

Guilin Proposed Requirements ETSI Alignment

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Orchestration Scenarios (a.k.a. ETSI-Alignment) Task Force weekly meeting,
Weekly meeting: Mondays at 12PM UTC, 5AM PT, 8AM ET, 2PM CET, 5:30PM India, 8PM China.
<https://zoom.us/j/722438866>
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ETSI Alignment Support, <https://wiki.onap.org/display/DW/ETSI+Alignment+Support>

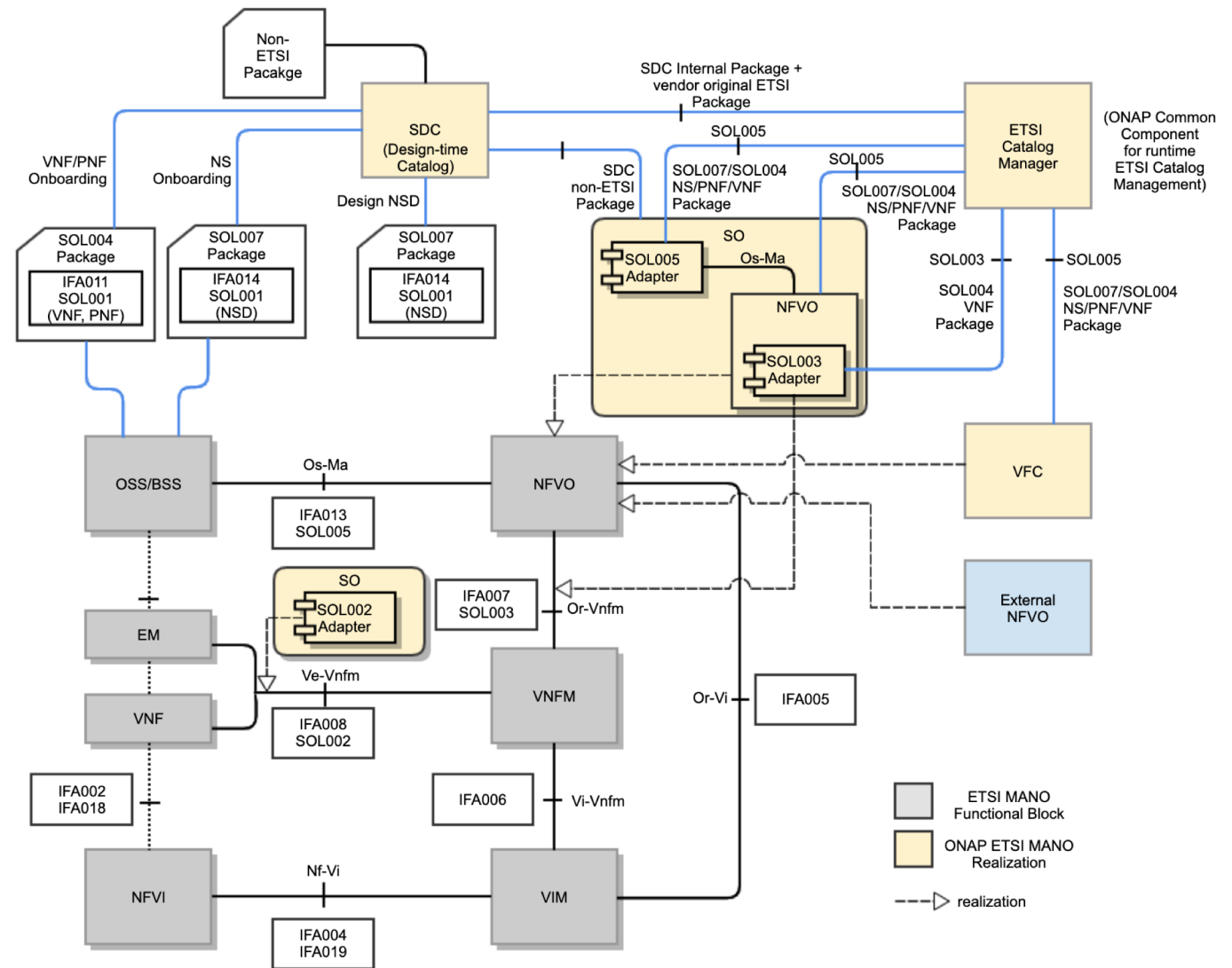
ETSI MANO and ONAP ETSI Alignment Landscape

As part of aligning ONAP to ETSI MANO, ONAP supports ETSI standards (2.7.1) for packaging, LCM operations, security for managing VNF, PNF and NS

- SOL004 standard is used for VNF and PNF packages
- SOL007 standard is used for NS package
- SOL001 standard is used to describe VNF, PNF and NS
- SOL003 standard is used for VNF Package Management, LCM and Monitoring
- SOL005 standard is used for NS/PNF/VNF Package Management, LCM and Monitoring.
- SOL002 standard is used for VNF/VNFC-level EM triggered scenarios (LCM, Fault, Performance, Configuration)
- ETSI Package and communication security are supported

ONAP components target realization of ETSI MANO

- SDC realizes SOL004 and SOL007 package onboarding, design and distribution functionalities.
- ONAP NFVO (SO NFVO & VFC) and External NFVO realize the NFVO functionalities.
- SOL003 Adapter realizes the Or-Vnfm (SOL003) interface
- SOL005 Adapter realizes the Os-Ma (SOL005) interface
- SOL002 Adapter realizes the Ve-Vnfm (SOL002) interface
- ETSI Catalog Manager provides ETSI Catalog/Package management for NS/VNF/PNF



ONAP ETSI-Alignment Overall Target Architecture

ONAP will be aligned with ETSI standards: SOL004, SOL007, SOL001, SOL003, SOL005, SOL002

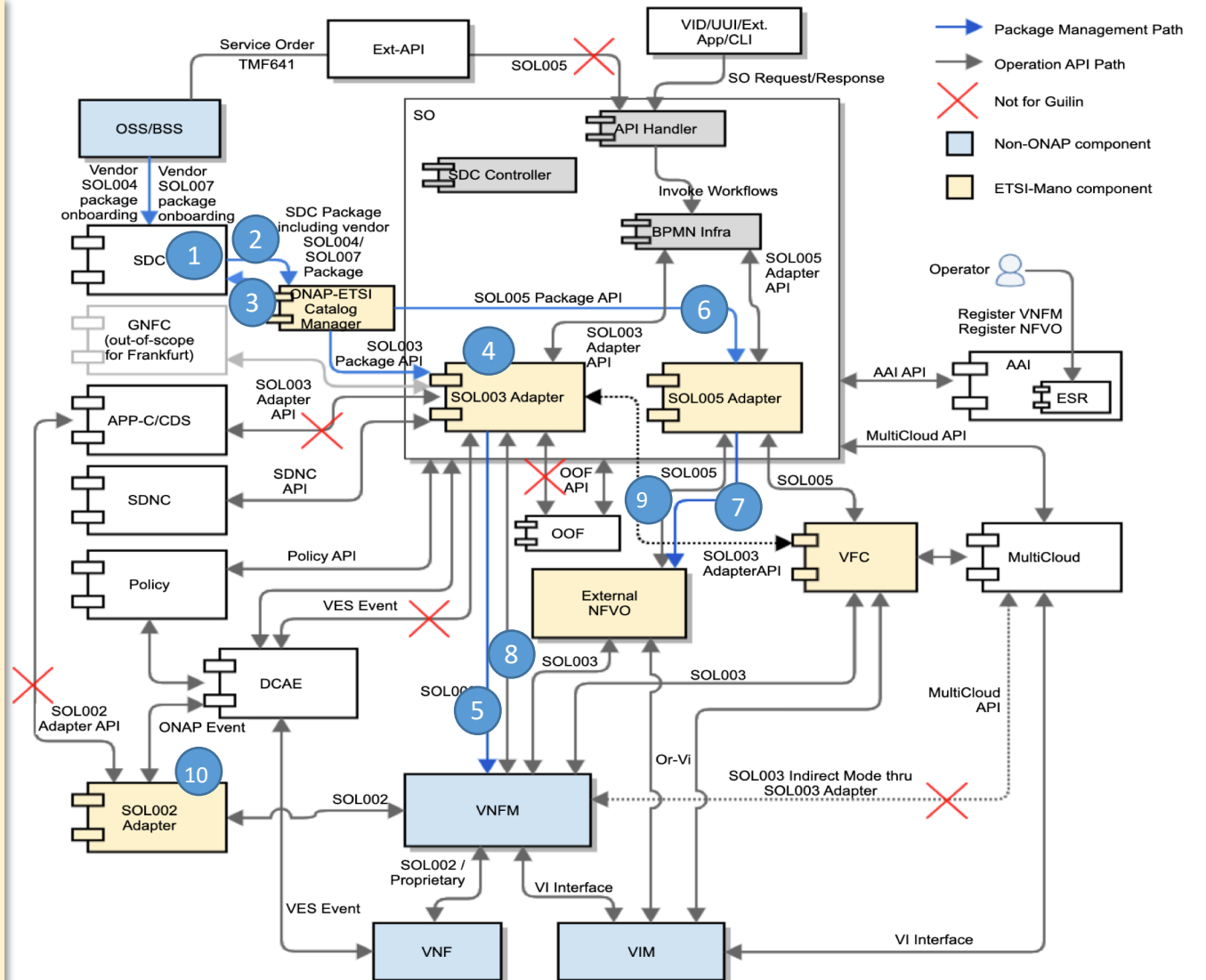
- SDC supports SOL004/SOL007 Package Onboarding
 - SDC CSAR embeds the vendor SOL004/SOL007 package in an ONAP VNF package
- ETSI Catalog Manager gets an SDC package notification and queries for the SDC package with SOL004/SOL007 package(s)
- ONAP-ETSI Catalog Manager queries for the SDC CSAR and stores the SOL004/SOL007 vendor packages in its database
- SOL003 Adapter supports VNF package management and LCM
- SOL003 Adapter forwards VNF packages to VNFM over SOL003 Package Management Interface
- SOL005 Adapter queries for NS/PNF descriptors & VNF packages
- SOL005 Adapter forwards NS/PNF descriptors & VNF packages to External NFVO
- SOL003 Adapter supports SOL003 Operations
- SOL005 Adapter supports SOL005 Operations
- SOL002 Adapter supports SOL002 Operations

Note: SOL003/SOL005/SOL002 Adapters will be designed to leverage common functionalities such as: Security, HPA, AAI, Policy, ETSI Catalog Manager

SOL005 Northbound support is not for Frankfurt

SOL003/SOL002 Adapter NBI GNFC-Ready & APPC/CDS are not for Frankfurt

SOL003 Adapter DCAE event mapping is not for Frankfurt



For more architecture and design details: <https://wiki.onap.org/display/DW/ETSI+Alignment+Support>

ONAP ETSI-Alignment Requirements Part 1

- **Onboard ETSI SOL004 compliant VNF packages**
 - Support for onboarding ETSI v2.7.1 SOL004 CSAR Packages ([Link to ETSI SOL004 v2.7.1](#))
 - Support for onboarding ETSI v2.7.1 SOL001 VNF Descriptor ([Link to ETSI SOL001 v2.7.1](#))
 - Support for mapping of ETSI v2.7.1 SOL001 VNF Descriptor into SDC AID Data Model
 - Support for using an ETSI v2.7.1 VNF in an ONAP Service
- **Onboard ETSI SOL007 compliant Network Service packages**
 - Support for Cataloging and Preserving the original SOL007 package
 - Support for mapping of ETSI v2.7.1 SOL001 NSD in the SOL007 package into SDC AID Data Model
 - Support for deploying a service that contains an ETSI SOL001 v2.7.1 compliant NS to NFVO (ONAP NFVO, External NFVO)
- **Design ETSI SOL007 compliant Network Service Descriptor packages**
 - Create NSD 1) includes NS Properties and VLDs, and 2) references VNFDCNF Support, PNFD and Nested NSD
 - Support for deploying a service that contains an ETSI SOL001 v2.7.1 compliant NS to NFVO (ONAP NFVO, External NFVO)
 - VNF-FG Design is a stretch goal
- **Support for Nested/Hierarchical ETSI SOL001 v2.7.1 NSDs**
- **Design Service templates, leveraging/referencing NSDs**
 - Support Service templates including NSDs

Business Benefits (Industry Compatibility and Deployment Flexibility)

- Enable operators and service providers to use same ETSI compliant models and packages to boost industry compatibility
- Enable operators and service providers to use standardized onboarding and distribution
- Enable operators and service providers flexible deployments, leveraging their own NFVOs and VNFMs

ONAP ETSI-Alignment Requirements Part 2

- **Support for ETSI v2.7.1 SOL003 and SOL002 interfaces from ONAP to external VNF Manager(s)**
 - Support for Create, Instantiate, Query, Heal, Scale, Modify of a VNF using an external VNF Manager
 - Support for Grant request from an external VNF Manager with incremental resource allocation and HPA support using OOF
 - Support for receiving VNF Life Cycle Notifications (LCN) from a VNF Manager and translation into DCAE Events
 - Oauth2 based authentication support between ONAP and VNFM(s)
- **Support for ETSI v2.7.1 SOL005 interface from ONAP to internal and external NFVO**
 - Support for Create, Upload, Update, Query, Delete of an ETSI NS Descriptor and ETSI VNF packages using VF-C and an external NFVO
 - Support for Create, Instantiate, Terminate of a ETSI NS using VF-C and an external NFVO
 - Support for Scale, Heal, Update of an ETSI NS using VF-C and an external NFVO
 - Support for receiving NS Notifications (LCN) from an NFVO and translation into DCAE Events
 - Oauth2 based authentication support between ONAP and NFVO(s)
- **Support for ETSI NFVO Orchestrator in ONAP SO that Network Service Descriptor packages**
 - Enable E2E workflows by orchestrating ETSI NFV compliant Network Services and VNFs.
 - Provide an ETSI NFV SOL005 v2.7.1 NBI which can onboard ETSI NFV SOL004 and ETSI NFV SOL007 v2.7.1 compliant packages which then can be Life Cycle Managed and monitored.
 - Use an ETSI SOL003 v2.7.1 SBI to invoke an external VNF Manager.

Business Benefits (Industry Compatibility and Deployment Flexibility)

- Enable operators and service providers to use same ETSI compliant models and packages to boost industry compatibility
- Enable operators and service providers to use standardized NFV Orchestrators and VNF Managers
- Enable operators and service providers flexible deployments, leveraging their own NFVOs and VNFMs

ONAP ETSI Package Structure and Distribution

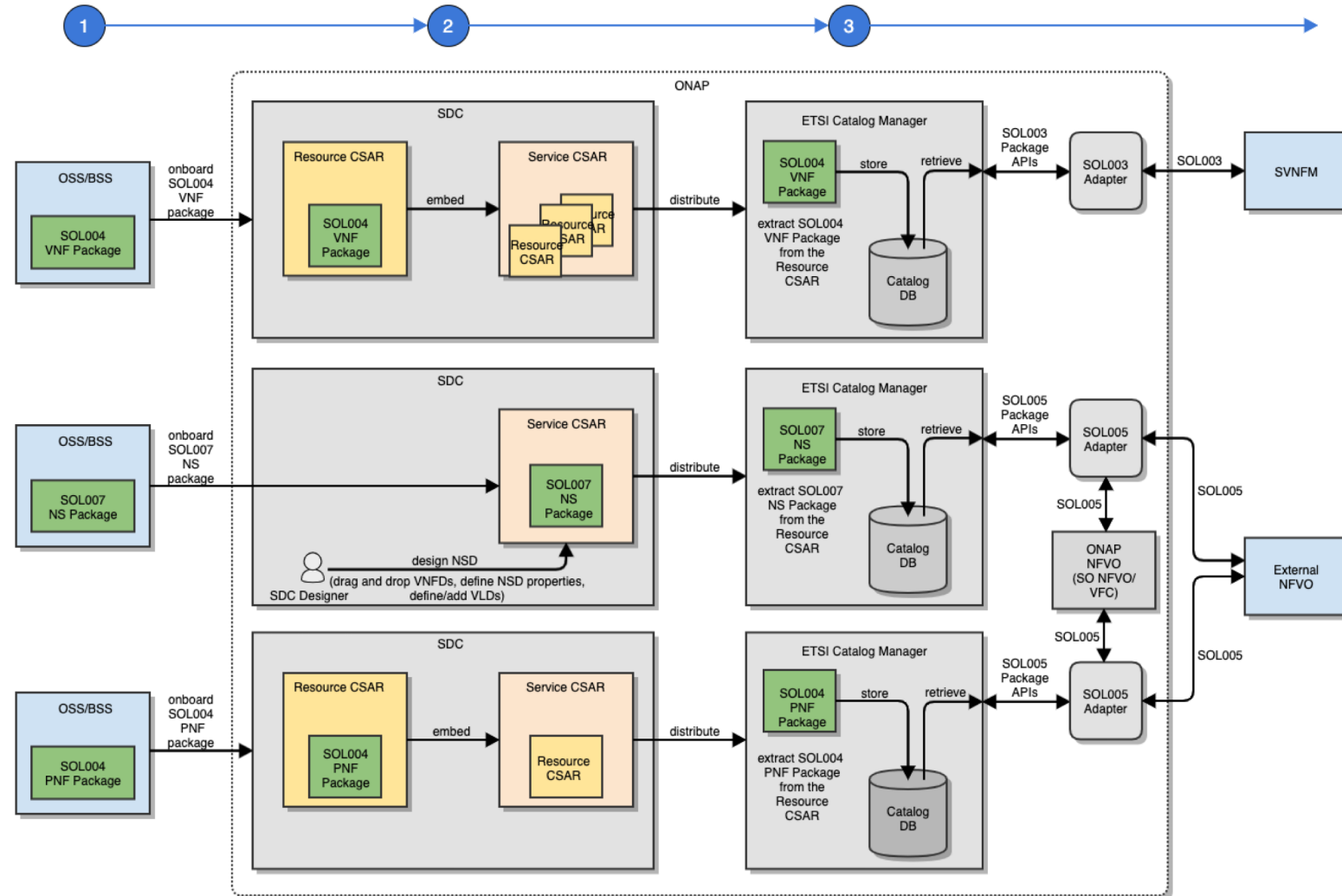
1. SOL004 VNF/PNF and SOL007 NS Packages are onboarded to SDC.

2. SDC creates its Resource CSAR by adding ONAP-specific files and metadata according to SDC procedure.

- For VNF onboarding, SOL001 VNFD is mapped to SDC Data Model.
- For NS onboarding, SOL001 NSD is mapped to SDC Data Model. Note: the SDC NS Data Model would be SOL001 NSD-based.
- For PNF onboarding, SOL001 PNFD is mapped to SDC Data Model.
- The original SOL004 VNF/PNF and SOL007 NS packages will be stored in the ONBOARDED_PACKAGE directory.
- SDC shall have a capability to design SOL007 NSDs and generates SOL007 NS packages
 - Since SDC does not have a proper NS Model, it will follow SOL001 NSD.
- SDC embeds the Resource CSAR into its Service CSAR for distribution.
 - After SDC validates the onboarded packages, the Service CSAR is distributed.
 - SDC sends the package notification to DMaaP for its package notification subscribers.

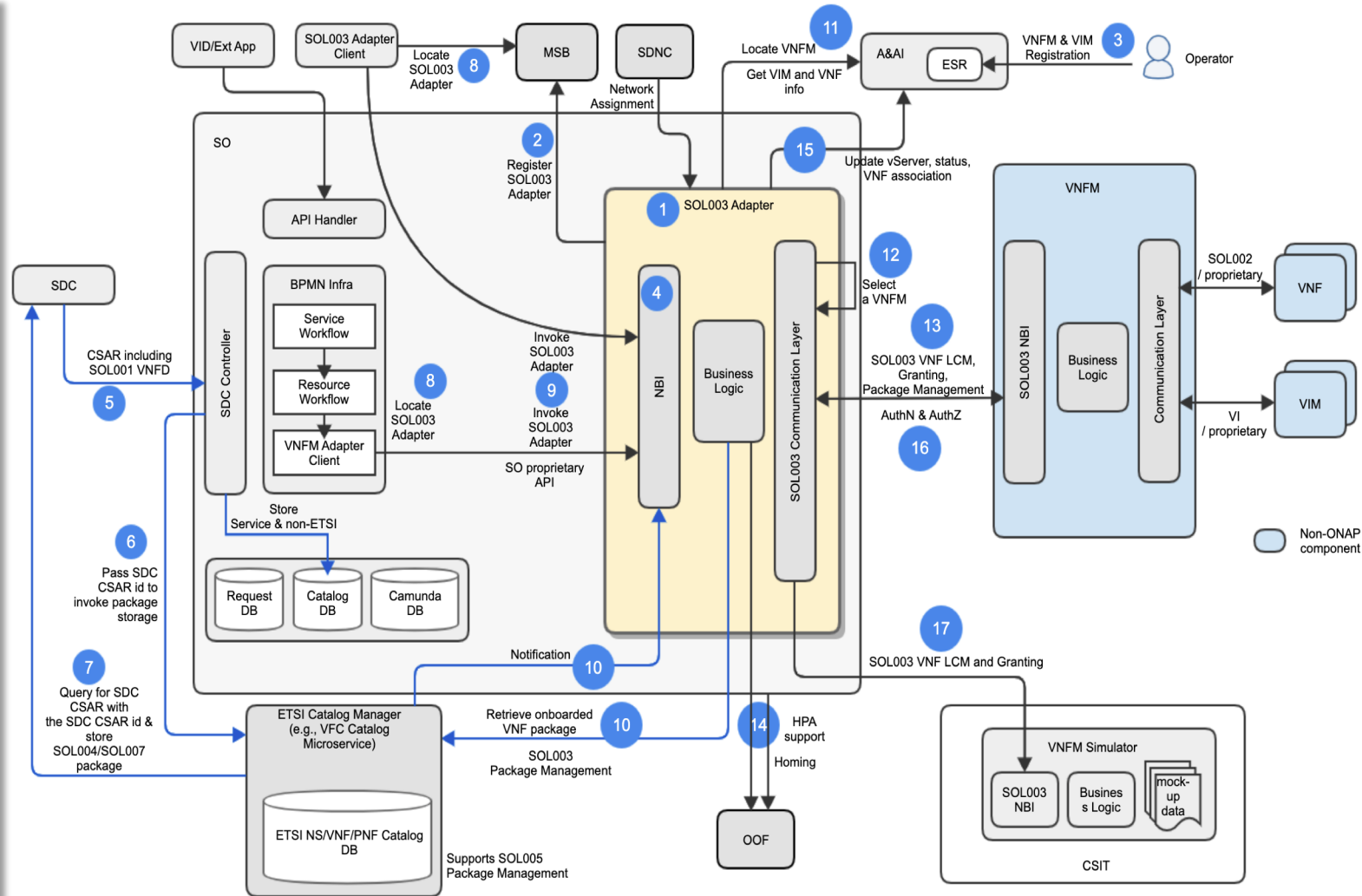
3. ETSI Catalog Manager receives the package notification from SDC.

- ETSI Catalog Manager queries SDC for the SDC CSAR.
 - ETSI Catalog Managers examines the SDC CSAR. If the SDC CSAR contains the ONBOARDED_PACKAGE directory, it extracts the SOL004/SOL007 packages from the directory.
 - ETSI Catalog Manager stores the SOL004/SOL007 packages to its Catalog Database.
- ETSI Catalog Manager provides APIs for the SOL003/SOL005 Adapters to distribute the packages to SVNFM/NFVO.



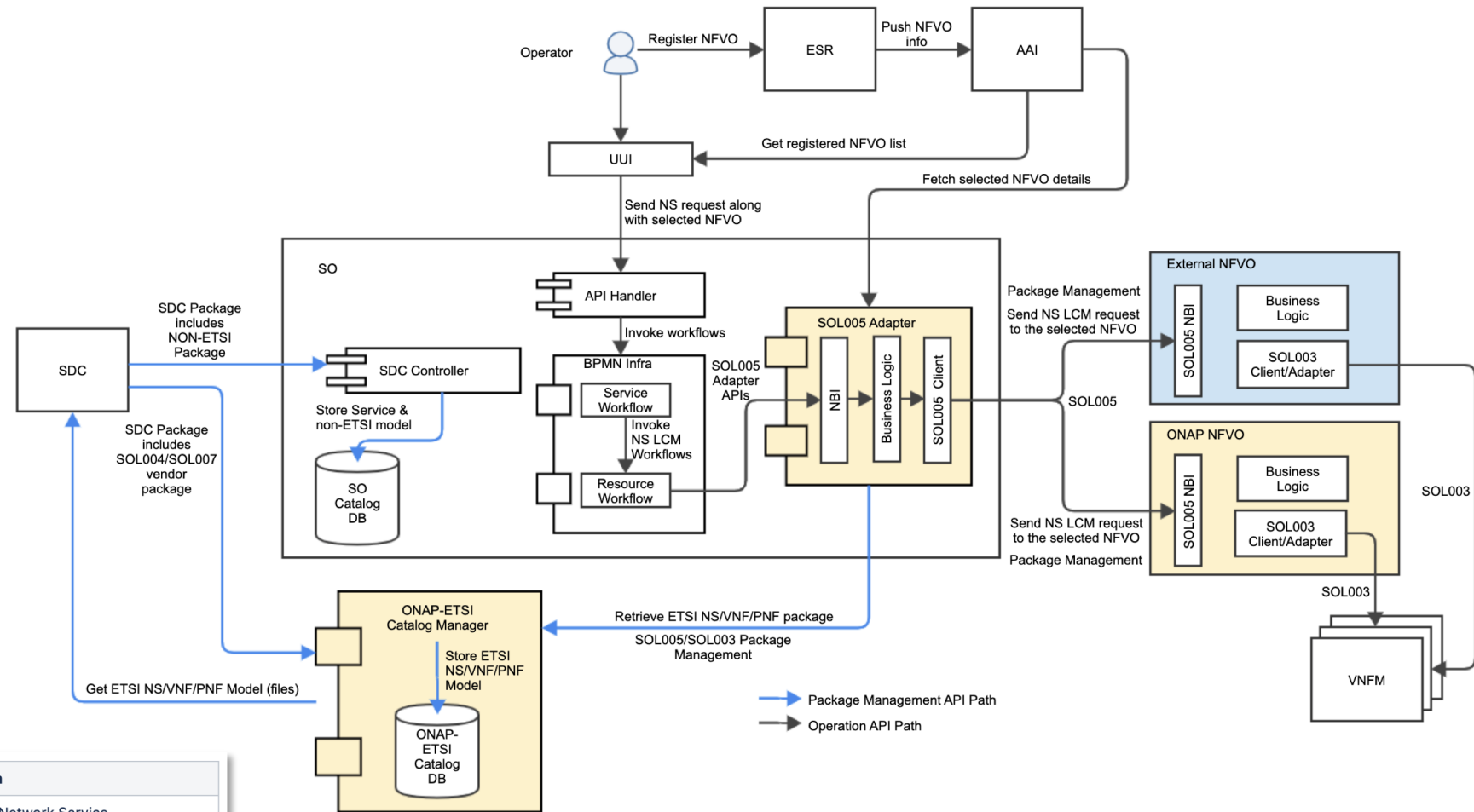
SOL003 Adapter Architecture & Use Cases

- SOL003 Adapter is a SO microservice component
- SOL003 Adapter is registered to MSB.
- Operator registers VNFM and VIM to ESR in AAI.
- SOL003 Adapter exposes its NBI to any SOL003 Adapter client in ONAP (not for Frankfurt)
 - Interfaces will be refactored to be generic to allow access by other ONAP components.
 - The NBI will be enhanced for additional SOL003 operation support
- SDC distributes SDC packages including the vendor original SOL004 (VNF and PNF) and SOL007 (NS) packages
- SO (SDC Controller) passes the SDC CSAR ID to ETSI Catalog Manager to invoke storage
- ETSI Catalog Manager queries for SDC CSAR with the SDC CSAR id & store SOL004 package.
- SO (BPMN) and the SOL003 Adapter client locates SOL003 Adapter.
- SO (BPMN) and the SOL003 Adapter client invokes SOL003 Adapter.
- SOL003 Adapter gets Notification & VNF package from Catalog Manager.
- SOL003 Adapter gets available VNFM locations (endpoints) and gets VIM and VNF Info.
- SOL003 Adapter selects a VNFM, based on a VNFM locating mechanism.
- SOL003 Adapter and SVNFM supports SOL003 VNF LCM, granting and package management operations.
- SOL003 Adapter supports HPA-based Granting, leveraging OOF.
- SOL003 Adapter updates vServer, status and VNF association in AAI
- SOL003 Adapter and SVNFM support authentication and authorization (AAF, and vendor AA mechanism) – partially for Frankfurt.
- For integration testing, the VNFM Simulator is used.



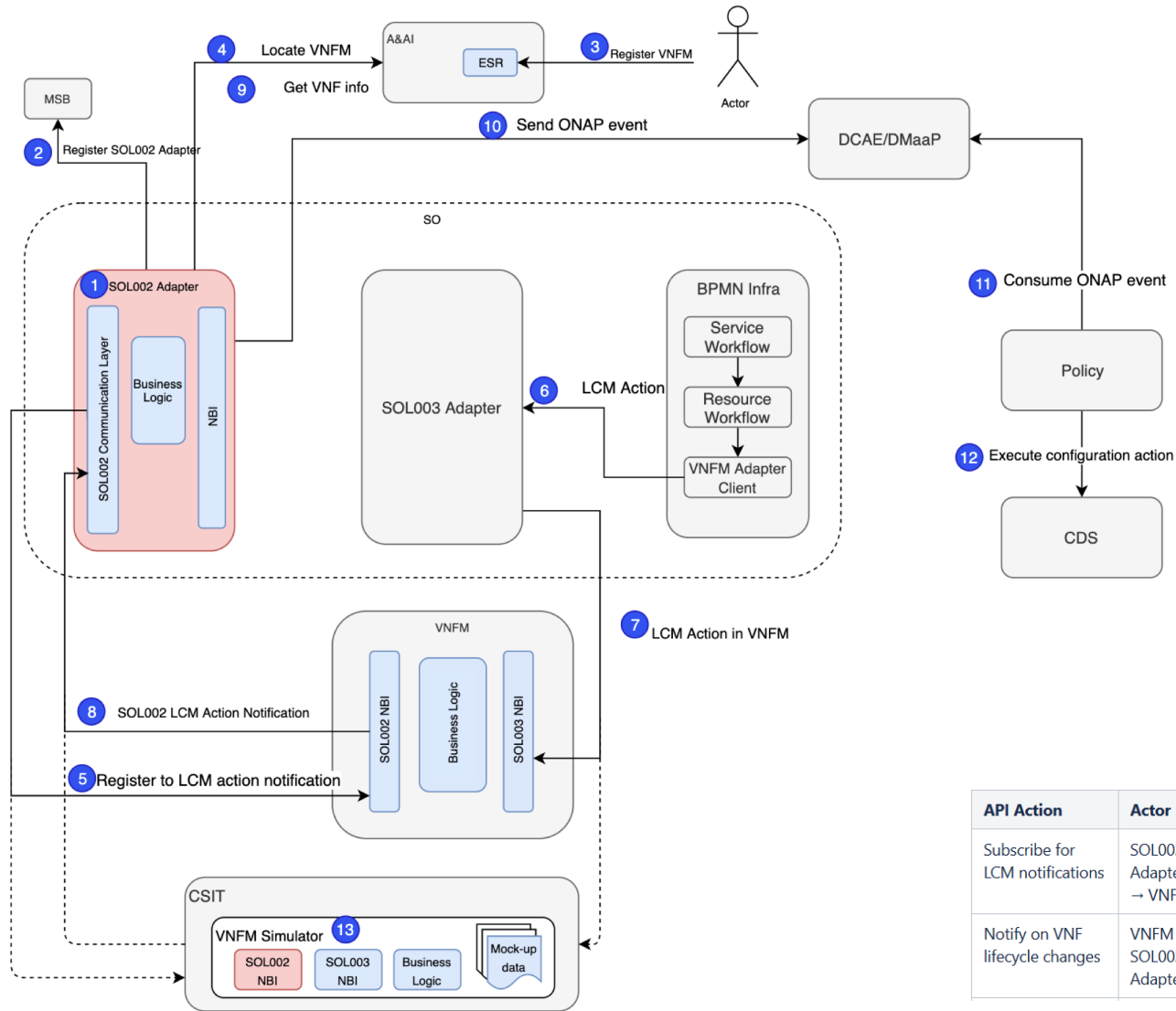
SOL005 Adapter Architecture & Use Cases

- SOL005 Adapter is a Microservice that will make connections between SO and VF-C/External NFVO through SOL005 standards.
- SOL005 Adapter will support the following APIs in Frankfurt
 - NS LCM : Create NS, Delete NS, Get NS, Instantiate NS, Terminate NS
 - Package/Descriptor Management is not for Frankfurt**
 - NSD Management : Subscribe, Query Subscription Information, Terminate Subscription, Notify
 - VNF Package Management : Fetch VNF Package Artifacts, Subscribe, Query Subscription Information, Terminate Subscription
- Use Cases
 - Operator registers NFVO to ONAP via ESR
 - ESR registration entities are pushed to AAI
 - Operator sends NS requests from UI along with selected NFVO details
 - SOL005 Adapter fetches NFVO details from AAI
 - SOL005 Adapter sends the requests to NFVO



API Action	Method	URI	Description
Create NS	POST	/ns_instances	To create a Network Service
Instantiate NS	POST	/ns_instances/{nsInstanceId}/instantiate	To instantiate Network service
Get NS Details	GET	/ns_instances/{nsInstanceId}	To query the status of the Network Service
Terminate NS	POST	/ns_instances/{nsInstanceId}/terminate	To Delete Network Service Instance

SOL002 Adapter Architecture & Use Cases

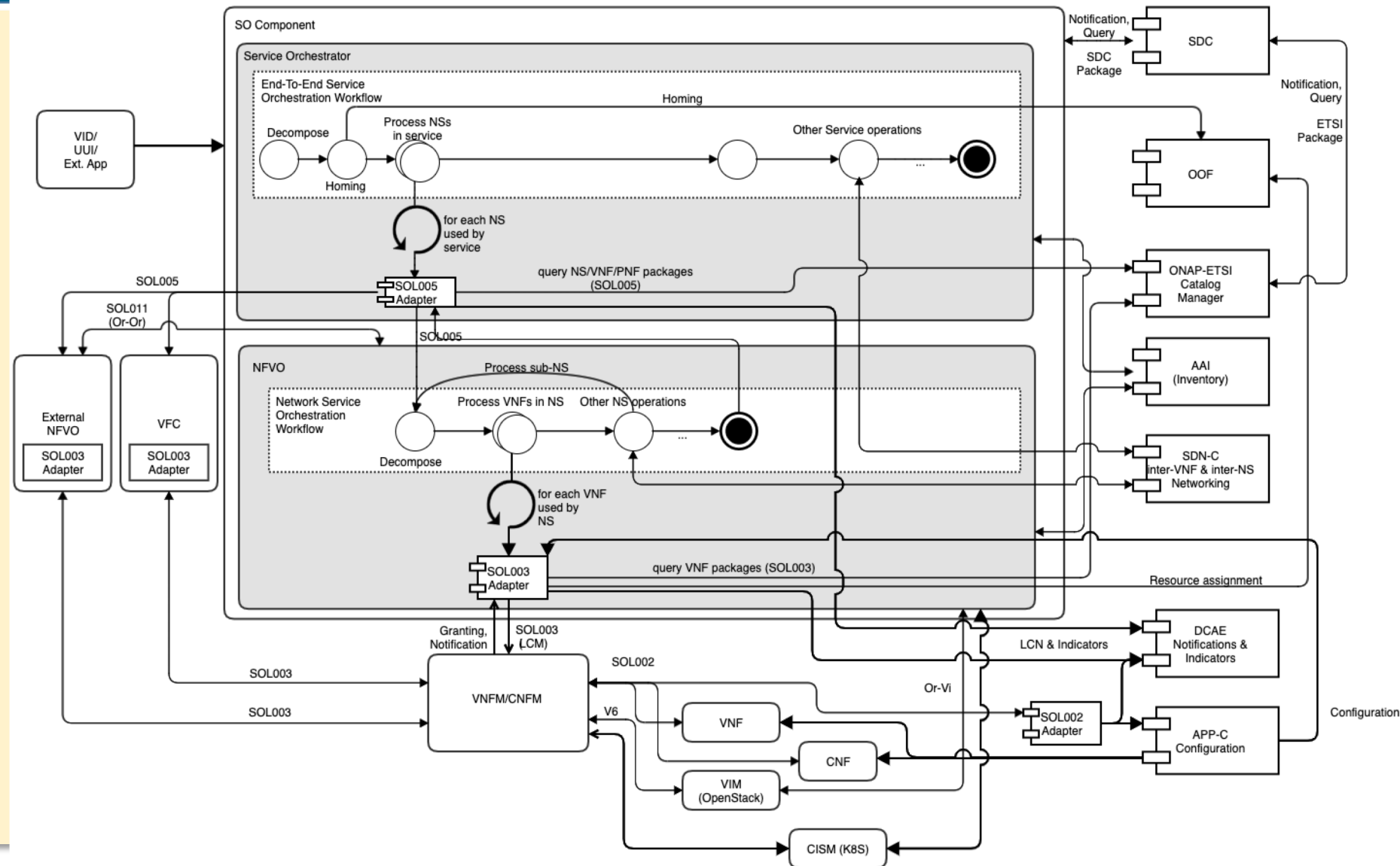


- SOL002 Adapter will be a SO micro-service that makes connections between VNFM and ONAP (as Element Manager) through ETSI defined Ve-Vnfm interface
 - SOL002 Adapter registers to MSB
 - Operator registers VNFMs to ESR in AAI
 - SOL002 Adapter locates VNFMs via AAI
 - SOL002 Adapter subscribes for VNFM notifications
 - SOL002 Adapter receives calls from VNFM
 - SOL002 Adapter gets VNF info from AAI
 - SOL002 Adapter sends ONAP events to DCAE/DMaaP
 - VNFM Simulator will be enhanced to interact with the SOL002 Adapter for SOL002 use case testing
- Use Case for Frankfurt
 - SOL002 Adapter subscribes and consumes VNF LCM notifications from VNFM

API Action	Actor	Method	URI	Description
Subscribe for LCM notifications	SOL002 Adapter → VNFM	POST	/vnflcm/v1/subscriptions (LcmSubscriptionRequest)	To create subscription for LCM notification
Notify on VNF lifecycle changes	VNFM → SOL002 Adapter	POST	/lcm/v1/vnf/instances/notifications (VnflcmOperationOccurrenceNotification)	To notify SOL002 adapter on VNF lifecycle changes

ONAP SO Hierarchical ETSI-based Orchestration

- The diagram depicts the orchestration functional blocks
- It is an ETSI-based hierarchical orchestration concept, to facilitate ONAP orchestration adoption by operators who have their own NFVOs and/or VNFMs
 - E2E, NS, VNF, CNF orchestration by leveraging ETSI standards
- Working with the existing VFC and external NFVOs
- Leveraging the common ETSI Catalog Manager
- Leveraging the common OOF for homing
- Possible ONAP SO embedded NFVO block
 - Handle NS LCM Orchestration
 - Take over Granting and Package Management from the SOL003 Adapter
 - Support SOL005 Northbound Interface
 - Support Or-Vi Indirect Resource control for VIM
 - Possibly, interface with other peer NFVOs (Or-Or)





ONAP

OPEN NETWORK AUTOMATION PLATFORM

Thank you!