

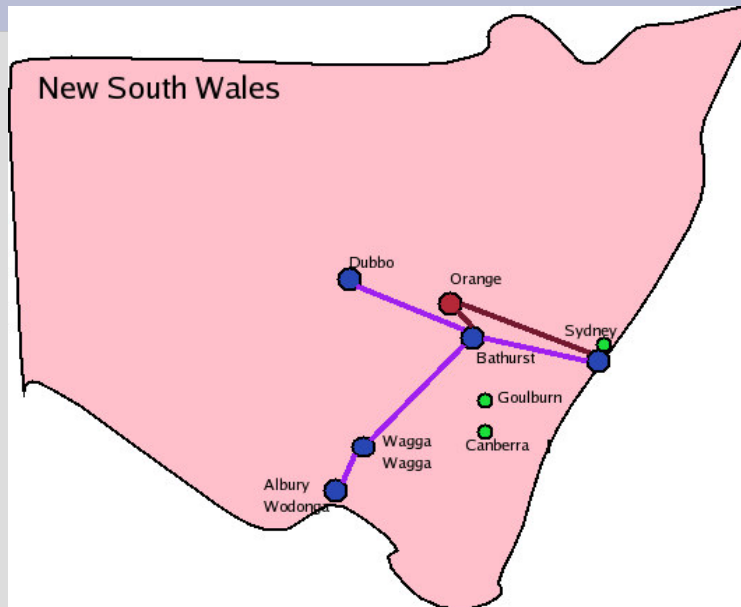
CSU NetReg

The “Why” and “How”
of registering computers
and charging for network access
at Charles Sturt University.

CSU NetReg

- System to register & charge computer access
- concept based on some internet projects
 - www.netreg.org
 - www.net.cmu.edu/netreg
- further developed/localised at CSU
- Important drivers:
 - New charging model required computer rentals
 - New Network roll-out
 - complete IP address re-number
 - device/computer names must be maintained

Charles Sturt University Network



Comms Recovery Models:

- Full comms cost recovery – no other funding

	Old Model	New Model
Phone Charges		
Rental per month	\$13.00	\$24.00
Tie Line	\$0.25	\$0.00
STD (per minute)	\$0.60	\$0.10
Mobile (per minute)	\$0.60	\$0.25
IDD (per minute)	\$2.00	\$0.60
Data Charges		
Rental per month	\$0.00	\$24.00
Download (per Mbyte)	\$0.20	\$0.03

New model principles

- Variable costs to cover variable costs
 - pass on actual costs for phone calls and internet downloads.
 - no longer inflate call charges to cover fixed costs
- Fixed costs to cover fixed costs
 - need computer rental charge to cover fixed data charges \$0 -> \$24 :
 - stress & queries from budget managers
 - self-service page for budget managers

Budget Manager Interface

- shows usage information for phones & computers
- Telephone Extension Actions
 - Delete an Extension – auto-disables
 - Transfer an Extension – requires a valid account code & informs recipient budget manager by email.
- Registered computer actions:
 - Disable (de-register) a computer
 - Transfer to another account code
 - Rename a computer registration
 - ie. suggest a new name

Budget Manager self service



comms review

Comms Charging > Introduction

Help

Introduction

These web pages will assist you in determining which telephone and computer registrations are still required in your section.

Please Note: these pages gather significant information about the services used for your account code. They can run slowly - particularly for large account codes. If the next page takes a while to load, please allow up to 5 minutes before re-trying or reporting a problem.

Important Note: We strongly recommend that you don't submit changes using this interface until you have attended a training session. Deleted telephones or computers will **cease to function correctly**.

We have identified the following account codes as being associated with your current login:

- INF
- A102.283

If the account code you are wanting is not listed above, please type it into the text box below to attempt a review of that account code

(e.g. A102.283 or A102.283.5432)

Account code:

Go

Phone

Numbers and costs for call types are since July 2004

Keep	Delete	Transfer	Extension	Description	Incoming	Internal	Tie	Local	STD	MOB	IDD	Rental
☐	☐	☐	32062	FAX	234	309	453	\$0.40	\$44.25	\$0.00	\$2.04	\$24.00
☐	☐	☐	32860	[REDACTED]	131	286	254	\$14.07	\$145.93	\$249.21	\$18.72	\$24.00
☐	☐	☐	32861	Doc Lines Ma [REDACTED] Ly [REDACTED] K [REDACTED]	926	820	320	\$29.25	\$134.73	\$65.31	\$0.00	\$24.00
☐	☐	☐	32903	R [REDACTED] ay	363	459	328	\$6.90	\$27.96	\$20.51	\$0.00	\$24.00

Computer

Computer registrations that are unused will be deleted by default. The initial Data Rental calculation has already removed these unused computers. Select Keep or Transfer if any such computers are still required.

Keep	Delete	Transfer	Rename	Computer Name	Last Used	Days Used	Recent Users	Rental
☐	☐	☐	☐	hplj1200	3-Jun-2005	172		\$24.00
☐	☐	☐	☐	kcollins-dt2	3-Jun-2005	189	masalmon	\$24.00
☐	☐	☐	☐	lgorman-dt	5-Jun-2005	35	lgorman cgorman jmaybury	\$24.00
☐	☐	☐	☐	lgorman-rt	16-May-2005	168	lgorman jcdickin godscha lgorman lgorman cgorman	\$24.00
☐	☐	☐	☐	mamoore-dt	5-Jun-2005	160	mamoore mamoore mamoore grmoore	\$24.00
☐	☐	☐	☐	rdoubleday-dt	2-Jun-2005	171	rdoubled rdoubled rdoubled	\$24.00
☐	☐	☐	☐	wfarts-hpjd500x-1	18-Feb-2005	142		\$24.00

Running Totals

Phone: \$48 Data: \$120 Total: \$168

Next > Cancel

Confirm

The following changes have been requested to Account Code **A102.104**.

Deletions

Click confirm box to remove rental charge and disable each item

Confirm Delete	Item	Details
☒	wfarts-hpjd500x-1	08:00:09:5f:37:60
☒	Telephone Extension	32062

Name Changes

Click confirm box and enter suggested new name

Confirm Name Change	Item	Details	New Name
☒	kcollins-dt2	00:0c:76:dc:2c:52	kcollins-dt23

Transfers

Click confirm box to transfer rental charge and enter account code supplied by the recipient for each item

Confirm Transfer	Item	Details	New Account Code
☒	mamooore-dt	00:09:6b:45:ea:29	A102.283
☒	Telephone Extension	32903	A102.283

☒ Simulate Action - Don't actually do it

Action

Back

Cancel

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comms review

Comms Charging > Action

Actions

Change actions were requested for Account Code **A102.104**.

Simulated Actions for Account A102.104

- Computer Name change request kcollins-dt2 -> kcollins-dt23 received - this should be completed within 1 week
- Computer Name wfarts-hpjd500x-1 08:00:09:5f:37:60 Disabled - this computer is no longer be registered on the CSU Network
- Telephone Extension 32062 Disabled
- Computer mamooore-dt Immediately Transferred to A102.283
- Telephone Extension 32903 Immediately Transferred to A102.283

Simulated Notifications

The Following Users would be informed of transfers to their account:

- direland@csu.edu.au,nrussell@csu.edu.au that xtn-32903 has moved to account code: A102.283
- direland@csu.edu.au,nrussell@csu.edu.au that mamooore-dt-00:09:6b:45:ea:29 has moved to account code: A102.283

Back

Back to previous page to Action changes without simulating

Cancel

Return to Main Menu

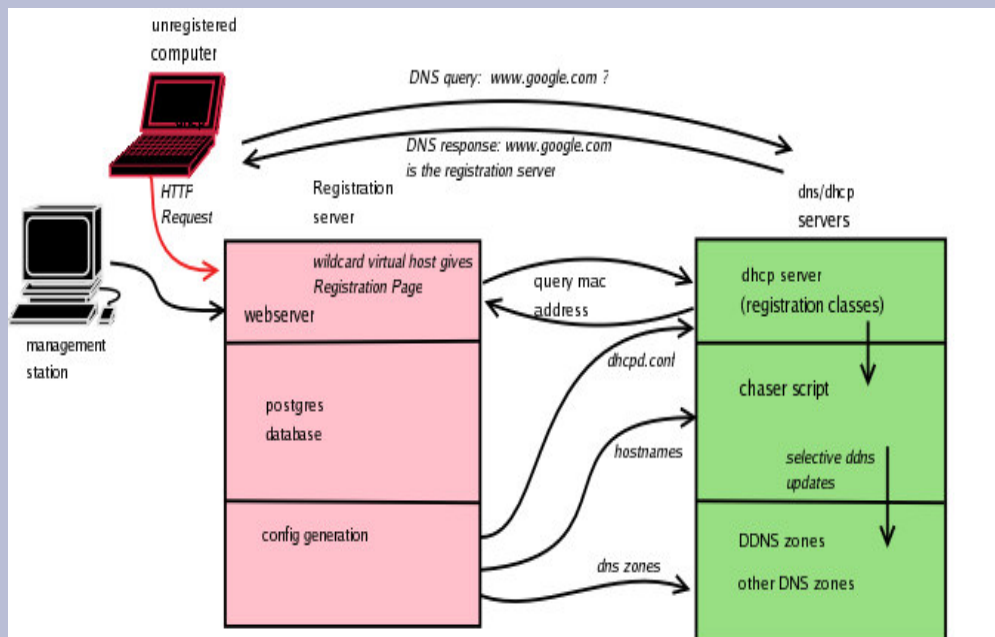
NetReg Concepts

- ideas from NetReg projects on the Net
- Relies on DHCP for IP address assignment
 - doesn't actively prevent manual IP assignment, though we plan to investigate router dhcp snooping
- Pool of addresses in each subnet for unregistered machines
- Bogus dns server returned to clients in the unregistered pool.
- Web browsing to any site from unregistered machine reaches registration page

CSU NetReg localisation

- Use our regular dns servers
- Up to 3 address pools per subnet
- DDNS updates using registered names
- supports controlled machine namechanges
- dovetails with Budget manager interface
- Track account codes for billing
- permit staff to self register for ad-hoc access
- special behaviour for res, student, radio vlans

NetReg Architecture



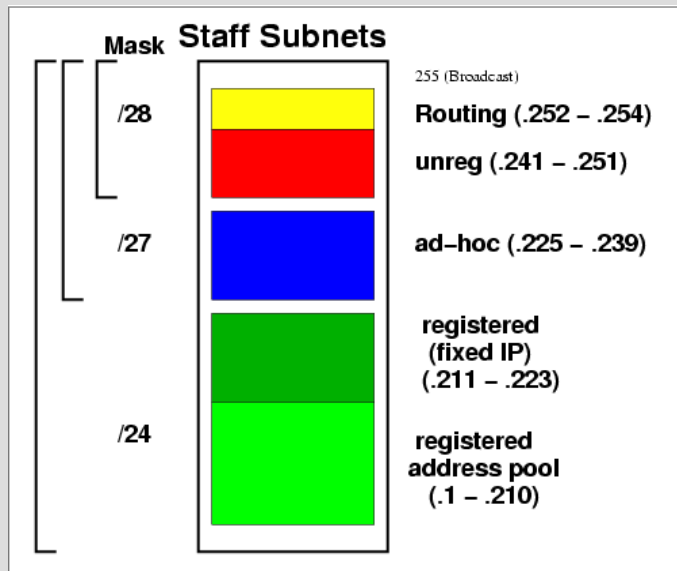
Chaser script updates DDNS

- Handles clients that don't do DDNS
 - NT4, print servers
- Updates with registered name
 - default ensures correct naming for print servers
 - uses client supplied name if namechange pending.
- Residences vlans – updates with username
 - Improves student traceability
 - residences student machine names stay out of DNS

NetReg Implementation

- Registration Server
 - linux (Fedora Core 3) – dual Xeon
 - Apache, mod_perl, postgresql database
 - dhcp & dns propagation scripts use perl
- DNS/DHCP Servers (1 per major campus)
 - Sun E420 or v440 – solaris 9
 - ISC bind version 9.2
 - ISC dhcpd version 3.0
 - chaser script uses perl

Staff subnet Address Pools



Netreg behaviour: unregistered

- Unregistered
 - only sees router and other unregistered machines
 - falsely small netmask
 - dns server returns registration server for all queries
 - ACLs prevent access to other machines
 - can't infect registered machines or servers with worms.

Netreg behaviour: ad-hoc

- CSU staff can self-register from unreg state
 - only sees router and other ad-hoc registered machines on subnet
 - falsely small netmask
 - dns server returns true results
 - ACLs prevent access to most other machines
 - select services & internet available to ad-hoc machines
 - can't infect registered machines or servers with worms.
 - Incurs \$2 per day computer rental charge

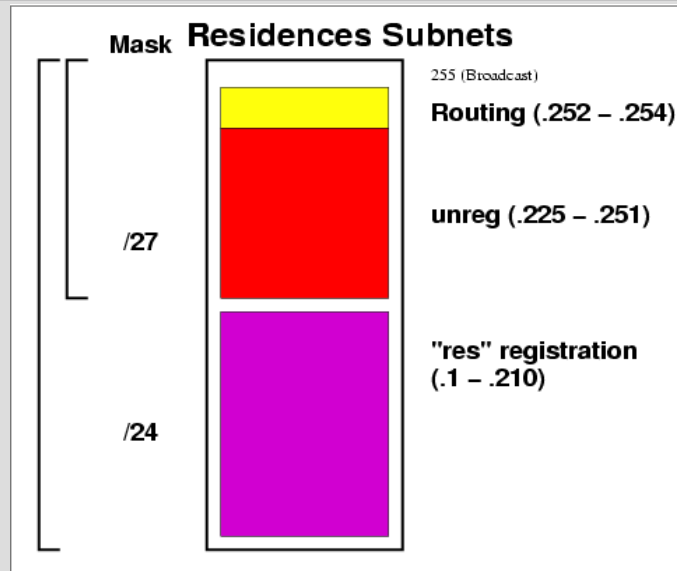
Netreg behaviour: registered

- registered machines
 - normal network access – true netmask
 - dns server returns true results
 - IT staff confident of patch/Anti-virus status.
 - Incurs \$24 per month computer rental charge
 - Large dynamic pool on each subnet
 - A few static IPs for QoS, special ACLs or server use.
 - Registration valid for entire CSU Network.

Netreg behaviour: residences

- residences registration
 - similar access to ad-hoc pool on staff networks
 - dns server returns true results
 - DDNS updates performed with student username
 - username.res.csu.edu.au
 - Yearly rental charge included in room rental
 - Registration valid for entire residence Network.
 - Residence registration will grant ad-hoc access on student vlans

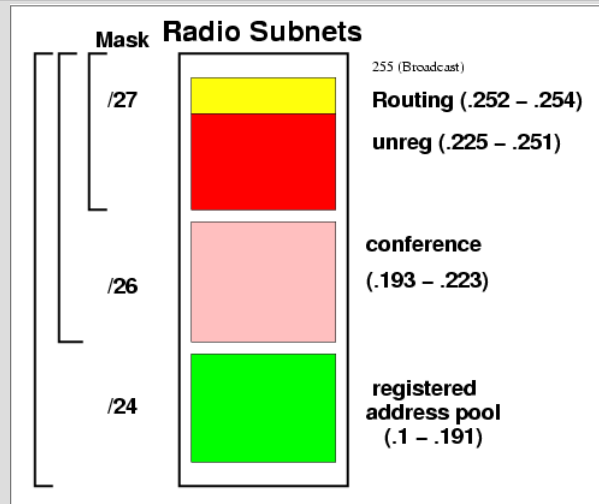
Residence subnet Address Pools



Netreg behaviour: radio

- radio: registered machines
 - Address pool can only access VPN
 - simple approach to radio security
 - may relax as radio security techniques further mature
 - Separate radio mac address tied to existing registrations
 - single \$24 per month rental for machines with both wired & wireless access
- radio: conferences (radio-direct)
 - conference username/password with valid dates
 - direct & easy Internet access
 - usage charges billed to the conference

Radio Subnet Address Pools



NetReg user pages



Register

[Network Registration](#) > Register

Register

This tool enables you to connect temporarily to the Charles Sturt University network.

To arrange a permanent connection please contact the IT Service Desk on extension 84357.

Temporary access to the CSU network is charged to the same account code as the telephone of the user requesting the temporary access at a rate of \$2 per day or part there-of. Downloads via the CSU proxy server and using the NetDirect utility will be charged at applicable rates.

Note: This system is currently running as a trial. If you experience any difficulty using this system please contact the IT Service Desk.

[[Continue](#)]

NetReg user pages



Register

[Network Registration](#) > Register

Register

Computer Address: 00:11:22:33:34:55

Username:

Password:

Register for:

☒ 1 day(s) (expiring Midnight Tue 14th Jun 2005)	\$2
☐ 2 day(s) (expiring Midnight Wed 15th Jun 2005)	\$4
☐ 3 day(s) (expiring Midnight Thu 16th Jun 2005)	\$6
☐ 4 day(s) (expiring Midnight Fri 17th Jun 2005)	\$8
☐ 5 day(s) (expiring Midnight Sat 18th Jun 2005)	\$10
☐ 6 day(s) (expiring Midnight Sun 19th Jun 2005)	\$12
☐ 7 day(s) (expiring Midnight Mon 20th Jun 2005)	\$14

NetReg user pages



Register

[Network Registration](#) > Register

Confirm Registration

Please confirm your registration details below:

Computer Address: 00:11:22:33:34:55

Number of days: 1 (expiring Midnight Tue 14th Jun 2005)

Charge to user: trayner

Account Code: A102.283

Total Amount: 1 day(s) @ \$2 per day
= \$2

The Budget Centre Manager(s) for this account code (direland@csu.edu.au,nrussell@csu.edu.au) will be notified via email of this registration.

If these details are correct please activate this registration by entering your password again and clicking 'Register'.

Password:

NetReg Residences user pages

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 **NETWORKS**

Register

Network Registration > Residences Registration

Register for access to CSU Residences Network

Welcome to the Charles Sturt University ResNet Service Access Registration Page.

To be able to access the ResNet Service, you will need to take a few minutes now to register your computer and login details.

By registering your computer and login details, you will be able to access CSU Online Services and the wider internet.

Access to the ResNet Service is conditional upon students completing this registration process.

By completing this registration process, you are agreeing to abide by the CSU Code of Conduct and CSU Policy for the Use of University of Computing and Communication Facilities, and other such policies as applied during the period that you remain registered for ResNet Access.

For information on what is and what is not provided as part of the ResNet Service, and for details on setting up your access to use ResNet, please [click here](#)

To report faults and problems related to ResNet Access, please contact the IT Service Desk on 84357

Username:

Password:

NetReg Residences user pages

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 **NETWORKS**

Register

Network Registration > Residences Registration

Register for access to CSU Residences Network

You have successfully registered your computer for access to the CSU Residences Network. Your computer will be assigned a DNS name of trayner.res.csu.edu.au.

Please wait 5 minutes and then restart your computer. After doing this you should have access to the CSU Residences Network.

NetReg Management Interface

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NETWORKS

SearchRegisterEditUtilities

Network Registration > Search > Results

Results

Search:

☒ Machine name ☒ Hardware address ☐ Account code ☐ IP address (static only)
☐ Include inactive enrolments ☐ Charge to user (eg residencies)

SearchCancel

Hardware address	Name	Current status	Static IPs	Last Seen	
00:10:4b:95:c5:3a	trayner-ct2	Registered (A102.283)	137.166.143.219	p750a-6513:Gi13/33 Tue 14-Jun-2005 23:05	[Edit] [Use As Template] [Terminate] [Disable]
00:c0:9f:37:8d:99	trayner-It	Registered (A102.283)		p760b-3750:Fa1/0/45 Fri 10-Jun-2005 11:05	[Edit] [Use As Template] [Terminate] [Disable]

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NETWORKS

SearchRegisterEditUtilities

Network Registration > Edit

Details

Hardware Address: 00:c0:9f:37:8d:99 [Change]

Secondary Addresses: None [Add]

Name:

QOS Category: ☒ none ☐ Gold ☐ Silver ☐ Bronze ☐ Best Effort

Firewall Category: ☒ none ☐ Low risk ☐ Medium risk ☐ High risk

Dynamic DNS Category: ☒ Database Supplied Via DHCP (Default) ☐ Client Supplied Via DHCP ☐ Disable Update DNS Via DHCP

Modify

Static IPs

No static IPs found for this computer!

[Add]

Enrolments

Active	Category	Start Date	End Date	Last Modified By	Account code	Charge to user	Notes
	Registered	30/01/2005 23:59	07/02/2005 14:06	user_trayner	A102.283		[Modify]
✓	Registered	25/05/2005 13:57		trayner	A102.283	Testing	[Modify]
	Registered	07/12/2004 00:00	30/01/2005 23:59	bulk_import	NETWORKS		[Modify]
	Registered	07/02/2005 14:57	25/05/2005 13:53	trayner	A102.283		[Modify]
	Residences	07/02/2005 14:54	07/02/2005 14:57	trayner		trayner	[Modify]

Note: the current effective enrolment is marked with a green check (✓).

registration classes & vlans

vlan	Staff	student	res	radio
Class				
registered	FULL	FULL	LIMITED	VPN Only
ad-hoc	LIMITED	LIMITED	LIMITED	VPN Only
res	NONE	LIMITED	LIMITED	NONE
radio_direct	NONE	NONE	NONE	Direct Internet
		staff/student:		redirect to radio
		redirect to	re-direct to	reg. page conf: ->
	re-direct to staff	staff/res reg.	res	radio_direct or
	registration page	page -> ad-	registration	staff/stud -> ad-
unregistered	-> ad-hoc	hoc/res	page -> res	hoc/res

Lessons learned

- DDNS with Netreg system made IP re-numbering across campuses much, much easier
- DDNS with chaser script gave much more control than we expected
 - DDNS can be better than just clients setting their own A and PTR records in DNS
- a few “gotchas”
 - redundant dhcp servers giving different leases
 - PCs printing to an IP address

“gotchas” cont.

- client dns caching – remembers old printer IP
- Unregistered worm-infested machines (residences) can load the registration server
 - some kernel tuning (syn_wait)
 - cached results of dhcp server mac-address query
- Unregistered machines needing AD domain authentication can't login to start web browser.
 - can fix if we open domain controllers to worm risk from infected unregistered windows clients.

The End!

- Questions ?