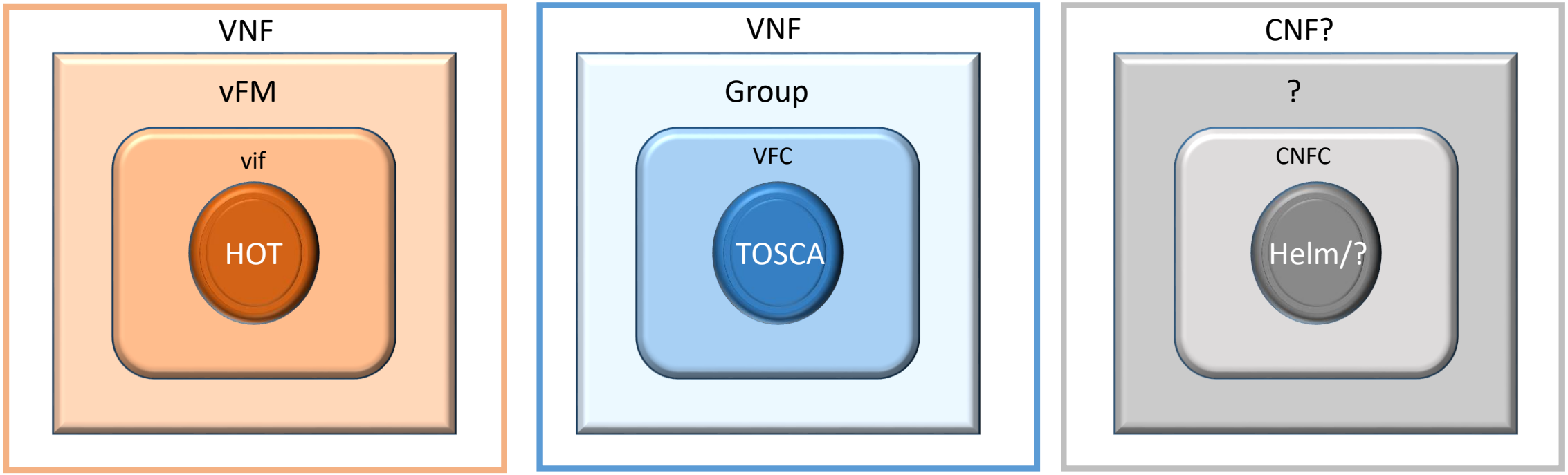
1. AAI representation of the Pods

2. How will the AAI persist it

3. how will the closed loop components deal with this persisted objects



Approach 1



Introduce a new model type into the SDC ,AAI built over the helm charts as an input and would be distributed to the other ONAP components

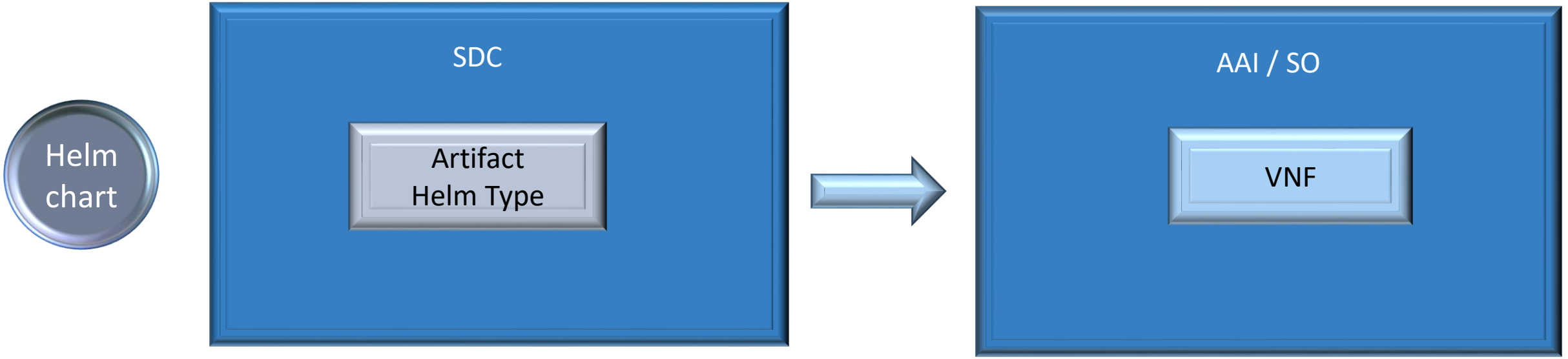
Pros

- ✓ Onboard a design template to the SDC and create a new resource from that
- ✓ Requires a new model to be introduced
- ✓ Will be inline to the existing models of the heat and TOSCA based VNFs
- ✓ Can also be extended to other formats for CNF modeling

Cons

- ✓ Initial analysis for understanding the standard model
- ✓ Requires more effort and may span across multiple ONAP releases
- ✓ The grouping model currently used in ONAP may pose a one-one mapping to the other standard formats

Approach 2



Helm Chart on-boarded as an artifact type to the SDC and distributed to ONAP, AAI would persist it as existing VNF
Helm chart would be stored as flat file and add it to the CSAR package to be distributed.

Pros

- ✓ Easy to develop than approach 1
- ✓ Better reuse of the existing functional code

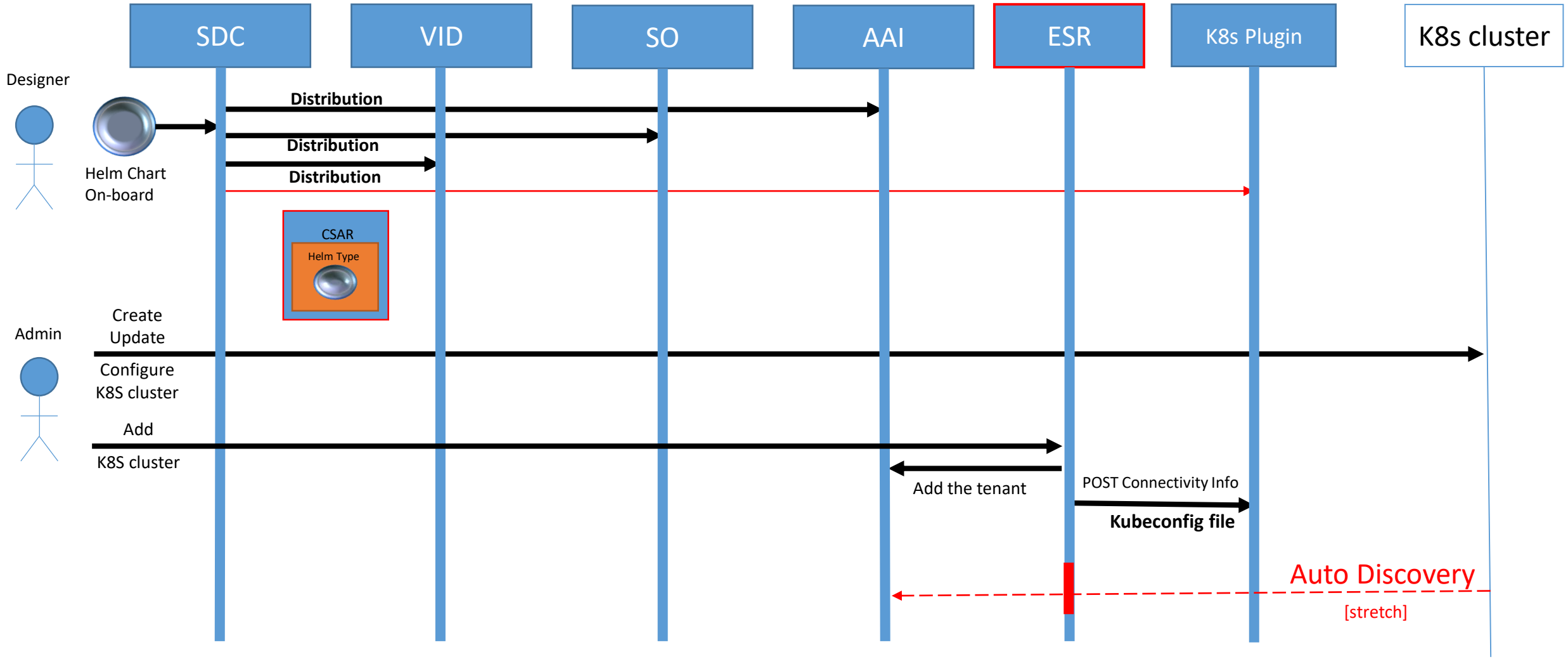
Cons

- ✓ Initial analysis for AAI persisting the CNF instance – Extend the VNF
- ✓ Very specific implementation and non extendable (non-helm)

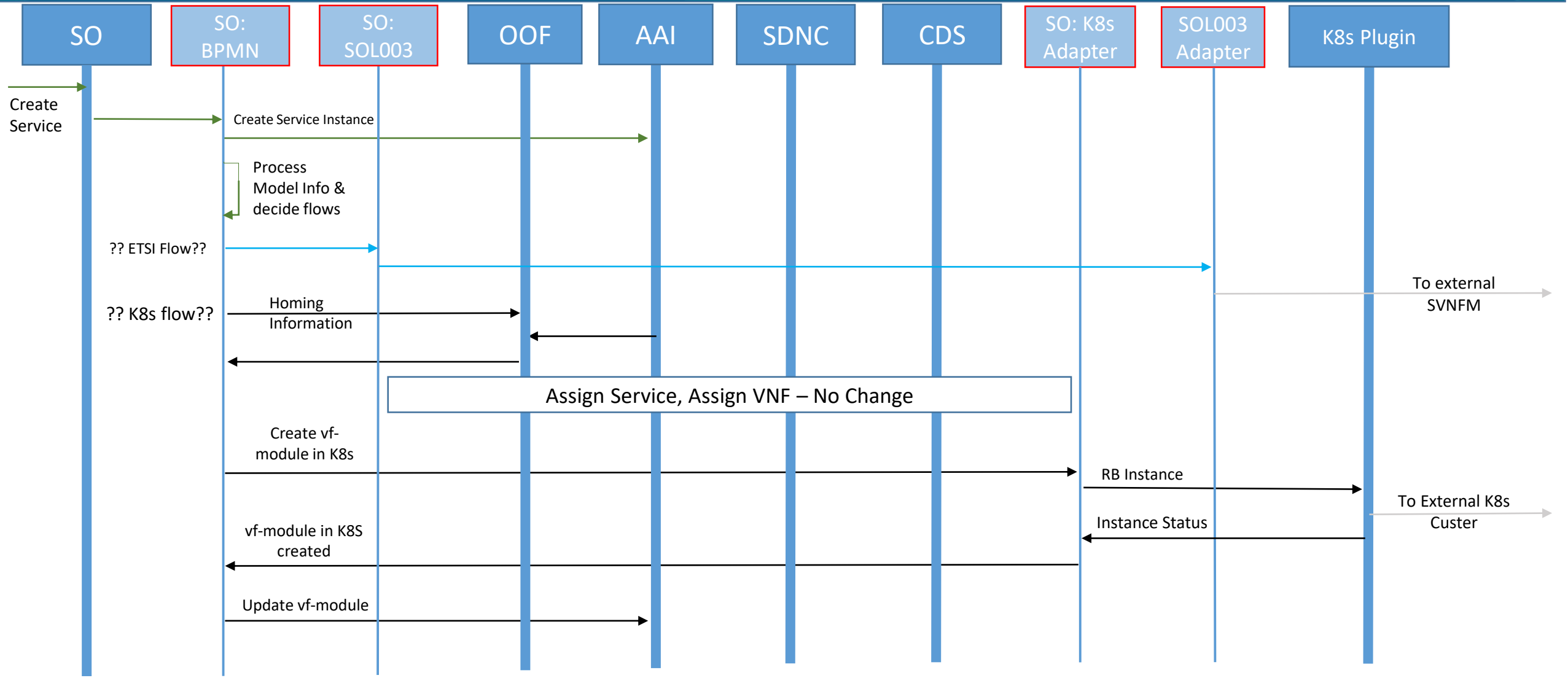
Guilin – Design and Implementation Grounds

- ✓ Backward compatibility with CNF Macro Instantiation Workflow [Frankfurt] -> cvFW Example
- ✓ Instantiation of Helm Package with existing VNF model
- ✓ Status and synchronization of instantiated k8s resources
  - ❑ Helm Resource Artifact in SDC/SO
  - ❑ Selected k8s resources added to VNF model in AAI: i.e. Deployment/Stateful Set/Service etc.
  - ❑ Update of AAI Information by SO: vf-module + CNF specific sub-objects
- ✓ Separation of k8s Plugin from MutliCloud (Rename it to K8s Proxy …)
  - ❑ K8s Adapter in SO to interact directly with the K8s Plugin
  - ❑ Enhance it to support the functions like the monitoring resources and status update
- ✓ Improvements in k8s cluster configuration process
- ✓ Validation of the flows through a standard usecase (cFW / c5G / ??)

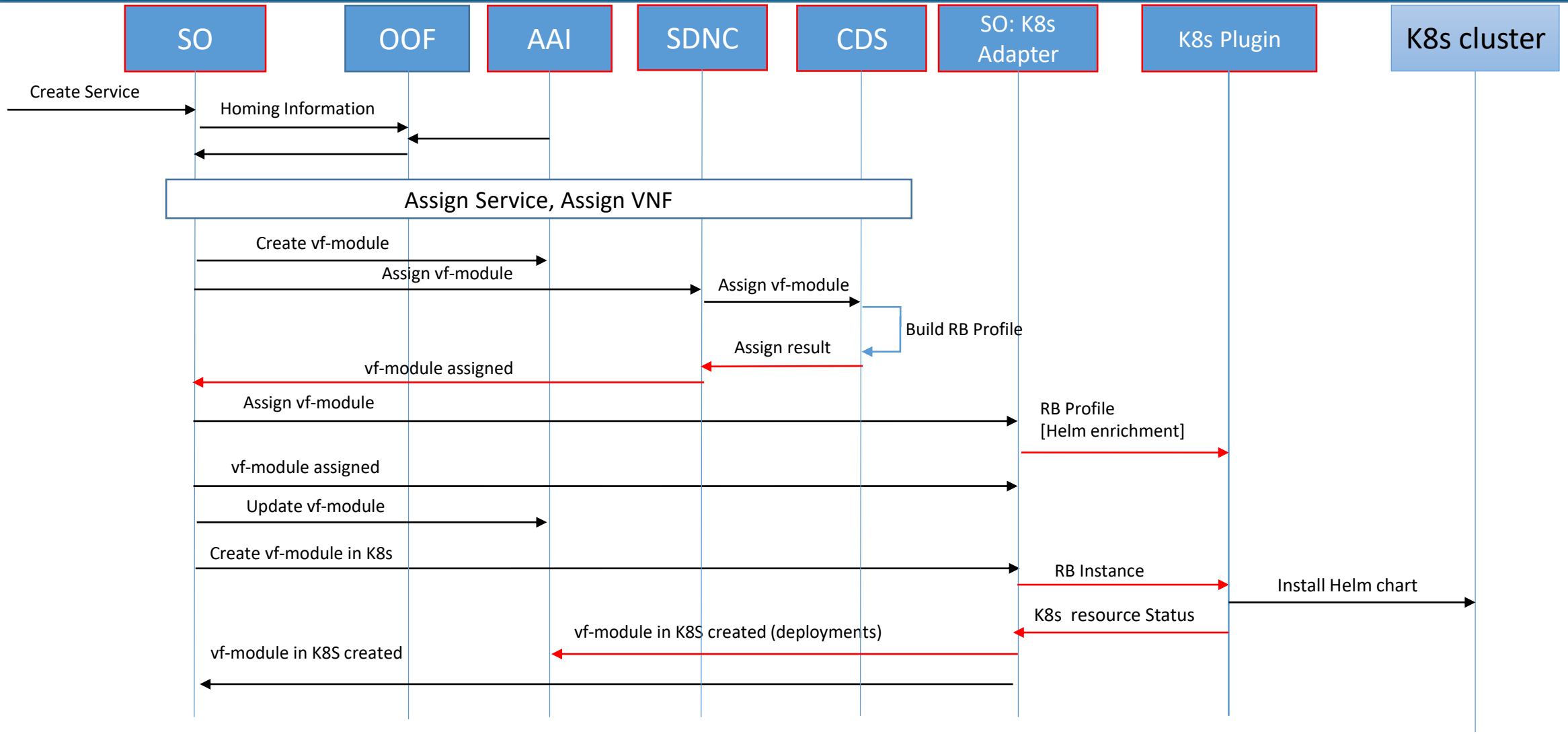
Guilin - Design and Distribution of the Helm Chart - Day 0



Guilin – Instantiation of the Helm Chart (Simplified - Intended) - Day 1



Guilin – Instantiation of the Helm Chart (Simplified- k8s Adapter MS) - Day 1



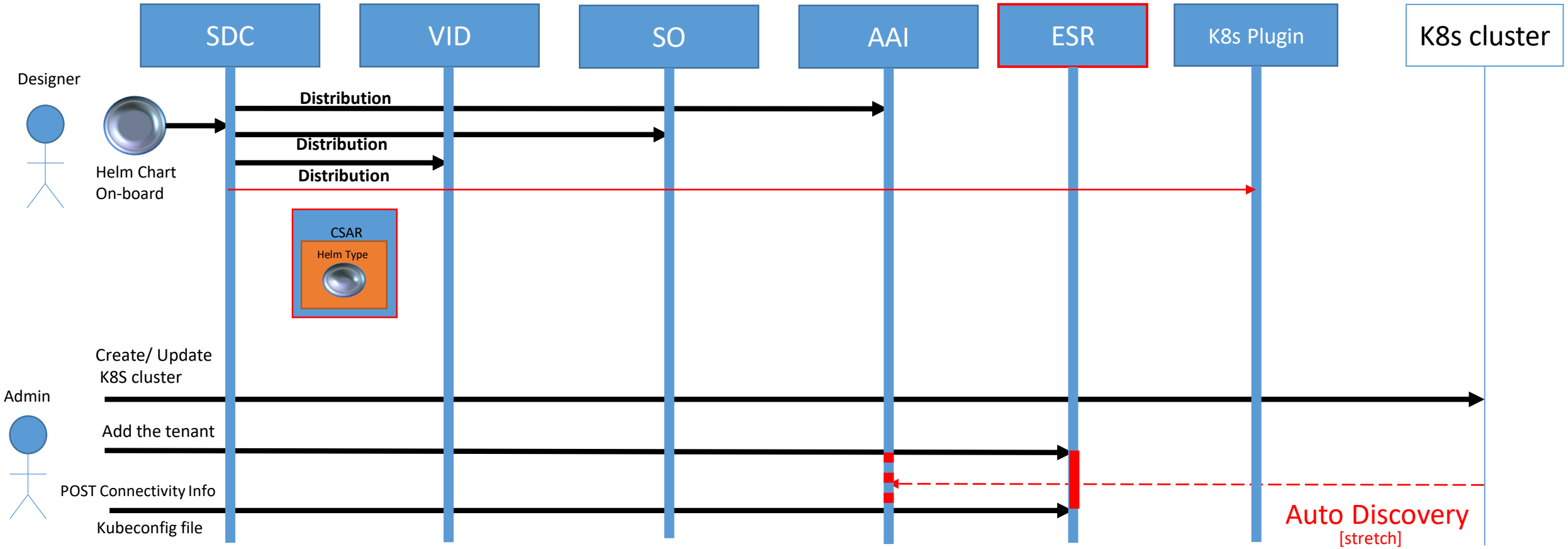
CNF - Modeling and AAI SME work group

- As part of extending the existing modeling to support the CNFO a separate group is formed with the SMEs from AAI, Modeling and existing function implementers.
- The key is to make sure we use the existing VNF model and adapt it to the CNFs to make them generic enough to handle most of the functional usecases
  - ✓Generic VNF model to be re-used
  - ✓Generic VF Module model to be extended to support CNFs
- This group is discussing the details
  - ✓How CNFs should be modeled
  - ✓How to persist the available resources to be used by the CNFO
  - ✓How to persist the CNF resource instances after they are validated
  - ✓Who are the consumers
  - ✓The intended format of the resource to be consumed by the Day 2 operations

✓Meeting is scheduled on every Friday 1:30 UTC

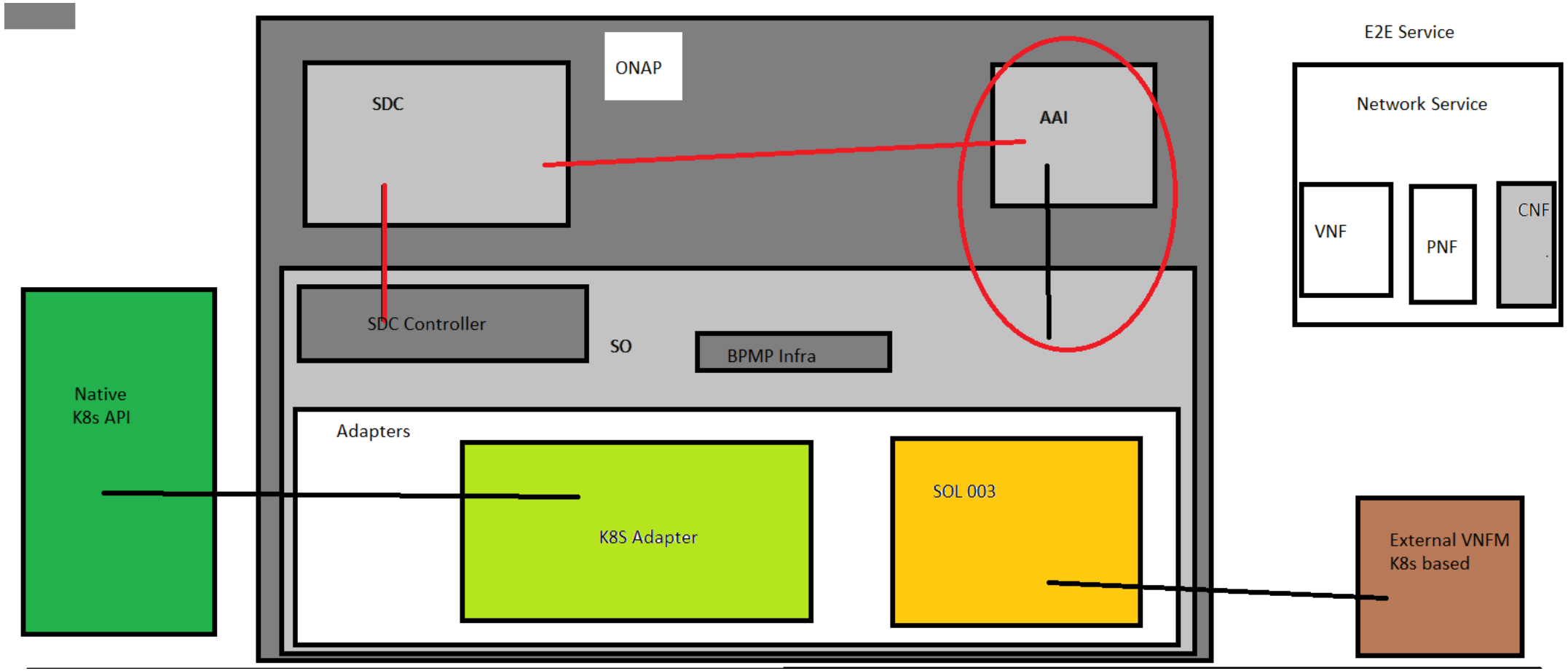
Thanks

Guilin - Design and Distribution of the Helm Chart - Day 0



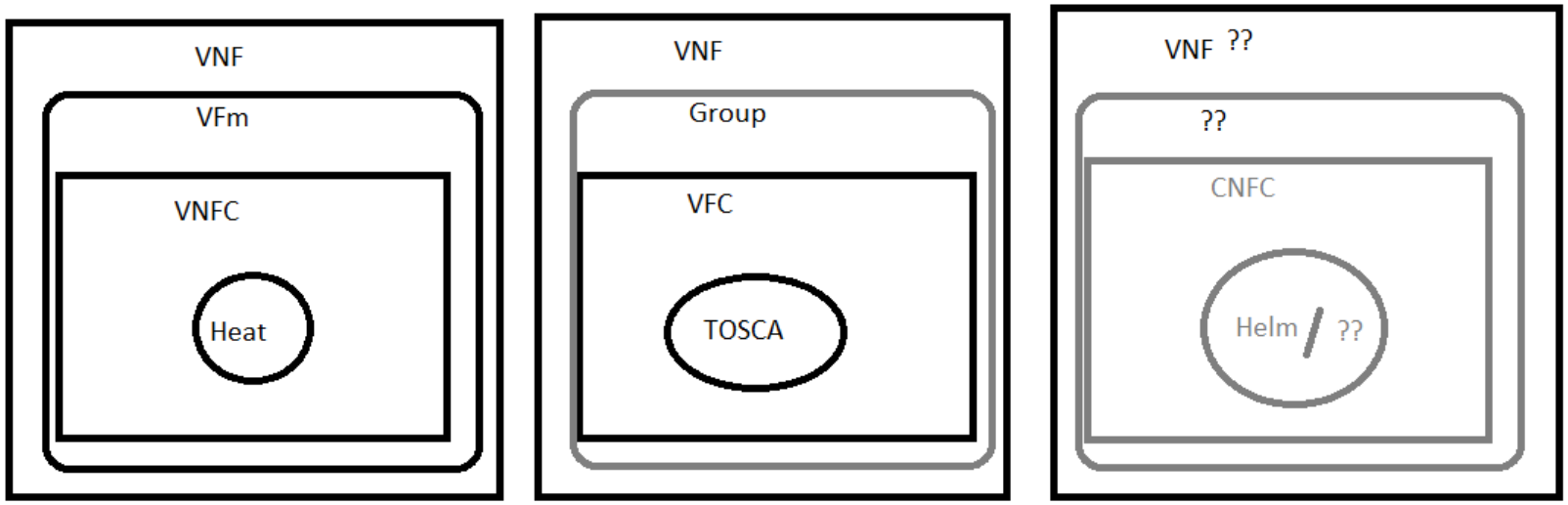
- ESR info with the cloud info into AAI

CNF Orchestration Scenarios - Guilin Proposal



Possible Approaches

Approach 1:



Approac 2:

SDC Artifacts : New type - Helm

AAI need to map to existing model