

41st Network Management Research Group (NMRG) meeting

IETF-97

November 15th 2016 - Seoul, South Korea

09:30 - 12:00 : Tuesday Morning session I - Studio 2

Access to the Meetecho recordings:

<http://ietf97.conf.meetecho.com/index.php/Recordings#NMRG>

09:30 - 09:35 : [Agenda Bashing](#) (Laurent Ciavaglia, Lisandro Zambenedetti Granville)

Thanks to our Jabber scribe: Wes Hardaker

Minutes taker: Laurent Ciavaglia

Number of participants: 37 on site (blue sheets) and ~10 on line.

09:35 - 09:55 : [Anycast vs. DDoS: Evaluating the November 2015 Root DNS Event](#) (Moritz Muller)

Provides analysis / insights on the attack on Root DNS occurred on Nov. 30 2015.

Explain anycast behavior under normal or stress conditions.

Illustrations (measurements) of effects of the attack on various servers.

Overall DNS reacted well and cope with the attack, however some letters were more affected than others.

Site flips as reaction and implications (more or less good effects in return).

Collateral damage: an attack can affect non-targets (e.g. shared data centers).

Q from ?: did you see such behavior?

A: Atlas probes do not ... Resolvers made the changes so DNS was reacting fine.

Q Lisandro: you mentioned further research?

A: develop testbeds, more insights on the resolvers behaviors

09:55 - 10:15 : [Autonomic Networking Use Case for Distributed Detection of SLA Violations](#) (Jeferson Campos Nobre)

<https://tools.ietf.org/html/draft-irtf-nmrg-autonomic-sla-violation-detection-04>

One of the Use Cases of the UCAN BoF/ANIMA WG.

Deployment of monitoring probes to measure the service levels at network layers.

Based on active probing: better accuracy, privacy. IPPM active mechanisms.

Cost of mechanisms/probes activation and coverage optimization.

In practice:

-deployment based on network engineer expertise and reactive --> inefficient (time-wise, coverage-wise)

-embedded in management SW: lack enhancements in scalability and

Solution approach (autonomic solution): a complete solution to steer the process of measurement probe activation.

4 advantages of the solution.

Intended user and administrator experience: lower the requirements on expertise, still some information necessary: SLOs, address of compliant devices.

Parameters and information involved: at the device and among devices levels.

Comparison with current solutions: no standard, scripts, passive monitoring, partial solution (faulty links), ...

Related IETF work: LMAP WG (SLA violation screening, decrease human workload), IPFIX WG (extension to passive mechanism), ALTO WG (measurement-based topology).

Security considerations: ANIMA bootstrapping of new devices, protection of the measurement data exchange. Possible attacks (local DoS, forged results).

Updates and outlook: several updates in NMRG, ask RG last call.

Q Alex Galis:

1-Empahsis on monitoring probes, collect a lot of information, transport of this information for evaluation to the right places. Did you take care of this?

2-SLA violation based on measuring network traffic. Not the only source of information. Extend to

A Jeferson:

1-scalability provided by the supporting peer-to-peer infrastructure. a centralized point will be a bottleneck.

2-IPPM WG meeting, some works to model a way to monitor service metrics, could be extendable with such new (composite) mettrics.

Q Laurent: how to configure the autonomic mechanism rightly?

A Jeferson: comparison in Cisco how to configure an IP SLA on existing system and AN system: informally new system more simple, but not a formal model. could be future work.

Q Alex Clem (jabber): configuration of the system will involve a few points: What is the likelihood with which SLA violations will be detected (autonomic system determines how much probing to do)

The configuration knobs are higher level: what's the accuracy objective? How much resources can you spend?

10:15 - 10:35 : [A Reference Model for Managing Large-Scale Software-Defined Network \(SDN\) Infrastructures](#) (Klaus Wehmuth)

SDN networks can become quite complex.

Multiple (sub-)layers.

How to represent / model these multi-layer networks: MAG MultiAspect Graph and then MultiLayer Graph.

Edge types: inter-layer, intra-layer, mixed edges.

Composite vertices representation.

Paths are constructed by antecessors and successors relations.

Generic example for SDN layers.

Take Away Messages: Can represent SDNs with arbitrary number of layers. Is equivalent to a directed graph. Can be represented by matrices or any other form of direct graph representation.

Can use well-known graph algorithms for the analysis of the SDN structure e.g. controller location, management of distributed controllers, study of intra- and inter-layers flows, ...

Q Laurent: looks like a good theoretical "tool". Any concrete examples on SDN?

A Klaus: work in progress. two types of use: off-line: What-if scenarios, and on-line: inside controllers (working on it).

Q Wes Hardaker: similar to marked directed graph where you can have multiple attributes. in your case attribute is the layer dimension.

A: ...

Q ?: data layer is also considered multi-layer?

A Klaus: yes.

10:35 - 10:55 : [The ANIMA reference model](#) (Michael Behringer)

Overview of the ANMIA reference model.

Devices perform self-management.

Q Sheng Jiang (as ANIMA WG co-chair): for clarification, 6 ongoing work items in ANIMA. reference model includes also future work items. WG at a stage of final work on GRASP, ACP, Bootstrap, Use cases.

Need to define the semantics for the ASAs to understand they speak about the same objective. I encourage people to make proposal on this for future work.

Q: Jeferson: use case BOF (UCAN), several use cases were proposed. basis for future work in ANIMA phase 2.

A Michael: the use case of Jeferson would be an ASA.

Jeferson: not yet modeled as an ASA but planned for next step.

To enable self-management, an important concept is "intent" (term coined 5 years ago).

Target role(s) of devices, not device individually.

Q Alex Galis:

1-how to deal with large number of intents, updated frequently... (scaling) problem of managing intents?

2-why orchestration are not part of the reference model?

A Michael:

1- low update rate for intent. no definite answer now. working bottom-up.

2- there will be orchestration. in SDN how to tell the switch where is their controller? we need mix of ANIMA and SDN. ANIMA provides base services (ACP, bootstrapping).

10:55 - 11:15 : [Slice Networking and Management - Research Challenges and Trends](https://www.ietf.org/archive/id/draft-galis-anima-autonomic-slice-networking-01.txt) (Alex Galis) <https://www.ietf.org/archive/id/draft-galis-anima-autonomic-slice-networking-01.txt>

Description of slice networking definitions, requirements, components and possible mapping over ANOM, SDN, and NFV reference models.

Q Julien Maisonneuve: in EU research project, slice a first order object. what are the justification to add this new layer/component? from the network service viewpoint, the slices can be grouped in the different network services. What are the real use cases that would require network slices?

A Alex: you might be right or wrong, so am I. Practical way to move forward, should be considered seriously. If tens/millions of slices to deploy different services, it will be the norm rather than an exception. progress on slice networking is happening in various SDOs around the world.

When you want to handle the management of "new" networks, you need to include such concept also for IP networks. Based on use case, not always. Consider the non-functional requirement. If slice is important for operators, need to be progressed.

Q Julien: at which level to expose the slices...? e.g. in 5G NORMA with 3 orchestrators...

A Alex: other project with more orchestrators. separation of orchestration and management activities (my own list).

11:15 - 11:35 : [SUPA policy-based management framework](#) (Will Liu)

Description of the SUPA Policy Management Framework, of the SUPA assumptions and models.

Q Laurent: short on time. It would be interesting to discuss further the relationships and implications of the various models presented today.

11:35 - 12:00 : [NMRG Present and Future](#) (Laurent Ciavaglia, Lisandro Zambenedetti Granville)

NMRG chairs presented a brief summary of what NMRG has achieved

recently and possible evolution for the RG.

Call for suggestion on topics, approach for future meetings.

Q Alex: co-locating with other academic events. ask for conference committees about putting in place a standard-related track.

The RG chairs will follow-up on the mailing list for proposals: official announcement (and follow-up) on topics (5G, IoT, Intent, Autonomic, measurement...) and how they relates.

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