

Telecommunication

The rapidly changing telecommunications sector –
challenges in maintaining and building resilience



National Lifelines Utilities Forum 15th October 2019

C H ● R U S
Rob Ruiters, National Lead for
Network Protection

1



noun: **lifeline**; plural noun: **lifelines**

a thing on which someone or something depends or which
provides a means of escape from a difficult situation

“the telephone has always been a lifeline for Gabby and me”

2

Traditional resilience

What Gabby had certainly has a ring of the past..

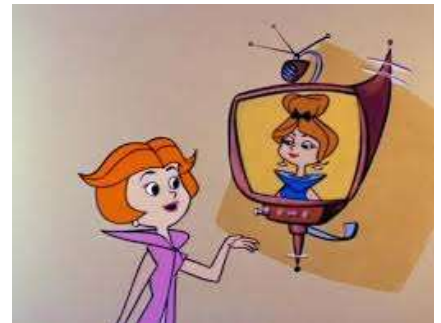
The party line, probably the most excellent lifeline ever !

- Mechanical hand generator (affirmative calling action)
- Battery at your phone (independent power)
- Ten other people on the same line (community)
- Manual exchange manned by a telephonist (knowledge, inquisitiveness & relay)
- Physically quick to repair (basic skill)



3

How are we communicating today ?



An evolution !

- Away from voice based telephony to Internet based textual and video blogging
- Diverse services, smart devices using multiple networks simultaneously
- Ubiquitous WiFi hot spots in concert with Cellular connectivity
- Counterpoise of Fibre delivered and Mobile connectivity with advent of 5G
- Internet of things – will result in critical autonomous networks

4

Societal reliance

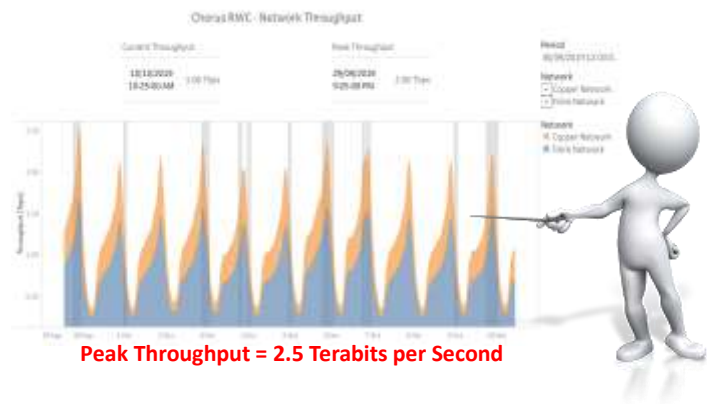


The telecommunication network service expectation - always ON

- Emergency communication of any kind
- Very diverse interpersonal communication, simultaneous and real time
- Streaming media and entertainment from multiple sources
- Internet access required for almost every inquiry and transaction
- Distributed networking integral to large and small enterprises
- Virtual environments, smart-meeting and telemedicine

5

The need for speed



Equivalent to **625,000** simultaneous
Netflix Video streams

6

What about resilience ?

Geographical location largely defines the network's resilience in peacetime and functionality during a major disruption

- Metropolitan centres, high level of network and provider meshing
- Provincial towns, at least two path geographical diversity
- Small towns and settlements, often only a single network feed



The MBIE driven “Telecommunications Resilience Review”

- First stages of the review have been completed and the findings analysed : further communication with the Telco sector is now underway to understand options and opportunities for further network and service resilience

7

Resilience enablers

Telcos take care to preserve continuity of service

- Careful selection and design of all routes
- Ongoing physical surveillance of critical routes
- Network diversity and redundancy (self healing)
- Inherent power robustness - batteries and generators
- Intrinsic robustness of ducted fibre reticulation

Technology advances to enhance fault responsiveness

- Real time OTDR (optical reflectometry) route monitoring
- Acoustic signature analysis to pre-empt disruptive events



8

Network evolution impacts on lifelines

Traditional network operating modes are changing

- Centralisation of services – loss of local hub functionality
- Move away from POTS – reliance on digitally derived voice
- Passive optical networks (UFB) – reliance on customer power



CDEM and Lifelines readiness for a crisis or disaster

- Use of alternative communication equipment (Satellite / Radio / WISPA)
- Integration of CDEM communication with existing networks (VHF / UHF)
- The provision of satellite derived COWs (Cellular on Wheels) by Mobile providers

9

Conclusion

- Massive technology and architecture changes in the Telecommunication “ecosystem”
- A multi-operator Telecommunication environment - common status view difficult
- Importance of the TEF in providing pan-sector collaboration during a crisis

Thank you !

*TEF – Telecommunications Emergency Forum



10