TLN WRO Certification type Document

< General Certification Procedures >

Document Housekeeping

Document Category and type

CAT	TYPE	DOC ID	Comment
General	CERT	TLN-WRO-TA-G-C-PDAA	Certification type documents (-CERT) describe the certification process and methodology (so not the interfaces or protocols, those are found in the specification type documents)

Document Authorization

EDITION	DATE	APPRAISAL AUTHORITY	STATUS	ORIGINATOR
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Document Effective Date

This document has come into effect as of xx/xx/2012 and remains valid until a valid subsequent Telenet Wholesale Reference offer, substituting this document is published.

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Telenet has appealed the CRC decisions of the VRM, BIPT and CSA of 1 July 2011 concerning the market analysis of the broadcasting market in Belgium and it consequently reserves all its rights in relation to this document."

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List of Appendixes

This document may refer to further detailed documents that are added in Appendixes to this document.
A reference to an appendix is in this document highlighted with grey background.
The list with appendixes of this document:

A. Appendix A, < APP-G-C-PDAA-A > contains :
    1) Appendix A1 – <Test List Legend>

List of References

This document may refer to external documents or information sources.
A reference to an external document or information source is in this document highlighted with grey background.
The list of referred external documents or information sources in this document:
Reference 1: TLN WRO CAT: Technical Processes: TLN-WRO-TA-T-T-PAAG
Reference 2: TLN WRO CAT: Technical Processes: TLN-WRO-TA-T-T-PAAH
Reference 3: TLN WRO CAT: Certification: TLN-WRO-TA-X-C-PXXX

Restricted information

This document may contain sections that are not public information and that can be made available only to parties that have executed specific NDA`s.

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1 Abstract

Certification type documents have as purpose to describe the roles and responsibilities in the certification process of Telenet and the AO, the test procedures and the interaction between TLN and AO throughout the product lifecycle of AO Customer Premises Equipment (CPE) with as main goal to ensure at any moment in time correct interoperability between the AO CPE and TLN infrastructure according to the relevant specifications. The same types of certification documents and procedures are also applicable for TLN network to AO network level of interconnections.

All Sections in this document are generic sections specifying certification procedures applicable to all AO CPE or network equipment that will be connected to the TLN network.

The feasibility of the technical designs and methods described in this document are subject to verification by a Proof of Concept (POC) test organized by Telenet and may be changed or updated depending on the outcome of this POC.

2 Glossary and Abbreviations

ADR: Audit Detailed Record
AIDTV: Annex Interactive Services for DTV
AO: Alternative Operator
ATF: Automated Test Factory
BSS: Business Support Systems
CA: Conditional Access
CAS: Conditional Access System
CDMA: Code Division Multiple Access
CDR: Call Detailed Record
CM: Cable Modem
CMTS: Cable Modem Termination System
CPE: Customer Premises Equipment
CPPS: CAS Proxy Provisioning Server
DAT: Detailed Acceptance Tests
DHCP: Dynamic Host Configuration Protocol
DOCSIS: Data Over Cable Service Interface Specification
DS: Downstream
DTV: Digital Television
DVB-C: Digital Video Broadcasting - Cable
ECM: Entitlement Control Message
EMM: Entitlement Management Message
EPG: Elecronic Program Guide
FTP: File Transfer Protocol
Gbps: Gigabit per second
GRE: Generic Routing Encapsulation
GTC: GRE Tunnel
HD: High Definition
HFC: Hybrid Fiber Coax
HO: Header Only
ID: Identifier
IEC: International Electrotechnical Comission
IP: Internet Protocol
IPSEC: Internet Protocol Security
IRD: Integrated Receiving Decoder
iDTV: Interactive Digital Television
LACP: Link Aggregation Control Protocol
LAG: Link Aggregation Group
LDAP: Lightweight Directory Access Protocol
LED: Light Emitting Diode
MAC: Media Access Control
MAN: Mandatory
MIB: Management Information Base
MPEG: Moving Picture Experts Group
MPTS: MPEG Transport Stream
MUX: Multiplexer
NDA: Non-Disclosure Agreement
NIT: Network Information Table
NIU: Network Interface Unit
OOS: Out of Scope
OSSI: Operation Support Systems Interface
PKI: Public Key Infrastructure
PPV: Pay per View
PSI: Program Specific Information
PVR: Personal Video Recorder
QAM: Quadrature Amplitude Modulation
RCU: Remote Control Unit

RF: Radio Frequency
ROBB: Telenet reference offer Broadband
RoHS: Restriction of Hazardous Substances Directive
ROTV: Telenet reference offer Basic TV
RPOI: Regional Point of Interconnection
RTSP: Real Time Streaming Protocol
RVSA: Regional VOD Service Area
SC: Smartcard
SCAT : Sanity Check Acceptance Tests
SD: Standard Definition
SI: Service Information
SNMP: Single Network Management Protocol
STB: Set Top Box
TLN: Telenet
TS: Transport Stream
UI: User Interface
US: Upstream
VDP: VOD Delivery Point
VHE: Video Headend
VOD: Video on Demand
VATEC: Verification of Acceptance Test Entry Criteria
VPN: Virtual Private Network
VSA: VOD Serving Area
VSP: VOD Service Proxy
WO: Wholesale Operator
WRO: Wholesale Reference Offer

3 Rules of engagement

(1) The AO underwrites following engagements when introducing CPE or network equipment that needs direct connection with TLN network infrastructure:

- The AO informs TLN in writing of its intention to introduce new or upgraded CPE or network equipment before planned launch date using the procedures foreseen in TLN-WRO-TA-T-T-PAAG.
- The AO proves (by demonstrating prior experience of involved people) that it has sufficiently technical knowledge and capabilities in the domain of the envisaged equipment.
- The AO proves (by demonstrating prior experience of involved people) that it has sufficiently technical knowledge and capabilities in the main cable network specific technologies (RF, Docsis, DVB-C, …)
- The AO will have the capabilities to test and (if required) update its equipments when TLN is introducing network upgrades(enhancements, security updates, etc.) according to the typical timelines as described further in this document.
- The AO will have the necessary resources (people, lab environment…) to execute its obligations as described in this document.
- The AO explicitly acknowledges that TLN is with no means responsible to engineer or test the AO systems or equipments towards delivering correct end - user functionality. TLN will only verify (using the ATF) if the AO equipment/systems behave correctly on the physical and logical peering interfaces with the TLN network with as prime purpose to preserve the integrity and correct functioning of TLN network and services.
- TLN will conduct certification testing on the AO CPE and systems or part thereof in accordance with the certification procedures described. The decision to conduct certification tests in full or partial scope is at Telenet's sole discretion and shall be in no way be a waiver for <Beneficiary's> responsibility to duly execute complete qualification testing on all relevant systems and interfaces.

4 Confidentiality

(2) The information that will be disclosed in the framework of the certification process will be covered by a specific NDA, being properly executed prior to the information exchange. It should be noted that TLN might be bound by NDAs with its suppliers and that TLN cannot guarantee that vendor NDAs can be successfully extended to include AO´s.

5 New AO CPE or network equipment introduction procedures

5.1 Introduction

(3) This section describes in brief the different generic steps that an AO will follow in order to introduce a new AO CPE or AO network equipment interacting with one or more components of the TLN WRO and that will cause the need for the execution of the certification tests and procedures as described in this document.

(4) Such certification tests and procedures will be performed as described below, executed at the moment an AO desires to become first time beneficiary of one of the TLN WRO.

(5) Such certification tests and procedures will also be performed whenever an AO desires to perform one of the following actions during the commercial operation of its service after successful implementation of the initial implementation project :

- Introduction of a new software version on an AO CPE hardware
- Introduction of small hardware revision variants to an existing AO CPE that do not modify the functionality
- Introduction of new software versions on AO network equipment hardware interfacing with the Telenet network
- Introduction of small hardware revisions on AO network equipment hardware interfacing with the Telenet network
- Introduction of new interface type cards with similar functionalities on AO network equipment hardware interfacing with the Telenet network

5.2 Design and development phase

(6) The AO will communicate towards Telenet in advance its plans to enter into a design and development phase for a new AO CPE hardware or new AO network equipment and will announce towards Telenet its desired timetable for field implementation.

(7) Telenet will then base upon the AO desired timetables and its own technical capabilities, roadmaps, resource constraints and availability of the ATF plan in agreement with the AO plan a timeslot for the execution of the certification procedures described in this document.

5.3 Certification phase

(8) Once the AO design and development phase is successfully completed the certification phase will start at the agreed time slot as described above.

(9) Passing the certification phase will imply the successful execution of the tests as described in section 8 of this document according to the methodology and procedures as described below..

5.4 Certification acceptance test procedures

- This section describes the acceptance test procedures based upon the certification documents as published in the TLN WRO.
- When <Beneficiary> declares to be ready for acceptance, as indicated in TLN-WRO-TA-T-T-PAAG, Telenet will conduct following acceptance test procedure:

(1) Verification of Acceptance Test Entry Criteria (VATEC) :

- Telenet will verify if hardware (if applicable), software binaries and documentation are delivered.
- Telenet will verify if quality records and results of Beneficiary's final integration testing are delivered.
- Telenet will review the release notes to verify if the newly developed features are properly described.
- Telenet will review the quality records to witness that no critical or major problems are contained in the delivered software.
- Telenet will verify if the list of known minor problems at time of release delivery is acceptable and if they indeed can be classified as minor problems because a workaround exists or they are classified irrelevant for the intended operation.

If any of the above VATEC criteria are not met, Telenet will declare the deliverables from <Beneficiary> not ready for acceptance and will formally notify <Beneficiary> of its default and will suspend the acceptance testing until <Beneficiary> has remedied the situation, after which the procedure will restart.

If the VATEC criteria are met, step 2 in the acceptance procedure will be entered.

(2) Sanity Check Acceptance Tests (SCAT):

During the SCAT step, Telenet will verify the key essentials of the delivered software for their suitability to be used for field deployment. This includes the following:

- Telenet will verify if the software can be correctly installed on the target CPE hardware, following the procedures described in the documentation.
- Telenet will verify if the CPE/systems can be started and restarted via the management interfaces and power up/down and reset and if this is a repeatable process.
- Telenet will verify if the AO CPE can operate as a Set Top Box (basic STB functionalities need to work stable and repeatable) or as a Docsis Modem (basic Modem functionalities need to work stable and repeatable)
- Telenet will do an initial 24H endurance test to verify if the software has stable operations without system crashes.

If any of the above SCAT tests fail, Telenet will declare the deliverables from <Beneficiary> not ready for acceptance and will formally notify <Beneficiary> of the failures and will suspend the acceptance testing until <Beneficiary> has remedied the situation, after which the procedure will restart.

If the SCAT criteria are passed, step 3 in the acceptance procedure will be entered

(3) Detailed Acceptance Tests (DAT):

During the DAT Telenet will execute detailed functional tests, inter-working tests, network integration tests, load and stress tests and endurance tests conform the certification documents published in the Telenet wholesale reference offer.

If during DAT, at a given time more than 1 (one) blocking or more than 3 major problems are open, or the system/software is found to behave fundamentally unstable, Telenet will suspend the acceptance testing and restart it only after the found problems are rectified by <Beneficiary>.

If during SCAT and DAT the acceptance test procedure is suspended for one of the above mentioned reasons, the overall period for the acceptance period will be extended with the sum of all suspension periods. It is agreed between Telenet and <Beneficiary> that a release that did not pass all acceptance tests cannot be deployed for commercial operations.

The following procedures will be in effect during the DAT phase:

1. Defect Reporting
    - In order for defects to be fixed in a timely manner, defects will be reported no later than 2 business days after being found.
2. Assignment of priority of defects.
   Telenet and <Beneficiary> will jointly agree on the priority of such defects.
3. Assignment of severity of defects.
   Telenet and <Beneficiary> will jointly agree on the severity of such defects.
4. Organising meetings at regular & agreed to review defects.
5. Planning for correction of defects
6. Telenet feedback on corrections which were implemented

<Beneficiary> shall provide access to an on-line defect reporting and follow-up system which will be used to report defects.
If <Beneficiary> deems it useful to have a representative present in person during part or the whole period of the acceptance testing conducted by Telenet, it is allowed to do so at its own expense.

5.5 Commercial introduction phase

(10) Upon successful completion of the certification phase Telenet will issue a conformance approval certificate towards AO, declaring the AO CPE or network equipment compatible with the TLN WRO and ready for commercial deployment within the constraints of the TLN WRO.

(11) An AO needs to hold **all** conformance approval certificates relevant to a particular TLN WRO before it can start commercial deployment of its services. Deployment based on partial certification is not allowed.

(12) During the commercial roll-out phase TLN is entitled to perform intermediate checks and audits on the deployed AO CPE to verify if the rolled-out equipment is still in conformance with the certification procedures.

6 AO CPE or network equipment upgrade procedures

6.1 Introduction

(13) This section describes in brief the different generic steps that an AO will follow in order to introduce an upgrade to an AO CPE or AO network equipment interacting with one or more components of the TLN WRO and that will cause the need for the execution of the certification tests and procedures as described in this document.

(14) Such certification tests and procedures will also be performed whenever an AO desires to perform one of the following actions during the commercial operation of its service after successful implementation of the initial implementation project :

- Introduction of a new software version on an AO CPE hardware
- Introduction of small hardware revision variants to an existing AO CPE that do not modify the functionality
- Introduction of new software versions on AO network equipment hardware interfacing with the Telenet network
- Introduction of small hardware revisions on AO network equipment hardware interfacing with the Telenet network
- Introduction of new interface type cards with similar functionalities on AO network equipment hardware interfacing with the Telenet network

6.2 Design and development phase

(15) The AO will communicate towards Telenet in advance its plans to enter into a design and development phase for upgrades on AO CPE software / hardware or upgrades on AO network equipment software / hardware and will announce towards Telenet its desired timetable for field implementation.

(16) Telenet will then based upon the AO desired timetables and its own technical capabilities, roadmaps, resource constraints and availability of the ATF plan in agreement with the AO a timeslot for the execution of the certification procedures described in this document.

(17) Based on the information provided by the AO, Telenet will determine which parts of the full certification test specifications are applicable to the specific upgrades as being proposed by the AO. Tests which cover functions that are deemed not being impacted by the upgrades proposed by the AO will be marked as “out of scope” (OOS) in the “IN SCOPE” column in the test score cards described further in this document.

(18) The decision of what tests are in scope or out of scope for upgrades is at the sole discretion of Telenet.

6.3 Certification phase

(19) Once the AO design and development phase for the upgrades is successfully completed the certification phase will start at the agreed time slot as described above.

(20) Passing the certification phase will imply the successful execution of the tests as described in section 8 of this document, excluding the tests that are marked “OOS”, according to the Certification test procedures as mentioned in chapter 5.4.

(21) In any case Telenet can, if it notices during the execution of the certification tests, that more changes have been introduced then originally communicated by the AO, decide at its own discretion to make the full test specification applicable, or even introduce additional certification test cases compared to the original list, if it has reasonable doubts that the modification on the AO CPE or network equipment could negatively impact the Telenet network and services in domains not previously discovered.

6.4 Commercial introduction phase

(22) Upon successful completion of the certification phase Telenet will issue a conformance approval certificate towards AO, declaring the AO CPE or network equipment compatible with the TLN WRO and ready for commercial deployment within the constraints of the TLN WRO.

(23) An AO needs to hold **all** conformance approval certificates relevant to a particular TLN WRO before it can start commercial deployment of its services. Deployment based on partial certification is not allowed.

(24) During the commercial roll-out phase TLN is entitled to perform intermediate checks and audits on the deployed AO CPE to verify if the rolled-out equipment is still in conformance with the certification procedures.

7 Telenet network upgrade procedures

(25) Telenet is executing from time to time upgrades to its network to keep it in pace with technological evolutions.

(26) During such upgrade programs Telenet will do its best endeavors to keep the network interfaces backward compatible so that the CPE and network interfaces from the AO are not impacted by the network upgrades.

(27) However this backward compatibility may not always be possible, e.g. during major technology step ups (e.g. the former upgrade from Docsis 2.0 to Docsis 3.0).

(28) In addition, even if upgrades are assumed to be backward compatible, re-testing of certain interfaces may be required.

(29) The Telenet network upgrade process is governed according to the procedures described in TLN-WRO-TA-T-T-PAAH.

(30) Telenet will determine the re-certification requirements towards the AO caused by Telenet network upgrades and communicate those towards the AO according the procedures described in TLN-WRO-TA-T-T-PAAH.

(31) The re-certification tests will be issued according to the procedures as described in section 6 of this document (use of reduced test lists with indication of OOS items).

8 Test Specifications for the certification procedures

8.1 Introduction

(32) The tests in each separate certification document will cover all of the requirements specified by TLN in the related specification document.

8.2 Test list

(33) The test list for each of AO equipment in the related certification document will be included in the Appendix of each certification document.

8.3 Test score card

(34) Each certification appendix will have its unique Test score card.

(35) The AO and TLN will hold a TEST score card.

(36) The AO-test score card describes the results of the certification tests as executed autonomously by the AO in the ATF.

(37) The TLN-test score card describes the results of the certification tests as executed autonomously by the TLN in the ATF.

(38) A failure on a test case (or sequence of tests grouped under that header) marked “Y” in the column labeled “MAN” (mandatory) does automatically imply non certification. If the test case (or sequence of tests grouped under that header) is marked “N”, a waiver may be given for deployment if the test case fails, depending on the nature and severity of the failure.

(39) The column labeled “FORMAT” is used to indicate format control aspects on the score card. The identification “HO” being placed in this column means that this particular line is a “header only” line, added for structural clarity of the table but without impact on the test scores. The identification “NA” placed in this column means that this particular line is a “not applicable” line, meaning that this particular test (or sequence of tests grouped under that header) is not applicable to this particular instance of the score card.

(40) The column, labeled “IN SCOPE” indicates that a particular test (or sequence of tests grouped under that header) is in scope or out of scope for this particular test run. When marked OOS (Out Of Scope), it implies that that particular test (or sequence of tests grouped under that header) is not applicable to this specific test run. This is used e.g. to make the distinction between full test runs and reduced scope test runs, applicable in the case of small updates only.

(41) The column labeled “PASS/FAIL” indicates if a given test case (or sequence of tests grouped under that header) has passed (P) or failed (F).

(42) The column labeled “REM” (remarks) is used to list remarks to the results of a particular test (or sequence of tests grouped under that header). It contains a reference in the format “(*xy)” to the bottom section of the table where a textual explanation of the remark may be given.

8.4 Conformance Approval Certificates

(43) Conformance approval certificates will be issued by TLN after completion of successful certification testing. The template of a conformance certificate includes the formal identification code of the AO CPE equipment, network element or interface that has passed successful certification according to the procedures and tests described in this document.

(44) In addition the certificate will list items like start and validity date of the certificate and its applicability for one or more TLN wholesale reference offers as well as a summary of the results of tests of the requirements defined in specification documents of the TLN WRO.

(45) Certificates will have a limited validity date. As technological pace of change goes very rapidly, there will be from time to time a requirement to re-certify AO CPE equipment, network element or interfaces.

(46) There are several columns and abbreviations used in the certificate. The column, labeled "Conformance Approval Certificate" describes summary information about the tested requirements. The column, labeled "Approval" lists if the specified requirement group has been tested positively or not.

(47) The column labeled "Not Applicable" contains a comma separated list of paragraph numbers in the corresponding specification document to which the certificate is not applicable. As an example paragraphs that relate to regulatory requirements, like compliance to the RoHS directive will be listed here as Telenet cannot declare conformance to such items as this is the responsibility domain of the relevant competent authority.

(48) The column labeled "Waivered" will contain a comma separated list of paragraph numbers of items in the corresponding specification document for which the test failed, but that are non-mandatory (see test score cards section). It means that although the test cases for such an item had a negative result, Telenet gives a waiver allow deployment anyhow for items that are not essential requirements for deployment.

(49) "HO" in the column labeled "Not Applicable" means this line is a header only for clarity of reading purposes only. A long sequence of paragraphs could also be noted as (x-y): e.g. (4-7) which would be equivalent to (4), (5), (6), and (7).

Appendix A1

Each certification document hold a detail list of tests that needs to be executed. The legend of the document can be found below.

Legend:

Test reference or description :

- if reference : DOC ID \ (paragraph number) of the corresponding ”specification type” document. It means that this test case verifies compliance with the requirement specifications as described in (paragraph number)
- if description : a clear description of the test case to be executed and the expected results

OK/KO : OK means test passed without any restriction. KO means test failed.

N/A : N/A means this condition is not suitable for the equipment.

Comment : if test failed (KO) : Comment field describes observed failure behaviour.

This document may refer to further detailed documents that are added in Appendixes to this document. A reference to an appendix is in this document highlighted with grey background.