CHARON-VAX application note

AN-014 Accessing SCSI & IDE disk drives with CHARON-VAX

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CHARON-VAX can directly access a SCSI or IDE disk attached to a CHARON-VAX host system and use it just like a physical disk on a MicroVAX. It is even possible boot a VAX operating system from this attached SCSI or IDE disk. As an example, this note documents the procedure for attaching a SCSI or IDE disk to CHARON-VAX. To understand the throughput, we have indicated the disk I/O performance we measured with a Digital RZ-25E SCSI disk attached to CHARON-VAX running under Windows 2000.

Step 1: Connecting a SCSI or IDE disk to a CHARON-VAX host

Physically connect the required disk to the host system. In case of an IDE disk connect the drive to the IDE main board connectors, use a SCSI controller card or embedded SCSI controller in case of a SCSI disk. The procedure for detecting and configuring physical SCSI or IDE disks depends on the operating system used:

Windows NT/2000.
Ensure that the attached disk is not allocated to Windows. Run the utility “Disk Administrator” (Windows NT) or “Disk Manager” (Windows 2000) to make sure that the disks dedicated to CHARON-VAX are not allocated by the Windows operating system.

OpenVMS
Any disks visible under the host system can be used by CHARON-VAX. Note that the disks should be dismounted or mounted as foreign under the host’s OpenVMS before using of them under CHARON-VAX.

Linux
Under Linux just note the names of the connected disks to be used when configuring CHARON-VAX.

Step 2: Configuring CHARON-VAX

Use the process described in the CHARON-VAX Users Guide to identify and configure your SCSI or IDE disks. See the section on mapping physical host system disks in the chapter on Emulation of Components. This allows you to associate the SCSI or IDE disks to CHARON-VAX, for example:

Windows 2000 or Windows NT:
SET DUA file[2]=”\\.\PhysicalDrive1”

OpenVMS:
SET DUA file[2]=”DKA100:”

Linux:
SET DUA file[2]=”/dev/hda”

Test Environment & Test Procedure Description

For the performance measurement the following configuration was used:

Component	Description	Purpose/ Comment
Base system	Intel P2 system 500Mhz, 2CPU’s 64Mb RAM S3 video board SCSI adapter NCR FDD 3.5”	
Disks	IBM 9 GB IDE ATA (Disk0), Digital RZ-25E SCSI (Disk1)	
Ethernet	4 port card using Digital 143 chipset	
Operating System	Windows 2000 Professional	Disk Caching is enabled

Four groups of tests were performed:

1. Copying one big file and then a large group of small files from one folder to another on the same attached disk (Disk1):
    a. On a physical disk mapped as a disk device under CHARON-VAX
    b. On a disk image placed on the disk, used in the test a.
2. Copying one big file and then a large group of small files between:
    a. A physical disk mapped as a disk device under CHARON-VAX (Disk1) and disk image placed on the main disk (Disk0) of the host system
    b. Two disk images, one of them was placed on the main disk of the host system (Disk0), and the other on the physical disk, used in the test a (Disk1).

Observed disk performance

File Transfer on the same disk:

1a. Disk1, used as a physical drive:

Test Description	Copied Blocks	Time, sec	Speed, Kb/sec
Copying one large file	111573	127	439.26
Copying a large group of files	108798	300	181.33

1b. Using a CHARON-VAX disk Image placed on the attached Disk1:

Test Description	Copied Blocks	Time, sec	Speed, Kb/sec
Copying one large file	111573	182	306.52
Copying a large group of files	108799	257	211.7

File Transfer between disks:

2a. Disk1, used as a physical drive:

Test Description	Copied Blocks	Time, sec	Speed, Kb/sec
Copying one large file (Disk0->Disk1)	111573	50	1115.73
Copying one large file (Disk1->Disk0)	111573	40	1394.66
Copying a large group of files (Disk0->Disk1)	108799	189	287.82
Copying a large group of files (Disk1->Disk0)	108799	130	418.46

2b. Using a CHARON-VAX disk image placed on the attached Disk1:

Test Description	Copied Blocks	Time, sec	Speed, Kb/sec
Copying one large file (Disk0->Disk1)	111573	93	599.85
Copying one large file (Disk1->Disk0)	111573	60	929.80
Copying a large group of files (Disk0->Disk1)	108799	147	370.06
Copying a large group of files (Disk1->Disk0)	108824	120	453.43

Conclusions for this particular configuration:

1. Copying between disks or disk images located on different drives is faster than using a single drive. This is probably due to the use of a dual CPU system.
2. Copying large files gives a higher throughput than copying groups of small files.
3. There is no clear speed advantage between using a full disk or a disk image, transfer speed highly depends on file size. In terms of ease of use, a disk image file can be more easily handled by the host operating system (e.g. backup).

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