
RECENT TECHNICAL ACTIVITIES

The Optical Disk Permanent Record

Background

Up until first quarter 1989, CFHT had been keeping its permanent record of observations on 6250 bpi 9 track magnetic tape. While this was adequate at the time it resulted in the following difficulties:

- too much manpower invested in tape handling
- the limited space in our data vault was almost exhausted
- our yearly costs for tapes were exceeding \$10,000
- our existing tapes were aged to the point where they would require yearly maintenance if they were to remain useful

After an investigation of the available devices we picked a Write Once, Read Many (WORM) Optical disk manufactured by Maxtor. This disk uses a 5 1/4 inch optical disk cartridge with a capacity of 800 Megabytes. The interface used is SCSI and the vendor of the drive, Delta μ Systems, supplied all the software required to move files on and off the media. Our reasons for choosing this drive were driven by the following considerations:

- the drive must interface to our current Unix hosts
- it must be inexpensive enough that a backup drive was affordable
- the drive chosen must be compatible with future juke-box configurations

Implementation

The drive was installed in Waimea on one of the Sun Workstations and both the drive and the workstation are on the Uninterruptible Power System. Software was created which automatically retrieves the FITS images/files from the summit in real time across the T1 leased line, compresses them using adaptive Limpel-Ziv coding, and writes them to optical disk. We have found from experience that compression factors of between 2 and 5 are typical for FITS images. This increases the effective capacity of the optical disks to at least 1.6 Gigabytes. Tests have shown that the images are removed from the summit in approximately 15 seconds.

Effects

We have made **no changes whatsoever** in the visiting observer's view of our tape handling. The observer writes data to tape at the summit and brings the tapes to Waimea for copying. In Waimea we are currently giving the observer a copy of the summit tapes and keeping the originals. We are making monthly tests comparing the original data tapes to the files on optical disk.

We expect to be able to rescind the requirement that observers make copies of their tapes in Waimea sometime

during 1990. However this will depend on the results of our comparison tests.

Results

We have found that we are filling up 1.5 optical disks per month. This will result in some 18 optical disks at \$150 each requiring storage in our data vault. The good news is that 18 optical disks take up about a cubic foot of storage space, thus increasing the longevity of our data vault.

If our comparison tests prove out, which they have to date, we will be copying all our existing 9 track tapes to optical disk.

Rick McGonegal

A Data Reduction Facility Development Computer System

Background

The CFHT network has become a very busy system with users depending on it twenty-four hours a day. This makes it difficult for the data reduction facility staff to perform software maintenance on the network and still keep the network alive. To help alleviate this problem, a small development system has been set up. Any time new software is to be added to the network or existing software needs to be upgraded, the changes are performed on the development system first. Hopefully, this strategy will minimize network downtime for software maintenance.

Implementation

The development system currently resides in Bob Link's office. It consists of a Sun 360 workstation, a Delta Microsystems 60MB cartridge tape drive, a Delta Microsystems 580MB winchester disk, and a PerfectByte 8 mm exabyte tape drive. The three storage devices are daisy-chained to the SCSI port of the Sun 3. The workstation is currently configured as a standalone computer using the winchester drive as the boot and storage device. The workstation is running Sun OS4.0 and is connected to the network so all network facilities are still available. If required, the storage devices are available to other users across the network. The development system provides another benefit to the network, there is one less machine to be served by the over-worked network file server machine. The 60MB cartridge tape is used primarily for reading in new software; these tapes are the most common medium for delivery of software. The exabyte tape is used as the primary system backup device for all disks across the network. While the exabyte is relatively slow, it has a large capacity so that a backup of the entire network can be stored on one tape. This allows the backup to be performed during the night, unattended. The