

OLT/ONT Upgrade Test Plan

Layer 2 Network Programme

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1. Introduction

1.1. Document Purpose

The purpose of this document is to provide Service Providers with an outline all the Chorus activities required to support and complete the test effort for the ISAM/ONT Upgrade project.

The intent of this test plan is to provide Service Providers with confidence as to what Chorus has tested, to provide an opportunity for feedback on specific tests and to provide guidance for Service Providers for their own onboarding testing, if required, using the Chorus Co-Innovation Laboratory.

The test plan provides the following;

- Details of the test approach;
- Details of the test scope;
- Describe items that are not within the scope of the test effort;
- A high level description of Test Scenarios
- Details of all test requirements, i.e. test environment(s), test data etc.;
- Details of resources required for the test effort, their associated roles and responsibilities; and
- Provide details of test activities, associated dependencies and timelines

Note that the detailed test steps and expected outcomes are not included.

1.2. About this document

This document has been developed by Chorus as a consolidated version of several Chorus internal test documents. Chorus has endeavoured to make this document as comprehensive as possible. Feedback on content, technical clarity, format and level of detail is welcome.

This document specifically excludes:

- Detailed test environment setup and configuration;
- Detailed test steps and expected outcomes of each test as these reflect internal processes;
- Names of Chorus personnel undertaking the testing.
- Customer commercial information, including regression testing of Private templates.

The nature of this document is that it contains internal Chorus names and systems that may not be familiar or relevant to Service Providers. These have been included for context, but feedback on whether this information should be included in future documents would be welcome.

1.3. Roles and Responsibilities

The RACI-VS for this document is as outlined in the following table, where:

R	<i>Responsible</i>	The role tasked with the job of preparing the document. Typically one role though may be more in some circumstances.
A	<i>Accountable</i>	The role that is ultimately answerable for the correct and thorough completion of the artefact or task, and has the overall approving authority. There can only be <u>one</u> named Accountable role.
C	<i>Consult</i>	The role(s) that must be consulted for their opinions (often subject matter experts) before the document is finalised and verified, prior to signoff.
I	<i>Inform</i>	The role(s) that need to be informed of document development progress, and once completed, advised of document approval (i.e. sent a copy to action further).

V	<i>Verify</i>	The role(s) that will be required to review this document to ensure it is up to a standard of quality prior to signoff
S	<i>Signoff</i>	The role(s) that will be expected to provide signoff on this document. Will include the Accountable role

1.4. Glossary of Acronyms

The following terms are referred to in this document:

Acronym	Description
AMS	Access Management System
APC	Access Provisioning Centre
API	Application Program Interface
BAT	Business Acceptance Test
CCDF	Chorus Change Delivery Framework
CR	Change Request
E2E	End to End Test
EMS	Element Management System
FD ISAM	Fibre to the node – Intelligent Service Access Manager
FX ISAM	Fibre Multiplexer – Intelligent Service Access Manager
GPON	Gigabit Passive Optical Network
IDM	Inventory Data Manager
NPE	Non Production Environment
OAD	OSS Alarm Dispatch
ONT	Optical Network Terminal
OSS	Operations Support System
PIV	Post Deploy/launch Verification Test
PM	Project Manager
PTM	Programme Test Manager
RBT	Risk Based Test Approach
SDC	Statistics & Data Collector
SDLC	System Development Lifecycle
SLA	Service Level Agreement
SME	Subject Matter Expert
SOM	Service Order Manager
TA	Test Analyst
TD	Test Director
TL	Test Lead
TM	Test Manager
TMP	Test Management Process
UAT	User Acceptance Test
UFB	Ultra Fast Broadband
VDI	Virtual Desktop Infrastructure
VM	Virtual Machine

Acronym	Description
WBS	Work Breakdown Structure

2. Test Scope

The objective of the project's test effort is to verify that the delivered solution;

- Meets the requirements as documented in the Detailed Requirements Specification and Detailed Design documentation. Note that these requirements are focussed on the Chorus product descriptions.
- Processes information in accordance with the Chorus business standards, policies and procedures, and
- Performs consistently & accurately.

Accordingly the following sections describe the scope of the Combined E2E and Business Acceptance test effort.

2.1. Project Background / Solution Overview

The UFB Layer 2 Access Platform consists of an Element Manager (AMS), a Network Analyser (NA-F), OLT shelves (ISAM 7302 and 7360), various line-cards (NTs and LTs) and Optical Network Terminals (ONTs).

The following business drivers require changes in the UFB fibre network:

- Components used to provide the Layer 2 access connections for UFB
- Software and Hardware Upgrades

The project will be delivered in the following releases:

Release 1 – Access network upgrade

- Upgrade of the AMS element manager software to AMS 9.6.03
- Upgrade of ISAM OLT/ONT software to R5.6.02

Release 2 - New equipment introduction

- Introduction of FANT-G NT card - 100G uplink port and 1280G switching capacity
- Introduction of FWLT-B Line card
- Dual GPON port optics
- Introduction of G-010S-A/B SFP ONT.

2.2. Test Scope

The following sections detail the 'In Scope' items and the testing activities that will be undertaken to ensure that test coverage is sufficient to confirm that the above objectives are met.

Any change to the identified scope will require the formal change control process to be followed. This will include an impact assessment of the change so that the relevant issues, effect of the change and associated risks may be understood and agreed.

2.2.1. Functional / Non Functional Requirements in Scope

The focus of the test effort will be to verify that the solution delivers and supports the following functionality;

TAT

- Validation of OLT/ONT Upgrade MoP including roll-back

- a. FD 7302 (ISAM) – multiple LT cards (NGLT-A/C) and NELT-B card
- b. FX 7360 (ISAM) – multiple LT card (FGLT-A/B) and NELT-B card
- c. G-240G-P (ONT)
- d. G-010S-P (SFP ONT)
- e. G-010S-A (SFP ONT)

(Note: the existing ONT I-240G-R will not be upgraded.)

- ISAM OLT/ONT base functionality testing post upgrade
 - a. AMS management
 - b. Radius authentication
 - c. Backup and restore
 - d. NA-F integration
 - e. 5529 IDM (Inventory Data Management) module validation
 - f. SDC report validation
- Service regression testing over a list of OLT/ONT combinations (including the new G-010S-A SFP ONT)
 - a. Bitstream service testing (Bitstream 2, 3, 3a, 4 sample services and SFP ONT services)
 - b. Multi OVC services
 - c. Multicast testing

E2E/BAT:

- Provisioning
 - a. Verify user access with user profile
 - b. Verify the SRI Upload (i.e. device list, configured template, etc.)
 - c. Verify the Service provisioning post OLT upgrade including inflight orders and card swap
- Assure
 - a. Verify user access with user profile
 - b. Verify manual functions in AMS/ISAM
 - c. Verify NA-F integration post OLT/ONT upgrade

Voice Services

- Voice service regression testing
- Dual ATA Testing
- Provisioning based on CWMP (TR-069) and TR-104 (Using OpenACS)

2.2.2. Systems / Applications in Scope

The following table details the systems, applications and associated interfaces that are required to support the solution being delivered and therefore within the scope of the OLT/ONT Upgrade E2E/BAT test effort;-

Systems / Applications	Interface(s)	System Version
Comptel	<ul style="list-style-type: none"> Comptel -> AMS-F 	Comptel with AS 1.2.3
AMS-F	<ul style="list-style-type: none"> AMS -> Comptel AMS -> ISAM 	9.6.03
AMS GUI	<ul style="list-style-type: none"> AMS GUI -> AMS-F 	9.6.03
ISAM (7302)	<ul style="list-style-type: none"> ISAM -> AMS-F ISAM -> ONT 	5.6.02
ISAM (7360 FX-4)	<ul style="list-style-type: none"> ISAM -> AMS-F ISMA -> ONT 	5.6.02
ONT (I-240G-R)	<ul style="list-style-type: none"> ONT ->ISAM 	5.2.01zu
ONT (G-240G-P)	<ul style="list-style-type: none"> ONT ->ISAM 	5.6.01
SFP ONT (G-010S-P)	<ul style="list-style-type: none"> ONT ->ISAM 	5.7
SFP ONT (G-010S-A/B)	<ul style="list-style-type: none"> ONT ->ISAM 	5.7

Where

System	Description
Comptel	Service Order Manager (SOM) – Logical and Physical Network Inventory, Service Activation
AMS-F	OLT Element Manager
ISAM (7302)	OLT
ISAM (7360)	OLT
COFFII SIT	Fibre fulfilment Non Production Environment (NPE)
NIL	Network Integration Lab NPE

2.3. Test Out of Scope

The following sections detail the items that have been deemed “Out of Scope” for the test effort.

2.3.1. Out of Scope Functional / Non Functional Requirements

The following Requirements are out of scope of the test effort:

Test Scope Exclusion	Reason / Responsibility
Non-functional Testing	Excluded as agreed with project team and business. The non-functional requirements have been assessed and no change has been identified for the OLT/ONT upgrade.
Comptel adapter system testing with ISAM R5.6.02	Not in scope of OLT/ONT Upgrade TAT; will be covered under Comptel certification test.
Netcool Integration and regression	Will be covered under OSS TAT
Other portions of the BS4 service provisioning except the access component.	Other portions of the BS4 service provisioning will not be impacted by the OLT/ONT upgrade and therefore will not be tested.
Any RSP Testing, i.e. CPE devices.	Not in scope of Project.
Any feature, function, or service enhancements offered as a result of the software upgrades other than those specifically required.	Not in scope of Project.
Call forward	This is a soft-switch function which will not be impacted by the OLT/ONT Upgrade.

2.3.2. Out of Scope Systems / Applications

The following Systems, Applications and/or Interfaces are out of scope of the test effort:

Test Scope Exclusion	Reason / Responsibility
Netcool	Covered by Nokia OSS TAT & ORT
Fibre Test tools, i.e. TechMate, CheckMate, etc.	It has been agreed with the project team and business that FTT testing is not required as there are no interface between FTT and Fibre AMS, OLT/ONT.
Fibre SOM	Covered by Nokia OSS TAT

3. Test Approach

The following describes the test approach to be undertaken with the objective of covering all testable Business Requirements and all aspects of the Solution Design deemed within the test scope.

3.1. Test Approach Overview

Testing will be executed in Chorus NPE Environment. The FX 7360 and FD 7302 will be upgraded from version R5.2 to R5.6. The ONT G-240G-P will be upgraded from R5.2 to R5.6. The ONT I-240G-R will not be upgraded and will be kept at the current software version R5.2. The existing SFP ONT I-010S-P will be upgraded from R5.5 to R5.7. The new SFP ONT G-010S-A/B will also be included in this test phase.

Both of the Reference Offer (RO) and Right Performing (RP) services will be covered during the service regression testing.

The Provisioning and Assurance test scenarios will be executed by the Chorus test team. The SMEs will be engaged to audit these test results in parallel to Test Execution.

3.2. Non-Functional Test Approach

Not applicable.

3.3. Test Suspension Criteria

This section specifies the conditions under which test execution will be suspended where;

- Key components of test environment are unavailable, not sufficiently representative of a 'production like' environment, or
- Defects degrade the environment significantly or severely limit both the ability to test and the integrity of the test results.
- Turnaround time for defect resolution does not meet stated time.

The decision to suspend testing will be made by the Test Manager in conjunction with the Chorus Programme Test Manager and Project Manager.

Testing will be suspended until the defect or other issues that led to the suspension have been satisfactorily resolved, or an acceptable workaround has been identified and implemented.

In the event that this results in a change in Requirements and/or Detailed Design(s) the Chorus Change Management Process is to be invoked.

3.3.1. Test Resumption Requirements

Testing will be resumed when the defect or other issues relating to the code, environment and/or scope have been resolved or sufficiently stabilised to enable testing to resume without the risk of negating the value or integrity of the test effort.

The decision to resume testing will be made by the Test Manager in conjunction with the Chorus Programme Test Manager and Project Manager. As part of this process the test schedule will be reviewed to determine how best to reschedule the testing that has been delayed.

4. E2E/BAT Entry and Exit Criteria

To maintain the quality throughout this test phase, quality controls will be implemented via agreed Entry and Exit criteria between each test type. These quality controls will define the criteria that must be met before moving from one test type to the next.

Test Deliverables	<ul style="list-style-type: none"> • Consolidated Test Plan (this document) • High Level Test Cases • Consolidated Test Summary Report
Entry Criteria	<ul style="list-style-type: none"> • Test Plans signed off by project stakeholders • High level test cases available • Exit Criteria has been met. • Nokia Fibre SOM testing has been completed and Comptel certificate has been issued • Base NPE infrastructure audit completed with no/acceptable issues; • Baseline & Data requirements have been identified and setup in advance where possible; • Designated 'Production Like' test environment has been built, configured and is under configuration management; • Configuration/ parameter changes deployed to designated test environment; • Technical and SME test support in place; • OLT/ONT Upgrade MoPs and scripts are available • Designs are complete and approved; • Dependencies identified in sec 6.2 have been met
Exit Criteria	<ul style="list-style-type: none"> • All planned test cases have been executed and results documented, and any exceptions documented and approved; • No outstanding Severity 1 or 2 defects; • Acceptable levels of Severity 3, 4 and 5 defects are reviewed and agreed prior to decision to test phase sign off; • All defect /issue workarounds are agreed and documented; and • Test Summary Report completed and approved

5. High Level Test Coverage

This section outlines the test scenarios or function or business processes to be covered by the OLT/ONT Upgrade E2E/BAT test phase.

Details of each individual test, such as step-by-step actions and expected results etc., are located in the individual test cases located in the project's test repository and are not included in this document.

5.1.TAT High Level Test Scenario Summary

The following table provides an overview of the planned test scenarios for the OLT/ONT Upgrade test effort.

Function / Business Process Outline	Total
OLT/ONT Upgrade TAT	27
Grand Total	27

The following sections provide a further breakdown by describing the individual Test Scenarios / Test Cases being prepared to ensure that the delivered solution is fit for purpose.

Tc.ID	Tc. Description
MoP Validation	
001*	OLT/ONT Upgrade MoP Validation including roll-back
Base Functionality post upgrade	
002	ISAM (7302 & 7360) Management
003	Radius Authentication Validation
004	ISAM Backup and Restore
005	NE Alarms Verification
006	IDM (Inventory Data Management) module Validation
007	SDC (Statistics & Data Collector) Report Validation
008	NA-F Integration
Service Regression	
009	Bitstream 2 Service Regression
010	Bitstream 3 Service Regression
011	Bitstream 3a Service Regression
012	Bitstream 4 Service Regression
013	Business SFP Service Regression (with existing G-010S-P and new G-101S-A SFP ONT)
014	Multi-OVC Service Regression
015	Multicast Service Regression

016	UIP Template Service Regression
017	Service Co-existence Test
018	Hardware Swap Test
ONT upgrade and G-010S-A SFP ONT Introduction Test	
019	SFP ONT Installation
020	UNI MAC Limit Test
021	Layer-2 Control Protocol Test
022	Fragmented Packet Test
023	Broadcast Frame Test
024	DHCP Relay Test
025	VLAN 4095 Pass-through Test
026	PPPoE and DHCP Test
027	IPv6 Test

Note*: Test case 001 will be executed by Chorus Network Design Team and the rest of the tests will be executed by Chorus Test team.

5.2. E2E and BAT High Level Test Scenario Summary

The following table provides an overview of the planned test scenarios for the E2E/BAT test effort.

Function / Business Process Outline [Breakdown]	Total
Baseline test before OLT/ONT upgrade*	12
Assure Test Scenarios	39
Provisioning Test Scenarios	34
Grand Total	85

Note: The above tests will be executed using mix of FX and FD ISAMs.

Note*: The Baseline tests need to be executed before the TAT test phase.

The following sections provide a further breakdown by describing the individual Test Scenarios / Test Cases being prepared to ensure that the delivered solution is fit for purpose.

5.2.1. Baseline Test Scenarios

Scenario ID	Scenario Description
B001	Create a bitstream 2 order in COM, Have this order automatically provision down to Network Elements

Scenario ID	Scenario Description
B002	Create a bitstream 3 order in COM, Have this order automatically provision down to Network Elements
B003	Create a bitstream 3a order in COM, Have this order automatically provision down to Network Elements
B004	Create a SFP service order in COM, Have this order automatically provision down to Network Elements
B006	Create a Voice service order in COM, Have this order automatically provision down to Network Elements
B008	Create a bitstream 2 (Secondary offer) order in COM, Have this order automatically provision down to Network Elements
B009	Create a bitstream 2 order in COM with waiting for service company install
B011	Modify a bitstream 3 order (which triggers network change) in COM with activation date post OLT/ONT upgrade

Note: please refer to Section 10.2 for the test data details.

5.2.2. Assure High Level Test Scenarios

Scenario ID	Scenario Description
A001	User group and Radius authentication validation
A002	Find ONT Using SN and SLID
A003	Verify User is able to view Object Details for EFM Bridge Port
A004	Verify User is able to view Port statistics (Show→PM Counters). Verify user is able to Start Monitoring the PM counters and also verify the polling interval can be modified.
A005	Verify User is able to Enable and Disable the PM collection for Ethernet port. "Action -> PM collection - > Enable/Disable"
A006	Verify P-Bit Troubleshooting counters – The user can Enable/Disable and View under VLAN Association
A007	Verify ATA port – execute the MLT Test
A008	Verify ATA port "Action-> PM Collection -> Call control" can be enabled and disabled, the states are shown when it's enabled.
A009	Verify ATA port "Action-> PM Collection -> RTP" can be enabled and disabled, the states are shown when it's enabled.
A010	Verify User can Lock/Unlock port
A011	Verify User can reset ONT
A012	Verify User is able to delete service using APC template where possible
A013	Verify User is able to modify/recreate service using APC template where possible
A014	Obtain RGW MAC address(requires working E2E service)
A015	Confirm ONT Object details (General) fields have not changed from previous version.
A016	Confirm ONT Object details (Details) fields show Rx Optical levels.

Scenario ID	Scenario Description
A017	Change ONT SW version
A018	Confirm service query working
A019	Run all service provisioning query's
A020	View v-VPLS for the IHUB connecting the LT card
A021	View/Modify/Create - SPFE/APC from Service View
A022	Show ONT alarms (Incl Historical)
A023	Confirm CLI cut through working – “constructor” only
A024	Confirm Current & Historical alarms show correctly
Integration with NAF	
A025	Validation of Serial Number, SLID, ONT ID and the address for the serviced PON PATH in NAF
A026	Verify Optical Line Link Status for the active serviced PON in NAF
A027	Verify the Optical Line Power status for the service PON Path in NAF
A028	Validation of traffic in both uplink and downlink in NAF
A029	Verify Optical line link down in NAF
A030	Verify Faults when the optical line link down
A031	Verify Fault resolve update when bringing UP the ONT/PON port
A032	History of the optical link Status
A033	verify the Optical signal level, Temperature, Current, Voltage and error code details for the active serviced PON
A034	Verify the Optical Line Power status on demand for the service PON Path in NAF
A035	Verify the alarms for the optical link down when PON and ONT Link down respectively
A036	Verify throughput statistics reported when traffic is generated
A037	Verify PON details display including topology and PON diagnosis can be made on demand
A038	Validate the line diagnosis stats for a secondary order on the same ONT – should display both primary and secondary service details from NA-F upon querying the line.
A039	Validate ONT Power Budget Validation Result – Optical power level is acceptable – System displays ‘validated/Normal’

5.2.3. Provisioning High Level Test Scenarios

Scenario ID	Scenario Description
SRI Upload Test	
P001	AMS Upload - Upload Device List - AluAmsPhysicalDevice
P002	AMS Upload - Upload Configured Templates - AluISAMPhysicalDevice

Scenario ID	Scenario Description
P003	Upload Device - AlulsamPhysicalDevice
Create New Services	
P004	Create a bitstream 2 order in COM, Have this order automatically provision down to Network Elements (on FGLT-B or NGLT-C card)
P005	Create a bitstream 3 order in COM, Have this order automatically provision down to Network Elements (on FGLT-A and NGLT-A card)
P006	Create a bitstream 3a order in COM, Have this order automatically provision down to Network Elements (on FGLT-B or NGLT-C card)
P007	Create a SFP service order in COM, Have this order automatically provision down to Network Elements (on FGLT-A and NGLT-A card)
P009	Create a Voice service order in COM, Have this order automatically provision down to Network Elements (on FGLT-B or NGLT-C card)
P011	Create a bitstream 2 (Secondary offer) order in COM, Have this order automatically provision down to Network Elements
Modify Baseline Services	
P012	Modify a bitstream 2 order from baseline in COM, Have this order automatically provision down to Network Elements
P013	Modify a bitstream 3a order from baseline in COM, Have this order automatically provision down to Network Elements
P014	Modify a SFP service order from baseline in COM, Have this order automatically provision down to Network Elements
P016	Modify a Voice service order from baseline in COM, Have this order automatically provision down to Network Elements
P018	Modify a bitstream 2 (Secondary offer) order in COM, Have this order automatically provision down to Network Elements
Inflight Orders	
P019	Verify new connect order that is waiting at Service Company Install can be progressed post OLT/ONT Upgrade
P020	Verify new connect order that is waiting at activation date can be progressed post OLT/ONT Upgrade
P021	Verify Modify order waiting at activation date can be progressed post OLT/ONT Upgrade
P022	Verify disconnect order waiting at activation date can be progressed post OLT/ONT Upgrade
Post Card Swap Scenarios (FGLT-A ->FGLT-B; NGLT-A->NGLT-C)	
P023	Execute the Card Swap MoP (FGLT-A ->FGLT-B; NGLT-A->NGLT-C)
P024	Modify a bitstream 2 order in COM, Have this order automatically provision down to Network Elements
P025	Modify a bitstream 2 (secondary offer) order in COM, Have this order automatically provision down to Network Elements

Scenario ID	Scenario Description
P026	Modify a bitstream 3a order in COM, Have this order automatically provision down to Network Elements
P028	Modify a Voice service order in COM, Have this order automatically provision down to Network Elements
P030	Create a bitstream 2 order in COM, Have this order automatically provision down to Network Elements
P031	Modify a BS3 service from Non UIP to UIP
P032	Modify a Multiple OVC service from UIP to Non UIP
P033	Rehome ONT (from one ISAM to another ISAM)
P034	Disconnect provisioned Service via COM

5.3.Voice Service High Level Test Scenario Summary

The following table provides an overview of the planned test scenarios for the OLT/ONT Upgrade Voice Service test effort.

Function / Business Process Outline	Total
OLT/ONT Upgrade Voice Service Test	23
Grand Total	23

The following sections provide a further breakdown by describing the individual Test Scenarios / Test Cases being prepared to ensure that the delivered solution is fit for purpose.

Tc.ID	Tc. Description
Post Upgrade Service Template Validation	
001	ATA Voice Service Provisioning
ACS (OpenACS) Access TR-069/104 Inter-Operability	
002	DHCP
003	ATA IP Address Duplication
004	TR-069, TR-098 Model Parameter Settings / Credentials
005	TR-069 RPC Methods
006	TR-104 Configuration
ATA Voice Service Regression with Dual ATA Separation	
007	Basic Calling dual ATA Registered
008	3-Way Calling with Call on Hold
009	Call Waiting
010	MWI – Message Waiting Indicator
011	CLIR & CLIP Feature

012	Tone Specifications
013	Facsimile (FAX)
014	Modem Calls (Low speed Modems Up to 14.4Kbits/s)
015	Security Alarm
016	EFTPOS Connection
017	DTMF tones (rfc2833 and in-band)
018	Direct Connect Service (Hotline)
019	Early Media – Support for 18x Provisional Response
020	Call Transfer
021	Timezone offset test
022	CWMP TR-069 Configuration Retention
023	SIP Response Codes

6. Assumptions and Dependencies

The following assumptions, dependencies and constraints have been identified in relation to the test effort for this test phase.

6.1. Assumptions

The table below describes the testing assumptions related to this E2E/BAT identified to date:

No.	Assumptions
1.	Test environments will reflect production as closely as practical and any releases of code to these environments will be completed with minimal impact to the test team (deploy early, late or lunchtime)
2.	Access to the test environments will be controlled through both the Test Manager & NPE Environment Manager
3.	Booked resources will be available to the project for the period specified
4.	Any changes to the design after the baseline is set (whether in test window or not) will be managed accordingly via the Projects Change Management Process
5.	Any changes made will require an Impact Assessment to be completed and approval from the project team which will include a Test Team representative from each phase impacted
6.	No change needs to be made on the FSOM adaptor as the result of the POLT/ONT upgrade and introduction of the new SFP ONT.
7.	FGLT-A provides same capabilities and performance as a FGLT-B, and NGLT-A provides same capabilities and performance as NGLT-C card. Therefore they are not tested explicitly as agreed with the project/business.

6.2. Dependencies / Test Pre-Requisites

For successful delivery of the test effort outlined in this Test Plan the following dependencies/pre-requisites must be delivered as scheduled to ensure that test activities can commence and/or complete as planned.

No.	Dependencies	Test Impact (<i>if not delivered as scheduled</i>)
1.	Chorus TAT Phase has been successfully completed and exit criteria has been met.	E2E/BAT Test cannot commence – test pre-requisite not met
2.	Nokia FSOM Adaptor testing has been completed successfully and certificate has been issued	E2E/BAT Test cannot commence – Test prerequisite not met
3.	Project resources and relevant SME's will be available to discuss and assist resolve any testing issues throughout the project.	Test execution timeline impact resulting in execution delays
4.	Solution Designs are approved and base lined prior to test commencement	Impacts to test planning activities, possible timeline impacts
5.	Pre-Requisite for all Testers to have access/logins/relevant permissions to test environments	Test execution timeline impact resulting in execution delays

If any of the above are not delivered as scheduled, the test approach, test scope and timeframe required for testing may need to be revised via the projects Change Control procedures.

7. Risk, Issues and Constraints

This section details the risks, issues and constraints identified to date that could or are impacting the test effort and will therefore need to be monitored and mitigated over the duration of the test phase. In accordance with the Risk and Issue Management Processes described in Projects Test Strategy, impact analysis has been undertaken and the results are detailed below.

7.1. Risks

The purpose of this section is to detail the risks to this test phase from the testing perspective, assess the risk exposure, and define the mitigation plan.

No.	Risk Description	Likelihood High=3 Med = 2 Low = 1	Impact High=3 Med = 2 Low = 1	Risk Rating = Likelihood *Impact	Owner / Assigned to	Risk Mitigation Plan
1.	NPE Environment Contention, i.e. conflicts with model resources and other projects	Med	High	6	Test Environment Manager Test Manager	<ul style="list-style-type: none"> • Early visibility / communication of targeted environment amongst related projects & engagement with Chorus NPE Manager.
2.	If there is Environment unavailability due to unforeseen circumstances, this will impact the testing timelines	Med	High	6	Test Environment Manager	<ul style="list-style-type: none"> • Adjust test execution set as per risk based approach • Build-in project contingency
3.	Test Resource Availability	Med	High	6	Test Manager	<ul style="list-style-type: none"> • Regular updates to Business units with respect to current schedule to allow accurate resource allocation. • Co-ordinate with other projects to minimise test scenario duplication to allow all project needs to be met

7.2. Issues

The table below describes the issues related to this test effort:

No.	Issue Description	Impact High, Med, Low	Owner / Assigned to	Issue Mitigation Strategy
1.	The NPE data refresh will remove all the services created during the AMS Upgrade TAT and E2E/BAT test phase.	Med	Test Manager	<ul style="list-style-type: none"> Baseline services will be re-created before the OLT/ONT Upgrade TAT.
2.	Commence of OLT/ONT Upgrade TAT execution has been postponed due to the NPE data refresh exercise.	Med	Project Manager	<ul style="list-style-type: none"> Update the project schedule

7.3. Constraints

The following constraints have been identified to date and have to be factored into the planned OLT/ONT Upgrade E2E/BAT test effort to ensure that the impact to overall project delivery is minimised.

No.	Constraints	Impact High, Med, Low	Actions
1.	None		

8. Resources – Roles & Responsibilities

This section outlines the roles, associated responsibilities and deliverables of both the test team and the key project stakeholders involved in the planning and managing of test delivery for this test plan.

8.1. Test Roles & Responsibilities

The table below details the core resources that are required to plan, support and execute the testing for this test phase:

Test Role	Test Responsibilities	Deliverables
Test Manager	<ul style="list-style-type: none"> Overall planning and management of the projects test approach and test deliverables. Central point of contact for all of the projects test activities Review of test deliverables from Vendors / Development Partners. High level test environment requirements High level test data requirements. Test resource planning. Risk and Issue Management. Management of CHORUS test phases. Provide liaison between other project and/or test teams operating in the same environment. Defect Management (including facilitation of defect review meetings). Change Management – Impact Analysis. Guidance for Test Design and Integration test execution phases. 	<ul style="list-style-type: none"> Test Plan Test Estimates NPE Environment Specifications Test Schedule / Project Plan Quality Peer Reviews Issue Resolution Defect Reporting Test Status Reporting Test Summary Report
Test Analysts	<ul style="list-style-type: none"> Creation of test artefacts – test scenario matrix, test cases etc. Identification/preparation of test data. Planning and execution of testing. Defect identification and analysis. Change Management impact analysis. Progress Reporting. 	<ul style="list-style-type: none"> Test Cases Test Execution & Results
Test Support Resources - Business Analysts - Solution Design Engineer - SME's - NPE Resources - Vendor/Delivery Partner	<ul style="list-style-type: none"> Provide test support in the form of expert knowledge of the solution and processes and for test planning and execution. Assist in the identification/creation of test environment(s). Assist in the identification/creation of test data. Defect analysis and resolution. Environment support. 	<ul style="list-style-type: none"> Quality Peer Reviews Change Impact Analysis

Test Role	Test Responsibilities	Deliverables
<ul style="list-style-type: none"> - Release Manager - Business Owner 		

8.2. Test Support Roles and Responsibilities

Support Role	Test Responsibilities	Deliverables
Chorus Programme Test Manager	<ul style="list-style-type: none"> • Test Management Process • Chorus templates. • Review and Sign-Off of formal test phase deliverables, i.e. Test Plan, Test Summary Report etc. • Escalation point to test issues. • Provide support/guidance. 	<ul style="list-style-type: none"> • Quality Peer Reviews / Sign Offs
Business Owner	<ul style="list-style-type: none"> • Escalation point for test effort priorities and defect severity. 	<ul style="list-style-type: none"> • Business Case
Chorus Project Manager	<ul style="list-style-type: none"> • Review Test Plans. • Review Test Summary Reports. • Attend defect review/ daily test update meetings • Risk / Issue Management. • Change Management. • Escalation point for risks / issues in relation to timelines or quality unable to be mitigated internally to test work stream. 	<ul style="list-style-type: none"> • Project Brief • Project Management Plan • Project Schedule • Project Deployment Plan • Release Schedule • Issue Resolution • Quality Peer Reviews • Weekly Reporting
Solution Architect	<ul style="list-style-type: none"> • Review Test Strategy. • Review Test Plans. • Review Test Summary Reports. • Escalation point for risks / issues in relation to the solution design unable to be mitigated internally to test work stream. 	<ul style="list-style-type: none"> • High Level Solution Design
L2 network specialist	<ul style="list-style-type: none"> • Consultation and review and Test Plans. • Consultation and review and Test results • Assist technical test lead with troubleshooting issues in NPE. • Escalation point for risks / issues in relation to the solution design unable to be mitigated internally to test work stream. 	<ul style="list-style-type: none"> • None
Technical Solution Lead	<ul style="list-style-type: none"> • Consultation and review of Test Plans. • Consultation and review of Test results. • Escalation point for risks / issues in relation to the solution design unable to be mitigated internally to test work stream. 	<ul style="list-style-type: none"> • Deployment checklist
Network Services Specialist / Services Assurance Manager	<ul style="list-style-type: none"> • Consultation and review and sign-off Test Plans. 	<ul style="list-style-type: none"> • None

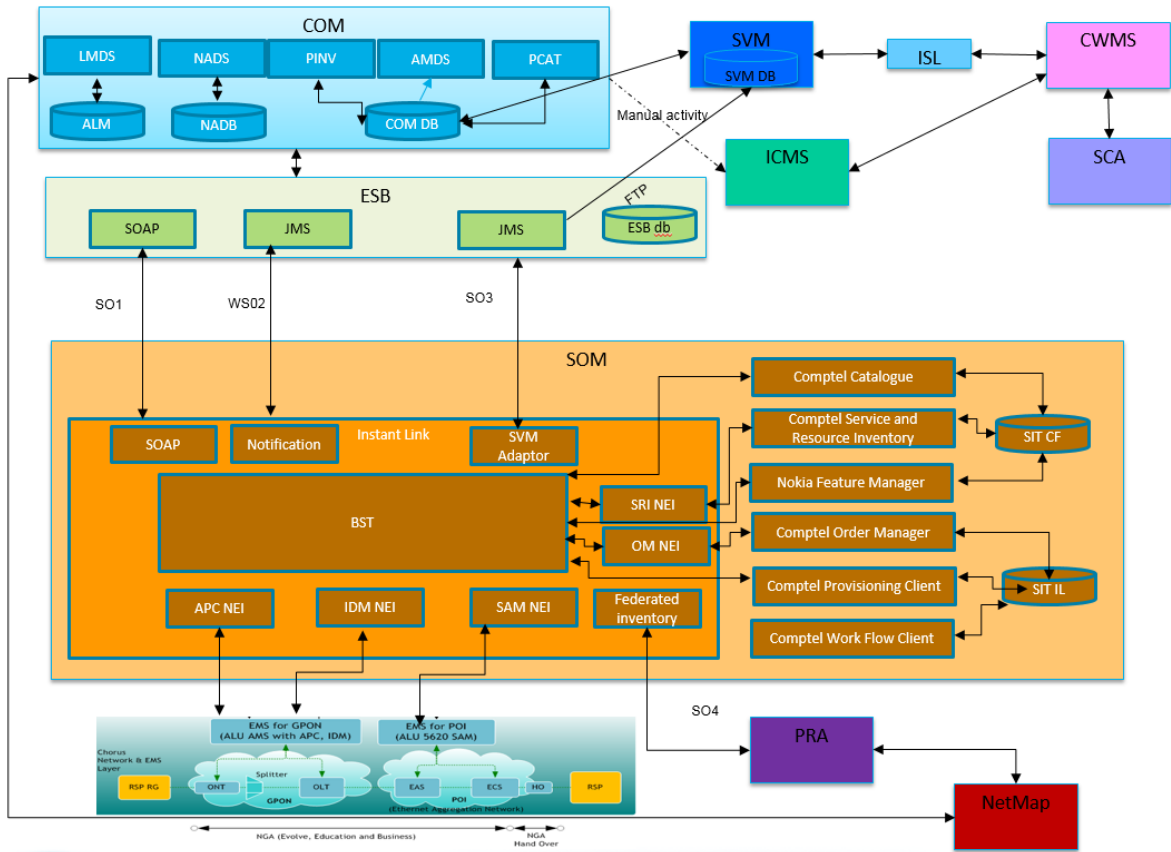
Support Role	Test Responsibilities	Deliverables
	<ul style="list-style-type: none"> • Consultation and review and sign-off Test results • Consult point for risks / issues in relation to the solution design unable to be mitigated internally to test work stream. 	
NPE Environment Manager	<ul style="list-style-type: none"> • Review Test Plan • Management of test environment build, configuration etc. • Resolution of environment issues. • Manage identification, analysis and resolution or escalation of project and/or environment related risks and issues. • Attend Defect Review Meetings 	<ul style="list-style-type: none"> • NIL Environment Diagram
Release Manager	<ul style="list-style-type: none"> • Review Test Strategy. • Review Test Plans. • Planning and co-ordination of build releases and defect fixes. • Preparation / Distribution of Release Notes. • Manage identification, analysis and resolution or escalation of project and/or release related risks and issues. 	<ul style="list-style-type: none"> • Deployment checklist

9. Test Environment Requirements

The following sections define the requirements that need to be met to ensure that the testing is undertaken in an environment which matches the expected production environment as closely as possible, and which enables all planned tests for this test phase to be executed.

9.1. Environment Context Diagram

The following diagram is an overview of the test environment(s) required to complete the planned test effort.



Network setup: Various, as required.

9.2. Environment Support Requirements

Env. Support Requirement	Description
Environment Availability	All components of the test environments booked will be required to be available a minimum of 8 x 5 (Eight hours per business day) for the duration of the project
Environment Maintenance	Over the duration of the project there is the expectation that the test environments may need to be wiped and re-built/re-generated, that configuration parameters need to be re-set or modified, or that data refreshes may be required as a minimum. This will be the responsibility of the Environment/Release Management team to liaise with the test environment owner (Test Manager) and coordinate the scheduling of this activity.
Environment Support	All components of the booked test environments require full support during the hours of availability hours described above

Env. Support Requirement	Description
	for the duration of the project. This includes support of the operating systems and the applications.
After Hours Support	<p>At times the test team may need to work longer than usual office hours or at weekends to meet project deadlines there will be a requirement after hours test support.</p> <p>Where possible 5 business days' notice will be provided to secure after hours support and it will be the responsibility of the Test Manager in conjunction with the Environment/Release Management team to coordinate this.</p> <p>It is expected that the level of support will include all appropriate resources required to support the test effort, such as DBA's, network engineers and pertinent developers associated with the code under test be at hand should the environment be brought down.</p>

9.3. Project Backup / Recovery Requirements

9.3.1. Test Environment(s) Backup / Recovery Requirements

All test environments are to be backed up on a daily basis and fall under the scope of the projects Backup/Recovery plans in the event of disruption/disaster.

This will be coordinated by the Environment/Release Management team in liaison with the Test Manager.

9.3.2. Test Data Backup/Restore Requirements

As the test effort will/may require multiple pre-defined and pre-prepared test data slices it is expected that multiple data slices will need to be stored as a baseline test data slice that the test effort can restore to at any point in time. Differing test phases are most likely going to have differing requirements to do this at differing times, hence the need for multiple environments

This will be coordinated by the Environment/Release Management team in liaison with the Test Manager.

9.4. Tools & Utilities

The following is a summary to the tools and/or utilities required to support the test effort identified to date:

Test Activity	Tool / Utility
Workstation	Chorus standard workstation image build
Project Management	Project Site
Test Artefact creation	HP ALM
Test Management / Repository	HP ALM
Data Base Query / SQL Client	N/A
Defect Management	HP ALM
Performance Tools / Utilities	N/A
Traffic generation	Spirent Test Centre
Traffic generation (PING packet with 3000B packet size)	Test PC
Advent Instrument Telephone Equipment Simulator	AI-5620
Analogue Telephones	x6 CLIP display capable

Test Activity	Tool / Utility
Analogue Telephones	x1 Call Waiting CLIP display capable
Traffic tracking tool	Wireshark
Call generator	ABACUS
IP network Impairment generator	Anue XGEN
FAX Machines	FAX Machines x 2
Laptops or Modems	Laptops or Modems x 2
Call simulator software	SIPp
Eftpos testing	Eftpos terminals
Medical alarm testing	Medical alarm terminals

10. Test Data Requirements and Set up

The purpose of this section is to identify the test data requirements for this test phase.

10.1. Test Data Scope

Baseline Test Data is mandatory to cover different Stages and permutations of setup. Following below are the combination of the ISAM and LT card versions and Data setup identified part of this Test Planning

10.2. Test Data Preparation

Following are the Test Data set Requirement for the OLT/ONT Upgrade E2E/BAT test effort:

7360 POLT	Card	Service	Product
CNT-POLT-02	FGLT-A	BS2	Evolve MAX-2.5-2.5 ver
CNT-POLT-02	FGLT-B	BS3	Business 4 - (HP 100M)
CNT-POLT-02	FGLT-A	BS3a	Business MAX - (HP 100M)
CNT-POLT-02	NELT-B	BS4	Bitstream 4
CNT-POLT-02	FGLT-B	SFP Service	Business -SFP 200 ver
CNT-POLT-02	FGLT-A	Voice	Evolve - ATA ver
CNT-POLT-02	FGLT-A	Multicast	Multicast Evolve 200-20-S ver (Secondary service)

7302 POLT	Card	Service	Product
CNT-POLT-04	NGLT-A	BS2	Evolve MAX-2.5-2.5 ver;
CNT-POLT-04	NGLT-C	BS3	Business 4 - (HP 100M)
CNT-POLT-04	NGLT-A	BS3a	Business MAX - (HP 100M)
CNT-POLT-04	NGLT-C	SFP Service	Business -SFP 200 ver
CNT-POLT-04	NGLT-A	Voice	Evolve - ATA ver
CNT-POLT-04	NGLT-A	Multicast	Multicast Evolve 200-20-S ver (Secondary service)

11. Defect Management

The following sections provide details of the defect review and reporting processes to be undertaken for the duration of this test phase.

For a more detailed view of the agreed the Defect Management Process please refer Appendix A for the following:-

- Defect Severity Classifications;
- Defect Priority Classifications

HP ALM is to be used as the projects central defect repository and used to facilitate the management and tracking of the following:-

- Defect Recording/Logging;
- Defect Analysis;
- Defect Tracking; and
- Defect Reporting.

11.1. Defect Review Meetings

The purpose of the defect review meeting is to provide the programme with a forum for reviewing and confirming the prioritisation of defects as well as providing information to enable the business to prepare workarounds that may be required for those defects that are not fixed prior to deployment.

For this test phase it is anticipated these meetings, either by conference call or 'face to face', will be held **weekly**, and initiated at the commencement of test execution. These will be organised and hosted by Chorus Test Manager. The participants will include representatives from Chorus and our vendors (as required). The representatives will be from the test team, design team, project management team, and other project stakeholders where necessary from all vendors supporting testing.

The objective of the defect review meeting is to:

- Confirm defect severities, priorities and resolution timeframes,
- Keep the Project / Business informed and involved,
- Provide a forum to talk through issues relating to the defects, i.e. Workarounds,
- Resolve 'Working as Specified' discrepancies which may lead to the requirement for Enhancements/Change Request to be raised, and
- Make decisions as to whether testing or implementation can proceed with a particular defect present where that defect is deemed critical or important to the business and cannot be fixed and retested before exiting a test phase or implementing to production.

11.2. Defect Reporting / Metrics

The following defect reports will be produced for the duration of the OLT/ONT Upgrade E2E/BAT test phase:

- Progress reporting category, incl. the total number of defects by status by severity, defect aging reports and trend analysis, the number of open defects by priority;
- Reports to evaluate the quality of the solution and achievement of exit or acceptance criteria such as the number of open defects by severity;
- Ad-hoc defect queries and reports.

12. Test Management Tool

12.1. Test / Knowledge Repository

HP ALM as the test management tool will provide the capability to build a test repository over the duration of the project as it allows for structured, consistent and repeatable processes to be implemented for the following test activities:-

- Requirements Traceability – test coverage mapping between the functional requirements, Test Scenarios and Interface/Integration Test Scenario's/Test Cases;
- Creation of CHORUS TAT, System integration, End to End and Regression Test Cases;
- Planning and scheduling of tests (test execution);
- Analyse / Verifying test results; and
- Test Progress/Status reporting, including real-time status reports and metrics.

All test documentation generated to support this test phase will be stored in the test management tool.

The test documentation for the project that is not generated/stored in HP ALM will be stored in the Projects Online Knowledge Repository Exchange 2.0 test folder: -

12.2. E2E/BAT Progress / Status Reporting

As outlined in the Test Strategy test progress / status reports will be issued by the test management on a weekly basis in order to provide the project management team with the following information:

- Progress against deliverables/activities;
- Progress against scheduled milestones;
- Tasks overdue;
- Tasks due next period;
- Key risks;
- Key issues; and
- Defect statistics

14. Appendix A –Severity/Priority Definitions

14.1. Defect Severity

Defect Severity is business-driven, i.e. what would be the impact on the business if the solution was deployed into production and this defect occurred in production.

The business owner and stakeholders are therefore entitled to the final decision on the severity of each defect. The test team/test manager will assign an initial defect severity based on their understanding of the impact, but it should be reviewed by the business, particularly if the defect is not resolved quickly or delivery timeframes are potentially impacted.

Severity	Description
1.	CRITICAL business functionality does not work, and no workaround exists. Cannot launch until resolved.
2.	IMPORTANT business functionality does not work, and a workaround exists but has a significant business impact and is not sustainable. Cannot launch until resolved.
3.	REQUIRED business functionality does not work, but a workaround exists. Can launch without fix with approval from the business, with an agreed plan for resolution.
4.	DESIRED business functionality does not work, but a workaround exists. Can launch without fix with approval from the business, with an agreed plan for resolution or further investigation.
5.	COSMETIC , recorded for business visibility only. No action required unless the fix is trivial and does not impact delivery timeframes.

14.2. Defect Priority

Defect Priority is delivery-driven, i.e. which defects need to be fixed first due to their impact on testing risk, productivity and timeframes.

Priority	Description
High	All or most testing has stopped as a result of defect, or a critical test case is impacted
Medium	Testing of a high-priority test case or a group of test cases is impacted, but other testing can continue in the short term
Low	Minimal effect on testing. Only one or a few low-priority test cases are blocked