Fermilab
FY2002 Self-assessment
Process Assessment Report
For
Division/Section: Particle Physics Division

Date: October 4, 2002

Division/Section performing assessment

Particle Physics Division (PPD)

Name of organization that owns assessed process

PPD Support Services Department, Data Support Group

Organization Strategy

As a Data Support Group (DSG) for the Particle Physics Division, we are entrusted to maintain and support desktop environments for Personal Computing and Department servers that include both Windows and Unix environments. Aspects of this support are: protection against loss of data due to software born viruses (Windows systems), hardware and software inventory tracking of Windows computers, and Unix data backup and retrieval

Names of Personnel on Assessment team

Allen Forni, Karen Carew, Jason Ormes, Vivian Villegas

Name of process assessed

Desktop Computing

Brief description of process to be assessed

Run queries against the Anti-Virus database to determine percentage of variance from current or newer AV product and DAT definition. See document "Data Support Group Anti-Virus Protection System" for acceptable percentage variance values.
Verify that the TS.Census server (dsg-wits.fnal.gov) communicates on a monthly basis with the DSG-supported Windows computers that have the TS.Census client software installed.
Backup of the data on the Fasic and Vxworks Unix clusters for the Electrical Engineering Department.
Backup and restore procedures for the Mechanical Department.

1. Are metrics associated with this process? If so, what are they?

The indicators shown below will be evaluated based on the following criteria:

100% - 90% -- Outstanding
89% - 80% -- Excellent
79% - 70% -- Good
69% - 60% -- Marginal
59% - 0% -- Unsatisfactory

Indicator #1

Compliance	Anti-Virus Policies adherence	• Product Protection - <10% • Engine Deployment - < 2% • DAT/Definition Deployment - <8%

Indicator #2

A DSG-supported computer in the Windows environment that misses 3 consecutive TS.Census scans is checked by a member of the Data Support Group.

Compliance	Asset Tracking: hardware & software	Computers missing 3 consecutive scans - <10 %

Indicator #3

Fasic & vxworks Data Integrity	Success Rate of Tape Backups	No errors & Non-critical errors < 90 % Critical errors < 10 %

No errors: The backup system (fmb) returns a completed result without any errors message.

Non-critical errors: The backup system (fmb) returns a result of completed with errors

of a non critical state. These errors include size errors and file missing errors caused by a user process changing the file between the time it was written and the time it was verified.

Critical errors: The backup system (fmb) returns a result of non-completed or completed with errors of a critical state. An example of this type of error would be a tape read/write error, or a hardware failure.

Indicator #4

Internal metrics include user error, (i.e. not changing tapes daily), which will overwrite the previous tapes. Other factors involved though, are not due to product error but system restraints, that include having older tape drives executing the backups and restore which limit the amount of data that is being stored, and also the exclusion non-critical files from the overall procedure. This brings us to the evaluation of the data integrity that is discussed in its entirety in part 5c and 5f below.

User satisfaction is very good. Restore always provides valid data when recovered from a sound backup. However, response times are dependent on the amount/size of the data to be backed up or restored, position on tape, total size (Gigabytes) of the DLT tape itself, and quickness of the server that is executing the back up or restore. In this respect, accomplishing the desired outcome can be time consuming.

Metrics considered: Total file systems backed up since August. This total divided by the number of failures of critical file systems gives the total percentage of fail rate. See table below.

Particle Physics Division Mechanical Support Group Data Integritiy	Success Rate of Tape Backups.	Success rate of critical systems >= 93 % Failure of Critical systems <= 7 %

2. <u>What are the names of the procedures associated with this process?</u>

Indicator #1

ePO Configuration – document Data Support Group Anti-Virus Protection System

Indicator #2

TS.Census Monthly Scans

Indicator #3

Fasic and vxworks Cluster Backup Procedures

Indicator #4

FMB is Fermi Modular Backup system (an in-house software) used to backup and/or restore files on systems and implements cpio or tar. It consists of a number of files and scripts that are modified to be used specifically with the Particle Physics Division UNIX Computer Aided Design servers. Fmb_backup, fmb_restore, fmb_locate, fmb_extract, &

fmb_find are some of the useful files for the administrator of this process. This procedure can be used for any number of Unix based OS's (Operating Systems) including Linux. The script mounts the tapes, writes the label and backs up the specified file partitions. However, it does not support Windows or NT.

Other files associated with this procedure are the fmb_files specifying the partitions to be backed up with the options that are read from fmb_options.
For the Computer Aided Design servers, the log files are located under /cadwhs.fmb_archive_logs. Here the daily log files are compressed and retained until the end of the month where they are manually placed in their respective monthly directory, i.e. Sept02/cadwhs01.Sep.A.gz. When uncompressed they specified which files were successfully backed up to tape.

In /usr/local/etc/cadwh.fmb_logfile tells when each file partition backup was completed and whether the backup was full "successful" or failed.

From /usr/local/etc/cadwh_fmb_run_A is the script that starts fmb initialized by placing this in the cron file, which is the script that executes system commands at specified dates and times on the server. This script sets up fmb, and kerberos, gets a key and proceeds with the backup, then destroys the key when complete.

From fmb_mail, mail is sent to the appropriate administrators who follow this procedure, for lists of "errors encountered" and success or failure of partitions.

The restore procedure is located at:
file:/cadwhs/server01_3/vivianv/txt/PROCFILES/fmb_backup_info.txt
and also on the web at:
\\ppdserver\SS.PPD\Internet\WWW\DSGOffice
only admin access and not seen off-site of the Laboratory.

There is the Backup Operator Schedule posted on the web. This lists the name of the personnel doing the weekly rotation for the Computer Aided Design servers' backups.
http://www-ppd.fnal.gov/ss_www/dsg/DSG_Info/DSG_Info.htm

There is also a posting of Computer Aided Design Backup Tape Records
A link also on the above page.

3. Are these procedures being followed? Are they current?

Indicator #1

Yes, graphs are generated routinely and compared to the minimum variance allowed. When variance is above the allowed limits, support expert/s are notified and action is taken to bring the variance into compliance.

Indicator #2

Yes. The procedure to identify computers with TS.Census scans older than 3 months was implemented in June 2002. Prior to this, computers that had not been scanned for greater than 3 months were visited as time permitted. Also, when the operating system, service packs, or software upgrades were added to computers, the TS.Census clients were checked by members of DSG to verify that they are communicating with the server.

Indicator #3

The attached Backup Procedure is being followed, And has been verified as being up to date.

Indicator #4

Yes, they are being followed. The product is at version 6.7 and 6.8 has been released.

4. Describe the methodology used to assess this process.

Indicator #1

As per document "Data Support Group Anti-Virus System" paragraph "ePo Configuration. Procedures were followed to determine compliance with said document.

Indicator #2

The TS.Census query called PPD Last Successful Scan Date was run with the scan date criteria set to less than or equal to June 30, 2002. The results were sorted according to the Last Successful Scan Date field. The Comments field of the computers not communicating with the server for 3 months was examined because information concerning the status of computers is noted in that field. Computers listed as dual boot, home computers, or computers not connected to the network are not visited if they miss 3 consecutive scans. Their presence in the database is informational only and they are not expected to connect to the server for the monthly scans.

Indicator #3

Emailed results from the backup system are reviewed daily for errors. Periodic, every 2 to 3 weeks, restoration of files from the tapes are used to check integrity of the tapes. See attached for examples of each process.

Indicator #4

Daily reading of mail log files, error checks, success or failure of backup.

5. Results of the assessment:

a. Are the existing process controls adequate?

Indicator #1

Yes, compliance percentages are attainable and realistic.

Indicator #2

Yes. While there are computers in the database that the server cannot contact, DSG must be slow to delete computers arbitrarily from the TS.Census database without verifying that the computer has been permanently removed from network use or surplused. The PPD domain login script has been disabled and TS.Census is not automatically installed on all DSG-supported computers.

Indicator #3

Most of the procedures are adequate. The backup procedure for the Vxworks cluster needs further review and adjustment.

Indicator #4

Yes.

b. Have any notable practices been identified?

Indicator #1

Yes, configuration is designed to allow missed updates to be applied once the desktop is up and running on the network. This allows our users to turn off their computers when they are out of the office for any length of time.

Indicator #2

No.

Indicator #3

None of the practices are considered notable at this time. Everything seems to be functioning as designed.

Indicator #4

No.

c. Have any major deficiencies been identified?

Indicator #1

There are no major deficiencies. However, there is apparently no way to identify desktops that have been removed from active service. Desktop computers are assigned to the end-user and as such, they control the day-to-day usage.

Indicator #2

Yes. Support people outside the Data Support Group must also be made aware that a unique identifier is assigned to each computer in the TS.Census database. This identifier must be recovered if a computer is re-built to the extent that TS.Census sees it as a "new" workstation. When computers are surplused, DSG should be notified. All computers need to run the TS.Census client application as a service so that a user login is not needed for a scan to run.

Indicator #3

More documentation is needed for non-primary personnel to better support the process when the primary personnel are not available. Documentation is needed describing how to fix the backup system in case of an error condition.

Indicator #4

Yes.

The data, (specified file systems, partitions, or directories) that are backed up are 100% and very reliable. However, because of tape limitations, not all data is backed up each evening. Secondly, errors are logged in a mail file to the administrator that backups have failed or are incomplete. The final message in the mailed log file to the admin can state that it has failed or is incomplete but in actuality, it can be successful. Success happens under a retry, and that is shown only in the mailed log file and not in the system cadwh.fmb_logfile. Verification occurs when restores are performed on so-called failed partitions or directories or

upon comparison with the mailed log file. When performing restores, filtering for specific files are limited. Generally, it is limited to restoring either whole directories, or a file at a time, tho wild cards can be used for several files of one name, i.e. NUMI_Muon_Chamber*.*, (all files in this range and any extension, lis, dxf, mdf, mf1, mf2, asm, etc.). I believe implementation of using "regular expressions" for restoring procedures would save time in elimination of restoring unneeded files. Instead of: /CAD_team/ideas/T62/shared/406* which restores 1000 files-use: /CAD_team/ideas/T62/shared/406[5-6]* would restore a "range" of files limited to 200.

d. Is the process working effectively? What improvements can be made?

Indicator #1

Yes, the database management software ePO is tracking the configuration setting of the client desktop and noting within the database any variation from the current standards. The standards for determining compliance are ever changing, that is to say, each week new configuration files are received from McAfee and those new files impose new standards to be applied. Because the standard is ever changing, it is impossible to have a compliance level of 100%. Therefore, small variances between the current standard and what is currently on the desktop system is an acceptable allowance.

Indicator #2

Yes. A steady reduction in the number of computers with communication problems is expected as DSG continues to convert the client software to run as a service. Dual boot computers often miss 3 consecutive scans if LINUX is the primary operating system for that user. All dual boot computers need to be noted in the Comments field. One of two non-Data Support Group people who work in the field has been notified to call the Data Support Group if he works on computers with TS.Census already installed so that the unique identifier can be recovered. As computers are migrated to the new FERMI Windows domain, one item on the check list is to verify that TS.Census is communicating with the server and that the client software is running as a service.

Indicator #3

The backup system is working effectively. Further documentation is needed to record the status of the periodic restores that are being done to test the integrity of the data. The entire Vxworks cluster needs to be re-assessed so that the backup procedure can be adequately adjusted to fit the new configuration. The vxworks cluster needs to be reworked as a result of the main user base shifting to the Fasic cluster. Meetings have been begun to decide how to proceed with this.

Indicator #4

The process itself, does the job well enough, just the abnormality with fail errors as mentioned above.

e. How does current performance compare to last assessment, other similar labs, industry?

This is the first assessment.

f. What are the results for the metrics?

Indicator #1

Product Protection – 93.3% compliant
5.7% for products out one version
1.0% of desktops do not have active scanning enabled.

Engine Deployment – 98.8% compliant
1.2% out of compliance

DAT/Definition Deployment – 71.4% compliant
3.0% out of date 1 version
4.6% out of date 2 version
1.2% out of date 3 version
3.0% out of date 4 version
15.8% out of date 5 or more versions.

The only figure that is below the acceptable level is the 15.8%. This number is more than likely higher due to inconsistencies between the Anti-Virus database and the actual active desktop systems. As noted in paragraph C above, desktop systems can be removed from active use, but aren't removed from the Anti-Virus database.

Total resulting value is: 87.8% = (93.3% + 98.8% + 71.4%)/ 3
Excellent

Indicator #2

Total Windows computers in the TS.Census database: 397
Total Windows computers evaluated for this assessment: 379
Total Windows computers that are dual boot, home computers, or not connected to the network: 18

- TS.Census scanned 338 computers after June 30, 2002
- TS.Census did not scan 41 computers after June 30, 2002

12.1 % of the computers evaluated are not communicating with the server
87.9 % of the computers evaluated communicate with the server.
Excellent

Indicator #3

Fasic & vxworks Data Integrity:

No errors: 85.4%
Non-critical errors: 7.3%
Critical errors: 7.3% Note this number was augmented by a tape drive failure that took a week to get a replacement from the vendor

Total backups evaluated for this measure was 137

Total critical error rate: 7.3%

Total No Errors & Non-Critical errors rate: 92.7%
Outstanding

Indicator #4

Since July, the total files that were backed up numbered 1853 partitions or directories. Of these 216 stated as failing, actually did fail on a retry. This would make the error outcome at 11.6% of the total. However, of the 216 file systems, 173 were those that did not have enough room on the tape to back them up, and the other 53 file systems were caused by kerberos time skew problems. Of the 173 files that did not have enough room on tape to be backed up, 88 of these file systems are not necessary to the integrity of the operation of the Particle Physics Division/Mechanical Support Group. Considering these elements, the failure of necessary file systems becomes only 128 out of 173 of a total of 1853, bringing the percentage of failure to 6.9%

Human failure, forgetting to change tapes, occurred approximately 3 times during this period and where someone else did not back up the person on rotation, bringing the total fail rate up to 7%.

Totl backups				1853 Total	
Totl Failures	216				
	Non-critical	→	88 total	No count	
		No room on tape	88		
	Critical	→	128 total	128 Total	
		No room on tape	72		
		Time Skew	53		
		Human error	3		
Fail rate				128/1853	7%
Success rate				100%-7%	**93%**

93% is in the Outstanding range.

g. *Adjectival grade achieved*

Indicator #1 87.8% (Excellent)
Indicator #2 87.9 % (Excellent)
Indicator #3 92.7% (Outstanding)
Indicator #4 93.0% (Outstanding)

Overall grade: 90.4% (Outstanding) = (87.8% + 87.9% + 92.7% + 93.0%)/4

Identified opportunities for improvement

Indicator #1

The DAT/Definition Deployment “out of date 5 or more versions” percentage is too high to be reasonable for desktops that connect to the network. This area should be closely reevaluated and changes to the database should reflect the loss or gain in systems. This will bring this percentage down into compliance.

Indicator #2

Optimal performance: convert all DSG-supported computers to run the TS.Census client application as a process. All dual boot Windows/Linux computers are noted in the comments field. If a computer with the DSG label is removed from network service or sent to surplus, DSG is contacted with the tag number

Indicator #3

The primary points of improvement for this procedure should be further documentation for secondary personnel so that if there is a problem with the backup system, and the primary is not available it will not cause a breakdown of the process. Additionally the Backup procedure for the Vxworks cluster needs to be re-evaluated to determine its further needs of data integrity. The vxworks cluster needs to be reworked as a result of the main user base shifting to the Fasic cluster. Meetings have been begun to decide how to proceed with this.

Indicator #4

I have, at this time, contacted the Computing Division about adding another DLT drive to these severs which can also be used to backup and restore NT servers when the Mechanical Support Group decides it is time to go in that direction. This will eliminate the necessity for removing some data from the backups, that though, not necessary, should be backed up for more complete restores if disk failure was ever to happen. A Super DLT Drive 5-7 stacker would help eliminate most of the human error in forgetting to load the drives daily. It would also allow for weekend backups.

Schedule for implementation of improvements

Indicator #1

As the Data Support Group goes through its normal migration process from the current WindowsNT domain to a Windows2000 domain, procedures are in place to check desktop systems for compliance with Anti-Virus policies. We are currently working on this desktop migration; our schedule for completion is before January 2003.

Indicator #2

By December 31,2002 all Windows 2000 computers in the FERMI PPD Organizational Unit should communicate at least once every 3 months with the TS.Census server unless it is listed as a dual boot system. As DSG continues to migrate computers to the FERMI domain, the remaining computers will be visited by a member of DSG before December 31, 2002.

Indicator #3

Further documentation is planned to be implemented in the following 12 months. This documentation should help secondary personnel in being more effective in the procedure when primary personnel are not available. Meetings have begun to discuss a time frame and a plan to alter the vxworks system.

Indicator #4

A FUE (Fermi Unix Environment) upgrade will be requested from the Computing Division late 2002 or early 2003.
In addition, a request for another DLT drive, preferably a Super DLT, robot, with the ability to store 180 GIG per tape .

Status of improvements from previous assessment

Not applicable – no previous assessment.

Attachments (supporting data, worksheets, reports, etc.

Indicator #1

Data Support Group
Anti-Virus Protection System

Allen Forni
9/20/02

Introduction:

As a Data Support Group (DSG) for the Particle Physics Division, we are entrusted to maintain and support the PC desktop computing for a large segment of the user community within the Particle Physics Division. One aspect of this support is the protection against loss of data due to software born viruses. These viruses have

numerous characteristics from benign pop-up messages, Denial-Of-Service (DoS) attacks to the destruction of data (local or network). The detection and removal of viruses within the PC desktop environment is an essential component in the overall PC desktop support policy.

Scope:

The Operating System (OS) covered under this document include all OS's that are supported by the Anti-Virus (AV) vendor and are currently under support by the DSG. Current supported OS's include Microsoft Windows line of operating systems (Windows NT, Windows 2000, and Windows XP).

AV Product:

The Anti-Virus System has two major components that manage the desktop virus protection. McAfee, anti-virus (AV) product VirusScan and ePolicy Orchestrator (ePO) was chosen to protect the desktop from viruses and to manage the distribution and configuration of VirusScan. By bringing together both VirusScan and ePO into one anti-virus protection system, we have gained the ability to remotely manage the anti-virus settings of our PC desktops. ePO is a task driven program that configures and monitors VirusScan for compliance with administrator policies.

AV Management:

All configuration and monitoring policies that govern how VirusScan interacts with the desktop are managed through the ePO management software. These policies instruct VirusScan on specific days and times of the week to perform scheduled product installation, upgrade, scan, and product removal. Additionally, once ePO detects a change in policy or the desktop does not comply with policy, automatic tasks are then run to bring the desktop into compliance. Monitoring for compliance is performed every 10 minutes or when directed by the administrator.

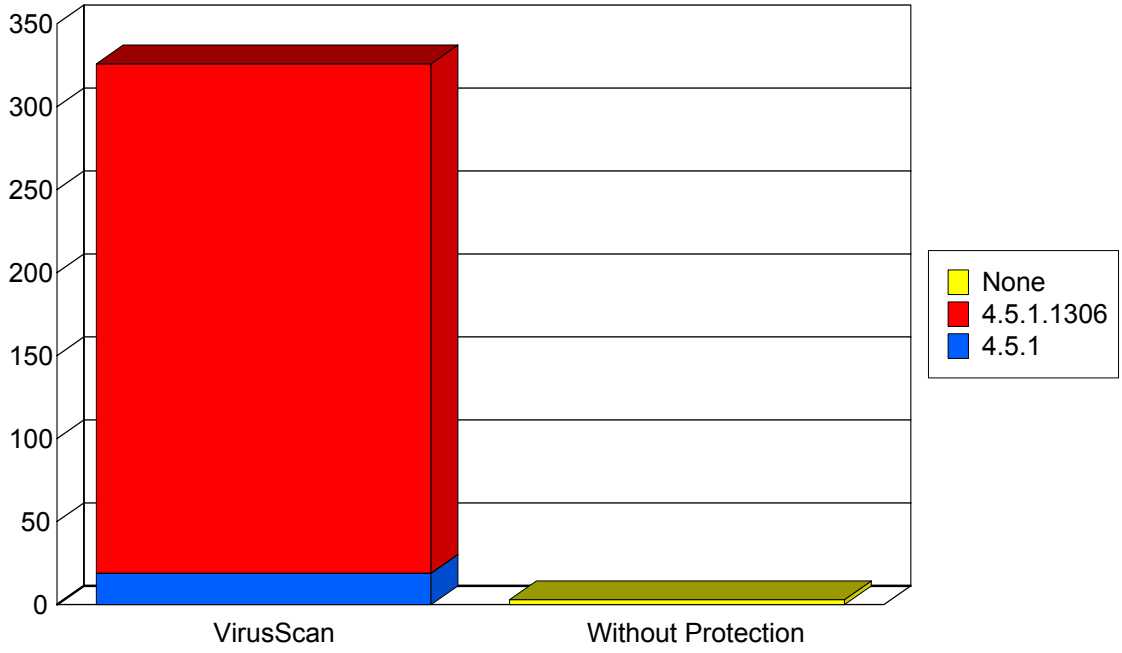
ePO configuration:

All nodes (desktop PC's) are grouped by IP address within a single domain. For ease of use, groups are defined based on physical location and IP address range (e.g. Wilson Hall, Village, Fix Target, etc…). Once the software is installed, nodes will be sorted into their proper group for policy enforcement. Both software configuration policies and VirusScan scheduled tasks are combined to create a policy enforcement criterion. The verification of policies adherence are done through queries to the ePO database. These queries consist of the following items: Product Protection Summary – Graph, Engine Deployment Summary – Graph, and DAT/Definition Deployment Summary – Graph. These graphs are then reviewed to determine if percentage of variance from current or the newer version are within the desired limits (Product Protection - <10%, Engine Deployment - < 2%, DAT/Definition Deployment - <8%). Once it has been determined that the limits have been exceeded a work order is generated and support experts are dispatched to fix the problem.

THE VACCINE FOR E-BUSINESS

Report Generation Details
Root: Directory
Filter Group: Directory
User: sa
Report Date/Time: 9/23/2002 2:17:21PM

Product Protection Summary



Total Number of Reported Machines : 329

VirusScan		
4.5.1	**19**	**VirusScan**
4.5.1.1306	**307**	**VirusScan**
	326	
Without Protection		
None	**3**	**Without Protection**
	3	

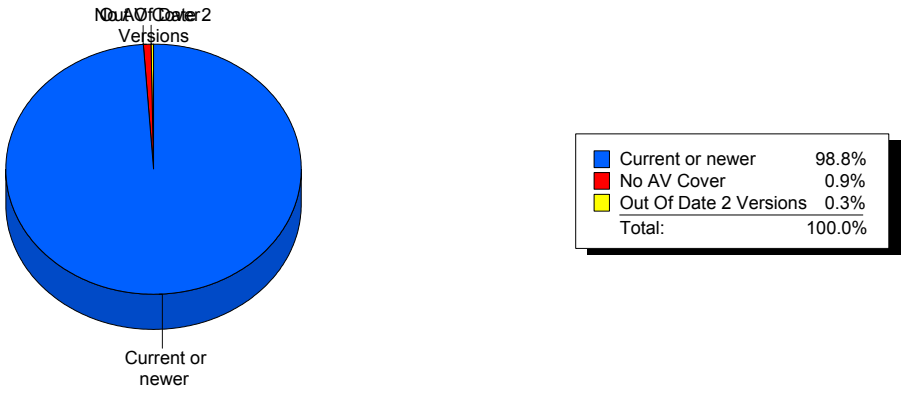
MCAFEE

THE VACCINE FOR E-BUSINESS

Report Generation Details
Root: Directory
Filter Group: Directory
User: sa
Report Date/Time: 9/23/2002 2:13:10PM

Engine Deployment Summary

VERSION	MCAFEE	SYMANTEC
Current Engine Version :	4.1.60 | 00	
One Version Out of Date :	4.1.50 | 0	
Two Versions Out of Date :	4.1.40 | 0	



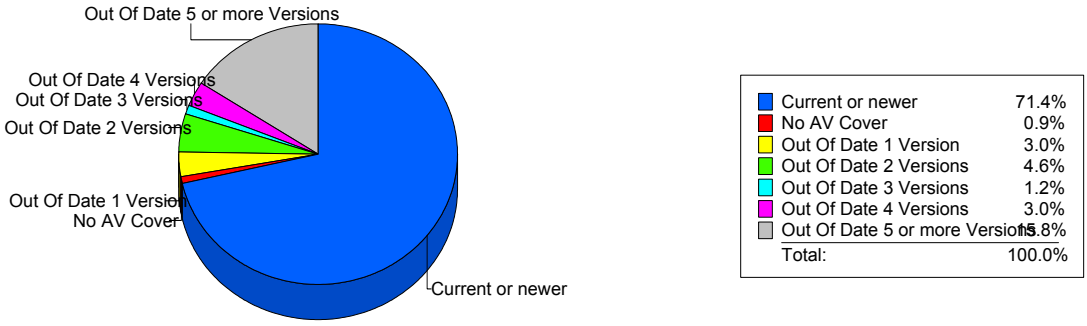
Current or newer	**325**
No AV Cover	**3**
Out Of Date 2 Versions	**1**

THE VACCINE FOR E-BUSINESS

Report Generation Details
Root: Directory
Filter Group: Directory
User: sa
Report Date/Time: 9/23/2002 2:17:47PM

DAT/Definition Deployment Summary

VERSION	MCAFEE	SYMANTEC
Current Dat Version :		
1 Version Out of Date :		
2 Versions Out of Date:		
3 Versions Out of Date:		
4 Versions Out of Date:		
	4.0.4224 | 30906d	4.0.4223 | 30824g
	4.0.4222 | 20926t	
	4.0.4221 | 00	
	4.0.4220 | 0	



Current or newer	**235**
No AV Cover	**3**
Out Of Date 1 Version	**10**
Out Of Date 2 Versions	**15**
Out Of Date 3 Versions	**4**
Out Of Date 4 Versions	**10**
Out Of Date 5 or more Versions	**52**

Indicator #2

TS.Census Monthly Scans
by Karen Carew

TS.Census Server Installation

TS.Census server software from Tally Systems is installed on a Windows 2000 workstation named dsg-wits.fnal.gov. The Data Support Group has purchased TS.Census client licenses. The TS.Census database name is TSCensusDT and the TS.Census manager is EntAdmin. A password is needed to gain access to the database. The TS.Census database is purged after every monthly scan so that it only contains current or the last known information about the workstations.

A Public Collection Schedule called PPD Monthly Schedule has been created within the TS.Census application. It defines that the collection cycle begins on the first Monday of each month, scanning for 5 days between 1AM and 11PM. New workstations are scanned immediately.

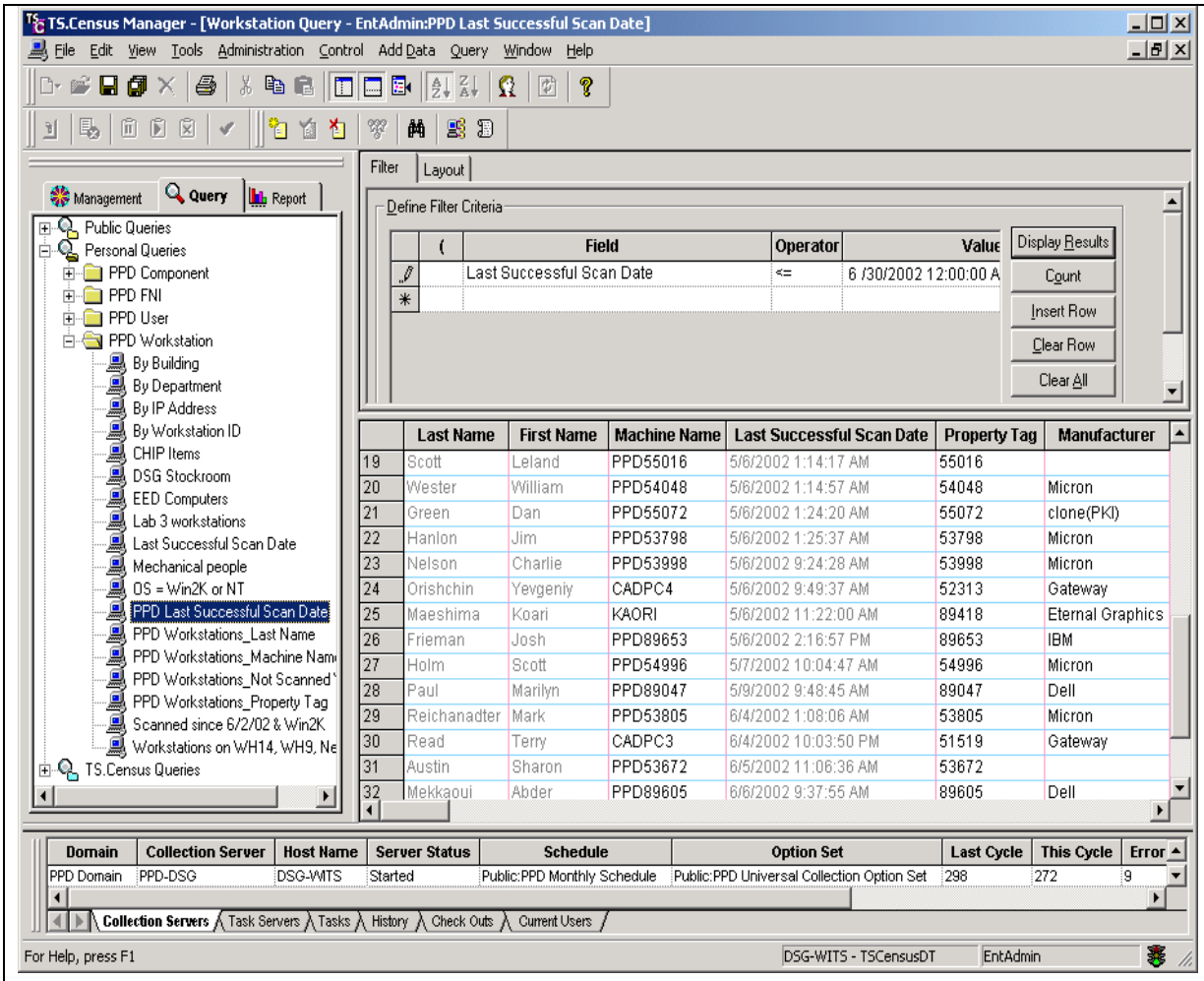
TS.Census Client Installation

Initial: A PPD domain login script, based on a list of users who have a home area on either of 2 servers that DSG supports, was used in the initial rollout of the client software. The PPD domain logon script was executed for 6 months whenever a user in the list logged on to a computer. If the client software was already installed, the script ended. If the client software was not found, the script ran the setup.exe file in the TS.Census client file store and installed the software on the desktop computer. A setup.iss file, which contains the TS.Census server name dsg-wits, is copied to the client computer during the installation.

On-going: Any new computer with the DSG image installed is required by DSG to have TS.Census also installed. Any PPD computer that the user wants supported by DSG is required to have TS.Census installed.

Monthly Query for Last Successful Scan Date

A TS.Census query named PPD Last Successful Scan Date was created on dsg-wits. The criteria for the Last Successful Scan Date field is set to > 3 months from the beginning of the last scheduled scan. The query includes the following fields: Last Name, First Name, Machine Name, Last Successful Scan Date, Property Tag, Manufacturer, Building, Floor, IP Address, LAN Address, Comments. The results of the query are sorted by the Last Successful Scan Date field. A screen snap of the query results follows. The query data is printed in preparation for a member of the Data Support Group visiting desktops where the computer has not been re-scanned for greater than three months.



<u>Causes of Server/Client Communication Failures</u>

A number of reasons why the communication between the server and client fails have been identified:

- The initial TS.Census version, followed by the next two upgrades, relied on the user being logged in a the time of the scans. If the user did not log in during the 5 days in each month when the scan took place, no re-scan of the workstation was done for that month. The recent 2 versions of TS.Census can collect data without a user login because the client software now runs as a service.
- The Collection Editor window that appeared after the initial scan of the computer had completed was not set to automatically save and send the workstation inventory file (wif) to the server. If no one completed the Collection Editor form, which contained a required field, it remained on the computer's screen, and was not delivered to the TS.Census database. The Collection Editor was changed to now auto save the wif file and send it to the TS.Census server after 5 minutes.
- The unique identifier, assigned to each workstation, must be recovered if the system is re-built to the extent that the workstation appears to the TS.Census server as a new computer.

Without the recovered identifier, communication between the server and client is broken.

- The computer is a test stand and is not connected to the network during the time of the scans.
- The computer was powered off during the time of the scans.
- The computer was removed from service by a non-Data Support Group member and sent to Excess.
- The computer is a home computer and not connected to the Internet at the time of the scans.
- The computer is a dual boot LINUX/Windows computer and is rarely booted into the Windows operating system.

Recovery of computers that miss 3 consecutive scans

A DSG-supported Windows computer that misses 3 consecutive TS.Census scans is checked by a member of the Data Support Group. The Comments field is checked for special circumstances that would prevent a system from being scanned: dual boot, home computer, test stand, etc. If higher priority tasks prevent DSG from checking on computers that miss 3 consecutive scans, the default is to leave the computer in the TS.Census database until it can be checked out.

Indicator #3

Example of status email received from the backup system:

Successful backup.
Loading tape 4
locking filesystem
offlining sub-mirror d1
unlocking filesystem
mounting file system d1 on /temp for backups
backing up file
Wed Sep 18 23:32:30 CDT 2002: /fnal/ups/prd/fmb/v6_8/NULL/fmb_backup -f
/fnal/ups/prd/fmb/v6_8/NULL/fmb_files/fasicsv1.part
Converting "/home/usr0/bekeur" to "fasicsv1:/home/usr0/bekeur"
Converting "/home/usr0/jimhoff" to "fasicsv1:/home/usr0/jimhoff"
Converting "/home/usr0/larwill" to "fasicsv1:/home/usr0/larwill"
Converting "/home/usr0/mekkaoui" to "fasicsv1:/home/usr0/mekkaoui"
Converting "/home/usr0/ormes" to "fasicsv1:/home/usr0/ormes"
Converting "/home/usr0/rivetta" to "fasicsv1:/home/usr0/rivetta"
Converting "/home/usr0/shenai" to "fasicsv1:/home/usr0/shenai"
Converting "/home/usr0/tzimmer" to "fasicsv1:/home/usr0/tzimmer"
Converting "/usr/local" to "fasicsv1:/usr/local"
Checking tape label
Writing label fasicsv1.18.A, Try 1
Verbose output being written on /var/adm/fmb_logs/fasicsv1.18.A

```
                Archive Size Information
             Full Backup
              Estimate
          Low           High          Actual Type    Name
          ---           ----          ------ ----    ----
     19677655k       21527034k          3616k partial  fasicsv1:/home/usr0/bekeur
     10772633k       11699208k      362665168k partial         fasicsv1:/home/usr0/jimhoff
      1615567k        1901681k     3626651680k partial         fasicsv1:/home/usr0/larwill
      2570570k        3098064k    36266516800k partial         fasicsv1:/home/usr0/mekkaoui
        14233k          16141k   362665168000k partialfasicsv1:/home/usr0/ormes
            8k           75k  3626651680000k partial       fasicsv1:/home/usr0/rivetta
      1153720k        1376322k 36266516800000k partial       fasicsv1:/home/usr0/shenai
      2151695k        2365843k 66516800007024k partial       fasicsv1:/home/usr0/tzimmer
     10233610k       12607339k 51680000702560k partial     fasicsv1:/usr/local
  ------------  --------------  --------------
     48189691k       54591707k 58492890194848k TOTAL

Compressing /var/adm/fmb_logs/fasicsv1.18.A to save space.

Executive Summary:
------------------
Thu Sep 19 00:37:57 CDT 2002
The backup was successful.

A total of 0 write retries were made.

========================================================================
offlining the tape
returning the tape to its tray
unmount temporary mount
onlining mirror d1

Failed Backup.
Loading tape 0
locking filesystem
offlining sub-mirror d1
unlocking filesystem
mounting file system d1 on /temp for backups
backing up file
Sun Sep 15 23:32:26 CDT 2002: /fnal/ups/prd/fmb/v6_8/NULL/fmb_backup -f
/fnal/ups/prd/fmb/v6_8/NULL/fmb_files/fasicsv1.full
Converting "/home/usr0/bekeur" to "fasicsv1:/home/usr0/bekeur"
Converting "/home/usr0/jimhoff" to "fasicsv1:/home/usr0/jimhoff"
Converting "/home/usr0/larwill" to "fasicsv1:/home/usr0/larwill"
Converting "/home/usr0/mekkaoui" to "fasicsv1:/home/usr0/mekkaoui"
Converting "/home/usr0/ormes" to "fasicsv1:/home/usr0/ormes"
Converting "/home/usr0/rivetta" to "fasicsv1:/home/usr0/rivetta"
Converting "/home/usr0/shenai" to "fasicsv1:/home/usr0/shenai"
Converting "/home/usr0/tzimmer" to "fasicsv1:/home/usr0/tzimmer"
Converting "/usr/local" to "fasicsv1:/usr/local"
Checking tape label
```

```
Writing label fasicsv1.15.A, Try 1
Verbose output being written on /var/adm/fbm_logs/fasicsv1.15.A

                Archive Size Information
              Full Backup
               Estimate
          Low          High         Actual Type    Name
          ---          ----         ------ ----    ----
     19675754k       21524631k       20756128k full    fasicsv1:/home/usr0/bekeur
      9810914k       10677324k 20756138297728k full          fasicsv1:/home/usr0/jimhoff [1]
      1615567k        1901681k 38297729804464k full          fasicsv1:/home/usr0/larwill [2]
      2570570k        3098064k 29804466931216k full          fasicsv1:/home/usr0/mekkaoui [3]
        14233k          16141k 04466931231488k full    fasicsv1:/home/usr0/ormes [4]
           8k           75k 44669312314912k full          fasicsv1:/home/usr0/rivetta [5]
      1153720k        1376322k 31231492503680k full          fasicsv1:/home/usr0/shenai [6]
      2154256k        2368548k 92503682277088k full          fasicsv1:/home/usr0/tzimmer [7]
     10233967k       12607688k 82277099910848k full          fasicsv1:/usr/local [8]
  ------------  --------------  --------------
     47228989k       53570474k 44006874027552k TOTAL

Compressing /var/adm/fbm_logs/fasicsv1.15.A to save space.

Executive Summary:
------------------
Mon Sep 16 23:53:27 CDT 2002
The backup was successful.

A total of 0 write retries were made.

========================================================================

Detailed error reports:
---------------
[1]
fmb: error during fmb_backup on Mon Sep 16 15:04:20 CDT 2002
 cpio archive of fasicsv1:/home/usr0/jimhoff was a differnt size than estimated.
 Abbreviated stderr output:
    artist/newSVX/simulation/testDec.cir &
    .fm/home/fasic9 /.state
    .fm/home/fasic9 /.cache
    .fm/home/fasic9
    20595480 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
 This archive may be incomplete.
---------
[2]
fmb: error during fmb_backup on Mon Sep 16 15:47:37 CDT 2002
 cpio archive of fasicsv1:/home/usr0/larwill was a differnt size than estimated.
 Abbreviated stderr output:
    Frame/CADtools/PCAD maintenace_po1
```

```
    Frame/CADtools/PCAD maintenace_po1.backup
    tom_rep/qie5/QIE5B6 pinout
    tom_rep/qie5/QIE Summary
    tom_rep/qie5/QIE5 IEEE
    tom_rep/qie5/QIE5 conf issue
    tom_rep/qie5/QIE5 IEEE vers2
    Desktop/Linux Documents
    Desktop/Red Hat Errata
    Desktop/Red Hat Support
    3608930 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
 This archive may be incomplete.
--------
[3]
fmb: error during fmb_backup on Mon Sep 16 17:00:19 CDT 2002
 cpio archive of fasicsv1:/home/usr0/mekkaoui was a differnt size than estimated.
 Abbreviated stderr output:
    design2/sift2001/eldo/FEND/Spice Deck.txt
    my .login
    5862440 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
 This archive may be incomplete.
--------
[4]
fmb: error during fmb_backup on Mon Sep 16 17:00:57 CDT 2002
 cpio archive of fasicsv1:/home/usr0/ormes was a differnt size than estimated.
 Abbreviated stderr output:
    Desktop/Print Queues
    31000 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
 This archive may be incomplete.
--------
[5]
fmb: error during fmb_backup on Mon Sep 16 17:01:08 CDT 2002
 cpio archive of fasicsv1:/home/usr0/rivetta was a differnt size than estimated.
 Abbreviated stderr output:
    70 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
 This archive may be incomplete.
--------
[6]
fmb: error during fmb_backup on Mon Sep 16 17:34:48 CDT 2002
 cpio archive of fasicsv1:/home/usr0/shenai was a differnt size than estimated.
 Abbreviated stderr output:
    2607380 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
```

```
 This archive may be incomplete.
--------
[7]
fmb: error during fmb_backup on Mon Sep 16 18:40:44 CDT 2002
 cpio archive of fasicsv1:/home/usr0/tzimmer was a differnt size than estimated.
 Abbreviated stderr output:
    reports/qie5/QIE5B6 pinout
    reports/qie5/QIE Summary
    reports/qie5/QIE5 IEEE
    reports/qie5/QIE5 conf issue
    reports/qie5/QIE5 IEEE vers2
    reports/xri/QIE5B6 pinout.backup
    reports/QIE5 Changes
    4554200 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
 This archive may be incomplete.
--------
[8]
fmb: error during fmb_backup on Mon Sep 16 23:52:28 CDT 2002
 cpio archive of fasicsv1:/usr/local was a differnt size than estimated.
 Abbreviated stderr output:
    23821710 blocks
    Exit code 0
 See /var/adm/fbm_logs/fasicsv1.15.A for complete error output
 This archive may be incomplete.
--------

offlining the tape
returning the tape to its tray
0f0700a2 HDWR interface:specified location is full -- Failed
unmount temporary mount
onlining mirror d1
Loading tape 6
locking filesystem
offlining sub-mirror d1
unlocking filesystem
mounting file system d1 on /temp for backups
backing up file
Mon Sep 16 23:59:48 CDT 2002: /fnal/ups/prd/fmb/v6_8/NULL/fmb_backup -f
/fnal/ups/prd/fmb/v6_8/NULL/fmb_files/fasicsv1.part
Converting "/home/usr0/bekeur" to "fasicsv1:/home/usr0/bekeur"
Converting "/home/usr0/jimhoff" to "fasicsv1:/home/usr0/jimhoff"
Converting "/home/usr0/larwill" to "fasicsv1:/home/usr0/larwill"
Converting "/home/usr0/mekkaoui" to "fasicsv1:/home/usr0/mekkaoui"
Converting "/home/usr0/ormes" to "fasicsv1:/home/usr0/ormes"
Converting "/home/usr0/rivetta" to "fasicsv1:/home/usr0/rivetta"
Converting "/home/usr0/shenai" to "fasicsv1:/home/usr0/shenai"
Converting "/home/usr0/tzimmer" to "fasicsv1:/home/usr0/tzimmer"
Converting "/usr/local" to "fasicsv1:/usr/local"
Checking tape label
```

Executive Summary:

Tue Sep 17 00:06:49 CDT 2002
Backup failed because the tape mount of fasicsv1.16.A failed.

A total of 0 write retries were made.

==========
offlining the tape
returning the tape to its tray
0f0700a2 HDWR interface:specified location is full -- Failed
unmount temporary mount
onlining mirror d1

Example of Files that are backed up log.
Backed up Wed Sep 18 23:32:37 CDT 2002
fasicsv1:/home/usr0/bekeur:
 fasicsv1:/home/usr0/bekeur/.dt/startlog
 fasicsv1:/home/usr0/bekeur/.dt/sessionlogs/fasic15_DISPLAY=ppd55279.fnal.gov:0.0
 fasicsv1:/home/usr0/bekeur/.dt/Trash/.trashinfo
 fasicsv1:/home/usr0/bekeur/.dt/Trash
 fasicsv1:/home/usr0/bekeur/.dt/Desktop/.!dtdesktop
 fasicsv1:/home/usr0/bekeur/.dt/Desktop
 fasicsv1:/home/usr0/bekeur/.dt/errorlog
 fasicsv1:/home/usr0/bekeur/.dt
 fasicsv1:/home/usr0/bekeur/cms/eldo/DLL4
 fasicsv1:/home/usr0/bekeur/cms/CCA1
 fasicsv1:/home/usr0/bekeur/.netscape/plugin-list
 fasicsv1:/home/usr0/bekeur/.netscape/history.dat
 fasicsv1:/home/usr0/bekeur/.netscape/secmodule.db
 fasicsv1:/home/usr0/bekeur/.netscape/lock
 fasicsv1:/home/usr0/bekeur/.netscape/cookies
 fasicsv1:/home/usr0/bekeur/.netscape
 fasicsv1:/home/usr0/bekeur/.nclaunch.opts.bak
 fasicsv1:/home/usr0/bekeur/.emacs
 fasicsv1:/home/usr0/bekeur/CDS.log
 fasicsv1:/home/usr0/bekeur/.libsel
 fasicsv1:/home/usr0/bekeur/.libmgr
 fasicsv1:/home/usr0/bekeur/.TTauthority
 fasicsv1:/home/usr0/bekeur/elisp/verilog-mode.el
 fasicsv1:/home/usr0/bekeur/elisp/verilog-mode.el~
 fasicsv1:/home/usr0/bekeur/elisp/verilog-mode.el.buggy
 fasicsv1:/home/usr0/bekeur/elisp
 fasicsv1:/home/usr0/bekeur/libManager.log
 fasicsv1:/home/usr0/bekeur/.cdsdoc/forms/Cookies.js

Example of restoration of sample file
fmb_restore -L fasicsv1.18.A -w /home/usr0/bekeur/CDS.log -t /dev/rmt/0ubn
Converting "/home/usr0/bekeur/CDS.log" to "fasicsv1:/home/usr0/bekeur/CDS.log"
Mount tape fasicsv1.18.A on /dev/rmt/0ubn and press Enter

Thanks!
Checking tape label
Tape fasicsv1.18.A:
written Wed Sep 18 23:32:33 CDT 2002
format cpio
blocksize 16k
archives:
fasicsv1:/home/usr0/bekeur
fasicsv1:/home/usr0/jimhoff
fasicsv1:/home/usr0/larwill
fasicsv1:/home/usr0/mekkaoui
fasicsv1:/home/usr0/ormes
fasicsv1:/home/usr0/rivetta
fasicsv1:/home/usr0/shenai
fasicsv1:/home/usr0/tzimmer
fasicsv1:/usr/local
Restoring CDS.log from fasicsv1:/home/usr0/bekeur into fasicsv1:/home/usr0/bekeur...
Already at fasicsv1:/home/usr0/bekeur (file number 1)...
Restoring...
Unmount tape fasicsv1.18.A on /dev/rmt/0ubn

Backup Procedure Documentation

Fasic Cluster Backup Procedure

Systems involved:
Fasicsv1, fasic12, fasic13, fasic14, fasic15

Tape drive location:
The drive is located in rack 34 of the wh7sw computer room.

System connected:
Drive is connected to fasicsv1.fnal.gov in rack 34 of wh7sw.

Tape Storage location:
Tapes are located in the bottom drawer of metal filing cabinet in Jason Ormes' office wh10e.

Backup Schedule:

Monday-Saturday: Incremental backups
Sunday: Full backup

The 6 Incremental tapes are re-used every week. The Sunday full tape is swapped out on Tuesdays and is re-used once a month. The Last Sunday of the month a full backup tape is kept for the rest of the year as a monthly backup.

Directories that are backed up that users can alter:
/home

Directories that are not backed up:

All other directories on the system. The users put all data in /home except for what is put in /scratch which they understand is not backed up.

Software used to backup and restore:

FMB from upd/ups products server.

Location of log files:

Location of the log files are on fasicsv1 in /var/adm/fmb (type of backup run) and /var/adm/fmb_logs (gzipped version of the table of contents of the tape). Additionally a copy of the log is mailed to Computing Division and Data Support Group personnel.

Tape Test Procedure:

Random files are periodically restored from tapes to check the tapes integrity. This is done on an as time allows basis.

VXworks cluster backup document

The computer havoc.fnal.gov is a SUN Sparc Station 10 (FNAL # 84126) located on WH14W just to the right of the west elevators. The door is unlocked. There are two types of backups run on the fasic cluster. Both types are done on the fasic server, host havoc.

Incremental Backups

What and Where

- One exabyte tape is needed each day. Incremental backups are run every day of the week.
- The incremental backup tapes are kept in the cream colored drawers opposite the devices. The drawer is labeled “Daily Backup A Tapes (B tapes are no longer used).
- Incremental tapes will be loaded in the stacker labeled /dev/rmt/1. Tapes can usually be changed on Tuesdays. If a holiday falls on Tuesday, the schedule can be changed.

Procedure

- The stacker is kept locked. The keys are on the table in front of the stacker.
- Clean the drive before loading the tapes on Tuesday. Use cleaning tape 18C. (The stacker door must be closed before the cleaning tape will start.) The cleaning tapes are located on top of the cream colored drawer unit opposite the devices.
- To load tapes remove the magazine from the stacker. Fill with the incremental tapes for the next seven days (include the tape for the day that you are changing the tapes), beginning in the bottom position. Put the empty cassette tape cases in the drawer. To insert the magazine, put the bottom feet in first, then gently push straight back so the slot in the magazine meets the corresponding part in the stacker. The top foot snaps in securely.
- Lock the stacker door.
- Press Reset and then Enter. The stacker LCD says “No_Error”. This is normal.
- There is a cron job that runs the backup script each night. Output from the cron job goes to Jason, Karen, Candies and Marcus so the success or failure can be monitored and recorded.

- Example: If today is Tuesday Jan 29th :
  - load tape labeled fasicsv.29.A in the bottom slot of the stacker's tape cartridge tray
  - load fasicsv.30.A in the next slot.
  - load fasicsv.31.A in the next slot
  - load fasicsv.1.A in the next slot and so on.

Full Backups

What and When

- Full backups are done once a month usually on the second weekend of the month and using new tapes. The tapes are located on top of the cream colored drawer unit opposite the devices.
- Five backup tapes need to be labeled manually once a month
- Load the 5 new exabyte tapes in the stacker labeled /dev/rmt/0.
- The completed full backup tapes are kept in the cream colored drawers opposite the devices. The drawer label says "Full Backups".

Example:

havoc.Jan.A 2002
havoc.Jan.B 2002
havoc.Jan.C 2002
havoc.Jan.D 2002
havoc.Jan.E 2002

Procedure

- The stacker is kept locked. The keys are on the table in front of the stacker.
- Clean the drive before loading the tapes. Use cleaning tape 18C. (The stacker door must be closed before the cleaning tape will start.) The cleaning tapes are located on top of the cream colored drawer unit opposite the devices.
- To load the tapes remove the magazine from the stacker. Load the 5 full backup tapes beginning with the A tape in the bottom position. Tape B goes in the slot above A and so on. To insert the magazine, put the bottom feet in first, then gently push straight back so the slot in the magazine meets the corresponding part in the stacker. The top foot snaps in securely.
- Lock the stacker door.
- Press Reset and then Enter
- There is a cron job that runs the backup script. Output from the cron job goes to Jason, Karen, Candies and Marcus so the success or failure can be monitored and recorded.

-- Once there is a successful full backup, remove the current full backup tapes and load the next set of new tapes for the next month. Notify Candies (kastner@fnal.gov) that they are ready. She'll setup the cron job for the second weekend (usually) of the month.

Troubleshooting

- If you need to get a tape out of the drive, press reset, then enter. The stacker arm will be moved out of the way. Press the eject button.

Eject button: Inside the stacker just to the right of the green drive light is a gray

peg. This is the eject button for the tape drive.

- If the stacker LCD says “No_Error”, this is normal.
- If both the green and amber lights are blinking inside the stacker, the drive needs to be cleaned.
- If the stacker LCD says: “Wait for Drv” an abnormal shutdown may have occurred. To clear this push the reset button on the front panel. The stacker will remove the current tape and insert another tape. You need to check the tape name to verify that the correct tape is ready for backup. If it is not the correct tape, press the reset button again. Press the eject button. Put the correct sequence of tapes in the magazine. Press reset and enter.

Indicator #4

Data Integrity and Backup Synopsis

Supported Systems

1. All data for the Particle Physics Division/Mechanical Support Group Computer Aided Design users are backed up on four Silicon Graphic Origin 200 servers, known as cadwhs01-04 and 11 Silicon Graphics workstations and includes all I-DEAS, (Integrated Design Engineering Analysis Software) users in working in the Particle Physics Division.

Systems Connected

2. These four servers are individually connected to four DLT tape drives, which hold 20 Gig of compressed data each.

Drive Location

3. Tape drives are located in rack 35 on wh7sw.

Backup Schedule

4. Tapes are rotated daily, weekly and monthly. Whereas daily tapes are overwritten weekly, weekly tapes are overwritten monthly and monthly tapes are overwritten yearly.
5. There are no incremental backups, only full backups nightly. M-F are Full Backups.

Software Used

6. FMB is the Fermi Modular Backup system is the in-house software used to backup and or restore files on systems and implements cpio.

Rotation Schedule

7. Data Support Group members rotate weekly doing the backups and are notified by e-mail when it is their turn.

Tape Location

8. Tapes are located in file cabinet, marked "BACKUP TAPES" in DSG member's Vivian Villegas’ office.

PC Backup Schedule

9. No data is backed up for users with PC's. This is stated to the user when he receives a PC and that he/she is responsible for all data on his/her machine. Any data that

he/she wants backed up, must be transferred to a Particle Physics Division NT server.

Partitions/Directories Backed Up

10. File Partitions that are backed up are:

    All user partitions
    All system partitions
    All Fermi products partitions
    All archive log areas
    All Engineering applications, I-DEAS and Ansys; their shared data areas and respective customized overlay applications
    All drawing archive data for D0, Mechanical, Physics and CDF
    All "other" applications not included with the Operating System or FUE (Fermi Unix Environment) products

    If space permits:

    Certain restored file areas where there may be ongoing restores and
    Disusered accounts that are tarred and archived

Partitions/Directories NOT Backed Up

11. Data Partitions that are NOT backed up are: Any scratch partitions or areas the engineering software uses for scratch files.

Location of Log Files

12. Logs that show which files were actually backed to tape and used to find which tapes need to be used for restoring: /cadwh.fmb_archive_logs

13. Daily log file showing success or failure of a particular partition or directory:
    /usr/local/etc/cadwh.fmb_logfile - on cadwhs01 & cadwhs02
    /cadwh.fmb_archive_logs/cadwh.fmb_logfile - on cadwhs03 & cadwhs04

Clean up Procedures, Purging etc.

14. Once a month the following clean up procedures are taken: Located within /cadwh.fmb_archive_logs area there are directories that coincide with the months of the year and within them are the logging files in gzipped format. These are made manually and the old directories are removed after one year.

Location of Backup Procedure

15. Backup procedure: /cadwhs/server01_3/vivianv/txt/PROCFILES/fmb_backup_info.txt
    Updated periodically to reflect changes in the cad cluster. Last major update was 07/16/02.

========== ==========
fmb_backup_info

RESTORING FROM A DLT
(Do a df -kl on the server where the restore procedure is being
done to make sure that the partition /restoredfiles is large enough
to hold all the restored files. If it is not, look at other
partitions not in use.)

setup fmb

AREA FOR RESTORED FILES:

cd /restoredfiles
on cadwhs01
cd /restoredfiles
on cadwhs02
cd /restoredfiles
on cadwhs03
cd /restoredfiles
on cadwhs04

SET THE ENVIRONMENT:

setenv TAPE /dev/rmt/tps2d4nrv
on cadwhs01
setenv TAPE /dev/rmt/tps5d4nrv
on cadwhs02
setenv TAPE /dev/rmt/tps2d4nrv
on cadwhs03
setenv TAPE /dev/rmt/tps2d4nrv
on cadwhs04

TO SEE TABLE OF CONTENTS:

WHOLE TAPE:
fmb_toc -k -t $TAPE

ONE DIR:
fmb_toc -t $TAPE -v nodename:/dir/you/want/to/see

TO USE CPIO TO RESTORE A SINGLE DIRECTORY:
Examples:
fmb_restore -t $TAPE -v cadwhw01:/cadwhw_local/home01/ms_villegas/
fmb_restore -t $TAPE -v cadwhs01:/cadwhs_local/server01/ms_yoffe/
fmb_restore -t $TAPE -v cadwhs02:/cadwhs_local/server02/jerauch/
fmb_restore -t $TAPE -v cadwhs03:/cadwhs_local/server03/trotter/dcsworkspace/
fmb_restore -t $TAPE -v cadwhs04:/cadwhs_local/server04/friend/bin/

OR TO RESTORE A SINGLE FILE:

SYNTAX:

fmb_restore -v -k -t $TAPE

EXAMPLE:

fmb_restore -t $TAPE -v "cadwhs02:/cadwhs_local/server02/ms_jerauch/cdf.mf1"
or

fmb_restore -t $TAPE -v "cadwhs02:/cadwhs_local/server02/ms_jerauch/cdf.*
for all files that pertain or are named “cdf” in the TEAM area.

WHEN FINISHED RESTORING, PLACE THE TAPE IN A TOF MODE:

mt -f $TAPE rew
mt -f $TAPE unload
mt -f $TAPE status
==========

List of Partitions/Directories that are Backed Up

14) List of backed up files that cron uses:
/usr/products/NULL/fmb/v6_7/fmb_files - cadwhs01 & cadwhs02
/usr/products/prd/fmb/v6_8/NULL/fmb_files - cadwhs03 & cadwhs04

15) Tape Test Procedure

Files are restored on a frequent enough basis to determine the success
or failure of the backups. Occurring at approximately once a month.

Here is a list of the directories and partitions that are backed up on a daily basis compiled from all four servers:

cadwhs01:/
cadwhs01:/cadwhs_local/server01
cadwhs01:/cadwhs_local/server01_2
cadwhs01:/cadwhs_local/server01_3
cadwhw01:/cadwhw_local
cadwhw03:/cadwhw_local
cadwhw04:/cadwhw_local
cadwhw06:/cadwhw_local
cadwhw09:/cadwhw_local
#
cadwhs01:/DCS_depository2
#
cadwhs01:/exports/local/IRIX6
cadwhs01:/exports/products
cadwhs01:/exports/products/sw
#
cadwhs01:/CAD_network/ideas/bin
cadwhs01:/cadwh.fmb_archive_logs
cadwhs01:/IDEAS
#
cadwhs02:/
cadwhs02:/cadwhs_local/server02
cadwhs02:/cadwhs_local/server02_2
#
cadwhs02:/exports/local
cadwhs02:/exports/products
cadwhs02:/exports/products/sw

```
#
rdmd01:/rdmd_local
rdmd30:/rdmd_local
cadwhw08:/cadwhw_local/home08
cadwhw08:/cadwhw_local/home08_2
#
cadwhw01:/
cadwhw02:/
cadwhw03:/
cadwhw04:/
cadwhw06:/
cadwhw08:/
cadwhw09:/
#
cadwhs02:/CAD_network/ideas/bin
cadwhs02:/cadwh.fmb_archive_logs
#
rdmd01:/
rdmd30:/
#
cadwhs02:/IDEAS
cadwhs02:/restoredfiles
cadwhs02:/sdrc_scratch/tarfiles
rdmd01:/ideas_spool
#
cadwhs03:/
cadwhs03:/cadwhs_local/server03
cadwhs03:/cadwhs_local/server03_2
#
cadb0w02:/cadb0w_local/home02/smoccia
cadb0w02:/cadb0w_local/home02/ms_smoccia
#
cadwhs03:/DCS_depository3/D0electrical
cadwhs03:/DCS_depository3/D0layouts
cadwhs03:/DCS_depository3/d0ms
cadwhs03:/DCS_depository3/physics
cadwhs03:/DCS_depository3/cdfmsg
cadwhs03:/exports/products
cadwhs03:/exports/products/sw
cadwhs03:/ICONS/cad_icons
#
cadwhs03:/DWG_ARCHIVE
cadwhs03:/IDEAS
cadwhs03:/CAD_network/ideas/bin
cadwhs03:/cadwh.fmb_archive_logs
#
cadwhs04:/
cadwhs04:/CAD_team
cadwhs04:/cadwhs_local/server04
cadwhs04:/cadwhs_local/server04_2
rdmd31:/rdmd_local
```

rdmd31:/
#
cadwhs04:/exports/products
cadwhs04:/exports/products/sw
#
cadwhs04:/CAD_network/ideas/bin
cadwhs04:/cadwh.fmb_archive_logs
cadwhs04:/IDEAS/ideas/i8
cadwhs04:/restoredfiles
cadwhs04:/IDEAS/ideas/ms9

Example of a mail log file showing partitions backed up:

Wed Sep 18 21:00:02 CDT 2002: /usr/products/prd/fmb/v6_8/NULL/fmb_backup -E /tmp -f cadwh.fmb_D
/usr/products/prd/fmb/v6_8/NULL/fmb_backup: warning: option file /usr/products/prd/fmb/v6_8/NULL/fmb_files/cadwh.fmb_D has both tape and file list options
Checking tape label
Writing label cadwhs04.18.A, Try 1
Verbose output being written on /cadwh.fmb_archive_logs/cadwhs04.18.A

Archive Size Information

Full Backup Estimate Low	High	Actual	Type	Name
-	-	-	full	cadwhs04:/ [1]
1557685k	1799666k	1662304k	full	cadwhs04:/ [1]
4874760k	5311106k	5076224k	full	cadwhs04:/CAD_team
2054138k	2301975k	2168336k	full	cadwhs04:/cadwhs_local/server04
858642k	930687k	891344k	full	cadwhs04:/cadwhs_local/server04_2
852622k	916090k	888216k	full	rdmd31:/rdmd_local
-	-	-	full	rdmd31:/ [2]
1351207k	1568455k	629560k	full	rdmd31:/ [3]
925047k	1176420k	1058912k	full	cadwhs04:/exports/products
1368794k	1614213k	1469824k	full	cadwhs04:/exports/products/sw
387k	1177k	576k	full	cadwhs04:/CAD_network/ideas/bin
452061k	481531k	466368k	full	cadwhs04:/cadwh.fmb_archive_logs
1831227k	2194765k	1967696k	full	cadwhs04:/IDEAS/ideas/i8
1074864k	1155029k	1110960k	full	cadwhs04:/restoredfiles
-	-	-	full	cadwhs04:/IDEAS/ideas/ms9 [4]
2452136k	2857011k	0k	full	cadwhs04:/IDEAS/ideas/ms9 [5]
19653570k	22308125k	17390320k		TOTAL

Compressing /cadwh.fmb_archive_logs/cadwhs04.18.A to save space.

Executive Summary:

Thu Sep 19 03:29:07 CDT 2002

The backup failed because one or more archives failed.

A total of 0 write retries were made.

==========
Detailed error reports:
---
[1]
fmb: error during fmb_backup on Wed Sep 18 21:26:05 CDT 2002
 cpio archive of cadwhs04:/ try 1 exited with Exit code 6
 Abbreviated stderr output:
   UX:cpio: ERROR: Cannot backup sockets or unknown file types: "tmp/.rtmond_socket"
   UX:cpio: ERROR: Cannot backup sockets or unknown file types: "tmp/.mediad_socket"
   UX:cpio: ERROR: Cannot backup sockets or unknown file types:
"tmp/.eventmond.events.sock"
   UX:cpio: ERROR: Cannot backup sockets or unknown file types: "tmp/.eventmond.info.sock"
   UX:cpio: ERROR: Cannot backup sockets or unknown file types: "tmp/.fam_socket"
   UX:cpio: ERROR: Cannot backup sockets or unknown file types: "tmp/.eventmond.cmd.sock"
   3324610 blocks
   6 error(s)
   Exit code 6
 See /cadwh.fmb_archive_logs/cadwhs04.18.A for complete error output
 This archive may be incomplete.
---
[2]
fmb: error during fmb_backup on Thu Sep 19 01:13:56 CDT 2002
 cpio archive of rdmd31:/ try 1 exited with Exit code 6
 Abbreviated stderr output:
   UX:cpio: ERROR: Cannot backup sockets or unknown file types: "tmp/.imd_socket-7273-:0.0"
This continues to list errors the errors here.

Here is an example of the file that is used to show which directories and/or partitions that are backed up each day on the servers with the chosen options:

cadwh.fmb_A

6-25-98 Added juker backups to DLT A & B - vmv
8-23-00 In the -E exclusion I removed the
/ in front of tmp, dev & var - Did to all DLT files
#
D0 DLT added 05-17-00
took out vivianv for mail 6-15-00 on errors
and added -x
-a cpio
-n "fmb_mail root@cadwhs01.fnal.gov"
-l /usr/local/etc/cadwh.fmb_logfile
-V /usr/local/etc/cadwh.fmb_archive_logs
-E "core:|\.netscape/cache|/dev/printer|/var/spool/lp/CMDSOCK|/tmp"
-E nsmail
-E /tmp
-E dev/printer

-E /var/spool/lp/CMDSOCK
-m quiet
-t /dev/rmt/tps2d4nrv
-x
-u
#
cadwhs01:/
cadwhs01:/cadwhs_local/server01
cadwhs01:/cadwhs_local/server01_2
cadwhs01:/cadwhs_local/server01_3
cadwhw01:/cadwhw_local
cadwhw03:/cadwhw_local
cadwhw04:/cadwhw_local
cadwhw06:/cadwhw_local
cadwhw09:/cadwhw_local
#
cadwhs01:/DCS_depository2
#
cadwhs01:/exports/local/IRIX6
cadwhs01:/exports/products
cadwhs01:/exports/products/sw
#
cadwhs01:/CAD_network/ideas/bin
cadwhs01:/cadwh.fmb_archive_logs
cadwhs01:/IDEAS
#cadwhs01:/CAD_network
#cadwhw07:/cadwhw_local/home07
#rdmd28:/rdmd_local
#rdmd23:/rdmd_local/v23_1
#rdmd24:/rdmd_local
Here is an example of the file that starts the job from the system cron.

cadwh_fmb_run_A

#!/bin/csh
#
Backup run on cadwhs01
#
source /usr/local/etc/fermi.cshrc

setup fmb
setup kerberos

setenv KRB5CCNAME /tmp/fmbkey.$$

/usr/krb5/bin/kinit -k -t /etc/krb5.keytab host/cadwhs01.fnal.gov@FNAL.GOV

$FMB_DIR/fmb_backup -f cadwh.fmb_A

/usr/krb5/bin/kdestroy

Here is a portion of the file that gives a running account of when the backups were completed and if they succeeded or failed. The file started when the Drive was installed in 1997.

cadwh.fmb_logfile

cadwhs01.17.A failed cadwhs01:/ Tue Sep 17 21:18:34 CDT 2002
cadwhs01.17.A failed cadwhs01:/cadwhs_local/server01 Tue Sep 17 21:46:49 CDT 2002
cadwhs01.17.A full cadwhs01:/cadwhs_local/server01_2 Tue Sep 17 22:07:06 CDT 2002
cadwhs01.17.A full cadwhs01:/cadwhs_local/server01_3 Tue Sep 17 22:21:13 CDT 2002
cadwhs01.17.A full cadwhw01:/cadwhw_local Tue Sep 17 22:31:16 CDT 2002
cadwhs01.17.A full cadwhw03:/cadwhw_local Tue Sep 17 23:15:35 CDT 2002
cadwhs01.17.A failed cadwhw04:/cadwhw_local Tue Sep 17 23:18:36 CDT 2002
cadwhs01.17.A full cadwhw06:/cadwhw_local Wed Sep 18 00:34:51 CDT 2002
cadwhs01.17.A full cadwhw09:/cadwhw_local Wed Sep 18 00:42:43 CDT 2002
cadwhs01.17.A full cadwhs01:/DCS_depository2 Wed Sep 18 01:32:32 CDT 2002
cadwhs01.17.A full cadwhs01:/exports/local/IRIX6 Wed Sep 18 01:34:52 CDT 2002
cadwhs01.17.A full cadwhs01:/exports/products Wed Sep 18 01:45:23 CDT 2002
cadwhs01.17.A full cadwhs01:/exports/products/sw Wed Sep 18 01:51:12 CDT 2002
cadwhs01.17.A full cadwhs01:/CAD_network/ideas/bin Wed Sep 18 01:51:31 CDT 2002
cadwhs01.17.A full cadwhs01:/cadwh.fmb_archive_logs Wed Sep 18 01:57:05 CDT 2002
cadwhs01.17.A full cadwhs01:/IDEAS Wed Sep 18 02:25:17 CDT 2002
cadwhs01.18.A failed cadwhs01:/ Wed Sep 18 21:18:30 CDT 2002
cadwhs01.18.A failed cadwhs01:/cadwhs_local/server01 Wed Sep 18 21:47:51 CDT 2002
cadwhs01.18.A full cadwhs01:/cadwhs_local/server01_2 Wed Sep 18 22:08:16 CDT 2002
cadwhs01.18.A full cadwhs01:/cadwhs_local/server01_3 Wed Sep 18 22:22:25 CDT 2002
cadwhs01.18.A full cadwhw01:/cadwhw_local Wed Sep 18 22:32:37 CDT 2002
cadwhs01.18.A full cadwhw03:/cadwhw_local Wed Sep 18 23:17:52 CDT 2002
cadwhs01.18.A failed cadwhw04:/cadwhw_local Wed Sep 18 23:21:09 CDT 2002
cadwhs01.18.A full cadwhw06:/cadwhw_local Thu Sep 19 00:38:08 CDT 2002
cadwhs01.18.A full cadwhw09:/cadwhw_local Thu Sep 19 00:46:00 CDT 2002
cadwhs01.18.A full cadwhs01:/DCS_depository2 Thu Sep 19 01:35:49 CDT 2002
cadwhs01.18.A full cadwhs01:/exports/local/IRIX6 Thu Sep 19 01:38:05 CDT 2002
cadwhs01.18.A full cadwhs01:/exports/products Thu Sep 19 01:48:46 CDT 2002
cadwhs01.18.A full cadwhs01:/exports/products/sw Thu Sep 19 01:54:35 CDT 2002
cadwhs01.18.A full cadwhs01:/CAD_network/ideas/bin Thu Sep 19 01:54:54 CDT 2002
cadwhs01.18.A full cadwhs01:/cadwh.fmb_archive_logs Thu Sep 19 02:00:33 CDT 2002
cadwhs01.18.A full cadwhs01:/IDEAS Thu Sep 19 02:28:39 CDT 2002

HOW TO RESTORE A MODEL FILE FROM A BACKUP TAPE TO IDEAS DATABASE

Make sure the user is logged out of I-DEAS

Go to the /ideas/team/T##/master/ directory
and cp the z_username##.pmd to z_username##.pmd.sav

Restore the complete ms_username directory
including all the .smd files. You need the
latest one before the file was crashed or
corrupted. It is called z_name##.smd and

of course the mf1 and mf2 files from the user's
ms directory.

NEW WAY:

Need two installations to work with of the same version of I-DEAS, (Integrated Design Engineering Analysis Software).

Need to read Tech Tip 14:

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RESTORE MDF FILE INTO IDM WITH ASSOCIATION

T.Parker 15-MAY-2002

rev: V.Villegas 16-July-2002
Added general notes-revised according to Particle Physics Division

Restore a missing mdf file back into IDM with association to the original part and/or assembly.

1. Must have the file to restore - from backup.

2. Must also know the source item for the drawing, i.e. Part or Assembly must exist.

3. Check out the source item as ref and create a minimal drawing, i.e. just so it's related to the source item. Choose the easiest view to process - we'll throw this away later. Name the new drawing exactly the same as the old one.

4. Check in the new drawing keep as ref or to modify. After the check in works, delete the drawing and ref part from your model file bin. From Master Modeler: File export Library data and export the New Drawing for Check out to a new package file. This will take the part or assembly along as Rfl. Make sure to set the Export User Attributes in the Options.

5. At the Operating System level containing the package files, copy the old md file to the exact new mdf file. make sure you gzip -d on it first if it's a .Z file. I-DEAS will import it and then not be able to read it.

6. Read the package in to another IDM, using the Original Project and Library names. (on cadwhs04 this can be done using /CAD_network2/ideas/i8/bin/ideas which will utilize /ideas/team/T82 as the team area) Select File Import Library Data and then choose the package file you created. You have a couple of options, but the easiest is to set the Use Original Toggle and then hit the Create Missing. It should create any required Projects and Libraries, look in the list window to see what it does. Under Options select Check for Conflicts, you may get errors on the unknown user, if so cancel and add the listed user to the project. The other option is to edit the actual package file and change all login = "unknownuser" to login = "you" this controls the created by and modified by so if you do this then you will also want to undo it in the package file you write to import back into the original IDM.

7. Check out the drawing and add a simple note to make sure a new library version will be created when you check it back in. Run Update on the drawing. You may not need to add a note but the goal is to make sure it creates a new version when you check it in.

8. Check the drawing back in. Make sure it created a new version, this is the item you will export back to the original location. It is still associated to the original part or assembly.

From Master Modeler:

9. Export the Drawing for Check out to a new package file. This will take the original part or assembly along. Again make sure to toggle on Export User Attributes under the Options.

10. Import the new package file to the original IDM. It will bring in the new drawing related to the original source part or assembly. The import should give you a warning about identical item, ignore it as long as the new drawing says it will create a new version. After the import is done, use Get From Library and select the new drawing, Check the related items and it should list the original part. Check out the Drawing, Get it on the workbench and run Update Attributes on it. This should reload everything, check it in Manage Bins, Select the drawing and Look at Details User Attributes. Check the drawing back in, you will need to enter the Part Number and Revision, i.e. --1 by hand, but as long as the listed correctly in the user attributes, the drawing is OK.

11. Delete the parts, assemblies, and drawing from the second IDM. May need to remove the Export locks.

12. That's it. Look at drawing 399424 in D0.SILICON2B-MECHANICAL this is the file I used for the test. The package files are in /sdrc_scratch/awparker PKG (exported from original IDM) and PKG2 (exported from second IDM) I did edit the pkg files and change login = "grimm" to awparker to read it into the second IDM and then I changed it back in PKG2 and read it into the original IDM.

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vmv 08-09-02

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RESTORING A DWG TO THE IDM INSTALLATION W/O ASSOCIATION
TO PARTS OR ASSEMBLIES

1. Follow the directions for restoring a file from an fmb backup tape. (My fmb notes follow.) Place the mdf files in a safe area.

2. Must have the IDM name, and filename of the mdf drawing that was deleted.

3. In I-DEAS, MasterDrafting, Create a new empty drawing with the same name as the one that was deleted.

4. Check this new empty drawing into the appropriate Super Project and Library and DO

NOT KEEP.

5. As ideasadm, go to the shared area of I-DEAS where the files are stored and find the drawing that was just created with the same name as the deleted drawing.

6. Check the I-DEAS file extension on the empty drawing and rename the restored drawing with the same extension.

ie.

Name of recreated empty drawing name in shared area:
TEST_TO_RESTORE_DWGS_0098.mdf

Name of restored drawing name in safe place:
TEST_TO_RESTORE_DWGS_0014.mdf

cd /ideas/team/T62/shared/dir.....
mv
TEST_TO_RESTORE_DWGS_0098.mdf
TEST_TO_RESTORE_DWGS_0098.mdf.onetoreplace

cd /sdrc_scratch/vivianv/safeplace
mv
TEST_TO_RESTORE_DWGS_0014.mdf
/ideas/team/T62/shared/TEST_TO_RESTORE_DWGS_0098.mdf

7) Now when you go to the Manage Bins and Get from Library, you should get the older drawing version that was deleted.

==========

Tech Tip #14

Data Sharing use in 'salvage mode'

1. Get the z_master.imd and the necessary .pmds from backup.

2. As ideasadm place them in some local directory named for example /scratch/team.

3. Copy the .ideas_paramX file from the ../ideas/ms#/ideas directory to the /scratch/team directory.

4. Edit the .ideas_paramX file. Change the Team.MasterId parameter to be equal to the value for the z_masterY.imd (where Y is some number). If the .imd file is just z_master.imd then the value is 0, otherwise the value is Y.

5. In the .ideas_paramX file Change the Team.MasterDirectory to point to the directory where the z_masterY.imd file is. In our example Team.MasterDirectory should be /scratch/team. Change the Team.ProjectsDirectory and Team.SharedDirectory to /scratch/team as well.

6. Now if the path to projects is the same as your existing data installation path, then you must unmount the /team directory. (NOTE: /team is an example, but whatever disk has your existing team data must be unmounted on the machine that you are creating this local installation.) You unmount the team directory as root. You unmount it because you do not want to be accessing your existing data installation.

7. Next set the environmental variable ideas_PARAMX=/scratch/team or whatever the path is for your local .ideas_paramX file. Export the variable, export ideas_PARAMX. Start I-DEAS. You should now be looking at the local data installation. Try to access one of the projects, the software should say it cannot find it. It will ask you to reconnect. Note the existing path that it is looking for the project. E.G. /team/projects/xxxx_yyyy.pmd.

8. Next create a symbolic link that recreates the path of the .pmd`s but points to where they actually exist. E.G. old project path is /team/projects. Change directories to the /team. If /team does not exist then mkdir /team as root. Then cd /team. To create the symbolic link do an ln -s /scratch/team projects.

9. Now start I-DEAS and determine which shared files you need to restore. If it is an assembly you wish to retrieve go to get from library and then highlight the assembly and select BOM. Change the format of the report such that it gives you the filenames of the items with that assembly. Those files are the ones you should restore from backup. You will also want to find out the filename for the upper level assembly. If you want to restore a drafting setup find out the filename of the library drafting setup and library binary drawing. Also note the path the shared files have.

10. Restore the shared files you need to /scratch/team.

11. Now you will want to create a symbolic link