

Backup

The installation of a simple method to back up workstations to a remote server (the host whitechuck) is described.

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Weekly Full Backup of Whitechuck

Introduction

Late each Saturday night, a full tape backup of whitechuck is initiated. It takes at least six hours. This section describes the process.

Tape Cycle

At present (May, 2005), a cycle of four tapes is used. One tape should always be in the tape drive. Two tapes should always be at an off-site location. The fourth tape is usually brought to the lab sometime during the week, so that it can replace the tape in the drive the following Monday.

Use only DLT IV tapes. There are some DLT III tapes in the server area, but they do not have sufficient capacity.

The tapes are numbered one through four. They are used in the normal cyclic order.

Tape Drive Maintenance

The only maintenance that we can perform on the tape drive is the occasional use of a cleaning tape. We do not have a DLT IV cleaning tape. Use the one that is marked DLT III. Simply insert the cleaning tape in the drive. The drive will sense it, use it for a few seconds to clean its heads, then eject it.

Use the cleaning tape about once a quarter, or if a lot of errors are reported during backup.

Tape Backup Software

We use a proprietary software package, called the *backup & restore utility* (bru) to back up whitechuck to tape. We use the desktop version 17.0, because it is both inexpensive and adequate for our purposes. The more expensive versions can back up multiple computers over the network. We accomplish the same thing by having file systems on webserver and cspkserver mounted on whitechuck, using NFS.

Bru can be easily reinstalled from CDROM, if necessary. The installation wizard will ask for the *license data* and the *license key*. These are printed on a label in the license brochure which should be kept in the box that contains the CDROM. Be sure to install both bru and the graphical interface, called xbru.

Scheduling the Backup

After reinstallation, or if it becomes necessary to change the schedule, the graphical interface, xbru, can be used to schedule a full backup, either one time or recurring. At present (May, 2005), we choose to full backup once a week, on Saturday at 10 PM.

Select the option which overwrites any data already on the tape.

Switch Tapes and Examine the Execution Log

Early in the week, preferably Monday morning, the backup administrator should remove the tape from the drive and replace it with the next in the cycle. To remove the tape, log into whitechuck from the shared keyboard, video monitor and mouse in the server area, then input the following in a terminal window:

```
su -  
mt -f /dev/nst0 eject
```

After the tape ejects, remove it from the drive and replace it with the next tape. The drive will take a minute or two to read the header information and position the tape.

During the time that the new tape is settling in, run xbru and use it to examine the execution log. You should see three entries, each of which will include a count of errors and warnings. There should be no errors and at most a few warnings. If this is not the case, you will need to initiate a one-time full backup.

In addition to checking for errors, verify that the total elapsed time for the backup is not becoming excessive. At present (May 2005), the backup takes about six hours. If this time becomes longer, it probably means that there is more data being backed up. At some point, the amount of data may exceed the capacity of the tape. One reason for a rapidly growing amount of data is the inclusion in one of the developer home directories of a file hierarchy which does not really need to be backed up, because it is not changing. If that is the case, ask the developer to move that data out of his or her home directory.

After the tapes have been switched and the backup log verified, the tape that was removed should be taken off site. It has been recent practice for the backup administrator to simply take the tape home at night, and to bring the tape that precedes it in the cycle to work in the morning. For example, if the recent backup was on tape one, then tape four precedes it in the cycle, and is the one that should be taken back to work so that it is available on the following Monday.

Restoring Files from a Backup Tape

Occasionally it becomes necessary to restore one or more files. This is easy to do, with the assistance of xbru. Here are some steps to follow:

1. Cause the tape currently in the drive to eject:

```
su -  
mt -f /dev/nst0 eject
```

2. Insert into the drive the tape most likely to contain a copy of the file to be restored. Wait until repositioning activity stops.
3. Start xbru in your root terminal window:

xbru &

4. Click the **Restore** button.
5. Xbru will read a hierarchical list of all directories and files on the tape. This can take quite a while.
6. Eventually the hierarchy will appear in the left half of the window. From that hierarchy, highlight directories and files that you want to restore and click the **Add** button to copy their names to the right half of the screen.
7. Open up the **options** screen, and decide whether you want data from the tape to always overwrite data on disk, or only if the data on the tape is the same age or newer than that on disk. Also decide whether you want the data to be copied right into its old place on disk, or just copied into a subdirectory for later disposition.
8. Click the **Restore** button, to start the copying from tape to disk. This may take quite a while.
9. When the copying is complete, a **Done** button will appear. Click it.
10. Before closing the xbru window, verify that you have what you want. You can press **Restore** again, and this time you will not have to wait for the hierarchy list to be created.
11. When you are satisfied, or resigned to the fact that the files that you want are not on the tape, close the Xbru window.
12. Cause the tape to eject, and replace it with the tape to be used for the next scheduled backup. *This is important!*

Daily Backup of Software Developers' Home Directories

Introduction

This section shows how to set up a process which automatically copies a developer's home directory on her workstation to a subdirectory of her home directory on whitechuck, after each work day. The copies on whitechuck are retained for eight days. Everything on whitechuck, including these workstation backup files, is backed up to tape once a week.

Prerequisites

Before attempting this installation, you should already have followed the installation processes in the following RFPK HOWTO documents:

- SSH Configuration HOWTO
- Electronic Notification HOWTO

Install the Shell Scripts

In a shell window, issue the following commands:

```
cd
```

```
mkdir bin
cd bin
scp whitechuck:/opt/download/shell.tgz .
tar xvzf shell.tgz
rm shell.tgz
```

Set Up get-agent-data To Run at Startup

One of the scripts that you installed in the previous section must be run by the Gnome desktop at startup, after the running of **ssh-add**. The script, named **get-agent-data**, writes variable assignment statements (in shell script language) for the environment variables that have just been set by **ssh-agent** to a file, so that they can later be read by other shell scripts running under the cron batch scheduler.

Perform the following menu sequence:

```
Main => Extras => Preferences => Sessions => left-click
```

This will open the Sessions window. Press the **Startup Programs** button followed by the **Add** button. Then set the following variables:

```
Startup Command: /home/username/bin/shell/get-agent-data
Priority: 75
```

where *username* is your username. Close the window by pressing the **OK** button.

Edit Your Crontab

The **crontab -e** command will open up an editor window, so that you can edit your crontab file. The default editor is **vi**. If you prefer **emacs**, add the following two lines to your `~/.bash_profile` file

```
EDITOR=emacs
export EDITOR
```

and then restart your desktop.

Execute the following command:

```
crontab -e
```

and an **emacs** window should appear, displaying the crontab file, ready for editing.

Add the following line:

```
30 2 * * 2-6 ~/bin/shell/backup-home-full
```

close the file, and your home directory will be backed up to whitechuck at 2:30 AM of each morning that follows a weekday.

Check Your Work

If everything goes well, you should be able to log into whitechuck the next morning and see the new file in the directory `~/backup`. If errors occur, they will be sent to the mail box on your workstation, which you can read using **pine**.

Backup