Using DICE Laptops

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1 Introduction

The DICE Informatics computer environment has been designed to work as well on laptops as it does on desktop PCs. As the user of a DICE laptop, you should be able to do all the same things on the laptop that you can do on a standard desktop machine.

However there are inevitably some differences, caused mainly by the need to be able to disconnect the laptop from the network and move it from place to place. These differences mean that a DICE laptop demands a little more care than does a desktop computer.

2 Software Updates

A DICE machine's software is installed and deleted automatically. On desktop machines the automatic software adjustments happen every night. This is not appropriate for a laptop, which may only be connected to the network occasionally, and then only for a brief period. For this reason, software updates on laptops happen only *when you command it*. Do this by connecting the laptop to the network, logging in, and typing

```
laptopupdate
```

You should do this daily, or as close to daily as you can manage.

Note that `laptopupdate` will only work when the laptop is connected to the network using a conventional network wire: it does *not* work over a wireless network connection.

Note also that **it is not safe to do anything else while laptopupdate is running**, because `laptopupdate` rebuilds the LDAP information on which much of DICE depends. (We aim to improve the LDAP updates to the point where this restriction will no longer be necessary.)

`laptopupdate` can take a few minutes to complete. While running it gives a commentary on what it is doing. The output from a typical `laptopupdate` run is shown in Appendix A.

3 Managing Home Directories

3.1 Local files and network files

A DICE laptop carries local home directories for its users on the laptop's own hard disc. (Without this, it wouldn't be possible to login and work normally while disconnected from the network.) These local home directories exist in addition to the normal "network" home directories.

The local home directory will appear at `/home/`*username*.

The network home directory is available (while the laptop is connected to the network!) at `/nethome/`*username*.

The laptop's local home directory will be empty until you start creating files there or copy them from your network home directory. Until then, any personal customisations that you have made to your normal environment will not be present on the laptop.

3.2 Backups and File Synchronisation

Your network home directory is regularly backed up. However your local home directory on the laptop is **not backed up at all** except by your own actions. You *must* copy any important files from the laptop to your network home directory, or make other backup arrangements of your own. If you do not, any disaster that befalls your laptop (hardware failure, airport theft, dropping it, etc.) will result in the loss of all your files! **Copy important files regularly to your network home directory!**

Unison is a good tool for synchronising files between laptop and desktop machines. The Unison manual can be found in `/usr/share/doc/unison–`*version*.

The *rsync* utility can also be used to copy files and directories between machines. See `man rsync` for details.

4 The Informatics Wireless Network

At the time of writing, the DICE wireless network covers the ground floor concourse and the east end of level 3 of Appleton Tower; pretty much all of 2–6 Buccleuch Place; and the 16, 24 and 25 corridors in JCMB. Coverage may also extend to adjacent floors. These areas form one logical network which is part of the Informatics domain. It is possible to move between the areas while retaining the same network address and all the same facilities as when connected to the Informatics wired Ethernet.

The wireless network has access control by MAC (Ethernet) addresses so that only registered users can connect. However, *there is no encryption* and the wireless range does extend outside of the building, so please think twice before sending sensitive data such as passwords in plaintext.

4.1 Connecting to the network

Use of a laptop on the wireless network requires the following:

❑ An 802.11b compatible wireless network card.

❑ The MAC address of the card to be registered with the support staff.

❑ The laptop to be configured for wireless support.

4.1.1 The wireless card: Newer laptops tend to have a wireless card built in; other laptops will need a PCMCIA wireless card.

In theory, any wireless card conforming to the 802.11b standard should be sufficient. However, encryption schemes on the wireless network are liable to change, so we only support cards based on the Lucent chipset and only when used with a DICE laptop. Other combinations of card and operating system may work, but use them only at your own risk; we do not support their use with the wireless network.

4.1.2 The MAC address: The support staff will need the MAC (Ethernet) address of the card to authorise connection to the network. This is usually printed on PCMCIA wireless cards; laptops with internal wireless adaptors should be able to tell you the card's MAC address through software. On a DICE laptop with an internal wireless adaptor, try `/sbin/ifconfig eth1`. It may take some time for new cards to be authorised, since adding individual cards is currently a time-consuming manual process.

4.1.3 Configuration: Support staff can configure standard DICE laptops to operate on the wireless network by making the appropriate configuration changes.

Windows machines should operate satisfactorily using the software supplied with the card. This should be configured to use the network name `informatics`. Most other parameters can be left at their default values. The wireless network supports DHCP for automatic assignment of network addresses.

Self-managed Linux machines can be used on the wireless network by using the `wvlan` drivers supplied with recent kernels. These drivers are preferable to the `wavelan2_cs` drivers supplied with the card. The `pump` program can be used to configure the interface via DHCP. Configuring Linux correctly is not easy, and we recommend the use of a standard system which includes software to automatically switch between networks.

4.2 Using the Wireless Network

For a DICE laptop with an internal wireless adaptor, sending it to sleep, disconnecting any network wires then waking it up again will make the system reconfigure for the wireless network. Reverse the process to switch back to the wired network.

If a PCMCIA wireless card is used, inserting it should make the system reconfigure to use the wireless network. Removing the wireless card and re-inserting a standard Ethernet card is sufficient to reconfigure for normal wired usage.

A network reconfiguration can be manually forced at any time by typing:

```
sconf -v
```

Note that machines will have different addresses depending on whether they are connected to the wired or wireless networks. It is important to use the appropriate name if addressing the laptop from elsewhere on the network. By convention, the addresses are given the DNS names *hostname*-X (where X is the name of the ethernet subnet normally used by that machine - for example *m* or *c* or *g*) for the wired connection and *hostname*-r for the wireless connection.

Non-DICE laptops will require their own mechanisms for switching between the networks and will be allocated dynamic DHCP addresses.

5 Using DICE Laptops on "Foreign" Networks

DICE laptops maintains a set of network "schemes", each defining all the necessary configuration variables for a particular network connection. Each scheme also contains a "probe" address for some well-known machine on that network. When a network interface is activated, an attempt is made to contact all the probe addresses (using the ARP protocol) and the one that responds is used to identify the current network. The network parameters are then set accordingly.

User schemes can be created for use at remote sites using the network scheme editor (`nse`). This supports both wired and wireless networks. See the document *Managing Network Schemes with LCFG Divine*[1].

6 Dial-up Access

DICE laptops can dial up and access the network over a telephone line using a modem (usually either built in or on a PCMCIA card). Configuring the laptop for dial-up access is covered in a separate note *Dial-up Access from DICE Linux Portables*[2].

7 General Tips

7.1 Battery Charge

The amount of charge left in the laptop's battery can be monitored using programs such as `apm` or `xapm` or Gnome's built-in battery monitor.

7.2 Shutting Down and Sleeping

To save battery power, the machine can either be shut down completely (do this by clicking the "Shutdown" button on the login screen) or it can be put into *sleep* mode.

In sleep mode the laptop is dormant and cannot be used.

"Waking" out of sleep returns the laptop to the state it was in before sleeping. For example, an interrupted login session will be restored to the same state as before the sleep — with the exception that when waking from sleep the machine will reconfigure to use the most appropriate network connection.

7.3 Filesystem damage

If the laptop was shut down uncleanly, it will automatically check the state of its filesystems when it next starts up. If it finds a problem which needs manual interventionq it will ask for a root password. If this happens, contact a User Support person immediately.

7.4 Tips for the HP 6000

7.4.1 Restart: The HP6000 cannot *restart* properly; if a restart is attempted the machine will hang indefinitely. To restart, shut the machine down then switch it on again.

7.4.2 Hung machine: To rescue a machine which has hung, slide the power key and hold it for several seconds. This forces a shutdown. When the machine is powered on it will perform a filesystem check and will probably demand a root password. Ask a User Support person to type this in for you.

7.5 Tips for the Dell Latitude C640

Other Dell Latitudes should be similar but have not been tested by the authors.

7.5.1 Sleeping: A Dell Latitude can be put to sleep by pressing *Fn-Esc*. Once asleep it can be woken up again with a press of the power button.

7.5.2 Power button: Press the power button to switch the machine on, but do *not* press it to switch the machine off. Doing this shuts it down in an unsafe way which may cause filesystem damage.

The exception to this rule is that you may have to force an unsafe shutdown if the operating system freezes completely; if this happens, try holding down the power button for several seconds.

7.5.3 Cooling fan: At times the internal cooling fan fails to switch itself off. Pressing *Fn-Z* should stop it.

7.5.4 Garbled screen: At times the screen may fill with strange patterns, perhaps after waking the laptop from sleep. If this happens, try clearing the screen with this key sequence:

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[1]/usr/lib/lcfg/doc/pdf/lcfg-divine.pdf
[2]/usr/lib/dice/doc/pdf/ezppp.pdf

Ctrl-Alt-F1
Fn-D
space bar
Ctrl-Alt-F7

7.6 Dell Latitude C640 with Dock

These additional notes may help if you're using a docking station with your Dell Latitude.

7.6.1 External monitor: If using an external monitor attached to the dock, with the laptop itself closed and docked, the laptop must be rebooted on being connected to the dock, and shut down before being removed from the dock.

7.6.2 Undocking and sleeping: If using an external monitor, you cannot undock the laptop then put it to sleep; you must shut it down before undocking. If using the laptop's own screen while docked, you can undock while the laptop is running.

In either case, to undock, pull the lever on the left hand side forward to release the laptop. If the laptop is still on you can now send it to sleep in the usual way.

Never suspend (sleep) the laptop while it is docked, then undock it. When the laptop wakes its screen may be garbled.

7.6.3 To access the wired network: The docking station has its own network connection. To get the laptop to see and use this network connection, boot the laptop while it is docked.

Alternatively the laptop's own network connection may still be used while docked. To bring the network connection into use, connect the wire then either bring the laptop back from sleep or type the `sconf` command.

7.6.4 Dock buttons: The dock's power button can be used to switch the laptop on. However you should *not* press it when the machine is already on, because it switches off the power in a way that can cause filesystem damage. Always switch off by clicking "Shut down" from the DICE login screen.

7.6.5 Dock headphone socket: The headphone socket on the dock may not work; headphones should be connected to the laptop's own headphone socket.

Appendix A **Sample output from `laptopupdate`**

```
Updating laptop configuration data...
[OK] auth: run
[OK] sshd: run
[OK] updaterpms: run
[OK] symlink: run
[OK] ldap: run
[OK] kerberos: run
[OK] dns: Update
[OK] snmp: run
[OK] boot: run
...update finished.

Some DNS maps may still be in transit, so please do not disconnect
from the network for a couple of minutes...
```

This is a fairly minimal run of `laptopupdate`. It may sometimes give extra information, for instance when it installs new software or runs periodic housekeeping commands.