Simplified NIF for GN4 Input

Purpose: This NIF form is to be used for the submission of New Ideas suggested for inclusion in the GN4 Phase1 and beyond proposals. Budget estimates, information about objectives, impact, benefits, etc. as well as scope must all be supplied.

Submit to: pmo@GÉANT.net by January 31st, 2014 with the subject label starting: GN4Input

Overview

Project Name:	Network Functions Virtualisations specification and testing	**Project Proposer:**	Brian Bach Mortensen

Project Type: GN4 Phase1 or longer term	Phase 1	**Estimated Project Costs (best effort!)**	
Duration proposed	Phase 1	Manpower in person-months also identifying specific expertise required	Manpower for various tasks: Product Management and Task Leading: 4MM D12 : 4MM M3: 6MM M6: 8MM M11: 10MM Total over phase 1: 32MM
Deliverables proposed (If any can be defined at this stage)	D12 - Documenting the proposed test and highlighting network functions that may be virtualised in next phase of GN4.	Hardware and equipment:	Virtual Machines can be used for initial testing (e.g.okeanos). VPS servers may be rented for testing periods (approximately 1000€)
Milestones proposed (If any can be defined at this stage)	M3 - Descripe the functions that should be tested using NFV M6 - Descripe the concrete SW implementations and the test metrics that will be	Other costs	Team meetings and travel to use cases: 10000€

	used. M11 - Test should have been carried out and ready to document in deliverable.	

1 Background and Reasoning

Provide background information and the context of the project. Explain the reason for the project. What do you want to be different? What do you hope to improve? Why is the project needed? This should be the reason for the project, not the solution.

The current push from ISPs towards software defined networks (SDN) and network functions virtualisation (NFV) appears to be driven by the need to lower CAPEX (and potentially OPEX). Especially for NFV one possible vision is that network function that are currently implemented in dedicated (costly) hardware, will be implemented in software. By doing so industry standard x86 server hardware can be utilised and the functions may be instantiated in various locations (compute centers). This can happen dynamicly without the need to install new equipment in the various POPs. NFV functions may also be utilised at the customer edge in CPE equipment, again potentially reducing CAPEX and OPEX by utilising standard based hardware. As such the core network may risk to end up as pure IPv6 transport channels leaving all advanced functionality at the edge network and in the datacenters. If this vision is likely to come through, the GÉANT project should commit significant resources in order to become a provider of NFV functions or there will be nothing hindering our customer base to get their network functions from commercial providers using the NREN networks for pure transport.

As a part of this task to is it proposed that the following functions are further specified and possibily tested in order to identify good ways of producing production services in GN4 phase and beyond.

- Firewalls
- VPN termination (e.g. L2/L3 VPNs)
- Switching
- Routing
- Software based MCU (Video conferencing)
- Deep packet inspections (as a service)

The functions above should be tested and validated using standard measurements used to test regular hardbased functions. Furthermore and evaluation should be made on the CAPEX and OPEX of the tested functions. It should be stressed that this task should not implement SW themselves but rather identify and test

SW solutions that are already available in the market both as open and closed source.

A list of Network Virtualisation Functions as defined by ETSI can be found here:
http://www.etsi.org/deliver/etsi_gs/NFV/001_099/001/01.01.01_60/gs_NFV001v010101p.pdf

2 Objectives, Impact and Benefits

Provide one or more bullet points to briefly describe the primary objective(s) of the project in terms of the desired outcomes. This should be expressed in the form: 'To ensure…', 'To implement…', 'To service...', 'To improve...', 'To innovate...', 'To optimize...', 'To save...', etc. For each objective mention the benefits to identified stakeholders (e.g. end-users, NRENs, large international research projects, industrial research partners, high level education, etc.) should be mentioned. A description of the expected overall impact must also be provided.

- To ensure that the GÉANT project and the NRENs are capable of prodiving advanced network services in the future at a competitive price level.
- To validate the specified functions and proposed candidates for implementation for service in phase 2 of GN4

3 Scope

Describe the areas expected to be covered or impacted by the proposed activity, such as organisational areas, systems, processes, resources.. i.e. what is 'in scope'. This is not a list of what will be done but identifying the services, areas or what, will be affected.

Also please enumerate specific items which although they could perhaps be related are intentionally not addressed by your proposal ("Out of Scope").

1. In Scope

- Defining clearly which functions to test and validate
- Defining technical measurement metrics
- Define CAPEX and OPEX for the tested functions
- Deploy the NFV functions in compute centers to measure their performance.
- Identify clear cases where existing services can be replaced by cost saving NFV implementations.

2. Out of Scope

- Building large SW and HW systems

4 General Information

Outline any potential issues, risks, dependencies, assumptions, constraints and limitations or any other points that may be useful to help assess the proposal.

- There is a risk that the NREN community will be bypassed by users when network function virtualisation becomes a commodity supplied by commercial operators. By identifying and validating different functions now, there is a possibility that NRENs will be competitive in the future as well.
- ETSI is quite active in this field (NFV) with a former GN3 participant (Diego Lopez) pushing the standardisation from Telefonica (http://sdnworldevent.com/diego-lopez-telefonica/). Plenty of ISPs and equipment/sw vendors are throwing In high effort in this field as well….
- It is suggested that project initiates contact to Diego Loez to get expert input and advice in this field.

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