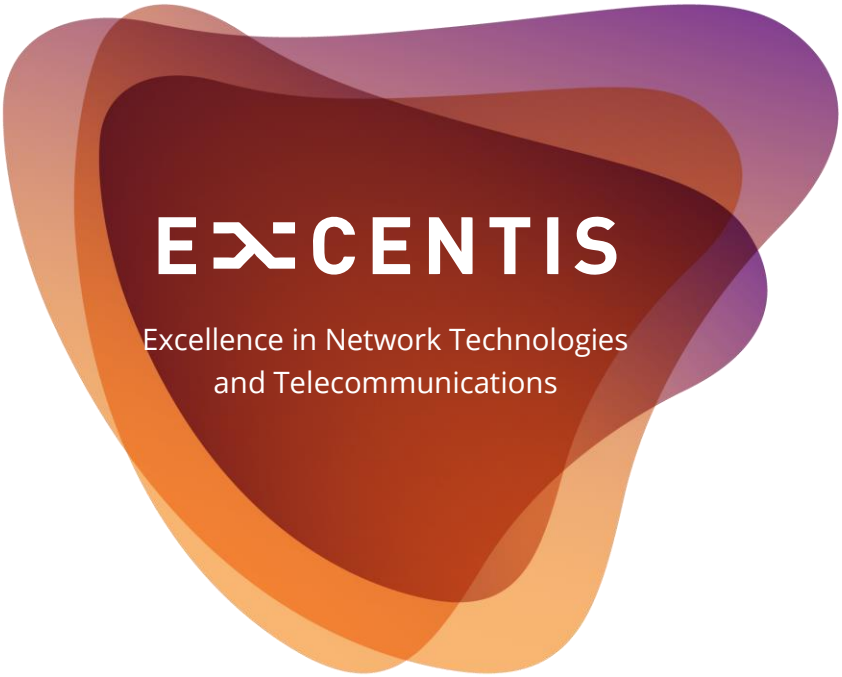

[redacted]

[redacted] Validation Test Service ATP

[redacted]

x/y/z Project reference:SO/xxx/yyyy

Revision: 01

Distribution: Provided under NDA by Excentis to [redacted]

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TABLE OF CONTENTS

1. Executive summary

[redacted] is planning to deploy a **new**, **DOCSIS 3.1 cable gateway** to provide their customers cable access **over the** [redacted] **HFC network (wholesale)**. WHO needs to have this new gateway validated by Excentis according to the WHP Test Book [redacted]. The gateway under test is the **Cable Modem Vendor** EuroDocsis 3.1 2-PORT Voice Gateway.

Current document is the **test report** to prove to WHP that this gateway will do no harm on their networks. Due to NDA the exact setup of the system configuration is not provided in this report.

No critical issues were found except for one on the eRouter side. The **eRouter sometimes does not apply the NAT settings** and is as such using the CPE private IP on eRouter public WAN side. Most likely all traffic will be dropped by the network in that case. Usually the problem dissapears after a power reboot of the modem. Cable MOdem Vendor was able to reproduce and stated they have a fix available.

A **second issue** on eRouter side was observed, [redacted]

The **modem does not support all functionalities** that were meant to be tested:

- [redacted]
- [redacted]
- [redacted]
- [redacted]

Apart from this, a **few minor issues** were noticed:

- [redacted]
- [redacted]

- [redacted]

2. Test Results

Tests are executed on a [redacted]

WHO **DUT** sysDescr:

[redacted]

An **overview** of the **test results**:

Test	PASS/FAIL	Observation
BsoD Service Fairness	[redacted]	[redacted]
BsoD	[redacted]	[redacted]
Config and SNMP Software Upgrade	[redacted]	[redacted]
Device Reset	[redacted]	[redacted]
Device Reset 3.1	[redacted]	[redacted]
Downstream Partial Service	[redacted]	[redacted]
Features	[redacted]	[redacted]
Filtering	[redacted]	[redacted]
FTP Application	[redacted]	[redacted]
Loadbalancing	[redacted]	[redacted]
MTA Disable	[redacted]	[redacted]
Network Access Disabled	[redacted]	[redacted]
Rate Limiting	[redacted]	[redacted]
SNMP Management	[redacted]	[redacted]

Stability Test	[redacted]	[redacted]
Node Split and Transients	[redacted]	[redacted]
Timers and Events	[redacted]	[redacted]
Upstream Partial Service	[redacted]	[redacted]
Version Capabilities	[redacted]	[redacted]
Second syslog	[redacted]	[redacted]
D3.1 features	[redacted]	[redacted]

Fail and remark descriptions

eRouter not using NAT

[redacted]

LAN DHCP issues

[redacted]

ARP within L2VPN fails

[redacted]

2.1 BsoD Service Fairness

Introduction

This regression test verifies service fairness. If internet service is provided via Alternative Operator configuration, the maximum speeds offered through this service is compared with normal Operator based internet services. The obtained maximum service throughput for both deployments is expected to be equal.

This fairness check is done under congested and non congested conditions.

Observations

The throughput results are very similar for the Alternative and the Normal Operator, both in congested and non-congested conditions.

To compare between non-L2VPN [redacted] and VPN condition [redacted] the time was measured for downloads (1.6 GB size = DS).

Test case	Non-L2VPN duration	L2VPN duration	Result
TestCase 1 DS (Non-Congested)	[redacted]	[redacted]	[redacted]
TestCase 2 DS (Congested)	[redacted]	[redacted]	[redacted]

Result

[redacted]

2.2 BSoD

Introduction

The objective of this test is to verify that the CM supports the BSoD-related requirements for implementing services on the Business Overlay CMTS network. It is checked if it correctly behaves in a BSoD environment by testing:

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

Observations

[redacted]

Result

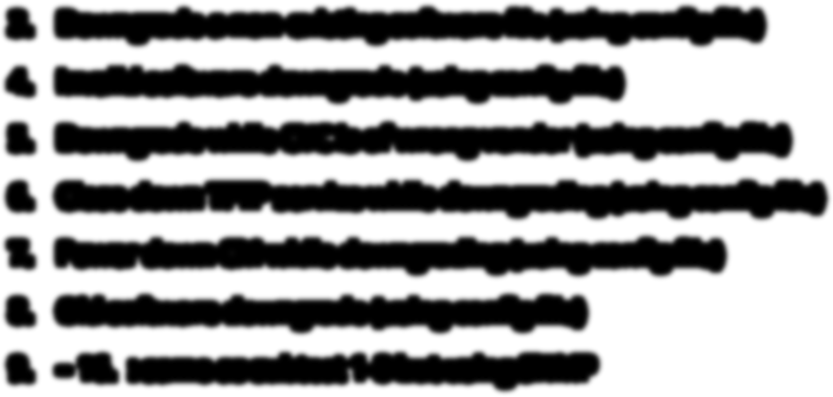
[redacted]

2.3 Config and SNMP Software Upgrade D3.1

Introduction

This test confirms that the CM will upgrade or downgrade to a specific software in different situations using SNMP or CM configuration file. The correct CM events, syslogs,... should be shown if upgrade or downgrade fails. The different situations (subtests) are:

1. [redacted]
2. [redacted]

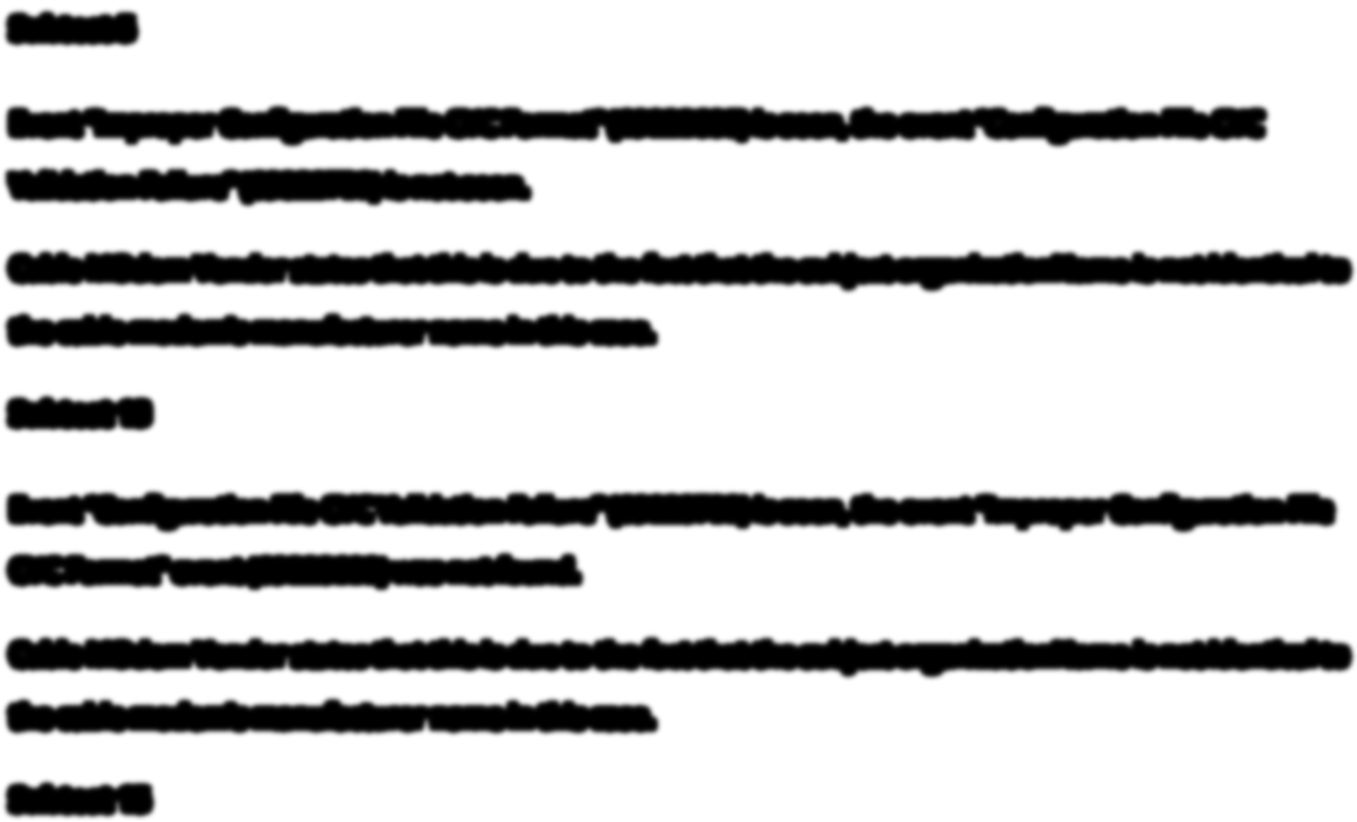


WHO will only upgrade the modems using D3.1 signed images (using 3.1 CVC chain).

Observations

Since the D3.1 software file size is about 75 MB (including RDK-B stack), HTTP download is recommended.

Following subtests had a remark:



[redacted]

Result

[redacted]

2.4 Device Reset

Introduction

This test verifies that the CM resets & recovers in a timely manner (~ 2 minutes) when reset by SNMP and from the CMTS MAC Domain in D3.0 mode.

Observations

[redacted]

Result

[redacted]

2.5 Device Reset 3.1

Introduction

This test verifies that the CM resets & recovers in a timely manner (~ 2 minutes) when reset by SNMP and from the CMTS MAC Domain in mixed D3.0/D3.1 mode.

Observations

[redacted]

Result

[redacted]

2.6 Downstream Partial Service

Introduction

It is checked if the CM behaves correctly in partial service. RF channels will be disturbed so that it is no longer usable by the CM (e.g. by putting another downstream channel of a different MAC Domain or different CMTS on the same frequency on the same HFC network or by injecting a signal using a signal generator on the same downstream frequency) and restored to normal operation again.

It is also checked that the CM correctly reports the disconnected/reconnected channels via CM-STATUS messages. It is checked that the CM correctly reports partial service via REG-ACK messages.

If the disturbed channel is the primary downstream channel of the CM, the CM must not send CM-STATUS messages, but must reboot immediately.

Furthermore it is verified that in the case of partial service also traffic is forwarded as expected.

Observations

[redacted]

Result

[redacted]

2.7 Features

Introduction

The first subtest verifies that a user can't change modem specific settings from the internal website. A second subtest checks that a modem can register when the configuration file name contains special characters.

Observations

[redacted]

Result

[redacted]

2.8 Filtering

Introduction

Positive CM registration is tested using a non-existing OID in the CM configuration file as well as negative registration when using a CM configuration file with invalid formatted TLV11 entry or a duplicate TLV11 entry. Furthermore, a port scan is executed to check for unexpected open ports.

Observations

[redacted]

Result

[redacted]

2.9 FTP Application

Introduction

This test verifies the interface between the FTP Server and the Residential Gateway products, i.e. the correct use of all OID's applicable for the FTP application features. The functionality is tested on downstream and upstream separately by means of configuration and functionality. Performance is tested individually on downstream and upstream but also using simultaneous sessions.

Observations

[redacted]

Result

[redacted]

2.10 Loadbalancing

Introduction

This test checks if the CM behaves correctly when load balancing (by using DCC and DBC messages) is enforced by the CMTS.

Observations

[redacted]

Result

[redacted]

2.11 MTA Disable

Introduction

This test verifies how an embedded MTA in the Device Under Test can be disabled. Two disable methods are tested. The first method is disable via SNMP which sets the eMTA interface (ifIndex 16, PacketCable Embedded Interface) down which as such prohibits the eMTA from communicating. The second method uses the option 122 which will disable the eMTA component.

Observations

This test is not applicable as the modem has no MTA.

Result

NA

2.12 Network Access Disabled

Introduction

This test verifies that if internet service on the CM is disabled (using NACO), the device is still manageable via SNMP from the operator side.

Observations

[redacted]

Result

[redacted]

2.13 Rate Limiting

Introduction

This test verifies that maximum speeds as defined by CM configuration file can be obtained by the system. Rate limiting is happening as during production configuration. The maximum possible download and upload speed (UDP and TCP) is also measured for the CM tested and when available compared with the test results of previous software versions of the tested CM.

Observations

[redacted]

Throughput measurements with **unlimited** rate (using multiple flows):

Mixed mode (config 32DS x 4US + 1 OFDM x 1 OFDMA)

Flow	**Down (Mbps)**	**Up (Mbps)**
UDP 256B	886	198
TCP	1680	191
Theoretical (Mbps)	1770	203

DOCSIS 3.0 mode (config 32DS x 4US)

Flow	**Down (Mbps)**	**Up (Mbps)**
UDP 256B	857	94
TCP	1515	89
Theoretical (Mbps)	1580	98

DOCSIS 3.1 mode (1 OFDM x 1 OFDMA)

Flow	**Down (Mbps)**	**Up (Mbps)**
UDP 256B	172	103
TCP	170	105
Theoretical (Mbps)	189	105

Result

[redacted]

2.14 SNMP Management

Introduction

This test checks if the CM behaves correctly when SNMP access rules for the alternative operator are defined. SNMP read/write access to the predefined MIB views using its SNMPv2c community strings are tested from the alternative operator's backbone, the operator's backbone and from CPE side.

Observations

- [redacted]

Result

[redacted]

2.15 Stability Test

Introduction

The objective of this test is to verify the stability/interoperability of a 3.0 CM in a simulated real-life setup (background noise disturbances, voice, UDP traffic and TCP sessions). It is expected that the 3.0 CM behaves correctly (based on packet loss and SNMP monitoring of the modems) over a period of 24h.

Observations

[redacted]

Result

[redacted]

2.16 Node Split and Transients

Introduction

This test verifies proper behavior of the CM during a typical node split scenario. During a node split scenario, the CM is going to lose its RF connectivity (without reception of prior managed reboot commands) and will obtain new channels. This new set of channels, on the same frequencies, typically belongs to a different MAC Domain with its own configuration MAC Domain specific settings. During this switch the CM is expected to obtain a different IP address and other operational parameters. This test will verify this proper transition.

Subtest 2 was executed.

Observations

[redacted]

Result

[redacted]

2.17 Timers and Events

Introduction

The objective of this test is to verify how CM timers will react & which events will be shown in different (network) situations.

CM resets or interruptions are tested triggered by:

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

Observations

[redacted]

Result

[redacted]

2.18 Upstream Partial Service

Introduction

This test checks if it correctly behaves in upstream partial service and remains interoperable with the CMTS. Partial service is tested during normal operation with and without CM-STATUS messaging and during registration.

Observations

[redacted]

Result

[redacted]

2.19 Version Capabilities

Introduction

In this test the objective is to check if the docsDevSwCurrentVers and docsIfDocsisBaseCapability MIB's and the DHCP parameters and options are filled in correctly. Furthermore the NACO capability is checked together with the LED indication.

Observations

[redacted]

Result

[redacted]

2.20 Second syslog

[redacted]

Result

[redacted]

2.21 D3.1 Features

Introduction

This test plan covers the operational readiness of DOCSIS 3.1 CPE devices to interoperate on WHP's network. This ATP is written to verify if the CPE is ready for the WHP DOCSIS 3.1 network/topology. This test set is intended to be run each time when a new major software release of the modem vendor is to be introduced in the field.

Observations

[redacted]

Result

[redacted]

3. CM Configfile

4. Revision History

Version 1.0: initial release