smartnumbers and Dual Parenting

Protecting against Local Exchange failure within the PSTN

Version 1.0

smartnumbers®

1 Introduction

Organisations are looking to enhance their preparedness against disruptive events by eliminating single points of failure within their voice and data networks. While they can control the resilience within their own networks, organisations are still dependent upon external networks, such as the PSTN, for the delivery of incoming calls. A failure to deliver incoming calls can impact the revenue and reputation of the business, and organisations are therefore keen to protect themselves against this.

One such potential exposure lies in the Local Exchange. Traditionally, a customers' DDI range is associated to a series of ISDN channels within a serving local exchange. For resilience purposes, a failure within the local exchange creates a single point of failure for incoming calls and customers are keen to understand how to protect against this rare occurrence. There are two ways for customers to protect against failure of the local exchange;

1.1 Dual Parenting

With dual-parenting, the customers DDI range is mirrored across two serving local exchange processors. Should either of these exchange processor's fail, and there is sufficient network capacity available connecting from the other exchange processor, then the delivery of incoming calls will be unaffected.

Depending upon the configuration of the exchanges, and whether they are System-X or System-Y exchanges, then dual-parenting will guarantee to deliver all calls through either exchange or 50% of the calls through either exchange processor, It is recommended companies speak with their local carrier to determine the configuration of dual-parenting for each customer site

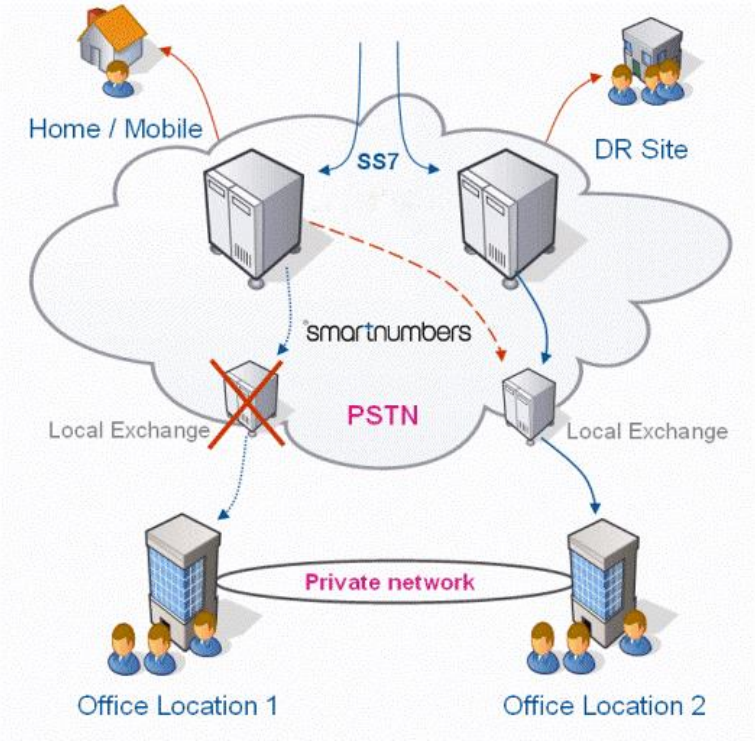
There are three issues to consider with respect to Dual Parenting.

- **Restricted to 1,000 DDI Blocks** - Dual Parenting is only available to companies with a contiguous 1,000 number range. For companies with number ranges of less than 1,000 numbers then Dual Parenting is not available.
- **Cost** - The second issue is that companies need to consider the purchase of twice the ISDN circuit capacity, since if one exchange fails then all calls need to be carried on circuits from the secondary exchange. This represents a doubling up of the existing network capacity to accommodate failure of a single exchange.
- **Limited Resilience** - The third issue is that while dual parenting protects against exchange failure, it does not protect against a denial of access event. Furthermore, other business continuity services such as Exchange Line Site Assurance, which can route calls to other sites, are themselves dependent upon the Local Exchange being operational. Failure in the local exchange will therefore affect the operations of these other business continuity services.

1.2 smartnumbers Proactive Recovery

smartnumbers Voice Continuity is a network-based service that provides unparalleled levels of resilience both to delivery of calls onto the corporate voice network as well as delivery of calls to staff who may need to work in other locations.

With smartnumbers Voice Continuity, a customer's DDI range is elevated from the local exchange and instead resides on a resilient 'Intelligent Inbound Network' within the PSTN. When a call is made to these DDI's, the service will first try to deliver this call normally, but if it detects a problem (either because the local exchange, ISDN or customers PBX is down) then it will automatically deliver the call to other locations. This may be to other offices, or to mobile, home or international destinations.



In addition, the service also provides resilience against denial of access by enabling up to 5 call-routing plans to be created and invoked as required. Once invoked, smartnumbers Voice Continuity will deliver calls destined for the original dialled number either to an alternate number or to a service such as an announcement, voicemail or fax-to-email service.

Should individual users not be able to reach their designated alternate location, they can log into the service through the web or any handset and define their current location for themselves. Calls destined for these users will be delivered to wherever the user defines. There is therefore great merit in customers using smartnumbers Voice Continuity for resilience since they will protect against both failure of the physical network as well as people / process failures should staff be denied access to the main offices and have to work elsewhere.

2 Benefits over Dual-Parenting

smartnumbers Proactive Recovery will in many cases replace the need for dual-parenting, since as dual-parenting provides local resilience by replicating a DDI range across two local exchanges, Proactive Recovery replicates these DDI's across multiple exchanges across the UK. The benefits of this are as follows;

- Resilience. In BCP terms, dual-parenting is able only to provide local resilience since the two serving exchanges on which the customers DDI range is hosted will be in close proximity to the customers building being served. For incidents that can impact a large area, dual-parenting may itself be rendered inoperable. Proactive Recovery however is able to provide metro-wide resilience since the customers DDI range is hosted on multiple sites across the UK, each of which are at least 25 miles apart and which will automatically route calls onto the customer's voice network anywhere in the UK or internationally should a problem be detected.
- Enhanced Detection. While both services are automatic and will detect problems in the local exchange or ISDN circuits, Proactive Recovery can also detect problems with the PBX onsite and if unable to complete the call will also route the call to another gateway on the customer's voice network.
- Denial of Access. In addition to the automatic detection of network problems, smartnumbers Proactive Recovery also protects against events such as denial-of-access. In cases where the customers voice network may be working without a problem, but staff are not able to get into the office, smartnumbers Proactive Recovery enables the invocation of alternate routing plans which take effect immediately.
- Guaranteed Call Delivery. Depending on the configuration of the serving exchanges, and whether these are System-X or System-Y exchanges, dual-parenting may deliver all or may only deliver 50% of the incoming calls. smartnumbers Proactive Recovery ensures that should any element of the network experience a problem, irrespective of type of exchange, ISDN circuit or PBX, then it will deliver 100% of all calls to the alternate voice gateway.
- Reduced circuit costs. Dual-parenting requires the customer to purchase twice the required ISDN capacity since if one each fails then traffic needs to be carried from the second exchange. smartnumbers Proactive Recovery can make use of existing circuit capacity linked to the second voice gateway if required.

While there are clear benefits of Proactive Recovery over dual-parenting, it doesn't need to be an either/or decision. For customer sites that are served with a 1,000 number DDI range, then Proactive Recovery will not enable these DDI's to be lifted into the Proactive Recovery service without a single point of failure. However, for sites with a 10,000 DDI range then Proactive Recovery will provide the benefits above.

3 Migrating to Proactive Recovery

Customers have three options to consider when adopting Proactive Recovery for resilience purposes;

3.1 'Porting' their existing number range

There is a long-established network management process, known as 'porting' by which an organisations telephone numbers may be migrated across the PSTN. This has traditionally been used by organisations wishing to keep their existing numbers as they move between operators, but is also the same process used by customers who wish to move their numbers to Proactive Recovery.

The problem with porting in respect of resilience is that calls to numbers which have been ported first hit the originating local exchange before being redirected over to the Proactive Recovery services for onward routing. While this may be acceptable for flexible working applications, in business continuity terms this represents a single point of failure, since if the originating exchange fails then calls to these numbers will not reach the Proactive Recovery service. As such, porting numbers to Proactive Recovery is not appropriate for resilience since it adds a single point of failure to incoming calls.

3.2 'Block Transferring' their existing range

For customers with an entire 10k block of DDI's an alternate method of moving DDI's over to Proactive Recovery is through a 'block transfer'. During this process, the entire DDI range is lifted cleanly out of the local exchange and placed on the Proactive Recovery service. Calls to these DDI numbers will be routed directly through the PSTN to the resilient Proactive Recovery service without touching the original exchange. As such, there is no single point of failure but this process is restricted to those customers with a complete 10,000 DDI range.

3.3 Issuing a New Range of DDI smartnumbers

For customers without a contiguous 10,000 DDI range, the only method to ensure true resilience will be to issue new DDI's, known as smartnumbers, which themselves natively reside on the Proactive Recovery service. Each smartnumber is associated with two automatic delivery points on the PSTN, and two exchanges, as well as to a call-routing table consisting of five plans which can be manually invoked in an emergency. For network resilience, Proactive Recovery will detect the viability of call-delivery and if it detects problems in the core network, such as through exchange failure, will automatically route calls to the secondary delivery point.

4 Complementing Dual Parenting

Should organisations not have a 10,000 DDI range but want to ensure they are protected against failure of the Local Exchange as well as the individual call-control provided by smartnumbers Proactive Recovery, another option is at hand.

In these cases, an organisation can choose to adopt smartnumbers Directed Recovery instead of Proactive Recovery. Directed Recovery works alongside Dual Parenting so that the organisation is protected against failure of the local exchange. Should a business continuity event occur that requires staff to route calls to alternative locations, then the organisation can instead invoke their Directed Recovery service.

Directed Recovery provides the full flexibility of call-routing as Proactive Recovery. However, unlike Proactive Recovery which is an instant and automatic service, Directed Recovery does require a manual invocation of the service, via an organisations' ELSA plan, and this may take 30 minutes to invoke.

Once invoked, Directed Recovery and Proactive Recovery provides the same flexibility in call routing and control, managed through a secure web portal.