Coming up in part 2...

- Linux/Unix VPN Client
- SSH
  - scp/sftp
  - Tunnels
  - SSH keys
- Authenticated access
  - to Cambridge web resources
  - to E-journals
- Other things
Linux/Unix VPN Client

- See http://www-uxsup.csx.cam.ac.uk/vpdn
  - Will cope with new kernels/64 bit CPUs
  - Doesn't lock out normal networking
  - Will work on several platforms, even where Cisco client will not.
  - Won't cope with rekeying, but sometimes the Cisco one doesn't either.
scp & sftp

- ssh has two similar ways of copying files
- scp
  - older
  - some error handling
- sftp
  - newer
  - handles files better
  - very limited error handling
scp & sftp (for Windows)

- **PuTTY (pscp & psftp)**
  - Simple
  - command line
  - Like “Unix”

- **WinSCP (uses PuTTY)**
  - graphical
  - “Friendly”
SSH Tunnels

- SSH supports 'port forwarding'
- Useful for creating secure 'tunnels'
- But also changes apparent origin
SSH Tunnels

- SSH supports 'port forwarding'
- Useful for creating secure 'tunnels'
- But also changes apparent origin
Basic forwarding

ssh -L 7654:ppsw.cam.ac.uk:25 jpk28@linux.pwf.cam.ac.uk

If you have any problems, please email Help-Desk@ucs.cam.ac.uk.

*** Message of the Day: ********************************************
Wed 8 Feb: Data Network (CUDN) service especially at SOUTH liable to
interruptions 07.45 - 08.30 (routine failover testing).
*** End of Message of the Day: ********************************************
*** Recent PWF News File items (Insertion date & Title): ***************
Wed 25 Jan  Printing to PWF printers from non-PWF computers
Fri 20 Jan   PWF print "common balance" - pilot status ended
             PWF NetStorage Service - pilot status ended

For further details including past items, please refer to the PWF News file
*****************************************************************************
See http://www.cam.ac.uk/cs/courses/ for Computing Service Courses
*****************************************************************************
jpk28@smaug:~
Basic forwarding

```
ssh -L 7654:ppsw.cam.ac.uk:25 jpk28@linux.pwf.cam.ac.uk
```


If you have any problems, please email Help@pwf.cam.ac.uk.

*** Message of the Day: **********************
Wed 8 Feb: Data Network (CUDN) service exception: interruptions 07.45 - 08.30 (route 56.4.1.2)
*** End of Message of the Day: **********************
*** Recent PWF News File items (Insertion date in format: week/week):

Wed 25 Jan  Printing to PWF printers from new equipment.
Fri 20 Jan  PWF print "common balance" - pilots.
PWF NetStorage Service - pilots.

For further details including past items, please see http://www.cam.ac.uk/cs/courses/.

```
jpk28@HomePC1:~$ telnet localhost 7654
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
jpk28@HomePC1:~$ 220 ppsw-9.cam.ac.uk (ppsw.cam.ac.uk [131.111.8.139]:25) ESMTP Exim 4.54+ppsw
wk+w+0 Wed, 01 Feb 2006 15:15:59 +0000
```
PuTTY can do this too
PuTTY can do this too

Not this!!!

(nor the -g option of ssh)
Simple web forwarding

ssh -L 7654:www.cam.ac.uk:80 jpk28@linux.pwf.cam.ac.uk


If you have any problems, please email Help-Desk@ucs.cam.ac.uk.

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*******************************************************************************

jpk28@Smaug:~
Simple web forwarding

ssh -L 7654:www.cam.ac.uk:80 jpk28@linux.pwf.cam.ac.uk
Forwarding a proxy connection

```
ssh -L 7654:wwwcache.cam.ac.uk:8080 jpk28@linux.pwf.cam.ac.uk
```

```
jpk28@HomePC1:~> ssh -L 7654:wwwcache.cam.ac.uk:8080 jpk28@linux.pwf.cam.ac.uk
Password:
Last login: Wed Feb 1 16:29:07 2006 from pcuxsup1.csi.cam.ac.uk


If you have any problems, please email Help-Desk@ucs.cam.ac.uk.

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    interruptions 07.45 - 08.30 (routine failover testing).
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***********************************************
See http://www.cam.ac.uk/cs/courses/ for Computing Service Courses
***********************************************
jpk28@smaug:~>
```
Forwarding a proxy connection

```
ssh -L 7654:wwwcache.cam.ac.uk:8080 jpk28@linux.pwf.cam.ac.uk
```
Securing the insecure

ssh -L 5900:localhost:5900 jpk28@linux.pwf.cam.ac.uk

Not just VNC, but anything insecure can be protected this way.
Problems with all this

• Tricky to get right and hard for naive users
• Need a tunnel endpoint
  – Own system
  – Department system
  – CUS (not for much longer)
  – linux.pwf.cam.ac.uk
• Best as an ad-hoc fix?
SSH keys

- Will *not* work with linux.pwf.cam.ac.uk
- Will work for “normal” Unix boxes
- Can work with most ssh clients, including PuTTY
- Keys are useful, but are only as secure as you make them
- Keys can be used with an agent (both ssh and PuTTY have support)
Authenticated access

• All this reliance on IP addresses is foolish
  – too restrictive
  – too lax
  – doesn't do what you think it does

• If we want to limit access to particular people then you have to identify the people at the target computer.
Our web-based resources

• Raven
• “A centrally-managed, password based authentication system for web applications”
• Central server
• Web browser/web application plugins
• Gives you a CRSid on which you can base decisions
• More info at http://raven.cam.ac.uk/project/
Explicit users

LoadModule ucam_webauth_module \modules/mod_ucam_webauth.so
AACookieKey afe8f45ce49666ab04b36976a

<Directory "/users_only">
    AuthType WebAuth
    Require user jw35 jml4 jpk28
</Directory>
Restriction by group

LoadModule ucam_webauth_module \ modules/mod_uacam_webauth.so
AACookieKey afe845ce49666ab04b36976a

<Directory "/groups-only">
  AuthType WebAuth
  AuthGroupFile groups
  Require group cs-staff
</Directory>
Restriction by group

LoadModule ucam_webauth_module \modules/mod_ucam_webauth.so
AACookieKey afef845ce49666ab04b36976a

<Directory "/groups-only">
  AuthType WebAuth
  AuthGroupFile groups
  Require group cs-staff
</Directory>

groups:
  cs-staff: jw35 jml4 jpk28
  friends: spqr1 abc99
Any Raven user

LoadModule ucam_webauth_module \modules/mod_uacam_webauth.so
AACookieKey afe845ce49666ab04b36976a

<Directory "/raven-only">
  AuthType WebAuth
  Require valid-user
</Directory>
'cam-only' for the 21\textsuperscript{st} century?

LoadModule ucam_webauth_module \ modules/mod_ucam_webauth.so
AACookieKey afe859ce49666ab04b36976a

<Directory "/cam-only">
  AuthType WebAuth
  Require valid-user
  Order allow,deny
  Allow from .cam.ac.uk
  Satisfy any
</Directory>
E-journals

- ERL (limited lifespan)
- Athens-based resources
  - Athens passwords
    http://www.lib.cam.ac.uk/electronicresources/Access_Passwords.htm
- E-Journals list
  - http://www.lib.cam.ac.uk/ejournals_list/
  - Accessible via Raven/Proxy
- More information (for users) from
  - http://www.lib.cam.ac.uk/electronicresources/index.htm
Limitations

- Raven is *web browser* only
- ssh is *TCP* only
- Some services cannot be tunnelled
- Some services cannot be proxied
- <your service>
If you have been, thanks for listening...

to this stolen talk...

Thanks to Jon Warbrick for letting me steal it!