

Chapter 9: Monitoring Enstore on the Web

There are several installed Enstore systems at Fermilab. Currently these include STKEN for general Fermilab users, CDFEN for CDF RunII, and DOEN for D0 RunII. For each Enstore system, a separate but structurally identical series of web pages is available for monitoring the system and any jobs you've submitted to it. The currently implemented websites for Enstore monitoring include:

- http://www-stken.fnal.gov/enstore/enstore_system.html for STKEN
- http://www-cdfen.fnal.gov/enstore/enstore_system.html for CDFEN
- http://www-d0en.fnal.gov/enstore/enstore_system.html for DOEN

We recommend that you bookmark the appropriate one in your browser.

In this section, we briefly describe the format and function of the web pages that are of interest to users, and show you how to navigate them.

The Enstore pages present snapshots of the status of various components of the Enstore system, and the pages are updated and refreshed periodically. The auto-refresh time interval varies from page to page, and does not correspond with the information update interval, which also varies from page to page. See the online help screens for more detailed information.



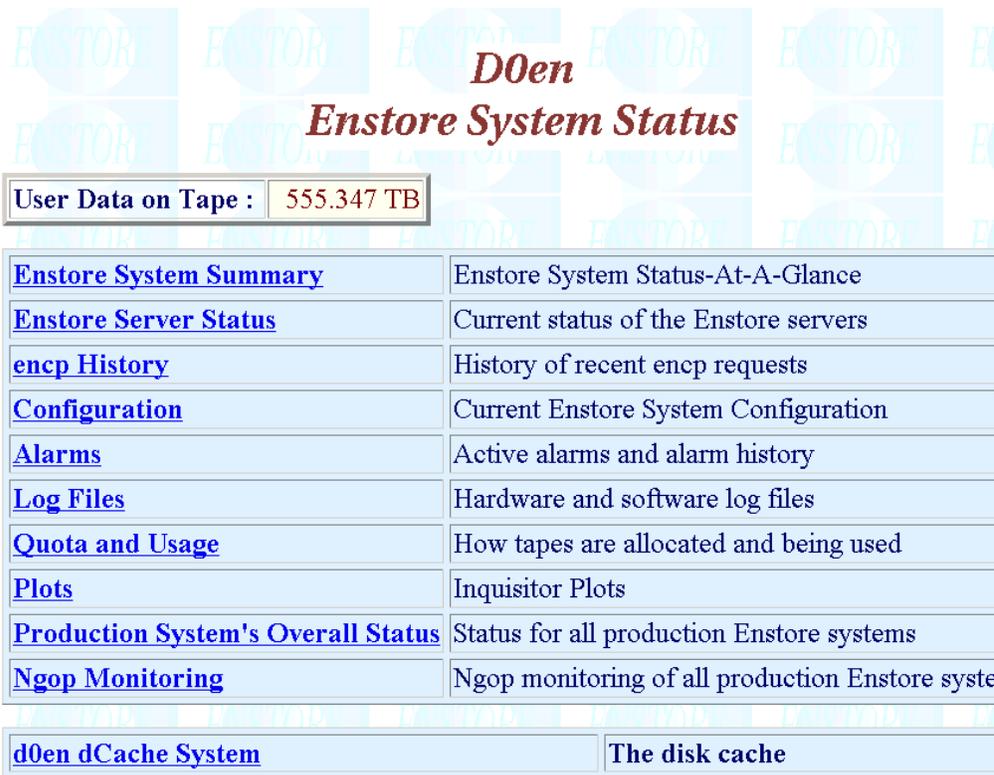
Note for Netscape users: Links on these pages are intended to take you straight to the item of interest, not to the top of the page on which it's found. Due to a Netscape bug, you'll find yourself at the top of the target page. To get to the item of interest, place your cursor in the URL area of the browser and hit **ENTER**.

9.1 Top Page

The top page for monitoring an Enstore system is located at <http://www-<xyz>en.fnal.gov/enstore/> (where <xyz> is one of `stk`, `cdf` or `d0`), as given above. This page has two sections, each containing links to other pages.

9.1.1 Enstore System Status Links

The links under the *Enstore System Status* heading lead to status web pages for the Enstore system and its servers, shown here for the D0en system:



D0en	
Enstore System Status	
User Data on Tape :	555.347 TB
Enstore System Summary	Enstore System Status-At-A-Glance
Enstore Server Status	Current status of the Enstore servers
encp History	History of recent encp requests
Configuration	Current Enstore System Configuration
Alarms	Active alarms and alarm history
Log Files	Hardware and software log files
Quota and Usage	How tapes are allocated and being used
Plots	Inquisitor Plots
Production System's Overall Status	Status for all production Enstore systems
Ngop Monitoring	Ngop monitoring of all production Enstore systems
d0en dCache System	The disk cache

The pages to which these links point (with the exceptions of *Quota and Usage* and *Production System's Overall Status*¹) share a header format, described in section 9.2 *Header Format for Status Pages*.

9.1.2 Information

Under the *Information* header are links for finding help, documentation, and so on.

1. *Quota and Usage* links to a text file with no header; and *Production System's Overall Status* has the header elements on the right-hand side only.

Enstore Help	Help on command line options
enstore.conf Help	Help on enstore.conf and network control
ENCP release notes	Latest encp release notes
Volume Import	How to import data into the Enstore environment
Tape Inventory Summary	Summary of inventory results
Tape Inventory	Detailed list of tapes and their contents
Tape Quotas	Plots of tape quotas
Cronjob Status	Plots of cronjob exit status for past week
Documentation	Design documents, Talks, Reports, Bug list etc.

9.2 Header Format for Status Pages

Here we see the header for the **Mass Storage Status At-A-Glance** page (from the link “Enstore System Summary” on the top page):

Header elements:

- In the upper-right corner you’ll find the page title, **Mass Storage Status At-A-Glance**, in this case.
- Underneath the page title is the name of the Enstore server that created this web page (e.g., Enstore), and the date and time that the current page was created. If the time shown here is more than a few minutes earlier than the current time, you should refresh your browser window to get updated information.
- The buttons in the upper-left corner are quick links to different pages:
 - Home** the top page, described in section 9.1 *Top Page*

- | | |
|----------------|--|
| System | the Status At-A-Glance page, described in section 9.3 <i>Mass Storage Status-At-A-Glance Page</i> (the page associated with the “Enstore System Summary” link on the top page; it is the page shown in the above image) |
| Servers | the Enstore Server Status page, described in section 9.4 <i>Enstore Server Status</i> (the page associated with the “Enstore Server Status” link on the top page) |
| Encp | the Encp History page, described in section 9.10 <i>Encp History</i> (the page associated with the “encp History” link on the top page) |
| Help | page-specific online help |
- Underneath these buttons you’ll find the Enstore system identifier; in the above image, it is *DOEN: Enstore for the D0/RunII AML/2*.

9.3 Mass Storage Status-At-A-Glance Page

- What?** The **Status-At-A-Glance** page presents summarized information indicating which parts of the Enstore system are up and working, which parts have problems, which have a scheduled outage, and other system information. It also provides a mapping between Enstore servers and the nodes that run them.
- Why?** Start at this page when investigating any possible problem. This page indicates which if any components of your Enstore system are experiencing problems.
- How?** To arrive at this page, start at the top page and click “Enstore System Summary”, or click the **SYSTEM** button on any of the pages.

The Enstore components and servers listed on this page are described in Chapter 7: *Overview of the Enstore Servers*.

Page Description

The page is divided into three sections. They list systems and servers, and code them with colored ball icons to indicate their status. The **HELP** button at the top of the page (see section 9.2 *Header Format for Status Pages*) describes the status icons.

The screenshot shows two sections of a web interface. The top section, titled "Overall Status", lists three items: "enstore" (yellow ball), "ADIC AML/2" (green ball), and "D0 Mezzanine Powderhorn" (green ball). A link "alarms" (yellow ball) is also present. The bottom section, titled "Enstore Individual Server Status", is divided into three columns: "Servers", "Library Managers", and "Media Changers". The "Servers" column lists "Alarm Server", "Event Relay", "Inquisitor", and "Volume Clerk". The "Library Managers" column lists "Configuration Server", "File Clerk", and "Logger". The "Media Changers" column lists "aml2r1.media_changer" and "stk.media_changer". Below these are "Movers", listed in three columns. The first mover column lists 994004.mover through 9940B32.mover. The second mover column lists 994007.mover through 9940B37.mover. The third mover column lists 994009.mover through 9940B38.mover. The fourth mover column lists 994011.mover through DI38M2.mover. The mover 9940B34.mover has a red ball icon, and 9940B35.mover (Power Supply) has a yellow ball icon.

Enstore Overall Status

summarizes the status (from left to right) of Enstore as a whole, the tape robots, the network, and alarm components. There is only one link:

The “alarms” link takes you to the **Enstore Active Alarms** page described in section 9.12 *Enstore Active Alarms*.

Enstore Individual Server Status

lists all servers (Chapter 7), library managers (section 7.3), movers (section 7.4), and media changers (section 7.5); includes individual status indicators. Each link in this section takes you to its corresponding server entry on the page described in section 9.4 *Enstore Server Status*.

Status indicators do not apply to the third section, which lists the nodes in the Enstore system and the servers that run on each of them (below we show the first few rows of the table). There is no status information.

Enstore Node/Server Mapping

d0enmvr10a	• D31ELTO.mover	d0enmvr11a	• 994011.mover
d0enmvr12a	• 994012.mover	d0enmvr13a	• DI38M2.mover • DI39M2.mover
d0enmvr14a	• D31BLTO.mover	d0enmvr15a	• DI42M2.mover • DI43M2.mover
d0enmvr16a	• DI44M2.mover • DI45M2.mover	d0enmvr17a	• D31DLTO.mover
d0enmvr18a	• D31FLTO.mover	d0enmvr19a	• 994019.mover

There is a legend at the bottom of the page for the status icons which looks like this:



9.4 Enstore Server Status

- What?** As the page title implies, the **Enstore Server Summary** page provides the status of all the Enstore servers included in your system. This includes movers, library managers, and so on. The servers are described in Chapter 7: *Overview of the Enstore Servers*.
- Why?** Use this page to find out what a particular server is currently doing, and what work it has pending.
- How?** To arrive at this page, start at the top page and click “Enstore Server Status”, or click the **SERVERS** button on any of the pages.

Page Description

The page is divided into two sections.

[Home](#) [System](#) [Servers](#) [Encp](#) [Help](#)
Enstore Server Status
Brought To You By : The Inquisitor
Last updated : 2002-May-08 16:06:19

D0EN: Enstore for the D0/RunII AML/2

Shortcuts

mezsilo.library_manager	meztest.library_manager	samto.library_manager	samm2.library_manager
samnull.library_manager	testlto.library_manager	testm2.library_manager	Movers
Full File List			

Name	Status	Host	Date/Time
alarm_server	alive	d0ensrv2	2002-May-08 16:05:56
event_relay	alive	d0ensrv2	2002-May-08 16:06:18
file_clerk	alive	d0ensrv0	2002-May-08 16:06:05
inquisitor	alive	d0ensrv2	2002-May-08 16:06:19
log_server	alive	d0ensrv2	2002-May-08 16:06:08
volume_clerk	alive	d0ensrv0	2002-May-08 16:06:00
ratekeeper	alive	d0ensrv2	2002-May-08 16:06:18
aml2r1.media_changer	alive	d0ensrv4	2002-May-08 16:06:16

The first section, *Shortcuts*, is simply a compilation of links that point to anchors in the table that comprises the second section. There is also a link labelled “Full File List” which takes you to the **Active File List** page, described in section 9.5 *Active File List* (useful for tracking down the library managers associated with the file you want to investigate if you only know the name of the file).

The second (and main) section is a status table which lists all the servers, and displays the server name, status, host, date/time, and last time alive for each. Some server names and status information in this table have links to pages with more information. We define the statuses below by server type.

This page is updated and refreshed periodically.

Library Managers

- The link on a library manager (LM) name points to the **Library Manager Queues** page for the corresponding LM (see section 9.6 *Library Manager Queues*).
- The link “Full Queue Elements” points to the **Full Library Manager Info** page (see section 9.7 *Full Library Manager Info*).
- The link on a volume name takes you to a text page with the volume’s inventory information (see section).
- The link on a mover name points to the **Movers** page (see section 9.9 *Movers Page*).

samto.library_manager	alive : unlocked	d0ensrv4	2002-May-08 16:06:02
	Ongoing Transfers	2 Pending Transfers	9 Full Queue
	Reading PRK136L1 using D31ELTO.mover from d0mino by sam Reading PRK137L1 using D31CLTO.mover from d0mino by sam Pending read of PRK138L1 from d0mino by sam [VOL_BUSY] Pending read of PRK137L1 from d0mino by sam [VOL_BUSY] Pending read of PRK137L1 from d0mino by sam []		

Statuses for library managers (LM) include:

- alive : unlocked
 - LM is working normally
- alive: locked
 - LM is rejecting new **encp** requests, but continues to assign jobs already in the pending queue to movers; **encp** does not retry
- alive: nowrite
 - LM is locked for write requests
- alive: noread
 - LM is locked for read requests
- alive: ignore
 - LM is ignoring new **encp** requests (returning “ok” to **encp**), but continues to assign jobs already in the pending queue to movers; **encp** retries internally so user is unaware of the delay
- alive: pause
 - LM is ignoring new **encp** requests, and holding pending jobs

Movers

The link on a mover name points to the corresponding mover (MV) on the **Movers** page (described in section 9.9 *Movers Page*).

994004.mover	alive : busy reading 672,186,215 bytes from Enstore	d0enmvr4a	2002-May-08 16:06:03
994007.mover	alive : busy reading 666,703,730 bytes from Enstore	d0enmvr7a	2002-May-08 16:06:12
994009.mover	alive : busy reading 85,099,444 bytes from Enstore	d0enmvr9a	2002-May-08 16:06:10
994011.mover	alive : busy writing 720,432,999 bytes to Enstore	d0enmvr11a	2002-May-08 16:06:01
994012.mover	alive : busy reading 147,623,913 bytes from Enstore	d0enmvr12a	2002-May-08 16:05:49
994019.mover	alive : busy writing 1,077,222,538 bytes to Enstore	d0enmvr19a	2002-May-08 16:05:54
994020.mover	alive : busy writing 191,688,701 bytes to Enstore	d0enmvr20a	2002-May-08 16:05:59
994023.mover	alive : SEEK	d0enmvr23a	2002-May-08 16:05:55
994024.mover	alive : busy reading 651,112,208 bytes from Enstore	d0enmvr24a	2002-May-08 16:05:51
D31ALTO.mover	alive : IDLE	d0enmvr21a	2002-May-08 16:06:10
D31BLTO.mover	alive : IDLE	d0enmvr14a	2002-May-08 16:06:12
D31CLTO.mover	alive : SEEK	d0enmvr22a	2002-May-08 16:06:09
D31DLTO.mover	alive : IDLE	d0enmvr17a	2002-May-08 16:06:07
D31ELTO.mover	alive : SEEK	d0enmvr10a	2002-May-08 16:06:19
D31FLTO.mover	alive : busy mounting volume PRK138L1	d0enmvr18a	2002-May-08 16:06:09

Statuses for movers include:

- alive : IDLE
 - MV is idle because there are no jobs to process
- alive : SETUP
 - MV is in initial phase of a job, it is setting up a connection with **encp** for a transfer

timed out	the inquisitor hasn't received the latest "I'm alive" message from the server
dead	duration of "timed out" status on server has exceeded configured limit (server name appears in orange)
not monitoring	server is known to the enstore system, but is not currently being monitored by the inquisitor (server name is displayed in gray)

9.5 Active File List

- What?** The **Active File List** page lists the data files being actively worked on by your Enstore system. The files are listed by user node.
- Why?** Use this page to find your file. This is the right starting page for checking on your job if you only know the name of the file you're reading or writing (i.e., you don't know the volume or any Enstore server information). This page has links to pages containing more job-related information.
- How?** To arrive at this page, start at the top page and click "Enstore Server Status". Then under *Shortcuts*, click "Full File List".

Page Description

The files are listed by their full path and name. For each file, the node from/to which it is being read/written is also given. This page doesn't distinguish between read and write.

D0EN: Enstore for the D0/RunII AML/2

Node Currently Active User Files

d0mino	/sam/cache32/boo/reco mcp10 p10.08.01maxopt nikhef pythia npv00+03+05+qcd-incl-PtGt2.0-PlateCaep mb-pois:
fnd01	/local/stage2/prd-cache/boo/all 0000145891 211.raw
fnd01	/local/stage2/prd-cache/boo/all 0000145891 230.raw
fnd010	/local/stage2/prd-cache/boo/all 0000145891 213.raw
fnd010	/local/stage2/prd-cache/boo/all 0000145891 236.raw
fnd011	/local/stage2/prd-cache/boo/all 0000145891 217.raw

Scroll as necessary or do a search to find your file in the list and click on it. This will take you to the **Library Manager Queues** page for the library manager servicing your job; see section 9.6 *Library Manager Queues*.

9.6 Library Manager Queues

What? The **Library Manager Queues** page lists the **encp** jobs that a selected library manager is currently managing or has pending in a queue (**encp** is described in Chapter 5: *Copying Files with Encp*). Movers in states other than busy or IDLE are listed at the bottom of the page (mover statuses are described in section 9.4 *Enstore Server Status*).

Why? Use this page to find out the status of a particular library manager's read and/or write queue(s) once you know which LM is servicing your job. You can find the status of your job, and its priority relative to other jobs in the queue. From this page you can click links to get full details on the processing of your file and on the volume associated with your file.

- How?** To arrive at this page, follow this string of links starting at the top page. Click “Enstore Server Status”, then:
- If you know the filename but not the library manager, then under *Shortcuts*, click “Full File List”. Click on your file of interest. This will take you to the **Library Manager Queues** page for the appropriate library manager.
 - If you know the library manager, you can click directly on the link in the second section of the **Enstore Server Status** page, instead.

9.6.1 Suspect Volumes

(no write-up yet)

9.6.2 File Reads

For the *Reads*, files are listed by volume. For each volume in use, the page lists the mover servicing it. Each **encp** job is listed on a separate line. The line lists the host to which the file is to be copied, the last 70 or so bytes of the filename (filenames can get quite long), the file’s current priority in the queue, and the file’s position on the tape. The files are ordered in the queue by priority.

[Home](#) [System](#) [Servers](#) [Encp](#) [Help](#)

Library Manager Queues

Brought To You By : The Inquisitor
Last updated : 2002-Mar-01 11:12:49

D0EN: Enstore for the D0/RunII AML/2

mezsilo.library_manager Page

Status : alive : unlocked

Reads [Full Queue Elements](#)

[PRL291](#) [at 994009.mover] fnd09 /local/stage2/prd-cache/boo/all_0000145891_163.raw (CurPri : 40 File : 125)
 fnd01 /local/stage2/prd-cache/boo/all_0000145891_166.raw (CurPri : 40 File : 126)

To get full information on the library manager's processing, click *Full Queue Elements* next to *Reads* to arrive at the *Full Library Manager Info* page (described in section 9.7 *Full Library Manager Info*). To get full information on a volume being read, click the volume id at the top-left of the queue containing your file. This takes you to the text inventory page for that volume (described in section).

9.6.3 File Writes

Under *Writes*, this page lists write jobs by file family. A mover is listed after the file family for a file only if the file is currently being worked on.

Writes

```
d0farm_daq_reco_lto [at D31FLTO.mover] d0bbin test/14704/store_in_progress/reco_all_0000146556_102.raw_p10.15.01_000 (CurPri: 40 FFWidth: 4)
[at D31BLTO.mover] d0bbin test/14704/store_in_progress/reco_all_0000146528_001.raw_p10.15.01_000 (CurPri: 40 FFWidth: 4)
[at D31CLTO.mover] d0bbin test/14698/store_in_progress/reco_all_0000150408_203.raw_p10.15.02_000 (CurPri: 40 FFWidth: 4)
```

Each file in the write queue appears on a separate line. Each line lists several pieces of information: the host from which the file is to be copied, the last several bytes of the filename (filenames can get quite long), and the current priority and file family width.

The mover name provides a link to the **Movers** page, described in section 9.9 *Movers Page*.

Job Processing and File Family Width

Normally, the number of WRITE jobs running per file family can equal but not exceed the file family width (see section 1.4.2 *File Family Width*). If a READ job is running on a tape that is not marked full, this also counts against the width.



But note: Even if the number of current jobs equals the width, it is possible for a new READ job to start on a tape that's not full (if the tape is marked full, the width is not an issue and the READ job can start anyway) since the width is checked only when assigning WRITE jobs; thus temporarily, the width may be exceeded. Any pending WRITE job must wait until the the number of jobs that count against the width drops below the width value.

9.6.4 Additional Movers

Underneath this information, there may be a table listing additional movers.

Additional Mover	State	Volume	File Family
D31ALTO.mover	HAVE_BOUND	PRK175L1	mc_phase10_reco_lto
D31BLTO.mover	HAVE_BOUND	PRK174L1	mc_phase10_reco_lto
D31ELTO.mover	HAVE_BOUND	PRK133L1	mc_phase10_root-tuple_lto

Movers that are in any of the following states are listed here (see section 9.4 *Enstore Server Status* for status descriptions):

- CLEANING
- DISMOUNT_WAIT
- ERROR
- HAVE_BOUND
- OFFLINE

Movers not listed anywhere on the page may be assumed to be IDLE, i.e., waiting for a job.

9.7 Full Library Manager Info

What? The **Full Library Manager Info** page displays the job parameters for each file in a given library manager's current READ and WRITE queues (e.g., local file name, local node, file family, volume ID, priority, etc.).

Why? Use this page to find the status of a READ or WRITE job, e.g., the file's position in the queue, how long it's been in a queue, when it was "dequeued" (i.e., when processing started), and other details about how Enstore is processing it.

How? To arrive at this page, follow this string of links starting at the top page. Click “Enstore Server Status”, find the library manager you want, and click “Full Queue Elements”.

If you don’t know which LM you want but you know the file, take this route. On the **Enstore Server Status** page under *Shortcuts*, click “Full File List”. On the **Active File List** page, click on your file of interest. This will take you to the **Library Manager Queues** page for the appropriate library manager. Here, click “Full Queue Elements” next to *Reads* to come to the **Full Library Manager Info** page. On this page, you can scroll down and locate your file.

Page Description

[Home](#)
[System](#)
[Servers](#)
[Encp](#)
[Help](#)

Full Library Manager Info

Brought To You By : The Inquisitor
Last updated : 2002-Mar-01 11:22:09

D0EN: Enstore for the D0/RunII AML/2

Name	Status	Host	Date/Time	Last Time Alive
mezsilo.library_manager	alive : unlocked	d0ensrv4	2002-Mar-01 11:22:03	
None None				
Reading tape 994009.mover				
Node fnd019 Port 3196				
Device Label PRL291 File Family datalogger_mezsilo_copy1 File Family Width "				
Job Submitted 2002-Mar-01 11:10:52 Dequeued 2002-Mar-01 11:21:29				
Priorities Current 40 Base 40 Delta 20 Agetime 15				
Local file /local/stage2/prd-cache/boo/all_0000145891_205.raw				
Bytes 330,720,169 ID fnd019.fnal.gov-1015002656-0-4046				
Reading tape 994023.mover				
Node fnd03 Port 1053				
Device Label PRL290 File Family datalogger_mezsilo_copy1 File Family Width "				
Job Submitted 2002-Mar-01 11:13:32 Dequeued 2002-Mar-01 11:21:59				
Priorities Current 40 Base 40 Delta 20 Agetime 15				

Your file will appear as one of two types of entries on this page: one type for files being worked on, and another for files pending in the queue.

Reading tape	994019.mover	Node	fn015	Port	1310
Device Label	PRL294	File Family	datalogger_mezsilo_copy1 File Family Width"		
Job Submitted	2002-Mar-01 11:10:52	Dequeued	2002-Mar-01 11:22:01		
Priorities	Current 40	Base 40	Delta 20	Agetime	15
Local file	/local/stage2/prd-cache/boo/all_0000145891_310.raw				
Bytes	287,951,606	ID	fn015.fnal.gov-1015002656-0-28037		
Pending Tape Read		Node	fn03	Port	1063
Device Label	PRL294	File Family	datalogger_mezsilo_copy1 File Family Width"		
Job Submitted	2002-Mar-01 11:17:00				
Priorities	Current 40	Base 40	Delta 20	Agetime	15
Local file	/local/stage2/prd-cache/boo/all_0000145891_184.raw				
Bytes	585,249,908	ID	fn03.fnal.gov-1015003020-0-29330		
Reason for Pending	VOL_BUSY				

For those files being worked on, the mover name is given, and it provides a link to the **Movers** page, described in section 9.9 *Movers Page*.

9.8 Tape Inventory Page (Text)

There are a couple of pages that present volume inventory information. One is straight text, discussed in this section. The other page is dynamically generated HTML; see section 9.17 *Tape Inventory Page (Dynamic HTML)*. The formats of both pages are similar.

- What?** For each volume declared to your Enstore system, there is a page that presents volume inventory information in straight text format. The page gets updated periodically; be aware that it may not reflect the most recent information.
- Why?** Use this page to find out details of the storage of your file(s) on a volume, to see how full a tape is, or to check the inhibits.
- How?** *If you only know the filename:* To arrive at the text web page, follow this string of links starting at the top page: click "Enstore Server Status"; then under *Shortcuts*, click "Full File List". Click on your file of interest. This will take you to the **Library Manager Queues** page for the appropriate library manager. Find your file, and click the corresponding volume ID to come to the inventory page for that volume.
- If you know the volume name:* To arrive at the text web page, follow this string of links starting at the top page: click "Enstore Server Status"; then look for the volume name listed with one of the active library managers, and click on the volume.

Page Description

At the top of the volume inventory (text) page, you'll find the volume ID, the last accessed date, the number of bytes free, the number of bytes written, and the inhibits (described below).

The volume inventory contains a line for each file on the volume, listed in location order. In addition to the tape label, this page lists the bfid, size, location_cookie, delflag, and original_name (the name given in the **encp** command used to write it). Scroll down to the bottom of the page to find information for the tape volume itself.

```
Volume:          VO1983
Last accessed on: Fri Mar 1 12:26:20 2002
Bytes free:      1.58GB
Bytes written:   17.42GB
Inhibits:        none+none

  label          bfid          size      location_cookie delflag original_name
VO1983 99773555900000 1429274624 0000_000000000_0000001 yes /pnfs/cms/production/Federation_backups
VO1983 99773593300000 1629028352 0000_000000000_0000002 yes /pnfs/cms/production/Federation_backups
VO1983 99773650900000 1333624832 0000_000000000_0000003 yes /pnfs/cms/production/Federation_backups
VO1983 99779826200000 6717440 0000_000000000_0000004 no /pnfs/cms/production/Federation_backups
VO1983 99779828100000 6553600 0000_000000000_0000005 no /pnfs/cms/production/Federation_backups
VO1983 99779830000000 6389760 0000_000000000_0000006 no /pnfs/cms/production/Federation_backups
VO1983 99779831900000 6553600 0000_000000000_0000007 no /pnfs/cms/production/Federation_backups
VO1983 99779833900000 6553600 0000_000000000_0000008 no /pnfs/cms/production/Federation_backups
VO1983 99779834700000 19791872 0000_000000000_0000009 no /pnfs/cms/production/Federation_backups
VO1983 99779835100000 6389760 0000_000000000_0000010 no /pnfs/cms/production/Federation_backups
VO1983 99779837000000 5898240 0000_000000000_0000011 no /pnfs/cms/production/Federation_backups
VO1983 99779839500000 19169280 0000_000000000_0000012 no /pnfs/cms/production/Federation_backups
VO1983 99779843200000 17203200 0000_000000000_0000013 no /pnfs/cms/production/Federation_backups
VO1983 99779866400000 1675657216 0000_000000000_0000014 yes /pnfs/cms/production/Federation_backups
VO1983 99779944000000 1675657216 0000_000000000_0000015 no /pnfs/cms/production/Federation_backups
VO1983 99779988700000 1118896128 0000_000000000_0000016 no /pnfs/cms/production/Federation_backups
VO1983 99780019900000 1603567616 0000_000000000_0000017 no /pnfs/cms/production/Federation_backups
VO1983 99780054800000 1425899520 0000_000000000_0000018 no /pnfs/cms/production/Federation_backups
VO1983 99780076000000 1261338624 0000_000000000_0000019 no /pnfs/cms/production/Federation_backups
VO1983 99780099700000 1445068800 0000_000000000_0000020 no /pnfs/cms/production/Federation_backups
VO1983 99780117500000 1068957696 0000_000000000_0000021 no /pnfs/cms/production/Federation_backups
VO1983 99780137800000 1270415360 0000_000000000_0000022 no /pnfs/cms/production/Federation_backups
VO1983 99780161200000 1602220400 0000_000000000_0000023 no /pnfs/cms/production/Federation_backups
```

Inhibits

The inhibits are listed on the page in the format `system_inhibit[0] - system_inhibit[1]`.

`system_inhibit[0]` can take any of the following values:

- | | |
|----------|--|
| none | the normal state (no inhibits) |
| READONLY | volume is read-only |
| DELETED | volume has been deleted, but admins can still restore the metadata if the volume has not been reused. |
| NOACCESS | no access allowed (set by system to prevent further access to volume on which it found an error; once the problem is resolved, operator must clear the NOACCESS state) |
| NOTALLOW | no access allowed (set manually by the operator to prevent access to volume) |

`system_inhibit [1]` can take any of the following values:

none	the normal state (no inhibits)
full	volume is full
migrated	files have been migrated to another tape

9.9 Movers Page

What? The **Movers** page displays the current status of all the movers. (The mover statuses are described in section 9.4 *Enstore Server Status*.)

Why? Use this page to see how far into a job a mover is, or to check other job details related to the mover, e.g., what volume is being used for your job.

How? There are several paths to arrive at this page. The two easiest and most common are:

- On the top page click “Enstore Server Status”. Click on a mover.
- On the top page click “Enstore Server Status”. Choose a library manager to get to the **Library Manager Queues** page, then click on a mover.

When you click on a specific mover, you are brought to the entry for that mover on the **Movers** page.

Page Description

This web page shows the most recent known state of all of the movers in the Enstore system. The first image (below) shows the field headings. The online help page provides a detailed description of the fields.

Movers Page

Name	Status	Host	Date/Time	Last Time Alive
994004.mover	alive : IDLE	d0enmvr4a	2002-May-10 14:34:18	
	Completed Transfers	3029	Failed Transfers	0
	Last Read (bytes)	80,224,557	Volume	PRJ154
	Last Write (bytes)	80,224,357	Location Cookie	124
/pnfs/sam/dzero/copy1/datalogger/initial_runs/d0farm/root-tuple/all/recoA_reco_all_0000146562_mrg_236-236.raw_p10.15.00.root --> d0mino/sam/remotecab/cache1/boof/recoA_reco_all_0000146562_mrg_236-236.raw_p10.15.00.root				

This next image shows movers that are busy mounting, seeking and writing tapes. The pnfs and user filenames are given as appropriate:

D31CLTO.mover	alive : busy mounting volume PRK221L1	d0enmvr22a	2002-May-10 14:34:06	
	Completed Transfers	3736	Failed Transfers	0
	Current Read (bytes)	0	Volume	PRK221L1
	Current Write (bytes)	0	EOD Cookie	0
d0mino/sam/cache21/nikhef/reco_mcp10_p10.15.01_nikhef_pythia_calibv00+03+27+z-qq-EtaGt-4.2+TM-174.3+PtGt5.0+KinMGt-60.0+EtaL4.2+KinMLt-130.0-PlateCaep-RecoRcp-lastMCK_mb-poisson-0.5_4032_02119114525 --> /pnfs/sam/ito/copy1/monte_carlo/phase10/mcc99/reco/all/reco_mcp10_p10.15.01_nikhef_pythia_calibv00+03+27+EtaGt-4.2+TM-174.3+PtGt5.0+KinMGt-60.0+EtaL4.2+KinMLt-130.0-PlateCaep-RecoRcp-lastMCK_mb-poi-0.5_4032_02119114525				
D31DLTO.mover	alive : SEEK	d0enmvr17a	2002-May-10 14:34:08	
	Completed Transfers	1587	Failed Transfers	
D31ELTO.mover	alive : busy writing 1,536,695,557 bytes to Enstore	d0enmvr10a	2002-May-10 14:34:05	
	Completed Transfers	1405	Failed Transfers	0
	Current Read (bytes)	701,759,311	Volume	PRK217L1
	Current Write (bytes)	655,884,288	EOD Cookie	151
d0bbin/d0/strip7/samtest/14573/store_in_progress/reco_all_0000153407_028.raw_p10.15.01_000 --> /pnfs/sam/ito/copy1/datalogger/initial_runs/d0farm/reco/all/reco_all_0000153407_028.raw_p10.15.01_000				

This image shows movers that are idle (awaiting a job), and busy reading a tape:

994012.mover	alive : IDLE	d0enmvr12a	2002-May-10 14:34:11	
	Completed Transfers	3253	Failed Transfers	1
	Last Read (bytes)	279,315,792	Volume	PRJ177
	Last Write (bytes)	279,315,592	Location Cookie	113
/pnfs/sam/dzero/copy1/datalogger/initial_runs/d0farm/root-tuple/all/recoA_reco_all_0000146562_mrg_197-199.raw_p10.15.00.root --> d0mino/sam/remotecab/cache1/boof/recoA_reco_all_0000146562_mrg_197-199.raw_p10.15.00.root				
994019.mover	alive : busy reading 677,385,094 bytes from Enstore	d0enmvr19a	2002-May-10 14:34:09	
	Completed Transfers	3194	Failed Transfers	0
	Current Read (bytes)	367,132,672	Volume	PRL443
	Current Write (bytes)	0	Location Cookie	108
/pnfs/sam/dzero/copy1/datalogger/initial_runs/d0farm/root-tuple/all/recoA_reco_all_0000146499_mrg_017-022.raw_p10.15.00.root --> d0mino/sam/remotecab/cache1/boof/recoA_reco_all_0000146499_mrg_017-022.raw_p10.15.00.root				

Understanding the Number of Bytes Read/Written

For a READ job,

“Last/Current Read (bytes)” means “bytes read from tape”

“Last/Current Write (bytes)” means “bytes written to user’s file”

whereas for a WRITE job,

“Last/Current Read (bytes)” means “bytes read from user’s file”

“Last/Current Write (bytes)” means “bytes written to tape”

For jobs in progress, the number of “Current Read (bytes)” is by necessity higher than “Current Write (bytes)”.

For finished jobs (e.g., of status IDLE or busy dismounting volume), you can compare “Last Read (bytes)” to “Last Write (bytes)” to tell if a job was a READ or WRITE. The file size is always bigger on tape than on the user’s disk because the file family wrapper is on the tape copy only. So for example, on a READ job, Enstore reads a larger file from tape and writes a smaller one to disk, and thus the “Last Read (bytes)” value is larger than “Last Write (bytes)” (as shown in image below). The converse is true for a WRITE job.

DI36M2.mover	alive : IDLE	d0enmvr6a	2002-May-10 13:34:25
	Completed Transfers	12	Failed Transfers 0
	Last Read (bytes)	48,765,342	Volume PF
	Last Write (bytes)	48,765,111	Location Cookie 26

9.10 Encp History

- What?** This page lists the last several **encp** transfers that have completed, either successfully or with an error.
- Why?** Use this page to review recent **encp** transfers.
- How?** To arrive at the **Encp History** page, click “Encp History” on the top page or the **ENCP** button at the top of any page.

Page Description

On the **Encp History** page:

Successful transfers show time that transfer completed, node, username and storage group, mover interface (the TCP/IP interface used on the mover node), bytes transferred, volume ID, and data transfer rate and user rate (both in Mb/s)

Unsuccessful transfers show time of attempted transfer, node, username, storage group and error summary. Each error summary contains a link to a more detailed error message.

The top portion of the page is a table listing details of each recent transfer:

Time	Node	User/Storage Group	Mover Interface	Bytes	Volume	Data Transfer Rate (MB/S)	User Rate (MB/S)
2002-05-10 15:08:40	d0test-g0	jozwiak/D0	d0enmvr1a	61627653 (1)	from NULA40	1.03	0.832
2002-05-10 15:08:31	d0test-g0	jozwiak/D0	d0enmvr3b	199012056 (2)	from NULA50	1.04	0.967
2002-05-10 15:08:26	d0bbin	sam	d0enmvr22a	250937281 (3)	to PRK220L1	0.759	0.457

The value under *Bytes* provides a link to the *Files Transferred* area of the page which gives you the originating and destination file names:

Files Transferred	
1	/pnfs/sam/NULL/test_harness/Jun_04_2001_16_58_10__Stream_1_0037095238_001.raw - > /sam/test10/jozwiak/dev/chris/boo/Jun_04_2001_16_58_10__Stream_1_0037095238_001.raw
2	/pnfs/sam/NULL/test_harness/Jun_04_2001_20_14_49__Stream_2_0037600162_001.raw - > /sam/test10/jozwiak/dev/chris_4/boo/Jun_04_2001_20_14_49__Stream_2_0037600162_001.raw
3	/d0/stripe5/samtest/14574/store_in_progress/recoS_all_0000153408_054.raw_p10.15.01 - > /pnfs/sam/ito/copy1/datalogger/initial_runs/d0farm/reco/all/recoS_all_0000153408_054.raw_p10.15.01

At the very bottom of the page, you can find the errors in red, if any:

ERRORS	
1	INFILE=/pnfs/cms/UserFederation/data/jetmet_production/Digs/2e33_jetDigs120_452_FINAL_D/jm_hlt1520/EVD6_jet0900.DB OUTFILE=/home/Federation/data/jetmet_production/Digs/2e33_jetDigs120_452_FINAL_D/jm_hlt1520/EVD6_jet0900.DB.anew FILESIZE=1697644544 LABEL= LOCATION= DRIVE= DRIVE_SN= TRANSFER_TIME=0.00 SEEK_TIME=0.00 MOUNT_TIME=0.00 QWAIT_TIME=0.00 TIME2NOW=0.00 STATUS=TOO MANY RETRIES ('TCP connection closed', None)

9.11 Configuration

- What?** The **Enstore Configuration** page shows the Enstore system's current configuration.
- Why?** This page is for administrators. But if you want configuration information on any component in the Enstore system, you can look here. For example:
- If you see a server listed as unmonitored (in grey) on the **Enstore Server Status** page, you can verify its status here (if the element `inq_ignore` appears, the server is unmonitored).
 - If you want to check the log files for activity related to a particular mover, look here for the `logname` value associated with the mover, then search the log files for that string.
- How?** To arrive at the **Enstore Configuration** page, click “Configuration” on the top page.

Page Description

The page is divided into two sections:

- The first section provides a quick link to each of the servers listed in the table in the second section.
- The second section, is a (potentially quite long) table containing detailed configuration information for all of the Enstore servers. For each server, there is a table row for each element that appears in the server's configuration. The information displayed includes the element name and its current value. No interpretation of the values is done, so for instance if the value is a python dictionary, then it is presented here as such. The server names, and under them the element names, are organized alphabetically.

This image shows the top of the table in the second section on the **Enstore Configuration** page, including the (truncated) entry for one of the system's movers:

Server	Element	Value
994004.mover	check_written_file	30
	compression	0
	data_ip	d0enmvr4a
	device	/dev/rmt/tps0d1n
	dismount_delay	10
	do_cleaning	No
	driver	FTTDriver
	host	d0enmvr4a
	hostip	131.225.164.27
	library	mezsl0.library_manager
	logname	BED4MV

9.12 Enstore Active Alarms

- What?** The **Enstore Active Alarms** page lists the alarms that have been raised but not yet resolved.
- Why?** This page is for administrators, but as a user, you can always look here for information when there is a problem with Enstore. In particular, if a volume is set to NOACCESS, you can look here to find out which mover was involved.
- How?** To arrive at the **Enstore Active Alarms** page, click “Alarms” on the top page.

The page is quite wide; we show first the left side, then the right.

[Home](#)
[System](#)
[Servers](#)
[Encp](#)
[Help](#)

Enstore Active Alarms

Brought To You By : The Alarm Server
Last updated : 2004-Jan-02 13:52:08

D0EN: Enstore for the D0/RunII AML/2

[Previous alarms](#) may also be displayed.
And a [volume audit](#).

Key	Time	Node	PID	User	Severity	Process	Error
<input type="checkbox"/> 1072166358.58	2003- Dec-23 01:59:18	d0enmvr17a	19421	root	W (1)	D31DMV	Too long in state ACTIVE for PRN385L1
<input type="checkbox"/> 1072199615.37	2003- Dec-23 11:13:35	d0enmvr21a	10874	root	W (1)	D31AMV	Too long in state ACTIVE for PRN302L1
	2003-						

Condition	Type	Ticket Generated	Additional Information
None	None	None	{'text': ()}
None	None	None	{'text': ()}
None	None	None	{'text': ()}
None	None	None	{'text': ''}
None	None	None	{'text': {'status': 'CRC mismatch: 2212165211 != 698524289', 'outfile': '/sams/cache10/boo/TMBfix-recoT_all_0000179270_mrg_032-037.raw_p14.03.01_p14.fixtrmb.01', 'infile': '/pnfs/sams/dzero/copy1/physics_data_taking/group-phase1/dzero/thumbnail/all/TMBfix-recoT_all_0000179270_mrg_032-037.raw_p14.03.01_p14.fixtrmb.01'}}

9.13 Enstore Log Files

What? The **Enstore Log Files** page provides links to Enstore system-specific user log files and to standard Enstore daily log files. You can search log files or retrieve entire log files.

Why? This page is for administrators. You can use the log files to retrace Enstore activity, to understand Enstore problems or behavior, and so on.

How? To arrive at the **Enstore Log Files** page, click “Log Files” on the top page.

There are three sections to the **Enstore Log Files** page.

Link to Search Page

First there is a link to a search page; look for “Enstore log files may also be searched”. Use the **HELP** button for information on constructing your search string. (Shown in the image below.)

User Specified Log Files

The next part is entitled *User Specified Log Files*. It lists miscellaneous log files configured and maintained for your Enstore system.

[Home](#) [System](#) [Servers](#) [Encp](#) [Help](#)

Enstore Log Files

Brought To You By : The Inquisitor
Last updated : 2004-Jan-02 14:11:57

Enstore log files may also be [searched](#)

User Specified Log Files

- [FAILED Transfers](#)
- [6509 BigA Switch Info](#)
- [AML/2 Logs](#)
- [Active Monitor Log](#)
- [Cambot](#)
- [DOEn Cluster Console Logs](#)
- [DOEn Cluster SDR Info](#)
- [DOEn Cluster SEL Info](#)
- [DOEn Cluster UDP Clogup Info](#)
- [DOEn Internode Rates](#)
- [Enstore Node Information](#)
- [Network-At-A-Glance](#)
- [PNFS Counters](#)
- [PNFS Export List](#)

Any given Enstore installation may contain some or all of these log files:

FAILED Transfers Lists all encp jobs that failed; lists by volume and by mover

Recent (robot) log messages	Displays all the messages from the robot (for the most recent few days)
Active Monitor Log	Displays the data transfer rate between the base node and all other nodes in the same Enstore system, including movers
Cambot (D0)	Displays a live image photographed by a camera mounted inside the D0 ADIC robot
Enstore Node Information	Displays information on all nodes belonging to this Enstore system.
Network-At-A-Glance	Displays network interface status of all nodes relative to base node; uses colored icons for easy identification of problems
PNFS Counters	Displays how much space is used in each PNFS directory
PNFS Export List	Lists all the existing PNFS areas for the Enstore system (when PNFS is mounted, these are the areas that get NFS-mounted)
Cluster UDP Clogup Info	Displays UDP activity in the Enstore system
Cluster Console Logs	logs from consoles
Cluster SDR Info	Displays hardware information, e.g., temperatures, fan speeds, voltages, and so on, for all nodes (servers and movers)
Cluster SEL Info	Displays System Event Log for all nodes in system
Internode Rates or Network Rate Test	Displays data transfer rates between each node and the base node ¹
6509 BigA Switch Info (D0)	Displays information relating to switch's status

Enstore Log Files

The bottom portion of the page is called *Enstore Log Files*. It displays a calendar of the current and previous months from which you can click the date of the log file to view (the image below was captured on January 2, 2004, the last date that shows an entry). The size of the log file is given.

1. The Active Monitor Log uses a different base node (<system>srv2) from the Internode Rates or Network Rate (<system>srv3).



Requesting a day's log file is memory intensive and very slow due to the large size of the log file.

Enstore Log Files

January 2004

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1 : 85242833	2 : 68445768	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

December 2003

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1 : 162884237	2 : 97480989	3 : 146608113	4 : 90673636	5 : 153475089	6 : 158234281	7 : 164138798
8 : 181267895	9 : 161510556	10 : 238282860	11 : 193128853	12 : 148597236	13 : 149629640	14 : 206700927
15 : 202231787	16 : 201950684	17 : 164234538	18 : 165667381	19 : 153979344	20 : 144520390	21 : 142725387
22 : 105356732	23 : 98315042	24 : 109162058	25 : 79643232	26 : 94976143	27 : 78401384	28 : 100661253
29 : 31803928	30 : 105487516	31 : 48091426				

9.14 Quota and Usage

- What?** The **Quota and Usage** page provides information on your Enstore volume usage, organized by library and by storage group. The page is not real-time, it displays a recent snapshot.
- Why?** Administrators and users can look here to see a variety of details about your Enstore system's resource and quota management.
- How?** To arrive at the **Quota and Usage** page, click "Quota and Usage" on the top page.

This page displays the following fields:

Library library manager

Storage Group	storage group
Req. Alloc.	requested volume (e.g., tape) allocation
Auth. Alloc.	authorized volume allocation
Quota	total space allowed in robot
Allocated	total number of volumes currently allocated in the robot
Blank Vols	of the allocated volumes, the number that are blank
Used Vols	of the allocated volumes, the number that are written
Deleted Vols	of the allocated volumes, the number that have been deleted
Space Used	total space used on all allocated volumes
Active Files	total number of active (non-deleted) files on all allocated volumes
Deleted Files	total number of deleted files on all allocated volumes
Unknown Files	

9.15 Enstore Plots

What? The **Enstore Plots** page provides information on Enstore performance in a visual format. These are not real-time, they are snapshots.

Why? You can look here to see a variety of details about your Enstore system's recent performance.

How? To arrive at the **Enstore Plots** page, click "Plots" on the top page.

The **Enstore Plots** page, provides information on some statistics that Enstore gathers. These statistics are gathered from the log files produced by Enstore. Several plots are available:

- Drive Utilization
- Bytes/Day Plot
- Bytes/Day per Mover Plot
- Mount Latency Plot
- Mounts/Day per Drive Type

- Storage group activity (STKEN only)
- Total bytes/Day
- Total bytes/Day combining all three systems (D0EN, CDFEN, STKEN)
- Total bytes written/Day
- Cumulative Mounts Plot
- Transfer Activity (log) Plot
- Transfer Activity Plot
- Mounts/Day Plot
- Null Terabytes/Day (Instantaneous Rate Plot)
- Real Terabytes/Day (Instantaneous Rate Plot)

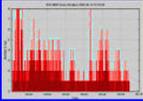
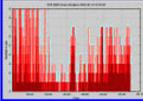
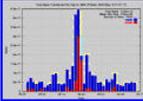
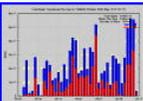
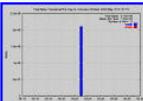
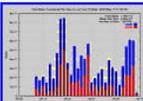
[Home](#)
[System](#)
[Servers](#)
[Encp](#)
[Help](#)

Enstore Plots

Brought To You By : The Inquisitor
Last updated : 2002-May-10 15:32:06

STKEN: Enstore for the StorageTek Silo

[Bytes/Day per Mover Plots](#)
[Bytes Written per Storage Group Plots](#)

 <p style="font-size: x-small;">9840 Drive Utilization (2002-May-10 15:00:14) (postscript)</p>	 <p style="font-size: x-small;">9940 Drive Utilization (2002-May-10 15:00:17) (postscript)</p>	 <p style="font-size: x-small;">9840 Bytes/Day (2002-May-10 01:37:47) (postscript)</p>
 <p style="font-size: x-small;">T9940A Bytes/Day (2002-May-10 01:37:50) (postscript)</p>	 <p style="font-size: x-small;">Unknown Bytes/Day (2002-May-10 01:38:25) (postscript)</p>	 <p style="font-size: x-small;">Bytes/Day (30 days) (no null mvcs) (2002-May-10 01:38:33) (postscript)</p>

All the plots are described in the online help page. Each plot is available for viewing three ways:

- a small version of the plot (postage stamp) displayed directly on the page
- a full size version of the plot; click on the postage stamp to display
- a postscript copy of the plot; click on the (postscript) link to display

9.16 NGOP Monitoring

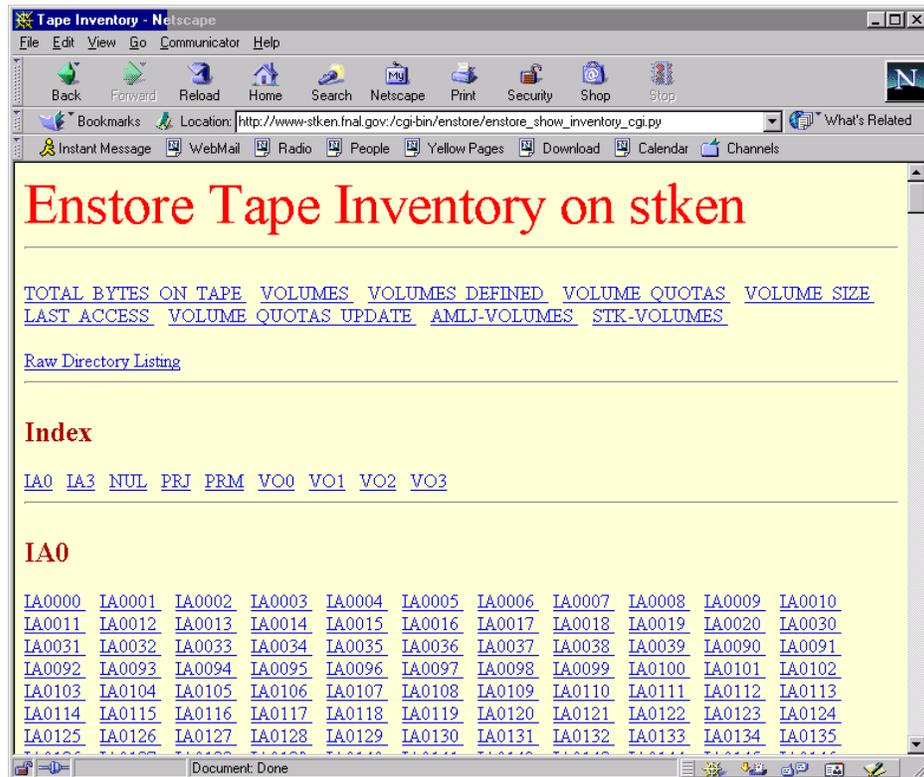
NGOP stands for “Next Generation OPerations”. This link requires a password to get in, and is typically reserved for administrators. It displays information relating to the Enstore node, e.g., daemons, the operating system, hardware, cron jobs, enstore nodes, and so on.

9.17 Tape Inventory Page (Dynamic HTML)

- What?** For each volume declared to your Enstore system you can dynamically (re)create a page that presents its volume inventory information in HTML format.
- Why?** Use this page to find out details of the storage of your file(s) on a volume, to see how full a tape is, or to check the inhibits.
- How?** To arrive at this page start at the top page, scroll down to the *Information* table, and click “Tape Inventory”. This brings you to a list of all declared volumes in your Enstore system. Click on the volume of interest.



This page is dynamic and uses a lot of server time; please minimize the number of times you regenerate this page.



Find the volume of interest and click it to get a file listing. The format is essentially identical to that shown in section 9.8 *Tape Inventory Page (Text)*, but in addition under the heading, you get a list of volume parameters:

```
{'blocksize': 131072,
 'capacity_bytes': 20401094656L,
 'declared': 998086428.80971301,
 'eod_cookie': '0000_000000000_0000446',
 'external_label': 'VO0094',
 'first_access': 998268618.43976796,
 'last_access': 1013139175.787874,
 'library': 'eagle',
 'media_type': '9840',
 'non_del_files': 445,
 'remaining_bytes': 2269696L,
 'sum_rd_access': 35,
 'sum_rd_err': 0,
 'sum_wr_access': 445,
 'sum_wr_err': 0,
 'system_inhibit': ['none', 'full'],
 'user_inhibit': ['none', 'none'],
 'volume_family': 'theory.theory-canopy-eichten.cpio_odc',
 'wrapper': 'cpio_odc'}
```

