

BRU-Pro Administrator's Guide

BRU-Pro Version 2.0



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BRU-Pro Administrator's Guide

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Preinstallation Requirements

BRU-Pro Server Preinstallation Requirements

Linux System Running Kernel 2.2.19/20 or 2.4.15/16/17

These are the ONLY kernel revisions we support. If you choose to use a 2.4 kernel older than 2.4.15, you're literally gambling with your data! Watch especially for devfs issues in pre-2.4.11. Also, the SCSI layer in earlier kernels exhibits __alloc errors when accessing SCSI devices for write I/O.

100MB Disk Space (Server - includes server, agent, and console) *plus ~1.5MB per 100K Files backed up for catalogs*

4MB Disk Space (Agent)

64MB RAM (128MB Recommended)

X11 Interface (800x600x16bit minimum resolution)

Linux compatible mouse

mt-st 0.5b, 0.6, or 0.7 (check with 'rpm -qa |grep mt-st')

*GNU mt provided with the cpio package **will not work.***

Server Preinstallation Steps

CURRENT BRU USERS: BRU and BRU-Pro CANNOT coexist on the same server. This is being examined and is scheduled to be resolved in an upcoming release.

If you are currently using another backup solution and wish to save any backups

If MySQL is installed on the system, shut it down during the BRU-Pro installation. This should be accomplished by running `"/etc/rc.d/init.d/mysql stop"` or something similar. Once the BRU-Pro installation is complete, you may restart the existing MySQL process without interfering with BRU-Pro operations. Refer to your OS documentation for information on stopping and restarting init processes.

Make sure your SCSI tape drive is connected and functioning properly. If you are using a library or loader, make sure that it is set to operate in **RANDOM** mode, not **SEQUENTIAL** mode and that all necessary SCSI ID's are properly set.

If you are running a library that does not offer barcode support,

make sure that any cleaning and diagnostic tapes are removed. Once the BRU-Pro installation completes, these tapes may be replaced and identified as non-destination tapes.

If your library offers barcode support, please make sure all cleaning cartridges are labeled with 'CL' labels (refer to your library documentation for details).

If you are installing from the CD, be sure that your system's automounter allows you to execute programs from the CD once it mounts them. If you examine the mount list and you see 'noexec' in the flags field for your CD-ROM, please unmount the CD and remount it manually to enable execution of programs. If you are installing from a downloaded tarball, please extract it into your `/tmp` directory for easier cleanup once the installation is complete.

Double check your host and domain names to ensure your system properly identifies itself (exec 'hostname' and 'domainname' to check). Set these to appropriate values if they are not properly configured.

****IMPORTANT**** The Server **MUST** have a static IP address, or your internal DHCP name for the machine **MUST** match the name assigned above. If they do not match, installation will FAIL. If you are using DHCP for your server, please consider using a fixed DHCP address or a static IP address to ensure that the server is properly recognized.

If you are using Red Hat 7.1 or 7.2 for your BRU-Pro installation, `libncurses.so.4` may not be installed. The implementation of MySQL included on the BRU-Pro distribution requires this version of `ncurses` for proper operation. If you don't find `/usr/lib/libncurses.so.4` on your system, please create symbolic links as follows:

```
In -s /usr/lib/libncurses.so.5.2 /usr/lib/libncurses.so.4
In -s /usr/lib/libncurses.so.5.2 /usr/lib/libncurses.so.4.2
```

For SuSE users - SuSE Linux ships with GNU `mt` installed. You will need the `mt-st` package for BRU-Pro to install and operate. You may retrieve the latest version of the `mt-st` package from www.rpmfind.net by searching for 'mt-st'

If you are running a Debian variant, a preinstall script is provided

to create the proper directory structures and symlinks necessary to run BRU-Pro under Debian. Additionally, this update provides the appropriate version of the `mt-st` utility.

Client Preinstallation Steps

Check your host name resolution to ensure the server name entered in the above steps resolves properly - in other words `engineering.tolisgroup.org` instead of just `engineering`. This is very important when configuring the client/server communications.

If your client does respond to a scan from the server, login to the server and execute `'telnet CLIENTNAME 6662'` to test connectivity. If you are greeted by the connect message, then you are able to connect to the client and `aserv` is running. If you receive "Connection refused" or no response, please check your network environment (routing, firewalls, etc.).

Refer to the appropriate sections below for detailed information on installing the server and client software.

Tape Server Installation

Tape server installation consists of:

- Creating a 'brupro' user
- Installing the software
- Initial system configuration
 - (administration configuration, device scanning)
- Final system configuration (client scanning)
- System boot configuration (get BRU-Pro to start when you reboot)

Creating a 'brupro' User

Create a user named 'brupro' using your OS's native tools (e.g., `useradd` or `linuxconf` for Red Hat Linux, `lisa` for Caldera, `YaST` for SuSE). The password for this account is not important since this user is strictly a marker account for the BRU-Pro installation. BRU-Pro maintains its own user and password database. You will be prompted for the BRU-Pro password for the `brupro` administrative user during the installation process. It is important that your first login to the BRU-Pro environment is

as brupro. After initialization, BRU-Pro only provides administrative access to this user.

After you've logged in as brupro, you may add users and assign them various administrative levels. We will discuss user hierarchies later in this document.

Installing BRU-Pro from the BRU-Pro CD

Mount the CD and set your working directory to the CD's root directory. Type `./install.sh`. You will be presented a menu shown below.

Installing Software Downloaded via FTP:

By downloading one of the server tarballs, `ServerLinux-i386.tar`, `ServerLinux-ppc.tar`, or `ServerLinux-ia64.tar` from our website, you have the full installation for the server system you will be using. This tarball contains the server, `tserve`, the console, `xbrup`, and the agent, `aserv`, and all other files required for normal BRU-Pro operation.

Move the `ServerLinux` tarball into your `/tmp` directory and 'cd' into `/tmp`. Using `tar`, extract the contents of the file using `tar -xvf ServerLinux-*.tar`. Once extracted, execute the 'install.sh' file to begin the installation process. You will be greeted with the following display:

```
-----  
                          BRU-PRO V2.0.0.2  
                    INSTALLATION OR UPDATE  
-----  
  
1. Install BRU-Pro tape server  
   Note: Installs client and control console too)  
2. Install BRU-Pro backup client  
3. Install BRU-Pro control console  
  
4. Update BRU-Pro tape server  
   (Note: Updates client and control console too)  
5. Update BRU-Pro backup client  
6. Update BRU-Pro control console  
  
Q. Quit  
-----
```

Initial System Installation

Selecting option 1 from this menu will begin a fresh install. Please note that if you are currently running a copy of BRU-Pro, it will be COMPLETELY overwritten - including your current, on disk, backup catalogs. This does not mean that you can't restore from any previous tapes, just that you will need to rescan them for use with your new installation.

If you wish to retain your existing configuration and catalogs, please select option 4, 'Update BRU-Pro tape server'.

The installer will display the LICENSE agreement. You must agree to this license to continue with the BRU-Pro installation.

If you agree to the terms of the license, the installer will copy the included files into their appropriate locations.

You will be prompted for a tape superuser password (the 'brupro' user). The installer will accept any alphanumeric password, but you should be careful since having this password gives anyone access to your BRU-Pro environment. Please do NOT use 'brupro' as your tape superuser password.

The installer scans your system and sets defaults for most of the fields that are displayed next. You may change any field displayed EXCEPT the server name field. BRU-Pro and your client systems depend on this name to ensure secure communications. If the name here does not agree with the name you expect, please abort the installation and check both 'hostname' and 'domainname' to discover why the value differs. Resolve the hostname discrepancy and restart the installer.

Once you are satisfied with the settings, select option '1' to begin the actual configuration and finalize the installation.

There are four questions that are asked next. These questions are to protect your existing backup media, as well as to prevent possible installation and scanning problems.

1. Have you removed all tapes from drives such as NS-20 or older DLT?

Older tape mechanisms didn't offer the ability to eject media via

software. If you have a drive that does not eject its media automatically, please be sure to remove any tape(s) before continuing.

2. Have you removed all of your non-barcoded cleaning tapes from loaders?
3. Have you removed all barcoded cleaning tapes whose bar code does not start with the letters 'CL'?

Cleaning tapes are a special case tape for BRU-Pro. Questions 2 and 3 are to ensure that any unlabeled cleaning cartridges do not confuse the slot scan of a library unit. If you have a barcode reader in your library and your cleaning tapes have labels that start with 'CL' or 'CLN', you do not need to worry about this as BRU-Pro manages these tapes. However, if your cleaning tapes are not properly labeled or you don't have a barcode reader, a cleaning tape can hang the slot scan requiring you to force-abort the BRU-Pro installation and start all over again.

4. Have you removed all diagnostic tapes from your loader(s)?

Diagnostic tapes are another special case tape type. Even if they are labeled properly, the scan could cause such a tape to be loaded with unexpected results (like reflashing your drive firmware ...).

Note that a "No" answer to any of these questions will cause the installer to abort the installation process.

The next step is the SCSI device scan. During the device scan, BRU-Pro will locate all drives and robotic units. As part of the process, BRU-Pro will load and unload tapes from each drive in each library unit to determine which drive(s) belong to which library. This step can take from one to ten minutes or more depending on the number of libraries and drives attached to your system.

Note - if you have the incorrect version of the 'mt' utility on your system, you will be informed that your kernel doesn't support SCSI tape drives. You MUST use the `mt-st` version of `mt` for compatibility with BRU-Pro. You can always download the latest version from www.rpmfind.net. Search their catalog for `mt-st` and get the latest version for your architecture.

***WARNING* ANY NON-BRU-PRO TAPES WILL BE ERASED**

After all devices have been properly detected, if a library mechanism is detected, installer will scan all tapes in the library. During this scan, any non BRU-Pro tapes will be overwritten and a BRU-Pro header will be placed onto the tape. It is a good idea to preload your library to its fullest capacity so that tapes will be prepared for use, saving steps and time down the road.

***WARNING* ANY NON-BRU-PRO TAPES WILL BE ERASED!**

If the installer locates BRU-Pro tapes, they will be fully scanned and their contents will be added to the new catalog database. In the event that the installer locates a BRU tape, it will be marked as a foreign tape, but will not be overwritten.

***WARNING* ANY NON-BRU-PRO TAPES WILL BE ERASED!**

This initial scan may take a long time with large loaders. If your loader has barcodes, the initial scan will not need to be repeated in the future, because the loader will be capable of detecting the bar codes and process recognized tapes properly..

The BRU-Pro tape server will then be ready for use. You should now install the 'aserv' agent software on any client machines that you wish to include in the BRU-Pro backup sessions.

Agent Software Installation and Configuration

BRU-Pro uses agent software on each of the client systems that you wish to backup from a BRU-Pro server. This agent provides the communication interface between the server and the clients. The Agent software, `aserv`, is available on the distribution CD or as a download from www.tolisgroup.com. You may access as many client systems as you have licensed on your BRU-Pro server. BRU-Pro does not track the type of client systems, only the number of clients to be managed.

Installing From the CD

Insert and mount the CD on each client system. If your system automounts the CD, make sure that the `'noexec'` flag is not set. You can determine this by running the `'mount'` command with no options. If `'noexec'` is set, you will need `umount` the CD and remount it manually to clear the `'noexec'` flag.

Run the installer as before, but this time select option 2 to install the Agent software on the client system.

Installing From the ftp Download

If you've downloaded the Agent tarball, all of the files are included in the tarball. Move the file into your `/tmp` directory and extract it. Note that you may need to manually uncompress the tarball if your version of `tar` does not support automatic uncompression.

Execute the `'install.sh'` that is extracted into your `/tmp` directory.

Agent Configuration

The installer will copy the `aserv` files onto the system and then present you with the Agent setup menu. As with the Server installation, many of the entries will be determined automatically.

For BRU-Pro 2.0, two new options have been added to the Agent software - client-side compression and client-side encryption.

The agent configuration menu will appear:

BRU-Pro BACKUP AGENT CONFIGURATION
Version 2.0.0.2

- 1 Our Machine's Name (Client Machine Name)
[giza.tolisgroup.com]
 - 2 Our Workgroup [Default]
 - 3 Network compression enabled (Y/N) [N]
 - 4 Network encryption enabled (Y/N) [N]
- s Save and continue
a Abort

Enter number of value to change, 's' to save, or
'a' to abort:

Ensure that your system name is correct. This is important since the client-server communication model used by BRU-Pro must be able to match the name entered here with the client name on the server for proper data transfer between the systems.

If you are running on a slow system (older HP, Sun, or PC systems, for example), you should probably not use the compression option as it can dramatically affect data throughput on systems with slower CPU's.

After saving the changes, the installer will ask you to define the server(s) that will be allowed to connect with this client system. You must enter the server name EXACTLY as it was entered in the server setup, or the systems will refuse to communicate.

```
Servers List:
=====
NO SERVERS DEFINED
=====
a) add server    d) delete server
                 q) quit this menu
```

Enter A Command(a, d, q):

Select 'a' to add a server and enter the server name. Again, 'sys.my.com' is not the same as just 'sys', so make sure that you enter the correct value.

Quit this menu and the agent software will be ready to use. If you need to rerun the agent setup, execute /bru/aserv/setup.sh on the client system.

Once you've installed and configured the aserv agent on all of your client systems, you are ready to add them to the server's list of controlled clients by using the console to scan and add them.

If you wish to modify any of the agent settings in the future, execute `'/bru/aserv/setup.sh'` and follow the prompts.

Firewall Considerations

If you will be backing up a client system through a firewall, you will need to supply a route between the server and the client that allows traffic through port 6661, 6662, 6663, 6664. This is a one way route from the server to the client. You will not need to open a route in the opposite direction.

Final System Configuration

Final system configuration consists of defining cleaning tapes (if your cleaning tapes are not barcoded with bar codes that start with “CL”), and scanning for clients.

Defining Cleaning Tapes

If your cleaning tapes all have barcode labels, and all the barcodes start with ‘CL’ or ‘CLN’, BRU-Pro will automatically recognize and assign slots for them. You may skip forward to Scanning for Backup Clients.

Otherwise, before you can put your cleaning tapes back into the autoloader or tape library, you will need to reserve some slots for cleaning tapes. This must be done via the xbrup console interface.

```
Execute 'source /opt/brupro/bin/setpath'  
Run xbrup.
```



Figure 1 - Main BRU-Pro Login Screen

For Server, use the tape server name.

For Machine, use the tape server name.

(For now, these two systems names are the same)

For User, use the name ‘brupro’.

For Password, use the password that you entered during installation, *NOT* the one that you may have assigned when you created the Linux user account.

You will now be logged into the tape server.

If you receive a ‘303 SPOOF’ error, or a ‘111 Cannot Connect’

error, check the machine and server names. These MUST match the names entered during the server installation.

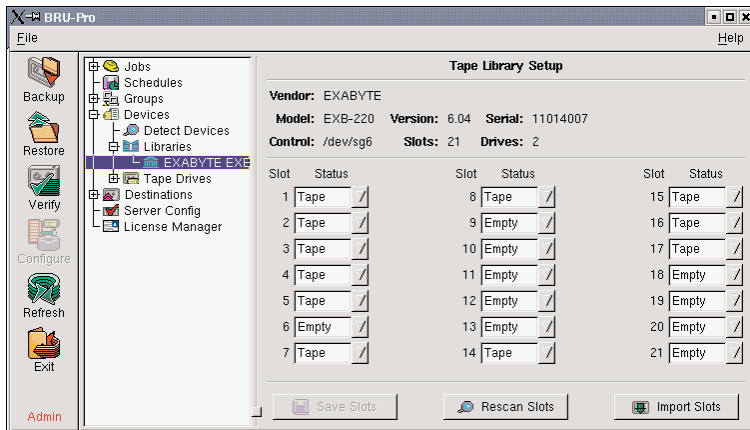


Figure 2 - Tape Library Setup Screen

You can then click on the 'Configuration' tab. Expand 'Libraries'. Then click on each recognized loader as shown above. For the slots that will hold cleaning tapes, click on them and change their status from 'Empty' to 'Cleaning'. You may now place your cleaning tape(s) back into your library or autoloader in the slots that you just assigned.

Scanning for Backup Clients

Do not do this until all client's software has been installed and is running on your network. Performing a scan at this point will result in no additional systems found.

The graphical administration console, xbrup, is installed on your server as part of the server installation. If you are not running in graphical, or X11, mode, start your X11 environment and login.

Start an `xterm`, run `xbrup`, and login to BRU-Pro as above.

Click on the 'Configuration' tab. Click on the '+' by 'Groups' to expand that tree. If you wish to create a workgroup for your clients, create it here. Click on the '+' by the workgroup you wish the clients to be placed into. If you do not create a group, any client systems will become part of the default group. We will discuss groups further in the BRU-Pro hierarchies section below.

Click on the 'Add a Client' entry under the selected group. It will

ask you for either a single hostname or IP address to scan, or a range of IP addresses to scan. Make sure that you do NOT enter a broadcast address as one of that range of IP addresses! (Ask your network administrator if you don't know what a broadcast address is).

For example, to scan the entire 192.168.0.X network, you would enter 192.168.0.1 as the starting address and 192.168.0.254 as the ending address. Again, if you are not sure of the address range of your network environment, check with your network administrator.

The client scan will run for some time (perhaps quite some time, if most of the addresses have no machines on them — it takes a while for the Internet protocols to decide “nope, nobody there” and move on). When BRU-Pro finishes scanning the range provided, all of your clients have been detected and configured.

System Boot Configuration

The tape server is started with the command:

```
/opt/brupro/bin/tserv.sh start
```

It is stopped with the command:

```
/opt/brupro/bin/tserv.sh stop
```

Note that the tape server really does prefer to be given the ‘stop’, rather than simply rebooting the system under it, because the MySQL database doesn't like being shut down in mid-transaction.

The `tserv.sh` command will be copied to `/etc/rc.d/init.d` on most Linux systems. The ‘runlevel’ environment variable will be checked, and a file `S99tserv.sh` will be placed into `/etc/rc.d/rc$RUNLEVEL.d` and the file `K01tserv.sh` will be placed into all other `/etc/rc.d/rc<n>.d` directories. On other Unixes, the above commands may need to be manually placed into system startup and shutdown scripts.

Unix Console Installation

The administrative console GUI app (`xbrup`) may be run on a

system other than the server that you installed. Currently, Linux on x86, ia64, and PowerPC are the currently supported platforms. Please check our website for updates to the supported platforms.

The easiest method for installing the administrative console is to copy the 'Console' tree off of the CD to a NFS file share accessible to all supported machines on your network. Once that is done:

1. Log in as user 'root'.
2. Mount that file share (or the CD), if it is not otherwise mounted.
3. Go to the 'Console' root directory. Type './install.sh'. It will install files on your system
4. Add /opt/brupro/bin to the global \$PATH variable. This is operating system dependent. For example, under Red Hat Linux, edit /etc/profile and edit the 'PATH=' line to say

```
PATH=$PATH:/usr/X11R6/bin:/opt/brupro/bin
```

You should then get the new path by logging out and then logging back in.

5. Type `xbrup` to start the console.

Note that the console is installed as part of the tape server installation, so you do not need to install it separately.

BRU-Pro Update Installation

BRU-Pro updates follow the same basic procedures as a new installation. The primary difference is that an update installation utilizes existing configuration settings and retains existing catalog database entries.

To update any of the BRU-Pro elements, Server, Console, or Agent, select the appropriate option from the main install menu. The subsequent menus will walk you through the update process.

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License Management and Server Settings

BRU-Pro is licensed based upon the number of client systems that you are backing up. By default, your initial BRU-Pro license is for the server and 3 additional clients.

As installed, BRU-Pro defaults to a 30 day demonstration license. To activate your full license, start `xbrup` and login as the Tape Administrator, 'brupro'.

Select the 'Configuration' tab and then select 'License Manager'.

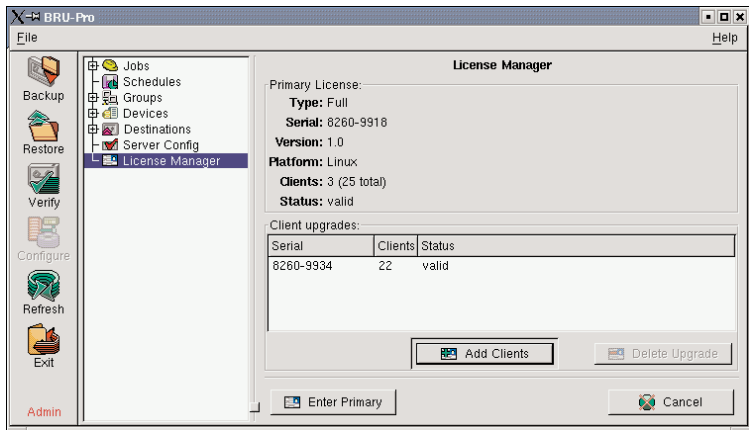


Figure 1 - License Manager Screen

The License Manager screen will appear as shown above. By clicking on the 'Enter Primary' button, you may enter the initial license data provided with your copy of BRU-Pro. The Primary License entry dialog will appear as shown below.

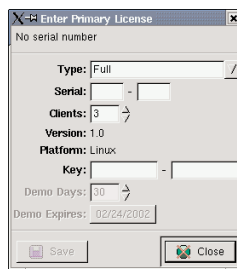
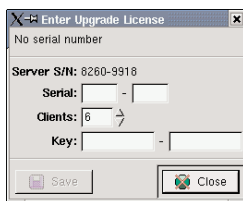


Figure 2 - Primary License Entry Dialog

Enter your serial number, number of clients, and license data as provided on the license card included with your copy of BRU-Pro. If you have additional client licenses to install, click the 'Add Clients' button and fill in the information requested in the 'Enter Upgrade License' dialog as shown below.



The image shows a Windows-style dialog box titled "Enter Upgrade License". At the top, it says "No serial number". Below that, it displays "Server S/N: 8260-9918". There are three input fields: "Serial:" followed by a hyphen and a small box; "Clients:" followed by the number "8" and a right-pointing arrow button; and "Key:" followed by a hyphen and a small box. At the bottom of the dialog, there are two buttons: "Save" and "Close".

Figure 3 - Upgrade License Dialog

Once you have successfully entered all of your license data, BRU-Pro will support the total number of clients authorized, plus the server itself. BRU-Pro does not track the types of clients supported, simply the total number.

If the total number of clients exceeds the number of authorized clients, you should contact your BRU-Pro reseller to purchase additional client licenses.

Note that upgrade licenses are assigned to a specific BRU-Pro server serial number. Therefore, upgrade licenses are only useful on a previously licensed copy of BRU-Pro.

Server Settings Configuration

Many of BRU-Pro's internal maintenance operations are performed once, or on a scheduled basis, and don't require normal administrator intervention. These various settings are set through the 'Server Settings' screen as shown below.

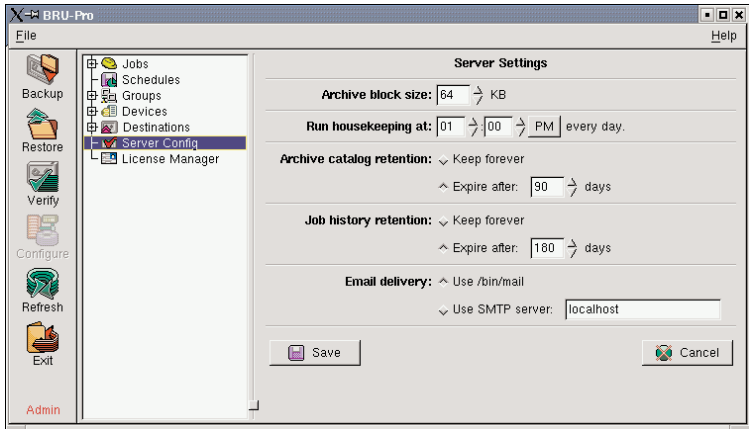


Figure 4 - Server Settings Screen

Many of these settings are configured during initial installation, such as block size and email, but other settings are only available through this screen.

Archive Block Size

The Archive Block Size sets the size of I/O buffer BRU-Pro uses in writing to your tape drive or library. For most environments, the default of 64K is sufficient. Check with your drive manufacturer to determine if you should use a different block size for their particular device.

Additionally, it is important that the default blocksize does not change once the system has been put into operation. Under some circumstances, different blocksize settings can result in tapes that are not readable under the new blocksize setting.

Housekeeping Schedule

Removing, or grooming, unnecessary record entries from the BRU-Pro logs and catalogs can greatly reduce the amount of disk space required by BRU-Pro. This entry sets the time that

BRU-Pro will perform the various housekeeping tasks each day. It is best to set this for a time of day when BRU-Pro is not actively backing up other client systems.

Archive Catalog Retention

This defines how long BRU-Pro will retain catalog entries in the catalog database. The default is 90 days. Options are to keep them forever (the catalog files could become quite huge), or to clean them up, removing entries over a defined number of days old. We have generally found that 60-120 days of catalogs is enough for most operations. If you rotate your tapes more often, you may reduce this time. For longer rotation periods, you may need to make this time longer.

Job History Retention

BRU-Pro tracks all operations in its various log files. Again, after many operations or over long periods of time, these files can grow to consume large amounts of disk space. This setting determines how long these logs are retained.

EMail delivery

EMail processing under BRU-Pro can be handled through the standard `/bin/mail` utility, or by communicating with an SMTP server on a given host.

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Client System Configuration

The main design criteria for BRU-Pro is the ability to backup and restore data on client systems. This capability is provided through a client/server architecture that operates over standard tcp/ip networking.

Once the server system is installed and configured, each client system that is to be managed by BRU-Pro must have agent software installed and configured. We briefly touched on the process of installing the agent software in the main installation section of this manual. In this chapter, we will examine some of the options available on both the client and server systems.

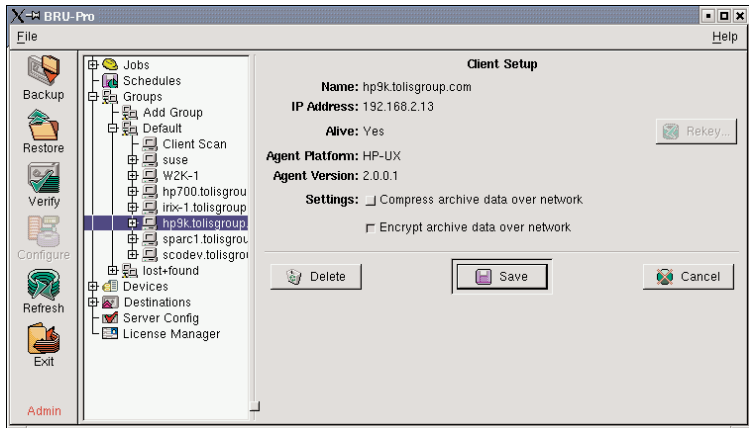


Figure 1 - Client System Configuration Screen

You have already been introduced briefly to the client configuration screen. In addition to the information previously presented, there are a few settings that can be configured to modify the manner in which BRU-Pro communicates with the client systems.

In Figure 1, a small network is represented with the various client systems scanned and recognized. By clicking on a machine name, we are presented with the options that are available for that machine. In the case of the system selected above, we can determine that it is online (Alive: Yes), running agent version 2.0.0.1, with both encryption and compression available for communication between the server and the client.

Even though the client has allowed, or enabled, compression and encryption, the Tape Administrator may elect to not use these settings by deselecting the checkbox next to each option. In our example, data compression has been deselected and encryption has been selected.

If a client system is either too underpowered to support the CPU tasking that encryption or compression requires, the agent software can be configured to disable both options. In the event that one or both options are disabled on the client system, the checkboxes will be disabled (grayed out) on the client configuration screen.

If you make changes to these settings, clicking the “Save” button will make them permanent. Clicking the ‘Delete’ button will remove the displayed system from the list of machines and delete any jobs that are specifically defined for the deleted system. You will be asked to verify the deletion before the system is removed from the data tables. Any catalogs for existing backups on the deleted systems will be relocated to the ‘Lost+Found’ group.

Client Side Agent Configuration

To change the settings on the client system, login as root and execute `‘/bru/aserv/setup.sh’`. You will be greeted with the Client Configuration menu shown below:

```
-----  
BRU CLIENT CONFIGURATION  
Version 2.0.0.2  
-----  
  
1. Configure Backup Agent  
2. Configure list of Authorized Servers  
3. Configure list of Additional Automounts  
4. Configure list of Extra Filesystems  
5. Start Backup Services  
6. Stop Backup Services  
7. Rekey A Server  
  
q. Quit  
  
-----  
Enter your selection:
```

By selecting option 1, you may change the default settings for

this client. If this is the first time you are configuring this client system, please pay close attention to the default setting for the machine name. If the client and server don't agree on the name entered, the authentication between the systems will fail. The initial configuration menu will appear:

BRU-Pro BACKUP AGENT CONFIGURATION
Version 2.0.0.2

- 1 Our Machine's Name (Client Machine Name)
[giza.tolisgroup.com]
 - 2 Our Workgroup [Default]
 - 3 Network compression enabled (Y/N) [Y]
 - 4 Network encryption enabled (Y/N) [Y]
- s Save and continue
a Abort

Enter number of value to change, 's' to save, or 'a' to abort:

If you change the workgroup on the client system, you must ensure that you create the same workgroup on the server as described in the Chapter on "User and Group Administration."

To disable the encryption and compression settings, select option 3 or 4 and enter an appropriate response (Y or N).

When you save these settings, the "Authorized Servers" menu will appear. When making changes or adding servers (you may have more than one authorized server), ensure that the name entered is the same as the name entered on the server - 'msys' and 'msys.company.com' are NOT considered the same system.

```
Servers List:
=====
suse
raid.tolisgroup.com
=====
a) add server    d) delete server
  q) quit this menu
```

Enter A Command(a, d, q):

Once you're satisfied with the servers that are displayed in the list, type a 'q' to quit and return to the main menu.

Server Side Agent Configuration

Once the settings are completed on the client system, the system should be scanned and added to the list of clients on the BRU-Pro server.

Before scanning, determine the group definitions that will be used. A client system may only be assigned to a single group. As installed, BRU-Pro has a single group - 'Default'. If you have fewer than 10 client systems that will be included in your backup definitions, this single group may meet your requirements. If you have a larger number of systems in different areas of your backup responsibility, defining new groups and assigning clients within those groups may be a better option.

Start the `xbrup` console and login to BRU-Pro as the tape administrator, `brupro`.

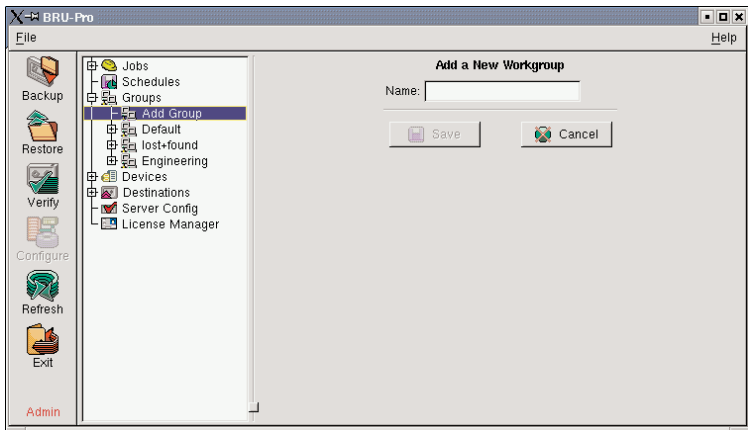


Figure 1 - Group Configuration

Click on the Configure button and then expand the Groups entry. As shown above, adding the group 'Engineering' is done by entering 'Engineering' into the text box and clicking the 'Save' button.

Once your new group is created, expand it by clicking on the '+' symbol or double clicking on the name. Initially, a new group will only have one entry - 'Client Scan'. Click on Client Scan and enter the appropriate address for the new client. If you will be adding multiple systems at once, you may enter a range of addresses to scan.

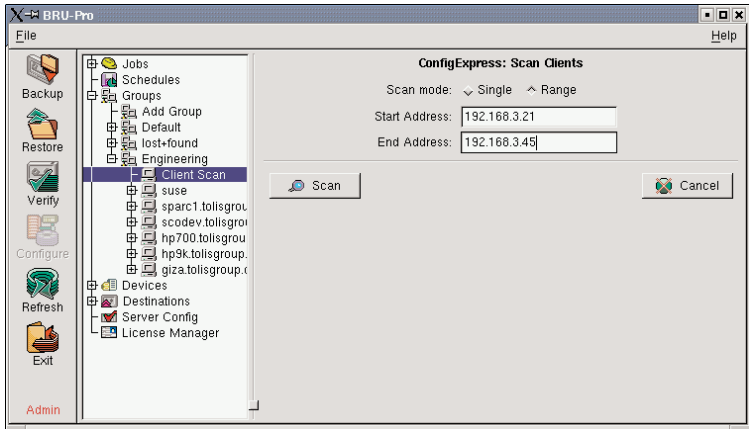


Figure 2 - Client Scan Configuration

Once your clients are scanned, they will appear in the expanded group listing as shown below.

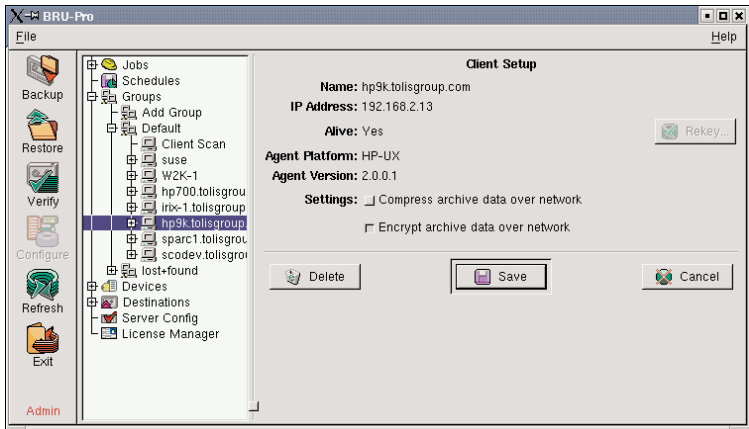


Figure 3 - Clients Scanned and Added

Check each of your client entries and set the compression and encryption options as required.

Once these steps are complete and the appropriate clients show up in your group definitions, you are ready to begin including the clients in your BRU-Pro backup operations.

More information on Groups and User levels is provided in the next chapter.

BRU-Pro Administrator's Guide

User and Group Administration

BRU-Pro offers 4 levels of user configuration and control. These levels define the abilities of a user in relationship to BRU-Pro control and operations.

The levels are (from highest to lowest):

- **Tape Administrator**
- **Group Administrator**
- **Machine Administrator**
- **End User**

BRU-Pro User Levels and Group Assignments

As with the UNIX group security model, a BRU-Pro user can belong to multiple groups. For example, our tjones user above could be a Group Administrator in the Default group, while being a Machine Administrator in other defined groups. The difference between the different levels of authorization and access is as follows:

Tape Administrator - Full access to all BRU-Pro features and functions for all groups and systems. May define other user's access, modify and create destinations, modify devices, and authorize access to destinations for job submission by group and machine users.

Group Administrator - Full operational control over all machines assigned to the specific group. Cannot access operations on other groups and cannot add additional users outside of the specified group. Also, cannot modify destinations or devices. Additional users may only be assigned access levels up to Group Administrator by this level user.

Machine Administrator - Access to all operations for the specified client machine. No access at the group level is allowed. Can only add End User level users for their specific client machine.

End User - May only access restore operations on the machine to which the account is assigned. May not perform operations on data that does not belong to her. This level allows the

administrators to offload many of the end-user generated restore requests. Full system security is maintained and this level user may only manipulate the data that belonged to them when the backup was originally created.



Figure 1 - Login Screen

After initial installation, a 'brupro' user is defined with Tape Administrator access assigned. This user is the first login user for all further work in BRU-Pro.

Accessing Group and User Configuration

Execute `xbrup` and login as 'brupro' using the password you assigned to this user during installation.

With your first login, the brupro user has access to all features of BRU-Pro, including the creation of additional authorized users and their assigned rights under BRU-Pro. When considering backup and restore operations, consider how much data is processed on a daily basis and how much control you wish to give various users within your organization.

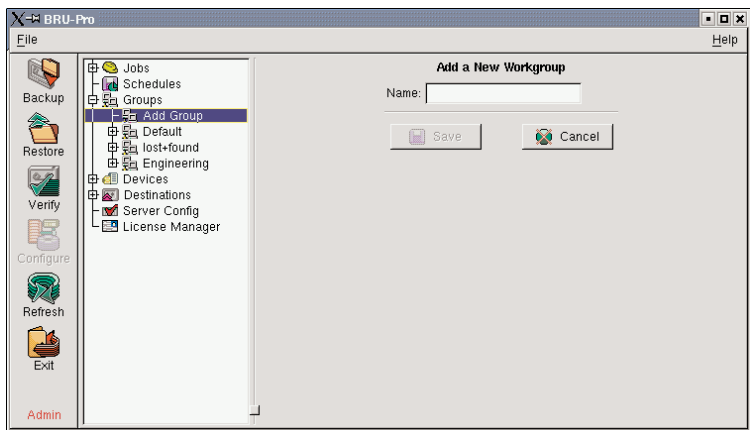


Figure 2 - Accessing Group and User Configuration

Once you have successfully logged in, select the 'Configuration' tab and then expand the 'Groups' configuration section. Once expanded, you will see the default groups, 'Default' and 'Lost+Found'. We'll discuss the Lost+Found group later.

For a small BRU-Pro installation, 10 clients or less, the Default group may be fine. You may also be able to properly operate with a single BRU-Pro user. If this is the case, you may move on to the next subject in this manual. If you run a somewhat larger environment, or just want to learn more about BRU-Pro's user levels, then you should continue with this chapter.

Tape Administrator - BRU-Pro's 'root' Level User

As noted above, the default 'brupro' user is a Tape Administrator level user. As such, this user has full control over the entire BRU-Pro installation and operation. It is usually a good idea to assign such responsibility to one or two trusted sysadmins. While having full access to BRU-Pro can't provide a possible exploit into any of your systems (this is why we keep our own user database), it could allow a malicious user to destroy your backups.

Adding New Users

To create a new user for a group, click the '+' beside the appropriate group name and then select the machine from which the user will log in. This is important because if you authorize a user 'admin2' to access BRU-Pro from one system, the same user name will not provide access from another. Therefore, not only is the access level controlled, so is the system from which this user's login can occur. This can prevent someone from watching over an authorized user's shoulder and then using the 'borrowed' account and password to login from another workstation.

As shown below, a user 'tjones' is being added to the machine 'suse' and awarded 'Group Administrator' rights. This means that tjones can login to BRU-Pro from the machine known to the system as suse and perform all operations that apply to the group the the machine 'suse' is a member of - in this case, the group known as Default.

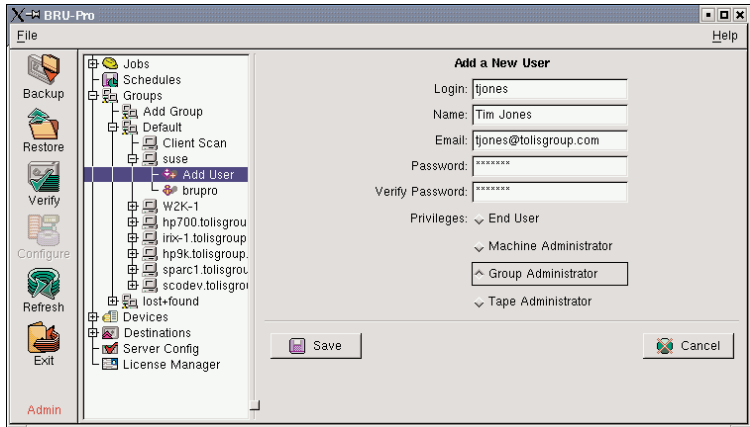


Figure 3 - Adding a User

If tjones attempts to login from one of the other machines in the Default group, the authentication process will fail and the login will be denied.

In addition to the BRU-Pro assigned user levels, there is one other type of user that BRU-Pro will acknowledge - a physical user with an actual Unix user account on the machine being logged in from.

For example, if a machine has an established user on it by the name of 'Judy,' and Judy has permissions to access her own files but does not have root access, she will be able to launch the BRU-Pro client from her machine, enter the machine name, and login under her system login name and password. This will give her access to her own files and allow her to create backup jobs that can, based on permissions, either be performed when scheduled or submitted to the tape administrator for assignment.

Groups - Segmenting Machines For Security and Sanity

As mentioned earlier, BRU-Pro creates a 'Default' group by default. The initial system inserted into this group is the server system onto which BRU-Pro is installed. In our case, a system known as 'suse'.

If you work in an environment where you have data in multiple divisions, it makes sense to segregate the machines, or clients, that data resides on into BRU-Pro groups. For example, Engineering, Marketing, Admin, Accounting, and Sales might be

required for a larger environment, while Office and Management might be good for a smaller environment.

In addition to segregating and grouping like data, group assignments also allow the 'brupro' Tape Administrator to off-load some of the daily BRU-Pro administration to departmental sysadmins. By creating a 'Group Administrator' for each defined group, the work of restores, verification, log monitoring, and adding or removing systems from the environment do not need to be directly performed by the primary Tape Administrator.

Lost+Found - a Special Group

In the event that a machine is removed from the BRU-Pro environment, all existing backup catalog entries will be relocated to the 'Lost+Found' group.

Additionally, in the event that data becomes corrupt in the catalog database, performing a database consistency check can result in corrupted entries being moved into this group. This is done to allow for the continued normal operation of BRU-Pro with the retention of as much backup history as possible in the event something happens to the server's hard drive.

Remember, unlike many other network backup products, recovery from a corrupted catalog is as simple as rescanning your library slots and importing the catalog sets saved with the backups on the tapes.

BRU-Pro Administrator's Guide

Destinations and Backup Planning

If you have any previous experience with backup applications, you are familiar with tapes and using them to store data. BRU-Pro takes the concept of a tape and expands it to be considered as a Destination.

In comparison to a tape, a BRU-Pro Destination can be a single tape, or all 40 tapes in a 40 tape library. This is important because in today's environment, it's not often that we can archive a complete set of company data on a single tape. By combining multiple tapes into a single Destination, BRU-Pro removes much of the concern over where a set of data will be written.

In the discussion and examples that follow, we will be working with a 21 tape library. Each tape in this library stores 50GB of uncompressed data and the total data to be backed up is 200GB with less than an average of 25-30GB changing per day. Tests have indicated that we achieve an average of 1.4:1 compression, meaning that we should safely achieve compressed tape capacities of around 70GB per tape.

By default, during its initial installation scan BRU-Pro creates default destinations of the entire library and each segment of continuous tapes. For example, if our library had tapes currently loaded into slots 1-10, 12-15, and 18-20, we would end up with four default destinations:

- **Default Destination 1 (1-10)**
- **Default Destination 2 (12-15)**
- **Default Destination 3 (18-20)**
- **Default Destination ALL (1-21)**

This may be acceptable, but we will rearrange things and fill the library and reassign the destinations to provide us with a more useful rotation capability.

Login to BRU-Pro and click the 'Administration' tab. Click the '+' next to 'Destinations' to expand it and you will be presented with the Destinations screen as shown below:

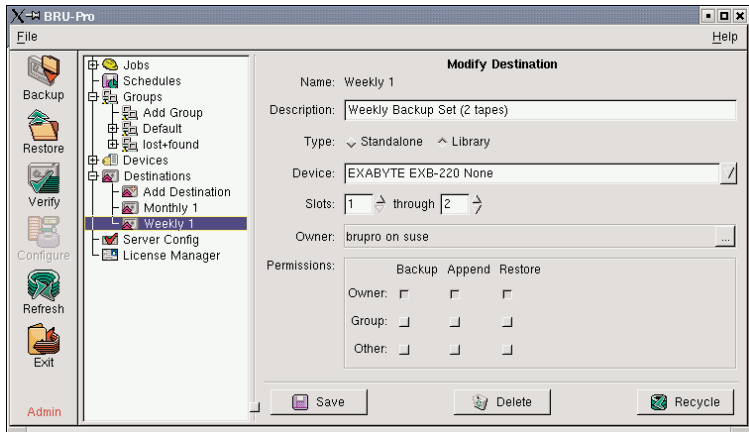


Figure 1 - Destination Configuration Screen

We need to modify the destinations to make more sense for our normal backup requirements. Since we've loaded the library with all 20 tapes (slot 1 is an import/export slot which we will dedicate to a cleaning cartridge), we'll plan accordingly.

Each weekly backup will consume somewhere in the neighborhood of 210-220GB of tape. Since we can safely assume that we are getting 70GB per tape, we need to dedicate 4 tapes for each full backup job.

Each daily, level 1, incremental job will use much less than the 70GB available on one tape, so we can safely assign a single tape to each of the weekday backups, Monday - Friday.

For a minimum rotation schedule, we will need 9 tapes - four for our full on Sunday morning, and five for the daily incrementals.

Since we have a total of 20 tapes available, let's create additional weekly destinations to allow us to maintain 3 weeks worth of backup history on site.

Our final rotation schedule will be each weekly destination every third week, overwriting the third previous set, and one tape for each daily, overwriting each day as the new day occurs. Additionally, we will create two, 2 tape 'Emergency' destinations that can be used for out of rotation backups that do not interfere

with the normal schedules. The final destination setup will look like the following:

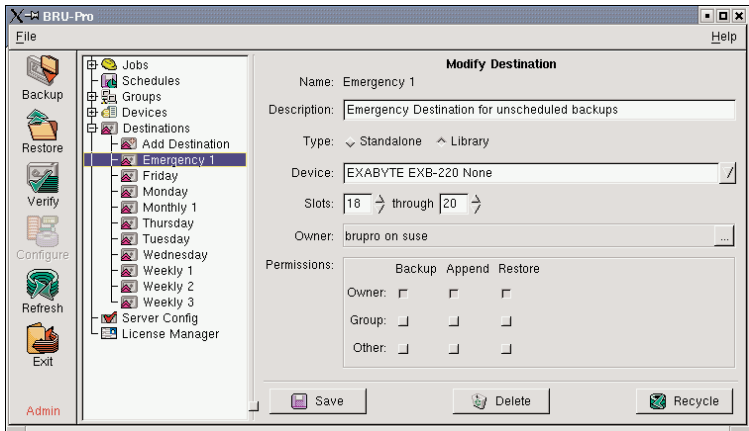


Figure 2 - 3 Weekly Rotation Destinations Defined

Once we have the destinations defined, we create and save 'Jobs' that perform the proper backups on the appropriate days using the Job Scheduler.

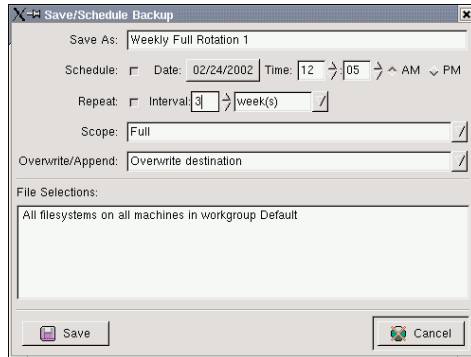


Figure 3 - Job Scheduler

In addition to our normally assigned tapes, we will assign a special Destination that appears to overlap a set of existing destinations. We will call this destination 'Monthly' in preparation for a special offsite backup. The backup performed using this special destination will be taken offsite for security once it is completed. To create the Monthly destination, select 'Add Destination' and create a destination that uses slots 1-10.

To allow this to work, we must assemble a set of magazines with 5 tapes (to start) that are not normally loaded into the library. If our data requirements expand, we can always add more. At the end of each month, after accounting has closed the month, one of these magazines are inserted into the the first magazine holder in our library. The backup is run manually and, once completed, removed and taken offsite. We then replace the original 10 tape magazine and return to our normal automated backup schedule.

This is one simple example of how BRU-Pro's destinations can be used to properly automate an intelligent backup rotation scheme. Of course, there are many alternatives to this scheme, you will need to examine your business data patterns to ensure that your backups are the most logical for your company's needs.

BRU-Pro Administrator's Guide

Backup Operations

Daily backups - that simple term can mean the difference between staying in business and standing in the unemployment line. BRU-Pro was designed with the purpose of simplifying day to day backup and restore operations.

BRU-Pro's data environment will normally be made up of multiple systems, or clients, on a network. A single tape server is installed and all data is copied from the client systems to a tape drive or library attached to the server system.

Backup operations, like most other BRU-Pro operations, are considered 'Jobs'. You define a backup job and then either run it immediately, save it in preparation for later operations, or schedule it based upon a backup rotation scheme. An example backup scheme is provided in the chapter on Destinations.

To get a quick feel for how you define and manage a BRU-Pro backup job, start `xbrup` and login as the Tape Administrator, `brupro`.

Once logged in, select the 'Backup' tab and then click on the '+' symbol to expand the Default group (or your working group if you've defined other groups).

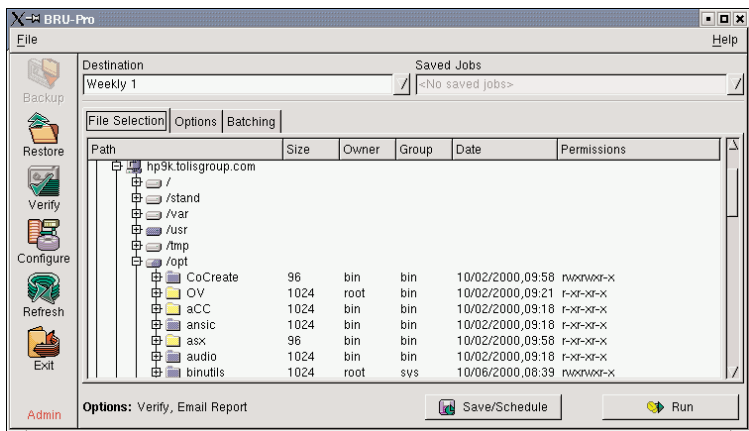


Figure 1 - Backup Selection Screen

In the figure above, we have expanded a client system and selected a group of files and directories for backup. When a file

or directory is selected, its icon will change from gray to purple. If only some files within a folder are selected, the folder icon will be part gray, part purple. In addition to the files and folders that we wish to include, we've also chosen a 'Destination' to which the backup will be written. We can also set options for automatic verification, compression, and email notification, and, through the batching interface, combine this backup job with other previously saved backup jobs.

Once we've finished our data selection and set our backup options, we can either 'Save/Schedule' the job or 'Run' it immediately.

For this example, we will click the Run button to start the backup immediately on the selected destination.

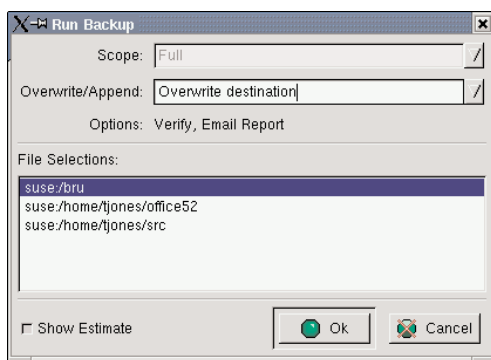


Figure 2 - Run Dialog

Once we click the Run button, the Run Backup dialog will appear. This allows us to verify the steps that will be performed when the backup job begins. If you wish to monitor the job as it runs, clicking the 'Show Estimate' checkbox will result in more useful information being provided while you are monitoring the job. If you do not intend to monitor the job, you can save time by leaving this option unchecked.

The Overwrite/Append popdown allows you to choose to either overwrite the destination without asking, append the new job to any existing data, or to prompt you once the destination media is loaded and scanned. When prompted, your choices are either overwrite, append, or cancel.

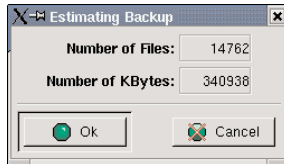


Figure 3 - Backup Estimate Dialog

Click the OK button to start the job. If you have checked the 'Show Estimate' checkbox, the system will display the Backup Estimate dialog and prescan the selected files and directories. Once the estimate is complete, you have 30 seconds to abort the operation. During this 30 second delay, you may click the cancel button or click the start button to abort the delay and start the job immediately.

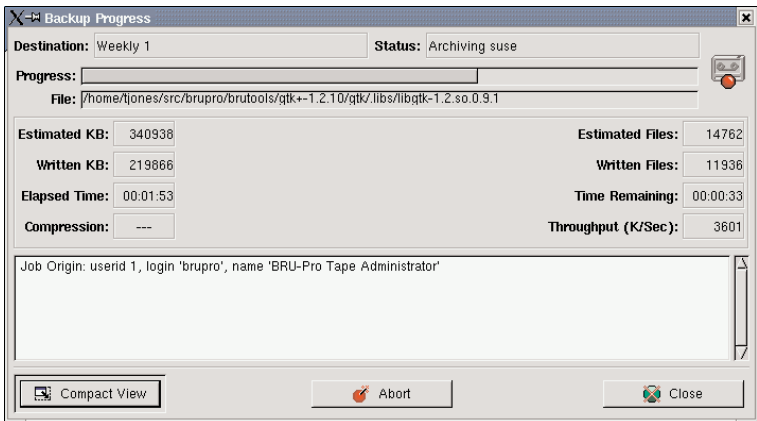


Figure 4 - Backup Progress Screen

While the backup job is running, the Backup Progress screen shown above will display the current backup operation progress. While this window is open, we can change the amount information displayed by selecting the 'Compact View' button, Abort the running job by clicking the 'Abort' button (you will get a chance to verify that you wish to actually abort the job), or you can close the monitor window with the 'Close' button.

Note that closing the window does not abort the backup job. It simply stops monitoring the job and the job continues to run quietly in the background. Once the progress window is closed, you can return to any other BRU-Pro task without interfering with your backup job.

If you do close the progress window, you can reattach and pick up monitoring the job by selecting the 'Configuration' tab on the main display and then select the 'Running Jobs' option. If your job is still running, you may select it in the listing and then click the 'Monitor Job' button to return to the progress window. The progress window will pick up the job status from its current state and display the same information as before being closed.

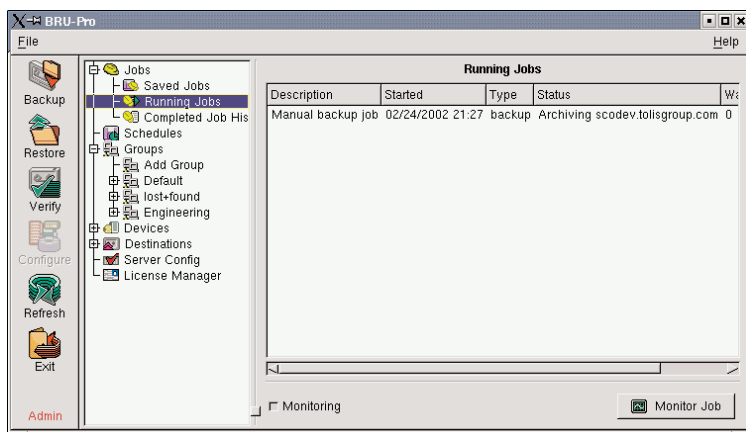


Figure 5 - Running Jobs Screen

In the figure above, we have one active, running job. By clicking on the entry in the list and then click the 'Monitor Job' button, the appropriate progress will appear and the current status of the selected job will be displayed.

Batching Jobs

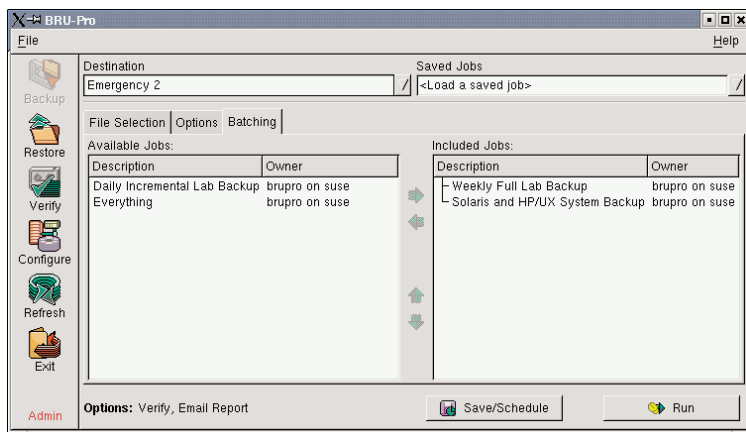


Figure 6 - Batching Interface

In addition to running a single selected job, BRU-Pro offers a batching interface that enables the execution of multiple jobs in succession.

To create a batch job definition, click on the 'Batching' tab and Select a destination. In the 'Available Jobs' list, select the job or jobs that you which to combine into a single job and click the right arrow to add them to the 'Included Jobs' list on the right. The jobs selected will be performed in the order of the list. To change the order of the included jobs, select the job to reposition and then click the up or down arrows to reposition it within the list.

Once you have the appropriate jobs in the Included Jobs list and the list arranged in the order you require, clicking on 'Run' will run the batch immediately and clicking 'Save/Schedule' will allow you to save and schedule the new batch job.

Scheduling Backups

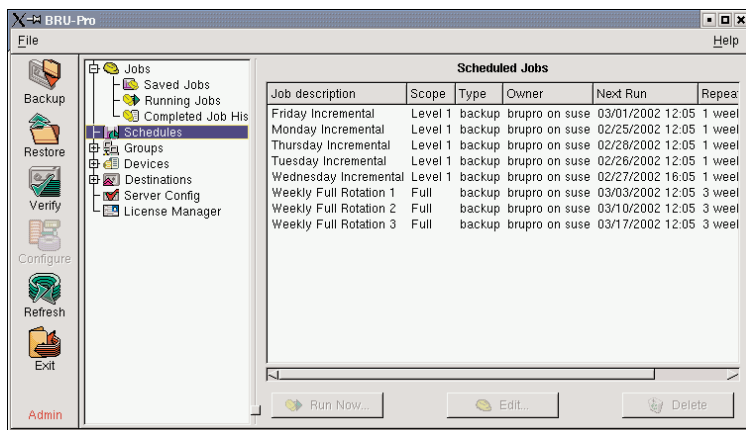


Figure 7 - Scheduled Backup Screen

As mentioned previously, BRU-Pro will either run your backup jobs immediately by clicking on the 'Run' button, or you may also define and schedule backup jobs for execution at a later time. A scheduled job is a defined backup - either 'Full', 'Level 1', or 'level 2' - that runs on a repetitive schedule without operator intervention.

Once a backup job is saved, it can be scheduled to run and provide repetitive full and incremental backups. To set up a Full

and Incremental rotation scheme, create save a backup definition that includes all systems for the selected destination. Open the saved job in the Backup screen and then click the 'Save/Schedule' button.

To determine the exact settings for a given scheduled backup, click on the job in the list and then click the 'Edit' button to examine the current settings for the schedule.

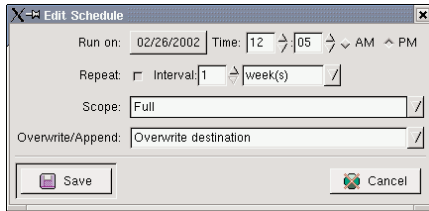


Figure 8 - Schedule Edit Dialog

From the Schedule Edit dialog, you may modify the job's starting date and repeat interval, the run time, scope - Full or Incremental, and whether to append or overwrite the Destination media.

If you make modifications to this job's schedule, clicking 'Save' will immediately save and reschedule the job using the new information. To cancel any changes, click on 'Cancel' and any changes will be discarded.

Performance Tips

If you have multiple tape drives in your library, BRU-Pro will write jobs simultaneously to all drives so long as you have created enough jobs and destinations.

If you are able to separate your jobs so that you have the same number of jobs as there are tape drives, you will see that backup operations are completed as quickly as your network infrastructure allows.

To make use of four drives in a library use the following steps:

- **Create four destinations - one for each tape drive**
- **Create four jobs, assigning each job to a different destination**
- **Schedule each job with a five minute headstart on each following job.**

At the appropriate times, each job will start. BRU-Pro will select which drive is used based on device availability. The result is that all four tape drives will be running and your jobs will complete as quickly as the combination of your network and the tape drives permits.

Drive Autobalancing™

As a maintenance function, BRU-Pro will monitor drive utilization within a multi-drive library and choose the least utilized drive for the next operation. This functionality requires no specific user intervention.

BRU-Pro Administrator's Guide

Restore Operations

Restoring files and systems with BRU-Pro is as simple as selecting the system to restore, clicking the Submit button and watching the files return. Or, if you have a more specific need, BRU-Pro offers full query options to allow you to specify a file type, group of machines, or a date in time.

Start `xbrup` and login as the Tape Administrator, 'brupro'. Select the 'Restore' tab and click the '+' symbol next to the Default group (or your working group if you've defined other groups).

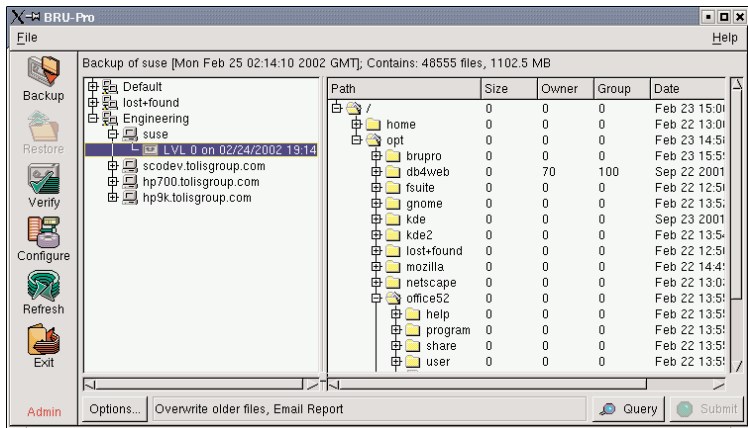


Figure 1 - Restore Selection Screen

By selecting a client and expanding it, all current backups for that system will be listed. By selecting one of the listed backups, the contents will be displayed in directory and file tree format. You may then select items from the selected backup to be restored.

By default, any items selected for restore will be restored to the original client with only older files on the system being replaced during the restore.

By clicking on the 'Options' button, the Restore Options dialog will appear and you can change this default behavior. In addition to overwriting only older files, you may choose to overwrite all files, or no files. You may also change the reporting options to send email to a different user.

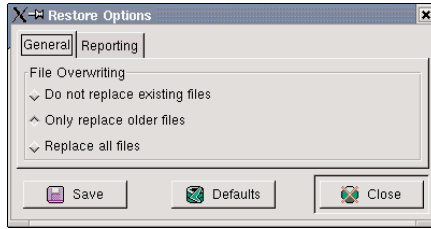


Figure 2 - Restore Options Dialog

If you always use the setting that you changed, by clicking the 'Defaults' button, you will save your changes as the new defaults for all backup operations. Clicking the 'Save' button will save the changes for the current operation. To use these changes, click on the 'Cancel' button. If you don't set the changes as your default settings, the changed settings will only be in effect for the current restore operation.

Submitting the Restore Job

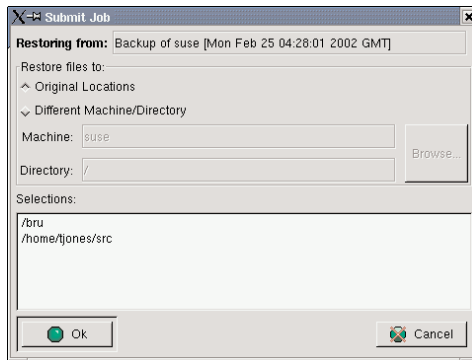


Figure 3 - Restore Job Submit Dialog

By clicking on the 'Submit' button, the Restore Job submit dialog will appear. Double check your settings for restore destination and click 'OK' to start the restore.

Restoring To An Alternate Location

By default, selected files are restored to their original system and directories, but by clicking on the 'Different Machine/Directory' radio button, you can specify an alternate destination for the restored files. If an alternate destination is selected, the BRU-Pro user performing the restore must have

appropriate security rights on the new system or the restore will fail.

Once the job is submitted, if you are monitoring the job, the Restore Progress screen will appear. From this screen, you can monitor the progress of the restore process, close the screen (which does not affect the restore), or abort the restore.

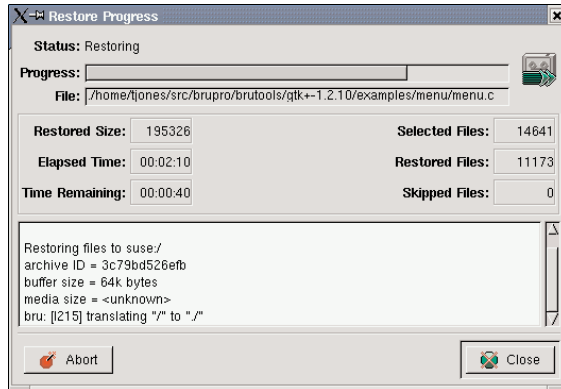


Figure 4 - Restore Progress Screen

Restore Using Search Parameters

In addition to manually selecting files to be restored, BRU-Pro provides a query mechanism which allows you to provide wildcard search patterns and apply them to specific backups or the entire BRU-Pro catalog.

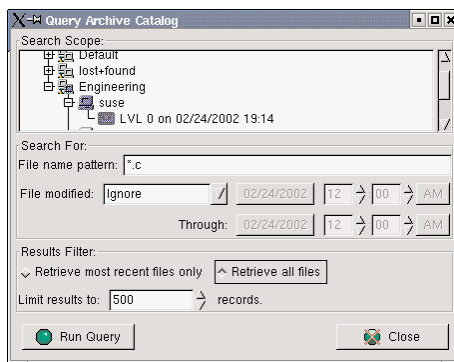


Figure 5 - Restore Query Dialog

By entering the information in the proper fields, a restore job can be created that spans all tapes for a given machine, backups from a selected date range, or even the entire BRU-Pro backup

history. By clicking the 'Run Query' button, BRU-Pro will search its database for all instances of the search string and parameters entered (up to the results limit setting).

Path	Machine	Archive	Modified	Size	Owner
/home/jones/src/bru/bru_15.0/src/common/access.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	10812	500
/home/jones/src/bru/bru_15.0/src/common/argv.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	8766	500
/home/jones/src/bru/bru_15.0/src/common/autoscan.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	18183	500
/home/jones/src/bru/bru_15.0/src/common/blocks.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	92112	500
/home/jones/src/bru/bru_15.0/src/common/bru.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	5366	500
/home/jones/src/bru/bru_15.0/src/common/bruraw.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	10444	500
/home/jones/src/bru/bru_15.0/src/common/brutab.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	47349	500
/home/jones/src/bru/bru_15.0/src/common/brutab2.c	suse	LVL 0 on 2002/02/24 19:14	Jun 13 1999	5784	500
/home/jones/src/bru/bru_15.0/src/common/brutab3.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	5036	500
/home/jones/src/bru/bru_15.0/src/common/brutab3info.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	2275	500
/home/jones/src/bru/bru_15.0/src/common/bruxpat.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	16809	500
/home/jones/src/bru/bru_15.0/src/common/brxsum.c	suse	LVL 0 on 2002/02/24 19:14	Dec 28 1998	17034	500

Figure 6 - Query Results

During the database query, results are displayed in the Query Results window as shown above. If you see the file you're looking for, you may abort the query while it's running. Once the query completes - either by running to completion, returning the limit number of entries, or because you aborted the run, you may select the file or files that you wish to actually restore.

To select more than one entry, use the mouse in conjunction with the shift key. Click the first entry that you want selected, use the slider to scroll the list to the last entry and then hold the shift key and click the left mouse button on the last entry. All files between the two entries will be selected. To remove files from within a shift-click selection, hold the Control key down and click on the file to be deselected. This file will be deselected without affecting the other files within the selection area.

When you are satisfied with the files that you wish to restore, click the "Restore Selected" button to submit the restore job. BRU-Pro will scan the necessary destinations and restore the requested files.

BRU-Pro Administrator's Guide

Media Management

BRU-Pro provides an easy and intuitive interface between the administrator and the machine. The BRU-Pro administrator or operator doesn't have to worry about where a file or machine is located within the library - a very important feature when you have 100 or so tapes - since BRU-Pro tracks all tapes within the defined destinations.

If you have a large enough library, you may be able to run for months without replacing tapes. However, the eventuality is that you will need to add new tapes into your backup rotation. Or, you may need to remove a set of tapes for offsite storage.

For systems with magazines where tapes are segmented into smaller element groups, this operation may be as simple as removing the current magazine and replacing it with a new, fully loaded magazine.

If you need to remove tapes from your library for storage, we recommend that you remove and replace the tapes in the same manner as you have them defined as Destinations. For example, if you have the following Destinations defined:

W1: Slots 1-4 D1: Slot 13 E1: Slots 18-20
W2: Slots 5-8 D2: Slot 14
W3: Slots 9-12 D3: Slot 15
D4: Slot 16
D5: Slot 17

You should replace the tapes in this same patterns. When you replace the media in Destination **W1**, replace all 4 tapes in slots 1-4. This way, you age the tapes consistently and ensure that you do not mistakenly overwrite a portion of a previously used destination.

It also makes sense to store your Destinations in much the same manner. This makes it easier to identify tapes within a Destination if you need to go backward in time prior to the media currently in your library.

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