VBaaS: VNF Benchmark-as-a-Service (draft-rorosz-nfvrg-vbaas-00.txt)

NFVRG

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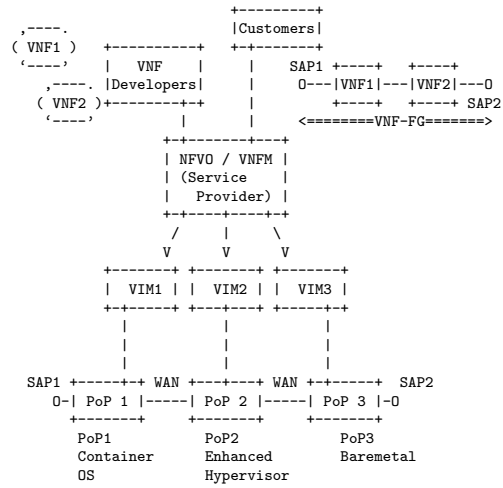
December 1, 2015

Outline

Outline

VNF Benchmarking

Actors as in the Figure

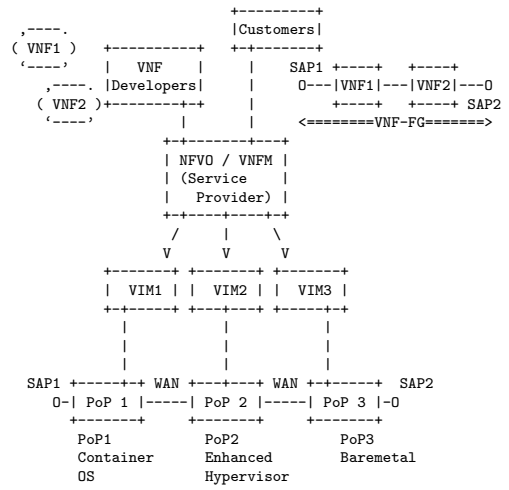


VNF Benchmarking

Actors as in the Figure

Problem to be solved:

- Gain information *autonomously* about VNFs' benchmark metrics with given reserved resources at given VIM (NFVI PoPs).



VNF Benchmarking

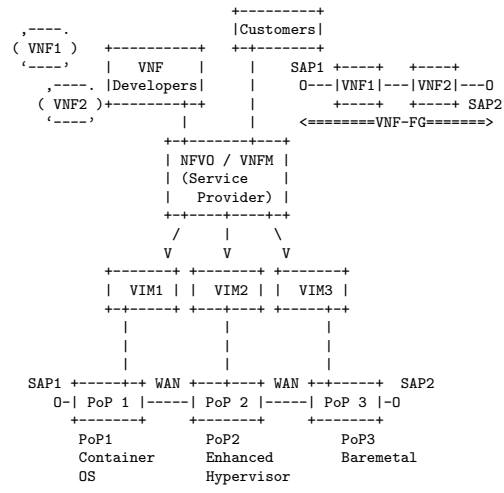
Actors as in the Figure

Problem to be solved:

- Gain information *autonomously* about VNFs' benchmark metrics with given reserved resources at given VIM (NFVI PoPs).

An important usage:

- Orchestration (e.g., NFVO) needs to know throughput, latency (and jitter) performance values for a given resource allocation (cpu, memory, storage) of a VNF at a VIM.



Insights

NFVRG Intersections

- Policy-based resource management
  - When handling VNF profile extractions dynamically
  - As input for resource management and policy enforcement
  - Compose profiles with predictable performance
- VNF Performance modeling to facilitate transition to NFV
  - On the inherited implementation of defining VNF benchmark profiles
  - i.e., how to benchmark VNFs?
  - Structural and functional domain specific components

Outline

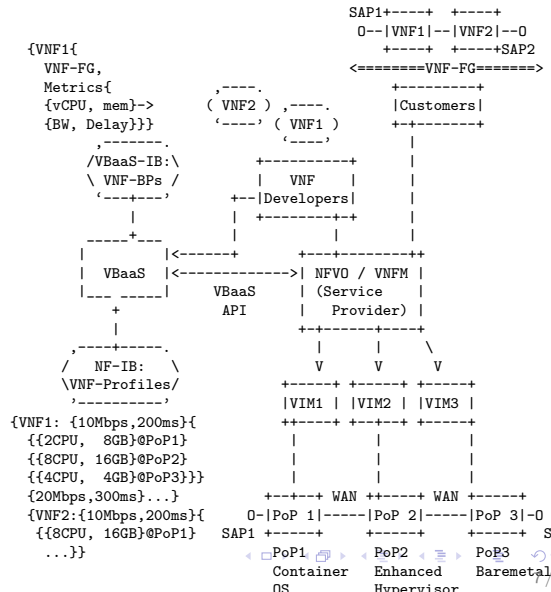
Goals

VBaaS aims at

- defining complementary functional components to ETSI NFV and other approaches;
- defining interfaces to the VBaaS service;
- defining possible VBaaS work-flows.

Work-flows

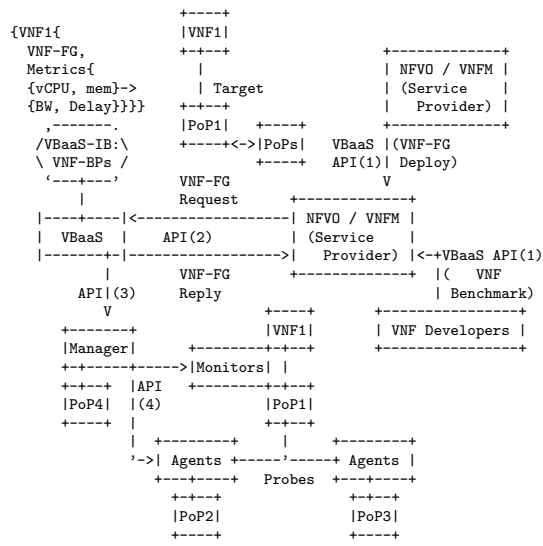
- for ETSI NFVO and VIMs
- for recursive orchestration



Highlights

Components

- VBaaS service function
- VBaaS Information Base for VNF Benchmark Profiles
  - structural
  - functional: manager, monitors and agents
- Different APIs
  - APIs (1) and (2) – External
  - APIs (3) and (4) – Internal

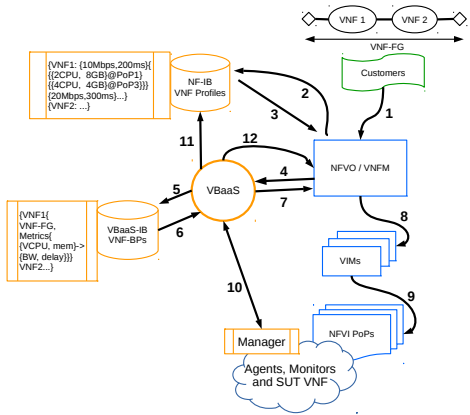


VBaaS Process Walk-through

Proposed Draft Updates

WorkFlow[a]

1. Customer requests VNF-FG deployment
2. NFVO requests profiles of VNF1 and VNF2
3. NFVO verifies non-existing NF-IB profiles of VNF1 and VNF2
4. VBaaS is requested for VNF-BP of VNF1 and VNF2 for defined NFVI PoPs
5. VBaaS request VNF Benchmark Profiles of VNF1 and VNF2
6. VBaaS-IB replies VNF-BPs
7. NFVO receives VNF-FGs to be deployed for profiles extraction
8. NFVO deploy in selected VIMs
9. VIMs interact with NFVI PoP candidates for evaluation
10. VBaaS deploy Manager' tasks and receives evaluations reports
11. VBaaS fills VNF1 and VNF2 profiles in NF-IB
12. NFVO receives notification of profiles built



[a] EWSDN'15: VNF Benchmark-as-a-Service (VBaaS)

Usage: Benchmarking, Dimensioning and Verification

Benchmarking

To measure VNF's throughput, latency, jitter parameters for given cpu, memory, storage reservation at given VIM.

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To measure VNF's throughput, latency, jitter parameters for given cpu, memory, storage reservation at given VIM.

Dimensioning

To determine cpu, memory, storage reservation parameters for given VNF at given VIM for target throughput, latency, jitter parameters.

Usage: Benchmarking, Dimensioning and Verification

Benchmarking

To measure VNF's throughput, latency, jitter parameters for given cpu, memory, storage reservation at given VIM.

Dimensioning

To determine cpu, memory, storage reservation parameters for given VNF at given VIM for target throughput, latency, jitter parameters.

Verification

To assess if given throughput, latency, jitter parameters of a VNF is met with given cpu, memory, storage reservation at given VIM.

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To measure VNF's throughput, latency, jitter parameters for given cpu, memory, storage reservation at given VIM.

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To determine cpu, memory, storage reservation parameters for given VNF at given VIM for target throughput, latency, jitter parameters.

Verification

To assess if given throughput, latency, jitter parameters of a VNF is met with given cpu, memory, storage reservation at given VIM.

Observation

Dimensioning and verification boil down to benchmarking operation(s).

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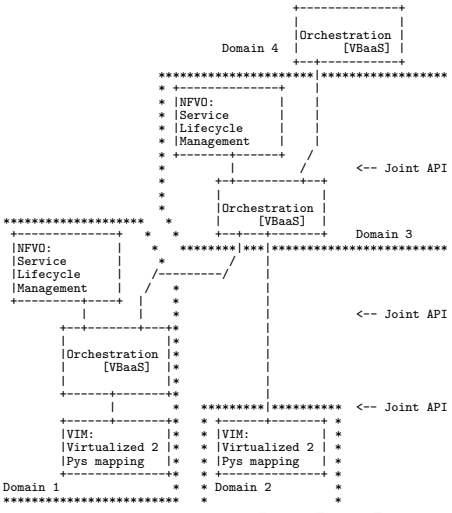
Recursive Orchestration with VBaaS

UNIFYing carrier network and cloud resources[a]

- Recurrent joint software and network control API[b]



[a] draft-caszpe-nfvrg-orchestration-challenges-00

[b] draft-unify-nfvrg-recursive-programming-02

Recursive Orchestration with VBaaS

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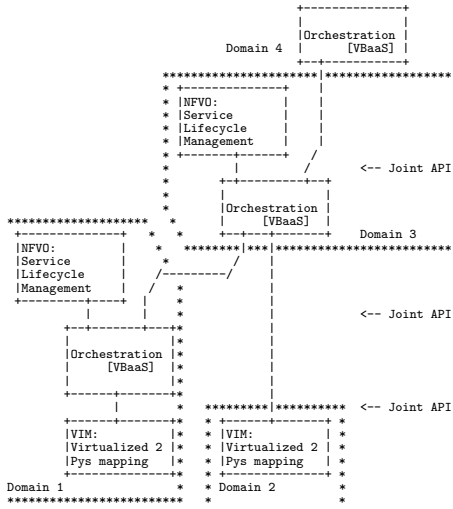
- Flexibility in resource virtualization with Big Switch with Big Software (similar to SDN Controller's Virtualized Data Plane concept)



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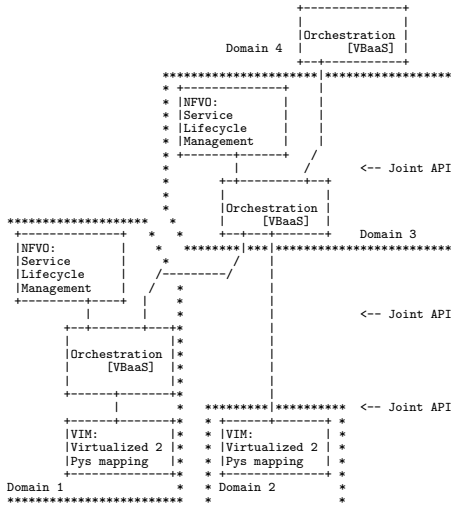
is part of each orchestration component; options:



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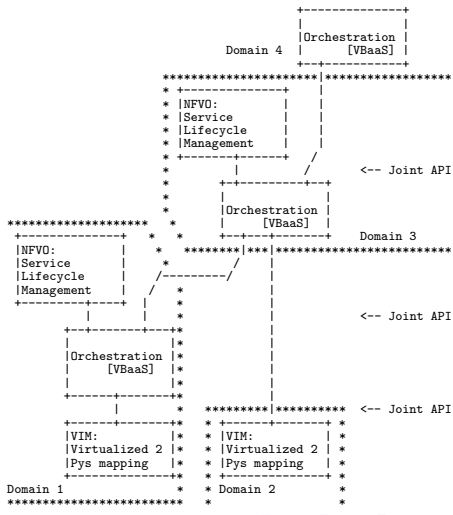

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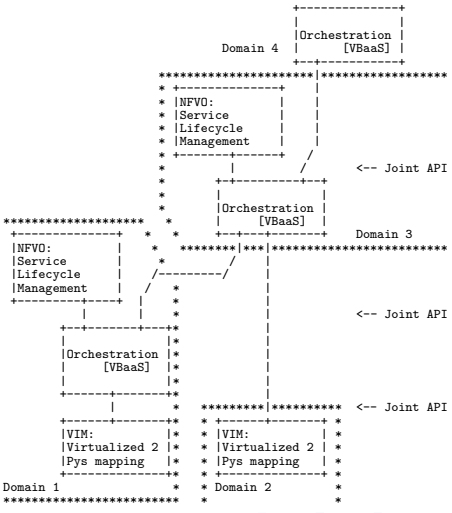
- do it on your own "transparently" over the underlying substrates.



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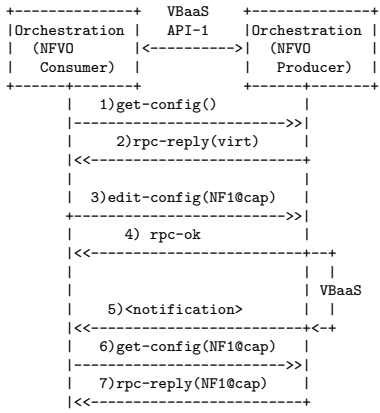
VBaaS Request and Reporting as Capabilities

Capability reporting

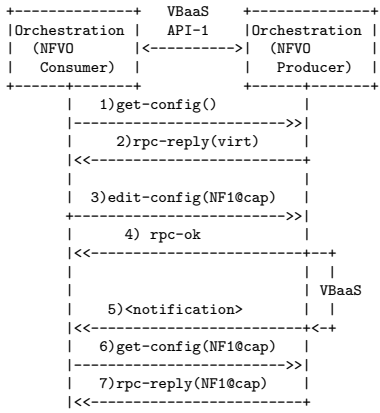
- Based on a virtualization yang model each execution environment can report VNF benchmarking results.



VBaaS Request and Reporting as Capabilities

Capability reporting

- Based on a virtualization yang model each execution environment can report VNF benchmarking results.
- Consumer can request a capability report by defining partial capability entries
  - Providing only performance KPI means a dimensioning request
  - Providing only resource allocation means a benchmarking request
  - Providing both mean verification



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Summary

Autonomous VNF Benchmarking service seems inevitable to support agile VNF development of 3rd parties.

VNF Benchmarking as a Service (VBaaS) aims at

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- defining interfaces to the VBaaS service;

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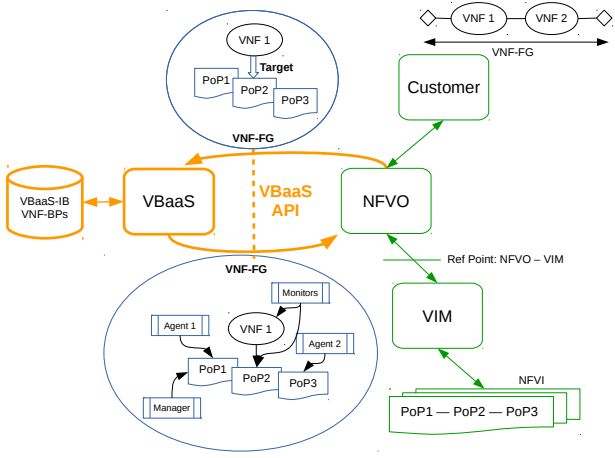
How? VNF Benchmarking as a Service (VBaaS)



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VBaaS objectives

- "Black box" VNF benchmarking, with respect to the
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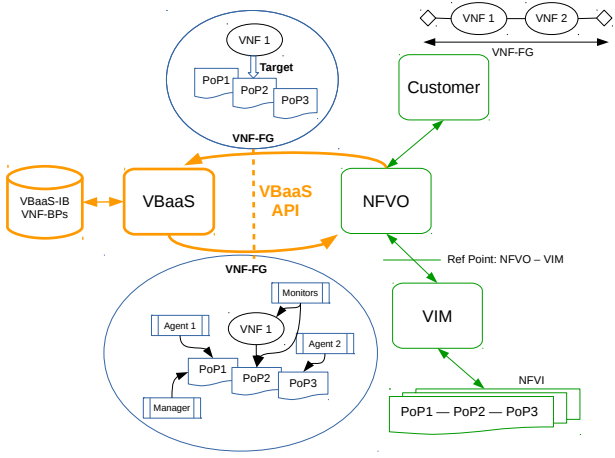
  - Benchmarking Service



How? VNF Benchmarking as a Service (VBaaS)

VBaaS objectives

- "Black box" VNF benchmarking, with respect to the
  - NVFO
  - Benchmarking Service
- VBaaS uses NFVO (or VIMs) to deploy benchmark measurements
  - e.g., by VNF-FG