



UNSW
THE UNIVERSITY OF NEW SOUTH WALES

UNSW's oxymoron – The Green Data Centre



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Agenda

DEATH BY POWERPOINT



www.gigadentify.com



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Definition of green

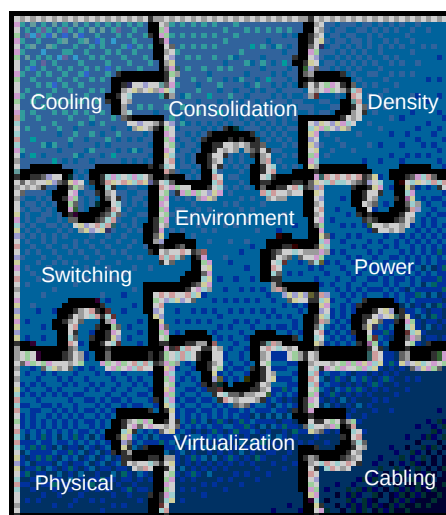
“A green product or service is one that delivers comparable or superior performance, utility, or other benefits to an alternative one while utilising fewer resources, containing fewer toxic materials, and/or boasting a longer lifecycle.”



Ted Samson



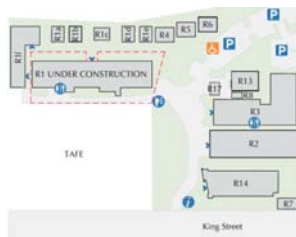
Pieces of the puzzle



The Physical



Old Randwick Tram Depot with R1 building in background



- Located in historical tramways building on Randwick Campus
- Located close (but not too close) to main Campus Kensington Campus
- Recycles an old building and minimises footprint and environmental project
- Building ideally suited to Data Centre with 6 metre ceilings and double brick construction
- Internal shell built to contain data centre within the space



The Environment

- The POD is the Data Centre
- POD is self contained environment power, cooling, security, servers, network, cabling and management



- APC infrastructure system
- Hot air contained in the centre, cooled and re-circulated by in-row cooling systems



The Environment



- 1Megawatt Electrical Substation
- Switchboard provides 1MW distribution

- 3 x 450kW generators all start in case of power failure – then sense load and shut down to match load
- Enough fuel for 12 hours run time



The Environment



- Efficient APC UPS in N+1 configuration near 99% plus efficient

- In row cooling scales to 30Kw per rack
- Cool the rack not the room
- N+1 redundancy spread across the rack with modules efficiently performing to match load



The Environment

- Sealed and insulated water reticulation cooling from chillers to in row cooling
- Utilises ambient air temperature
- No water wastage



- Pod-based nitrogen-fired water mist attached to VESDA fire suppression
- Protects valuable infrastructure

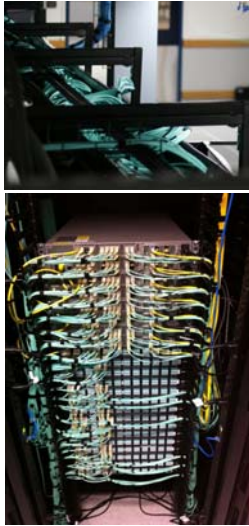


Passive Infrastructure

- Redundant dark fibre between Data Centre's
- Two data centre's beating with one heart – layer 2 network
- Future proof connectivity – roadmap for 100Gig



Passive Infrastructure



- Modular fibre to the rack – fast, efficient and reusable
- Reduced cost
- Reduces cable management and congestion on top of racks
- Fibre equals less power, less heat and less cooling



Networking



- Unified communications utilising Nexus family
 - Integrates storage and data networks
 - Lower cost per connection
 - Improved performance
 - Increased reliability/ resilience
 - High density
 - Faster provision
 - Roadmap to 100Gig

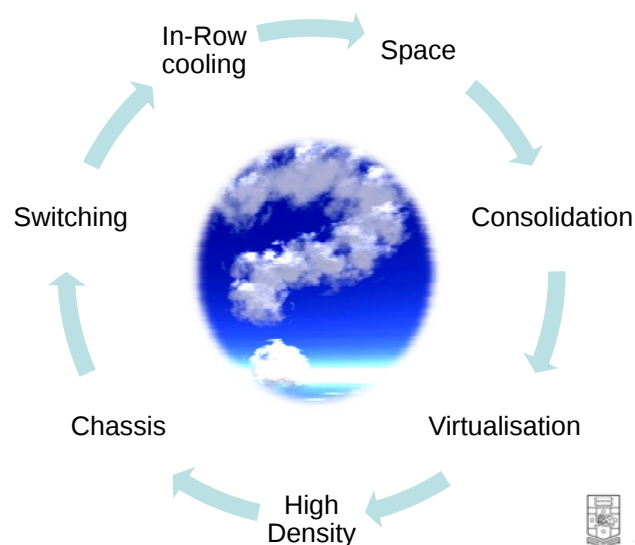


Virtualise and Consolidate

- High density chassis server platform
- High speed connectivity (10Gig plus)
- High density storage
- Virtualisation and integration
- Power, efficiency, in-built redundancy and density
- 5 x the power in 1/5th the rack space



Self fulfilling prophecy



It's a journey – not a destination

- 2011 computing requires 2011 infrastructure
- Consolidation requires virtualisation
- Kw as a measure – not m²
- Cool the rack not the room
- The POD is the data centre
- No false floors to hide under
- Wire it all together ... with glass



It's a journey – not a destination

- Re-use of existing building
- Minimise building works – no false floors
- Higher utilisation of higher density processor farms
- Greater utilisation of shared storage
- Cooling equipment directly – not the entire room
- Energy efficient UPS system



It's a journey – not a destination

- Efficiency is gold – drives down costs
- You won't be the first to have done it – use that acquired knowledge
- You can't do it by yourself
- Council – Levies, delays and noise
- Energy suppliers
- Expect the unexpected – it is a project after all!



With a little help from your friends

- Project Manager, visionary and mate – Charles Nolan
- New Energy efficient High Density Data Centre design & consulting
- Canberra Data Centres
- POD-based InRow cooling infrastructure
- APC InfraStruXure
- Construction and Building Project management
- UNIPOINT (with UNSW Facilities Management & IT at UNSW)
- Chassis Servers and Chassis Switches
Dell - M1000, M905/605, Dell/Cisco – 3130G
- Data Centre Cabling design and implementation
- UNSW IT Infrastructure
- Integration and Project Management
- UNSW IT Infrastructure
- Unified Switching – in-rack & POD(FC, FCOE & E)
Cisco Nexus - 7000, 5000, 2000
- Consolidation environments
Microsoft Windows 2003/8, Vmware - ESX, SRM, LCM



Green?
Efficient and responsible.
Ready for the next big wave!



Question time



Thank you

