

An Independent View of University Public Web Server Availability

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This Presentation

- The aim of this talk is to present measured availability data of Australian university public web services.
- I have not attempted to interpret the data.
- This talk will present what is happening with availability, all the questions it raises, including the big question **WHY** require further research.
- The performance data for any one university is confidential, and can not be disclosed.



What is Monitored

- Availability of Public Web Service
 - 38 Australian Universities
- Since June 2002 – 2 years data



Monitoring Details

- The default page of the public web service is retrieved every 10 minutes.
- www.university.edu.au -> index.html
- Retrieved by three separate servers:
 - Aktiom Networks : Denver
 - Managed Solutions : San Jose
 - CalPOP : Los Angeles
- Results of all three servers are compared
- Use Nagios monitoring software



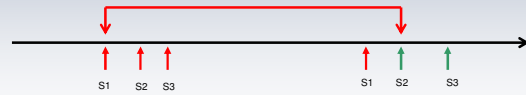
What is an Outage

- A failed check is one that does not receive the default index file within 15 seconds. (index.html size varies from 1.6kb -74kb)
- When a failed check occurs, two more checks are conducted at 1 minute intervals.
- An outage is recorded when the 3 checks fail to retrieve the web page over 2 minutes.



What is an Outage

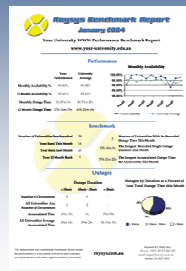
- Logs from the three monitoring servers are compared.
- An outage must be recorded on the three servers simultaneously.



Benchmark Report – The Plug

Independent and confidential
Monthly Benchmark Report

Availability
Benchmark Comparison
Ranking
Analysis of Outage Types



Average Availability

	2002 (June – Dec)	2003	2004 (Jan-June)
Average Availability	99.48%	99.33%	99.47%
Average Monthly Outage Time	3h 50m	4h 50m	3h 49m
Average Total Outage Time	26h 55m	57h 55m	22h 50m



Best and Worst - Time

	2002 (June – Dec)	2003	2004 (Jan-June)
Best Availability	16m 0s	6h 58m 2s	1h 28m 40s
Worst Availability	3d 16h 52m 33s	10d 19h 15m 29s	4d 1h 30m 47s
Average Total Outage Time	1d 2h 55m	2d 9h 55m	22h 50m

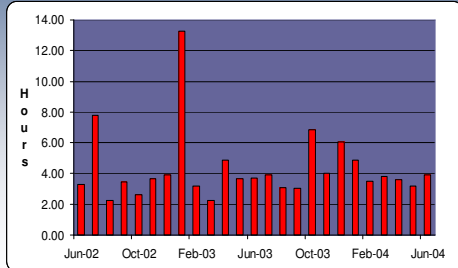


Best and Worst - Percent

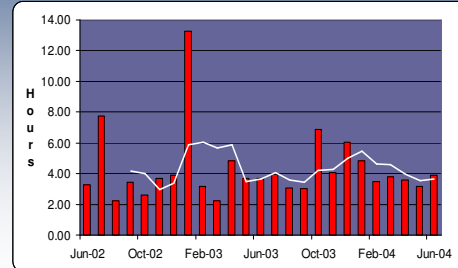
	2002 (June – Dec)	2003	2004 (Jan-June)
Best Availability	99.995%	99.920%	99.966%
Worst Availability	98.270%	97.040%	97.755%
Average Total Outage Time	99.476%	99.333%	99.474%



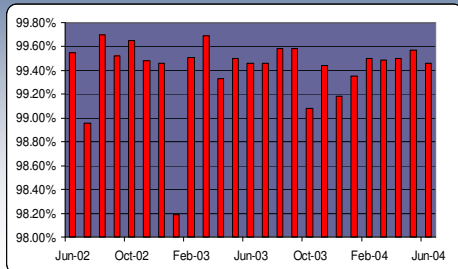
All Universities Average Monthly Outage Time



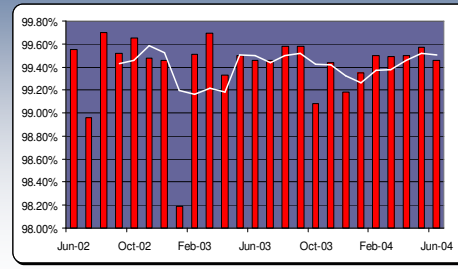
All Universities Average Monthly Outage Time with 4 month moving average



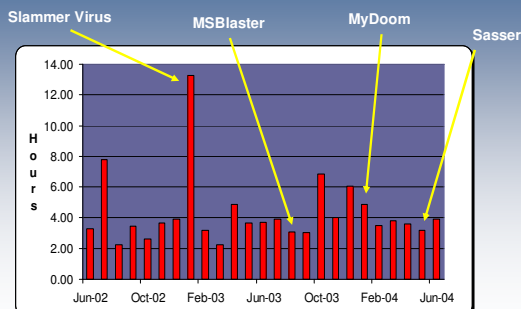
All Universities Average Availability



All Universities Average Availability 4 Month Moving Average



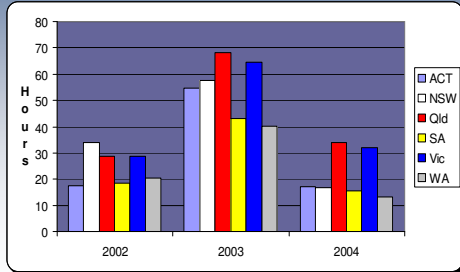
Virus Events



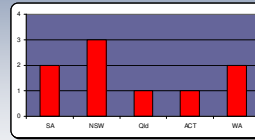
Comparison by RNO

- Assumed each university is connected to it's states RNO
- Removed single member RNO's to protect their confidentiality

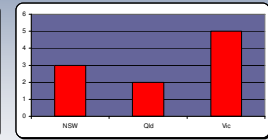
Average Yearly Outage Time by State



Rankings by State For the last 12 Months to June 2004



Top 10 Ranking



Bottom 10 Ranking

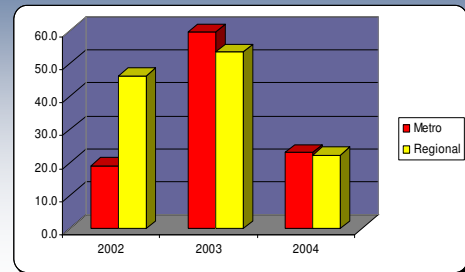


Comparison by Regional/Metropolitan

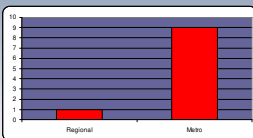
- Any university with a major campus in a capital city is Metropolitan
- Charles Darwin recorded as a regional
- 27 Metropolitans
- 11 Regionals



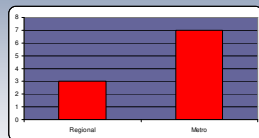
Average Yearly Outage Time by Regional/Metropolitan



Ranking Comparison Regional/Metropolitan For the last 12 Months to June 2004



Top 10 Ranking

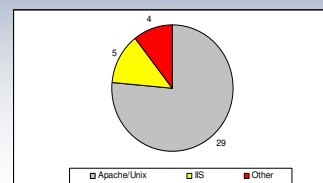


Bottom 10 Ranking



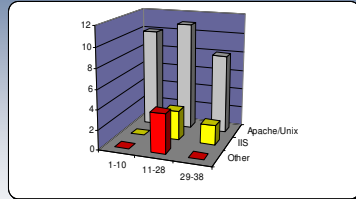
Web Server Technology

- August 2002 and July 2004 (netcraft.com)
- Breakdown of web server technology has not changed in 2 years.



Web Server Technology Rankings

- In the past 12 months:
- Top 10
 - all Apache/Unix
- Bottom 10
 - 2 IIS server
 - 8 Apache/Unix servers



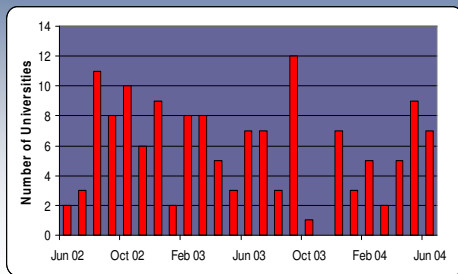
Availability

The Good and the Bad



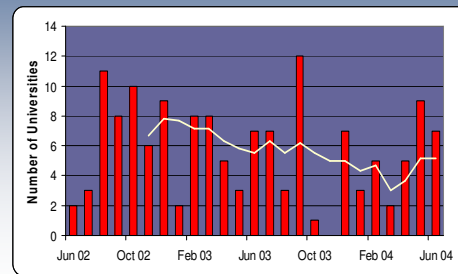
The Good - Zero Outage Count

Number of universities with no monthly outage



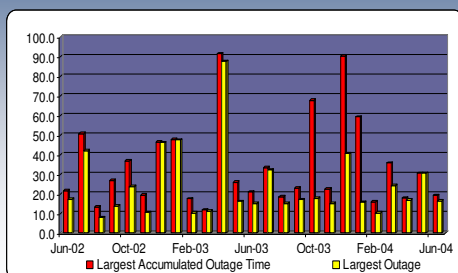
Zero Outage Count

4 Month Moving Average



The Bad - Worst Outages

Largest single outage and largest total accumulated monthly outage time

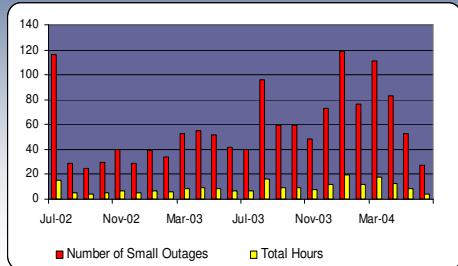


Breakdown of Outages

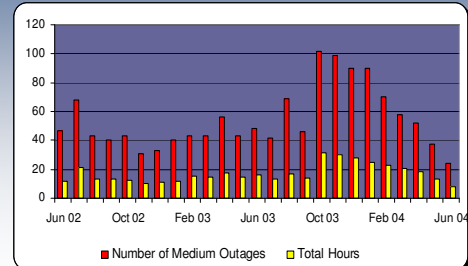
- Categorise Outages by Duration.
 - Small - less than 10 minutes
 - Medium - 10 minutes to 30 minutes
 - Large - greater than 30 minutes



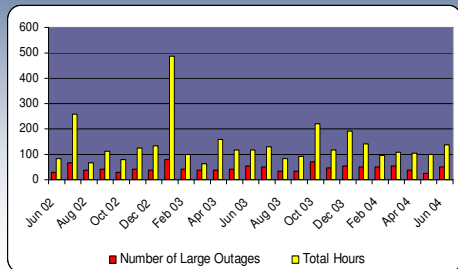
Small Outages



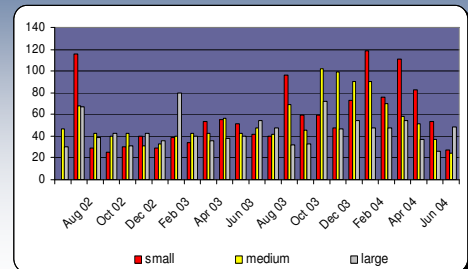
Medium Outages



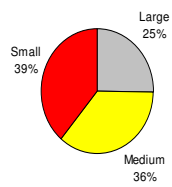
Large Outages



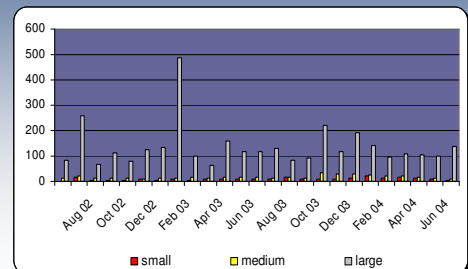
Number of Outages by Duration



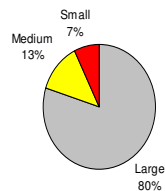
Number of Outages by Duration



Total Time of Outages by Duration



Total Time of Outages by Duration



Rankings

- Universities ranked on the total outage time in a 12 month period
- Two periods used for comparison:
July 2002 – June 2003
July 2003 – June 2004



Ranking Movements

- 4 universities have stayed in the top 10 from 2002/3 to 2003/4
- The other 6 have shifted to rankings:
11, 13, 25, 28, 29, 34
- 3 universities have stayed in the bottom 10 from 2002/3 to 2003/4
- The other 7 have shifted to rankings:
5, 12, 18, 19, 21, 24, 26



In The Future

- Learn about statistics !!!
- Study why in addition to what
- What is the difference between a top 10 ranking university and a bottom 10 ranking university
- Compare static web services to dynamic web services, e.g. student portals
- Compare the education sector to other sectors
- Compare Australian universities to international universities

