

CONSULT21

BT wholesale

CONSULTATION

**Siting of Interconnect Nodes for NGN
Call Conveyance PSTN Emulation and
Wholesale Broadband Connect**

Issue 1 : Consultation C21-NS-014

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1 Background

BT is developing NGN Interconnect Products to enable Communications Providers (CPs) to interconnect with 21CN, BTs Next Generation Network (NGN). This Interconnection will be enabled through the development of a Multi Service Interconnect Link (MSIL).

NGNuk, of which BT is a member, has been set up by Ofcom as an independent Industry body to determine the commercial arrangements for NGN interconnect. In this role NGNuk has requested that BT consider providing Interconnect Nodes for NGN Call Conveyance (PSTN Emulation) and Wholesale Broadband Connect at 31 locations. This document presents BT's response to this request and seeks the views of Communications Providers on certain key issues.

2 Industry Consultation

2.1 What are we consulting on?

NGNuk has requested that BT consider providing converged Interconnect Nodes for NGN Call Conveyance (PSTN Emulation) (NGN CC(PE)) and Wholesale Broadband Connect (WBC) at 31 locations. A number of issues arise in relation to the locations requested, and the purpose of this consultation is to obtain feedback from Industry on the options before BT finalises the locations at which interconnect will be available.

2.2 Process for Handling Consultation Queries

Any further questions from Communications Providers on this consultation should be sent to john.morden@bt.com, john.a.davey@bt.com and chris.evans@bt.com.

2.3 Consultation Timings

Consultation document issued to CPs	29 May 2007
Bilateral discussions begin	31 May 2007
Bilateral discussions end	19 June 2007
CP responses required by	19 June 2007
BT publishes Summary of Responses	22 June 2007
BT publishes Conclusions	20 July 2007

3 Context

NGNuk's first 3 objectives are to:

- 2.1.1 Create a set of guiding principles, a vision and an implementation framework for an interconnected NGN future for the UK, including interconnection between PSTN replacement NGNs, IP-based mobile networks, VOIP operators, and other relevant future developments in communications networks and services;
- 2.1.2 Establish a commercial stream of work that will focus on the creation and substantial agreement, including in respect of pricing principles, of an IP Interconnect Commercial Model for an interconnected NGN future in the UK, having regard to the work being undertaken pursuant to Article 2.1.3;
- 2.1.3 Establish a technical stream of work that will ensure that the necessary activities are taking place to create a substantially agreed IP technical interconnect and IP network intelligence interoperability environment. Where this work is already well established and meeting Electronic Communications network and service providers' needs, no attempt will be made by NGNuk to duplicate it. Early engagement with Consult 21 and the NICC to understand progress in these areas will be essential.

Under this remit, NGNuk is addressing the issue of where interconnect should take place, using BT's 21CN network as the exemplar. BT's current plan is for Points of PSTN Service Interconnect (PoSI) at 106 locations, and Points of WBC Service Interconnect at a subset of 20 locations.

In respect to the desire for Points of NGN Interconnect to be converged, BT suggested that the most efficient locations for NGN CC(PE) interconnect in relation to the topology of its 21CN would be at 20 locations, which are also the locations for WBC. The other industry players in NGNuk considered this in relation to their own networks, and asked BT to consider the following changes to its proposal :

1. Changing 3 of the proposed locations, and adding 11 locations for NGN CC(PE)
2. Increasing the availability of WBC to the same 31 locations
3. Any suggestions BT has to overcome the potential lack of equivalence that will arise if BT route NGN CC(PE) calls at all 106 locations whereas equivalent CP calls have to be routed via just 20 or 31 locations.

BT has since responded to NGNuk, and agreed to consult on its response through Consult21, in parallel with further discussions within NGNuk.

4 Summary of BT Response

BT has carried out feasibility work on the implications of redesigning the 21CN topology to provide all the proposed 31 locations with full physical functionality for NGN CC (PE) and WBC Interconnect and resilience. BT's conclusions are that :

- It is not feasible to provide Edinburgh, London South West and Nottingham with the degree of resilience and functionality as planned for Clyde Valley, Guildford and Derby due to lack of space, cable chambers and duct. However, it may be possible to interconnect edge functionality at Edinburgh, London South West and Nottingham, whilst retaining full network resilience at Clyde Valley, Guildford and Derby, where interconnect would no longer be available.
- It would be possible to site interconnect edge functionality at the 11 additional locations, but it would result in additional capital and operational expenditure to bring product availability up to the standards of the other 20 locations, which would be reflected in the charges made by BT to Communication Providers . In particular, Inverness and Cambridge are many times more expensive than the other locations in view of the likely call profiles. This consultation document seeks the views of Communication Providers on which additional locations they wish to proceed with, if any.
- There has already been consultation on the 20 WBC Handover nodes, and no requests to increase the number had been received prior to the NGNuk request. BT is also aware that many Communication Providers do not favour any increase. Bearing in mind Communication Providers need either to connect to all the WBC Handover nodes, or take a Managed Broadband Product for those nodes they chose not to connect to, it is not proposed to change the number of WBC Handover Nodes, although three of the locations would change if Clyde Valley, Guildford and Derby are changed to Edinburgh, London South West and Nottingham as interconnect locations.
- BT proposes to route all its NGN CC(PE) calls via the agreed interconnect locations thus addressing the equivalence issue

5 Analysis of Sites requested by NGNuk

5.1 BT Design

For NGN CC (PE), the PoSI functionality is at a Border Gateway (BGW) for the media, and a Signalling Firewall (SFW) for signalling. In the May 2006 Plan of Record, BT has stated that there will be PoSIs at all 106 locations. However, these would be split between 20 physical PoSIs and 86 logical PoSIs, because it is not economic to deploy BGWs and SFWs at all 106 locations. This reflects the economics of NGNs which leads to the concentration of intelligence and functionality at a smaller number of larger sites. This applies to all players in

the industry, hence the consideration of concentrating interconnect on a smaller number of locations. For the feasibility work, we have assumed that the 3 substitutes for the existing locations and the 11 additional locations would need to be upgraded to achieve the required product availability, and have BGWs and SFWs physically sited at those locations.

5.2 3 Substitute Locations

NGNuk asked BT to consider substituting 3 of the locations, namely :

- Edinburgh for Clyde Valley
- Nottingham for Derby
- London South West for Guildford

Taking each site in turn:-

Edinburgh

- There is no accommodation available for upgrade to full resilience functionality
- The 20CN equipment is programmed for recovery in 2011 but still will not release adequate space

Nottingham

- There is no possibility of upgrading to the required standard

London South West

- Some space will become available when the DLEs currently located on the site are recovered in 2009 but not enough for full upgrade.

BT has concluded that it is not feasible to substitute Edinburgh, London South West and Nottingham for Clyde Valley, Guildford and Derby due to lack of space¹, cable chambers and duct. However, we have explored alternative ways of meeting Communication Providers requirements. For instance, it may be possible to make Edinburgh, London South West and Nottingham interconnect locations by siting some edge equipment e.g. Border Gateways, Signalling Firewalls, Ethernet Edge Aggregation (EEA) and Broadband Edge Aggregation (BEA) at the sites whilst retaining Clyde Valley, Guildford and Derby with full network resilience and functionality within the BT Network, but not available for interconnect.

Question 1 – As it is not possible to substitute the 3 locations requested what alternative will best meet your requirements?

- a. Interconnect at the original locations : Guildford, Clyde Valley and Derby

¹ The availability of collocation space for CPs will be the subject of a separate consultation

- b. Make Edinburgh, Nottingham and London South West Interconnect locations for NGN CC(PE) and WBC by siting some edge equipment at those locations
- c. Alternative proposal – please specify

5.3 11 Additional Locations

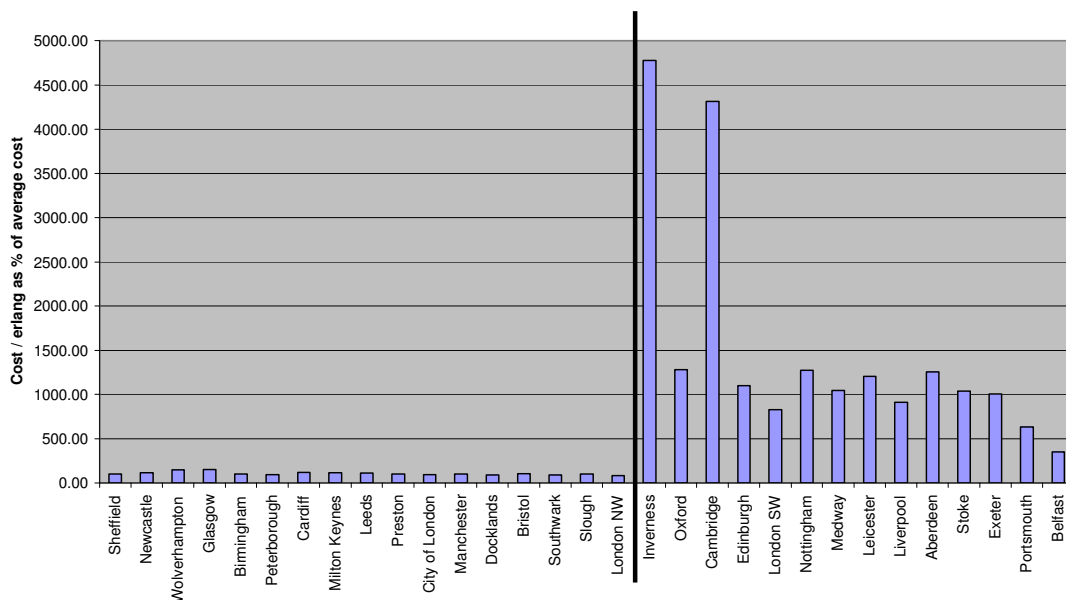
NGNuk asked BT to consider the following additional sites for Interconnect locations : Aberdeen, Belfast, Inverness, Liverpool, Medway, Portsmouth, Stoke, Exeter, Cambridge, Leicester , Oxford. BT has evaluated these sites against the following criteria :

- Border Gateways and Signalling Firewalls provided at each location, as the current design assumes ‘tromboning’ via one or more of the other 20 locations
- Extra equipment to improve the product availability - but not physical security or transmission diversity
- Availability of accommodation, power and ventilation at the proposed locations

All 11 locations are possible. In the case of Oxford, the accommodation will not be available until 2010.

Additional capital and operational costs will be incurred in installing additional equipment to increase product availability at the additional locations. These costs would be reflected in the charges to Communication Providers. BT has modelled the call profiles for each location based on the existing catchment areas. Note, the chart below shows existing catchment areas for Edinburgh, Nottingham and London South West.

31 POSIs - Cost Per Erlang as % of average cost



It is clear from this analysis that it is most cost efficient to interconnect at the 20 locations in relation to BT’s Network. However, BT accepts that this may not be the case in relation to other Communication Providers networks and geographic requirements. That said, it is clear that Inverness and Cambridge are massively less efficient in view of the call volumes.

Question 2 – In view of the additional costs and relative cost efficiency of the various locations, which of the 11 additional locations do you require?

5.4 Additional WBC Handover Nodes

For Broadband, the Point of Service Interconnect is at the Wholesale Broadband Connect (WBC) Handover node. For 100 percent national coverage and resilience Communication Providers need to interconnect at all Handover nodes either directly with WBC & MSIL or with a third party Broadband product for those nodes they chose not to connect to. BT has already proposed and consulted on 20 Handover nodes, and no requests to increase the number have been received prior to the NGNuk request. BT is aware that many Communication Providers do not favour any increase in the number of locations and are already planning their networks in relation to the 20 Handover nodes. Bearing in mind the increase to 31 WBC Interconnect Nodes will result in an increase in initial set up costs of ~50% for Communication Providers that do not want to take the third party product, it is not proposed to change the number of WBC Handover nodes although three of the locations would change if Clyde Valley, Guildford and Derby are changed to Edinburgh, London South West and Nottingham as interconnect locations .

Question 3 - Do you agree that 20 is the most appropriate number of Handover nodes for Wholesale Broadband Connect? If not, please state your requirements and reasons.

5.5 Equivalent Routing

NGNuk asked about the lack of equivalence that could arise if BT routed NGN CC(PE) calls at all 106 locations whereas equivalent CP calls would have to be routed via one of the 20 or 31 locations. BT proposes to route all its NGN CC(PE) calls via the agreed interconnect locations thus resolving the equivalence issue.

6 Summary of Questions

Question 1 – As it is not possible to substitute the 3 locations requested what alternative will best meet your requirements?

- a. Interconnect at the original locations : Guildford, Clyde Valley and Derby
- b. Make Edinburgh, Nottingham and London South West Interconnect locations for NGN CC(PE) and WBC by siting some edge equipment at those locations?
- c. Alternative proposal – please specify

Question 2 – In view of the additional costs and relative cost efficiency of the various locations, which of the 11 additional locations do you require?

Question 3 - Do you agree that 20 is the most appropriate number of Handover nodes for Wholesale Broadband Connect? If not, please state your requirements and reasons

END

Annex 1 - Glossary

21CN	Twenty First Century Network
BEA	Broadband Edge Aggregation
BGW	Border Gateway
CPs	Communications Providers
EEA	Ethernet Edge Aggregation
MSIL	Multi Service Interconnect Link
NGN	Next Generation Network
NGN CC (PE)	NGN Call Conveyance (PSTN Emulation)
POH	Point of Handover
POSI	Point Of Service Interconnect
PSTN	Public Switched Telephone Network
SFW	Signalling Fire Wall
WDM	Wave Division Multiplexing
WBC	Wholesale Broadband Connect