This is a white paper on Backup Professional. It will explain some of the technical features of the product and why you should consider it over other similar products that are available. In many ways, you will glean an understanding of the design philosophy behind the product. It is assumed you have read and are familiar with the sales literature and feature bullet lists of Backup Professional.

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There are a lot of good network backup products available. You may be overwhelmed trying to choose one that best meets your needs. The competitive advantage Backup Professional has over other similar products in the industry, in a nutshell are the following:

- Very easy and fast (10 minutes for server, 3 minutes for client) installation and setup
- Server-sided crash recovery (SCO Unix, SCO OpenServer 5, Solaris Sparc, Unixware 7)
- PC ParaChute(tm) - crash recovery for every PC on the network
- Full bit-level verification (even across the network)
- Non-proprietary tape format
- Speed using double-buffering
- Client side graphical user interface
- Remote administration via dial-up, telnet session or browser with plug-in
- Very compact database (with auto-correction)
- Extensive configurability
- Comprehensive and robust backup scheduler
- Reliable backup engine - has been in use for over 11 years on over 30 Unix platforms
- Does not require NFS
- Adjustable CPU run-time priority levels

- Both graphical and character mode interfaces for the server
- Selective and/or non-destructive registry restore (Win95/98/NT/2000)
- Hot DLL restore (WinNT)
- Built-in network troubleshooter
- Extensive configurability
- Jukebox support for almost every jukebox and autoloader on the market
- Native jukebox drivers
- Can integrate with any third-party jukebox driver
- Raw partition backup/verify/restore
- Integrates with third party databases (Informix/Oracle/Sybase)
- A single daemon process manages all background activities

"A recent server install under Red Hat Linux 6.0 took two minutes and nine seconds."

The server installation is simple yet robust. The development team spent quite a bit of time on this aspect of the product. We were not happy with the way a lot of other products worked, which for many meant hiring an on-site technician to install and configure the Network Backup product to work properly. We felt things should be simpler than that. Many products require a trained technician to come on-site for several days to get things working.

Backup Professional does not require an on-site technician and installation is, in fact, quite simple. A typical system administrator can set up a server in about 10-15 minutes. A recent server install under Red Hat Linux 6.0 took two minutes and nine seconds.

We do recommend that you read the manual first as this will help you plan in advance such things as group schedules and how you want to set up and name your tape devices. You are also warned of common mistakes during the installation (such as using the rewind tape device as the tape control device instead of the no-rewind tape device). You can also decide in advance if you need to put Backup Professional database on a separate drive or filesystem by answering the set-up questions appropriately. The installation requires that you know the device pathnames of the tape rewind device, and no-rewind device as well as the exact machine name of any computers you wish backed up.

If you are upgrading Backup Professional to a new release, you will be impressed by the way in which your configuration settings are preserved across the upgrade. Since Backup Professional has over 15 categories of configuration parameters and, within each category there are from one to fifteen different settings, it is important that once you have everything properly configured, that these setting be preserved across an upgrade. In fact, this is done. Your old settings are merged with the newly available settings and any options available in the new release, but not available in the old release, are set to default values.

After the installation, you have an option of testing the tape drive. This tests things such as the ability to accurately perform tape labeling as well as dataset labeling so multiple datasets can be stacked on the tape. It also tests to be sure the no-rewind device is in fact a no-rewind device and that all tape devices are behaving as expected. This prevents untold problems later. If you elect not to do the tape test, it only warns that it hasn't been done. You should always perform the tape test each time you set-up and inform Backup Professional of a new tape.

The client installation is very simple. The client package comes either as a self-extracting .exe or on a diskette. For Win3.1/95/98/
NT/2000 clients, the install process takes about three minutes. No kidding, just three minutes. At the time you install the client, if your network is working properly with regard to the client, you can automatically register the client with the server and start your first backup without a reboot. You can also perform a protocol test. This tests all types of Backup Professional communication packets between the client and server and makes sure that your backups will perform flawlessly and that you do not have any problems with IP addresses, domain name problems, hosts or /etc/hosts table problems and the like.

The client installation on a Unix client is also fairly straight forward. It asks you several questions such as the name of Backup Professional Server machine and registers itself with the server automatically.

Upgrading Releases

The Win3.1/95/98/NT/2000 clients come with a custom FTP module that allow you to easily update all clients with a new release direct from the server. This saves you the hassle of individually loading a new copy of the client each time there is an upgrade or a new release. On sites with hundreds of PCs, this is a real time saver. You can simply batch FTP the files to each client and they are automatically extracted on the client and installed, requiring no interaction.

Keep in mind, you must enable this option on the client when you install it as it is not enabled by default for security purposes. Also, this works only with Win3.1/95/98/NT/2000 clients and not Unix clients. You would have to write your own FTP script or use FTP interactively to perform the transfers.

Backup Professional has a fine level of control in almost every aspect of the software. When it was designed, if there was an item that it was felt ever needed to be modified, it was made as a configurable option. All the configuration options are available in one file,

master.ini and are arranged in categories. Although, you can edit this file by hand, it is recommended that you use the provided menu interface to make adjustments.

For example, the items that you can control include TCP/IP performance options used on Backup Professional's TCP sockets connections to client computers. You can adjust time-out parameters, network ports to listen for a connection, the types and level of SCSI control you wish to use for your tape drive, the network blocking factor, TCP/IP windowing sizes and more.

Configuring Backup Profiles

Backup Professional has default backup profiles for each of the three basic backup types available on all of the supported platforms:

- Backup
- Restore
- Verify

Each backup profile can be customized and configured to include over a 100 different features or options. This includes the backup operation (master, incremental, selective and/or image), include and exclude lists, software compression, double buffering for speed, exclusion of read-only mounted filesystems, file-locking level to use, non-destructive restore and many others. These profiles are in backups, restores or from within the scheduler. The profiles can be saved, edited and named. This gives you ultimate control of your backups down to the individual machine level even within a group schedule.

Configuring Run-Time CPU Priority

You can configure the run-time CPU priority of the backup process. Thus, if your system is backing up while you are using it, you will appreciate the low priority which gives more of the CPUs processing to the applications you are using.

Licensing 

Backup Professional's licensing policy is based on a point system. This means that when you purchase the product, you purchase a number of points. The points are used to determine how many clients you can back up. For example, if you have a Solaris server, you need 12 points for the server and 1 point for each Win3.1/95/98 machine you have on the network and intend to backup. You need a certain number of points for each autochanger based on the number of slots in the autochanger. A WinNT workstation client takes 2 points and most UNIX clients take 4 points.

Thus, if you need to increase the number of machines you are backing up, you simply purchase more points, and your license is updated accordingly. Licensing is performed by faxing or e-mailing a license request sheet. In short order, you receive a return fax or e-mail with your license key. If you need to purchase more points or it is a first time

purchase, the transaction is handled through VISA or a mutually agreed upon method. You then enter the license key and Backup Professional is now operational for a new number of points, new clients or for whatever purpose you needed to change your license.

The performance of Backup Professional is exceptional. You have the option of using a technique called **double buffering**. This technique causes Backup Professional to split into two process which specialize in the work they do. One process gathers the data from the hard disk while the other pumps it out the network channel to Backup Professional server on the other side. This minimizes waiting and makes the backups go as fast as your hardware and network will allow. This is especially fast on systems with dual processors as each process runs on a different CPU.

Backup Professional reports all performance data in the backup summary as well as real-time in the task monitor. Backup Professional uses only TCP and does not require NFS (Network File System). This enhances performance considerably. Additionally, Backup Professional uses two channels for each connection, one is for data and is optimized for high-speed reliable transfer, while the other one is for control such as the server and client process communicating with one another. This combination makes the performance phenomenal. In addition, you have control over the performance options placed on the TCP connection for the data channel. Thus, you are in control and can get the performance up to the very maximum available with your hardware.

Backup Professional has been tested with all the major industry standard tape drives. We have close working relationships with the major tape manufacturers such as Overland Data, Quantum, Exabyte, ADIC, Conner, HP, Qualstar, Tandberg, Sony and more. It runs on all the major types of tape drives ranging from the low end Travan, QIC, 4mm DDS1, DDS2, DDS3,DDS4, AIT-1,AIT-2, 8mm, Magnum, and DLT.

Internal Database Features

The internal database used by Backup Professional is very fast, robust, and scalable. It is designed for computer networks with millions of files. The database has its origins with large-scaled, transaction-based systems. This means it has withstood the test of time including the legacy, Cobol business applications and demands. It is the engine that was used by Cobol business applications but is not a Cobol database.

The database is self-correcting. This means that if your system crashes while the database is in use and being updated, when you come up again, this fact is detected and the database is automatically fixed. This sometimes requires some minor changes and other times the indexes are rebuilt if they have been corrupted. The nice thing is that this all

happens transparent to you, the user, (appropriate status messages are displayed) and you do not have to be a database expert to use the product.

The database stores all data in a highly compact form. In fact, it requires only 22 bytes per file to record all the information such as the name, parent directory, size, modification times, owner, group, permissions, etc. Most competing products use 80 to 1024 bytes per file. We will challenge any competing product as to the efficiency of storage and are confident that our database is the most storage efficient. The designers spent a considerable amount of time and effort making sure the storage of this database information was fast and efficient.

When you recycle a tape (overwrite the contents), all the database information on the tape is also automatically purged. This keeps the database at a nearly constant size once you reach an equilibrium point in terms of your tape rotation schedule. You can manually purge database information for any given tape if the tape was destroyed or unusable for some reason.

"About once a week, the database automatically recompacts itself. This is mainly for indexes and recycled tapes, to make sure that they are compact and remain efficient. Any empty space that has accumulated from purged information is reclaimed."

The database is accessible from the clients as well as from the server. This makes it easy for clients to look up information such as what backups have been done and what files are on which backups. This database access is done through Backup Professional server-client connection and does not require NFS. This makes the client graphical user interface very useful. From an administrator's point of view, this saves you time since the user can pick out which version of the file they really want, and will know which tape number it is on.

Restoring Files

Restoring files with Backup Professional could not be easier. You can restore files either from the client or from the server. In either case, the process is similar. The user is presented with a calendar showing the dates of the backups available for the given computer. When one of these dates is selected all the backups for that day are shown and the user selects the one they are interested in previewing. Then the actual files or directories to be restored are selected using a graphical user interface.

Because Backup Professionals database is fast and efficient, there is essentially no waiting on the database. On other products we have seen, the restore facility take upwards of 10 minutes on starting just to create a temporary database view of backups and files available. Even on a client, there is no waiting or very little waiting as the client

connects directly to the server's database and only the items of interest are transported across the network connection.

On systems or tape drives capable of quick seeking, this method is used to restore files. On 4mm DDS2, DDS3, and DDS4 tape drives, most files are made available within 30 seconds. Similar results are reported on AIT-1 and AIT-2 tape drives. This can take a little longer on DLT tape drives but is certainly faster than waiting for the tape drive to read the entire fileset to get through the data.

Backup Professional supports most all of the industry standard SCSI II autochangers. We are in close contact with the major autochanger library vendors and perform extensive in-house testing to ensure that autochanger support is the most current and up to date available. This section will describe the autochanger support and how it works.

Backup Professional supports many different types of autochanger drivers which are referred to as *Autochanger Interfaces*. The interfaces available depend on the type of server operating system you are using. Backup Professional has its own internal interface which talks direct to the SCSI tape library on operating systems that support SCSI pass-through mode. Other operating systems have native autochanger drivers and these can be used by Backup Professional. Also, third-party drivers such as those available for Exabyte or the *mtx* utility from HP can be used. Each type of driver is considered to be an *Autochanger Interface* from Backup Professional's perspective. When you set up autochanger support, you pick the desired *Autochanger Interface* from a pick list and that interface is then used. The interface can be customized further if desired.

Due to the wide variety of needs and ways in which companies want to use the slots in the autochanger, we have made the interface fairly easy to understand, and adjustable for your particular site. Backup Professional uses a configuration file that is created during the setup of a autochanger device. This file specifies the autochanger slot numbers to use for backups on any given day. Thus, if you do master backups on Friday, you may need more slots on this day. Other days need less slots. This allows you to use other slots for purposes not related to Backup Professional (such as another backup software, HSM or specialty tapes), and also you can easily change the slot allocation on a temporary basis by editing the easy to understand configuration file.

Backup Professional issues autochanger commands before or after a group schedule backup and, before and after an individual backup. The activity and results of autochanger commands are displayed real time by the task monitor and also appear in the

reports if there were problems. Also, if your autochanger fails to work properly, it is easy to understand and change what Backup Professional's idea of the current tape in the drive is. Backup Professional shines when there is a problem with the changer. It is easy to get the tape library and Backup Professional in sync again and it does not require an extensive autochanger reinventory of the entire tape library. On a tape library with 80 slots, this can take a very long time and is very frustrating to see when all you may have done was open the library door and remove some dust or adjust a label.

Backup Professional works smoothly with your autochanger and does not force you into a rigid way of using it. The methodology is simple, easy to understand, and easily configured and changed. Backup Professional keeps tracks of tapes inside the autochanger and, if you need to restore a file residing on a tape housed in the autochanger, Backup Professional automatically retrieves the tape from the proper slot, loads it in the tape drive, restores the data and puts the tape back into its previous slot.

Backup Professional works fine with libraries containing multiple tape drives. In fact, you can be backing up on 3 drives simultaneously, while doing a restore from the fourth drive. All autochanger motions are coordinated so that no conflict occurs. You can also use multiple autochangers if desired. There are no restrictions since each autochanger has a name (used by Backup Professional) and its own individual configuration file.

If your version of Backup Professional is not specifically licensed for autochanger support, the menu options for autochanger are grayed out. You must have a license feature string that says: **j=xxx**, where *xxx* is the number of slots available in your autochanger. When the autochanger module is purchased, the purchase price will depend on the number of slots in the autochanger unit. Some autochangers have the capability to increase their slot capacity with purchase of an additional media spindle or slot-pack. The increased number of slots can be accommodated by reissue of a new license for the additional slots. This allows you to license and use only the slots you need.

Crash Recovery - Introduction

UniTrends pioneered the first fully-automated crash recovery using bootable floppies in 1989. This was for Xenix systems. The technology was extended to Unix systems in the early 1990s, and later to SCO OpenServer5 in 1995. Solaris was added in 1998, and finally UnixWare 7 in 1999.

UniTrends also pioneered the ParaChute technology which allows crash recovery for every Intel-based PC on the network (PC ParaChute). For servers, we offer crash recovery for RISC-based systems (Server ParaChute) and Intel-based systems (ParaChute 2000). A little bit of explanation is needed to understand the difference between the different types of crash recovery modalities available.

- **Air-Bag modality** - File-by-file restore of master and incremental backups to freshly prepared filesystems. This does not require reinstallation of the operating system.

- **PC ParaChute modality (clients)**- Partition-by-partition image restore of PC ParaChute backups. Works for Intel-based operating systems that use a partition table on the front of the root hard disk. This does not require reinstallation of the operating system. Follow this link for supported drivers.
- **ParaChute modality (RISC servers)** - similar to the above except it avoids partitions since it is used on RISC-based servers that do not have a partition table at the front of the root hard disk. It does a direct image backup of the root hard disk and any other desired hard disks.
- **ParaChute modality (Intel servers)** - works just like PC ParaChute except it backs up and restores directly to tape.

The ParaChute technology is an imaging technology. This technology allows bit-level verification, after-the-fact verification (e.g., 1 year later), integrity checking on restore, on-the-fly compression and is ideally suited for streaming mode through the network or onto a tape drive. ParaChute backups eliminate backing up dead or unused space on the hard disk and is generally much smaller in size than the total capacity of the hard disk. This format has no knowledge of the underlying filesystem structures or files. Its advantages are simplicity, speed and portability.

Crash Recovery - Servers

SCO Unix, SCO OpenServer 5, UnixWare 7

These systems use a two volume floppy disk boot set called the **A1** and **A2** diskettes. When the server crashes, a reinstall of the operating system is not required. Instead, you boot from the **A1** and **A2** diskettes and are presented with a comprehensive menu.

You can perform a totally automated restore or a step-by-step rebuild. There are also many options for custom reconfigurations, such as installing a larger or different type of hard disk. Other options include repairing a damaged superblock, restoring your CMOS settings, comprehensive diagnostics and a make your disk bootable option.

This product is referred to in our literature as the System Crash Air-Bag (TM) and is one of our most popular products. VARS love the product because it allows them to move from one type of hard disk controller to another without a reinstall of the operating system. Or they can move to a system with a larger hard disk. This product usually saves about 6-8 hours of time in a crash situation.

Solaris (Sparc)

Under Solaris (Sparc), either a custom floppy or custom tape is generated depending on whether or not your server has a floppy disk drive. The information recorded on the floppy is the configuration information for your Solaris (Sparc) server such as the types and sizes of the filesystems, hard disks, and partition information, tape, as well as a complete interactive crash recovery menu system.

When the server crashes, you boot from the CD provided with your OS. Then you mount the floppy or load in the tape, and run the crash recovery menu system. This loads the necessary drivers to access the tape drive. You can rebuild the entire system with a few simple keystrokes.

All filesystems are remade, mounted and you restore from Backup Professional tapes for that server. The process works very smoothly and is easy to use and understand. You restore both Backup Professional master backup for that server as well as the incremental backup and reboot from the hard disk. Then your system is back up and running just as it was at the time of the last incremental backup.

This feature comes bundled with each Solaris (Sparc) server and Solaris (Sparc) clients at no additional charge. It supports Solaris (Sparc) 2.5, 2.6 and Solaris 7.

Linux (Intel)

Linux (Intel) crash recovery is provided with a module referred to as ParaChute 2000. This is a bootable floppy diskette that uses the ParaChute technology. It creates a partition-by-partition image backup of your root hard disk. When you crash, you can boot from this diskette and restore the backup to a new root hard disk. This avoids a reinstallation and reconfiguration of the operating system which will save you 1-2 hours of time when you crash.

HP-UX, AIX and Dec Alpha

Crash recovery on these server platforms again rely on the ParaChute imaging technology. Utilities are provided by Server ParaChute for performing a ParaChute backup of the root hard disk when in single user mode or booted from the operating system installation CD. When the root disk crashes or becomes corrupted, the ParaChute backup on a tape is used and restored to the same or a fresh root hard disk. This saves reinstallation, relicensing and reconfiguration of the operating system. The time saved depends on the actual operating systems but usually is at least 3-4 hours.

Crash Recovery - Clients

Solaris (Sparc) Clients

Complete crash recovery is available for Solaris clients. The process is similar to the server-sided crash recovery in that you make a custom floppy or tape for each client. Optionally, you can include the custom information for several clients on the same floppy, thus having a single crash diskette for a cluster of Solaris clients. The booting process is similar in that you boot from the bootable CD provided by Sun. After loading the crash recovery menu system, you can connect with Backup Professional server through the network and restore data.

In fact, you run the same restore interface you would if you were booted from the client's hard disk. Like the server crash recovery, this process works smoothly and seamlessly. Once the system is rebuilt and all files are restored, you reboot from the hard drive on the client and resume your work. This saves the hassle of reinstalling the operating system from scratch and trying to gather the configuration information for the client such as the number of filesystems and sizes and filesystem types.

Unix Clients

Crash recovery for Unix clients running on an Intel processor include the following platforms:

- Linux
- BSDI
- Unixware 2.x
- Unixware 7
- SCO ODT, SCO OpenServer 5
- Solaris 7 Intel
- SVR4 Generic

This product uses a crash recovery diskette that is generated on the server. You boot from this diskette to perform a crash recovery backup or restore. The crash recovery backup can be automated through the Backup Professional scheduler as well.

Novell Server (3.x, 4.1)

Crash recovery for Novell servers is provided with the PC ParaChute technology. This uses a bootable diskette which performs a ParaChute style backup of the system and sends the data over the network wire to the server where the tape drive resides. This backs up and restores the bindery and NDIS. There are never any open file or locking issues since the ParaChute backup is obtained with the machine in a quiet state.

PC ParaChute allows full crash protection for any Intel-based PC on the network including Win3.1/95/98/NT/2000. When a PC crashes, you can restore it back to its original state by inserting a crash recovery diskette that has been previously generated. Once booted from this diskette, the PC connects through the network to the Backup Professional server and a full and complete restore is done. This avoids the hassles of having to reinstall Windows and each application as well as reconfigure the system. It also saves significant time.

The PC ParaChute backup of the PC is performed as an unattended backup and can be done at night. In order to be sure all files are in a quiet state, the backup is performed from a bootable PC ParaChute diskette. This is the same bootable diskette that is used to restore the system. The user or administrator makes sure this diskette is in the drive at some time during the day.

When the crash recovery backup is scheduled to run, the server connects to the Backup Professional agent on the PC who shuts down the machine and boots from the PC ParaChute diskette. A special lightweight Backup Professional agent backs up the entire system with the assurance that the operating system is not running, no processes are running, all files are closed and there are no modifications being made to the filesystem. The entire system is backed up and stored on the main server.

An average PC (4 Gb hard drive - 25% full) can be restored to completion this way in approximately 20 minutes. And it can be done by users without expertise in Windows. This extends the abilities of the system administrator, saves time, saves additional training and ensures you can get any PC back to an operating state in short order.

Non-Proprietary Tape Format

Backup Professional uses a non-proprietary tape format. In fact, in the worst case scenario, you could restore your data using the standard utilities available on any Unix system. The tapes format is designed to be extensible and allow stacking of multiple backups on a tape.

Each tape contains a tape label which contains the tape number as well as other information. Each set of data is preceded by a fileset label that contains information about the type of data on the tape, the way in which is was recorded (block size) and so forth. You can read these labels with either the *dd* or the *tar* utility using a standard no-rewind tape device name.

Windows 3.1/95/98/NT/2000 Special Features

Hot DLL Restore

If you have ever tried to perform a full restore of a running Win95/98/NT/2000 system, you find that any DLL that is in use, will not restore. You then have to try to create a list of these DLLs and manually attempt to restore them after shutting down applications and parts of Windows. This is frustrating , time consuming, and generally does not work because many DLLs are always in use by the system.

Backup Professional works around this by allowing a **Hot DLL Restore**. When Backup Professional restores a DLL that is already in use, it puts the new DLL in a special place to be restored on the next reboot. The next time Windows is rebooted, a Backup

Professional process runs that restores all the DLL that could not be restored previously. This is run before any Windows processes run so there is no chance the DLL is in use.

This allows you to get your system back to an exact previously known working state and avoids the hassles of trying to restore over DLLs that are in use.

Open File Handler

Backup Professional has extensive features for handling open files on Windows 3.1/95/98/NT/2000. Open files are files that are in use by either Windows or another application. In most cases, Backup Professional can successfully back these files which other backup products skip over. For those few cases in which Windows stubbornly denies access to a file (system file), Backup Professional provides a unique priority scheme. It maintains a list of all open files encountered.You mark all files that are okay to skip if they are in use. Backup Professional does not report errors on these files.

Backup Professional integrates with third party open file managers such as St. Bernards Software. These packages take a snap shot of the system and allow a backup program to read every file on the hard disk, even files that are open or locked.

Before and After Commands

Client-sided before and after commands are available for fine control of the environment under which your backup runs. Thus you can shut down specific applications to guarantee that they are not running during the backup. And they can be restarted again when the backup is complete.

Windows 95/98/NT/2000 Registry Backup and Support

Extensive work has gone into the Windows 95/98/NT/2000 registry support. The registry contains critical settings and configuration parameters as well as application specific settings. Backup Professional backs up all the registry settings and can do so even when the system is being used. This happens as part of the normal backup unless of course, you exclude the registry.

The distinguishing feature of Backup Professional over others is the restore capabilities of the registry. The registry names are mapped into the filesystem space when the filenames to be restored are displayed. This allows you to pick all or part of the registry to restore just as you would pick a filename to restore. This makes working with the registry and restoring all or parts of it easy and understandable.

You can restore a specific hive of the registry, a specify sub-directory or an individual key. You can restore all the registry settings to exactly how they were on a specific date at a specific time (usually when you know everything was last working well). You can restore the registry settings for a specific application to how they were at a given time in the past.

The capability to perform a non-destructive restore of the registry is available. This is crucial if you have reinstalled Windows 95/98/NT/2000 on new hardware and now are ready to restore your application files and application registry settings. The non-destructive registry restore adds registry information not previously present (applications) but does not wipe out registry settings pertaining to the new hardware.

We have worked extensively with Microsoft to ensure that our handling of the registry is the most robust and reliable available and will stand up to changes made to the registry in future Windows upgrades.

In short, you will find Backup Professional's registry backup and restore support to be one of the most comprehensive of any backup product in the industry.

Tape Management

Backup Professional tape management comes with a powerful feature that controls when a tape can be overwritten. For example, if your site rotates tapes every 14 days, you can set a *recycle time* of 14 days when you label the tape. This means the tape cannot be used before 14 days have elapsed, thus protecting against accidental overwriting of the tape by Backup Professional. Most commonly, a tape is overwritten when it is used for a restore and the write protect tab has not been set on the tape. Later a backup kicks off and uses the tape in the drive, possibly causing it to be overwritten. This recycle time is referred to as the retention period which derives from nomenclature used in the mainframe days.

When the tape retention period has expired, Backup Professional will recycle the tape. This means that the old backups are retired, a fresh tape label is written to the tape (using the same tape number) and the tape is used again as if it were a fresh tape.

Backup Professional will not overwrite a tape that contains the last good master, incremental, or ParaChute backup for a given client. When a tape is recycled, all prior knowledge of the data on the tape is automatically purged from Backup Professional's database. This purging is done in a highly efficient manner (a matter of seconds). This keeps the database synchronized with the actual data on the tapes at all times.

Periodically (once a week), Backup Professional will determine if it can save 25% or more space in the database by doing a reorganization. If it can, it will reorganize the database. The interval at which it checks as well as the space savings are configurable.

Backup Professional will keep appending to a tape until it is full or it encounters a hard write error. Once this happens the tape is marked as full and cannot be written to unless the retention period has elapsed. If you are not happy with this policy, you can either use

a retention period of 0 days use a schedule command that forces a fresh tape label be written on a nightly scheduled backup each night.

Tape Knowledge Database

You can access the tape knowledge database from the server's graphical user interface. This contains all the information Backup Professional knows about any given tape including its retention period, the number of backups on the tape, how much data is on the tape, whether the tape is full or not or encountered and error, whether the tape is retired, and other such information. This is very useful for finding information about any given tape used by the server.

Importing Foreign Tapes

You can import tapes from another Backup Professional server by using the *Tape Import Feature.* This reads in the tape label as well as each backup on the tape and records the information in the database as if Backup Professional had written the tape itself. This information then becomes a permanent part of the database. You may wish to use this feature if you had to restore your system to how it was a week ago due to a malfunction in your primary application. In this case, Backup Professional's database does not know about the last 7 tapes backed up. You simply import these tapes, and then Backup Professional database is current and users can graphically select files to restore from these tapes.

Retiring a Tape

You can retire a tape from the system. This marks the tape as retired and purges all information regarding the tape and the backups on the tape from the database. This is useful, if a tape has been physically destroyed (heat damage or tape breakage) and is useless. In these cases, there is no point in having the database contain files that in reality can never be restored.

Cloning a Tape

You can clone a Backup Professional tape to be used for off-site storage. This can be cloned to the same exact tape format or to a different type of tape format (4mm to DLT for example).

Client-Sided GUI

This is a powerful feature of Backup Professional and one which most other network backup products do not have. This saves the administrator's time because the user can restore the proper version of the file themselves without any administrator support. If you have 50 to 100 PC users, this can add up to quite a bit of time saved and well justify any cost differences you may find. Furthermore, some power users or high level individuals

may be nervous about having a network backup product backup their sensitive data. In this case, the power user can insert their own tape in the servers tape drive, do their backup and retrieve and store the tape themselves in a private place.

Other sites may choose to have some users responsible for their own backups. In these cases, most likely the user will have the backup start as they are departing for lunch.

On Win3.1/95/98/NT/2000 the user interface is that of native Windows. Under Unix, the graphical user interface is an X-Window interface which is what these users are used to and expect.

Support Contract

A support contract is vital in order to receive support after the first 60 days has elapsed. Most customers choose to include the cost of the support in their initial purchase. Annual technical support is available for 20% of the total purchase cost.

Also, support entitles you to all the maintenance upgrades and new releases. Support contracts are for a period of one year. When you purchase Backup Professional, you receive 60 days free technical support.

Technical Support

The design team spent considerable time making technical support integral to the product and not simply an after thought. The diagnostic and support features of Backup Professional are robust and powerful. For example, the base product generates a comprehensive Technical Support Fax Sheet. This is faxed to the support department 20 minutes before you call. This gives the support engineers all the information they need to know about your operating system, computer set up, and specific settings of Backup Professional. By printing and sending in this sheet, you will save your time and phone expense as it makes it much quicker for the support engineers to arrive at a solution.

Many support features and capabilities are built into the product. For example, almost any level of utility logging can be done. The level of logging can be limited to a specific binary or to a specific module within a binary. This makes it possible to send or e-mail a given log to the support team who can interpret the log and find the problem. The capability exists to print out in ASCII format parts or all of the database as well.

Backup Professional has a built-in network troubleshooter. This means if there is trouble connecting to a given client, it reports to you in English what the problem is. This could be as simple as not being able to ping the client to the fact that the clients name is not listed as an alias in the DNS (Domain Name Server) tables.

Overall, the design team incorporated over 11 years of support experience in backup and recovery industry and incorporated it into Backup Professional. Our hope is that you will never need technical support, but when you do, you find it responsive and accurate.

Comprehensive Backup Scheduler

The comprehensive backup scheduler is one of the most powerful features of Backup Professional. It does not use the cron facility of Unix, but rather its own daemon - *tasker*. You can set up back up groups and schedule any backup group at any given time or interval. You can specify on which clients you wish to perform a master backup and which to perform an incremental backup on any given day. Any individual customized backup profile can be attached to an individual client as part of a group backup. This allows you to back up your company's computers in groups such as accounting, shop-floor, human resources, etc.

The scheduler has other such features such as the ability to temporarily disable a group schedule and/or an individual client within a group schedule. When you establish a schedule, you first set up the group (you can have a group of 1) and then pick the *Backup Strategy* you want from a predefined list of over 8 predefined backup strategies. This list includes the most commonly used strategies as master on Friday and incrementals on Monday through Thursday. You can have a weekly strategy or a monthly strategy or even a quarterly or yearly strategy. If you are not happy with the predefined strategies, you can edit and existing one or design you own using the interactive *Schedule Designer*. We have not yet met a schedule we could not design and implement with the powerful *Schedule Designer*.

Schedule Reporting

You receive a nice report each morning after a nightly schedule has completed. This includes the schedule start and elapsed times, status report of each client, and the number of files and megabytes backed up on each workstation. You also receive the status of the bit-level-verification on the backup.

Image Backups

Backup Professional supports backing up raw partitions as well as image backups of your hard drive. It is not a bad idea to perform an image backup of your hard drive at least once. This also can be used for replicating and duplicating hard drives. Many of you have requested the ability to support image backups of hard drives. Large file support > 2Gb is supported on many platforms. Call for details.

Remote Administration

Backup Professional has one of the most comprehensive remote administration modules of all products in the industry. This is a character-based interface that is quite powerful

with pop-up windows, drop-down boxes, selection lists and full color support. You can perform all the functions of the X-Window based server GUI from a dial-up modem connection, or through a telnet session.

Remote administration can also be used by any browser that support an ANSI terminal emulator plug-in of which many are available (both freeware and commercially). This makes Backup Professional administration available from most browsers.

Additionally, this allows full administration of Backup Professional from a WinNT workstation or Windows 3.1/95/98/2000 machine using telnet. An administrator can dial-in from home to check on the progress of backups.

What to do if you do not have an X-Window Display

The primary interface for the Backup Professional server is an X-Window display. If this is not available, there are several options. You can simply use the character-based remote administration interface (*bpmenu -c*). You can run this from a browser using a terminal emulator plug-in or from a telnet session from a Windows 3.1/95/98/NT/2000 workstation.

Alternatively, you can install a X-Server such as Hummingbird's Exceed on a Windows 3.1/95/98/NT/2000 machine and redirect the X-Window display to this workstation.

Command Line Interface

Most all features of Backup Professional are available through the command line. In fact, if you are familiar with the Unix tar utility, you already know many of the switches available for *bpr*, the command line engine that uses a Unix tar-like command line interface to Backup Professional. In addition to the normal switches there are -zSERVER=xxxxx and -zCLIENT=xxxxx to specify the server and client machine for the backup, restore or verify process. All the command line features are nicely documented in the printed documentation that comes with the product and the on-line manual.

Security

Security is integral to Backup Professional. Only backups created on a specific client machine can be restored to the client machine. If the supervisor override password is used, this can be overridden. Unlike some other network backup products, we do not use the *rsh* method of communicating between client and server. Thus, you do not have to worry about security concerns that arise when you open up system access by adding entries to the .rhosts and /etc/hosts.equiv files on a system. All operating system permissions are enforced on non-root backup and restores.

Built-in Network Troubleshooter

Backup Professional has a built-in network troubleshooter. This is activated if you are having trouble connecting to a given client either during set-up or while performing a backup or restore. This network troubleshooter gives you very specific information as to why the server cannot connect with the client and tells you what you need to do to fix the problem. This can save the administrators hours of frustrating time trying to troubleshoot a connection.

Hypertext On-Line Documentation

The printed documentation that accompanies the product is very comprehensive and robust as well as easy to read. In addition, Backup Professional has extensive on-line context-sensitive help. This means after pressing help, you receive an icon of a question mark. You place this over the item in question, click your mouse button and the context-sensitive help appears.

Backup Professional ships with the entire documentation on the CD. Take your browser to /usr/bp/info.dir/BP.book.html and you have the entire manual at your fingertips. Of course you can also view it directly from the web site.

The remote administration module also has extensive on-line help. Every menu choice, every form, every field has extensive very context-sensitive help that will guide you through every step of using the product.

NT Server

The release date for the WinNT server version of Backup Professional is Winter 2000. This version provides all the standard features of Backup Professional. We do; however, support it as a client.

Third-Party Databases (Oracle/Sybase/Informix)

Backup Professional integrates nicely with Oracle, Sybase and Informix. There are so many ways in which the databases can be backed up that it is beyond the scope of this paper to discuss them all. Your database might reside in a raw partition in which case you use the raw partition backup feature of Backup Professional.

Alternatively, you may have a replication server. You may have archive logs. You may desire to go in the "Hot Archive Mode" for the entire database. Other sites will use hot archive mode on a table-by-table basis.

Please call our technical sales staff to discuss any specific database backup issues that you may have.

MS Exchange

Backup Professional can properly backup Microsoft Exchange Server. This can be done with a minimum of down time to the Exchange Server (5-10 minutes on most systems).

This is done by creating a custom backup profile. The before command of the backup profile temporarily shuts down the exchange server database engine. Then the exchange server data directory is backed up. Following this, the after command restarts the exchange server. This provides for a complete backup of all exchange server with a minimum of down time.

A restore profile can be custom created to restore the entire exchange server should the need arise. Like the backup profile, the before and after commands stop and then start the exchange server database engine.

Also, please note that Backup Professional will soon be available with hot file backup. This is described in the previous FAQ. This allows Backup Professional to get a backup snapshot of the Microsoft Exchange Server product as well as the other files on the hard disk without ever having to shutdown the exchange server database engine. This allows 24x7 use of the Microsoft Exchange Server.

If you want to be able to restore an individual mailbox at any given date and time Backup Professional will not help you in this endeavor. Backup Professional can restore on a file-by-file basis pieces of an Exchange Server but does not work from a logical view of a single mailbox. A module to perform this is planned for a future release.

Summary

We hope this Backup Professional white paper has been helpful to you in your purchase decision of a network backup product. With over 11 years of experience regarding backup and restore as well as crash recovery , the design team put a lot of thought and consideration into the product. You will find the "little things" are all present in Backup Professional. You will also find that it inter-operates well with other software, backup products and strategies that you are using. When you need to make a configuration change, most likely you can do it right then and there as opposed to waiting for a new release to support that as an option. If you need performance, Backup Professional has it. If you need reliability, Backup Professional has it. If you crash, Backup Professional will get you back up.

All this, and more, is reflected in the fact that even in its first release, it won the Top of the World award during a review in an industry computer magazine (*SCO*

WORLD - September 1997), beating such well known names as Cheyenne Software.

We hope you give Backup Professional your utmost consideration. Please call our sales representatives for additional information, for a quote or to discuss client-server options of Backup Professional that would best meet your company's network needs.

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