Support xNF Software Upgrade in association to schema updates

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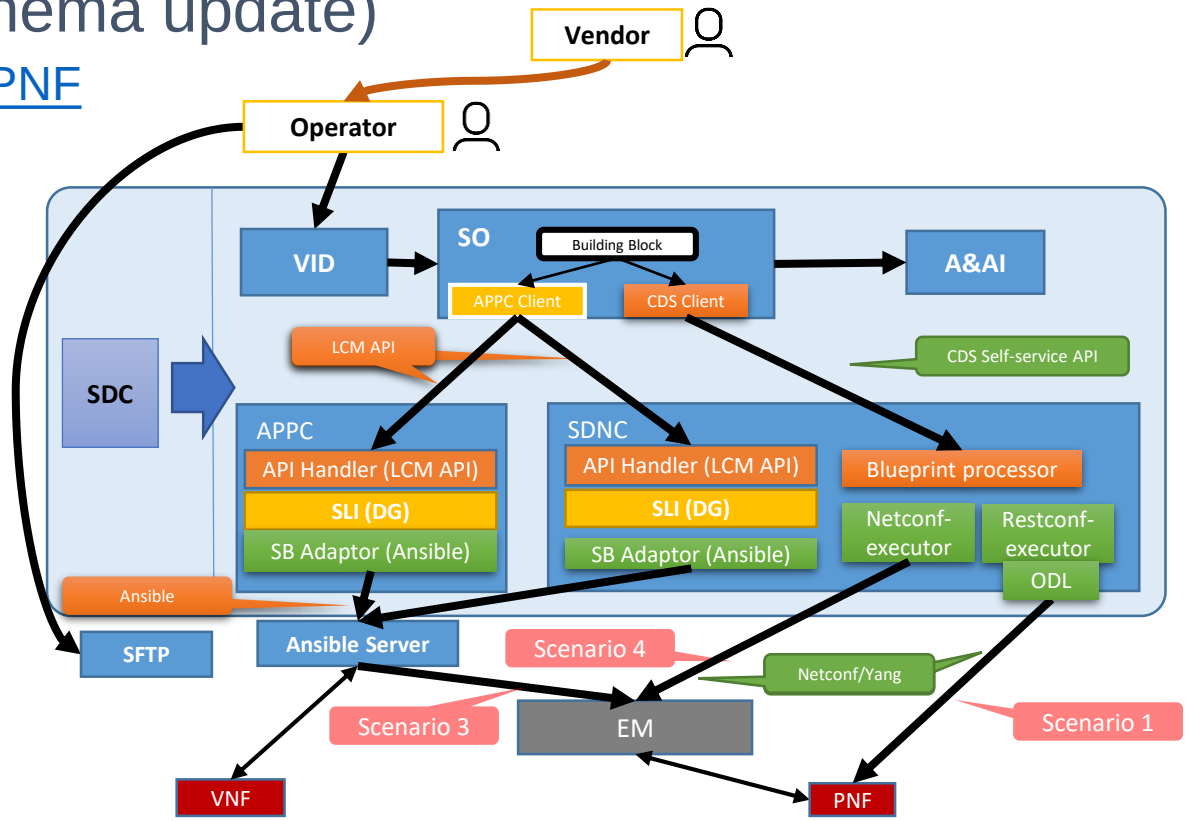
Requirement

- **Executive Summary** - A schema update in relation to a xNF software upgrades is a routine for network upgrade to support new xNF features, improve efficiency or increase xNF capacity on the field, and to eliminate bugs. This use case provides to ONAP an advantage in orchestrating and managing the Life Cycle of a Network Services in-line with business and service objectives.
- **Business Impact** - Deployment and orchestration of new services over CNFs, VNFs and PNFs in a model and software driven way simplifies the network management. Enables operators and service providers to manage the Life Cycle of a Network Service. Assuring continuity of operation of services is crucial for production and carrier grade environments. The actualization or upgrades of software and in consequence required changes in the service model is a natural part of service instance life cycle. Without the support of ONAP service update with schema change, service life cycle management by ONAP can be very difficult which can impact the quality and continuity of services.
- **Business Markets** - All operators and service providers that are using ONAP for service and network function Life Cycle Management
- **Funding/Financial Impacts** - Reduction in operations expense from using industry standard Interfaces.
- **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.*

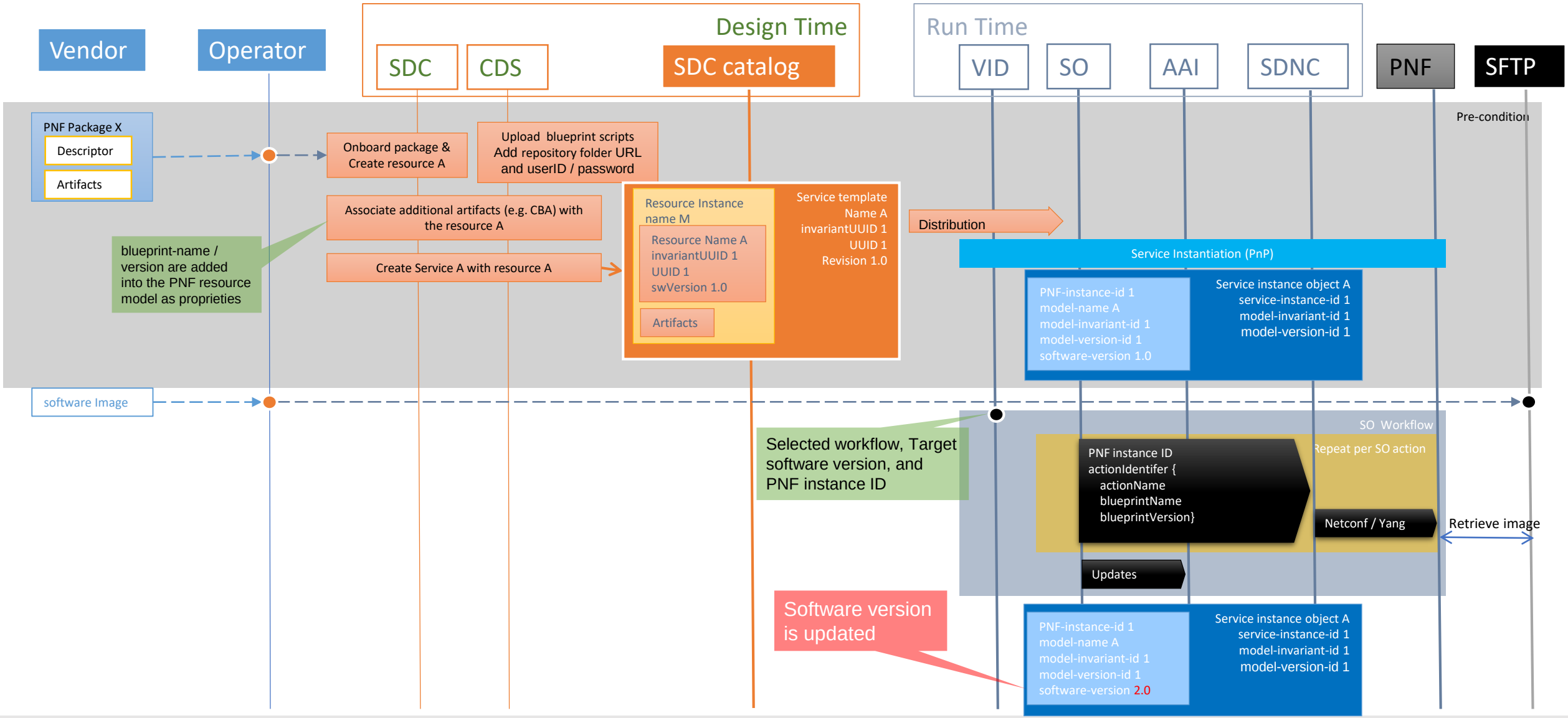
xNF Software Upgrade without xNF artifacts updating in Release F

- VNF in-place software upgrade procedure on a single VNF instance without VNF artifacts updating (schema update)
- PNF in-place software upgrade procedure on a single PNF instance without PNF artifacts updating (schema update)
  - Scenario 1: Using direct Netconf/Yang interface with PNF
  - Scenario 3: Using Ansible protocol with EM
  - Scenario 4: Using Netconf/Yang interface with EM

The descriptor and artifacts information included in the resource and service template are named as schema in this project. The procedure of updating the resource / service template info, i.e. descriptor and artifacts, is named as schema update in this project.

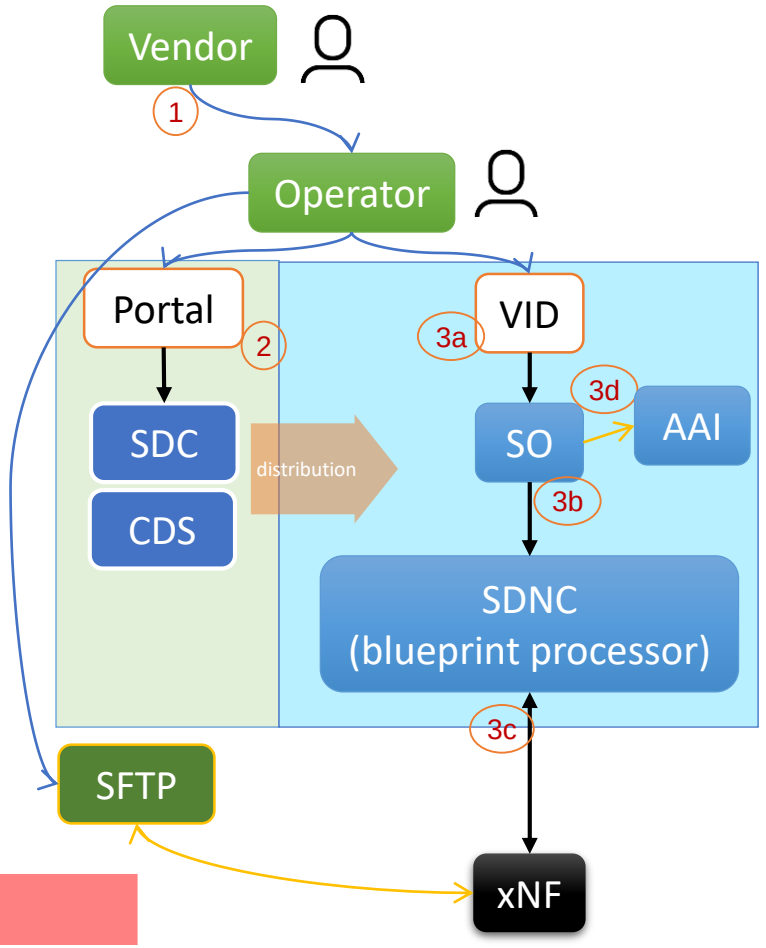


Update one PNF instance without schema update



New schema update procedure in Release G

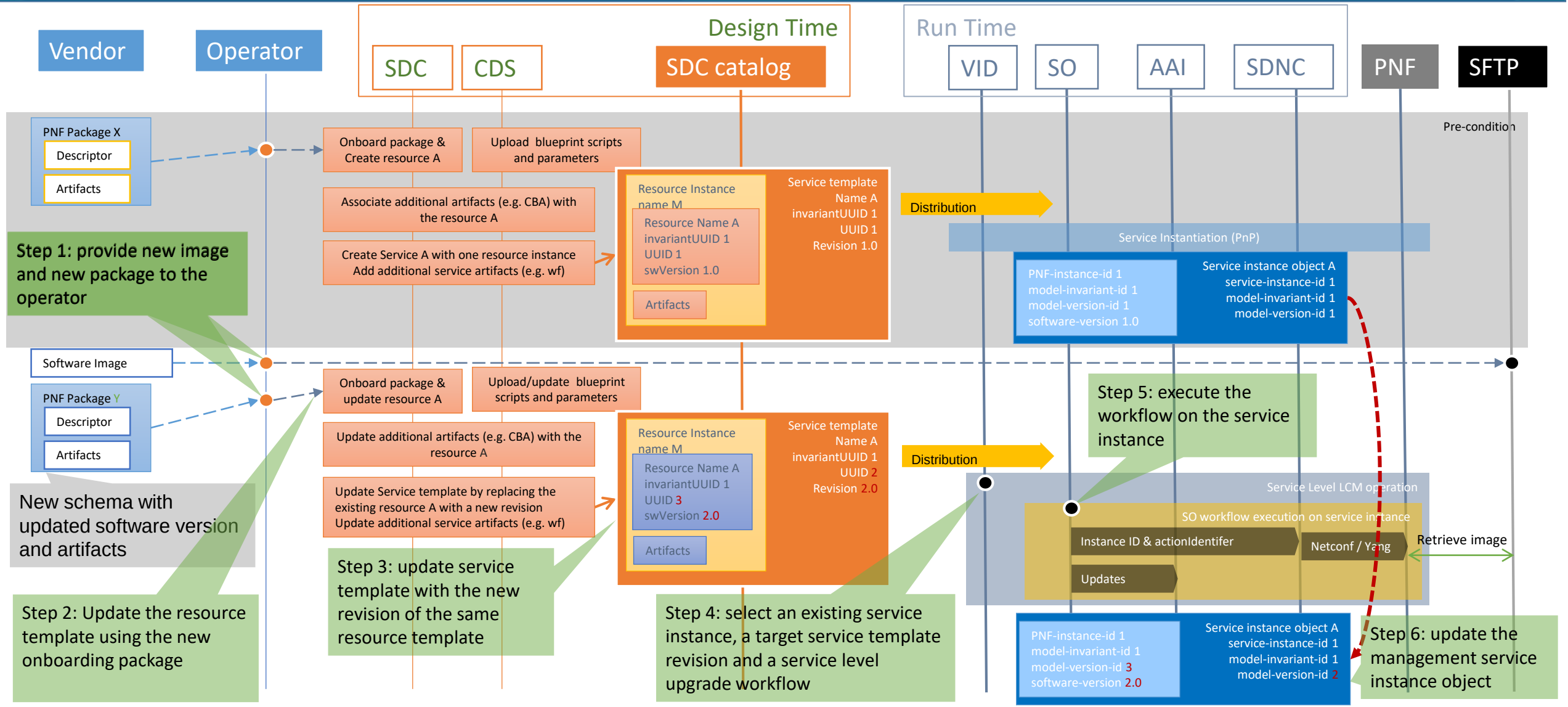
1. A vendor shall provide
   - a new VNF / PNF package with updated artifacts, and
   - the new VNF/ PNF software image to the operator.
2. At receiving of the new package, the operator shall
   - onboard the new package and create a new resource template or update the existing resource template (PNF / VNF)
   - update the existing service template with the new or updated resource template
   - distribute the updated service template to run time.
3. At run time, the operator shall, based on the updated service template,
   - upgrade a service instance and its resource instances, and
   - update the AAI entry accordingly



Schema upgrade must be handled at service level for both design time and run time

Then ONAP can make use of the new artifacts provided by the vendors, after schema update

Service level LCM operation example
with the same PNF resource name



Onboarding procedure

Onboarding
Heat / xNF csar
package

Create a VSP from a new onboarding package

Update a VSP from a new onboarding package

Create a VSP manually via SDC UI

VSP

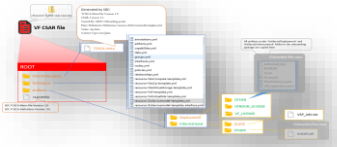
SDC adding additional metadata automatically, including UUID, vendor license model, etc.

Create a resource from VSP

Update a resource from a new version VSP

manually creating a resource

resource(VF)



manually updating a resource

updating any descriptor proprieties

updating / adding / removing any artifacts

Create a Vendor License Model manually

VLM

adding additional info automatically, including a link of the vendor license model based on input

Create a service model by adding resource models

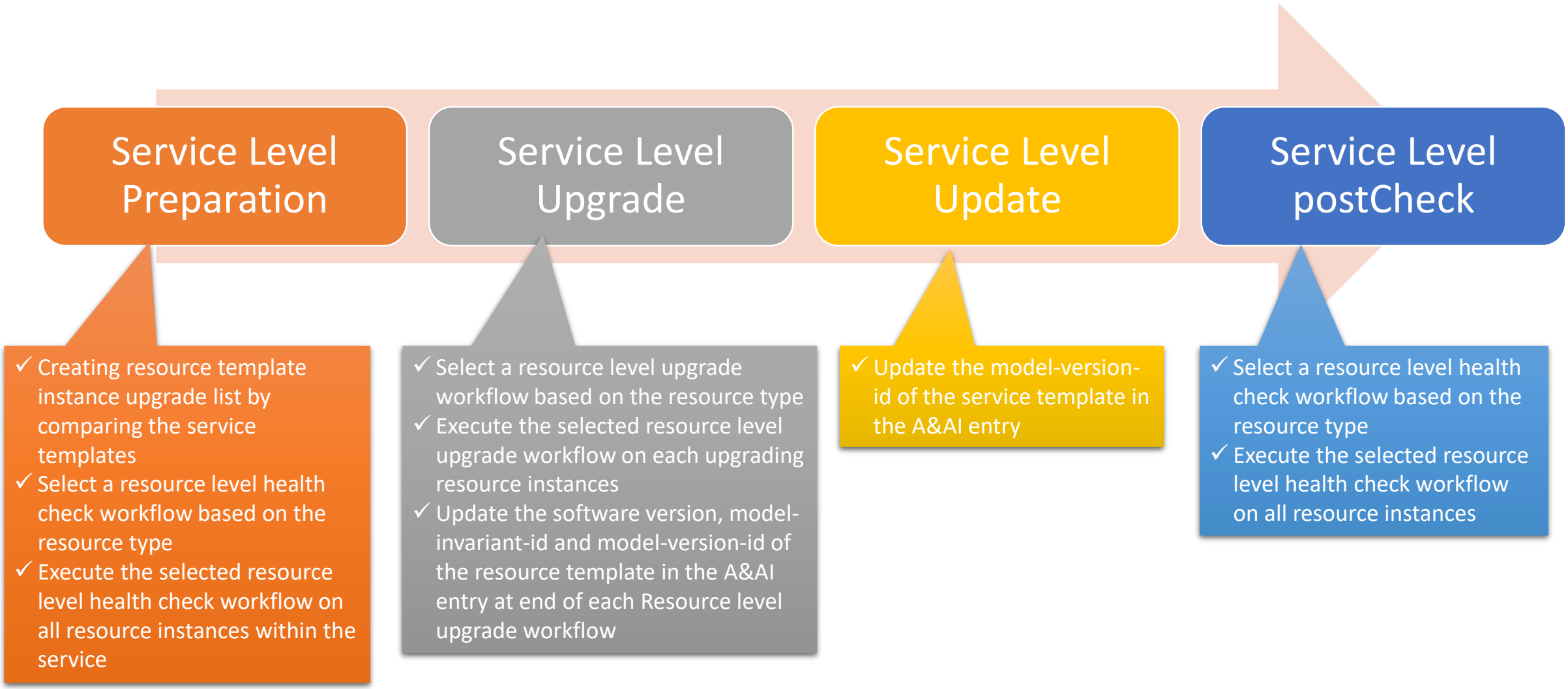
Update a service model with updated resource models

Service model

Distribution

Run time

SO Service level upgrade workflow



SO Service level upgrade workflow

Service Level Preparation

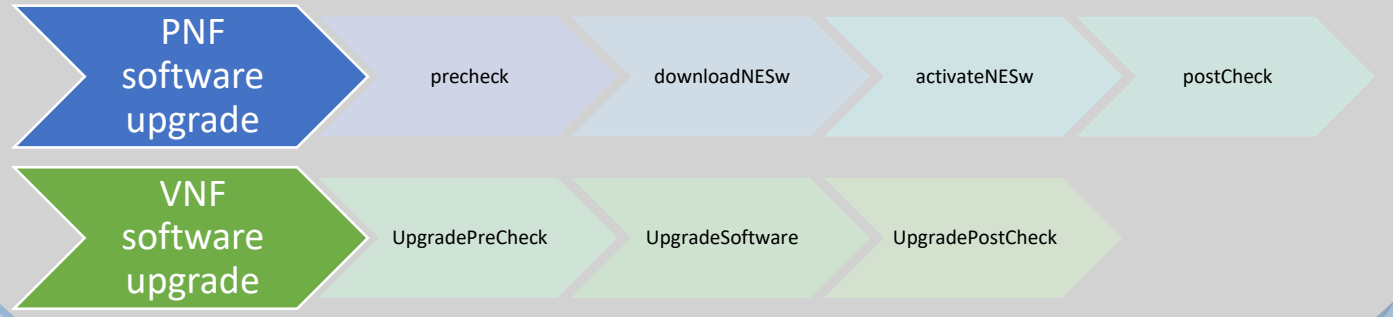
Service Level Upgrade

Service Level Update

Service Level postCheck

Note: the service level workflow is network function type independent. When upgrade one resource instance, the subsequent resource level upgrade workflow is selected based on the network function type.

Example of resource level upgrade workflow



Repeat on each to-be-upgraded resource instance

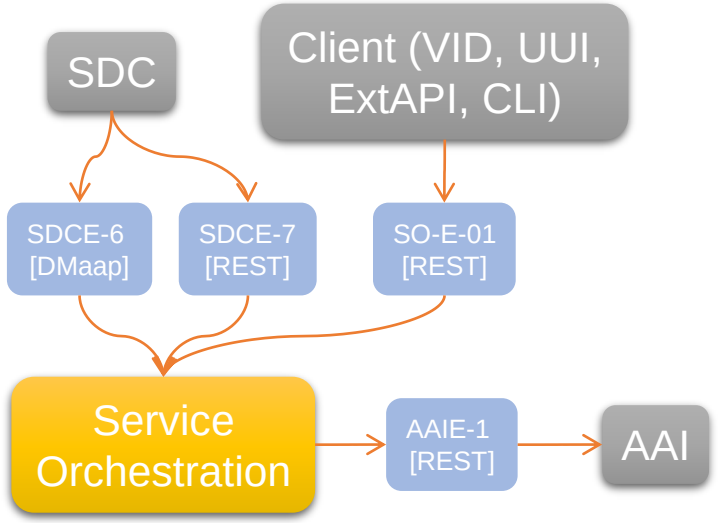
API Impacts

Consumed existing A&AI APIs (No impacts on AAIE-1)

Retrieve all services instance:
GET /business/customers/customer/{global-customer-id}/service-subscriptions/service-subscription/{service-type}/service-instances

Update A&AI with new resource model version:
PATCH /network/pnfs/pnf/{pnf-name}
PATCH /network/generic-vnfs/generic-vnf/{vnf-id}

Update A&AI with new service model version:
PATCH /business/customers/customer/{global-customer-id}/service-subscriptions/service-subscription/{service-type}/service-instances/service-instance/{service-instance-id}



New SO APIs (SO-E-01 extensions)

Service model retrieving API
Get /serviceSpecifications/v1/serviceModels?serviceModelInvariantId={model-invariant-id}

Service level workflow retrieving API
Get /workflowSpecifications/v1/workflows? serviceModelVersionId={UUID}

Service level workflow execution API
POST /instanceManagement/v1/serviceInstances/{serviceInstanceId}/workflows/{workflow_UUID} ? targatVersion=serviceModelVersionId

ONAP Impacts

ONAP components	Story
SDC	• PNF software version onboarding (done in R6) • Update a resource template from a new onboarding package
SO	• New building blocks to enable service level LCM operation. • Generic service level upgrade workflow • Service model retrieving API • Service level workflow retrieving API • Service level workflow execution API
Documentation	• Defining the new service level software upgrade procedure
Integration	• test cases on resource template updating • test cases on new SO APIs • test cases on service level workflow execution • test cases on e2e service level upgrade procedure (with PNF simulator)
Modeling	No impacts
New components	Not Applicable

Thank You!