

Virtualized Network Function (VNF) Pool BoF

IETF 89th, London, UK.

BoF Chairs:

Ning Zong (zongning@huawei.com)

Melinda Shore
(melinda.shore@nomountain.net)

Note Well

This summary is only meant to point you in the right direction, and doesn't have all the nuances. The IETF's IPR Policy is set forth in BCP 79; please read it carefully.

The brief summary:

By participating with the IETF, you agree to follow IETF processes.

If you are aware that a contribution of yours (something you write, say, or discuss in any IETF context) is covered by patents or patent applications, you must disclose that fact.

You understand that meetings might be recorded, broadcast, photographed, and publicly archived.

For further information, talk to a chair, ask an Area Director, or review the following:

BCP 9 (on the Internet Standards Process)

BCP 25 (on the Working Group processes)

BCP 78 (on the IETF Trust)

BCP 79 (on Intellectual Property Rights in the IETF)

Agenda

- Introduction & Purpose of the BoF (Chairs, 5 mins)
- Problems – 35 mins
 - Problem Statement (Melinda, 15 mins) <https://datatracker.ietf.org/doc/draft-zong-vnfpool-problem-statement/>
 - Q & A (all, 20 mins)
- Use Cases – 50 mins
 - Generic Use Case (Michiaki, 5 mins) <https://datatracker.ietf.org/doc/draft-xia-vnfpool-use-cases/>
 - vEPC Use Case (Marco, 10 mins) <https://datatracker.ietf.org/doc/draft-king-vnfpool-mobile-use-case/>
 - Load Balancing (Andy, 5 mins)
 - vCDN Use Case (Pedro, 10 mins) <https://datatracker.ietf.org/doc/draft-aranda-vnfpool-cdn-use-case/>
 - Resource Pool Use Case (Sue, 10 mins) <https://datatracker.ietf.org/doc/draft-hares-vnf-pool-use-case/>
 - Q & A (all, 10 mins)

Agenda (cont.)

- Related Works – 15 mins
 - RSerPool Applicability (Thomas, 10 mins)
<https://datatracker.ietf.org/doc/draft-dreibholz-vnfpool-rserpool-applic/>
 - Q & A (all, 5 mins)
- Charter Discussion – 30 mins
 - Charter (Chairs, 5 mins)
<http://www.ietf.org/mail-archive/web/vnfpool/current/msg00224.html>
 - Open Discussion (all, 25 mins)
- Wrap-up (Chairs, 10 mins)
- End

Introduction

- Vancouver bar BoF
 - Open discussion and some consensus on problems around reliability issues of virtualized network function (VNF);
 - Brief introduction on reference arts including RSerPool and ZooKeeper;
 - Review of status (I-Ds, list threads);
- Since Vancouver
 - I-Ds: Updated Problem Statement (-03), New **Four** Use Case Drafts;
 - Proposed Charter;
 - List discussion around Charter, I-Ds, issues like relationship with SFC;
- Purpose today
 - Achieve consensus there is work in IETF to be done;
 - Achieve rough consensus on Charter;
 - Critical mass showing interests on contribution;

Presentations

Charter Scope

- Currently focus on mechanisms supporting the reliability of VNF set: redundancy within VNF set; stateful failover among pool members.
 - Signaling between members of a VNF pool, and across different VNF pools for VNF transition (e.g., state change, scaling, moving) notification, and backup advertisement;
 - Identification and evaluation of state sharing mechanisms between members of a VNF pool, including distributed shared memory, gossip protocols, pfsync, and state check pointing;
 - Exchange of reliability related information between a VNF set and VNF set users, and information between a VNF set and underlying network (e.g., interfacing with ALTO, I2RS);
 - Identify and analyze reliable transport characteristics for the aforementioned control plane traffic of VNF pools;
 - Analysis of transport security characteristics to provide protection against known threats, and identification of appropriate trust model;
- Additional mechanisms might be included after further gap analysis between identified requirements and existing IETF technologies.
- Currently does not intend to resolve the service availability issue, although the reliability of VNF set will benefit service availability.

Work Items

- Initially the VNFPool WG will develop:
 - problem statement
 - VNF pooling requirements and architecture including considerations on the manageability of VNF pools
 - use cases
 - gap analysis
- The VNFPool WG will seek re-chartering before adopting any work to develop new, or extend existing, protocols.

Relation to SFC WG

- We believe that SFC and VNFPool are independent but complementary.
 - SFC targets on steering packets among VNFs, while VNFPool focuses on the high resiliency of VNF instances based on pooling mechanisms, and without caring about how to construct the data path.
 - VNFPool could interact with an SFC control entity to either advertise the capability/status of VNF pools, or receive the resiliency requirement from the SFC control entity.
 - VNFPool is not only used in the case of "chained VNFs", but also applicable to other cases where the VNFs are not necessarily sequentially connected.

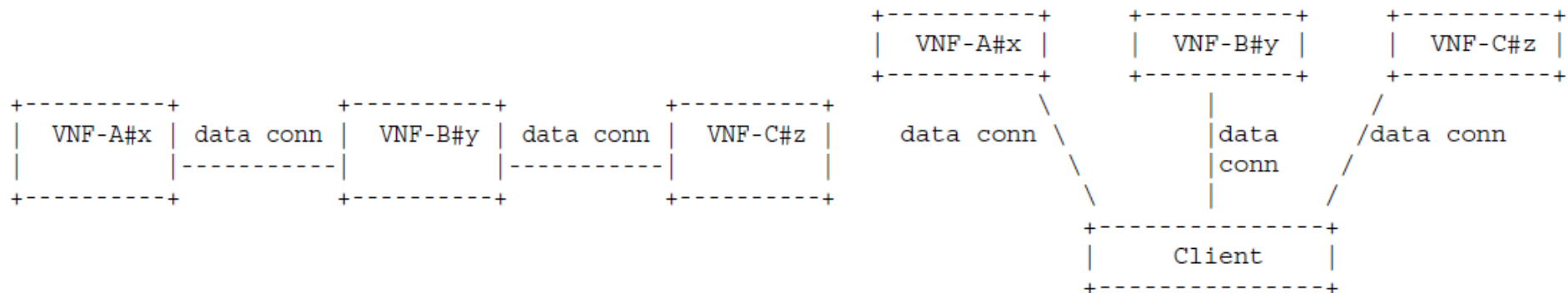
Open Discussion on Charter

Wrap-up

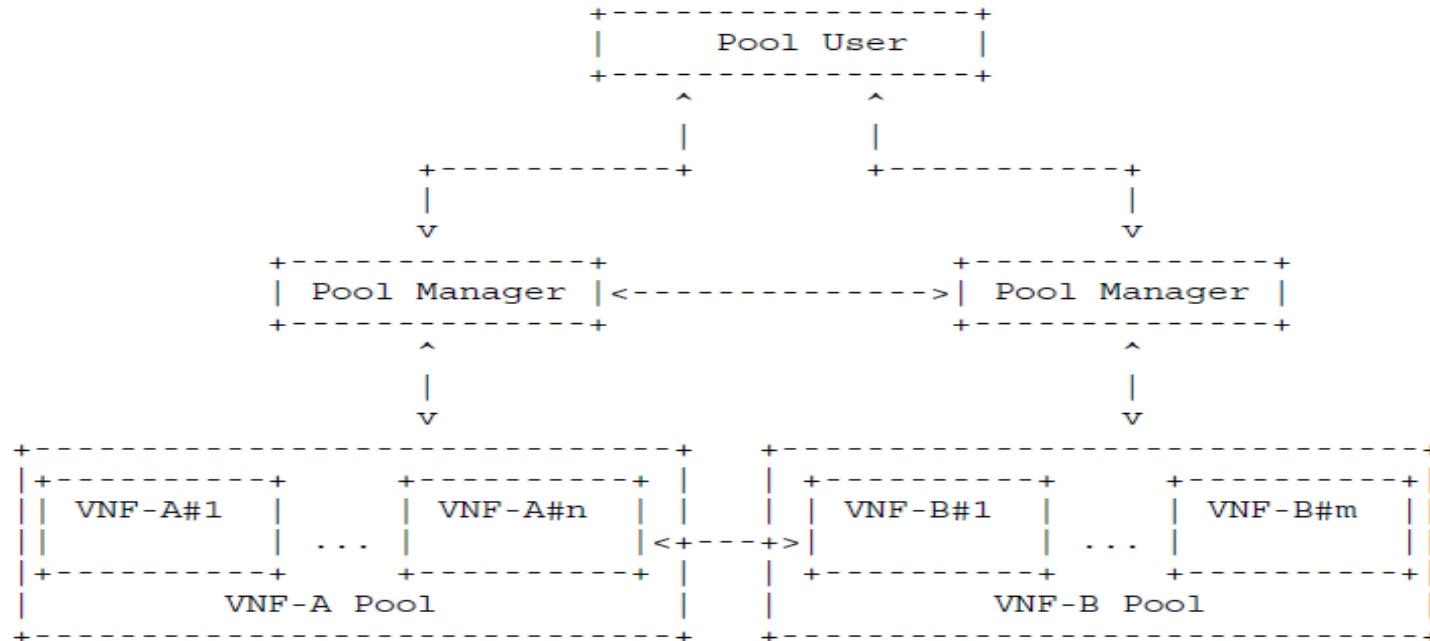
- Questions for BoF
- Actions & Next Steps

Backup – Concepts

- We call a group of VNFs a VNF set. A VNF set includes a single or multiple types of VNF. Each type of VNF corresponds to a number of VNFs that form a VNF pool.
 - Example: {vFW#1,vFW#2,...,vFW#n};
 - Example: {vFW#1,...,vFW#m, vLB#1,...,vLB#k};
 - Generally, we denote VNF-A#x is the xth instance of VNF type A; VNF-B#y is the yth instance of VNF type B; and so on.
- A VNF set can be used to build network services.



Backup – Pooling Architecture



- A VNF set is a group of VNFs distributed in multiple VNF pools.
- Each VNF pool contains a group of VNF instances (also called VNF pool elements/members) providing the same network function.
- Each VNF pool also has a VNF pool manager that manages the pool elements, and interacts with the VNF pool user to provide the network function.
- A VNF pool user can be either an application end-host or a service component (e.g., orchestrator in DC service) requesting the network functions.