

Virtualized Network Function (VNF) Pool Problem Statement

IETF 90th, Toronto, Canada.

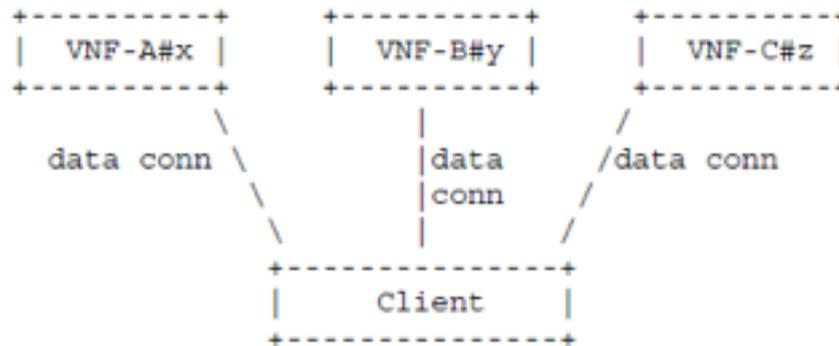
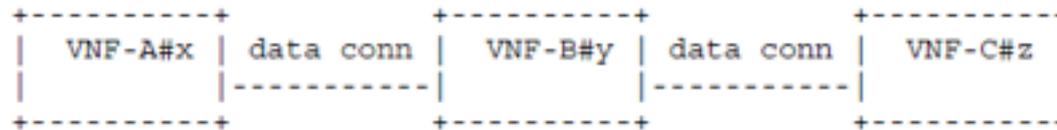
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Main Changes Since IETF 89

- Added a new section to clarify that the proposed scope is based on VNF instance pooling managed by a VNF, and is not visible to the entities outside of VNF, such as a service control entity.
- Scope clarification
 - We are specifically concerned with the reliability of an individual VNF. Reliability-related control or routing between different VNFs in the service graph is out of scope.
 - Service state synchronization is out of scope in this phase.
 - We currently assume that a VNF Pool contains instances of the same VNF functional type. Different types of VNF instances are in separate VNF Pools.
- Reorganized the “Problems” section to focus on
 - Redundancy model
 - Interaction between VNF and Service Control Entity
- Updated the section on Relation between VNFPool and SFC.

Using VNFs to Build Network Service

- Virtualized Network Functions (VNFs) can be used to build network services, with various forms of service graph.

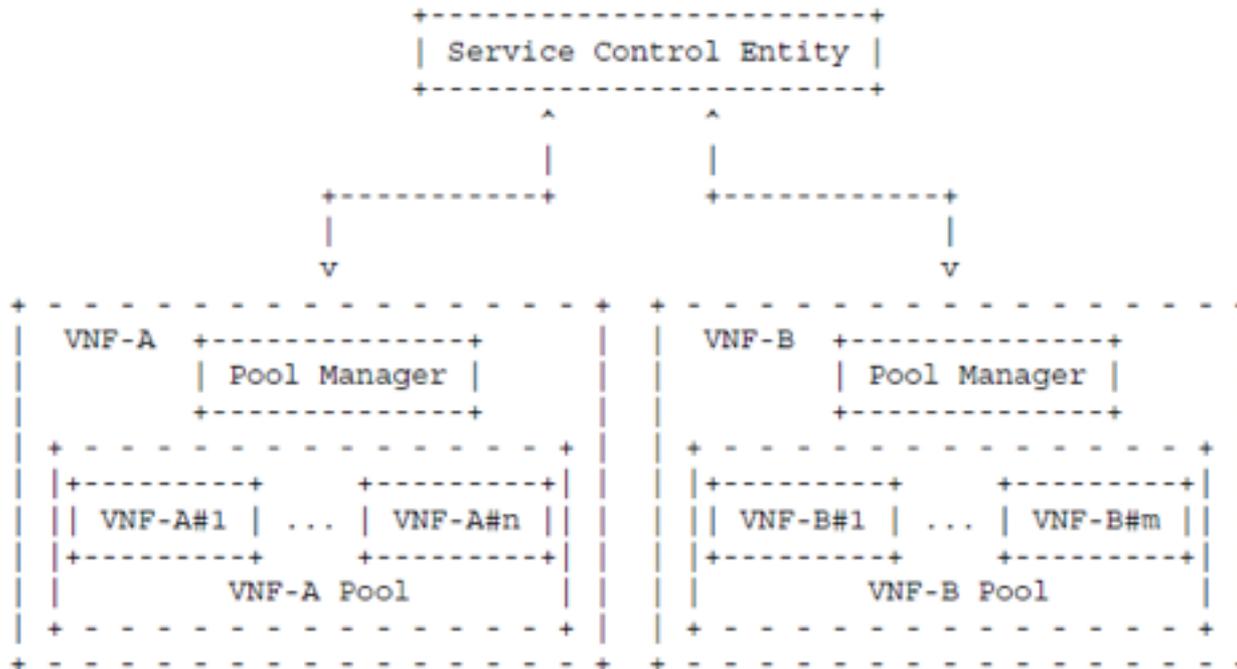


Reliability Challenges

- However, there are reliability challenges to VNFs.
 - A VNF instance typically would not have built-in reliability mechanisms provided by its host (i.e., a general purpose server).
 - There are factors that may increase the unreliability of a VNF instance, such as
 - hardware failure or resource status change such as server overload;
 - software failure at various levels, including hypervisor, virtual machine (VM), VNF;
 - instance migration caused by instance performance, server consolidation or other service requirement changes.
 - maybe more ...

VNF Pool

- To achieve high reliability, a VNF may adopt a pooling mechanism, where a number of VNF instances with the same function are grouped as a pool to provide the function. We call such a pool a “VNF Pool.”
- Reliability mechanisms, such as VNF instance redundancy, are achieved by a VNF Pool adopted by the VNF, and thus not visible to the Service Control Entity



Challenges and Open Issues

- Redundancy management
 - How should redundancy be managed (selection of active/standby VNF instances in a VNF Pool), given infrastructure conditions?
 - There could be policies influencing the selection/placement of backup instance.
- Interaction between a VNF and a Service Control Entity
 - What information is exchanged between a VNF and a Service Control Entity?
 - After a VNF instance failover, how does a VNF notify the Service Control Entity of the characteristics of the VNF (if there are any changes from the previous instance), without disclosing the pooling mechanism?
- Reliable transport
 - The transport mechanism used to carry the pool control messages, e.g., redundancy management, should provide reliable message delivery.

Relation to SFC

- SFC and VNF Pool are complementary.
 - SFC would essentially see a VNF Pool-enabled VNF as a normal service function and therefore be able to merge it into an SFC just like any other service function.
 - Much like the communication between any pool user and VNF Pool, the information exchanged between the VNF Pool and the SFC may include some operational information from the VNF Pool.

Q & A