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Multi-Service Interconnect of UK Next Generation Networks

Purple Release

Version 1.2.2

Network Interoperability Consultative Committee
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Normative Information

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1. INTRODUCTION

A significant driver for Next Generation Networks (NGNs) is the realisation of a common network that can support multiple services on the same platform infrastructure. NGNs use a number of packet technologies for service transport, of which the most common is the Internet Protocol (IP). However, an NGN interconnect also has to support services that are not IP based, therefore the underlying interconnect transport infrastructure needs to accommodate the range of services that require interconnectivity. In order to use this physical transport infrastructure efficiently, i.e. cables or fibres, the underlying transport infrastructure needs to be able to be flexibly configured to allow a range of services to share the available capacity.

The approach for NGN Multi Service Interconnect (MSI) is to define a common transport infrastructure that is service independent and can offer different transport capabilities to the services requiring interconnect. As new services are added to the scope of the NGN MSI, a new service-specific architectural specification will be produced that will define how the service works and its use of the underlying common transport infrastructure. This new service specification, or any enhanced service specification, will be included in the scope and associated document references of the NGN MSI Release document.

In order to manage the complex relationship between the services that are defined for using the NGN MSI and other associated UK standards at any one point in time, an interconnect release is defined by this top level document for each release. As multiple releases will co-exist as deployments in the UK, so multiple versions of the release document will co-exist to support these deployments. This will remain the case until they are no longer needed and can then be deprecated.

2. DOCUMENT SCOPE

This document defines:-

- a) the document structure for NGN MSI standards releases,
- b) the relationship of NICC standards and the work of ETSI
- c) the release history
- d) the requirements for the new services in this release and for services previously defined in previous releases that can be used on the same multi-service interconnect.
- e) the NICC service architecture specification versions that form this version of the release.

3. DEFINITION OF TERMS USED IN THIS DOCUMENT

3.1 Key Words

The key words “shall”, “shall not”, “must”, “must not”, “should”, “should not”, “may”, “need not”, “can” and “cannot” in this document are to be interpreted as defined in the ETSI Drafting Rules [1]

3.2 Abbreviations

ATM.....	Asynchronous Transfer Mode
C7.....	The European terms for SS7 signalling in telecoms networks, CCITT7
CP.....	Communications Provider
DTMF.....	Dual Tone Multi-Frequency
ETSI.....	European Telecommunication Standards Institute
IETF.....	Internet Engineering Task Force
IP.....	Internet Protocol
ISDN.....	Integrated Services Digital Network*
ISUP.....	ISDN User Part of C7 signalling
ITU-T.....	International Telecommunication Union - Telecoms
MSI.....	Multi-Service Interconnect
ND.....	NICC Document
NGN.....	Next Generation Network
NICC.....	Network Interoperability Consultative Committee
OTM.....	Operational Test Manual
PSTN.....	Public Switched Telephone Network*
PVC.....	Permanent Virtual Circuit
RFC.....	Request for Comments
SCTP.....	Stream Control Transmission Protocol
SIP.....	Session Initiation Protocol
TCP.....	Transmission Control Protocol
TDM.....	Time Division Multiplex
TISPAN.....	Telecoms & Internet converged Services & Protocols for Advanced Networks
UDP.....	User Datagram Protocol
UK.....	United Kingdom

* PSTN and ISDN when used with the term ‘service’ define the replication of the service set applied to NGNs rather than the legacy networks themselves.

4. DOCUMENT STRUCTURE

The NGN Multi-Service Interconnect Release document structure has been formed to provide Communication Providers (CPs) who require interconnection with other CPs

using NGN technology with an understanding of the principles and standard specifications required to achieve that aim.

The NICC ND documents that enable NGN interconnect to be achieved have been formed into a manageable structure that is flexible enough to remain useful as the industry moves through its various phases of definition and implementation.

4.1 NGN MSI Document Structure

The NGN MSI is fully defined by a four layer documentation structure:-

Layer 1) The top layer document, this document, which defines the scope of Multi-Service Interconnect for UK NGNs. It holds the Service Requirements and identifies the Service Architecture Specifications and their associated version and binding them to this release of the NGN MSI.

Layer 2) This document layer contains each of the service level interconnect specifications supported by the release. Each interconnecting Service Architecture Specification will describe the service specific interconnect and the documentation hierarchy and any other general reference documents that **must** be taken into account, in part or in whole. It provides the binding of NICC standards associated with that service, defining the versions of these documents that should be used.

Included in this document layer is the common transport service as a common infrastructure that is agnostic to the services it carries.

Layer 3) This document layer contains

- Service Management Guides
- Architectural specifications for specific areas that are service agnostic and are common to one or more Service Architecture Specifications
- Service management information that is common to one or more Service Management Guides.

Layer 4) This layer contains General Reference NICC Documents that are referred to within the Layer 2 or 3 documents for service specific or common infrastructure implementations. This includes signalling interface specifications.

Figure 1 **Error! Reference source not found.** shows a generic example of the structure and relationship of the ND documents under the NGN MSI Release Scheme as defined here.

It is important to note that there can be more than one version of a given ND document active at the same time with one version being relevant in one colour NGN Release and another version relevant to a different colour Release (e.g. the different versions of the NGN MSI Common Transport Architecture ND document in Figure 1).

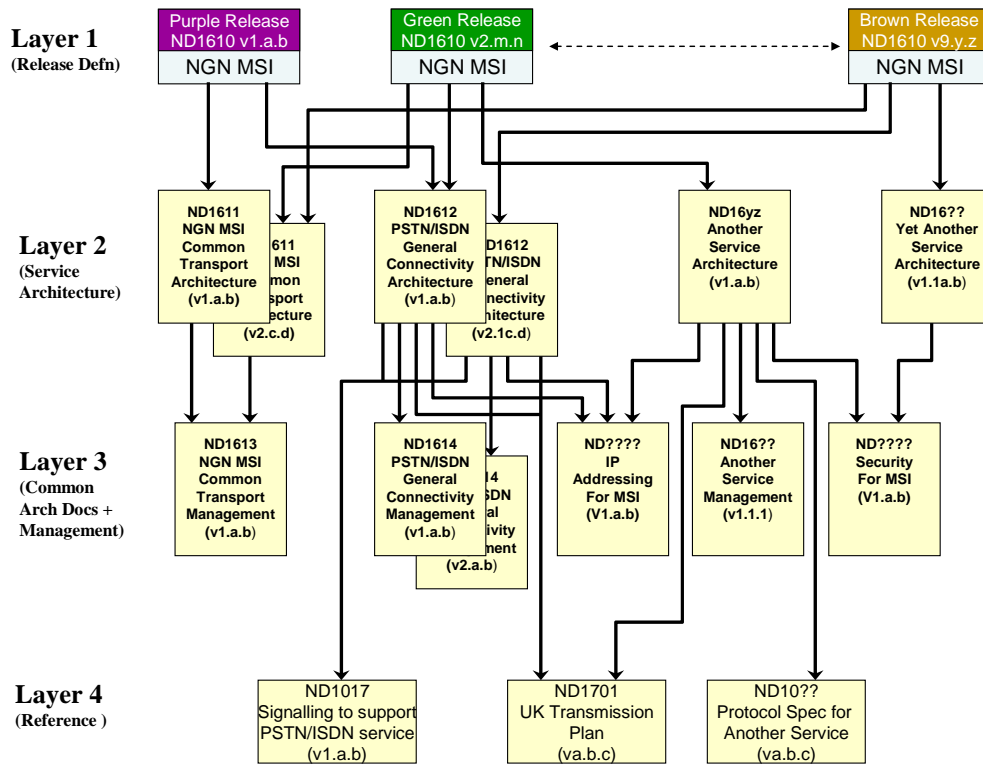


Figure 1: Generic Example of NGN MSI Release Documentation Structure

For the Purple Release, the ND documents that are applicable are given in Section 9, Table 1.

4.2 NGN MSI Version Numbering

NGN MSI documents **shall** be version controlled using the following scheme

Version A.B.C where:-

- A is a number indicating major changes / new version
- B is a number indicating minor changes
- C is a number indicating editorial changes

4.3 Release Colour Scheme

The Release Colour scheme is, in chronological order -

Purple - 2006

Green – 2008

Orange - tba

Blue - tba

Yellow - tba

Red - tba

Cyan - tba

White - tba


Brown - tba

The Release Colour scheme list will be expanded as required.

Amongst the NGN MSI documents, the Release Colour scheme ***only*** applies to the release document, i.e. this document. This allows unchanged documents to be referenced from multiple active releases.

5. PURPLE RELEASE HISTORY

The following records the history of releases for NGN MSIs.

Release Colour	Version	Published	Status (Active / Deprecated)
 Purple	Issue 1	05/2006	Deprecated
	V1.2.2	01/2009	Active

6. RELEASE SCOPE

6.1 *The Purple Release*

The Purple release includes:-

- **Common Transport:-** The reference to the specification of a common interconnect transport infrastructure that has the capability to simultaneously support a range of different services.
- **PSTN/ISDN Service:-** The reference to the specification for interconnecting current PSTN and ISDN services that are on an NGN and the associated use of the underlying common interconnect transport infrastructure. The specification defines the PSTN/ISDN service general connectivity that is used by various interconnecting products (e.g. interconnect for geographic numbers, number portability, carrier pre-selection) but not these specific products themselves.

7. NICC USE OF ETSI TISPAN ARCHITECTURE

The Purple architecture is based on the principles of the first release of the TISPAN NGN delivery.

8. HIGH LEVEL REQUIREMENTS

8.1 *Purple Release Requirements*

All the General requirements in this release are subject to review in subsequent releases.

8.1.1 *General Requirements*

- 8.1.1.1 The transport solution for interconnection **shall** be capable of carrying PSTN / ISDN and other services, e.g. static ATM-based PVCs, existing TDM interconnect services and other IP-based services.
- 8.1.1.2 The interconnect architecture **should not** hinder migration from a bi-partite interconnect to a common signalling discovery and connectivity model.
- 8.1.1.3 The interconnect architecture **shall not** require an operator to reveal their internal bearer network topology.
- 8.1.1.4 The interconnect architecture **shall not** require an operator to reveal their control network topology.
- 8.1.1.5 The architecture **shall not** make any assumptions about physical network security.
- 8.1.1.6 The architecture **shall not** be defined in such a way that policing/policy enforcement of the interface becomes impracticable.

8.1.2 *Requirements for PSTN ISDN Service General Connectivity*

- 8.1.2.1 The architecture **shall** support the functional equivalent of UK legacy TDM PSTN/ISDN for both 64kbps clear mode and G.711.
- 8.1.2.2 A globally unique call reference **shall** be carried in signalling.
- 8.1.2.3 The architecture **shall** prevent or constrain circular session routing.
- 8.1.2.4 The architecture **shall** support ISDN channel bonding.
- 8.1.2.5 The architecture **shall** support an automatic mechanism to prevent overload at the point of interconnect, including but not limited to:
 - a) Signalling transport
 - b) Session processing
 - c) Bearer control mechanisms

- 8.1.2.6 The establishment and tear down of media streams under application layer control **shall** follow the behaviour of existing UK-ISUP networks.
- 8.1.2.7 Where it is expedient to achieve timely availability of an initial interconnect arrangement, the network architecture **shall** be based on the assumption that the transport interconnect is configured to provide a virtual point to point service with deterministic quality, availability and bandwidth characteristics between CP networks. Quality measures **shall** include latency, jitter and packet loss.
- 8.1.2.8 Bearer resources: A call **shall not** be established unless the necessary bearer resources are available to support the requested service.
- 8.1.2.9 Bearer resources: Once a call is established, the necessary bearer resources to support the requested service **shall** be maintained throughout the duration of the call. Continued availability of resources for established calls **shall not** be compromised by the initiation of subsequent calls.
- 8.1.2.10 Bearer resources: Whilst bearer capacity failure is recognised no new calls **shall** be attempted over that resource.
- 8.1.2.11 Bearer resources: The bearer media stream **shall** natively support voice-band data and DTMF. IETF RFC2833 (DTMF out-of-band transport) and ITU T.38 (Fax/modem out-of-band transport) are not required.
- 8.1.2.12 Signalling: Network security **shall** be maintained by providing appropriate protection (including authentication and privacy) mechanisms for signalling between networks.

9. RELEASE DEFINITION

Documentation that forms the NGN Multi-Service Interconnect, Purple Release is defined and controlled by the following table.

Note: the table below shows the layer 2 (ie Service Architecture specifications) in the Purple Release. As stated in Section 4.1, each Service Architecture specification will list the NICC standards associated with that service, defining the versions of these documents that should be used.

Doc Layer	Document Title	Doc No.	Version
1	Multi-Service Interconnect for UK NGNs	ND1610:2009/01	v1.2.2
2	Multi-Service Interconnect Common Transport for UK NGNs	ND1611:2007/12	v1.2.1
2	General Connectivity of PSTN/ISDN Services between UK NGNs	ND1612:2008/02	v1.2.2

Table 1: List of Service Architecture Documents applicable to NGN Purple Release

10. REFERENCES

Ref no.	Document Reference	Title	Version	Publisher
[1]	SR 001 262	ETSI drafting rules Section 23:- Verbal Forms For The Expression Of Provisions	2.0.0 2004-07	ETSI

11. PURPLE RELEASE DOCUMENT HISTORY

Issue Number	Date	Reason for update
Issue 1	02/05/2006	Authorised for publication on the Ofcom web site at TSG07 and NICC55.
V1.2.1 Draft a	25/08/2006	Updated by the TSG secretary to include the Release Colour scheme in section 4 and a number of minor editorials
V1.2.1 Draft b	20/3/08	Updated to remove ND numbering from Figure 1 to make it generic.
V1.2.2	Jan 2009	Formal issue

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