



Netconf / Yang Usage Scenarios

For Hrvatski Telekom TS Field Trial Phase 3

HT, Deutsche Telekom, Traveling & Telekom Innovation Laboratories -
Berlin, 31st of July 2013

Version 0.2



LIFE IS FOR SHARING.

Objectives of the slide set

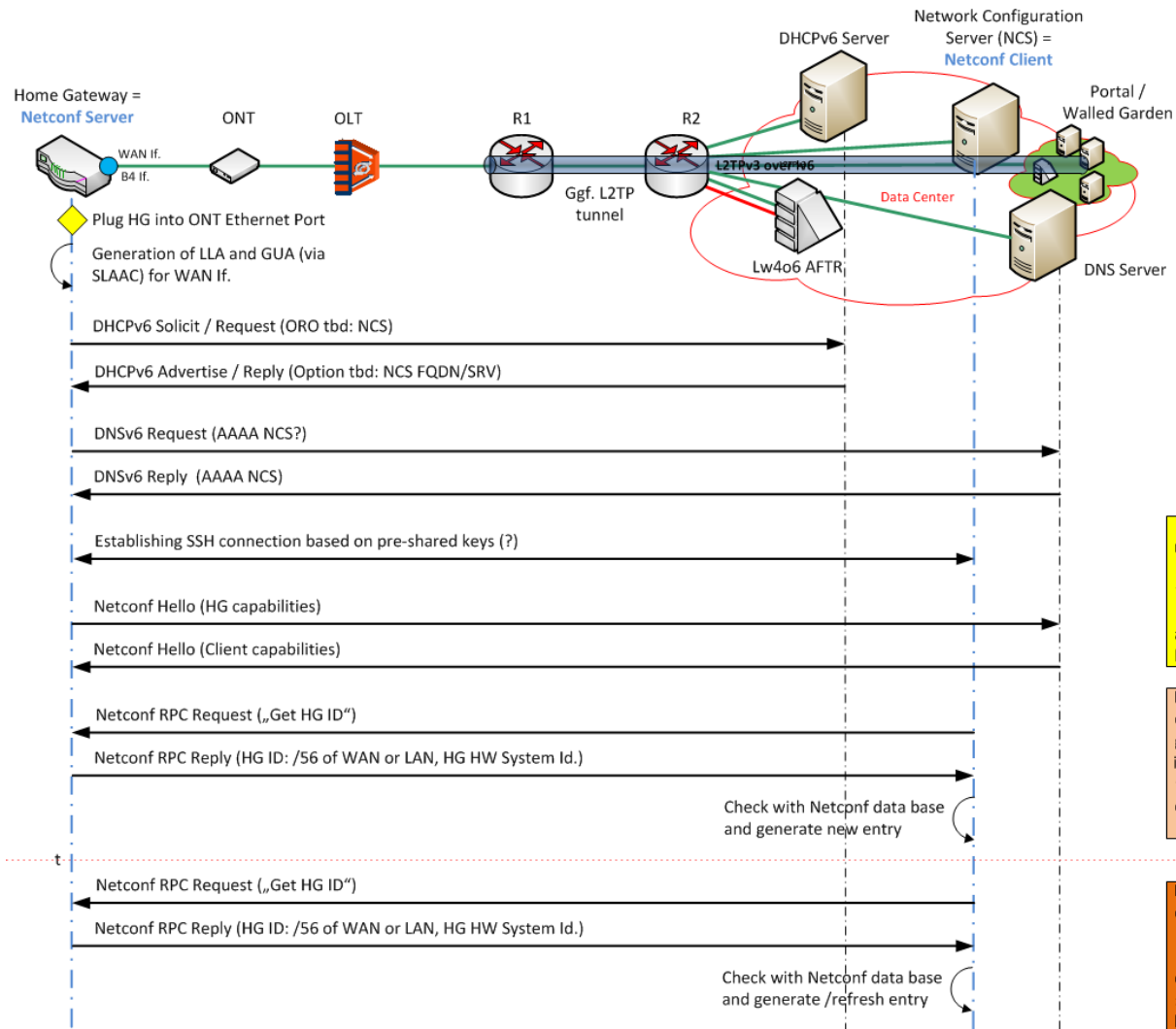
TeraStream Netconf/Yang Use Cases for Hrvatski Telekom Field Trial phase 3

1. Agree on planned Netconf / Yang use cases for demonstrating Netconf / Yang functionality during phase 3 of the Hrvatski Telekom TeraStream Field Trial Phase 3.
2. More detailed description of the use case scenarios in order to
 - Create a common understanding of scenarios that will be implemented
 - Generate a starting point for Home Gateway (HG) related Netconf/Yang activities in the TeraStream project.
 - Allow Traveling to derive a corresponding Yang HG data model
 - ❖ That will be used for the first prototypes
 - ❖ That contains all needed information / parameters
 - ❖ That can be extended to further use cases
 - Identify still open questions / issues and things that need to be defined in order to realize the use cases.
 - Build the base for the future HG implementations done by T-Labs in cooperation with Traveling.
3. ...

TeraStream Home Gateway Netconf/Yang Use Case 1

Bootstrapping, Registration of
HG at the Network
Configuration Server (NCS)

Netconf/Yang during TS HT Field Trial Phase 3.



Netconf/Yang during TS HT Field Trial Phase 3.

Bootstrapping, Registration of HG at the Network Configuration Server (NCS)

Short description

1. Discovery of NCS via DHCP (IP address or DNS FQDN or DNS SRV record)
2. “Call home” of HG to NCS (establish SSH (?) connection, exchange Netconf “hello”)
3. NCS requests HG ID
4. HG replies and gets registered with NCS
5. (Periodically refreshing the registration at the NCS)

Open questions / To be discussed

- a. Provisioning of NCS by DHCP or pre-configuration into HG?
- b. How should the DHCPv6 parameter look-like?
- c. With which information will the HG be registered? (HW ID, IPv6 address or prefix (/56) of WAN or LAN interface, ...)?
- d. What RPC call / message to use for registering and refreshing? Check with RFC / Traveling)
- e. How to refresh registrations? Needed at all? When to erase registration inside NCS? How to detect that HG is gone?



Registration also when only connected to walled garden and re-registration after “sign-up”?

TELEKOM INNOVATION

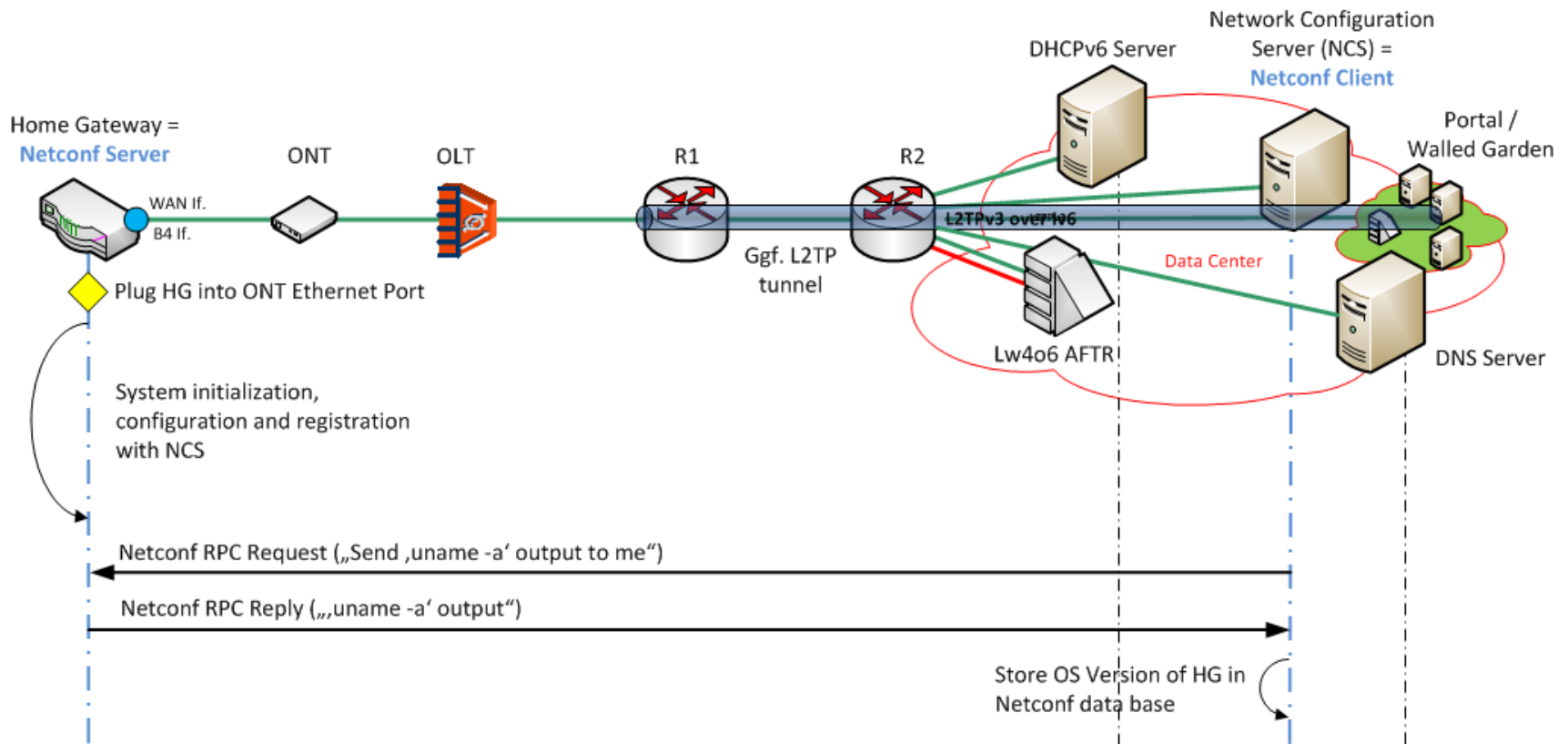
LABORATORIES

How to do secure SSH (?) communication between HG and NCS? Pre shared keys?

TeraStream Home Gateway Netconf/Yang Use Case 2

Request / Signaling of HG OS
version to NCS.

Netconf/Yang during TS HT Field Trial Phase 3.



Netconf/Yang during TS HT Field Trial Phase 3.

Request / Signaling of HG OS version to NCS

Short description

1. In context of registration or after registration
2. NCS request Home Gateway to send result of “uname -a” output towards the NCS.
3. HG replies and NCS stores “uname -a” information together with HG parameters in its DataBase.

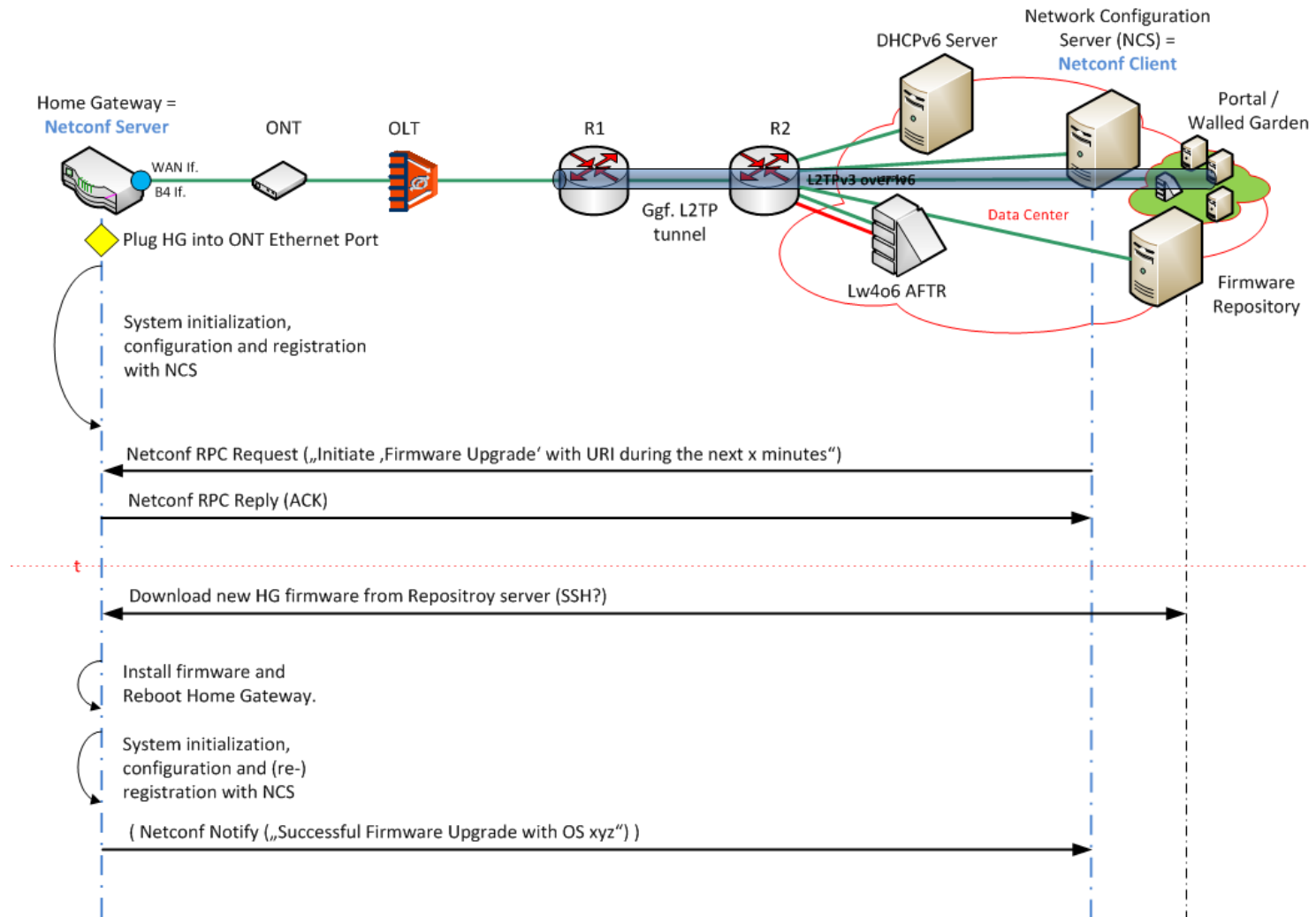
Open questions / To be discussed

- a. When and how to request / trigger signaling of OS version from HG towards NCS?
 - On startup already?
 - Why should the NCS trigger this?
 - Scalability issues
- a. What RPCs to use for requesting / replying the “uname -a” output? (Check with RFC / Traveling)

TeraStream Home Gateway Netconf/Yang Use Case 3

Firmware Upgrade via
Netconf.

Netconf/Yang during TS HT Field Trial Phase 3.



Netconf/Yang during TS HT Field Trial Phase 3.

Firmware Upgrade via Netconf

Short description

1. NCS sends HG a request to upgrade its firmware with a new one that can be found under a certain URI within the next x minutes.
2. HG ACKs and triggers the firmware download randomly within this time interval.
3. After successful firmware download and HG upgrade the HG reboots and runs again through the standard NCS register process.
4. (If needed the HG may send an additional Netconf “Notify” to the NCS in order to explicitly signal the successful upgrade.)

Open questions / To be discussed

- a. What RPCs to use for requesting firmware update? (Check with RFC / Traveling)
- b. How to signal where proper firmware is located (URI ?) and could be downloaded?
 - How to transport firmware to HG?
- a. What parameters are needed else?
- b. Firmware repository = NCS?
- c. How to reregister after successful reboot? (Standard “Register with NCS) or special “Notify”. What parameters in “Notify”?)
- d. What is the behavior / process when for instance firmware download or installation failed?

- a. How to authenticate/identify the HG at the firmware repository server?

TeraStream Home Gateway Netconf/Yang Use Case 3

Other Topics – General Open
issues.

Netconf/Yang during TS HT Field Trial Phase 3.

General Open Questions

TBD.

- Need to define the overall architecture as well
- Creation of interface stack model
- Implementation of interface stack model in OpenWRT
- Decide regarding the best transport for Netconf (Assuming SSH?)
- Fix a unique ID per device
- What systems to use as backend? (Who contacts Tail-F ?)
- How to realize a test setup?

THANK YOU!



LIFE IS FOR SHARING.

Contact.



Participant List:

Ian Farrer Ian.Farrer@telekom.de
Branimir Rajtar Branimir.Rajtar@t.ht.hr
Hrvoje Habjanic Hrvoje.Habjanic@t.ht.hr
Holger Winkelmann hw@travelping.com
Olaf Bonness Olaf.Bonness@telekom.de

Editor: Olaf Bonneß

Telekom Innovation
Laboratories

Winterfeldtstraße 21-27,
10781 Berlin

Phone: +49 30 8353 58826

E-Mail:
Olaf.Bonness@telekom.de



TELEKOM INNOVATION
LABORATORIES

- internal -

09/27/13

e

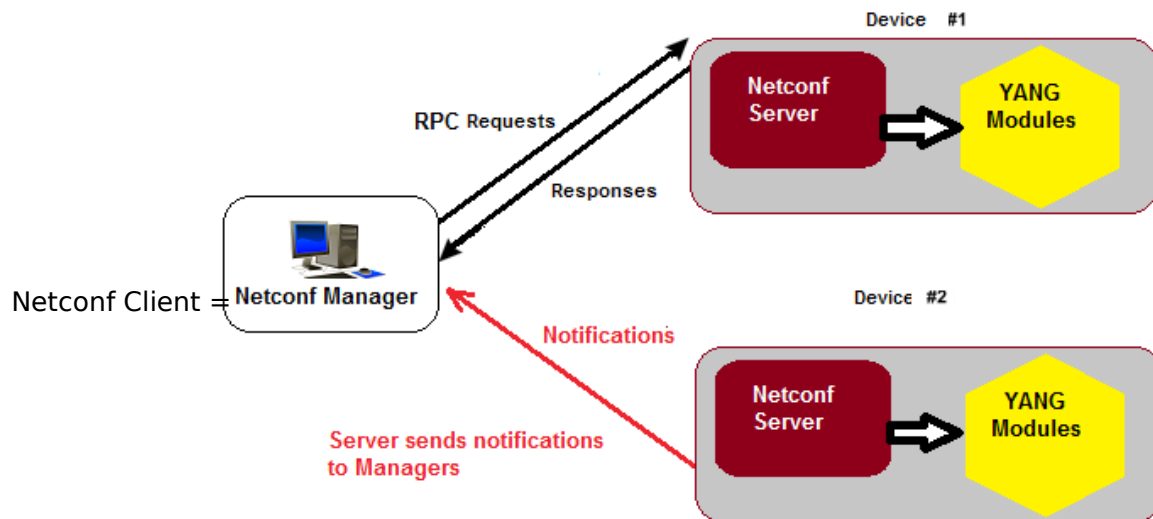
Versioning

Changes	Editor	Status	Date
Initial structure	Olaf Bonness	Draft v01	06.08.2013
Insertion and description of first use cases; Identification of topics tbd.	Olaf Bonness	Draft v02	16.08.2013

Netconf / Yang Usage Scenarios For Hrvatski Telekom TS Field Trial Phase 3

Backup

Netconf/Yang during TS HT Field Trial Phase 3.



1. **NETCONF Managers:** A NETCONF manager is a software application (in client role) that configures, manages and/or monitors the NETCONF Servers in the managed network devices. A NETCONF manager sometimes is also called a Network Management System (NMS).
2. **NETCONF Servers:** A NETCONF Server is a software application (in server role) that runs in network devices such as switches, routers and printers, etc., talking to both the device and NETCONF Managers and acts as an “agent”. A Server configures the device to certain states upon receiving requests from Managers, and collects state information about the device and pass them to Managers. In other words a server executes protocol operations invoked by a client. In addition, a server can send notifications to clients.
3. **YANG Modules:** NETCONF Data models defines the configuration data and management information that is passed between a Server and a Manager.