

Common NFVI Telco Taskforce

Technical F2F Work Shop – January 13-16, 2020

Infrastructure Description (Manifests) Validation

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 THE **LINUX** FOUNDATION



The 'Manifest Validation' is a novel process – reference work or tools do not exist in public.

It has a major role to play in 'automation'.

Infrastructure Description

Goal

Create automated means to do a manifest validation / or audit of actual delivery and installation of the OpenStack deployment

Approach

- › Machine-Readable Definition/Description of the infrastructure – Hardware and Software – using a specific schema (preferably standardized?).
- › The Infrastructure: Environment In/On which ‘ANY’/’Targeted’ VNFs (CNFs) runs.

Scope

- › NFVI + SDN
- › MANO
- › Underlay/Fabric

Consumers

- › Primary: Installers.
- › Secondary: Test and Verification Framework, Application designers, Management/Operations.

What really user can 'Describe'?

These are organized by Installer-Specific Schema

GENERIC

Management (location, owner, etc.), Strategy, Globals, Tooling, Versioning,

HARDWARE

Vendor, Gen., BIOS, CPUs, Memory, Disks, NICs (PCI, MAC), etc.

PROFILES (HOST)

Name, Disks & Partitions, N/W->NIC Mapping, OS,

NETWORK

Names, vlans, cidr, routes, ip, g/w, speed, mtu, bonding, etc. cidrs for diff. n/ws, container n/w, SRIOV, etc.

NODES

Profile-Mapping, Networks & address, metadata.

SECRETS

Certificates, passphrases, public keys, etc.

SOFTWARE

Software and nodes mapping, versions, registry,

ACTIONS

Boot actions - custom scripts, drivers, etc.

OTHERS

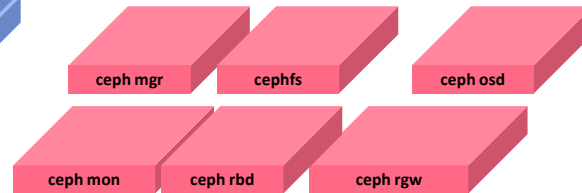
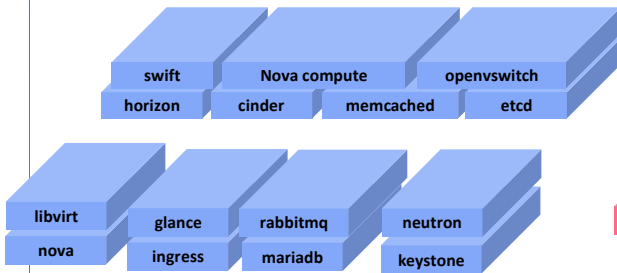
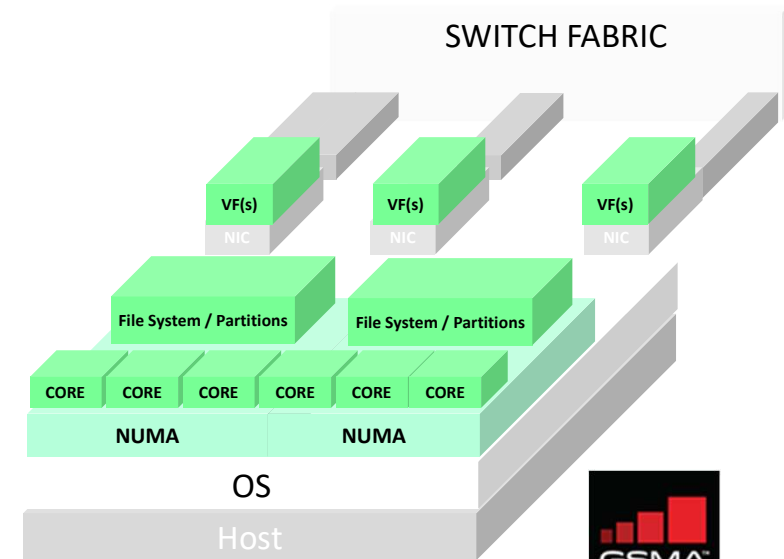
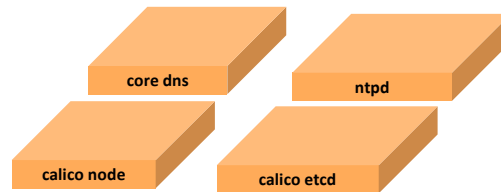
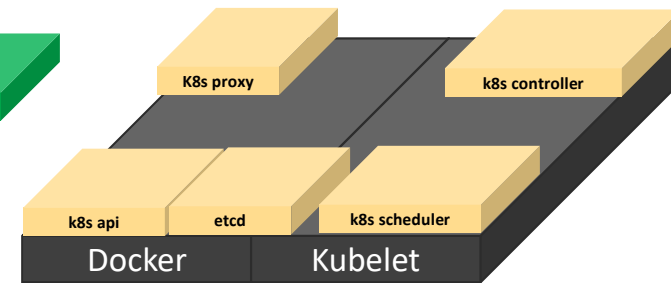
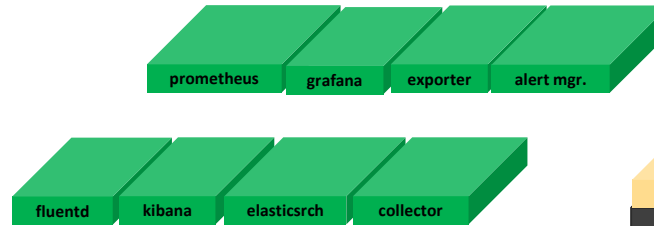
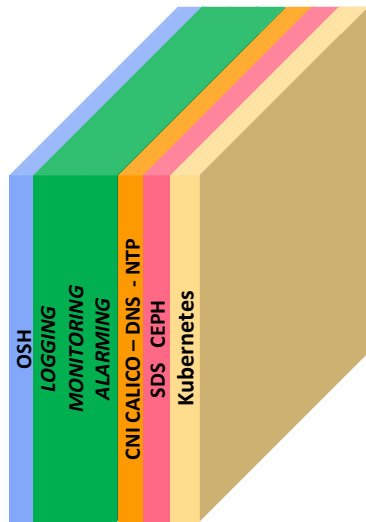
Jump Hosts-Definition, Network Services (NTP, DNS, etc)

Infrastructure Description

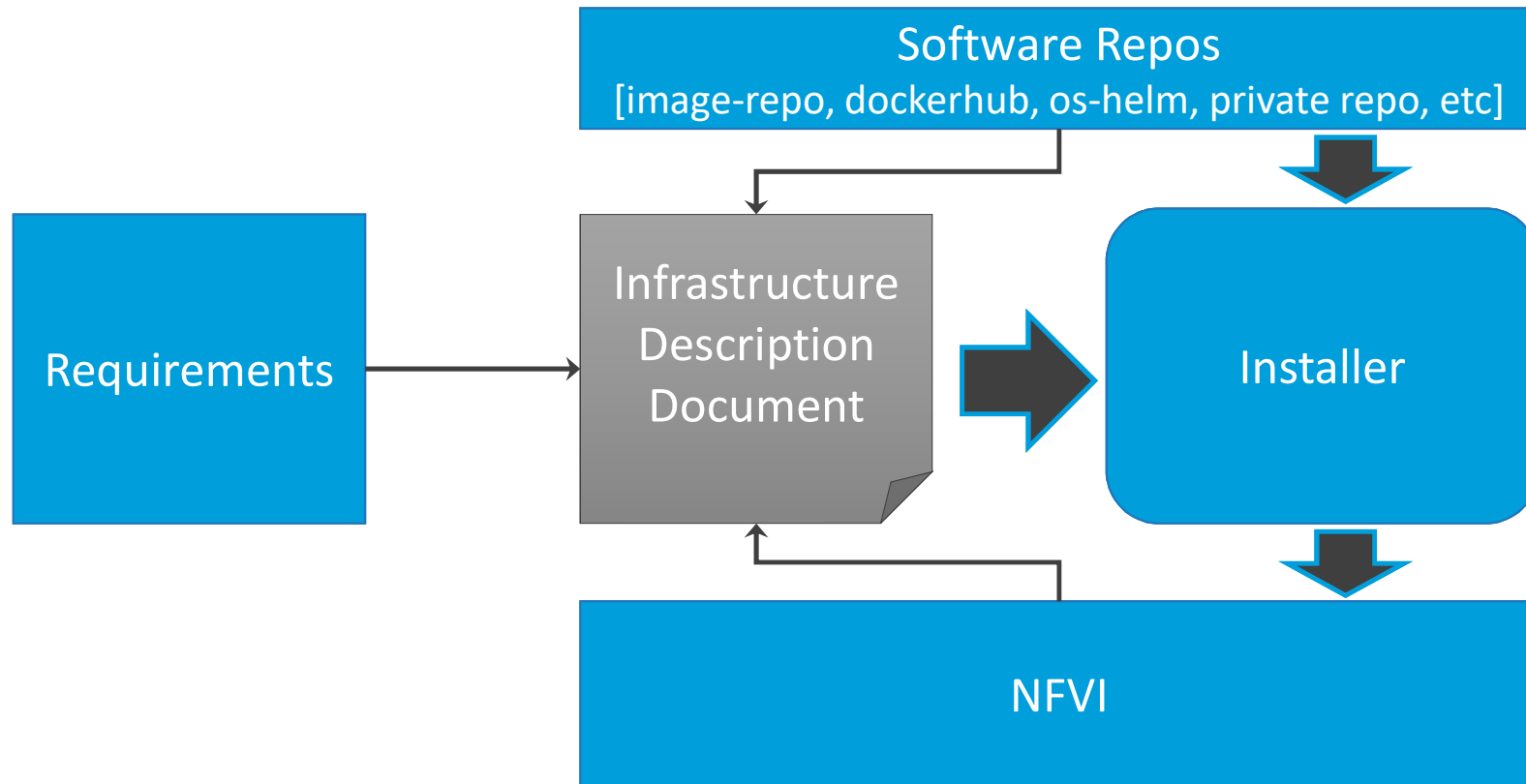
Example Works

- › Airship Treasuremap Manifests
- › OPNFV PDF/IDF
- › TripleO Heat Templates
- › Kayobe's YAML files.
- › Fuel Configuration in OPNFV-IDF.
- › GUI-Based configuration in compass.
- › OPNFV Apex's - inventory, network and deploy settings.
- › Kubernetes CRDs

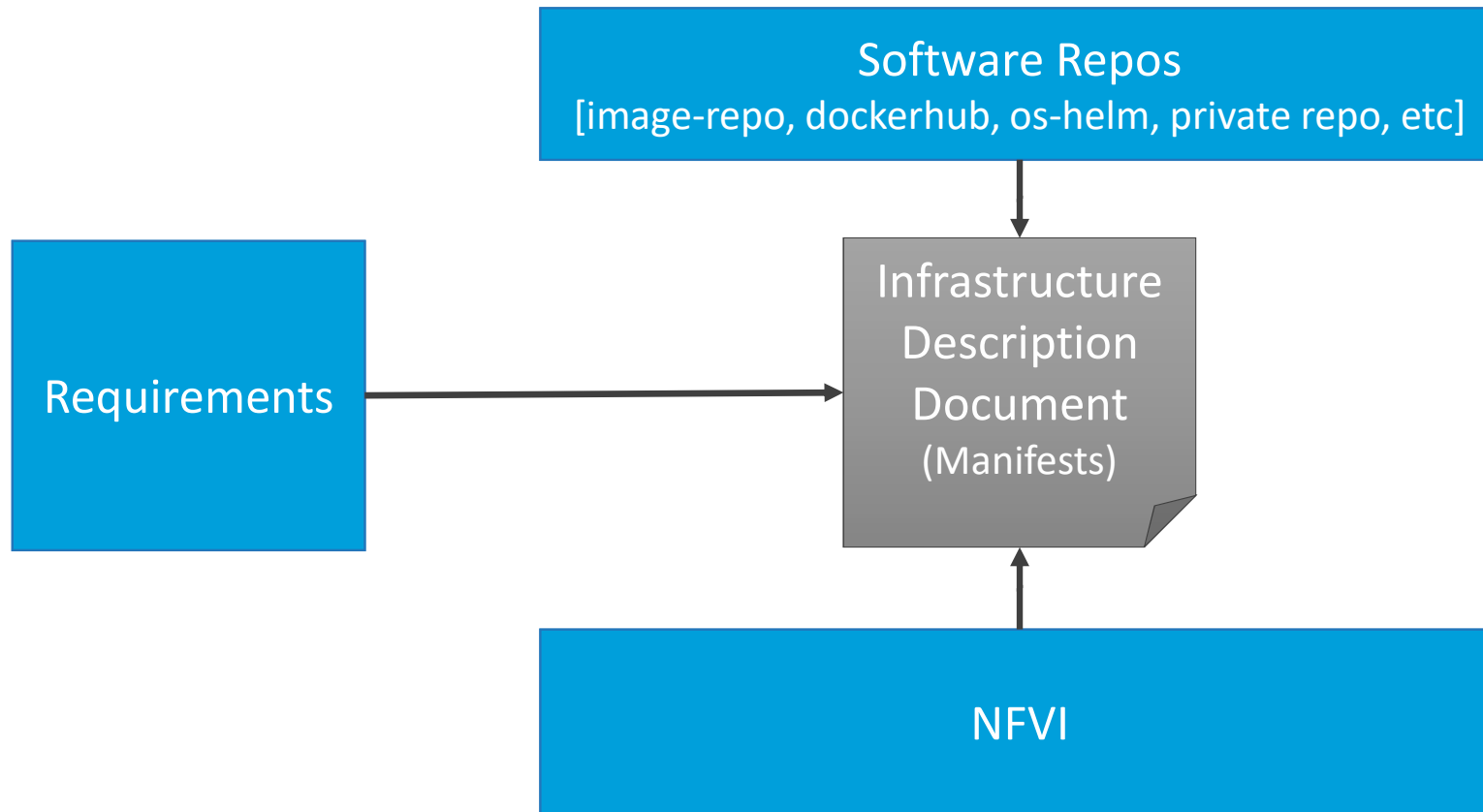
Infrastructure Description: Example (Airship)



Infrastructure Description: Manifests



Validating Manifests: What are we validating against?



Validating Manifests Vs Validating Deployment

Overlaps does exist....

| Category | Manifest Validation | Deployment Validation |
|--------------|--|--|
| Scope | Applies to only a subset of requirement | Validation covers all the requirements |
| Source | Documents | Physical Systems |
| Phase | Pre-Deployment [Cloud and Application] | Post-Deployment |
| Approach | Manual/Scripts | Test-Frameworks, Automation Scripts |
| Stakeholders | Cloud Architect, Application designers and Testers | |

Validating Manifests: Why and How

Why

- › Pre-Installation Checks for RM/RA
- › Minimize/Eliminate deployment failures.
- › Drive test-automation
- › Consistency Check for efficient automation
- › 'Handoff' to RC

How & When (2020)?

- › **Manual:** Requirements Mapping (Jan), Software/Config Validations (Feb)
- › **Automated:** Script Creation and PoC (Mar), Implementation (Apr)

Who - Script Development Supporting Skill

- › Meta-Data file interpretation (PDF/SDF/IDF), knows way around a command-line, system admin for data comparison between systems

Example: Considering CNTT Requirements

Requirements (Chapter 5)


| Requirement | Basic | NI | CI | POD-10 |
|---|-------|------|------|---------------------------------------|
| Number of CPU (Sockets) | 2 | 2 | 2 | 2 |
| Number of Cores per CPU | 20 | 20 | 20 | 22 |
| NUMA | N | Y | Y | Y |
| Simultaneous Multithreading / Hyperthreading (SMT/HT) | Y | Y | Y | Y |
| GPU | N | N | Y | Y (glxinfo grep "direct rendering") |
| Local Storage HDD | | | | |
| Local Storage SSD | Y | Y | Y | Y |
| NIC Ports | 4 | 4 | 4 | 4 |
| Port Speed | 10 | 25 | 25 | 10 |
| PCIe slots | 8 | 8 | 8 | 8 (dmidecode -t slot) |
| PCIe speed | Gen3 | Gen3 | Gen3 | Gen3 |
| PCIe Lanes | 8 | 8 | 8 | 8 |
| Cryptographic Acceleration | N | O | O | N |
| SmartNIC | N | O | O | N |
| Compression | | | | |

Requirements (Chapter 2)

Categories

- › Opensource
- › Cloudnativeness
- › Scalability
- › Resilience
- › Availability
- › Compute
- › Storage
- › Network
- › Acceleration
- › General
- › API
- › Automated Deployment
- › CI/CD⁺
- › Integration⁺
- › Monitoring
- › Zoning
- › Compliance
- › Networking*

Requirement-Level

- › Must
 - › Should
 - › May
- 

- › Pod-10 (ex. Validation)
- › [separate excel sheet]

Validation Approach & Classification of Requirements

| Validation Approach | Requirement Type |
|---------------------|---|
| Testing Framework | APIs, OpenStack-Features, Operations, |
| Automation Scripts | Configurations & Settings, System Capabilities, |
| Manual | Rest.. |

Thanks