

August 29th 2011



Committee Secretary  
Senate Standing Committees on Environment and Communications  
Parliament House  
Canberra

via email: [ec.sen@aph.gov.au](mailto:ec.sen@aph.gov.au)

Dear Committee Secretary,

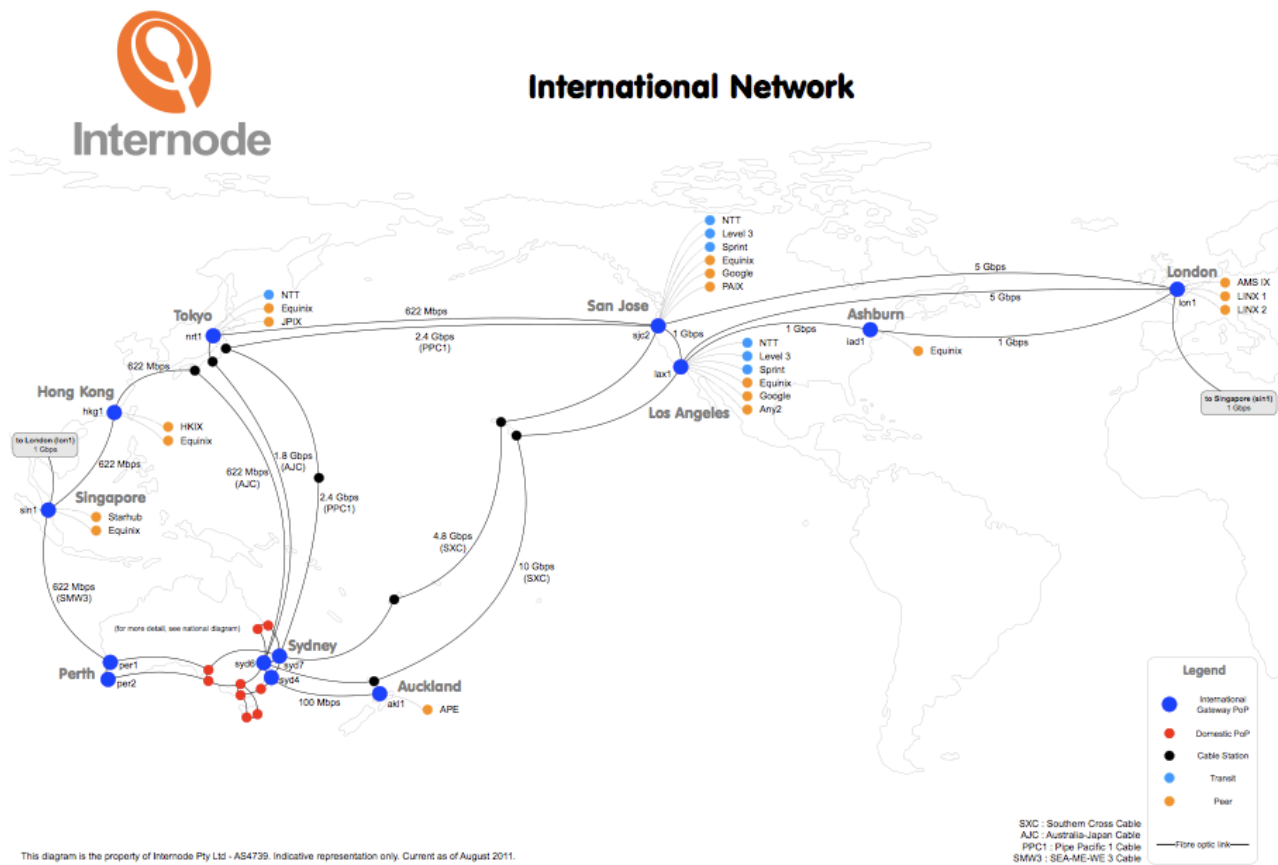
I would like to thank Senator Fisher for her questions of August 10 and provide the following answers:

1. *What is the likelihood of the service of an ISP shutting down in a natural disaster scenario?*

While I can only speak for Internode I can offer the following insight into how competent ISPs design and operate their networks.

If you look at the design of Internode's network you can see that it consists of rings and parallel paths:

[http://www.internode.on.net/about/our\\_network/international/](http://www.internode.on.net/about/our_network/international/)



This design means that a failure in one part of the network is unlikely to break the connection between two "nodes". This architecture is generally known as "protected".

In the event of a major disaster in any capital city, Internode's customers in the rest of the country would continue to receive service even if both PoPs in that city were disabled.

Because Internode's network connects customers via two Points of Presence (PoPs) in each major aggregation city, in adversity, when one PoP becomes unserviceable, Internode's customers are generally likely to continue to receive an Internet service.

Further, Internode provides around 40% of its customers with Voice Over IP telephony services and many of those are the customer's primary telephony service. The network that provides this service has the same level of redundancy to ensure availability.

Internode has designed its network with a ring around Asia to ensure that Adelaide, specifically, remains connected to the world even if there is a major disruption in Sydney. Very few service providers have this level of redundancy and it is seen as a significant selling point for major customers in Adelaide including the State Government. Naturally this level of redundancy is carried on throughout the network wherever feasible.

Perth is emerging as a significant second connection city for Australia. It is likely that a very high capacity submarine cable will connect Perth to Singapore in 2013 and this will provide a significant improvement in the underlying resilience of Australia's backbone.

Internode is very concerned that the Point of Interconnection (POI) architecture being imposed by the ACCC on NBNCo will remove the major benefit of Internode and other service providers having dual PoPs by moving the single point of failure for connecting tens of thousands of end users to the NBNCo POI. The 121 POI model sees around 80,000 to 150,000 end users connected via each POI with no physical redundancy for the actual POI site. The current PSTN connects around 10,000 to 20,000 end users from each exchange site with those sites connected in a mesh to multiple concentration sites. This means there are no single points of failure beyond the local exchange for PSTN services.

Ensuring NBNCo is permitted to provide alternative POI services at one of the 120 POIs would eliminate this risk.

2. *Are ISPs required to have at least two (2) servers operating to reduce the possibility of shutdown occurring, or is it at the discretion of the ISP as to how many servers they are linked to?*

No, there are no minimum technical or availability standards for ISPs or carriers. Further, ISPs require no license or permit of operate other than the requirement to be a member of the TIO and conform to lawful interception requirements of the relevant agencies.

Competent ISPs generally have two or more upstream connections to "the Internet" but most have one. Competent upstream providers always have multiple connections.

The largest ISPs generally have an architecture similar to Internode's but you would need to confirm this with each of them.

3. *If the PSTN service is not available as a result of power outage, will the fibre optic NBN connections remain "live"? If not, then presumably mobile phone contact is the alternative source of emergency communication?*

Based on the information provided to Internode by NBNCo, between the head end of the Fibre Service Area (FSA) and the end user, fibre optic NBN connections are as reliable as the PSTN service they replace. The network between the FSAs and the POIs is also likely to be at least as reliable as the current PSTN. Further, the fibre infrastructure is much more water proof than large parts of the copper network so it should be inherently more reliable in floods than current PSTN services.

The lack of redundancy at the POI layer is of great concern and under the current model would be prohibitively expensive. A failure at a location quite distant from the end user could disrupt services over a very large area.

Ensuring NBNCo is permitted to provide alternative POI services at one of the 120 POIs would eliminate this risk.

Regarding power outages, there are two further areas of concern.

During power outages are the need for power for the end user's premise for the Optical Network Termination (ONT) equipment and whatever they connect to this. NBNCo will provide a battery backup mechanism for the ONT which will ensure an old fashioned telephone connected via a cable will continue to work for a reasonable period without mains power. This is not any worse than the current PSTN and many, if not most, end users have cordless telephones as their only device so their telephone service actually stops during a power outage.

The second concern is the availability of power to the NBN POI sites which will be located within Telstra exchange sites. These sites will have batteries and diesel generators so the major concern is that the site becomes inaccessible for an extended period. There is always a trade-off between public safety for sites located within residential areas and the quantity of fuel stored at the site.

In May 2010 the ACMA reported that mobile phones are the source of 63% of emergency calls:

[http://www.acma.gov.au/WEB/STANDARD...PC/pc=PC\\_312112](http://www.acma.gov.au/WEB/STANDARD...PC/pc=PC_312112)

Mobile phones are the primary means of making the clear majority of emergency calls so land lines should now be considered the backup service.

Internode is concerned that if mobile operators are using the NBN as their backbone, end user's primary and backup emergency service call service may become unavailable over large parts of non-metro Australia if the one and only NBNCo POI servicing that region becomes unserviceable for any reason.

4. *Do you consider that wireless infrastructure (towers, etc) is sufficiently protected to minimise the potential damage that could occur in an event such as a bushfire or flood?*

There are several types of damage that can occur during a disaster. Flooding can physically damage equipment that is submerged which makes the recovery after the disaster much more difficult even once power has been restored.

Physical access is often restricted either for the safety of workers or due to their being no land access to the site. During the Brisbane floods Telstra and Optus reported using helicopters to take generators to mobile base stations that had lost power:

<http://exchange.telstra.com.au/2011/01/17/flood-update-no-7-from-telstra/>

Because radio tower sites are such an obvious single point of failure carriers generally go to considerable lengths to ensure equipment is above likely flood levels and that there is a large enough fire-break around the site that it is likely to survive the passage of a bush fire.

As can be seen from the recovery after the Brisbane floods and from various bush fires, wireless infrastructure is generally quite well protected from damage and able to resume service after major disruption so we can conclude carriers have generally done a good job of protecting this infrastructure.

If Senator Fisher would like a further briefing on any of these issues, Internode's office is literally over the road from hers and I would be more than happy to pay a visit.

Yours sincerely,

John Lindsay  
GM Regulatory and Corporate Affairs  
Internode and Agile