Supercomputer SX-3 Overview

SUPERCOMPUTER SX-3 OVERVIEW

Senior manager Satoru Hirogami, Manager Masahiro Miyazawa
Assistant manager Akihiro Musa
NEC Corporation,1st C&C Systems Operations Unit
1st Government Systems Division

1.System Configuration

In February 1992 National Institute for Environmental Studies(NIES) installed the SX-3 system,a SX-3/14 with the operating system SUPER-UX. Fig.1 shows the system configurations with the SX-3 and the other central machines; SUN Server490, SGI Power 4D/310GTX, SGI Power 4D/35TG. The network is based on a FDDI backbone ring connecting the Ultra-Net with CISCO router. A LANP and Ultra Hub are used to attach the SX-3 to the FDDI.

NIES's SX-3 provides a peak vector performance of 5.5 GFLOPS, and has the following features:

- 1 Gbytes of main memory
- 3 Gbytes of extended memory
- 53 Gbytes of magnetic disk capacity
- 28 Gbytes of high speed magnetic disk capacity
- Ultra Net operated at 800 Mbps.
- 790 Gbytes of mass data processing system

The mass data processing system(MDPS) and the SX-BackStore system were installed in March 1994. The MDPS has 525 optical disk units(790GB) and connects to HIPPI channels. The SX-BackStore is archival file-storage system of the MDPS.

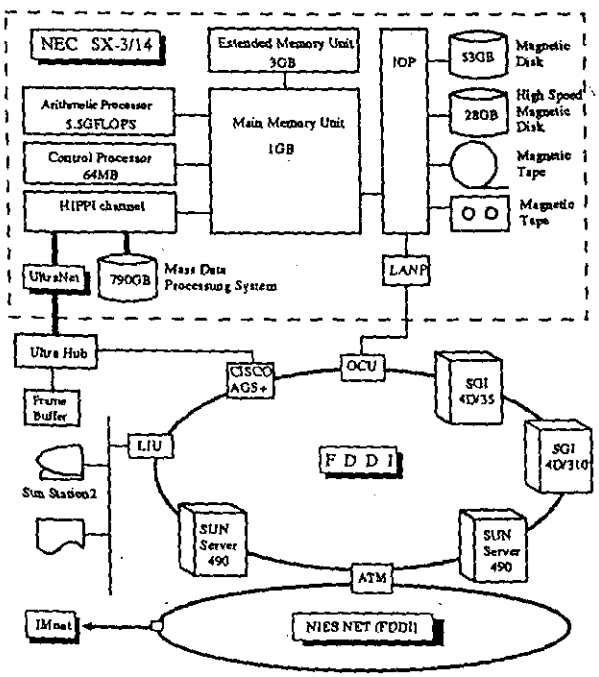

Fig.1 System Configuration

2.SX-BackStore

The SX-BackStore is archival file-storage system. This system migrates large volumes of file data to large-capacity, lowcost external storage devices, and secure free space on your file system. Moreover,when you access migrated files, the data is automatically recalled(restored) to the original file system, allowing subsequent accesses at high speed. This migration/recall function makes optimized allocation of file date on devices based on the frequency of access of the data.In addition,job abort due to insufficient space can be prevented.

Depending on the user's operation, the user can choose the appropriate model from the following two configuration models, or use a combination of the models.

1. Client Model: In this model, files on the SX are migrated to the file server's file system. Because a maximum of 8 recall processes can process multiple simultaneous recall requests can be reduced. Any of NFS,ftp,or rcp can be used for file data transfer with another host. If the file server can do an NFS mount on the SX, any server from any vendor is usable(Fig.2).

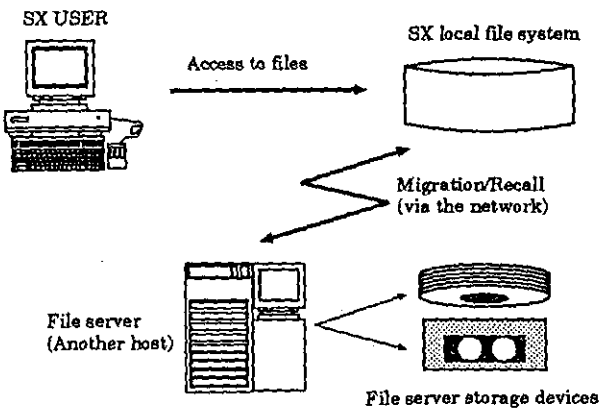

Fig.2 CLient Model

2. Server Model: In this model, files on the SX are migrated to mass storage devices connected to the SX(Fig.3).

The SX-BackStore has the follpowing features.

1. With absolutely the same access interface as for ordinary file systems, there is no need to modify programs and applications. Moreover,because

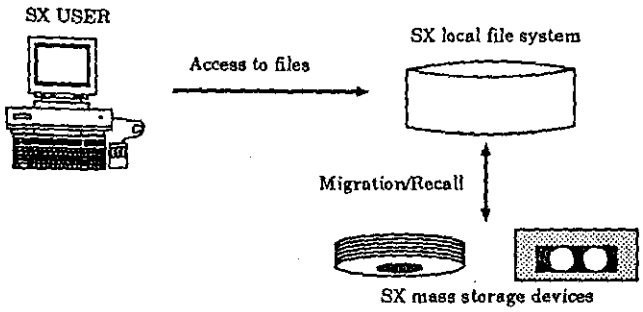

Fig.3 Server Model

the file system structure is not changed, there is no need to convert or rebuild the file system you are using now.

2. When free space drops below a defined threshold value, data that has been brought in by the recall function is again compulsorily migrated out when the file is closed. This prevents sudden loss of free space when large recalls occur.
3. Commands are provided to execute migration and items such as the time of execution and files affected can be set optionally. By appropriately setting these parameters, users can aloso effect periodic file backups.

3.Usage of the SX-3

The usage of the SX-3 resources is monitored and controlled through user administration activities like account application processing, user accounting, etc.

Fig.4 and Fig.5 show the session time and cpu time usage from JULY 1995 to JUNE 1996.

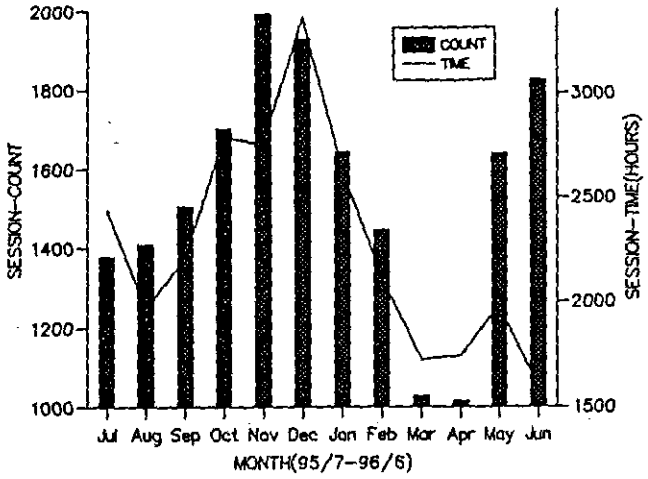

Fig.4 Usage of Session

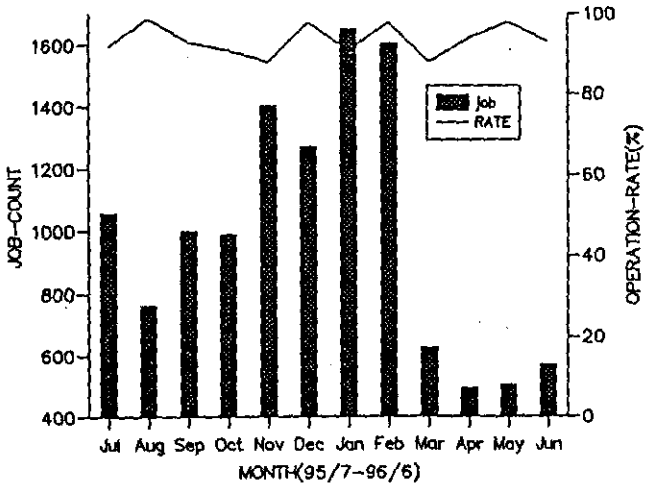

Fig.5 Usage of Job