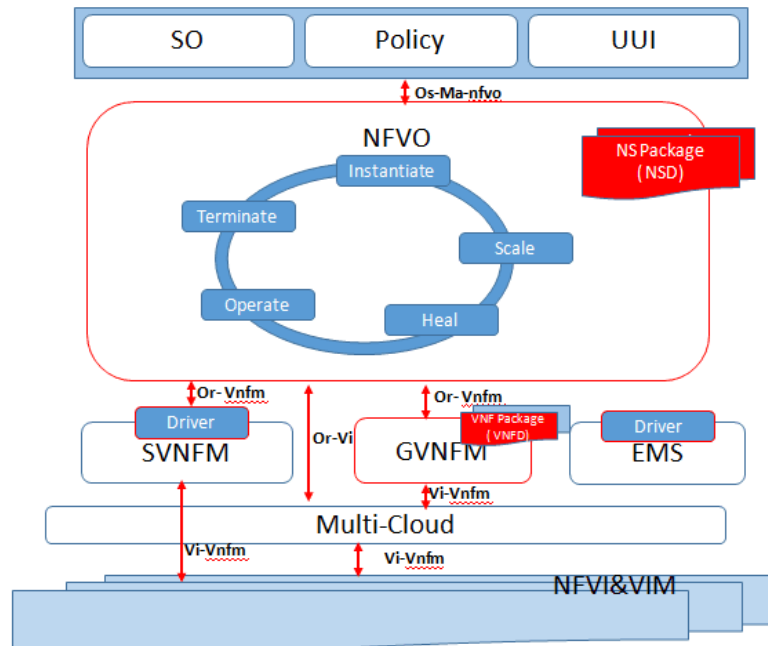


Network Service Descriptor Proposal

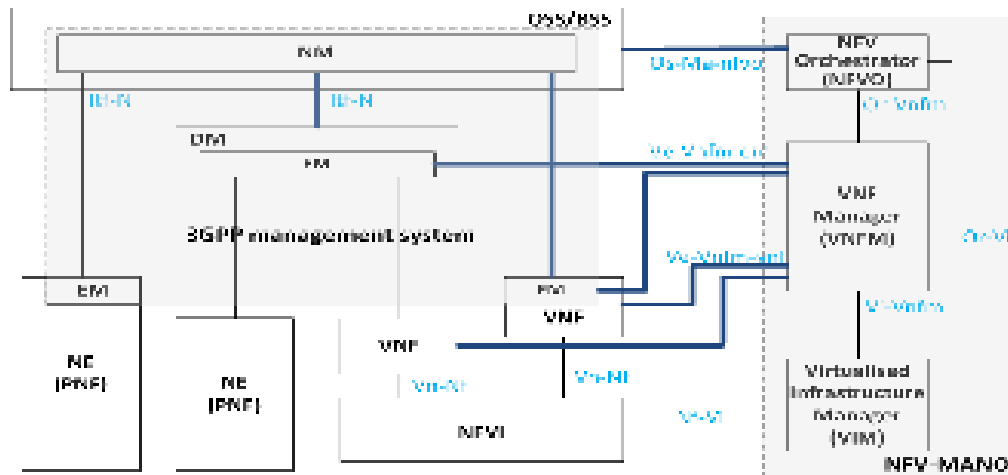
NSD Requirements:

1, VFC project requirement

- VFC project implement ETSI NFVO, which needs to consume the NSD.



- VFC needs to expose NFVO northbound SOL005 interfaces to SO or OSS/BSS/3GPP Management System
JIRA : [VFC-635/VFC-648](#)



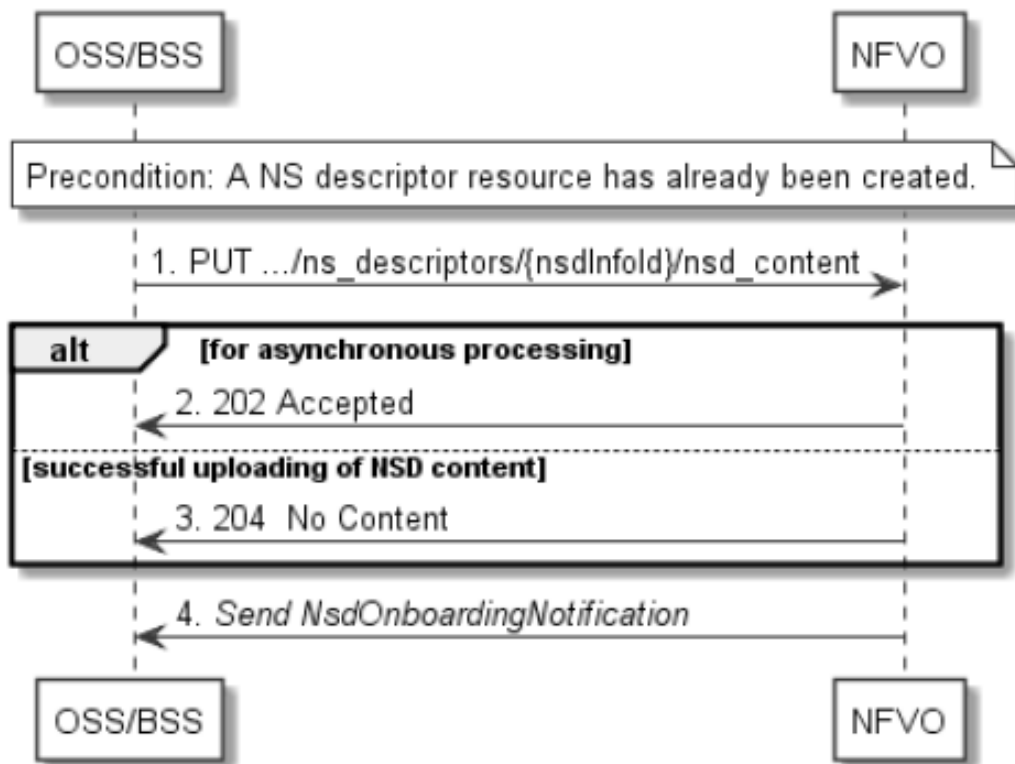


Figure 5.3.2-1: Flow of the uploading of NSD content

2, NSD vs ServiceD differences:

Service Descriptor in SDC R3: service composites many resources in the SDC, including SDC AID resources(vf, extVL, [AllottedResource](#)) and R2+ resources.

NSD in VFC: NSD composites VNFD, PNFD, and NSVirtualLink, nested NSD, etc, ETSI NFV resources.

NSD requires to do some limitation in NFV resources composition, not all the SDC resources and substitution_mappings to NS TOSCA node

NSD related work pages:

[R3 NetworkServiceModel](#)

[ONAP R2+ Design-Time Service DM Input.](#)

[PNF resource IM proposal](#)

[Network Service Descriptor Model - Based on R2](#)

Node Type

tosca.nodes.nfv.NS

```
tosca.nodes.nfv.NS:
  derived_from: toska.nodes.Root
  properties:
    ns_id:
      type: string
      required: true
    designer:
      type: string
      required: true
    version:
      type: string
      required: true
    name:
      type: string
      required: true
    invariant_id:
      type: string
      required: true
  capabilities:
    #monitoring_parameter:
      # modelled as ad hoc capabilities in VNF node template
  requirements:
    - virtual_link:
      capability:
        toska.capabilities.nfv.VirtualLinkable
      relationship:
        toska.relationships.nfv.VirtualLinksTo
      node: toska.nodes.nfv.NsVirtualLink # toska.nodes.nfv.VL
      occurrences: [ 0, UNBOUNDED ]
```

tosca.nodes.nfv.VNF

refer to <https://wiki.onap.org/display/DW/Node+Type> #tosca.nodes.nfv.VNF:

tosca.nodes.nfv.PNF

```
tosca.nodes.nfv.PNF:
  derived_from: tosca.nodes.Root
  properties:
    descriptor_id: # instead of pnfd_id
      type: string
      required: true
    provider:
      type: string
      required: true
    version:
      type: string
      required: true
    descriptor_invariant_id:
      type: string # GUID
      required: true
    name:
      type: string
      required: true
    function_description:
      type: string
      required: true
    #geographical_location_info:
    #  type: TBD
    #  required: true
  requirements:
    - virtual_link:
        capability: tosca.capabilities.nfv.VirtualLinkable
        relationship: tosca.relationships.nfv.VirtualLinksTo
```

tosca.nodes.nfv.NsVirtualLink

```
tosca.nodes.nfv.NsVirtualLink:
  derived_from:
    tosca.nodes.Root
  description: node definition of Virtual Links
  properties:
    provider:
      type: string
      required: false
    version:
      type: string
      required: true
    vl_profile
      type: tosca.datatypes.nfv.VlProfile # only covers nin/max bitrate requirements
      required: true
    connectivity_type:
      type: tosca.datatypes.nfv.ConnectivityType
      required: true
    qos:
      type: tosca.datatypes.nfv.Qos
      required: false
    service_availability:
      type: tosca.datatypes.nfv.ServiceAvailability
      required: false
  capabilities:
    VirtualLinkable:
      type: tosca.capabilities.nfv.VirtualLinkable
```

Data Type:

tosca.datatypes.nfv.ConnectivityType

```
tosca.datatypes.nfv.ConnectivityType:
  derived_from: tosca.datatypes.Root
  properties:
    layer_protocol:
      type: string
      required: true
      constraints:
        - valid_values: [ethernet, mpls, odu2, ipv4, ipv6, pseudo_wire ]
    flow_pattern:
      type: string
      required: false
      constraints:
        - valid_values: [Line, Tree, Mesh]
```

tosca.datatypes.nfv.ServiceAvailability

```
tosca.datatypes.nfv.ServiceAvailability:
  derived_from: tosca.datatypes.Root
  description: service availability
  properties:
    Level:
      type: string
      description: service availability levels
      required: true
      constraints:
        - valid_values: [ Level1, Level2,Level3 ]
```

Capability

tosca.capabilities.nfv.VirtualLinkable

```
tosca.capabilities.nfv.VirtualLinkable:
  derived_from: tosca.capabilities.network.Linkable
```

Relationship

tosca.relationships.nfv.VirtualLinksTo

```
tosca.relationships.nfv.VirtualLinksTo:
  derived_from: tosca.relationships.DependsOn
  valid_target_types: [ tosca.capabilities.nfv.VirtualLinkable ]
```

NS Example

NS Example

```
tosca_definitions_version:
tosca_simple_yaml_1_1
metadata:
  ...
imports:
- nodes:
    file: nodes.yml
- datatypes:
    file: data.yml
- capabilities:
    file: capabilities.yml
-relationships:
    file: relationships.yml

topology_template:
  inputs:
    # omitted here for brevity
  substitution_mappings:
    node_type: tosca.nodes.nfv.NS.example
  node_templates:
    NsVL1:
      type: tosca.nodes.nfv.NsVirtualLink
      properties: ...
    NsVL2:
      type: tosca.nodes.nfv.NsVirtualLink
      properties: ...
    VNF1:
      type: tosca.nodes.nfv.VNF.VNF1
      properties: ...
      requirements:
        - virtualLink1: NsVL2
    VNF2:
      type: tosca.nodes.nfv.VNF.VNF2
      properties: ...
      requirements:
        - virtualLink1: NsVL1
    VNF3:
      type: tosca.nodes.nfv.VNF.VNF3
      properties: ...
      requirements:
        - virtualLink1: NsVL1
        - virtualLink2: NsVL2
    PNF1:
      type: tosca.nodes.nfv.PNF.PNF1
      properties: ...
      requirements:
        - virtualLink1: NsVL1

#####VNF1 Template #####
.....
substitution_mappings:
  requirements:
    virtualLink1:
      - ext_port_1
      - virtual_link
  node_type: tosca.nodes.nfv.VNF.VNF1

#####VNF2 Template #####
.....
substitution_mappings:
  requirements:
    virtualLink1:
      - ext_port_1
      - virtual_link
  node_type: tosca.nodes.nfv.VNF.VNF2
```

```
#####VNF3 Template #####
```

```
.....
```

```
substitution_mappings:
```

```
  requirements:
```

```
    virtualLink1:
```

```
      - ext_port_1
```

```
      - virtual_link
```

```
    virtualLink2:
```

```
      - ext_port_2
```

```
      - virtual_link
```

```
node_type: tosca.nodes.nfv.VNF.VNF3
```

```
#####PNF1 Template #####
```

```
.....
```

```
substitution_mappings:
```

```
  requirements:
```

```
    virtualLink1:
```

```
      - ext_port_1
```

```
      - virtual_link
```

```
node_type: tosca.nodes.nfv.PNF.PNF1
```