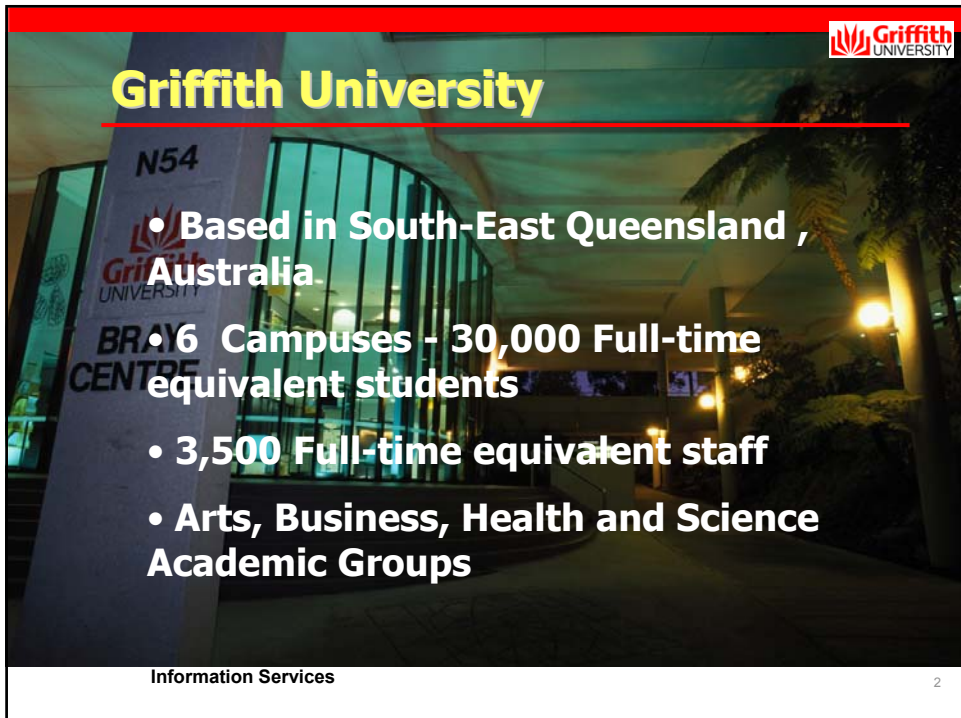


Virtual Server Campus Network Design and Disaster Recovery

Bruce Williams and Sudath Wijeratne



Griffith University

- Based in South-East Queensland , Australia
- 6 Campuses - 30,000 Full-time equivalent students
- 3,500 Full-time equivalent staff
- Arts, Business, Health and Science Academic Groups

Information Services

2



Bruce Williams

Principal Network Engineer, Griffith University

- In ICTS industry and Higher Education sector for over **10** years



Sudath Wijeratne

Manager of the Infrastructure Continuity
and Architectural Services Group, ICTS,
Griffith University

- In ICTS industry for over 15 years
- Higher Education Sector for more than 10 years

Agenda

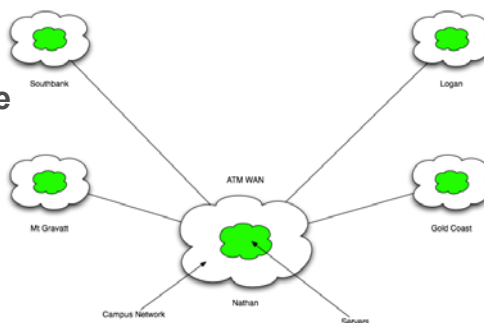
- Background
- Virtual server campus network design
- Our DR Strategy
- Utilisation of the Virtual Server campus for DR
- Questions

Background

- **Griffith has 5 campuses from Brisbane's Southbank to the Gold Coast**
- **Servers have been installed local to campus**
- **Nathan centric corporate systems and servers**
- **Inter-campus network evolution**
 - **3 stages**
- **Virtual “Server Campus”**

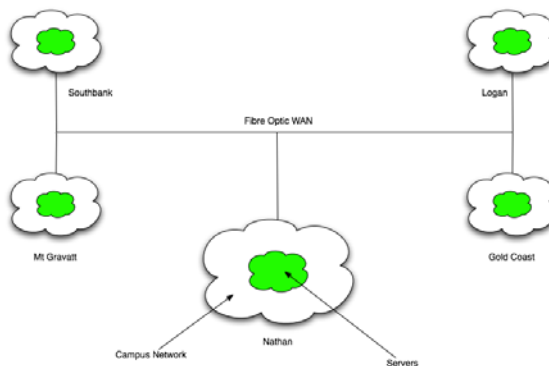
Virtual server campus network design

- Original WAN
- Nathan Centric
- 155Mb/s Microwave



Virtual server campus network design

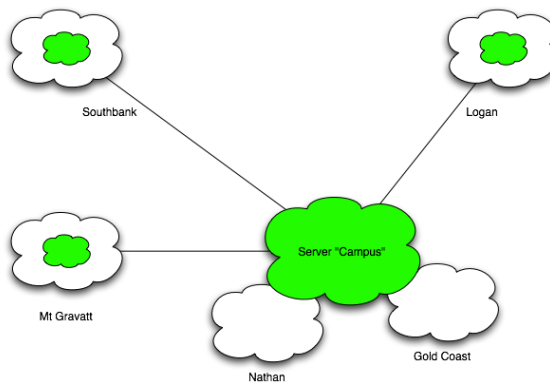
- Dark Fibre
- Nathan – Gold Coast
- Nathan - Southbank
- CWDM for GbE and FC



Virtual server campus network design

- Acquired dark fibre connectivity for major campuses
- We have connectivity, what can we do with it?
- Move servers out of the campus

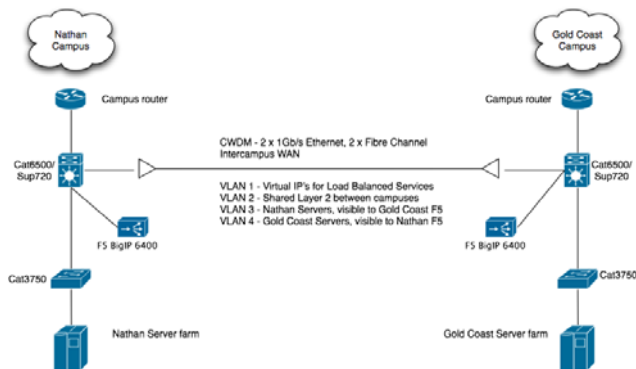
Virtual server campus network design



Virtual server campus network design

- Provide equal access to servers from anywhere
- Well defined access points into the server subnets
- Greater server to server connectivity
- Allow for DR planning by allowing a shared layer 2 between sites
- Easy to migrate servers and services between sites

Virtual server campus network design



Virtual server campus network design

- What does it really look like?

Our Disaster Recovery Strategy

Our DR Strategy - background

- AUQA audit in 2003 identified risk management as a priority
Impact of loosing the core Nathan Data Centre has the potential to cripple the University's ability to deliver its core services.
- Current demand for high availability of Information systems requires highly available delivery infrastructure that exhibits resilience and timely recovery from disaster
- Lack of involvement and sponsorship from core business units has proven a traditional top down Business Impact Statement (BIA) approach to disaster recovery is difficult

Disaster recovery in information technology is the ability of an infrastructure to restart operations after a disaster. Disaster recovery is used both in the context of data loss prevention and data recovery.

Our DR Strategy – background ...

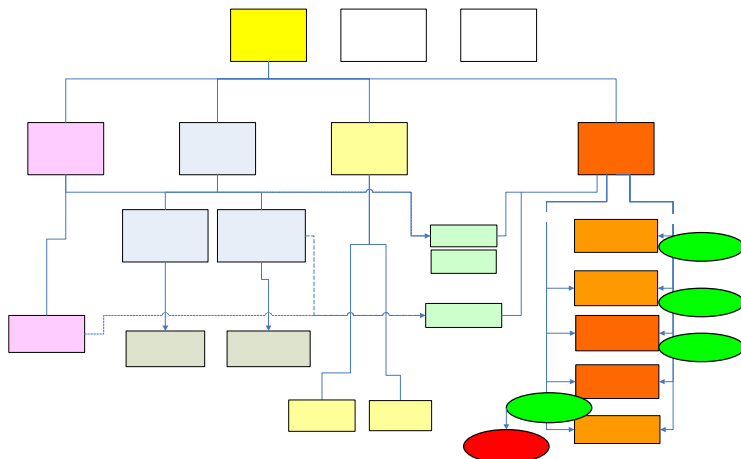
- In response to these needs ICTS management team commissioned a disaster recovery project to jumpstart the process via a bottom up approach for three critical University systems:
 - Learning@Griffith
 - Staff Email
 - Corporate Web Services

Our DR Strategy – Methodology

- We needed a way to guide us to approach system by system
- We have developed a methodology called “Building Block”

Building Block methodology

- Top down approach is to analyse IT services iteratively decomposing them into key technological components and dependencies.
- As a result of this process the key building blocks required to deliver the service are identified.
- Recovery solutions for each building block are then undertaken.
- A second round of analysis identifies building blocks that are reusable for other systems, or as base components for holistic disaster recovery (e.g. DNS services, LDAP).



Our DR Strategy is based around ...

- Two physically separated primary Data Centres
- Distributed operation of major systems between these Campuses
- Near real-time data replication capabilities between these Data Centres

Key Dependencies for DR Project

- SAN Infrastructure provisioning at Gold Coast campus
- Network server campus virtualisation (Between Nathan and Gold Coast)

Server campus project

- Primary concerns
 - Latency: ~77km, 27 splices
 - Extended ping between Cisco switches averaged 3ms RTT
 - Using Asynchronous TrueCopy on SAN

Server campus project

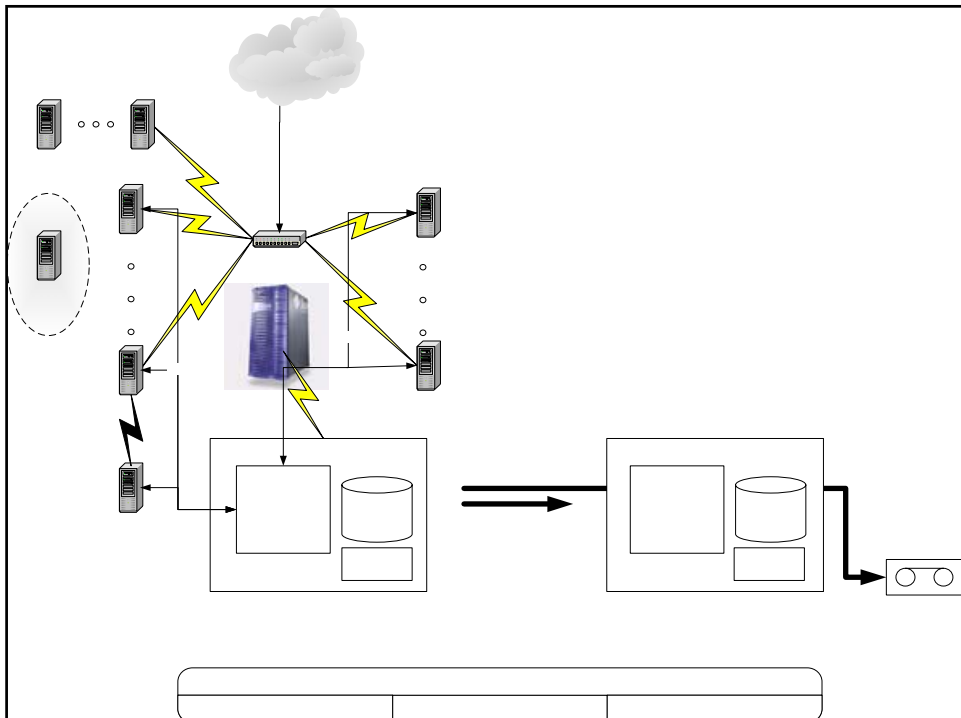
- Cisco MDS 9509 Director
 - connected using CWDM-MUX8A
 - not all wavelengths worked, 1610 unreliable for FC, but works for Gb/E
 - achieving 160 MB/s transfers
 - some support confusion as we use passive CWDM not ONS15k series

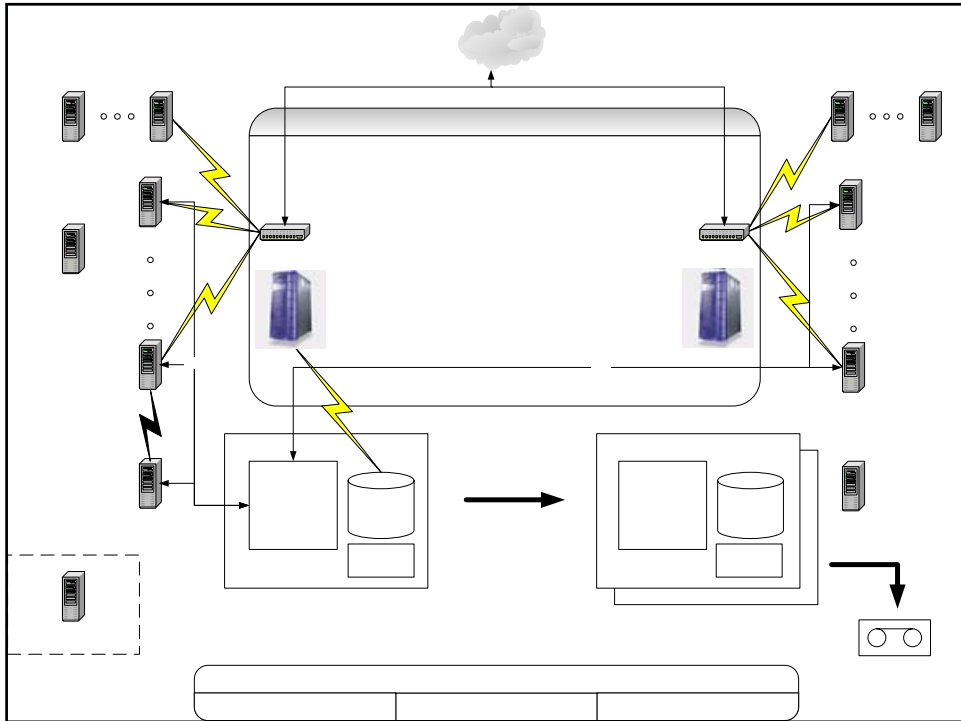
Server campus project

- Other considerations
 - fibre breakage, IP network traffic can fall back to Microwave radio, Fibre-channel cannot
 - future project to link Nathan – Logan – Gold Coast which will provide a diverse path

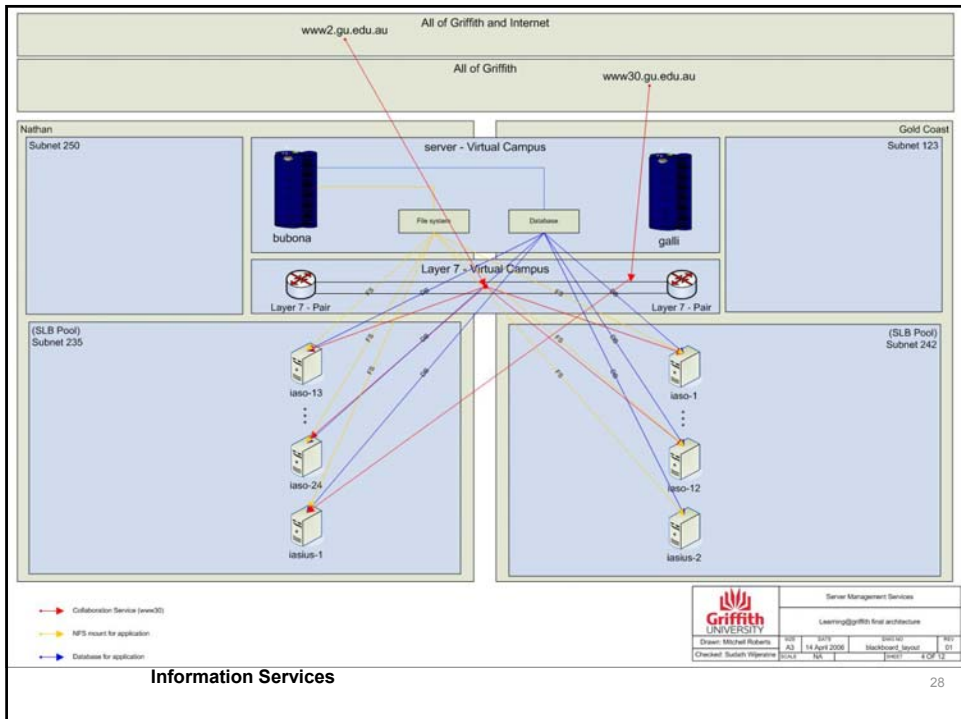
Learning@Griffith Architecture overview

- Blackboard Before DR implementation
- Blackboard DR architecture
- Blackboard in a Disaster at Nathan



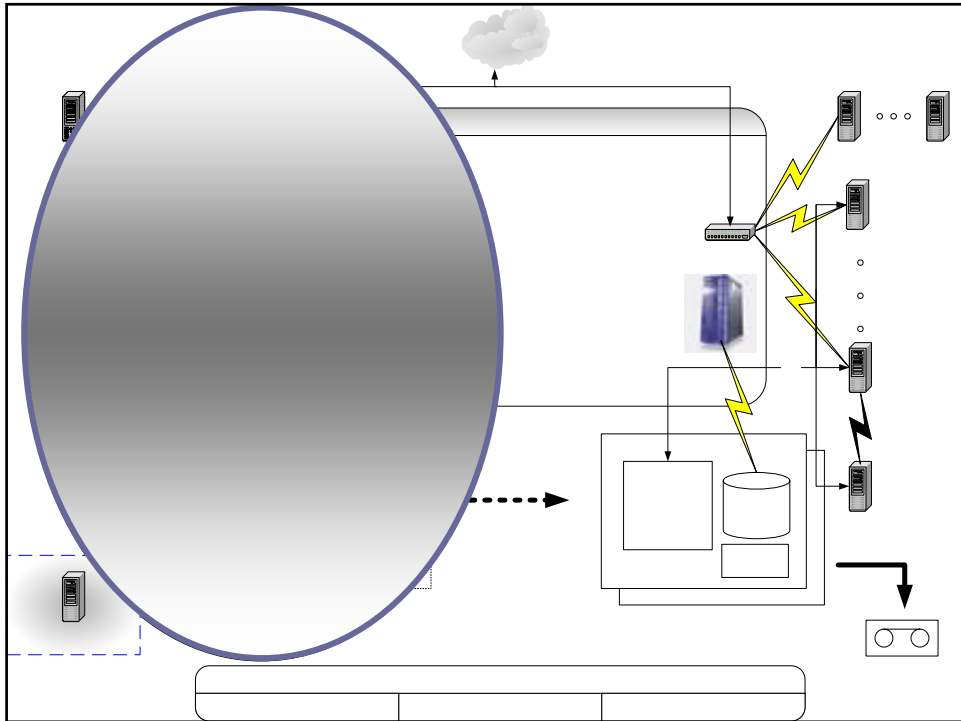


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LDAP Server

App Server 1



Next steps

- In the process of planning for Staff email and Corporate web DR
- Will be effectively utilising Network server campus
- Extension of server campus network to other campuses (i.e. Logan and South Bank)

LDAP Server

App Server 1

Questions?