System Administration

July 2006

System Administration Topics

- Secure Shell (SSH)
- System Startup and Shutdown
- Checking the Health and Status of the System
- Tape Operations
- System Backups and Restores
- User Administration
- Commercial Off-the-Shelf (COTS) Software Administration
- Security

Secure Shell (SSH)

Improves Network Security

- **Passwords not sent in the clear**
- **Encrypts entire session**

sshsetup = Local Host Setup

sshremote = Remote Host Setup

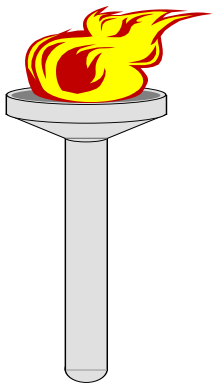
sshchpass = Change Password

System Startup

Cold Startup

No Subsystems Running

- Power failure
- Following system maintenance
- Power switch OFF?



Warm Startup

Some Subsystems Running, Others Off

- Operator intervention
- External malfunction

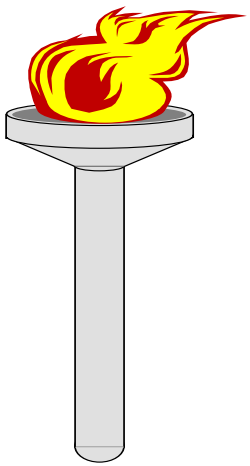
Cold Startup Procedure

- **Determine existence of following systems:**
  - **Domain Name Server (DNS) Master**
  - **Name Information Server (NIS) Master**
  - **Mail Hub Server(s)**
  - **Automount Servers**
  - **ClearCase Server**
  - **Communication Subsystem (CSS)**
  - **Other License Servers**
  - **Sybase SQL Servers**
  - **Data Server Subsystem (DSS)**
  - **Planning & Data Processing System (PDPS)**
  - **Client Subsystem (CLS)**
- **Turn on power for each one IN ORDER**

Cold Startup Boot Order

DNS Master Server
NIS Master
CSS Server
ClearCase Server
Interface Server(s)
MSS Server(s)
DSS Server(s)
Ingest Server(s)
PDPS Server(s)
Client Server(s)
Data Management Server(s)

Warm Startup Procedure

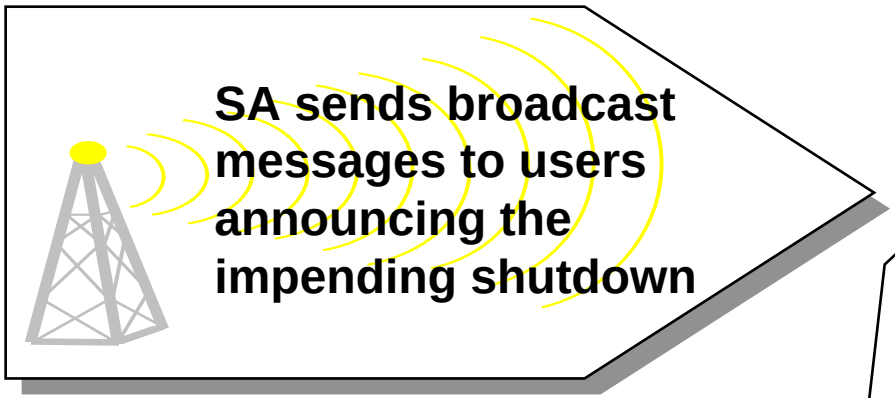


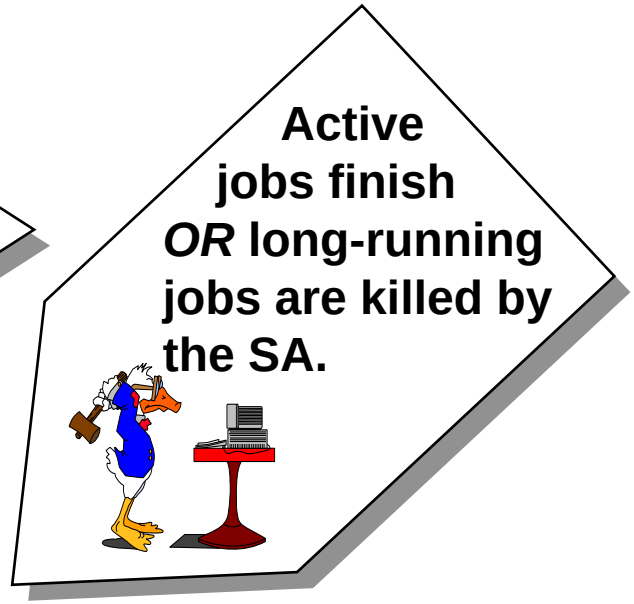
- Determine which server is down
- Determine order in which servers are to be booted
- Determine the interoperability dependencies among the machines
- Turn on machines in an order consistent with the dependencies

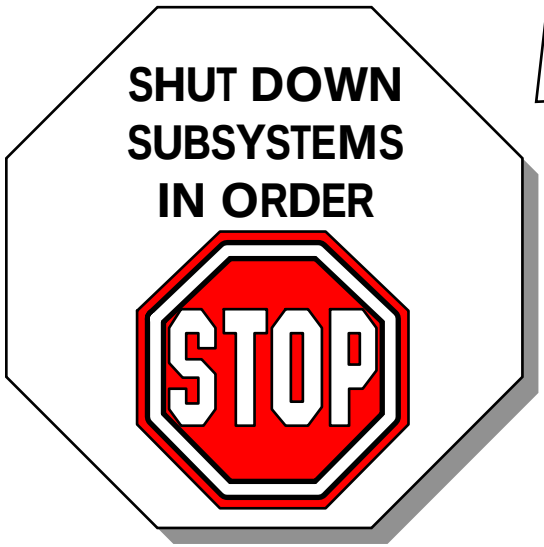
Normal Shutdown

- Turn off power to FULL system
- Turn off power to a component subsystem
- Scheduled by Resource Manager
- Approved by DAAC Manager
- Minimal disruption to system users
- NO loss of data

Normal Shutdown Procedure







Normal Shutdown Order

Normal shutdown order is the reverse of the start-up order

Emergency Shutdown

- **Indications**
  - **System or Subsystem is locked up**
  - **Unable to access or maneuver through the system**
  - **Impending or actual power failure**
  - **Hardware or Software failure**
- **Verify need to shutdown**
  - **Resolve subsystem and user problems first**
  - **Shutdown is a last resort**
- **Minimize loss of data**

Emergency Shutdown Procedure

- **Type sync and press Return/Enter to flush buffers**
- **Repeat the first step**
- **Shutdown Subsystems IN ORDER**

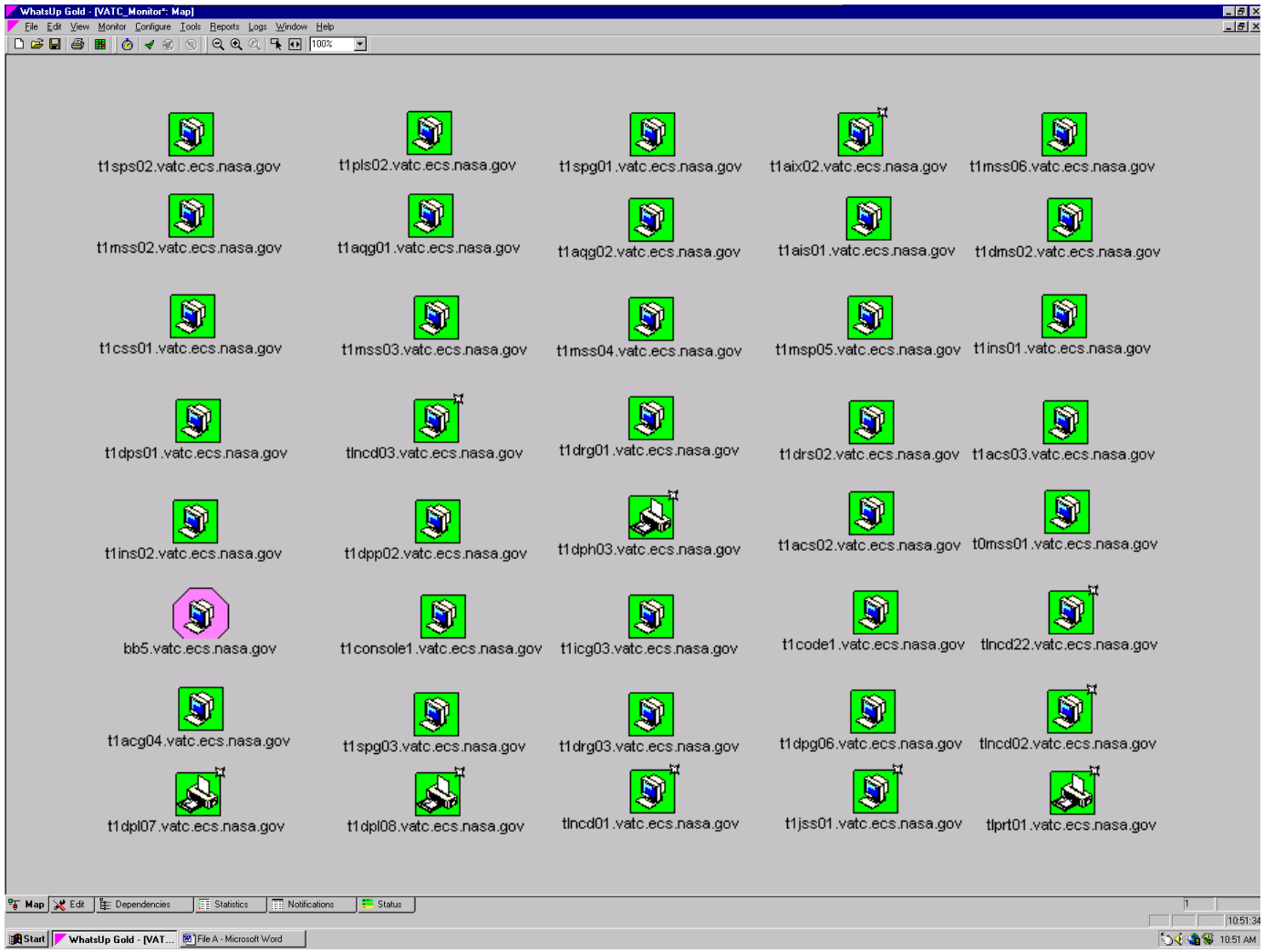
System Status and Health

- **WhatsUp Professional 2006**
- **Whazzup???**
- **ECS Health Check GUI**
- **ECS Assistant**

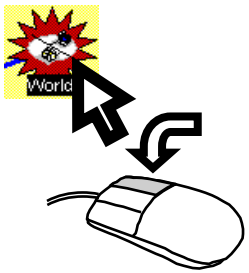
Checking Network Health & Status

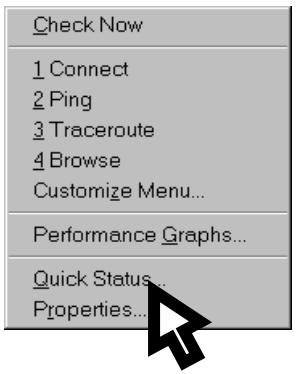
- **WhatsUp Professional graphic network monitoring tool**
- **Installation establishes network map and initial notifications, device properties, and polling**
- **Color alerts indicate status of mapped nodes**
  - **highlighted name: an event has been logged**
  - **green square background: device is up**
  - **light green diamond background: one poll missed**
  - **yellow diamond background: two polls missed**
  - **red elongated diamond background: device is down (after eight polls are missed, background is red starburst)**
  - **light purple octagon background: a service is down**
  - **gray square background: monitoring turned off**

Checking Network Health & Status: WhatsUp Professional Network Map



Checking Network Health & Status: WhatsUp Professional Status Display





WhatsUp Gold – [VATC_Monitor*: Map]

Categories

Status

History

Up-Time

Log

Status

Status: 0 Active and responding

Count: 2621 RTT: 0

ICMP Status

Down Count	Total	Last Response Time:
123	2620	Not since initialization

Service Status

Down Count	Total	Last Response Time:
123	123	Not since initialization

DNS | FTP | HTTP | SMTP

OK Cancel Help

Checking Network Health & Status: WhatsUp Professional Item Properties Box

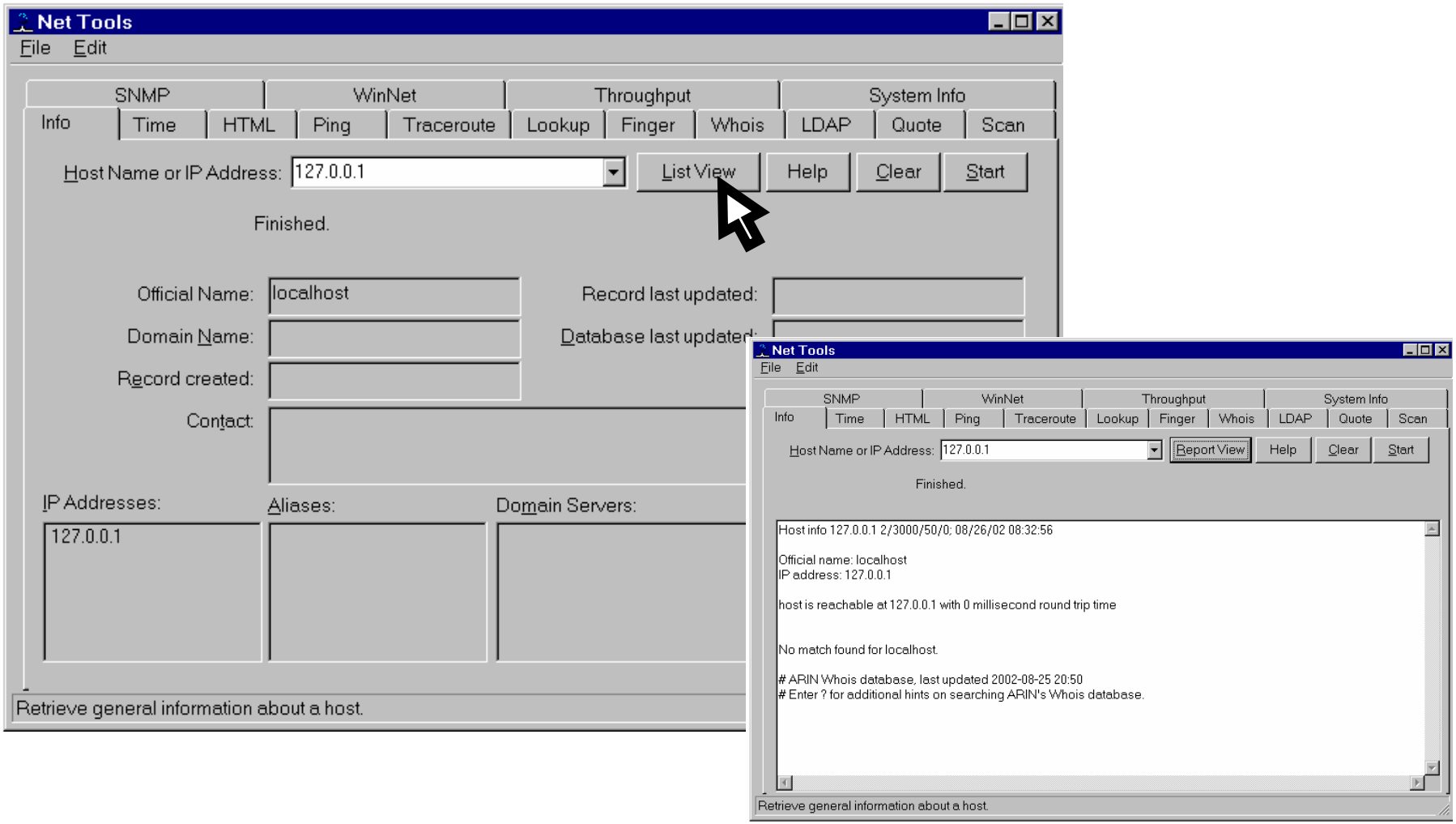
- Display
- Attach
- Link
- Set Dependencies
- Lock Position
- Poll Now
- Acknowledge
- Device Reports
- Group Reports

- 4 Traceroute
- 3 Ping
- 2 Connect
- 1 Browse
- Remote Desktop
- Device Status Report
- Properties
- Time
- HTML

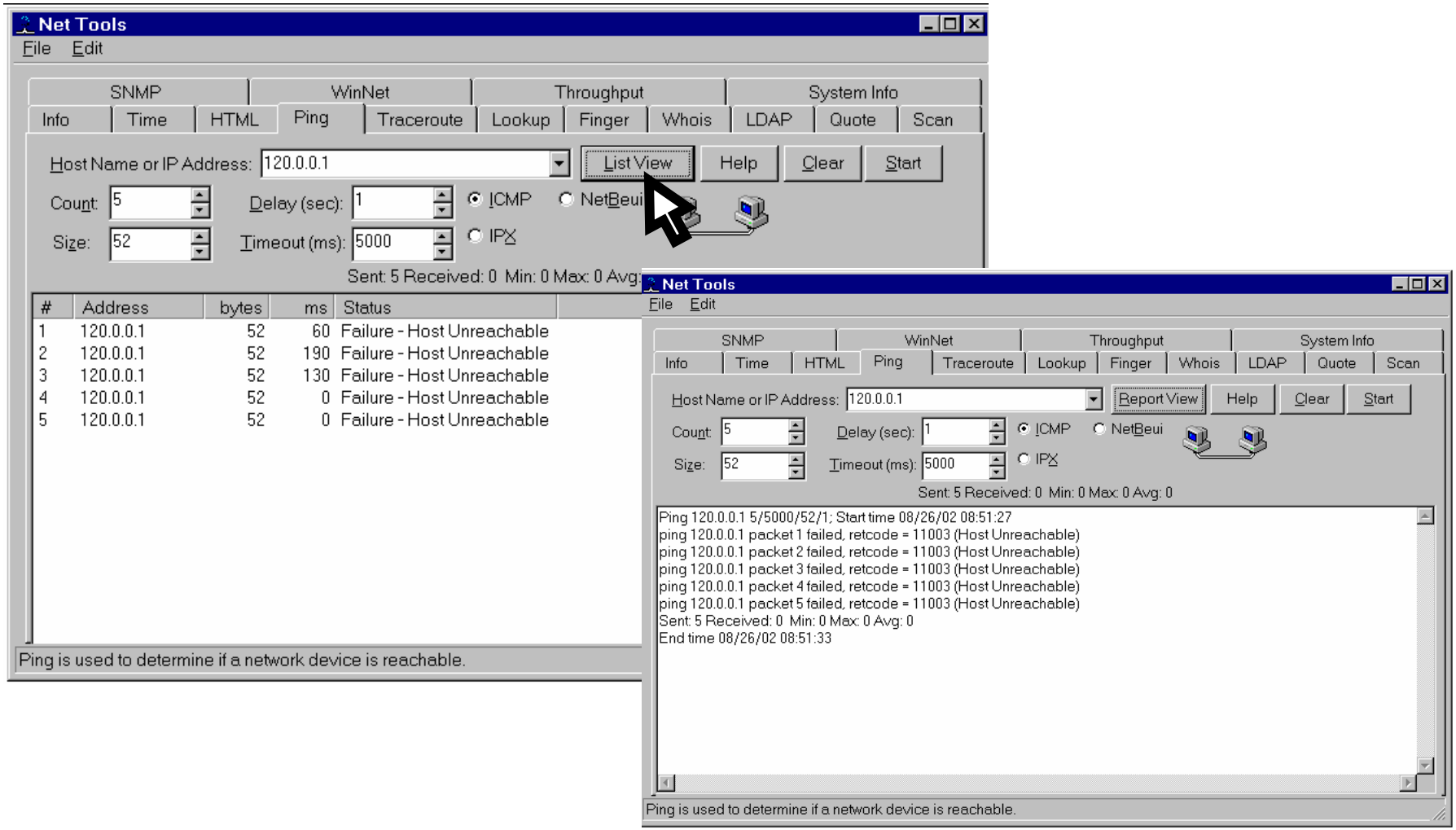
Checking Network Health & Status: WhatsUp Professional Net Tools

- **Info**
  - display a summary of device information
- **Time**
  - synchronize your computer's clock with a remote time server
- **HTML**
  - query a web address
- **Ping**
  - verify connectivity to a host
- **TraceRoute**
  - trace and view the route to an Internet host
- **Lookup**
  - query Internet domain name servers for information about hosts and name servers
- **Finger**
  - display information about users on a host
- **Whois**
  - display information about Internet domain ownership and groups
- **LDAP (Lightweight Directory Access Protocol)**
  - search directories for names and information on another computer
- **Quote**
  - view quotations from a quote server
- **Scan**
  - scan a range of IP addresses to create a network map
- **SNMP**
  - view and graph Simple Network Management Protocol (SNMP) values for a device
- **WinNet**
  - View Windows Network domains, hosts, and workstations
- **Throughput**
  - test data throughput on the connection between your computer and a remote computer
- **System Info**
  - information about your local system

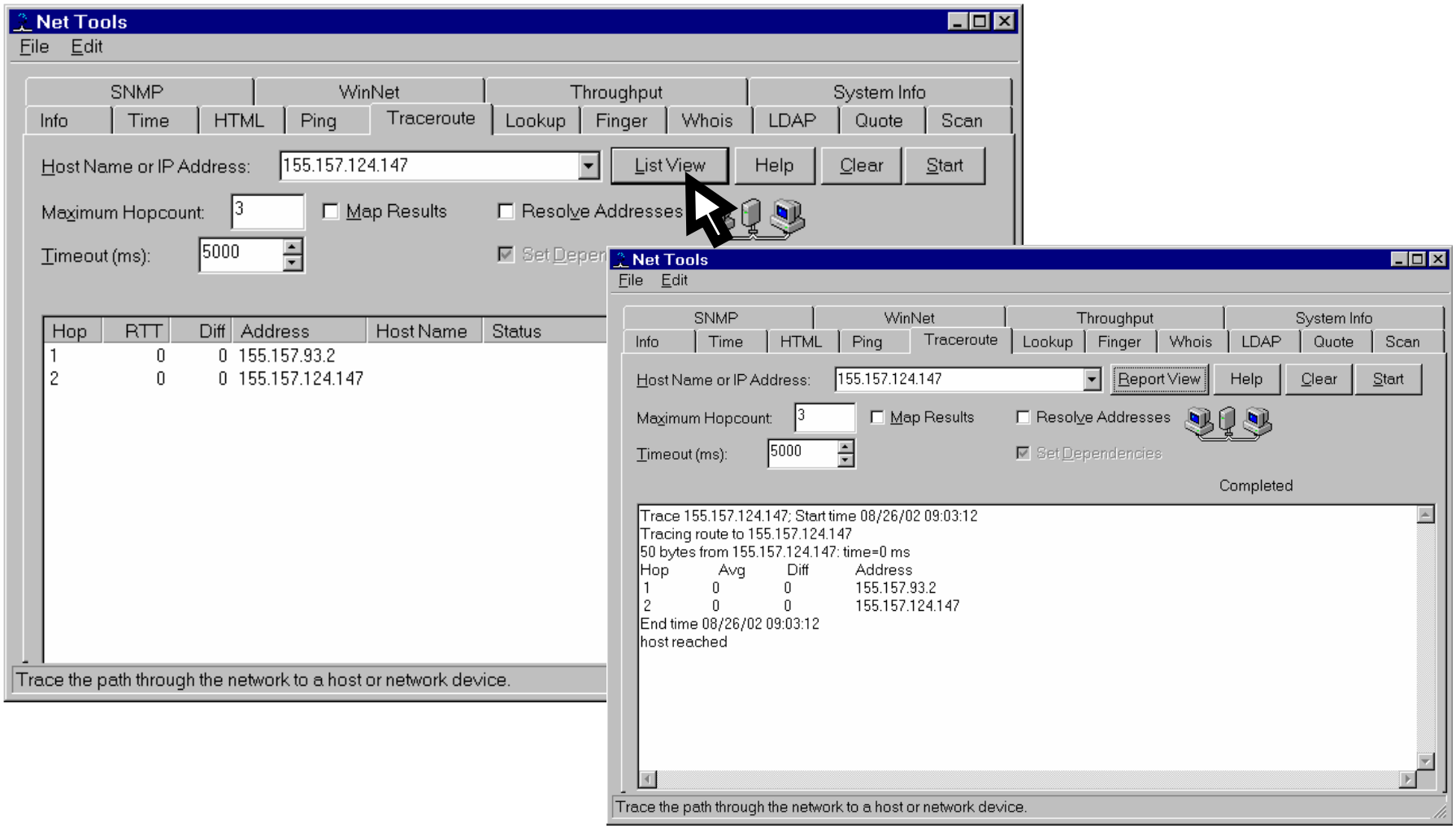
Checking Network Health & Status: WhatsUp Professional Net Tools - Info



Checking Network Health & Status: WhatsUp Professional Net Tools - Ping



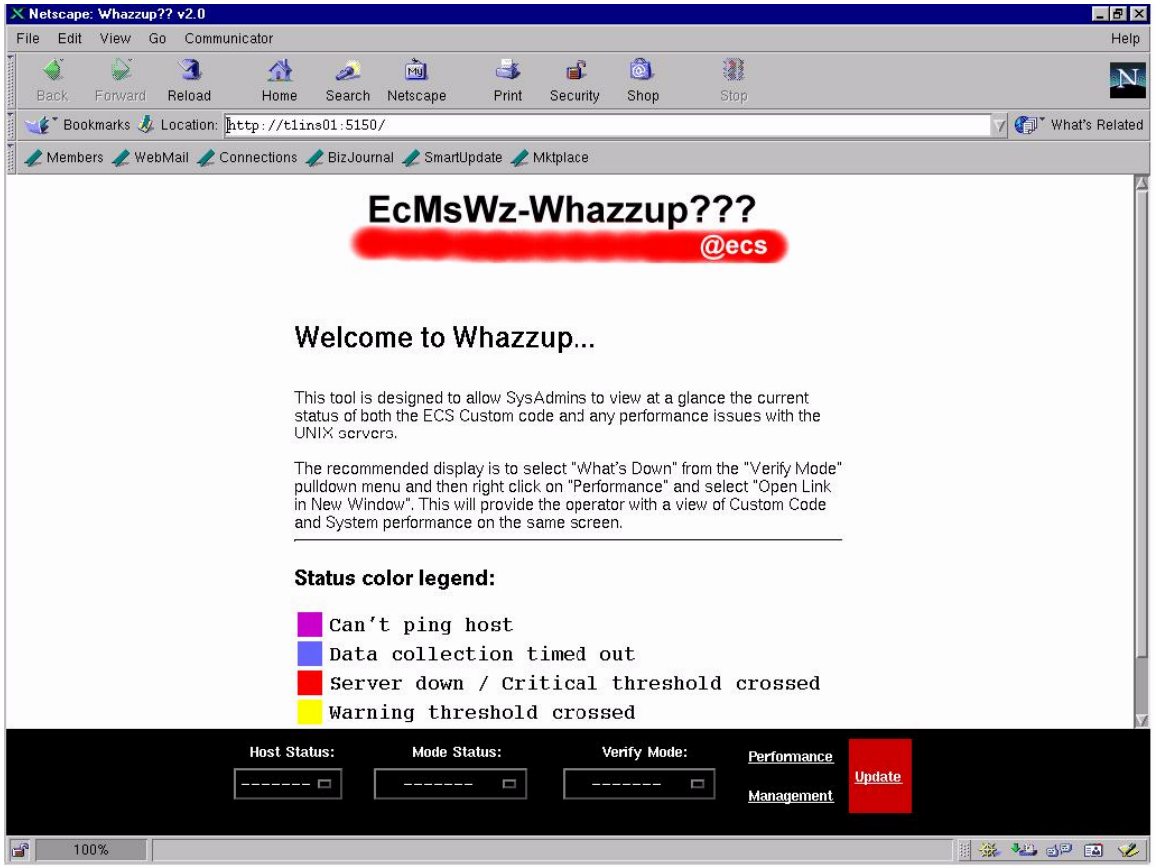
Checking Network Health & Status: WhatsUp Professional Net Tools - Traceroute



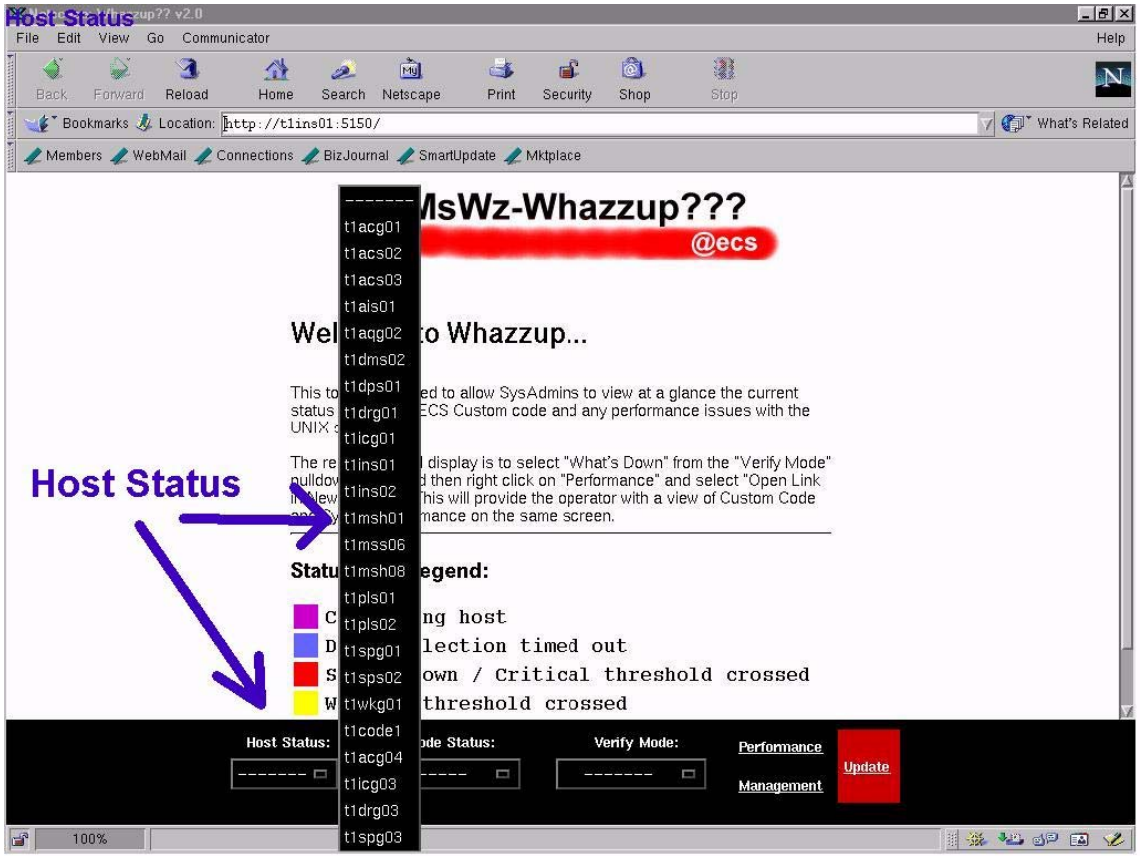
Checking Network Health & Status: WhatsUp Professional Reports

- **Reports**
  - **Store all device information across all device groups through a variety of reports.**
- **Event Log**
  - **logs events (changes to network status, such as a device going down or a device coming back up)**
  - **provides a history of what has occurred on the network, call Historical Availability reports**
- **State Change Timeline**
  - **Reports a timeline of when each monitor on a device in the selected group changed from one state to another during a specified period.**
  - **Provide additional information on when and how the device went down**

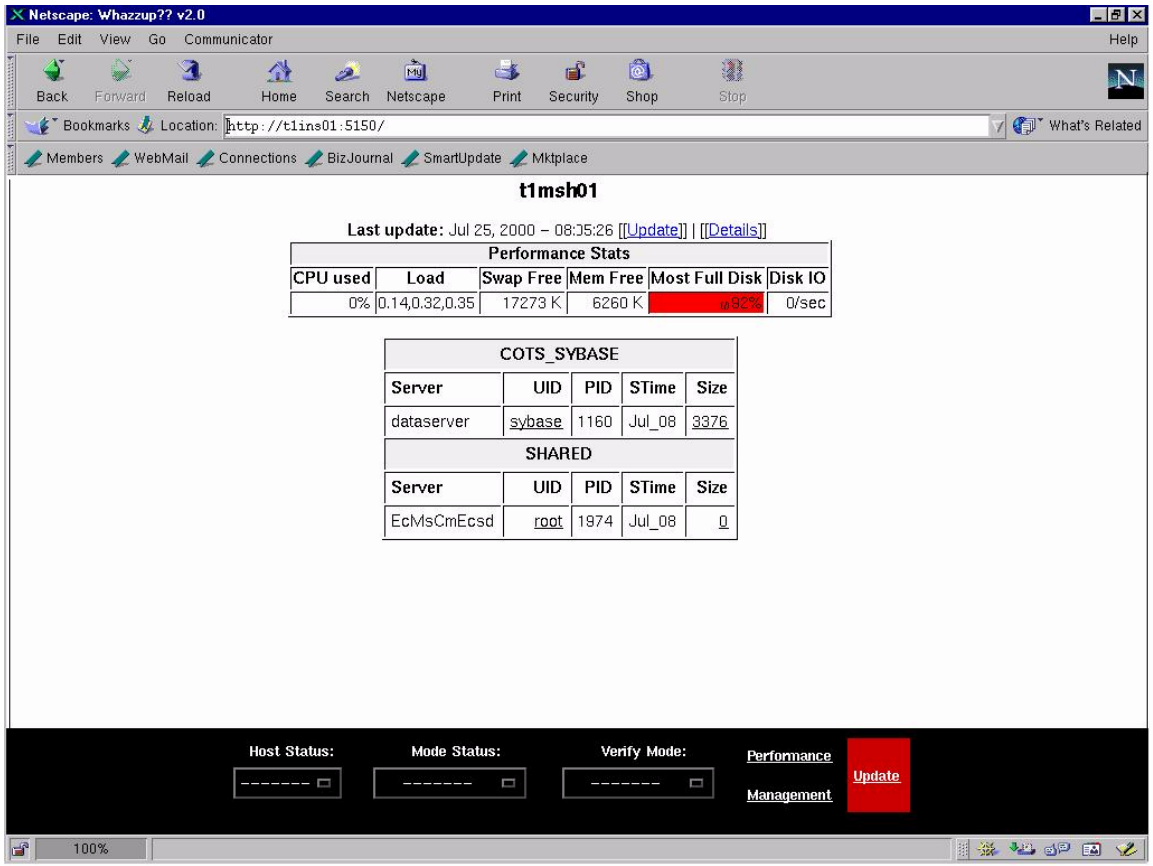
Whazzup???
Initial Screen



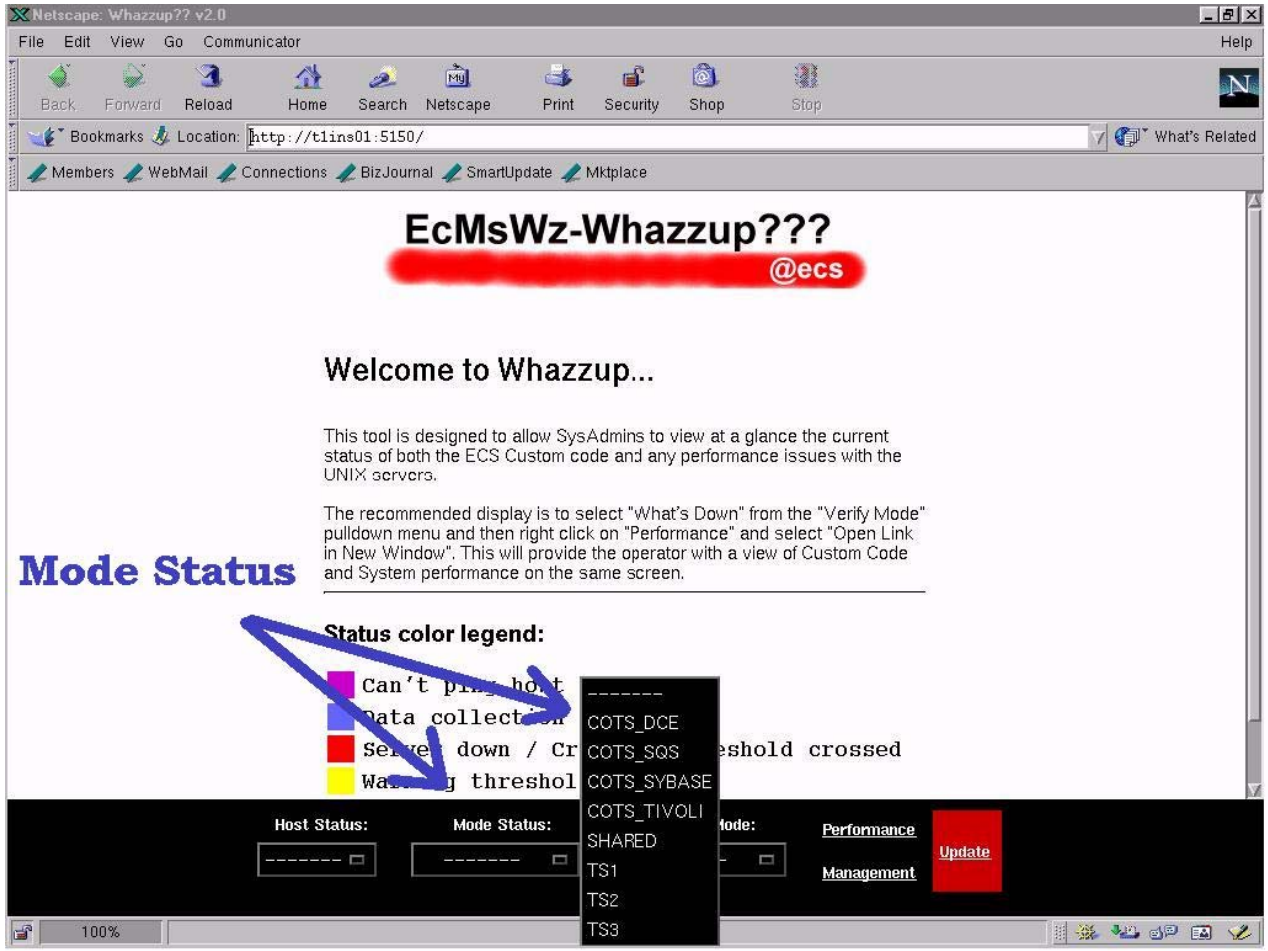
Whazzup???
Host Status Select



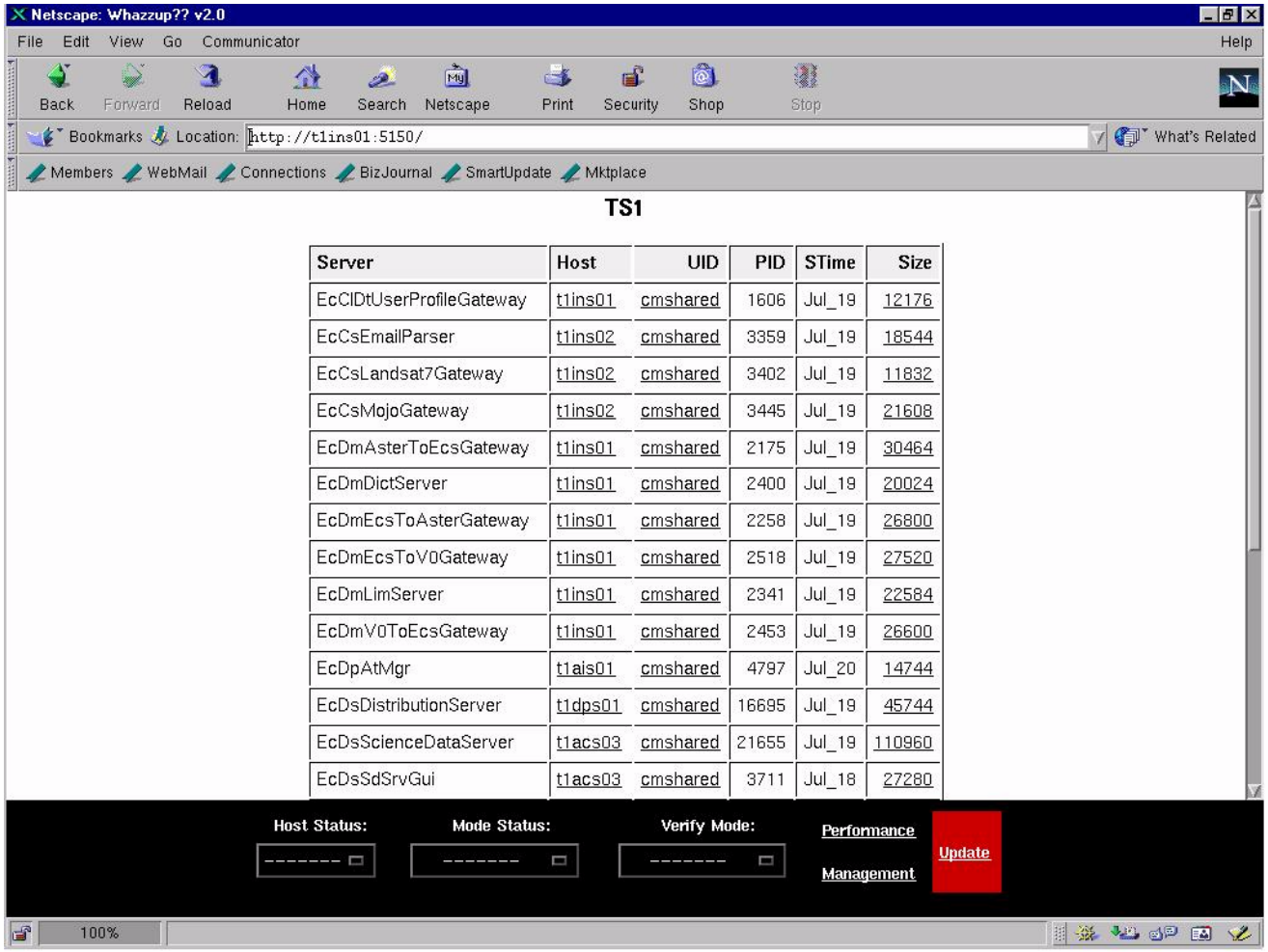
Whazzup???
Host Status Data



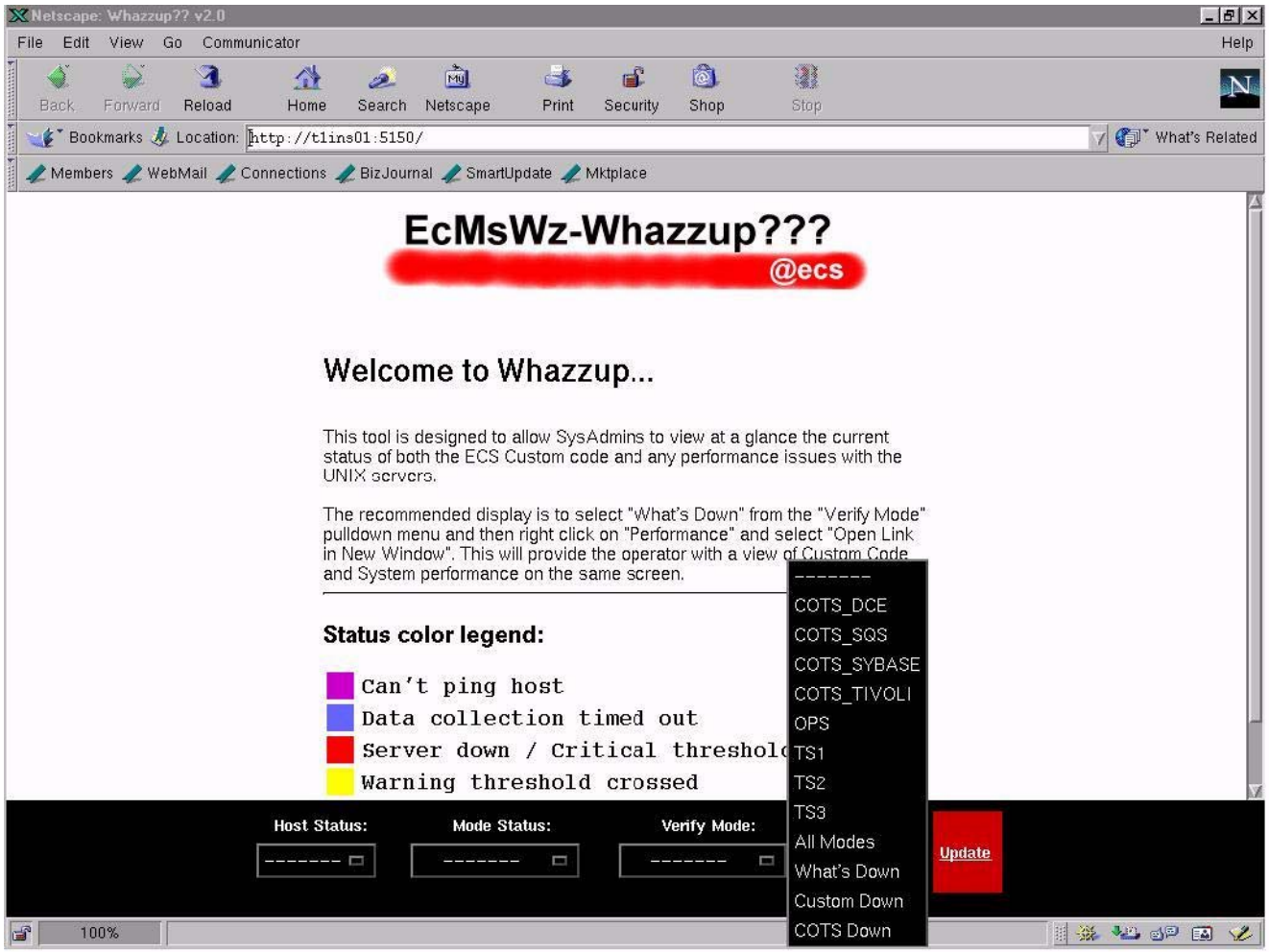
Whazzup???
Mode Status Select



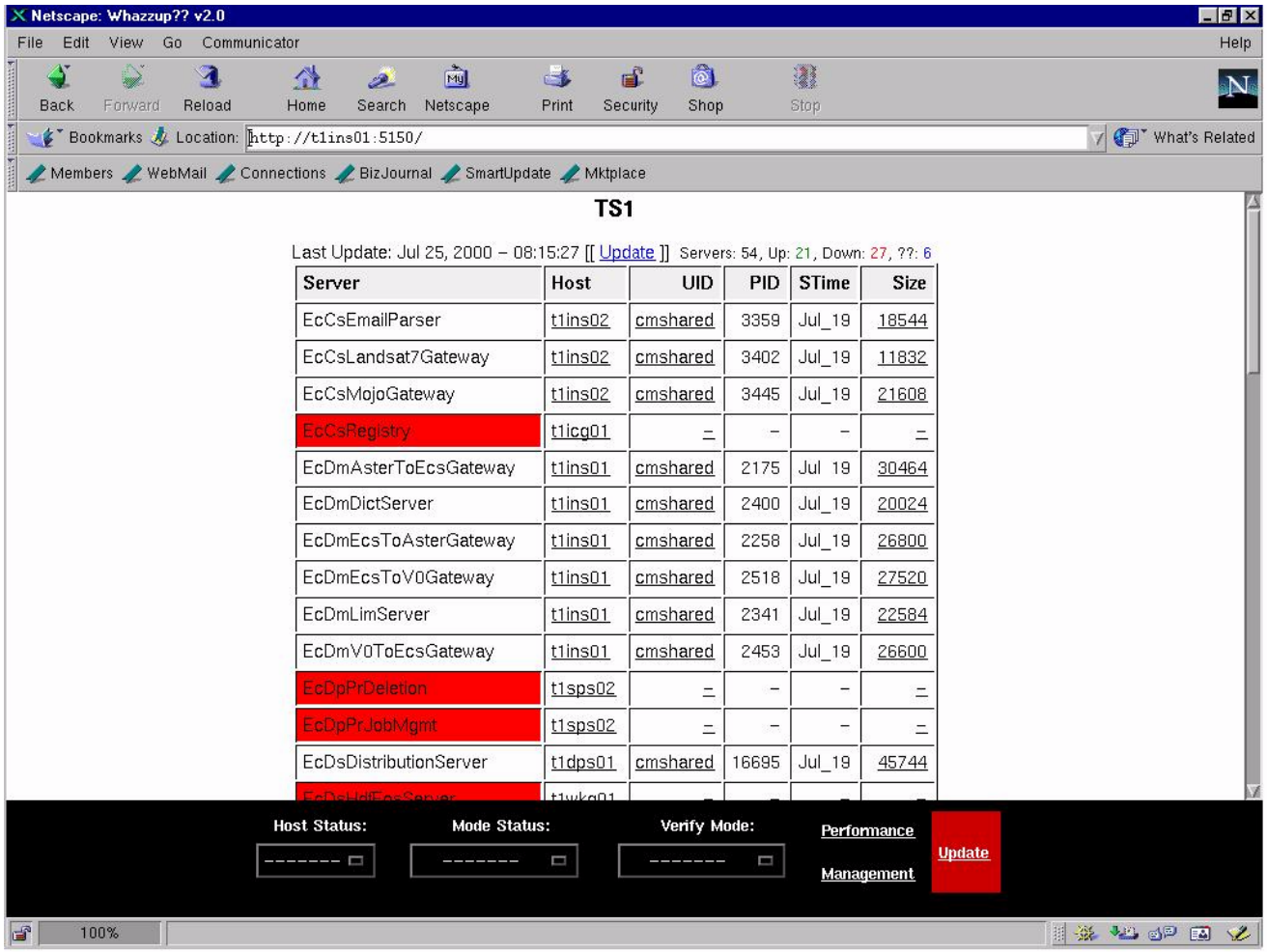
Whazzup???
Mode Status Data



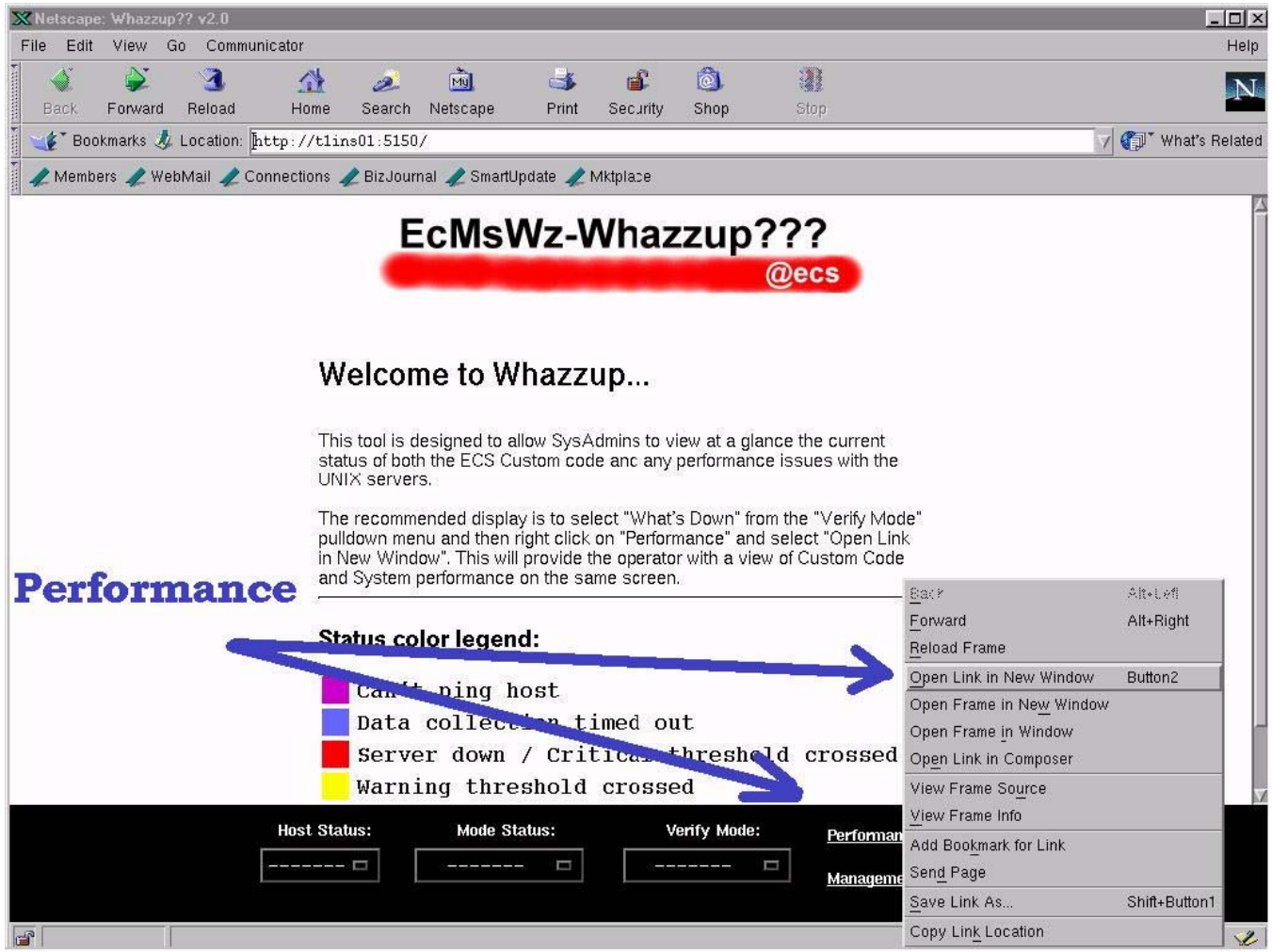
Whazzup???
Verify Mode Select



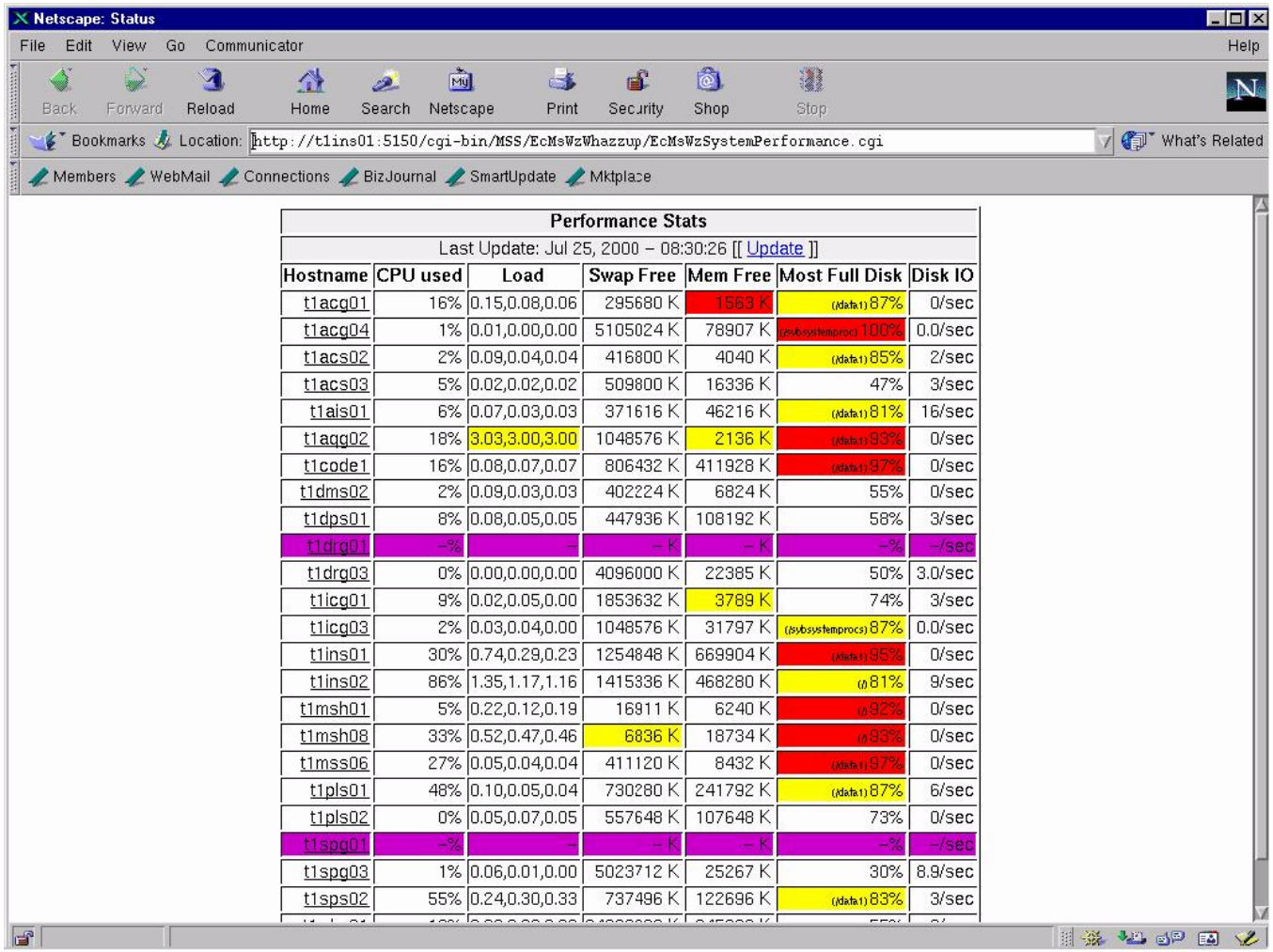
Whazzup???
Verify Mode Data



Whazzup???
Performance Management Select



Whazzup???
Performance Management Data



Performance Stats

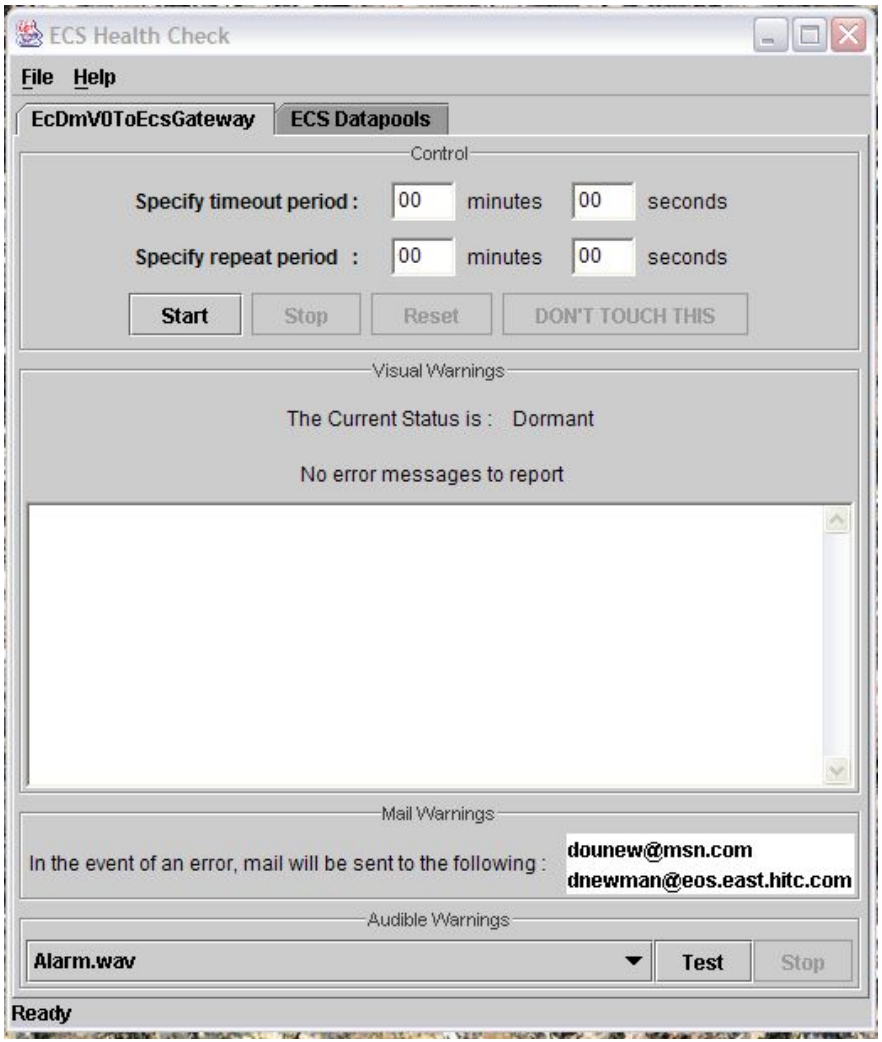
Last Update: Jul 25, 2000 – 08:30:26 [[Update]]

Hostname	CPU used	Load	Swap Free	Mem Free	Most Full Disk	Disk IO
t1acg01	16%	0.15,0.08,0.06	295680 K	1563 K	(/data1) 87%	0/sec
t1acg04	1%	0.01,0.00,0.00	5105024 K	78907 K	(/subsystemprocs) 100%	0.0/sec
t1acs02	2%	0.09,0.04,0.04	416800 K	4040 K	(/data1) 85%	2/sec
t1acs03	5%	0.02,0.02,0.02	509800 K	16336 K	47%	3/sec
t1ais01	6%	0.07,0.03,0.03	371616 K	46216 K	(/data1) 81%	16/sec
t1agg02	18%	3.03,3.00,3.00	1048576 K	2136 K	(/data1) 93%	0/sec
t1code1	16%	0.08,0.07,0.07	806432 K	411928 K	(/data1) 97%	0/sec
t1dms02	2%	0.09,0.03,0.03	402224 K	6824 K	55%	0/sec
t1dps01	8%	0.08,0.05,0.05	447936 K	108192 K	58%	3/sec
t1drg01	–%	–	– K	– K	–%	–/sec
t1drg03	0%	0.00,0.00,0.00	4096000 K	22385 K	50%	3.0/sec
t1icg01	9%	0.02,0.05,0.00	1853632 K	3789 K	74%	3/sec
t1icg03	2%	0.03,0.04,0.00	1048576 K	31797 K	(/sybsystemprocs) 87%	0.0/sec
t1ins01	30%	0.74,0.29,0.23	1254848 K	669904 K	(/data1) 95%	0/sec
t1ins02	86%	1.35,1.17,1.16	1415336 K	468280 K	(/) 81%	9/sec
t1msh01	5%	0.22,0.12,0.19	16911 K	6240 K	(/) 92%	0/sec
t1msh08	33%	0.52,0.47,0.46	6836 K	18734 K	(/) 93%	0/sec
t1mss06	27%	0.05,0.04,0.04	411120 K	8432 K	(/data1) 97%	0/sec
t1pls01	48%	0.10,0.05,0.04	730280 K	241792 K	(/data1) 87%	6/sec
t1pls02	0%	0.05,0.07,0.05	557648 K	107648 K	73%	0/sec
t1spg01	–%	–	– K	– K	–%	–/sec
t1spg03	1%	0.06,0.01,0.00	5023712 K	25267 K	30%	8.9/sec
t1sps02	55%	0.24,0.30,0.33	737496 K	122696 K	(/data1) 83%	3/sec

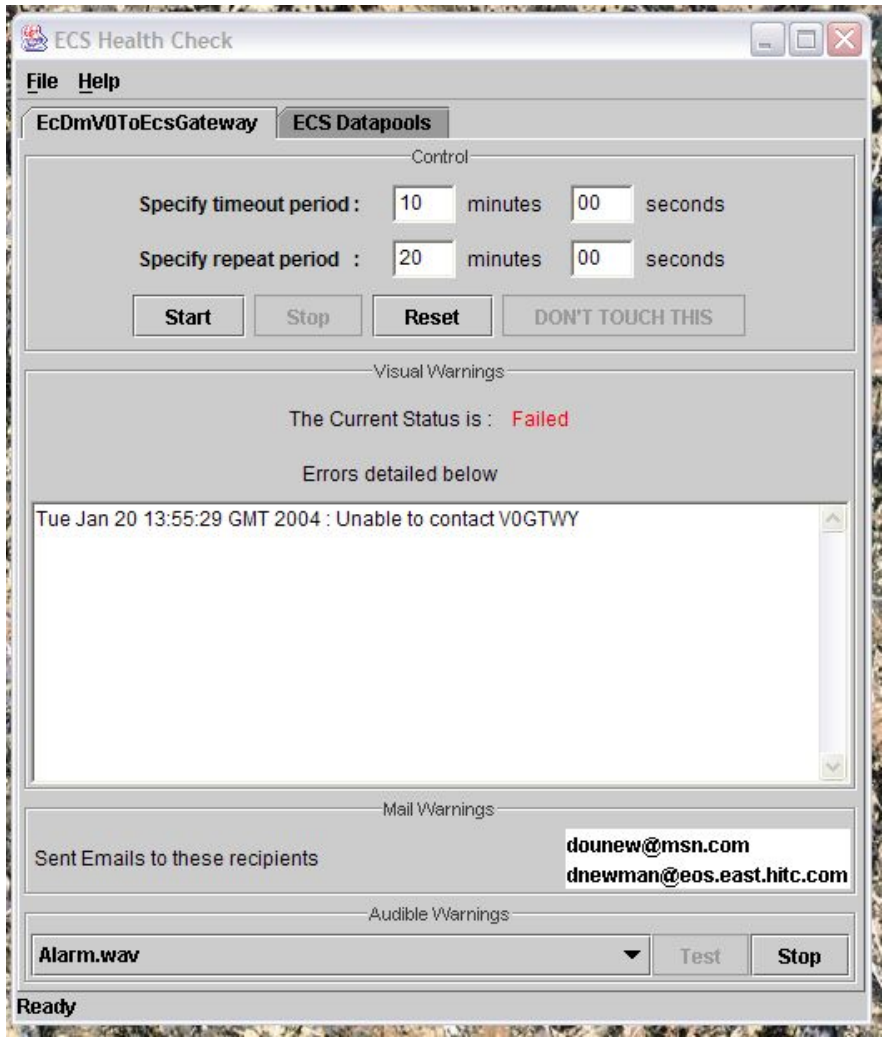
ECS Health Check GUI

- **ECS Health Check GUI**
  - **Provides status of EcDmV0ToEcsGateway and Data Pool drill-down search engine**
  - **At a specified rate it sends inventory searches to the EcDmV0ToEcsGateway and/or submits granule search requests to the Data Pool**
  - **Provides multiple warnings when a failure is registered by the GUI during the current search**
    - **Visual warning (including details about the time and nature of the error)**
    - **Audible alarm (when implemented)**
    - **E-mail message**

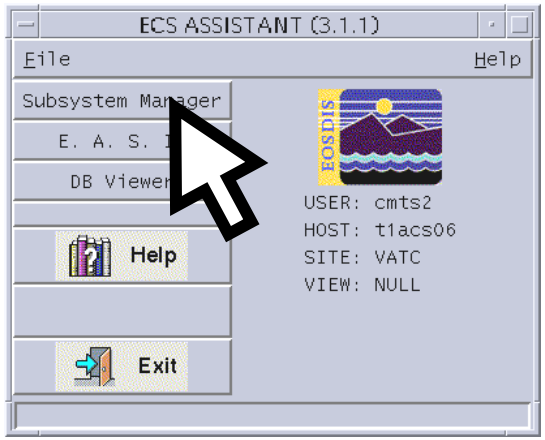
ECS Health Check GUI (at Startup)

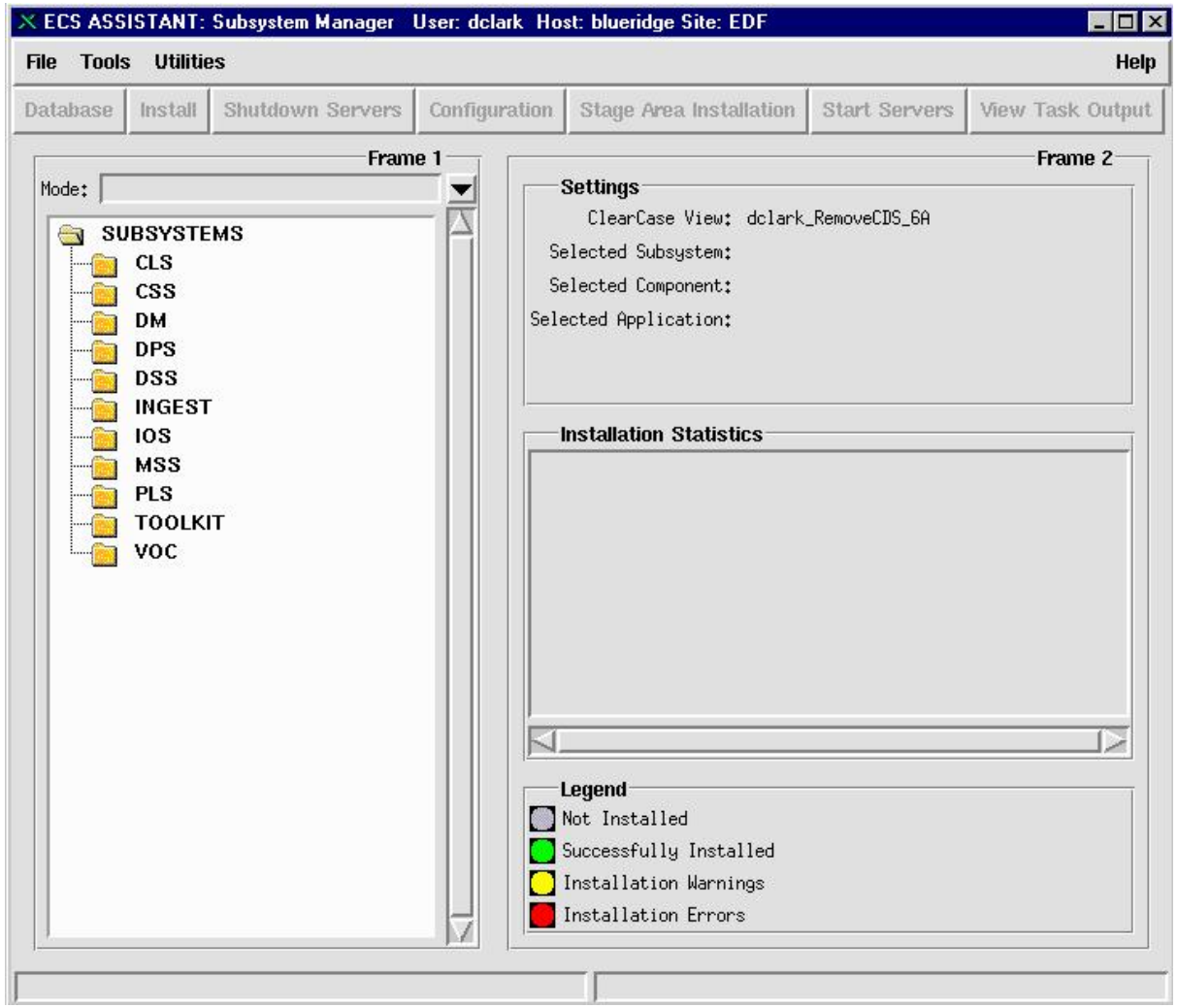


ECS Health Check GUI (Having Detected an Error)

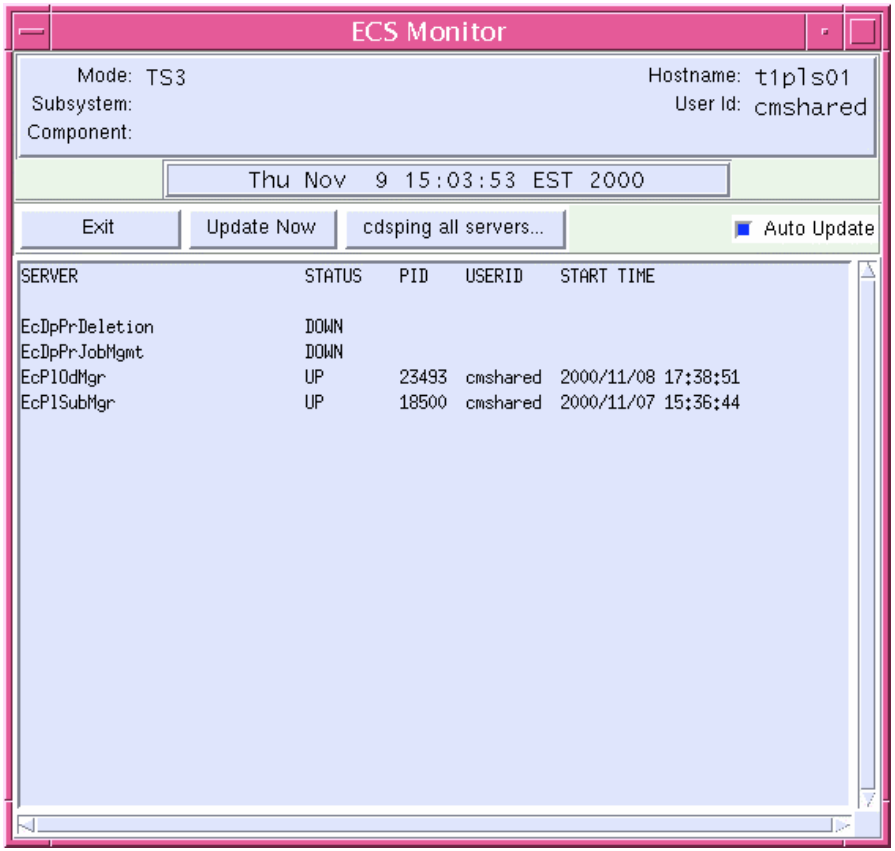


ECS Subsystem Manager GUI

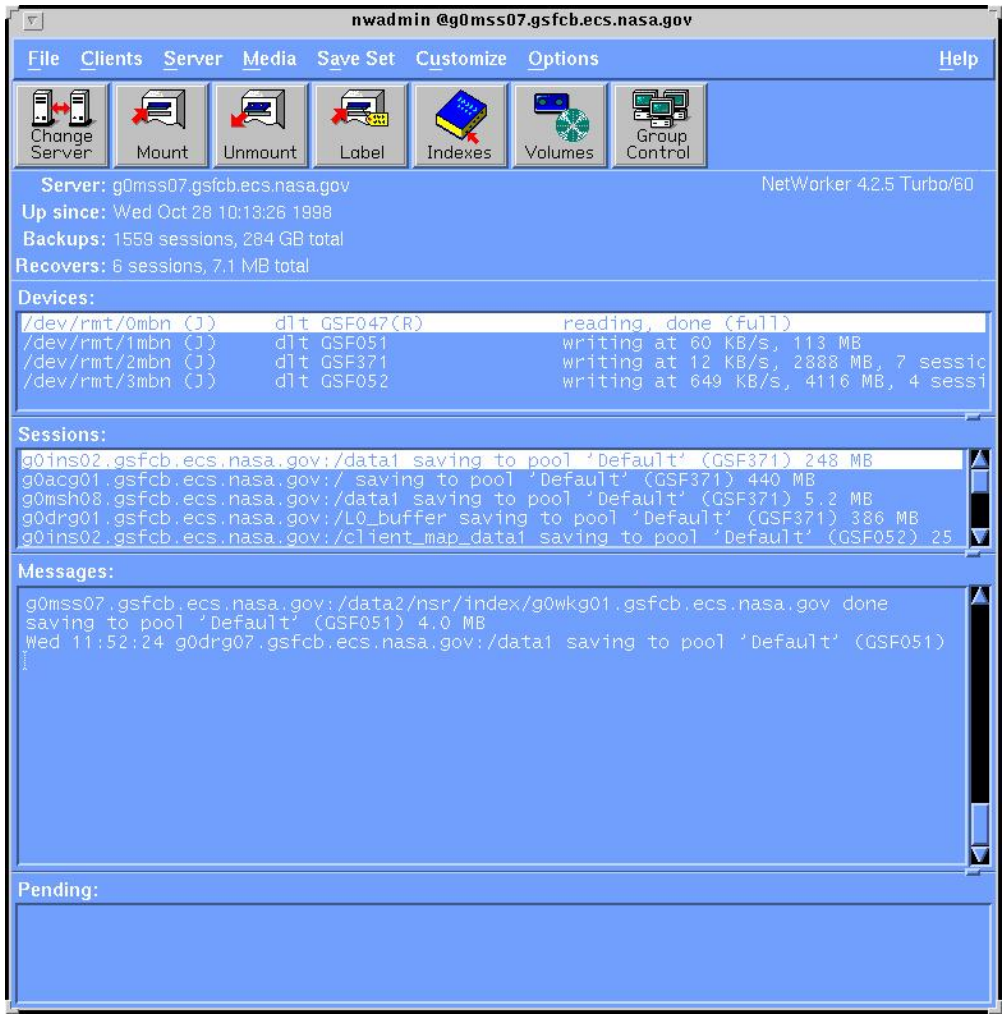




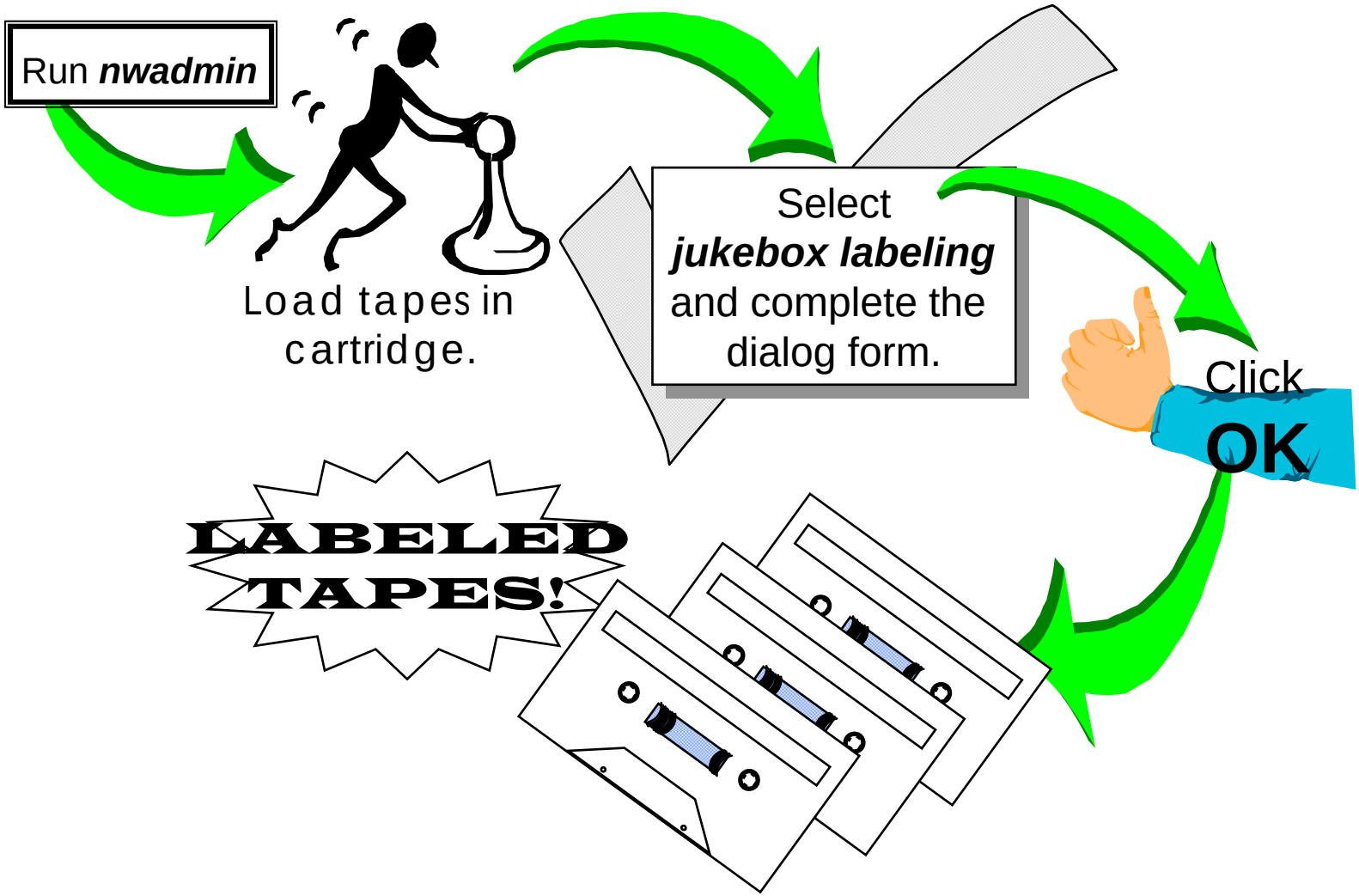
ECS Assistant Monitor



Networker Administrator Main Screen

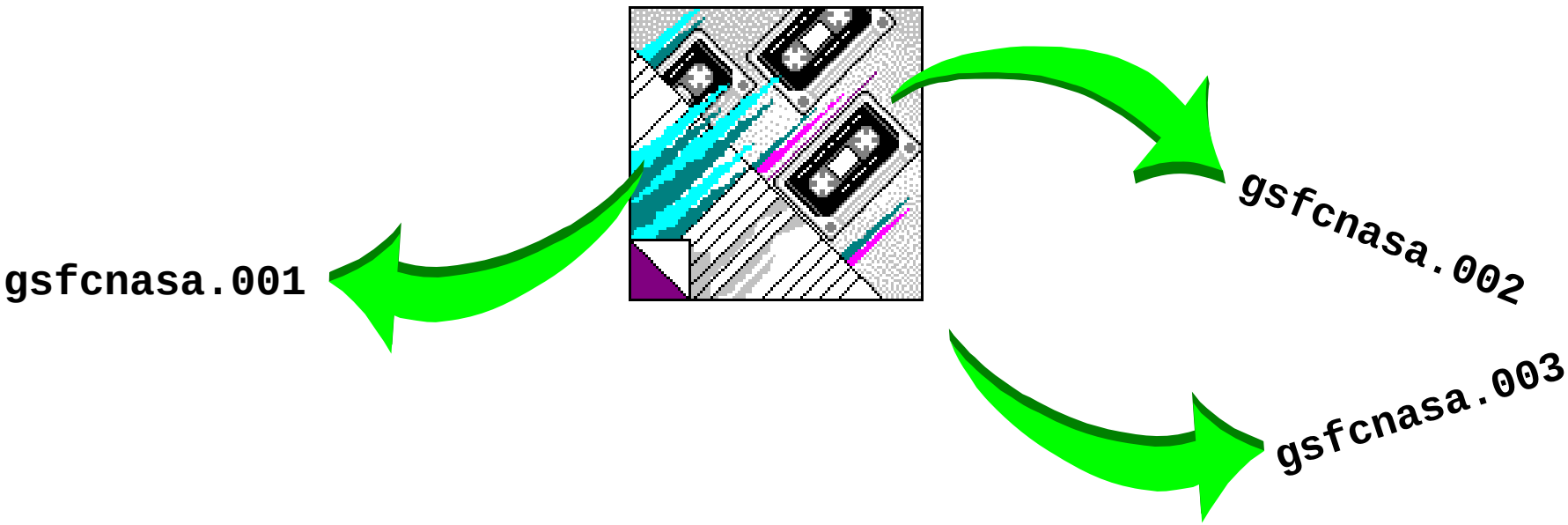


Tape Labeling Procedure

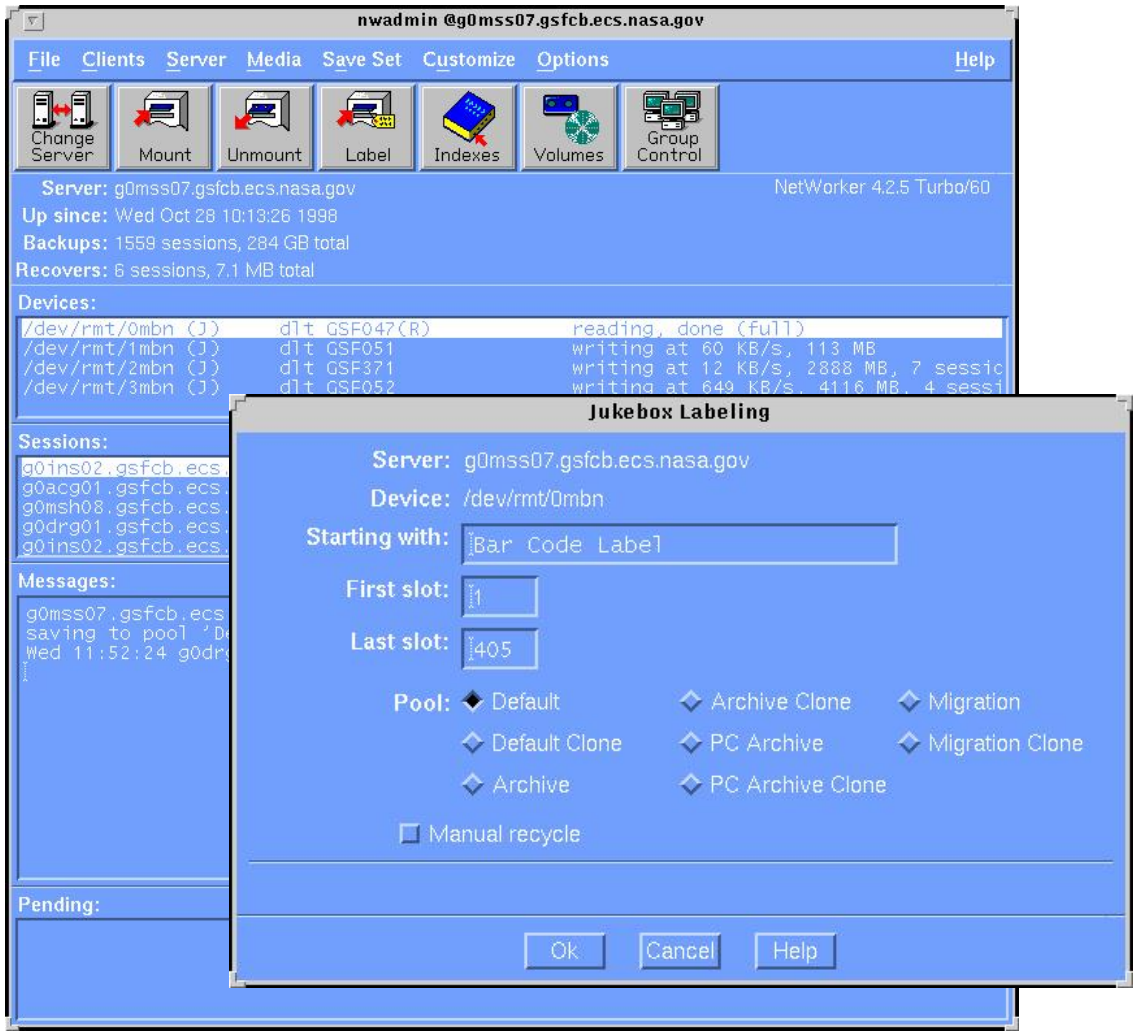


Tape Labeling

- Creates a unique name for each tape
- Identifies tape to Networker
- Stores list of labels in memory (index)



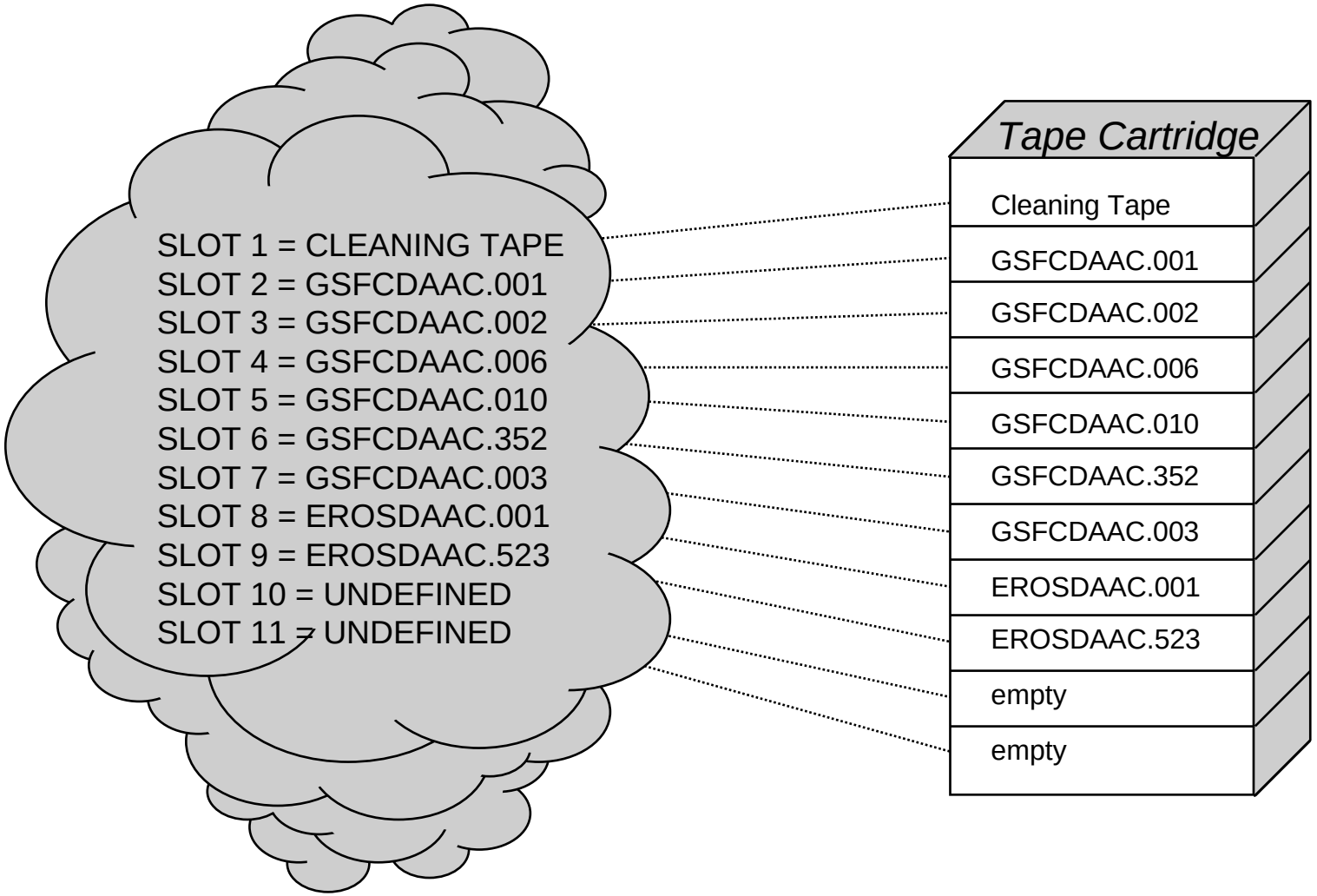
Jukebox Labeling Window



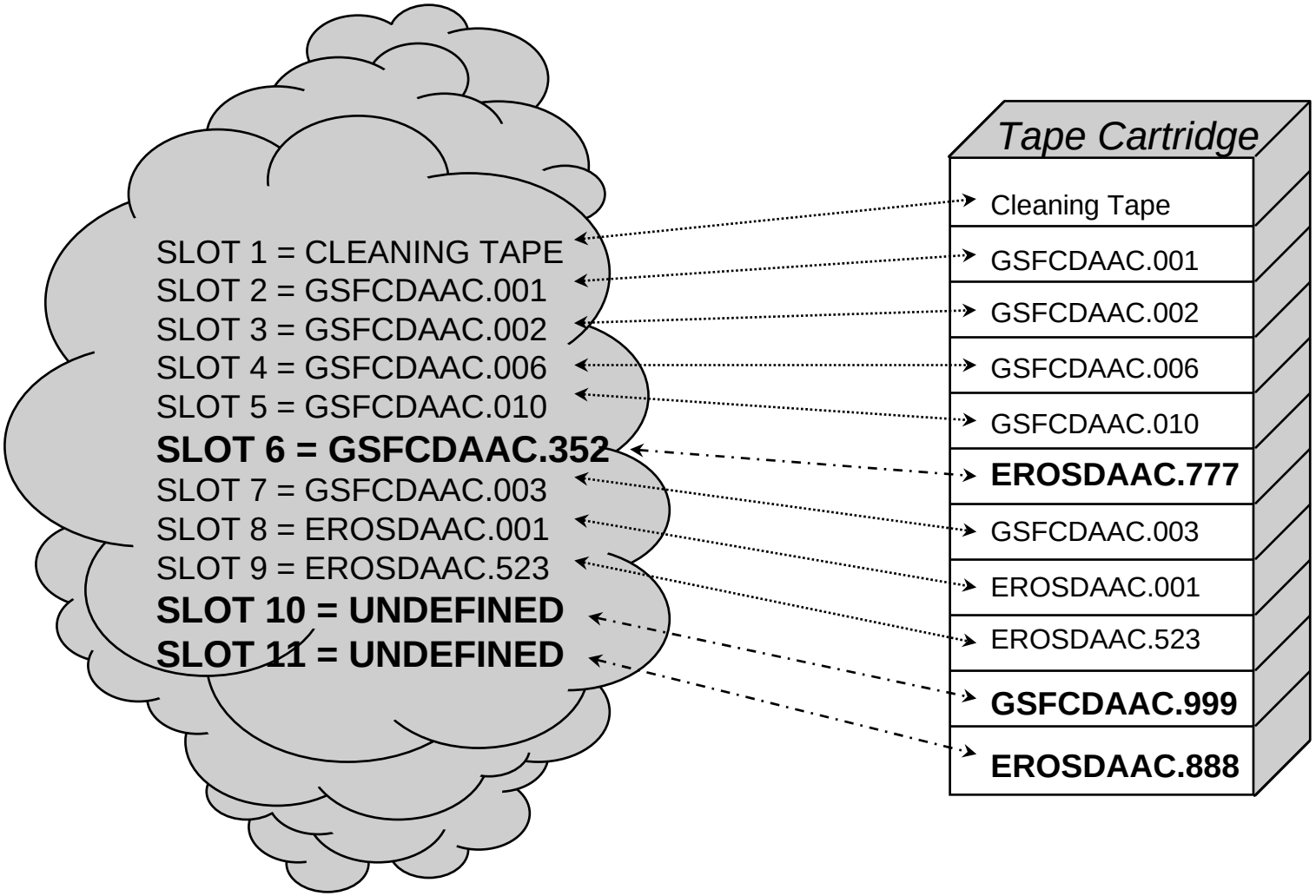
Tape Indexing

- **Networker's way of identifying each tape's location in the jukebox**
- **Reads each tape's label and matches it to the jukebox slot**
- **Can be time consuming (2-3 minutes per tape)**
- **Must be performed after tapes are added, removed, or changed**

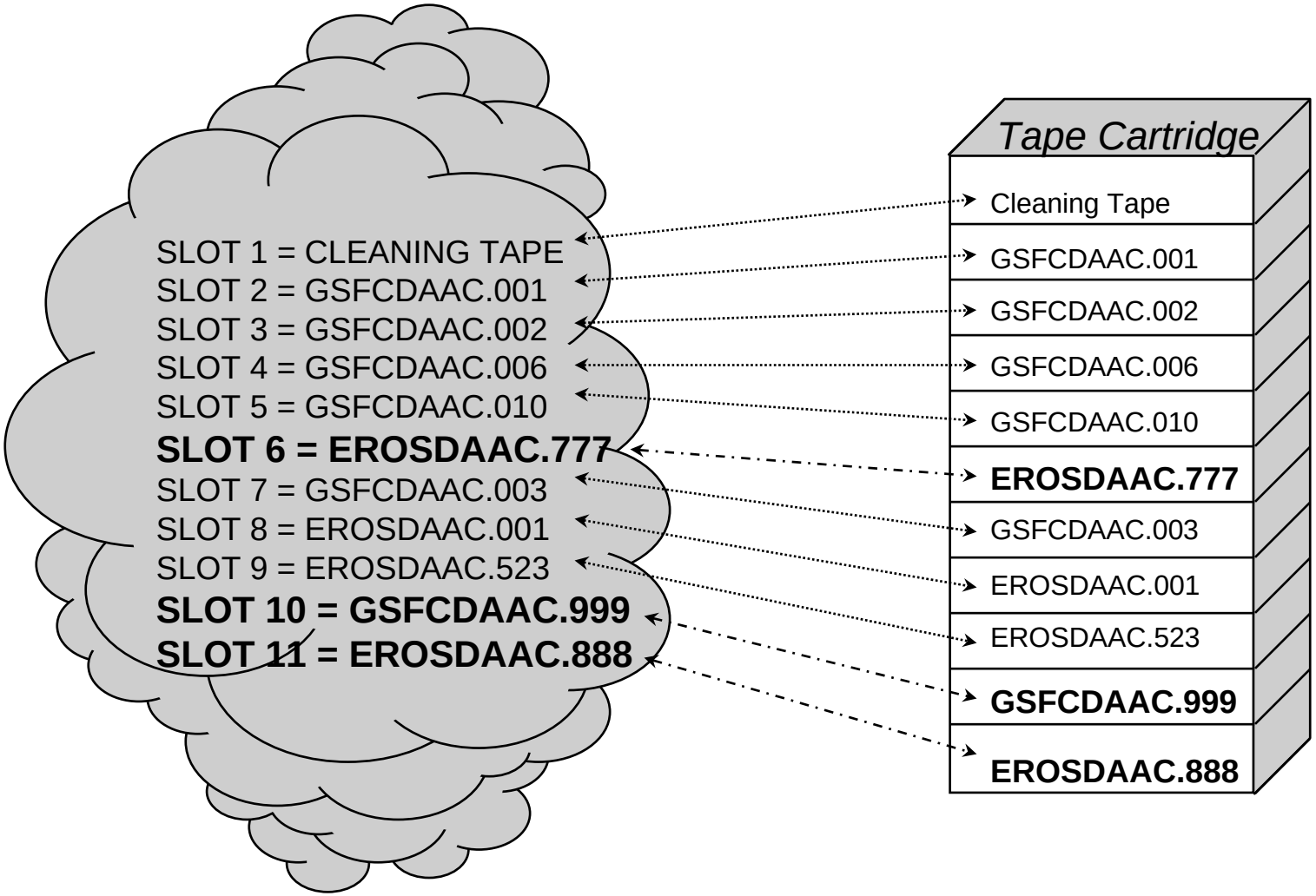
Tape Indexing
After Initial Inventory



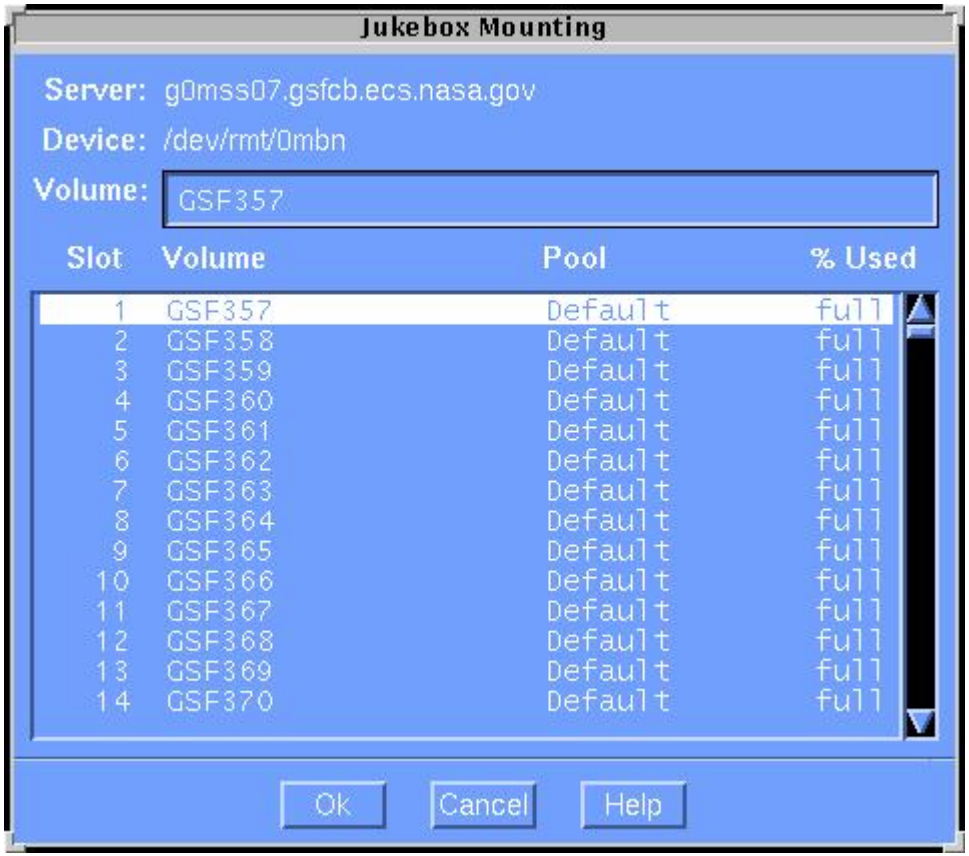
Tape Indexing
Tapes Changed But Not Re-Inventoried



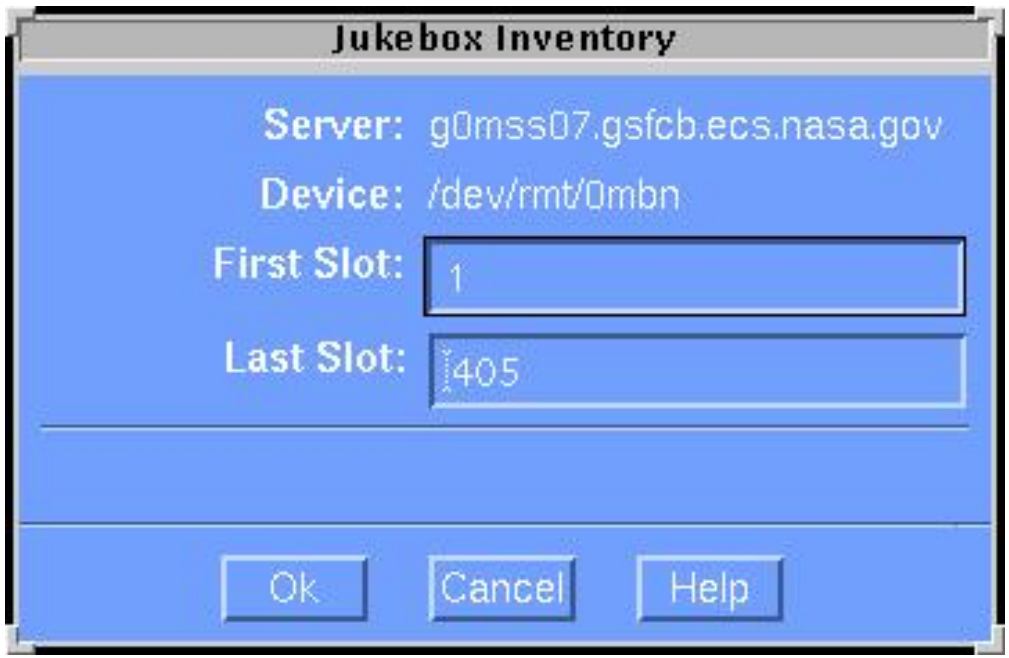
Tape Indexing After Re-Inventory



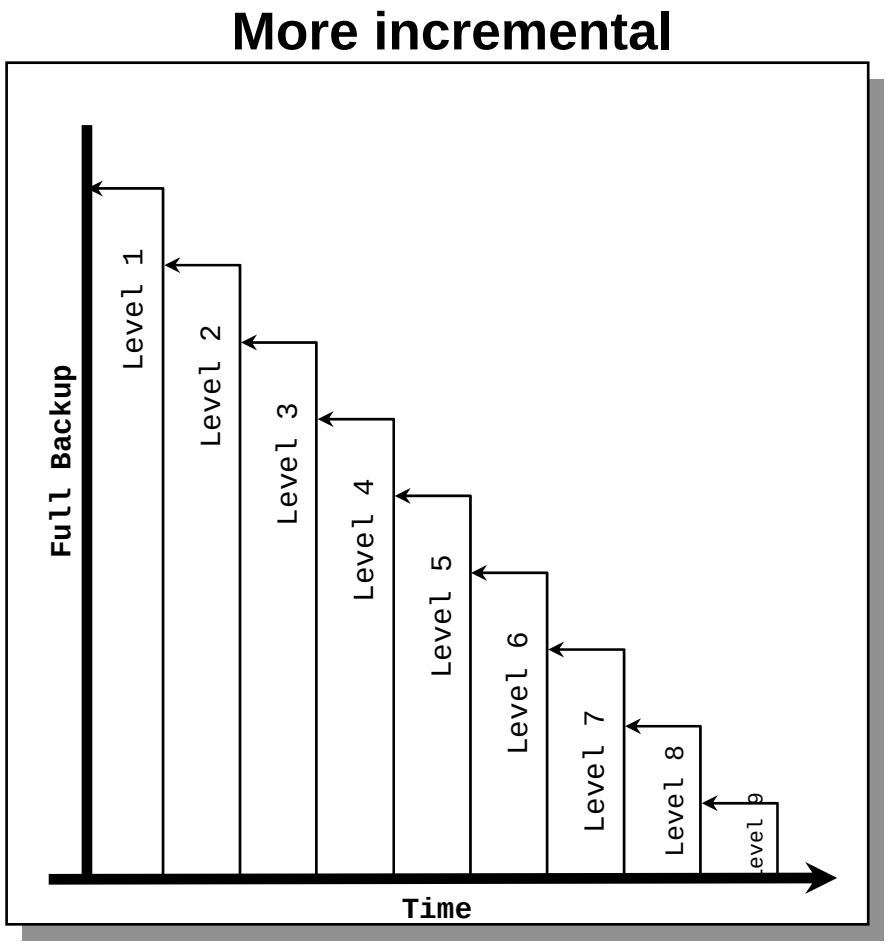
Jukebox Mounting Window

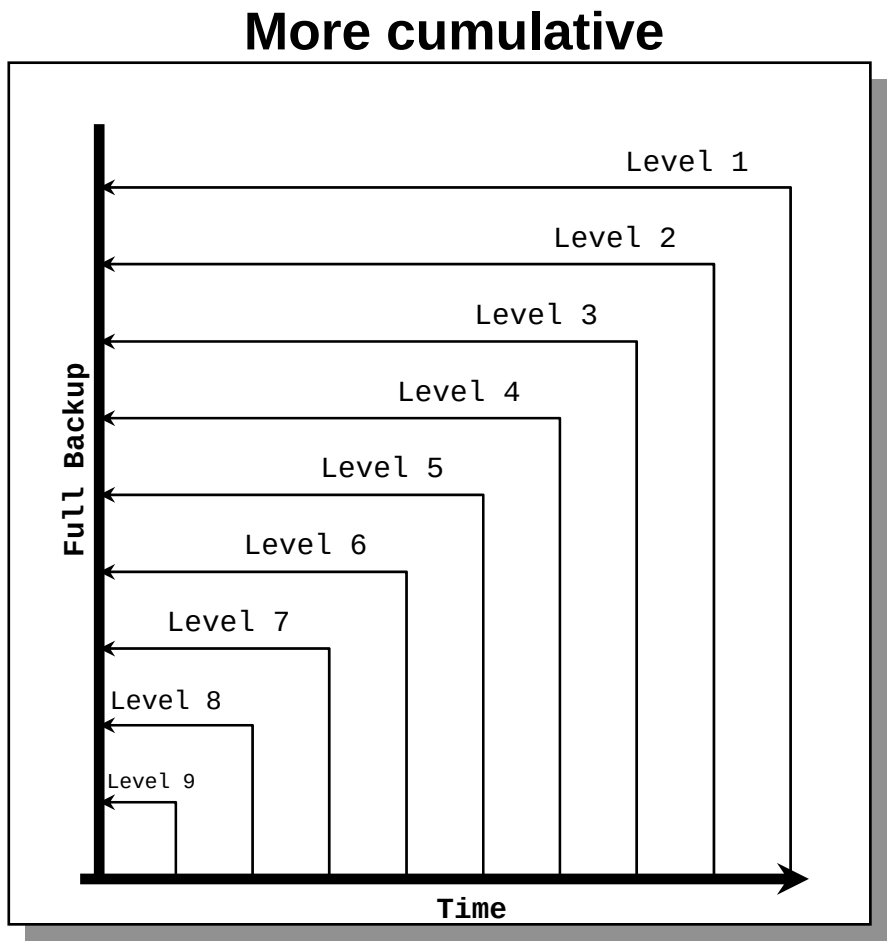


Jukebox Inventory Window

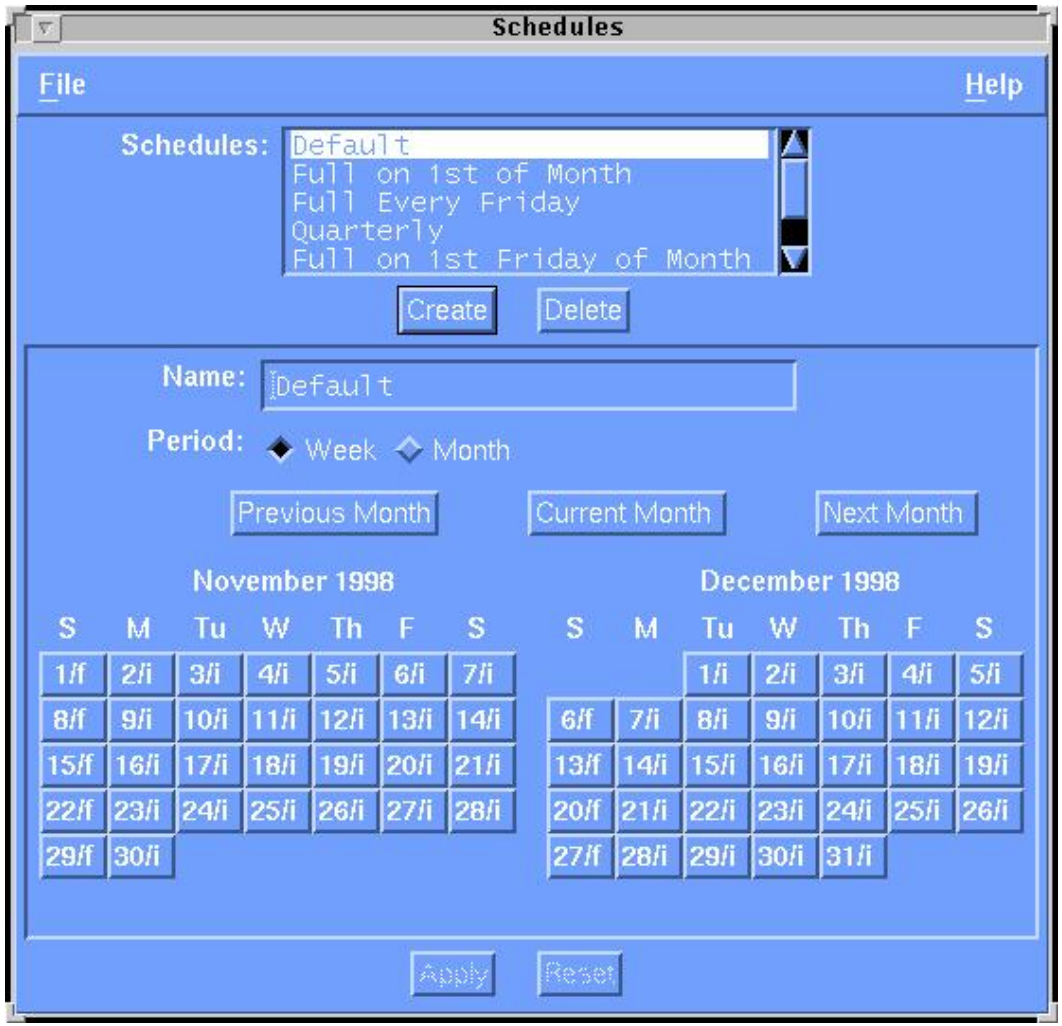


Backup Levels Overview

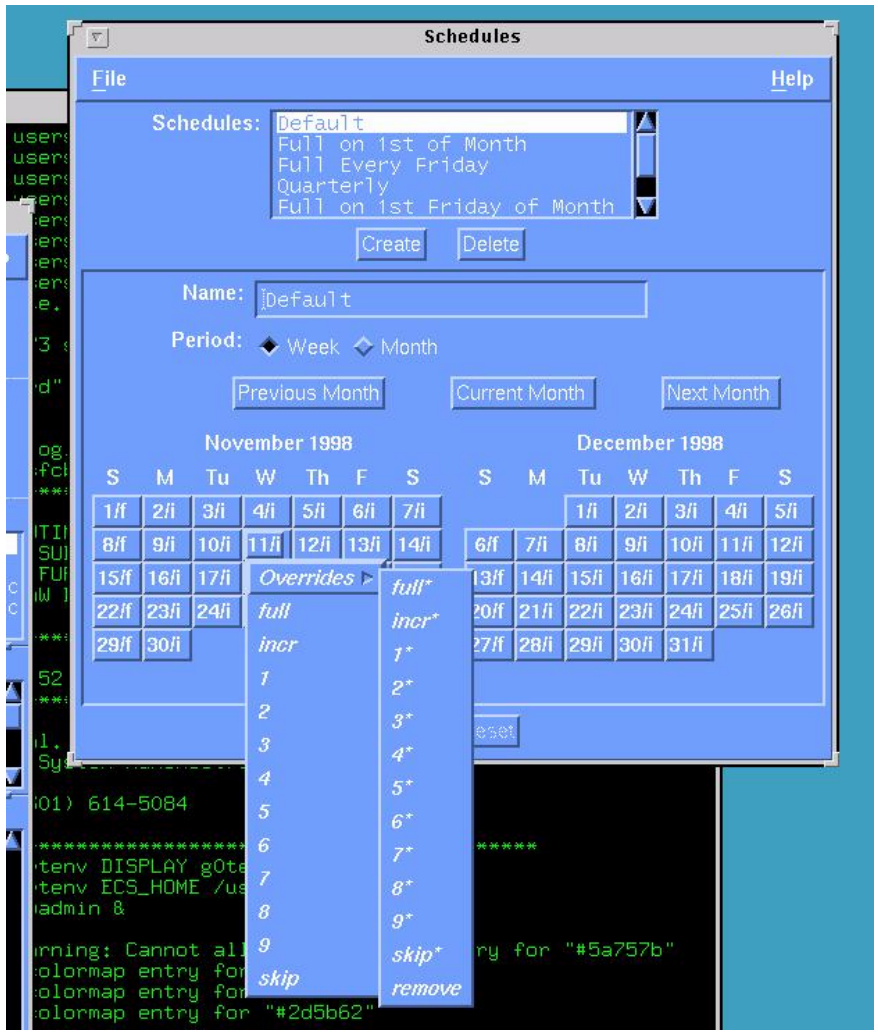




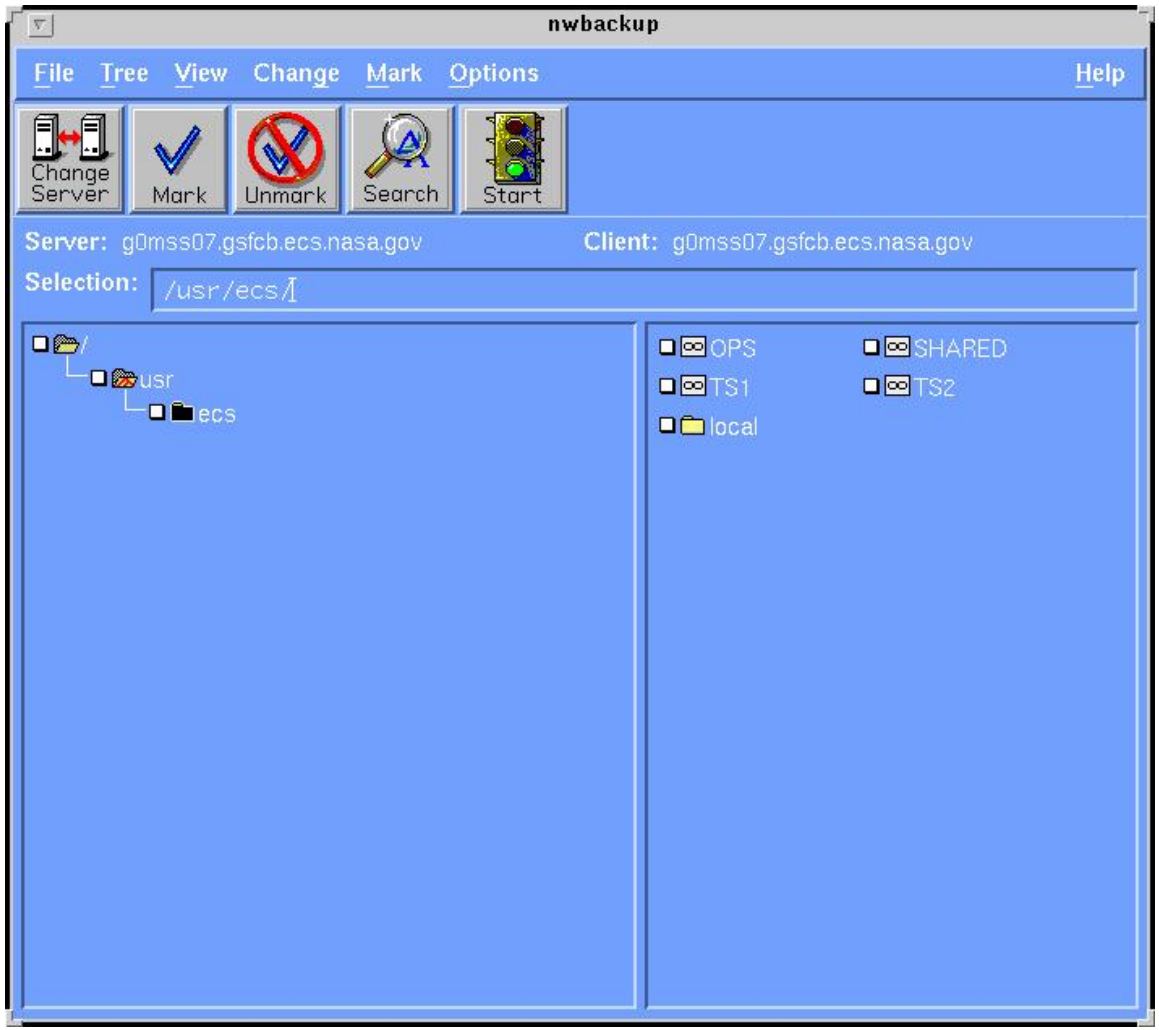
Networker Backup Scheduler



Networker Backup Scheduler Overrides Menus

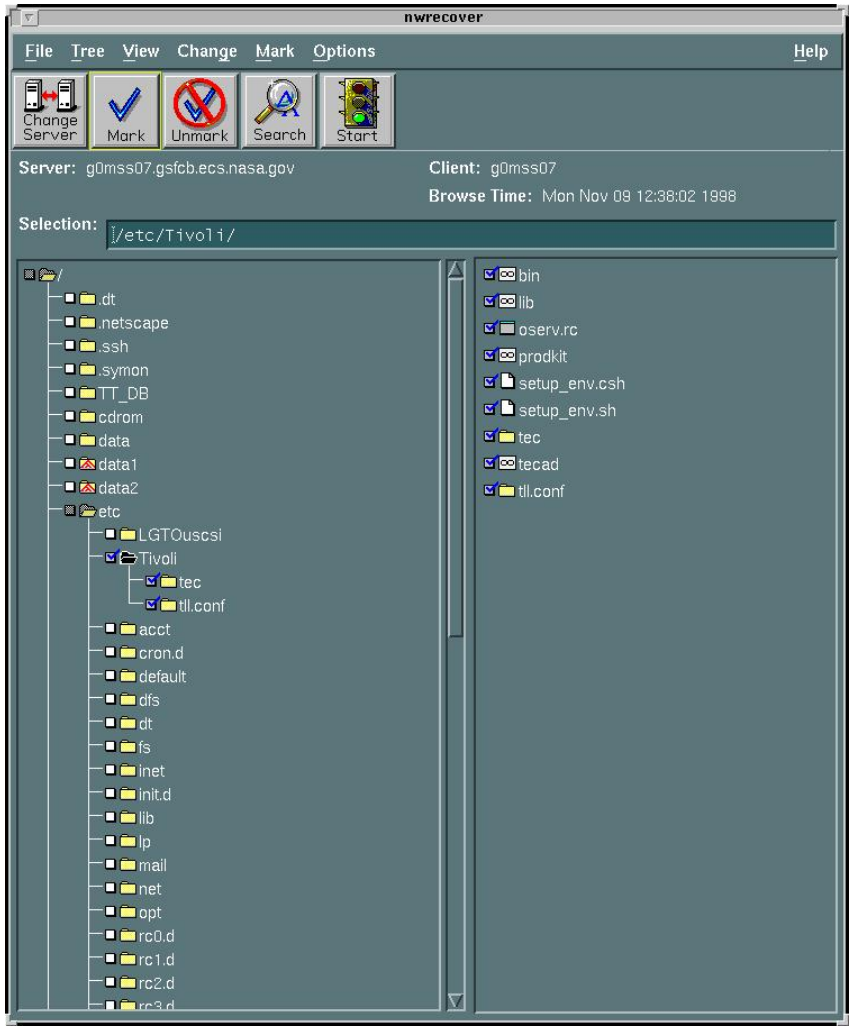


Networker Backup Window

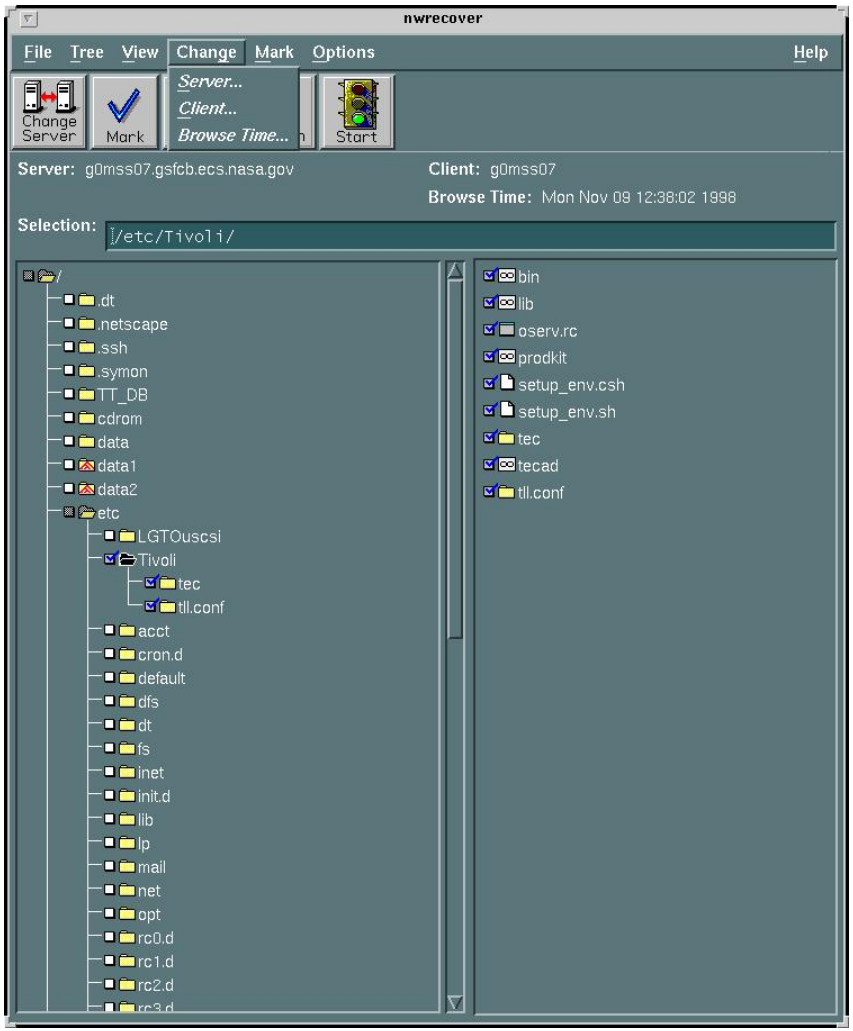


Networker Recover Window

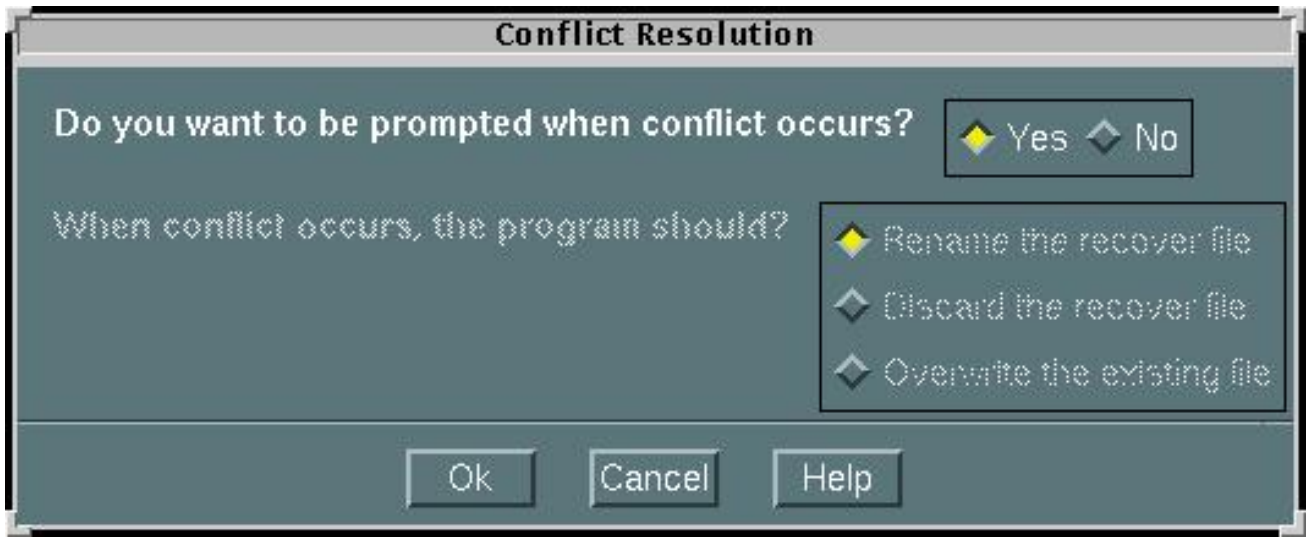
Networker Recover Window with Files Selected



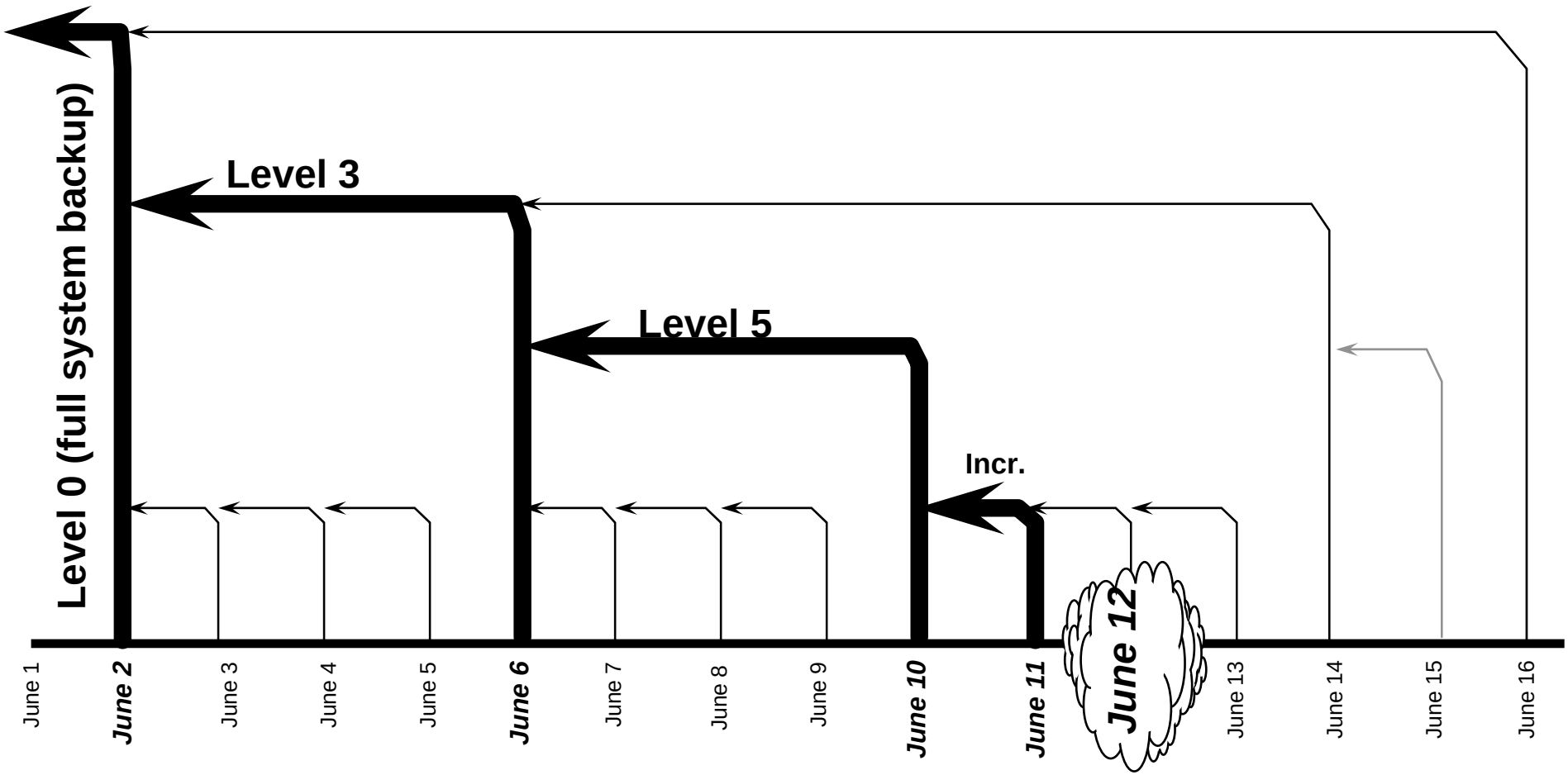
Networker Browse Time Window



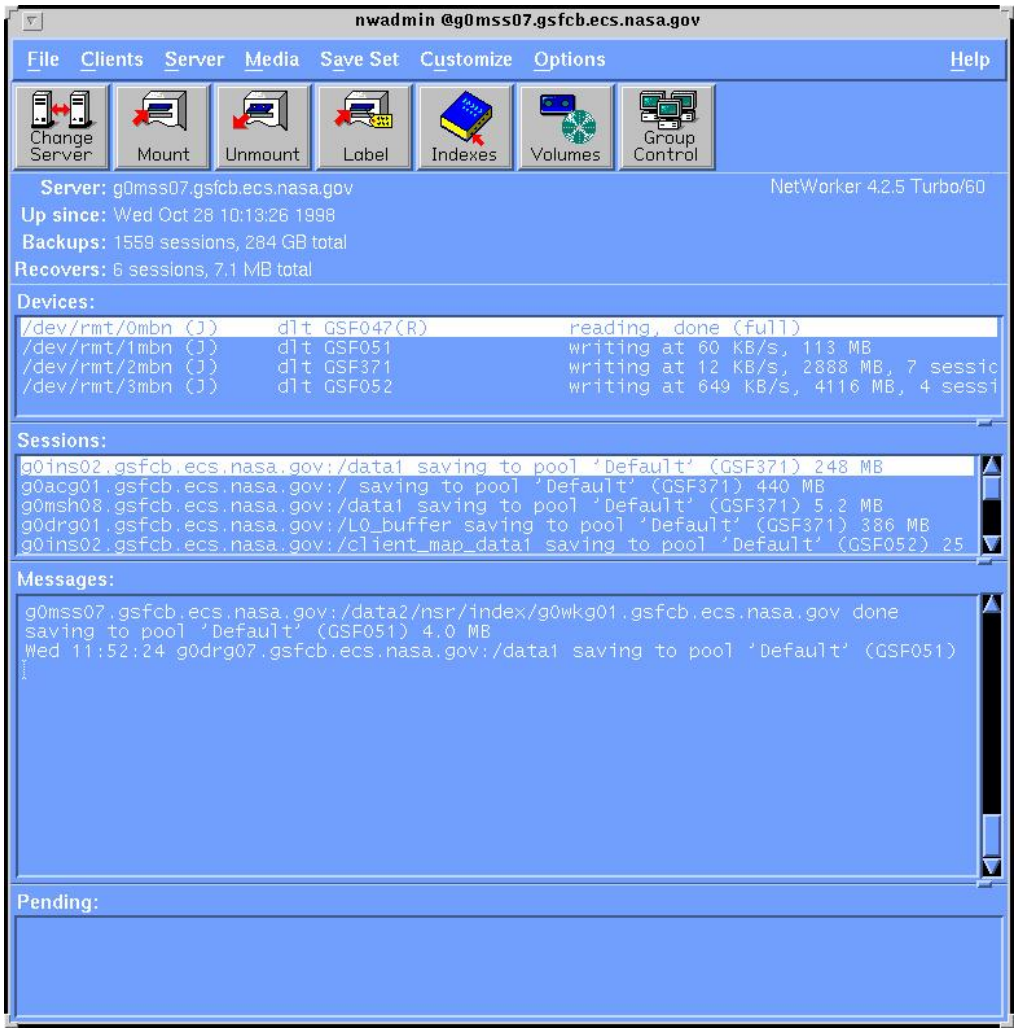
Networker Conflict Resolution Window



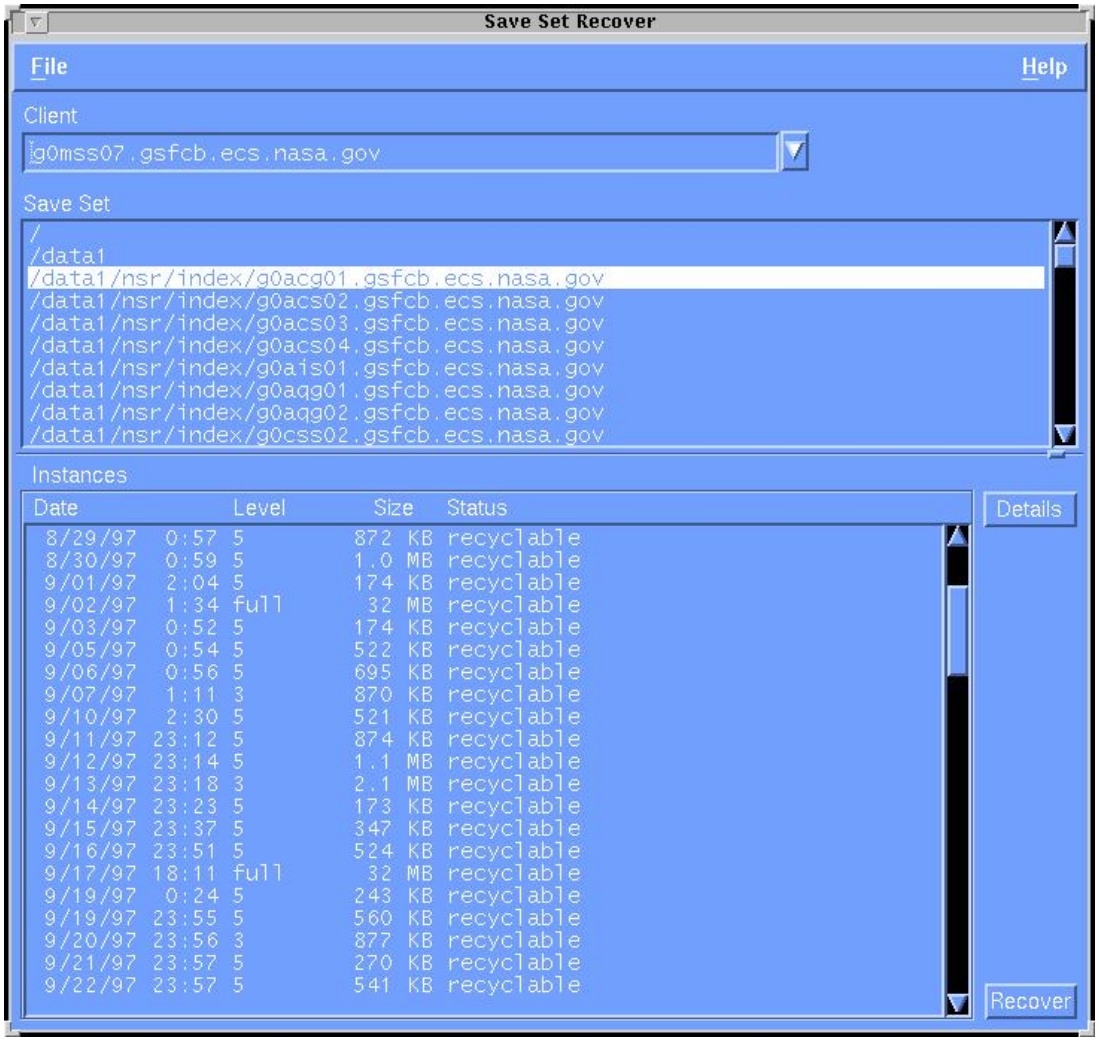
Tapes Required for Full System Restore



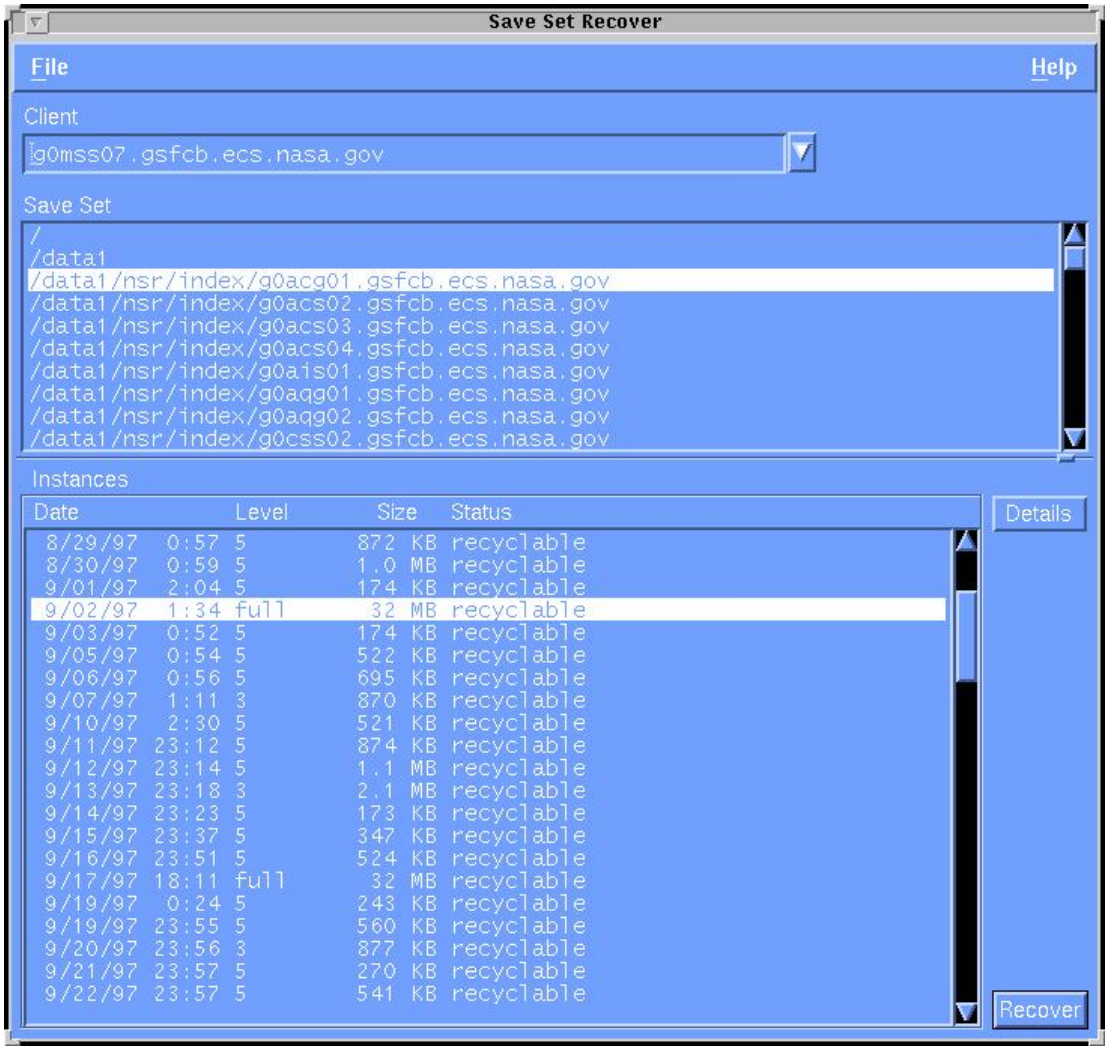
Networker Administrator Main Screen



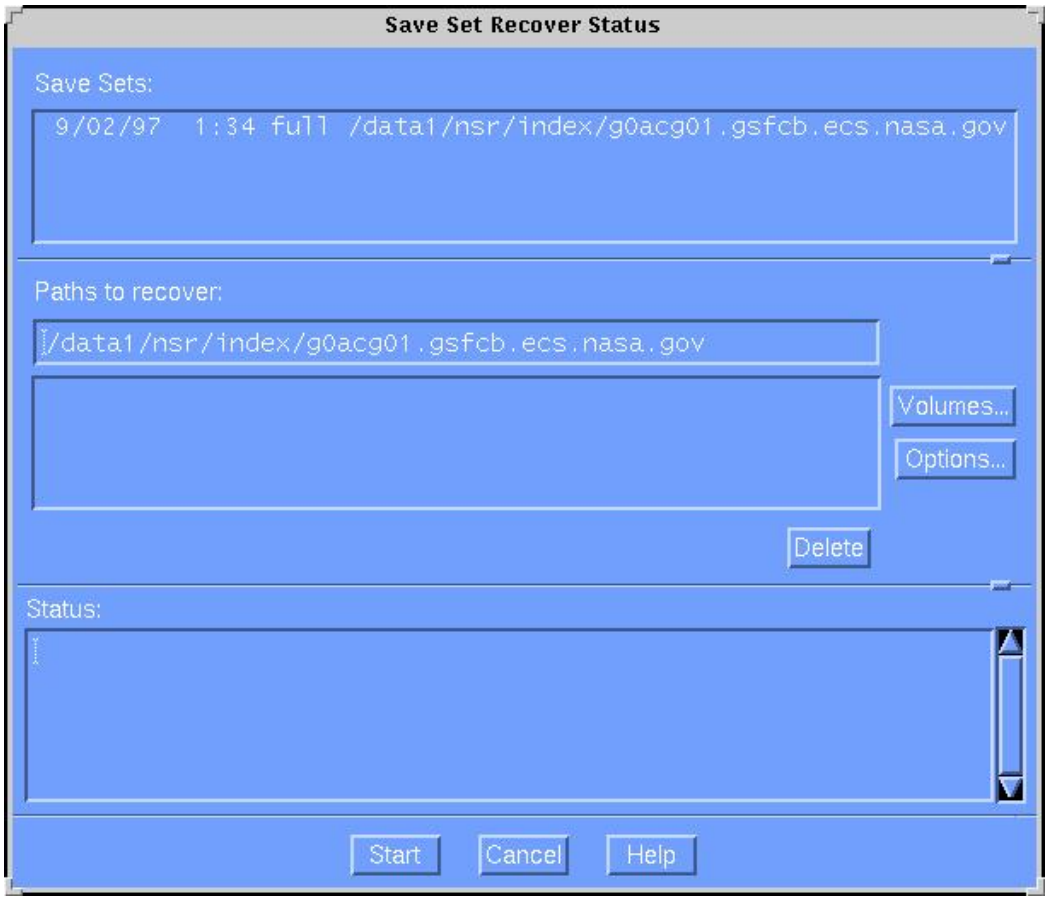
Networker Save Set Screen



Networker Save Set Screen (Cont.)



Networker Save Set Screen (Cont.)



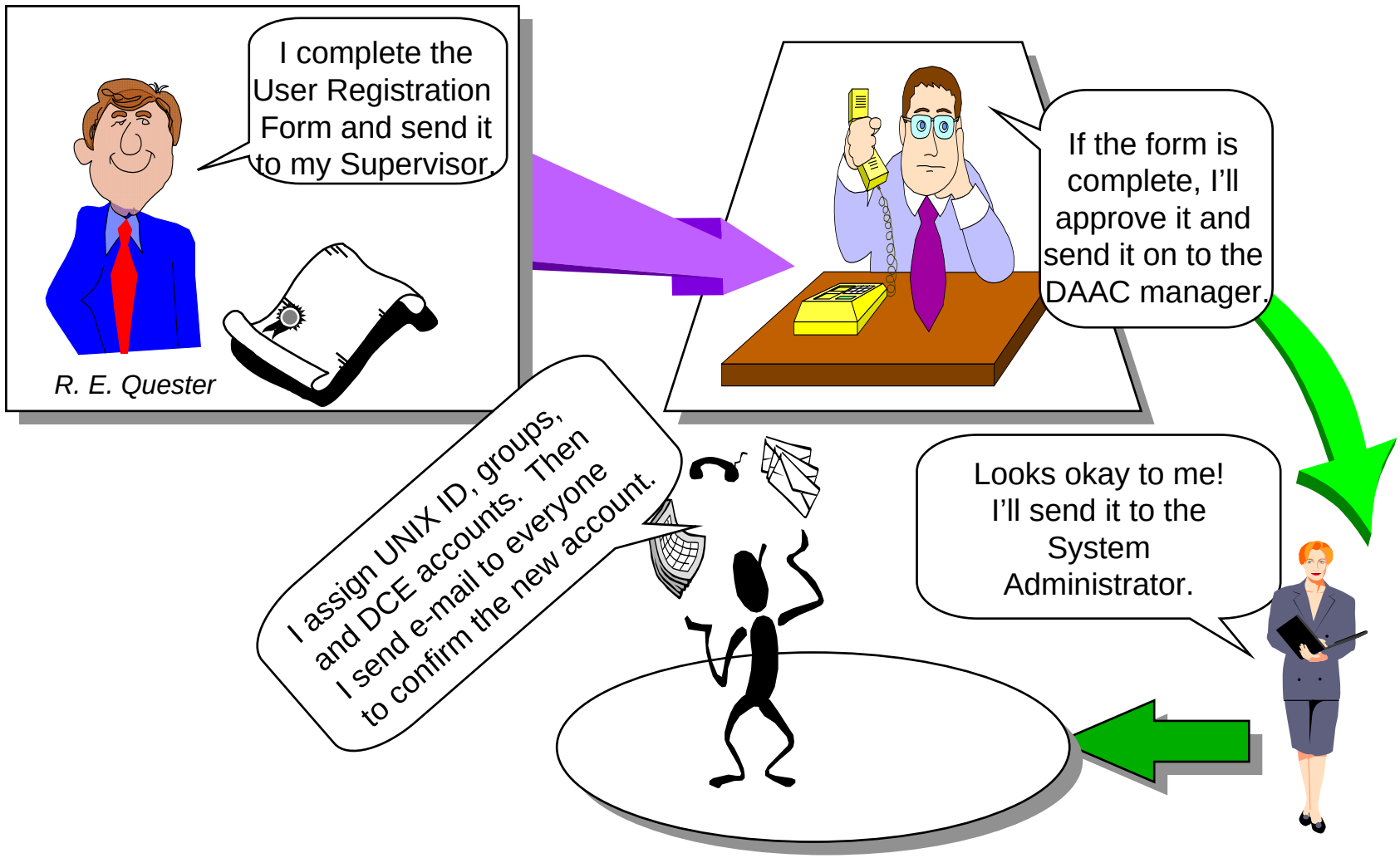
Personnel Screening

- **OMB Circular A-130, Appendix III and NPR 2810.1 and Internet Protocol Operational Network (IONet) Access Protection Policy and Requirements 290-004 together require screening for:**
  - **All employees who require privileged access or limited privileged access to a Federal computer system or network**
  - **All employees who require privileged access, limited privileged access, or access to the Closed Segment of the Internet Protocol Operational Network (IONet) (formerly NASCOM)**
  - **All employees having access to IONet network control devices**

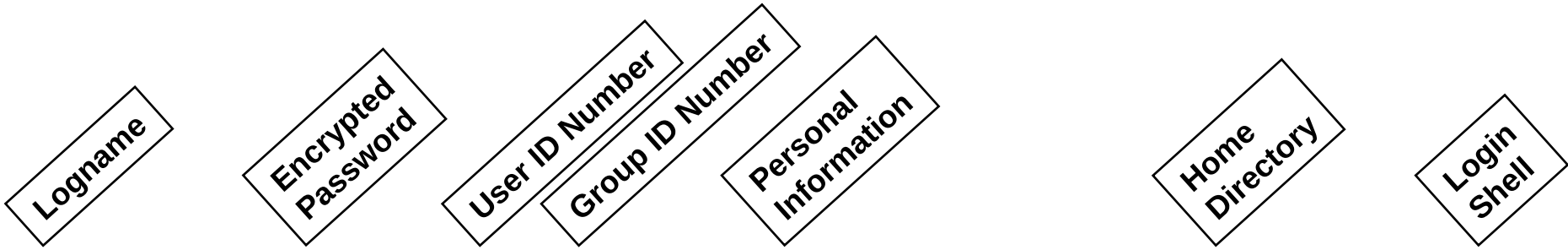
Personnel Screening (Cont.)

- **NPR 1620.1 requires that all employees granted unescorted access to a NASA Resource Protection (NRP) facility or area and/or a NASA-designated Limited Area undergo screening**

New User Approval



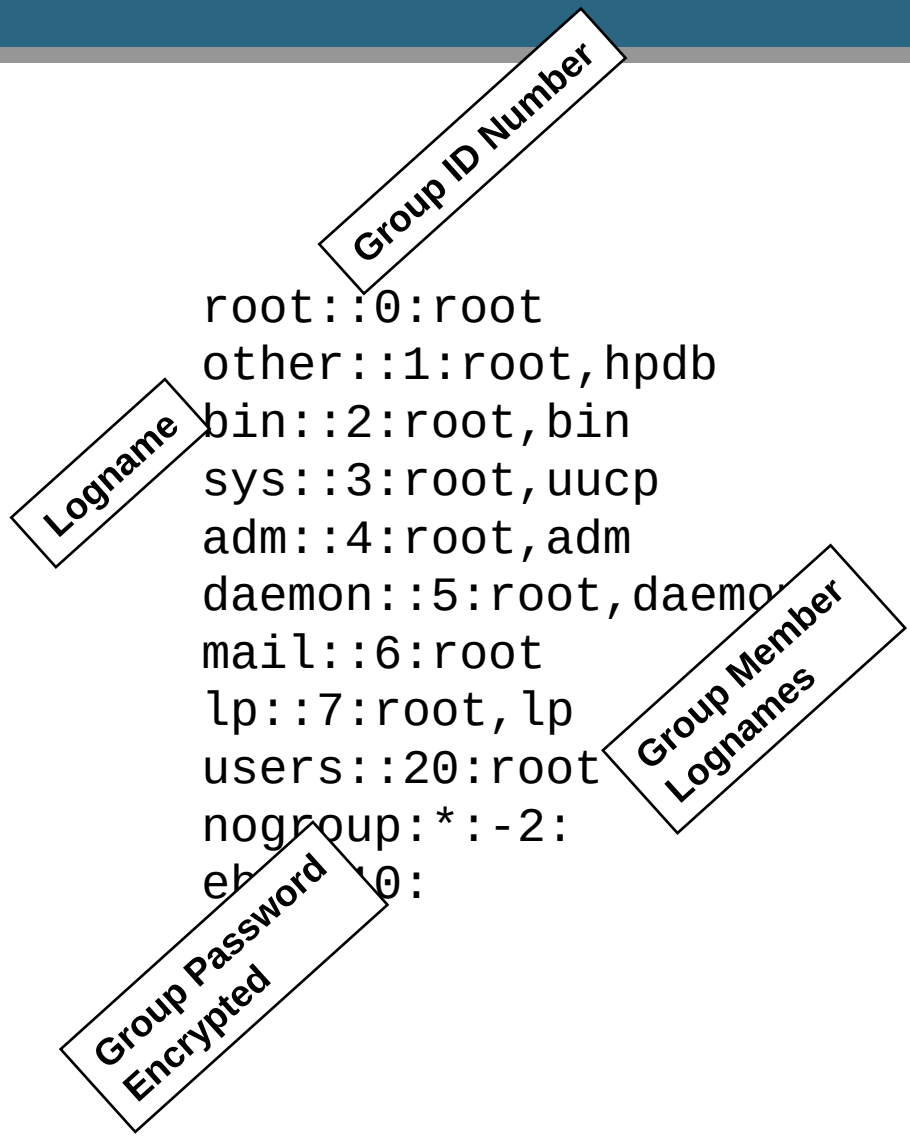
/etc/passwd File




```
mresnick:$sy732az)[xyzz:510:1:Michael Resnick {x4076}:/home/mresnick:/bin/csh
jsmith:hY%dd98dwWrxPnm:511:1:Janet Smith {x0821}:/home/jsmith:/bin/csh
rknickerb::512:1:Robert Knickerbocker {x4111}:/home/rknickerb:/bin/csh
```

Empty field (no password)

/etc/group File



/etc/auto.home File

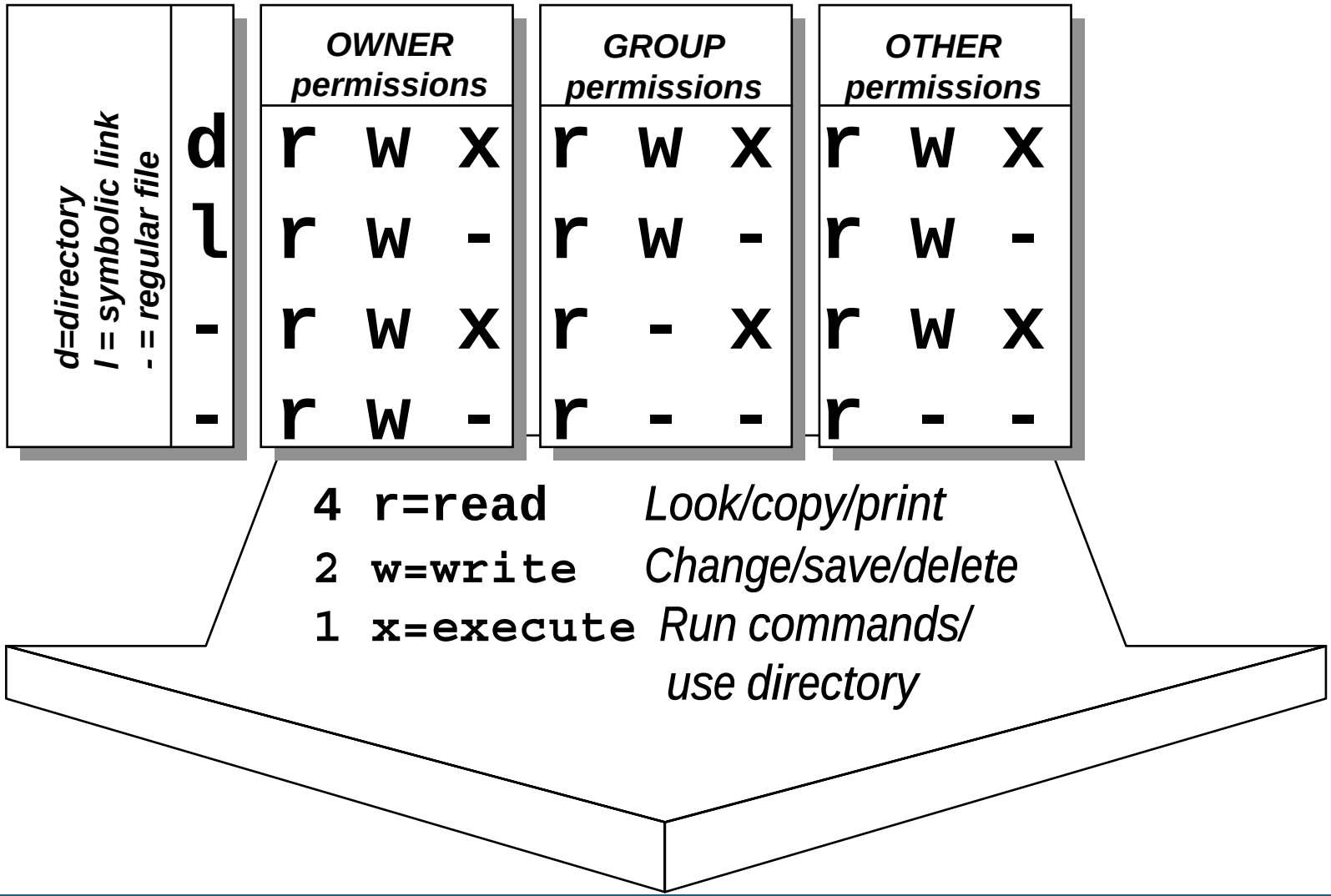
Logname	Permissions	Location of Home Directory
dwashing	-rw,intr	acmn1sgi:/vol0/users/dwashing
jmangum	-rw,intr	acmn1sgi:/vol0/users/jmangum
mlynch	-rw,intr	acmn1sgi:/vol0/users/mlynch
ddavis	-rw,intr	acmn1sgi:/vol0/users/ddavis
rcampbel	-rw,intr	acmn1sgi:/vol0/users/rcampbel
spete	-rw,intr	acmn1sgi:/vol0/users/spete
kkleis	-rw,intr	acmn1sgi:/vol0/users/kkleis
echeung	-rw,intr	acmn1sgi:/vol0/users/echeung

ls -l Output Explanation

File permissions | Links | File Owner | Group | File size in bytes | Modification date/time | File name

```
drwxrwxrwx    3    mresnick    training     8192    Jun 14 08:34    archive
drwxr-xr-x   11    mresnick    training     4096    Jul 03 12:42    daacdata
-rw-rw-rw-    1    mresnick    training      251    Jan 02 1996     garbage
lrw-r--r--    2    jjones      admin       15237    Apr 30 20:07    junk
-rwxr--rw-    1    mresnick    training     5103    Oct 22 1994     trash
```

Access Permissions



User Account Configuration Change Request Form

USER ACCOUNT CONFIGURATION CHANGE REQUEST FORM

Name of Requester:_____

Reason for request: _____

CURRENT INFORMATION		CHANGE TO:
User ID:		
Office Address:		
Office Phone:		
Home Phone:		
E-Mail Address:		
UNIX Group ID:		
DCE Group ID:		
Login Shell:		

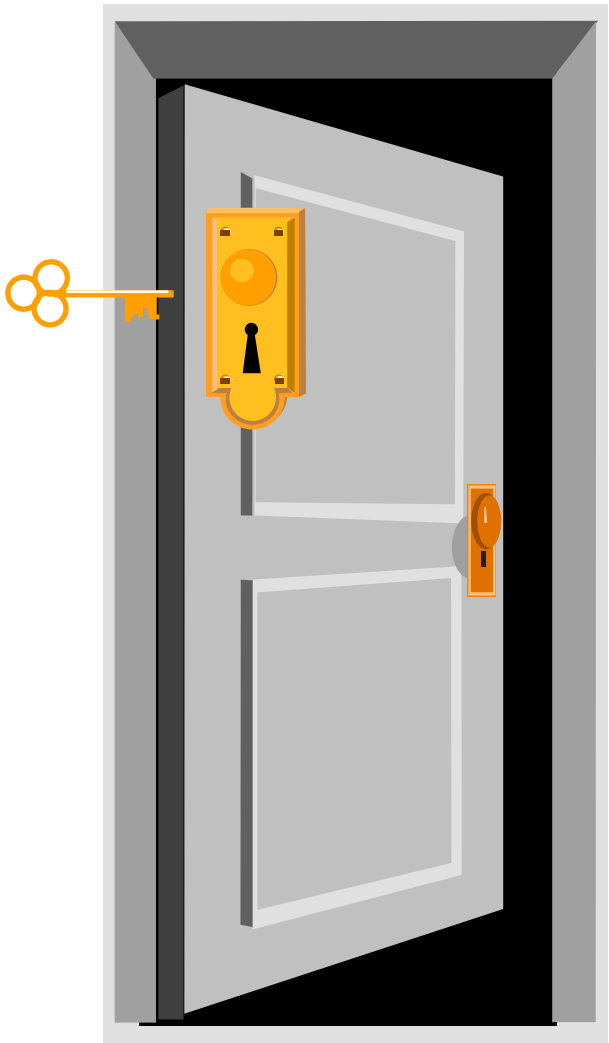
Date of Request: / / **Required by:** / /

Approval: _____ **Date:** _____

Commercial Off-The-Shelf (COTS) Software Administration

- **The EMD Project software consists of various architectures in addition to customized code, science software and COTS products**
  - **The project maintenance philosophy for software is to provide EMD centralized support for developed items and vendor support for COTS software**
  - **Log files are to be maintained for documenting all COTS installations and modifications**
  - **Because each DAAC site is unique, COTS patches may be provided by the vendor to resolve a DAAC specific problem**
  - **CCB approval is required before COTS software upgrades can be loaded on any platform**
    - **DAAC CCB must be informed via CCR**

Security



- ANLpasswd and Crack for password protection, local and network access
- Tripwire for flagging unauthorized file changes
- TCP Wrappers (except NSIDC) for network access control at DAACs