



UNIVERSITÄT
PADERBORN



UPB — Computer Networks Group

Management of ServiCes Across MultipLE clouds

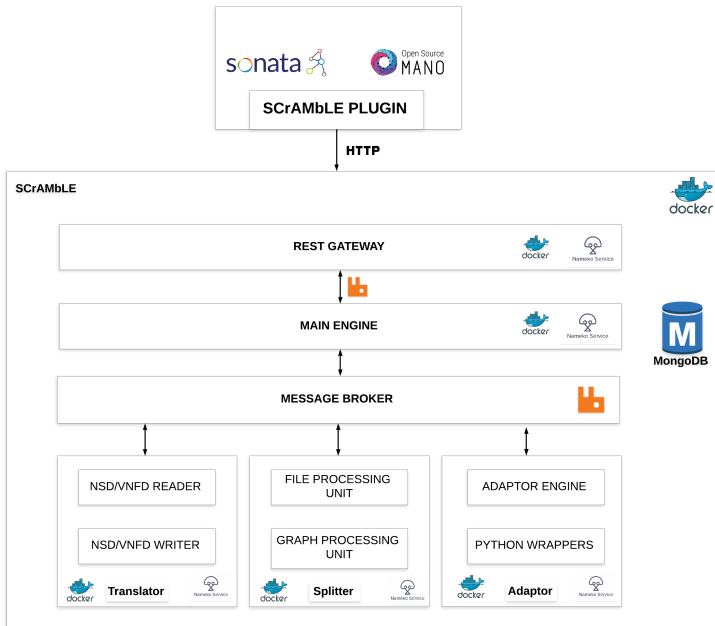
SCrAMbLE — Work Packages Demo

Agenda

- 1 Introduction
- 2 Adaptor Demo
- 3 Translator Demo
- 4 Splitter Demo
- 5 Conclusion

SCrAMbLE - Requirements and Architecture

- Service descriptor translator
 - Translate between MANO frameworks
- Service descriptor splitter
 - Translate between MANO frameworks
- MANO adaptor
 - Scalability support



ADAPTOR

Adaptor Design

- Common Interface


Adaptor Design

- Common Interface
 - Python Base Class

Adaptor Design

- Common Interface
 - Python Base Class
 - Semi-automated generation from ETSI Document

210 lines (154 sloc) | 5.05 KB

Raw Blame History  

```

1  """ Common Interface - nsd
2
3  Reference interface to implement REST API Wrappers
4  for MAND Frameworks Defined according to the
5  ETSI GS NFV-SOL 005 V2.4.1 (2018-02).
6
7  Defines abstract methods which are to be implemented
8  by the wrappers.
9  """
10
11  from abc import ABC, abstractmethod
12
13
14  class CommonInterfaceNsd(ABC):
15      """
16      NSD Management Interfaces
17
18      Base: {apiRoot}/nsd/v1
19      """
20
21      @abstractmethod
22      def get_ns_descriptors(self):
23          """ NSD Management Interface - NS Descriptors
24
25          /ns_descriptors
26          GET - Query information about multiple
27              NS descriptor resources.
28          """
29          pass
30

```

Adaptor Design

- Common Interface
 - Python Base Class
 - Semi-automated generation from ETSI Document
 - ...
- Highly Documented

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- Highly Documented
 - Very important aspect of Adaptor
 - Tracked on excel sheet

Adaptor Design

VNF PACKAGE MANAGEMENT INTERFACE							
Resource name	HTTP method	Meaning	SC/AMBLE common interface methods	OSM-RS endpoint	SONATA-3 endpoint	SC/AMBLE endpoint	OSM-RS Adaptor
VNF packages	GET	Query VNF packages information	get_vnf_packages	/vnfpkgm/v1/vnf_packages_content	/catalogues/api/v2/vnfs	/vnfpkgm/v1/vnf_packages	
	POST	Create a new individual VNF package resource	post_vnf_packages	/vnfpkgm/v1/vnf_packages_content	/catalogues/api/v2/vnfs	/vnfpkgm/v1/vnf_packages	
Individual VNF package	GET	Read information about an individual VNF package	get_vnf_packages_vnfpkgid	/vnfpkgm/v1/vnf_packages_content/vnfpkgid			
	PATCH	Update information about an individual VNF package	patch_vnf_packages_vnfpkgid		/catalogues/api/v2/vnfs/vnfpkgid		
	DELETE	Delete an individual VNF package	delete_vnf_packages_vnfpkgid				
VNFD of an individual VNF	GET	Read VNFD of an on-boarded VNF package	get_vnf_packages_vnfpkgid_vnfd	/vnfpkgm/v1/vnf_packages/vnfpkgid/vnfd			
	GET	Fetch an on-boarded VNF package	get_vnf_packages_vnfpkgid_package_content	/vnfpkgm/v1/vnf_packages/vnfpkgid/package_content			
VNF package content	PUT	Upload a VNF package by providing the content of the VNF	put_vnf_packages_vnfpkgid_package_content	/vnfpkgm/v1/vnf_packages/vnfpkgid/package_content			
Upload VNF package from URI	POST	Upload a VNF package by providing the address information of	post_vnf_packages_vnfpkgid_package_content				
Individual VNF package artifact	GET	Fetch individual VNF package artifact	get_vnf_packages_vnfpkgid_artifacts_artifactid	/vnfpkgm/v1/vnf_packages/vnfpkgid/artifacts			
Subscriptions	POST	Subscribe to notifications related to on-boarding and/or changes of VNF	post_vnf_packages_subscriptions				
	GET	Query multiple subscriptions	get_vnf_packages_subscriptions				
Implemented in Mono Adaptor							



...

Adaptor REST API

- Adaptor follows ETSI endpoints

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- Adaptor follows ETSI endpoints
 - Unified access to MANO instances
 - Enforce if a MANO is using non-standard endpoint
- **MANO**: parameter sent with each request
 - Currently supports **OSM** and **Sonata**



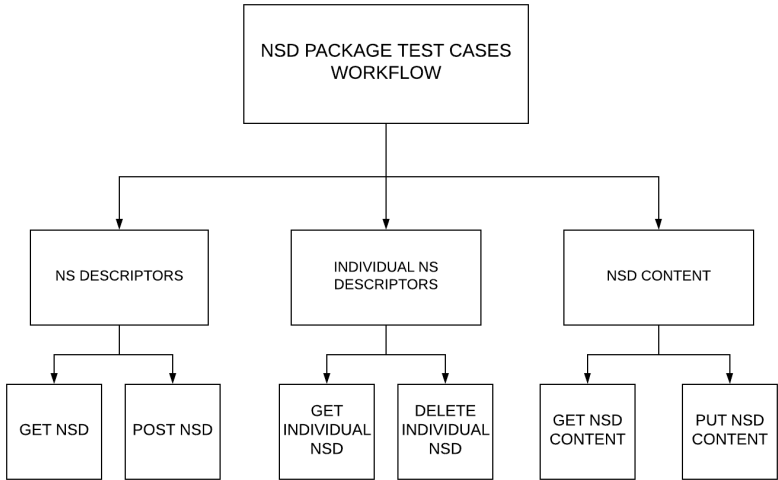
DEMO —>

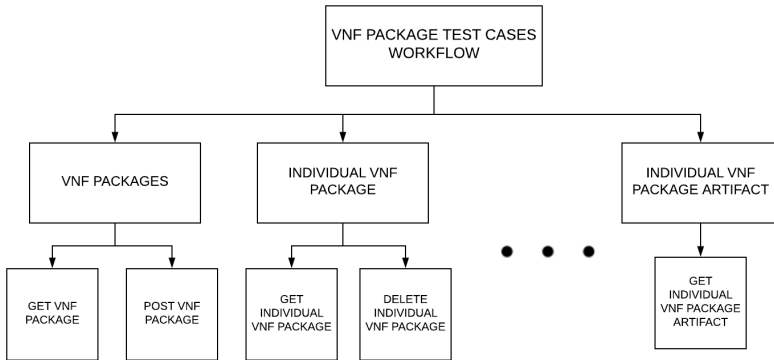
Test cases

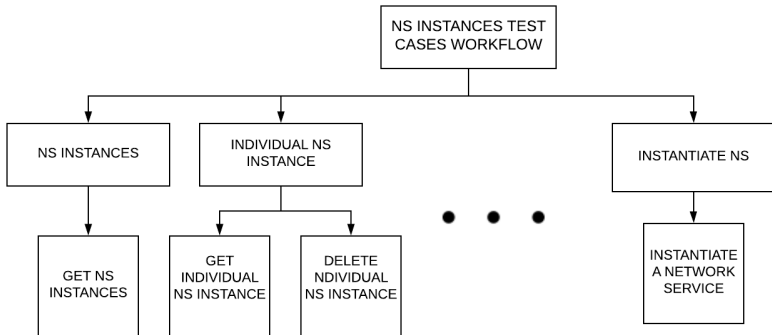
- Test-driven development
- Around 60 test cases are running




DEMO —>









MANO Scalability Investigation

Scalability of a system

- Scaling Approaches
 - Service Replication
 - Proactive and Reactive Scaling
 - Heirarchical scaling

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- Scaling Approaches
 - Service Replication
 - Proactive and Reactive Scaling
 - Hierarchical scaling
- Scaling effects
 - Reliability
 - Availability
 - Heterogeneity

The background of the slide features a network of light gray dashed lines connecting small gray circular nodes. These nodes are positioned at various points, including the top left, top center, top right, and bottom right, creating a web-like pattern that frames the central text.

What Next?

What next?

Work in progress

- MANO as a NS — **25%**
- Scalability Investigation — **25%**
- Code review and bug fixes — **50%**

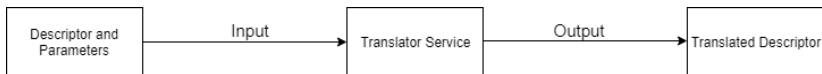
Next in pipeline

- Co-ordinate with OSM, 5G Tango, OpenBaton...
- Scalability Manager



TRANSLATOR

Aim of Translator Service



Translator receives as input descriptor files to be translated and parameters, such as “Osm-to-Sonata” if OSM descriptor has to be translated to Sonata or “Sonata-to-osm” if Sonata descriptor has to be translated to OSM. The output of the translator is a translated descriptor as per the parameter

Working of Translator Service

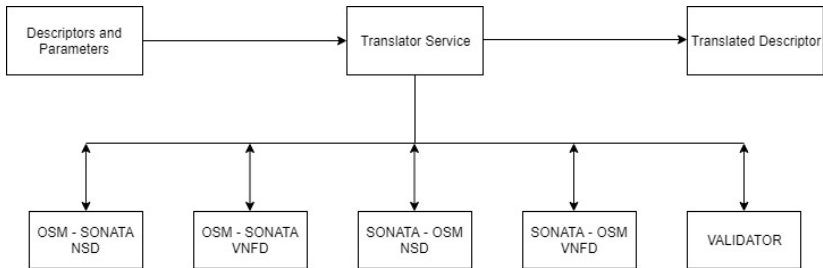


Figure: processing of descriptor file within translator

Milestone and challenges

Milestone:

- The translator can successfully translate simple NSD and VNFD descriptors and validate them.

Challenges:

- Translation: have to work on additional properties such as "monitoring parameters", "forwarding graphs".
- Validation: Issue with OSM descriptor validation



SPLITTER

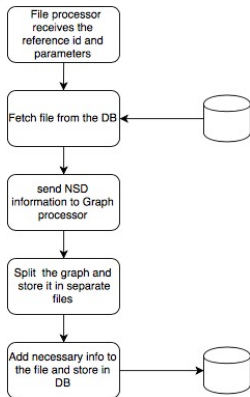
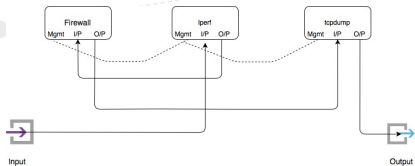


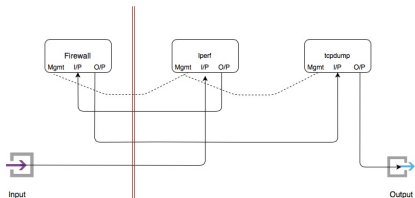
Figure: Work-flow of Service Descriptor Splitter



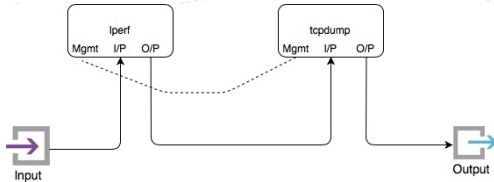
Splitting of SONATA NSD



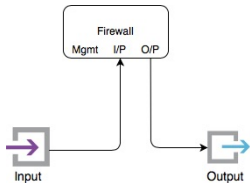
Forwarding-Graph of Sonata NSD



Splitting criteria



Graph of iperf and tcpdump NSD



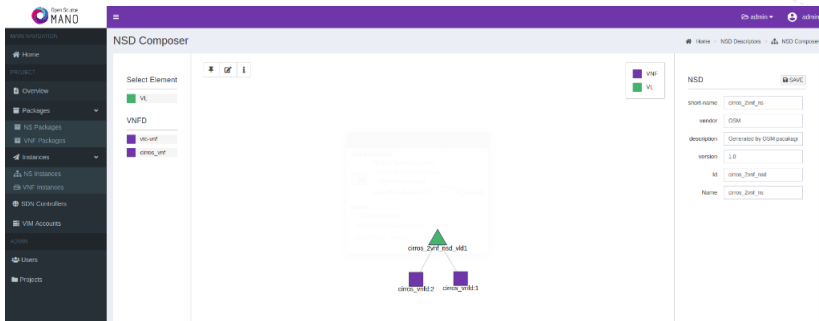
Graph of Firewall NSD



DEMO —>



Splitting of OSM NSD



Forwarding Graph with two VNFs

Open Source MANO

admin admin

NSD Composer

Home NSD Descriptors NSD Composer

Select Element

- VL

VNFD

- vlc-vnf
- ciros_vnf

ciros_vnfd:2

ciros_2vnf_nsd_vld1

NSD

SAVE

short-name: ciros_2vnf_ns

vendor: OSM

description: Generated by OSM pacakaj

version: 1.0

Id: ciros_2vnf_nsd_1

Name: ciros_2vnf_ns

Graph of ciros_vnfd:2



DEMO —>

Future Work

- Code review and bug fixes
- Integration of all WPs
- Plug-in development for SONATA and OSM