

NGN Interconnect: Media Path Technical Specification

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Foreword

This NICC Document (ND) has been produced by NICC

Introduction

This specification forms part of the Next Generation Network, Multi-Service Interconnect (MSI) Release Structure and ought to be read in conjunction with the associated releases of the standard 'Multi Service Interconnect of UK Next Generation Networks' [2].

In line with the four level documentation structure defined in the release document ND1610 [1], this is a NICC layer 3 document.

1 Scope

The present document defines the generic Media Path which has the attributes for supporting PSTN / ISDN type services at the interconnect between UK NGNs using IP technology.

This specification is in support of service architectures requiring high quality media streams for PSTN ISDN type services carried by a common transport as defined in the MSI Common Transport Specification [2]. The MSI supports logical network layer point-to-point connectivity with dedicated bandwidth as the transport between communications providers (CPs).

Where reference is made to Common Transport Functions (e.g. fB3, iC4) these refer to Figure 1 in ND1612.

2 References

For the particular version of a document applicable to this release see [ND1610](#) [1].

2.1 Normative References

- [1] ND1610 Multi-Service Interconnect of UK Next Generation Networks
- [2] ND1611 Multi-Service Interconnect Common Transport for UK NGNs
- [4] RFC 3551 RTP Profile for Audio and Video Conferences with Minimal Control
- [5] ND1704 End-to-End Network Performance Rules & Objectives for the Interconnection of NGNs
- [6] TS 01 025 TISPAN NGN Service and Capabilities Requirements
- [7] RFC 0768 User Datagram Protocol
- [8] RFC 3550 RTP: A Transport Protocol for Real-Time Applications, Internet Engineering Task Force
- [9] Recommendation T.38 Procedures for real-time Group 3 facsimile communication over IP networks
- [10] RFC 4833 RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals
- [11] Recommendation G.826 End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections.
- [12] Recommendation G.811 Timing characteristics of primary reference clocks
- [13] ND1636 NGN Interconnect: IP Address Allocation
- [14] RFC2327 SDP: Session Description Protocol

2.2 Informative references

- [3] SR 001 262 ETSI drafting rules Section 23:- Verbal Forms For The Expression Of Provisions

3 Definitions and Abbreviations

3.1 Definitions

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 [3].

3.2 Abbreviations

CP	Communications Provider
DNS	Domain Name Service
DTMF	Dual Tone Multi-Frequency
ETSI	European Telecommunication Standards Institute
IETF	Internet Engineering Task Force
IP	Internet Protocol
ISDN	Integrated Services Digital Network*
ITU-T	International Telecommunication Union - Telecoms
MF4	Multi-Frequency signalling No. 4
MSI	Multi-Service Interconnect
NGN	Next Generation Network
PSTN	Public Switched Telephone Network*
PT	Payload Type
RTCP	Real Time Control Protocol
RTP	Real Time Protocol
SDP	Session Description Protocol
UDP	User Datagram Protocol
VBD	Voice Band Data

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

Where used in this document the term VLAN refers to an Ethernet Static VLAN.

4 Network Protocols

The media stream transport **shall** use the User Datagram Protocol (UDP) described in IETF RFC 0768 [7], and **shall** use the Real-Time Transport Protocol (RTP) described in IETF RFC 3550 [8].

The media stream **shall** only support symmetric RTP (i.e. originating and terminating media flows use the same IP address and port number).

5 Default Encoding Packet Size

A 10ms encoding packet size **shall** be used. This size is required to meet the delay requirements in End-to-End Network Performance Rules & Objectives for the Interconnection of NGNs NICC [5].

Note: The default of 20ms **shall not** be used for this service type.

The RTP payload type (PT) header field identifies the RTP payload format, and the mapping of payload type codes to payload formats **may** be static or dynamic (static means that the same code is bound to a particular format for all calls, whereas dynamic means that the code associated with a particular payload format may change from call to call). The number ranges 96-127 **shall** be reserved for dynamic assignment of payload type numbers in accordance with RFC 3551 [4].

6 Voice Band Data

The media stream **shall** natively support voice-band data (VBD).

The media stream interface **shall not** support fax modem bypass standard T.38 [9].

The media stream interface **shall not** support DTMF (MF4) bypass standard [10].

7 Voice Activity Detection

The media stream shall not support silence suppression / voice activity detection.

8 Error Performance and Packet Loss

In order to emulate current ISDN services with the same error performance, interconnecting networks **shall** meet the national end-to-end error allocation and packet loss that are given in ITU-T Recommendation G.826 [11] and End-to-End Network Performance Rules & Objectives for the Interconnection of NGNs[5].

9 Delay and Packet Variation

Refer to End-to-End Network Performance Rules & Objectives for the Interconnection of NGNs [5] for information on delay and packet delay variation.

10 Echo Control

Refer to End-to-End Network Performance Rules & Objectives for the Interconnection of NGNs [5] for information on echo control.

11 Media Stream Synchronisation

The multi service interconnect is not a reliable source for the provision of a clock synchronisation service.

In order to meet the required media slip rate for PSTN and ISDN service types, each interconnecting network **shall** be synchronised to a clock source in accordance with ITU-T recommendation G.811 [12] by an independent means. Further guidance is available in End-to-End Network Performance Rules & Objectives for the Interconnection of NGNs[5].

12 Monitoring of IP Media Streams

The interface (iB1) **shall** carry RTCP packets between packetisation end points, which **shall** enable the following parameters to be monitored:-

- Delay
- Packet loss
- Jitter

This **may** be achieved using the *Sender Reports* described in the Real Time Control Protocol (RTCP) specified in IETF RFC 3550 [8].

13 Media Stream Use of the Common Transport Capability (iT4b)

The media stream interface **shall** be carried over the IP capability of the transport function (iT4b) on a trail of fixed bandwidth reserved for media streams only.

The Media Stream shall be announced across the signalling interface (iC1) using the Session Description Protocol (SDP) defined in IETF RFC 2327 [14].

Authentication or encryption of a media stream **shall not** be required between the Media Border Functions (fB3) on an interconnect.

14 Media Stream IP Address Allocation

An IP subnet **shall** be allocated for each media trail connection (VLAN) between the media border functions in each CP's network in accordance with ND1636 [13]. Each media border function **shall** be allocated a specific IP address within this subnet.

The media stream transport **shall** use the User Datagram Protocol (UDP) described in IETF RFC 0768 [7], and **shall** use the Real-Time Transport Protocol (RTP) described in IETF RFC 3550 [8].

The media stream **shall** only support symmetric RTP (i.e. originating and terminating media flows use the same IP address and port number).

15 Media Security

Media security **should** be provided by the dynamic pinhole functions of the Media Border Function (fB3) under the control of the Edge Session Control Function (iC1) which derives it from the internal and interconnect signalling.

Authentication or encryption of the content of a Media Stream **shall not** be required between the media Border Functions on an interconnect.

History

Document history		
1.1.1	Jun 2008	Initial issue