Essential Networks Group Ltd

Back to the Future..?

Forecast trends in Telecommunications & IT Infrastructure

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Purpose

To answer the following question:

"What trends should my IS organisation be aware of in telecommunications and infrastructure products and services, when planning for the future?"

Approach

- Take a 30-year “longitudinal” view commencing in 1990 and finishing in 2020 (we are 2/3s the way through this period);
- Examine the major areas <u>that influence</u> ICT infrastructure decisions individually, and from that;
- Synthesise an aggregate view which may prove useful to a group of CIOs…

The Caveat…

"Prediction is always difficult – especially about the future."

attributed to both Niels Bohr and Yogi Berra.

So…all the usual disclaimers apply.

Why 30 Years?

Enterprise decision-making revolves around planning cycles and product lifecycles:

- 1.5 x a 20 year carrier technology lifecycle;
- 6 x 5-year Asset Depreciation lifecycle;
- 6 x 5-year Strategic Planning cycle;
- 10 x 3-year carrier contracting cycle;
- 30 x Annual budgeting round!

Plus: It provides context and perspective…

10 Trend Areas

1. The PSTN
2. Data Networks
3. The Internet
4. Mobile
5. The PABX
6. Distributed Computing
7. Hardware
8. Site Works
9. Industry Structure
10. The "Left-field Game Changer"

The PSTN

90s:

- Centrex & Intelligent Network Services (0800, 0900, VPN etc.);
- A mix of analogue and digital trunks. Exchange-based voicemail;
- First generation Videoconferencing (VC) on ISDN.

00s:

- VoIP in corporate and public sector environments;
- ISDN PRA & BRA dominate as digital voice trunking technologies;
- Second generation VC on IP.

10s (trend predictions):

- The slow disappearance of ISDN – the rise of SIP Trunks;
- SIP Telephone Services. The rise of Dynamic Voice Codecs (c/o Microsoft);
- Third Generation VC integral to Unified Communications.

Data Networks

90s:

- DDS and frame relay service;
- TDM Mux evolves to IP and Ethernet. The rise of Cisco;
- Managed router services e.g. LanLink on top of DDS and FRS

00s:

- Managed IP Network services (OneOffice, PIP etc);
- QoS WANs;
- Heavy network integration: voice to data, fixed to mobile.

10s (trend predictions):

- Widespread fibre deployment and much higher symmetric speeds;
- The rise of “green networks”: more performance *and* less power;
- QoS reaches its zenith, but increasingly less important for voice

Distributed Computing

90s:

- Servers: Novell, NT, flavours of UNIX;
- Desktop: Win3.x to Win95/98/2000;
- Client-Server mostly.

00s:

- Servers: Win2KX and flavours of UNIX. The decline of Novell;
- Desktop: MS dominates the enterprise, others specialise;
- N-tier applications and thin client. The rise of VMWare;

10s (trend predictions):

- Servers: MS dominates the enterprise, others specialise;
- Desktop: MS challenged for OS & Apps;
- Virtualisation (server and desktop), SOA and SaaS

Hardware

90s:

- Moore's Law 30 years on (in 1965 Gordon Moore, a founder of Intel, predicted CPU performance would double roughly every 2 years);
- 486 processors, hard disks evolve, USB 1.0, Ethernet everywhere;
- The desktop you want costs $5K (has done since 1981).

00s:

- Moore's Law marches on;
- Pentium processors, the zenith of spinning media, LCD flatscreens;
- The desktop you want still costs $5K. USB 2.0.

10s (trend predictions):

- Moore's Law *still* going strong;
- 64-bit processors, Solid State Disks, advances in displays, USB3.0;
- Information Appliances (e.g. Netbooks). External Terabyte Storage.

Internet

90s:

- The rise of the WWW. Email becomes ubiquitous;
- Browser wars and the Dotcom Boom;
- Viruses, spam and AV software. Search engines.

00s:

- Commerce goes online. Dotcom Bust. The rise of Google;
- The rise of P2P. Music sold online. Web 2.0 technologies;
- Firewall and related technologies becomes ubiquitous.

10s (possible trends):

- Web 2.0 goes corporate?;
- More copyrighted material is sold on-line (books, movies)?
- Machine-to-machine and IPv6?;
- Security Policy standards and compliance e.g. ISO 27000?

The PABX

90s:

- Proprietary digital TDM PABXs. Nortel is the biggest industry player;
- The rise of voicemail attached to the PABX;
- First generation call centres and CTI. The rise of Genesys.

00s:

- The rise of the Telephony Server and VoIP. TDM in decline;
- 2nd gen call centres: Call Recording, WFM, QMS;
- Unified Messaging. Nortel gone in a decade. The rise of Cisco IPT.

10s (trend predictions):

- Big 3: Cisco, Avaya and Microsoft OCS-based Telephony. Other players specialist/regional;
- Blended multi-media call centres. The decline of Genesys;
- Unified Communications (around MS Exchange).

Mobile

90s:

- Analogue to 2G;
- BellSouth enter as second mobile operator. The rise of Vodafone;
- Handset miniturisation and the rise of Nokia;

00s:

- 3G Cellular, SMS and the rise of Mobile Data;
- Smartphones, PDAs and rise of the Mobile OS;
- Vodafone introduces ITZ – $0 M2M and F2M in-house calling.

10s (trend predictions):

- LTE (Long Term Evolution) and "Super-bulk" Mobile Data Plans;
- The third NZ operator and mobile reseller proliferation;
- Mobile OS War: RIM, Symbian, WM6x, i-Phone, Android.

Site Works

90s:

- The rise of structured cabling with Systemax;
- Cat 5: cables that can handle high bandwidth signals.

00s:

- Structured cabling becomes ubiquitous in new installs;
- Cat 5e and Cat 6 in widespread deployment. WiFi;
- Big supporting role in making Ethernet ubiquitous.

10s (trend predictions):

- GigE to the desktop;
- Increased use of WiFi technologies as security concerns are addressed.

Industry Structure

90s:

- Late 80's Telecom "deregulation" results in cosy duopoly;
- Competitive proliferation but:
  "Telecom has 90% of the revenue, 100% of the customers and 110% of the profit" *Brook Paterson, Clear Communications, 1999.*

00s:

- Cosy duopolies continue, including Vodafone. Eventual re-regulation;
- IT Industry concentration with fewer and bigger players;

10s (trend predictions):

- More regulation (watch for mobile interconnect rates and rules next) and improved retail competition;
- Structural split between Network Wholesalers and Service Provider/Integrator Retailers. Should prove a sound model…

“The Left-Field Game Changer”

90s:

- The Internet and WWW;
- Managed Network Services.

00s:

- Cisco IPTel in the enterprise (major impact of the MoSP project in 2000);
- SMS. Apple’s iPod and iPhone;
- Facebook, YouTube, Twitter, Trademe and Blogs.

10s (technologies to watch carefully):

- SIP Phones?
- Electronic Book Readers (Kindle, Sony e-book, future Apple product etc)?
- WAN Acceleration Technology?
- Web 2.0 goes Corporate?
- A new development we didn’t see coming…?

Synthesis

- On the next slide, is a list of 20 key technologies or trends highlighted in earlier slides in red.
- These are significant trends that can be predicted with a significant degree of confidence…
- As you read the list – what picture emerges about the medium term future?

20 Key Technologies & Trends

- SIP Trunks;
- Dynamic Voice Codecs;
- Unified Communications;
- Widespread Fibre deployment;
- Green Networks;
- Virtualisation;
- Service Oriented Architecture (SOA);
- Software as a Service (SaaS);
- Microsoft OCS-based Telephony;
- The Left-Field Game Changer;
- Information Appliances;
- Solid State Disks;
- External Terabyte Storage;
- GigE to the Desktop;
- USB 3.0
- WiFi
- Mobile LTE
- Mobile OS War;
- Network Wholesalers;
- Service Provider/ Integrator Retailers

Synthesis: 10 trends watch…

1. The dominance of Exchange and OCS at the heart of the enterprise;
2. Huge marketing push for UC. What will it mean for your organisation?
3. Dramatic increase in reliance on the enterprise network for all communications – and the resiliency risks associated with that;
4. A decline in traditional PSTN services - SIP phones anyone?;
5. A proliferation in low cost end-user and storage devices of <u>all</u> types;
6. Enterprise applications moving into public and private "clouds". Mobile becomes a strategic enterprise platform;
7. An increase in Managed Services offerings as an alternative to D.I.Y. Unified Communications and Apps;
8. Pressure on IS shops from the business for energy efficiency and "Best Practice/Standards Compliant" security policy and architecture;
9. Dramatic increases in bandwidth (for roughly what you are paying now);
10. Is it "Back to the Future": The "Mainframe Model" redux?

The Last Word…

Some things won’t change:

- The pace of innovation (thank-you Gordon Moore);
- IS must remain focused on the needs of the business;
- The Left-field Game Changer (expect the unexpected);
- The Tug-of-War with the vendors over who controls your infrastructure;
  - WARNING: Beware of “Vendor Capture”;
- The value of quality, independent advice to help your organisation navigate its way through the mine fields ahead…

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