ConneXon's response to Ofcom Consultation Document

"Changes to General Conditions and Universal Service Conditions"

Detailed Response to Question 4:

"Do you agree with our proposals for emergency call numbers - which includes amending the definition of CP and requiring that location information is provided free of charge, as soon as the call reaches the emergency organisations and is accurateand reliable (in line with our proposed high level criteria)?"

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Executive Summary

The current obligations for 999 call handling by private telephone networks are set out in design guidelines invoked by General Condition 2 of the General Conditions of Entitlement. These design guidelines require local PSTN break-out at each site on a private telephone network with the aim of ensuring that accurate caller location information is presented with a 999 call.

The problem is that these design guidelines are routinely ignored for IP-PBX networks. This is putting end-users of IP-PBXs at increased risk when compared with their predecessors that used legacy analogue and TDM PBXs and also end-users that have a direct connection to PSTN lines.

It was our understanding that the proposed amendment to General Condition 4 addressed this issue by including electronic communications services provided over private telephone networks in the revised definition of Communications Provider.

This would have ensured that the providers of private telephone networks deploy readily available and cost-effective management information systems for delivering 999 calls to the appropriate Call Handling Agent with accurate and reliable location information.

Ofcom's statement of intent on 18th March 2011 that the amended General Condition 4 should **not** apply to private telephone networks will result in continued non-compliance with the General Condition 2 guidelines and increased risk to end-users of IP-PBXs.

We believe that this is unacceptable and contrary to the stated aims of the 2009 EU Directive. It is also contrary to a reasonable interpretation of the text in Article 26 of the Framework Directive and the proposed amendment to General Condition 4.

We also believe that an amended General Condition 4, in accordance with our interpretation, would be proportionate in that it does not represent an increased financial burden when compared with the obligatory, but ignored, alternative of following the existing General Condition 2 design guidelines.

Introduction

ConneXon are based in Montreal, Canada and are involved in the provision of emergency caller location identification solutions and routing services for enterprise PBXs. Our solutions ensure compliance with legislation, particularly in the USA, for 911 call delivery and location identification.

ConneXon solutions add value to, and compete with, vendor specific solutions from major PBX vendors such as Cisco, Microsoft, Avaya and Mitel.

None of these vendor solutions are offered in the UK primarily because there is no specific legislative requirement for accurate location information for 999 calls from PBX extensions.

An additional problem in the UK is that, until the recent launch of ConneXon's E999 routing service, there has been no enhanced 999 routing service in the UK that will deliver 999 calls to the appropriate Call Handling Agents with location information from within PBX networks.

ConneXon's emergency calling solutions are now available in the UK and are available to enterprises that wish to minimise the Health & Safety risks and address the Corporate Responsibility issues associated with delivering unreliable and inaccurate location information for 999 calls from their PBXs.

We were initially pleased that the proposed amendments to General Condition 4 appeared to be similar to 911 legislation in the USA in that they placed an obligation on enterprises with private telephone systems to ensure that 999 calls are delivered to the appropriate emergency Call Handling Agent with accurate and reliable location information.

We were disappointed with the subsequent clarification from Ofcom that it is not their intention that General Condition 4 should apply to electronic communication services provided over private telephone networks.

Our submission is that this intent is not clear from either the text of General Condition 4 or related documents such as Article 26 of the Framework Directive or the 2003 Communications Act.

We also believe that there are sound reasons why General Condition 4 should apply to private telephone networks and that this would not represent an additional financial burden on enterprises when compared with the cost of implementing existing network design guidelines invoked by General Condition 2.

These design guidelines have been in place for over 10 years and have the aim of ensuring that 999 calls from private telephone networks are delivered with accurate and reliable location information. However, the guidelines are routinely ignored by enterprises that have deployed multi-site private telephone networks based on IP-PBX technology.

It is ConneXon's view that if General Condition 4 is not amended so that it covers electronic communication services provided over private telephone networks then the increasing deployment of IP-PBXs will, in turn, result in increasing non-compliance with General Condition 2.

The consequence of this is that PBX end-users will have less protection than their predecessors who used private telephone networks comprising analogue and TDM PBXs. They will also have less protection than end-users that make 999 calls from telephones that are directly connected to PSTN lines.

Our view is that this is unacceptable.

ConneXon also note that Ofcom are carrying out a separate investigation into access to emergency call numbers and the provision of caller location information from VoIP providers.

In our view this is not relevant to the issues raised in this response because the problems faced by public VoIP providers in establishing caller location information are significantly greater than in a private IP-PBX VoIP network.

The difference is that in a private VoIP network calls are made across a single managed network where the location of all the endpoints is known and subject to access controls. It is therefore possible to establish a caller's location using management information systems that are integrated with the IP-PBX.

Detailed Response

ConneXon's detailed response is set out below in the following six sections:

1. Current Situation & Compliance with General Condition 4
2. Impact of IP-PBXs
3. 999 Solutions For IP-PBXs
4. Regulatory Change Required to Address Issue of 999 Calling from IP-PBXs
5. 2009 EU Directive and Amendments to Article 26
6. Proposed Amendments to General Condition 4

1 Current Situation & Compliance with General Condition 4

General Condition 4 of the General Conditions of Entitlement sets out the obligations of Communications Providers for handling emergency 999 calls.

Currently, the 999 calling obligations in General Condition 4 apply only to Public Electronic Communications Services and Public Telephone Networks. This is made clear by the definitions of Communications Provider in paragraph 4.3 of General Condition 4.

This implies that there are no obligations in General Condition 4 that require Communications Providers who provide electronic communications services over private telephone networks to provide access to 999 services or to provide caller location information for 999 calls.

However, there is a requirement in General Condition 2 for all Communications Providers (including those that provide services over private telephone networks) to comply with, and take account of, technical standards issued by various UK and European standards organisations. This includes both compulsory and voluntary standards.

There are two documents issued by relevant standards organisations that address the design of private telephone networks and which contain recommendations on the handling of 999 calls. These documents are:

1.1 Voluntary Code of Practice for Design of Private Telecommunication Networks

http://www.niccstandards.org.uk/files/current/nd1406_1997_10.pdf?type=pdf

This Code of Practice was produced by the NICC and issued by Ofcom. It was written in 1997, but is still in force and applies to all private telecommunication networks that have ISDN and/or analogue break-out to the PSTN irrespective of the PBX technology used within the network.

The Code of Practice contains the following statements about the handling of 999 calls in terms of ensuring accurate caller location information:

"Where a terminal that has its own individual PSN number, as with DDI, is capable of originating calls to Public Emergency Services such calls should be routed via a PSN, NTP on the same site so that calls to the emergency services will forward the appropriate CLI information."

"In their handling of emergency calls, PTOs endeavour to correlate the origin of a call with the authority responsible for dealing with that type of emergency in the location concerned. Those planning the PTN are advised to bear this in mind in the routing of such calls to ensure reasonable correspondence between the location of the PTN terminating station from which the call originates with the location of the PSN interface at which the call is connected to the PSN."

The implication of the above paragraphs is that the Code of Practice requires that private telephone networks should be designed to have a local PSTN break-out point at every site on the network in order to ensure that the public telephone network provider can deliver the correct location information with 999 calls.

The NICC Code of Practice also states that 999 calls from a private telephone network should be routed directly to the 999 Call Handling Agent via the PSTN and should not be barred or intercepted at a reception desk or other safety answering point (except for certain classes of enterprise).

It also makes the point that suppliers of equipment for use in private telephone networks (ie PBX vendors) have some responsibility for ensuring compliance with the Code of Practice. The responsibility is expressed as follows:

"Those who supply apparatus and other functions for integration into PTN should provide sufficient information about their products to enable the performance and operation of PTN to be designed or developed to conform with this Code of Practice."

This implies that PBX vendors should be pro-active in advising their customers on how their products can be deployed to ensure compliance with the 999 call handling requirements of the Code of Practice.

1.2 Basis of requirements for communication of individuals with authorities/organizations in case of distress (ie Emergency Call Handling)

http://pda.etsi.org/exchangefolder/tr_102180v010201p.pdf

This is an ETSI document containing recommendations for emergency call handling which has the following recommendation regarding location information:

"Location information within a private network should be made available when possible and comply with the requirements of the corresponding emergency authorities in the country/area, in which the site or premises of the company are installed. For large private networks (covering several countries or even continents), attention must be paid to the fact that this requirement may be of importance when designing the architecture of the private network."

As with the NICC document this document requires that private networks should be designed so that the location information that is delivered with 999 calls is correct.

Therefore, the current situation is that there are obligations on private telephone networks to deliver accurate location information for 999 calls. These are in the form of guidelines that require the design of private telephone networks to take account of the fact that public telephone network providers can only provide location information for the PSTN break-out point.

However, these obligations are routinely ignored in private telephone networks that are based on an IP-PBX solution.

In other words, in an IP-PBX based private telephone network it would not be unusual for a 999 call to break-out of the network at a different site from that of the caller. The call would therefore be delivered to the 999 Call Handling Agent with incorrect location information.

This is a serious issue because of the widespread and increasing deployment of IP-PBXs.

2 Impact of IP-PBXs

In this section we examine why the managers of IP-PBX based private telephone networks do not typically follow the network design guidelines that were used by their predecessors who managed legacy analogue and TDM PBX networks.

In our view the main reasons are associated with cost and complexity. However there are other reasons that are included in discussion below:

2.1 Cost and Complexity

With analogue and TDM PBXS it is relatively easy and inexpensive to implement a private telephone network that complies with the 999 call handling requirements of General Condition 2 as set out in the NICC and ETSI documents referred to in the previous section.

Such networks usually have a distributed design in which each site on the network would typically have its own PBX. These can easily be programmed to intercept local 999 calls and route these over locally connected PSTN trunks. This is not so easy to achieve with private telephone networks based on IP-PBX technology.

A private telephone network based on IP-PBX technology would have a centralised design comprising a PBX server in a data centre. This would be connected to its extensions via internet connections and IP routers at each site.

IP routers are designed to handle telephone and data traffic in a single data stream. This makes it difficult, but not impossible, to intercept 999 calls at the router and route these via PSTN lines connected to the router.

The problem is that the additional hardware and software costs to achieve 999 call interception and local PSTN break-out at an IP router would add approximately £500 to the cost of the router. There are also increased maintenance and support costs associated with the additional hardware and software.

[Source: Cisco advised it would cost approximately £500 to add "SRST" local PSTN break-out capability to an IP router.]

In addition to the IP router costs, there are the costs associated with the connection and rental of the local PSTN lines together with the additional resources required to manage the increased complexity of the network.

One of the benefits of migrating to IP-PBX private telephone networks is that it is relatively inexpensive to connect every site to the network, including home offices and locations used by nomadic employees. This brings operational efficiencies, particularly when the IP-PBX is deployed in a Unified Communications platform.

However, the high cost of providing PSTN break-out for 999 calls at each site would prejudice the financial case for deploying an IP-PBX solution.

2.2 Lack of information from IP-PBX vendors

As stated above, the NICC Code of Practice requires that IP-PBX vendors should make the managers of private telephone networks aware of how their products can be deployed to ensure compliance with the Code of Practice. This would include the requirement for 999 call handling to ensure correct location identification of the caller.

It is possible that IP-PBX vendors are unaware of this responsibility in their discussions with potential customers and in their tender responses.

2.3 Change in management culture

Another possible reason why traditional telecommunications network design principles are being ignored is that an IP-PBX server is now just another server in an enterprise's data centre, sharing the same IT network infrastructure as other servers.

The IT managers looking after these resources are less likely to be aware of the importance of local PSTN break-out point for 999 calling when compared with their predecessors who managed dedicated private telephone networks based on legacy PBXs.

The reality is that, for whatever reason, multi-site IP-PBX networks are being deployed in increasing numbers and enterprises are routinely ignoring their General Condition 2 obligations to provide a PSTN break-out point for 999 calls at each site on the private telephone network.

3 999 Solutions For IP-PBXs

The most cost-effective method for providing a 999 call handling solution for IP-PBX based private telephone networks that delivers accurate location information is not to be found in network design. Instead, it is to be found in the use of management information systems such as those available from the major IP-PBX vendors and third party solution providers such as ConneXon.

Major IP-PBX vendors such as Cisco, Avaya, Microsoft and Mitel have proprietary management information systems that will identify the precise location of an emergency caller on the network. This information can then be passed to an emergency routing service that delivers the emergency call and the attached location information to the appropriate Call Handling Agent.

These systems are in widespread use in the USA where there are strict obligations on private telephone network operators to provide precise and accurate location information for 911 calls.

They are not used in the UK primarily because there is no regulatory obligation on enterprises to use them.

A further complication in the UK is that until the recent launch of ConneXon's E999 Emergency Routing Service there was no easy way of delivering a 999 call to one of the 999 Call Handling Agents (ie BT or C&W) with location information that has been derived from a PBX information system.

The problem is that the public telephone network's standard 999 routing services are limited in that they can only deliver location information associated with the PSTN break-out point.

Nevertheless, it is certainly possible for a private telephone network to use a standard SIP trunk service to deliver 999 calls with location information that is presented by a PBX management information system.

This is in fact the basis of the ConneXon's E999 Emergency Routing Service.

It is therefore technically feasible (and has been for some time) for an enterprise with an IP-PBX based private telephone network to use existing systems and services to deliver accurate caller location information to the 999 Call Handling Agents in the UK.

One final point is that an enhanced 999 solution based on IP-PBX management information systems should not be seen as an unnecessary financial burden. Such systems are typically more cost-effective than the obligatory, but ignored, alternative of local PSTN break-out for IP-PBX based private telephone networks.

4 Regulatory Changes Required to Address Issue of 999 Calling from IP-PBXs

In our view it is not within the scope of General Condition 2 to specify that enterprises that provide PBX services over a private telephone network should use a management information system to identify the location of a 999 caller.

Our view is that it would be more appropriate to address this issue in General Condition 4 by extending the definition of Communications Provider so that it includes electronic communication services provided over private telephone networks.

Otherwise, IP-PBX extension users that make 999 calls will continue to have less protection than their predecessors. They will also have less protection than if they make a 999 call from their home.

This is clearly unsatisfactory and has Health & Safety and Corporate Responsibility implications.

5 2009 EU Directive and Amendments to Article 26

Ofcom's General Conditions of Entitlement are derived from an EU Framework Directive on universal service and users' rights relating to electronic communications networks and services. General Condition 4, in particular, must reflect the requirements and obligations that are set out in Article 26 of the Framework Directive.

Towards the end of 2009 an EU Directive was issued amending the overall Framework Directive. In our view this addressed the 999 calling issues described above, both in its overall aims and in the specific requirements of Article 26.

For example, in the recitals to the Directive it was stated that:

"The obligation to provide caller location information should be strengthened so as to increase the protection of citizens."

As explained above, under the current Article 26 (and therefore General Condition 4) IP-PBX extension users have less protection than their predecessors and less protection than 999 callers from phones directly connected to PSTN lines. They are therefore citizens who are clearly in need of increased protection, particularly as there are cost-effective solutions readily available.

One of the key changes in Article 26 appears to address this issue by amending the definition of Communications Provider (ie *"undertakings"*) to which Article 26 applies to read as follows:

"… undertakings providing end-users with an electronic communications service for originating national calls to a number or numbers in a national telephone numbering plan …"

The previous definition referred only to "publicly available telephone services".

The new definition includes Communications Providers that provide any type of electronic communications service subject to the qualification that the service provided enables end-users to originate calls to national telephone numbers.

The ConneXon interpretation of this is that Article 26 would now apply to private telephone networks. Our reasoning was as follows:

5.1 Definition of "electronic communications service"

Our understanding is that an electronic communications service provided over a private telephone network is covered by the definition of *"electronic communications service"* in the Framework Directive.

This is confirmed by Ofcom guidelines at:

http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/general-conditions/general-conditions-guidelines/

5.2 Definition of "end-user"

The term *"end-user"* qualifies the definition of *"electronic communications service"* and is defined in the Framework Directive as:

"a user not providing public communications networks or publicly available electronic communications services"

This states what an *"end-user"* is **not** and logically implies that a PBX extension user in a private telephone network can be considered an end-user for the purposes of Article 26.

5.3 Originating calls to national telephone numbers

The other qualification is that the *"electronic communications service"* can be used to originate calls to national telephone numbers. This would not exclude private telephone network services from the Article 26 definition since one of the key functions of a private telephone network is that it enables end-users to originate calls to national telephone numbers.

The only possible issue might be the fact the end-users of a private telephone network would typically have to dial 9 before the national telephone number digits, but the same issue would apply to public electronic communication services such as Centrex (eg BT Featureline).

If Centrex services are not excluded from the Article 26 definition then private telephone network services should not be excluded.

5.4 The word "public" does not precede the term "electronic communications services"

If it was intended that Article 26 should continue to apply only to public electronic communication services then it is reasonable to assume that the word "public" would have been used in the definition of Communications Provider.

It has not been used and in fact has been conspicuously removed from the Article 26 definition.

Our conclusion is therefore that the amended Article 26 would apply to private telephone networks and that General Condition 4 would have to be modified accordingly.

6 Proposed Amendments to General Condition 4

As required by the 2009 EU Directive the amendments to the General Conditions of Entitlement have to be implemented by 25th May 2011. In preparation for this Ofcom issued their proposed amendments to comply with the requirements of the Directive on 24th February 2011 in the form of a consultation document.

This included the anticipated changes to General Condition 4.

In the proposed amendments the revised definition of Communications Provider to which General Condition 4 applies is stated as:

"… a person who provides End-Users with an Electronic Communications Service, [or payphone service] , for originating calls to a number or numbers in the National Telephone Numbering Plan…"

This is exactly the same as the wording in Article 26 of the EU Framework Directive.

Our conclusion was therefore that electronic communication services provided over private telephone networks would come under the remit of General Condition 4 for the same reasons given above for Article 26.

However, Ofcom published a clarification on 18th March 2011 stating that it was not their intention that General Condition 4 should apply to private telephone networks and that this should be apparent from the reading the definition of Communications Provider.

The Ofcom clarification is at link below:

http://stakeholders.ofcom.org.uk/consultations/gc-usc/general-condition-4/

We read the General Condition 4 definition again and also the corresponding definition in Article 26. We also studied other relevant documents such as the Ofcom Consultation notes, the EU Framework Directive, other General Conditions and the 2003 Communications Act. However, we are unable to rationalise the Ofcom "clarification".

We have already explained our interpretation of the EU Directive's Article 26 definition. The paragraphs below examine more closely the Ofcom proposals, the Ofcom Consultation notes and the 2003 Communications Act in terms of the proposed definition of Communications Provider in General Condition 4:

6.1 Definition of a provider of Electronic Communications Services

Ofcom's guidelines to the General Conditions of Entitlement state clearly that a provider of electronic communications services includes:

"… providers of all types of electronic communications networks and services, including both public and private networks, mobile and fixed (unless otherwise stated) voice telephony, data and internet. It includes resellers as well as own-network providers."

An enterprise with its own private telephone network is therefore considered to be a Communications Provider for the purposes of the General Conditions of Entitlement.

The guidelines state that this definition of Communications Provider can be restricted in each individual General Condition. The only qualifications in the General Condition 4 definition are the terms *"End-User"* and the service described as *"originating calls to a number or numbers in the National Telephone Numbering Plan".*

6.2 Definition of "End-User"

We have already discussed the definition of *"End-User*" in terms of the definition in Article 26 of the Framework Directive, but there are some important additional points to make regarding the definition of "End-User" in the General Conditions of Entitlement and in particular the Ofcom Consultation notes.

Confusingly, there appears to be two definitions of "*End-User*" in the Consultation notes.

In one part of the Consultation notes Ofcom state that the definition of "*End-User*" is to be deleted from the General Conditions of Entitlement and that it should have the same meaning as that defined in the 2003 Communications Act which states that:

" 'end-user', in relation to a public electronic communications service, means:

(a) a person who, otherwise than as a communications provider, is a customer of the provider of that service;

(b) a person who makes use of the service otherwise than as a communications provider; or

(c) a person who may be authorised, by a person falling within paragraph (a), so to make use of the service;"

The term *"End-User"* in General Condition 4 is **not** used in relation to a public electronic communication service. It is therefore not clear to us that the 2003 Act definition would apply.

The other definition of *"End-User"* in the Ofcom Consultation notes is that used in the Framework Directive. *"End-user"* is defined in the Framework Directive as:

"a user not providing public communications networks or publicly available electronic communications services"

As discussed before in relation to the amended Article 26, this states what an *"End-User"* is **not** and logically implies that a PBX extension user in a private telephone network can be considered an "*End-User"* for the purposes of General Condition 4.

Another point to make is that the term *"End-User"* is also used in General Condition 2 in terms of ensuring compliance with transmission standards for End-to-End connectivity. The Ofcom Guidelines to the General Conditions of Entitlement state specifically that own network PBXs are covered by the obligations in General Condition 2.

The logical conclusion of this is that if the term *"End-User"* includes end-users of PBXs in General Condition 2, then it must also include PBX end-users in General Condition 4 since there is nothing that states otherwise.

6.3 Originating calls to national telephone numbers

We have already discussed this qualification in terms of the definition in Article 26 of the Framework Directive and the same conclusions apply.

To reiterate, our conclusion is that this qualification should not exclude private telephone network services from the definition of Communications Provider in General Condition 4 since one of the key functions of a private telephone network is that it enables end-users to originate calls to national telephone numbers.

The only possible issue might be the fact the end-users of a private telephone network would typically have to dial 9 before the national telephone number digits, but the same would apply to public electronic communication services such as Centrex (eg BT Featureline).

If Centrex services are not excluded from General Condition 4 then private telephone network services should not be excluded.

In summary, despite the Ofcom "clarification", we can see nothing in the proposed text of General Condition 4, or in related documents, that would change our view that the amended General Condition 4 should apply to electronic communications services provided over private telephone networks.