

This is a presentation slide with a white background and a purple decorative element on the left side. The University of Queensland Australia logo is in the top left. The title 'WHAT THIS TALK IS (AND ISN'T)' is at the top. Below it, the text 'It's not:' is followed by a bulleted list of three items. Then, the text 'It is:' is followed by a bulleted list of two items. At the bottom right, in small grey text, is 'Dealing with Disaster – The UQ Experience July 2011'.

The University of Queensland Australia

WHAT THIS TALK IS (AND ISN'T)

It's not:

- ... a technical discussion
- ... anything to do with datacentre design
- ... a howto on avoiding disaster in the first place

It is:

- ... a discussion on dealing with the inevitable – a disaster
- ... primarily from the viewpoint of University Networks – one team within ITS at UQ

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DISASTER 1: FIRE

(What?)

22 August, 2010, early morning: fire in a datacentre

- A UPS battery failed and caught fire
- No automatic suppression – fire brigade put it out (with hand-held extinguishers)
- No air conditioning – or power – isolation (equipment fans ingested polluted air)
- Clearly an unpredictable event – no meaningful forewarning

Result:

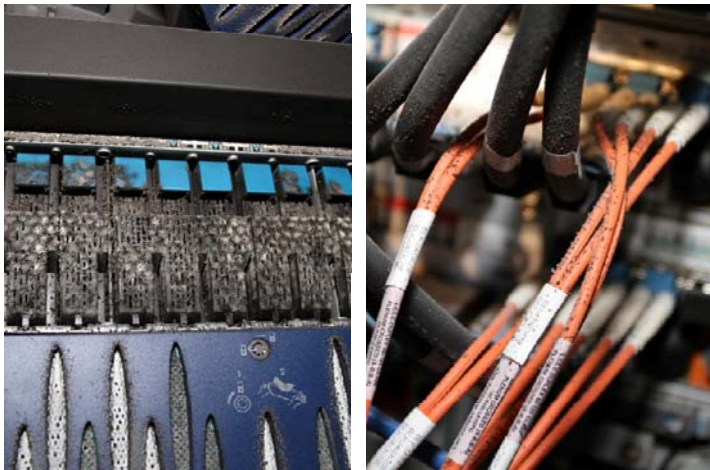
- Substantial smoke/powder/CO₂ damage to (running) equipment
 - Some equipment replaced; some more cleaned and reused
- Long ETR (for full recovery) and the (temporary) loss of a computer room

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DISASTER 1: FIRE

Short Term Response (0-4 hours)

Location, Location, Location ...

- Impacted datacentre was in the basement of the main ITS office building on campus
 - Fire anywhere in the building means no go (no power, too)
- Serendipity: having a separate facility elsewhere on campus ready to go...
 - Bonus points for being able to accommodate all responders at once
- Redundancy is great, if (and only if) it works

Situation

- What's impacted? What of this matters **now**/this week/later? (Triage)
- The importance of a written DR plan, stored on paper, cannot be overestimated
- Master password lists also need to be available on paper (assume your auth servers are be dead...)

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DISASTER 1: FIRE

Short Term Response (0-4 hours)

Situation (cont.)

- Whiteboards are fantastic tools for recording state
 - Lists of down services/what actually matters/who's and what/etc
 - C4ISR systems call them "totes" – as do bookmakers

Care and Feeding

- Responsive on-call staff are a big bonus at this point – value them
- Never underestimate the value of snacks (especially from hour 3 on)

Communication

- Overcommunicate rather than undercommunicate, particularly with fellow respondents
- Remember **all** your customers – this may include suppliers, depending on network configuration

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DISASTER 1: FIRE

Same Day Response (4-12 hours)

Recovery

- Think laterally about essential service recovery – sometimes it helps
 - ... but document any "non standard" changes so they can be undone later
- Focus on the important services first; avoid distractions
 - Have someone "run interference" on outside distractions (customers, managers, other groups...)

OH&S

- No service at a university (or almost anywhere!) is worth risking life, limb, and health
 - Leads: Remember **your** obligations to your staff (and yourself)
 - Discourage risky behaviour (going into a burned out datacentre...)
 - Provide PPE and ensure staff use it
- Plan to deal with fatigue early and often – send people home

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DISASTER 1: FIRE

Longer Term (2 days +)

Equipment

- "Essential" equipment will be unrecoverable – prepare accordingly
- Stocktake and control – in **and** out
 - Not all rack rails fit all systems; finding the right rails can cost time
 - Know what equipment you have **before** the disaster strikes (updated hi-res photo library?)
- Expect to deal with insurance requests; do so efficiently
- Expect to deal with supportability issues (vendor-specific!)

OH&S (yes, again)

- Fatigue becomes a big problem in the first weeks – actively manage it
 - Multi-skilling and documentation becomes important
 - Use **all** your staff, not just your "guns"
- PPE is still important...

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DISASTER 1: FIRE

Longer Term (2 days +)

Communication

- Honest and transparent communication will "buy time" and tolerance from customers

Service Recovery

- That Problem You've Always Meant To Fix But Never Had The Outage Window: now's (possibly) your chance
- Plan to eat an elephant ("one bite at a time") – some services will take substantial time to recover, so start somewhere
- Work methodically: don't unnecessarily multitask
- Properly implement any of the "quick fixes" as soon as practicable
- Documentation should be updated ASAP, but no sooner

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The image shows the bottom half of a presentation slide. On the left, there is a white vertical bar containing the University of Queensland logo and the text 'THE UNIVERSITY OF QUEENSLAND AUSTRALIA'. To the right of this bar is a large purple rectangle. In the center of the purple rectangle is a large, white, stylized 'UQ' logo. At the bottom right of the purple rectangle, there is a small white text box that reads 'Dealing with Disaster - The UQ Experience July 2011'.

DISASTER 2: UPS FLOOD

(What?)

3 March 2011: Unseasonably heavy rain

Air conditioner drip trays + high voltage do not mix...

- Drip tray located above UPS
- Drip tray outflow soldered into building downpipe; no backflow prevention
- Heavy rain caused downpipe to backfill

Result: loss of power to UPS room (and subsequently, to datacentres)

DISASTER 2: UPS FLOOD



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DISASTER 2: UPS FLOOD



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(NEAR) DISASTER 3: FLOOD

(What?)

January 2011: Rain. Lots of Rain.

- One datacentre relatively close to 1974 flood height
- A bit of advance notice this time – not a (completely) unpredictable event

Result:

- We got off (relatively) lightly – no datacentre impact; water below 1974 levels and our equipment
- Some buildings lost access/aggregation switches ...

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(NEAR) DISASTER 3: FLOOD



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(NEAR) DISASTER 3: FLOOD

Beforehand

Physical labour may be required

- Sandbagging
- Moving equipment (when possible)
- Stocktake of equipment (when it isn't)

OH&S cannot be forgotten

- Especially important with physical labour considerations
- If it's not safe, it's not to be done

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(NEAR) DISASTER 3: FLOOD

During and After

Wait ...

- ... and watch – up-to-date monitoring tools are handy for “damage assessment” (we use Intermapper; Big Brother; Statseeker)
- Use the time: plan for recovery

Communicate

- Flooded equipment will need to be replaced
- ... worst case, this can mean lots of hardware (we were lucky)
- Keep your service status pages up to date (it cuts down the calls)
- Be aware of what a loss of power means for the mobile phone network

Rebuild

- Use tools like RANCID, CiscoWorks, etc to recover configurations quickly

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(NEAR) DISASTER 3: FLOOD

During and After

Site Access

- Major flood event = closed roads; be aware of what routes are available and for whom
- Some staff will simply not be able to get to site safely (VPN access is important)
- Prepare to be stopped by emergency services

Staffing

- Major flood event = flooded homes; people's own lives should come first (effective resource planning helps in dealing with this)
- OH&S – people shouldn't proceed through flooding

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TAKEAWAYS

People

1. Disasters can make for excellent team building opportunities
2. Look after your staff throughout:
 - Feed your disaster respondents during the “acute” phase – it keeps them happy and alert
 - Watch for signs of burnout, actively manage it
 - Use all of your staff – treat disaster as a learning exercise
3. Fear – of failure – is an inappropriate response when responding; drive it out
4. In a “metro area” disaster, people will have their own problems to cope with – accommodate these

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TAKEAWAYS

Process

1. Paper records, stored appropriately, are essential
2. Keep the "day job" under control, and a disaster becomes easier to manage
3. Communication is an important part of the process

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TAKEAWAYS

Tools/Technology

1. Silver linings: Use the disaster to improve services if feasible
2. Know your levels of redundancy – test them, and know how (if) they'll fail

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AND FINALLY...

**Disasters can and will happen:
don't think it can't happen to you!**

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