

The Island



Heron Island Research Station WAN Upgrade Project

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Name of presentation Month 2009

The Users

The Heron Island Research station is situated about 80km off the coast of Gladstone.

HIRS has approximately 10 staff on the island.

There is room to accommodate up to 150 visiting researchers and school trips within the research station.



Research on the Island in 2012 includes work many educational and research institutes:

University of Qld
Australian Institute of Marine Science
James Cook University
University of Technology Sydney
Queensland University of Technology
Central Queensland University
South Australia Government
CSIRO
University of Copenhagen

The Facilities



Research Facilities include:

- Darkened Microscope Room for light controlled work.
- Indoor and Outdoor Aquaria areas, with tank space to support sharks and other large species
- Reference Library
- GBROOS sensors and related data available.



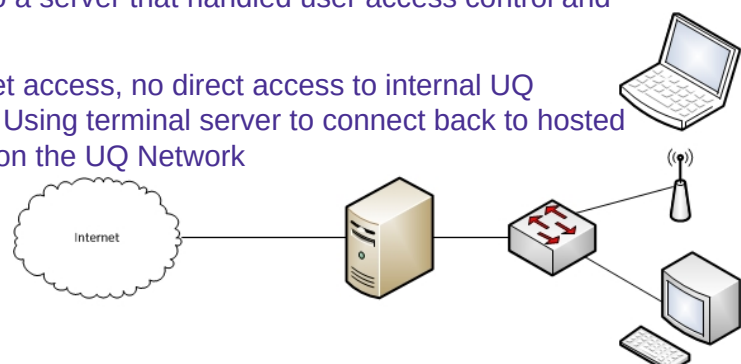
<http://www.uq.edu.au/heron-island-research-station/>

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The (old) Technology



- Satellite connectivity, 1.5Mbps download, 256Kbps upload. ~500ms RTT to St Lucia.
- Connected to a server that handled user access control and accounting
- Direct internet access, no direct access to internal UQ applications. Using terminal server to connect back to hosted applications on the UQ Network



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The Problem



Internet Explorer cannot display the webpage

Most likely causes:

- You are not connected to the Internet.
- The website is encountering problems.
- There might be a typing error in the address.

What you can try:

- [Diagnose Connection Problems](#)
- [More information](#)

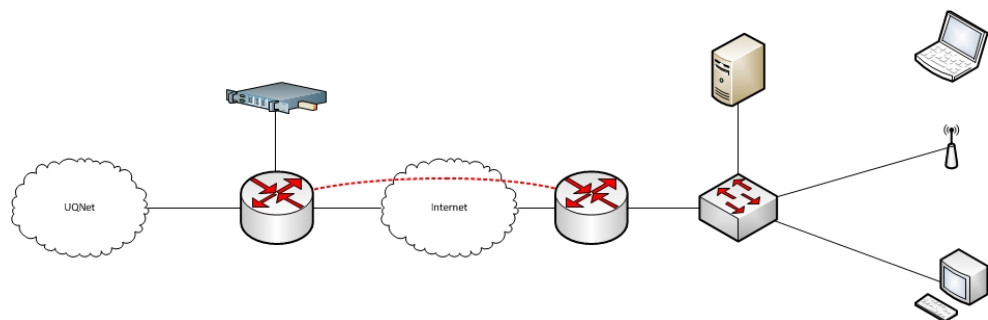
Several issues with island connectivity needed to be addressed:

- No direct access to internal applications
- Independent traffic accounting and billing
- Slow WAN link
- No management access to networking gear for NOC staff

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The (new) Technology

- Satellite link remains (for now...)
- Cisco 2951 router on site (active and cold standby unit)
- Embedded service module running WaaS software
- WAVE-294 and WAVE-594 on St Lucia Campus
- GRE tunnel for UQ Network and Internet access



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Cisco WaaS Platform

We have installed two Cisco WAVE devices in the St Lucia data centre to terminate the WaaS service.

Speedy is a WAVE-294 and acts purely as a central manager to allow management of both the acceleration engine at St Lucia and on the island.

Gonzales is a WAVE-594, which is the St Lucia acceleration engine

The acceleration engines on the island are embedded in the routers, running on the Services Ready Engine.

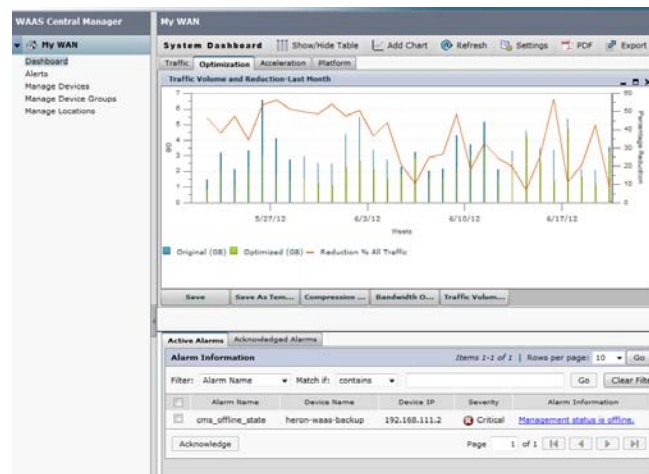
The St Lucia end has been implemented to allow future services to have their traffic routed via *Gonzales*.

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Cisco WaaS Platform (Cont.)

Using default optimization settings on the St Lucia – Heron link, we have seen a significant level of traffic reduction on the link.

Between 7% and 60% reduction in traffic on the WAN link depending on time of day.



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Minimizing WAN Link Traffic

In an attempt to minimize the bandwidth utilization of the satellite link, we were running an IOS content filtering service on the island, utilizing Cisco EEM to implement 'business hours' filtering. This did not work very well given the conditions.

Some issues were...

- Round trip time to the AV server was upward of 15 seconds for initial category check.
- Some sites were not getting cached in IOS properly, so there was a ~15 second delay every time a DNS lookup was required. This was noticed particularly with the Qantas website, staff were completely unable to book flights.
- Some sites were being classified in less than ideal categories.

This has now been disabled and we are currently investigating alternatives.

The Results

The performance of the link was measured by simply timing how long it took to login to key UQ resourced before and after the change.

Prior to the installation of the router on the island, staff were logging into a Windows terminal server at St Lucia to access these resources. The process of logging into the terminal server was taken into account.

There were four major services that were considered by the faculty as key services to measure. These were:

- Aurion
- UniFi
- The Risk Management DB
- The Incident DB



The Results (cont.)

We saw both a significant decrease in time taken once the GRE tunnel was implemented, which allowed taking the terminal server out of the equation; and after enabling the WaaS service.

	Before	After (No WaaS)	After (WaaS)
Aurion	1 min 55 sec	50 sec	23 sec
UniFi	2 min 4 sec	25 sec	14 sec
RiskDB	1 min 1 sec	1 min 12 sec	43 sec
IncidentDB	35 sec	30 sec	21 sec

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The Results (Summary)



Island staff can now directly access UQ corporate applications



Traffic Accounting is now handled via the central UQ login portal, with Visitor access cards available for visiting researchers.



The WAN link has been optimized using the Cisco WaaS technology.



The NOC staff can now login to all network devices on the island.

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The User Perception

During the upgrade we received mixed feedback from the island.

- No more local traffic management to take care of
- No more local proxy configuration to manage
- Not having to use terminal server
- Faster web access
- Broke some websites during the content filtering stage.
- *"Everything is the same"*



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In the Works

We are still investigating other filtering products for the island, mostly to limit p2p downloading from visiting school trips.

In the near future we will also see a trial service provided by AARNET which will see a Microwave service installed on the island back to a base station on the main land.



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More of this...



The Island: Heron Island Re

Questions?