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Title Slide

Ladies and Gentlemen, this presentation will focus on a narrow subset of the Business Continuity Planning and Disaster Recovery Agenda. Specifically, I will be describing the higher-order IT architecture approach that was commenced in 2004 is being progressively implemented at Griffith University to address what has traditionally been referred to as “Disaster Recovery” but we at Griffith, as well as an increasing number of other organisations, are now referring to as a “Continuous Operation” architecture.

For the non-technical people in the audience, don't worry, this is not a technical presentation.

First, a few acronym definitions for this talk:

BCP = Business Continuity Planning

DR = Disaster Recovery; not Digital Repository or Digital Rights

CO = Continuous Operation

GC = Gold Coast

MG = Mt Gravatt

Agenda Slide

I will give a brief overview of Griffith University, followed by a very brief review of why BCP/DR/CO is important. This will be followed by a brief history of the Griffith DR journey. I will then outline some of the features of our “Continuous Operation” approach and then describe what we have done and are continuing to do. If my timing is good, we will have time for questions.

Griffith Overview - Map

Griffith University sits in the Brisbane-Gold Coast corridor; one of the fastest growing regions in Australia.

We have five campuses:

In the Brisbane CBD we have our South Bank campus that hosts the Qld Conservatorium of Music, the Qld College of Art, the Griffith Film School, and part of the Business School.

Very close to each other but on opposite sides of the M1 Freeway on the south side of Brisbane we have the Mt Gravatt and Nathan campuses.

The Nathan campus is the original Griffith campus prior to the Dawkins' amalgamations of 1990/91.

Further south at Logan, we have the newest campus that took its first students in 1998.

At Southport on the Gold Coast, we have the Gold Coast campus plus the Griffith Health complex (incorporating the Medical and Dental Schools) adjacent to the Gold Coast Hospital.

Griffith Overview – Features

The Gold Coast campus is the fastest growing campus. It is also the largest in terms of student numbers with over 11,000 students, slightly more than Nathan, although Nathan still has the bulk of the administrative staff.

In total, we have over 34,000 students and 4,500 staff.

Griffith is probably the most centralised University in Australia with, from July 1997, all HR, Finance, Student Admin, IT staff reporting in centrally. So, from an IT perspective, we basically have responsibility for the lot. This has provided great opportunities to leverage economies of scale and standardisation with commensurate productivity improvements. However, that is another story.

Additionally, Griffith was the first University in Australia to implement the integrated/converged model of bringing together Library, IT, and on-line learning into one division and this is our 20th year of this model. That also is another story.

Drivers for BCP/DR

CAUDIT members annually develop the “CAUDIT Top-10 Issues” list.

BCP/DR was #1 in 2006 and #5 in 2007.

Coming in at #3 in 2007 with Project and Portfolio Management was Risk Management.

Clearly, ANZ IT Directors think this is an important topic.

DR/BCP was #4 in EDUCAUSE 2006 Top-10 Issues

Additionally, the EDUCAUSE Centre for Applied Research (ECAR) published a major report in March this year on Business Continuity in HE.

I hope you are all aware of the need for giving BCP/DR proper attention so I won't dwell on this too much. However, some of the major drivers are:

1. We have to be ready for major events that could seriously compromise our operations. They could be terrorist events (such as the attacks in New York), they could be environmental events (such as floods, cyclones, fires), or they could simply be some local event (such as a fire to the Data Centre or a major power disruption).
2. IT-based information systems have become critical to the business and our clients have an expectation of the systems being available 24*7. Clients simply expect systems to be there and in the event of a major disruption, clients will want it fixed fast!
3. Not surprising, there is increased Executive management focus on DR and BCP.
4. Similarly, there is increased Audit focus as well.

The important point is this - the good old days of the last century are long gone.

If IT systems are unavailable for an extended period of time, the business is severely compromised.

Further, it doesn't take long for the media to find out and your organisation can quickly become a major story for the wrong reasons with damage to reputation capital.

The Griffith Journey

Phase 1 – the 1990s

1. The main Corporate Data Centre was and, for the next couple of years, remains at Nathan
2. At a direct result of the 1997 centralisation of IT mentioned earlier, we commenced consolidation of Faculty Data Centres. This also included upgrading our Data Centres and, as I am sure the IT people in the audience are aware, this is a never-ending activity.
3. Back in the 90's, systems were much less complicated and generally independent with relatively simple interfaces where necessary.
4. They were certainly not as heavily used by our clients then compared with usage today.
5. While I am sure some of my colleagues had great disaster recovery plans in place, I suspect the majority of the sector operated under

the principle: “She’ll be right, mate!” with expectation that we could operate critical systems elsewhere if necessary. And I think that back in the 90s, that approach may well have been adequate for the times.

Phase 2 (Applications) – 2000+

1. Griffith commenced a range of major projects:
 - a. The implementation of PeopleSoft ERP for Student Administration, HRM, Finance, Research Administration, Enterprise Portal
 - b. The implementation of Lotus Notes for university-wide Groupware (inc email)
 - c. The implementation of Blackboard for on-line learning.
 - d. The implementation of Sun Microsystems JES for student email.
 - e. Electronic workflow for a range of administrative processes
 - f. A Corporate meta-directory for enterprise Identity Management to feed authentication systems to provide, amongst other things, Same-Sign-On for all major systems
2. In a short period of time commencing in 2000, the IT environment changed dramatically and became very interdependent and complex.
3. The old “She’ll be right, mate” approach was no longer anywhere near good enough.

Phase 2 (Disaster Recovery) – 2000+

1. In addition to all these, and other, IT projects, we also commenced a formal BCP project that included a Business Impact Assessment.
2. Unfortunately, our BCP Project was too ambitious, there were too many other major, high-priority projects underway (both IT projects and dealing with rapid university growth) and the institution was not able to devote the necessary resources to it and it was put on the backburner
3. I decided we had to do something so we embarked on a narrower, bottom-up, IT-focussed DR strategy. Some of the actions taken include the following.
4. We upgraded the MG Data Centre and made it the “Backup” site. We already had our own dedicated optic-fibre between Nathan and MG so all major databases were mirrored to MG and backed up to tape over there. There was some capacity for failover to MG in the event of a disaster but only in a very limited capacity

5. We upgraded the existing GC Data Centre in 2002 with the medium/long-term view of making this a major Data Centre as the “Centre-of-gravity” of Griffith University moved south.
6. In 2003/2004 we made the decision to adopt a “Continuous Operation” strategy with production capacity split across both Nathan and Gold Coast Data Centres
7. We decided on an initial set of applications that would be re-architected into a DR/CO mode:
 - a. Blackboard for eLearning
 - b. Lotus-based Staff email
 - c. Static Web site
8. CO architecture work commenced in 2004.
9. Dedicated Optical Fibre links between Nathan and GC became operational in January 2005 with implementation and testing of CO architecture throughout that year.
10. We commenced the “splitting” of production systems across both campuses in 2005/2006

Features of our “Continuous Operation” Approach

1. This is not a “Cold site”, “Warm site”, or even “Hot site” strategy
2. It takes advantage of the geographically separate Nathan and GC campuses (65km)
3. Rather than have production systems all running from one Data Centre on one campus, we split production systems across multiple campuses.
4. Note, this does not mean having Lotus Notes run on one campus and Blackboard run on another campus. For Griffith, this means having Lotus Notes run in production on both campuses simultaneously and Blackboard run in production on both campuses simultaneously.
5. Incorporates redundant, dedicated optical-fibre between all campuses providing a high availability network.
6. Data is mirrored across both Data Centres.
7. If a failure occurs at one site, the other site can continue to operate in production mode (although, depending on the disaster, to a reduced client base).
8. For those systems operating in CO mode, in the event of a disaster, the outage could be zero or ideally less than a few hours.
9. Additional costs are not great since the production hardware is not duplicated; it is simply split in half (not exactly true) and shared.
10. Expanded backup strategy across three campuses (Nathan, MG, and GC) with the usual off-site storage of tapes in a warehouse service.

11. Given the interdependence of systems today, the above is much easier said than done. It is mandatory to have all the components of a system available on both campuses to be able to operate in the absence of one of them. These components start at the network layer, continue up through a raft of middleware components, the databases and file systems, the applications, etc. It is very complex and we spent considerable time using a “building block” approach to analyse and decompose each system into its many parts so that all are available in the event of a major disaster.
12. We have had great support from Cisco and Sun Microsystems who worked with us to review the approach and relevant architectures.

I will now present some layers of the Griffith CO architecture

Slide 1 – the network layer and WAN diagram

Features of the network include:

1. We have (or will shortly have) diverse-path, redundant fibre between all campuses
2. We have dual connections to Qld AARNet POP via both UQ and QUT (a ring – the only point of failure is a third-party Building in the Brisbane CBD)
3. A future option is to have a connection to NSW AARNet POP out of GC campus

Slide 2 – the middleware layer

1. We have set up virtual server campus network so that a single subnet could run across both Nathan and GC computer rooms
2. We have layer-7 load balancing switches at both campuses to allow load balancing at the application layer to the servers currently experiencing the lowest load which could be either of the campuses.
3. Similarly, authentication to enterprise systems is split and provided at both campuses.

Slide 3 – Application 1 – Lotus Notes – email for staff

1. The Lotus Notes architecture is very sympathetic to a DR/CO approach. Each staff member has a primary email server on one campus and a secondary server on a different campus. In the event of a failure at one campus, the secondary server at the other campus automatically becomes the primary server for the client.
2. Data is mirrored and associated with each local server
3. Web access is provided from off campus in addition to a rich PC-based client.

Slide 4 – Application 2 – Blackboard

1. Application servers are split across both campuses and clients access application servers on either campus.
2. Database servers are mirrored but all application servers point to only one database server on one campus
3. In the event of a major outage, downtime depends on whether it is the active or mirrored database server site. If the mirrored site has the disaster, everything else keeps running. If the active database site has the disaster, there is an outage while the relevant IT personnel manually make the mirrored database the live database.

Challenges and The future

1. A major challenge is to make sure the CO architecture is not compromised when upgrades to these systems are implemented. We have a very sophisticated ITIL-based change management process and project management standards and associated templates are being upgraded to try and ensure the necessary checks are made.
2. A positive cultural change is occurring and IT staff are typically thinking about DR/CO considerations and making appropriate adjustments for a wide variety of systems and upgrades.
3. We need to do more work on operational approaches when we have had a disaster. For example, mirroring to another site is not necessarily available and the standard backup approach via the affected campus will not be available.
4. The next major application to be moved to CO mode is PeopleSoft. We currently have a project to upgrade to PeopleSoft V9.0 for both Students Admin and HR with go-live around Easter 2008. The architecture for the new system is being designed with building-blocks and CO operation in mind.
5. There remain a wide range of applications and systems that are not in CO mode and we need to ensure that DR for these systems is also addressed.

Conclusion

Well I hope I have given you a helpful overview of “Continuous Operation” thinking.

Griffith is not alone. I was heartened to hear a presentation by my counterpart from George Washington University at the Sun Microsystems Education & Research Conference in New York in Feb 2006 where he articulated a similar strategy.

In times of constrained resources, we believe this approach is a very cost-effective method of providing a disaster recover capability for our environment which has the advantage of geographically dispersed campuses connected by diverse-path optic fibre and, significantly, in the event of a disaster, those applications in CO mode should continue to operate.

Thank-you for your attention. I would be happy to respond any to questions now or informally after the session concludes.

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