Novell™ Tape Backup Performance Testing

StorageWorks™

Application Note

EK–SMA03–AN. A01

This application note summarizes the results of a study designed to evaluate the performance of four different current StorageWorks tape drive models. Data for this test was gathered by backing up large sets of user data using these drives and Novell NetWare backup software. Testing criteria consisted of drive type, file type, and RAID configuration. A broad range of test factors were considered such as:

- How fast will the system complete a given backup of data?
- What was the highest bandwidth of the software from each RAID configuration to each tape device?
- What was the highest bandwidth of the tape devices in each RAID configuration through each software backup package?
- What was the highest bandwidth of selected RAID configurations through the backup software to each tape device?

Test Bed Configuration

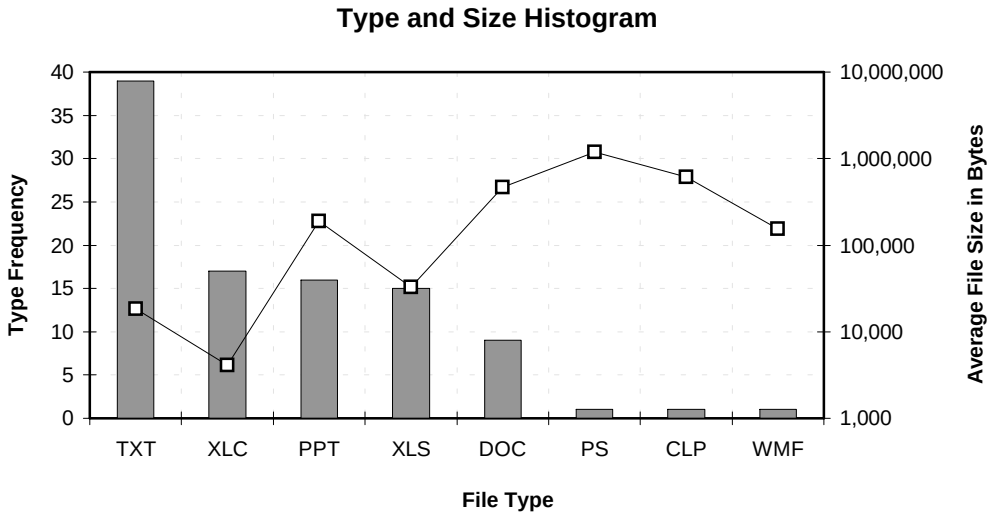
The test-bed configuration used to conduct the backup testing consisted of the following:

1. A DECpc 560 ST **server** operating with NetWare 3.12. The system was equipped with a 60 MHz, EISA Bus Pentium CPU and 64 MB of memory. The server's disk block size was set to 4096 bytes (Novell default).
2. Palindrome NetWork Archivist and Cheyenne Arcserve **backup software**.
3. Data compression **tape drives** consisting of the following StorageWorks devices:
   - SWXTA-AA DDS1 DAT drive (2 GB uncompressed, 4 GB compressed)
   - SWXTA-BA DDS2 DAT drive (4 GB uncompressed, 8 GB compressed)
   - SWXTE-AA 8mm drive
   - SWXTL-BT ½-inch DLT (Digital Linear Tape) drive (10 GB uncompressed, 20 GB compressed)
4. RAID configurations consisting of the following **storage subsystems**:
   - SWXRA-XB (RAID Array 110) configured with five SWXD3-SB 2 GB drives and RAID level 5
   - SWIKX-BA (RAID Array 210) configured with five SWXD3-SB 2 GB drives and RAID level 5
   - SWIKX-BA (RAID Array 210) configured with five SWXD3-SB 2 GB drives, NetWare volume spanning, and JBOD (just a bunch of drives)

User Files Saved

A typical user directory of 100 files totaling approximately 10 MB was cloned over the disks. The 100 files totaled 10,487,753 bytes (approximately 10 megabytes).

The type and size of file distributions on the disk are important to backup performance. The chart below shows the file name extension of the types of files saved across the "X axis". The file types that occur the most are at the left and those types which occur the least are toward the right. The left "Y axis" refers to the bars and shows the number of these types in each user's directory. Since the total number of files is 100, the quantity is equal to the percentage of each type. The logarithmic right "Y axis" refers to the line graph and shows the average size of each type in bytes.



Backup Tape Drive Performance Results

The following chart shows tape drive performance for the four StorageWorks devices tested. The variations are caused by differences between the two backup software products and Novell system environments. The files backed up here are assumed to be fairly typical and are a mixture of PC application data and text files. They exhibited an approximately 2.5:1 compressibility ratio (60% compressed). Your results will fluctuate due to the effects of user file compressibility which can vary by as much as a factor of two on either side of the figures depicted below.