

INNOVATION

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Information on: Product Updates,
Questions & Answers, Hints &
Recommendations and New Features

Welcome to INNOVATION FYI

The objectives of FYI are to share with you the answers to common questions that users ask, to bring you up-to-date on our products' latest capabilities, to differentiate our products' capabilities versus the competition and to provide you with hints and recommendations.

FOCUS ON:

S/390 Linux and OS/390 UNIX

FDR full-volume high-speed backups may be used to back up S/390 Linux volumes in CDL (compatible) format, but only full-volume recoveries are possible from these backups. You cannot restore individual Linux files from full-volume backups. Since Linux uses "lazy writes", you must "harden" the Linux data to disk before dumping it with FDR by unmounting the Linux file system or shutting down Linux.

VM volumes containing Linux minidisks can also be backed up with FDR. Although it is possible to restore individual Linux minidisks, you still cannot restore individual Linux files from these backups.

FDR full-volume backups and FDRDSF data set backups may be used for high-speed backups of the HFS and zFS data sets used by OS/390 UNIX System Services (USS). You can restore entire individual HFS and zFS data sets from these backups but you cannot restore individual USS files from these backups. When backing up HFS data sets, you should also "harden" the data by unmounting the file systems or using the FDR parameter HFS=QUIESCE to quiesce the file systems during backup.

So, these FDR backups can be used for high-speed restores for disaster recovery, and for local recovery of entire volumes, or file systems, but they are not appropriate for recovery of individual files which have become lost or corrupted.

Innovation offers FDR/UPSTREAM for S/390 Linux and OS/390 UNIX to address this need. FDR/UPSTREAM can back up Linux S/390 and OS/390 UNIX files to OS/390 mainframe disk or tape without requiring an unmount or shut down. FDR/UPSTREAM can restore individual files or groups of files on command.

One of the key NEW features of FDR/UPSTREAM S/390 Linux is:

UPSTREAM S/390 Linux Rescuer

A powerful and unique addition to the FDR/UPSTREAM S/390 Linux support is the S/390 Linux Rescuer, the industry's first and only complete backup and restore solution with disaster recovery for S/390 Linux. The S/390 Linux Rescuer is a stand alone system recovery facility for SuSE S/390 Linux systems.

The S/390 Linux Rescuer allows administrators to completely restore a system from data that is saved in FDR/UPSTREAM without separate system backups. S/390 Linux Rescuer is completely integrated into FDR/UPSTREAM.

In addition to the S/390 Linux Rescuer, UPSTREAM provides:

- Logical file backup for network attached Linux on the Desktop, Linux on Intel Servers as well as Linux for S/390.
- Online Database agents for Oracle and DB2 for S/390 Linux.

UPCOMING EVENTS 2003

SHARE

Technology Exchange

Feb. 24 - Feb. 26

Adam's Mark Hotel
Dallas, TX

•

EMC Tech Summit

April 28 - May 1

Mandalay Bay
Las Vegas, NV

•

IBM Storage & Storage Networking Symposium

July 28 - Aug. 1

Chicago Hilton
Chicago, IL

•

SHARE

Technology Exchange

Aug. 11 - Aug. 13

Marriott
Washington, DC

2004

LinuxWorld Conference & Expo

Jan. 21 - Jan. 23

Javits Center
New York, NY

NEW Features for FDR V5.4 L20

LARGE DISK SUPPORT

All FDR programs have been updated to support “large disks” (up to 32760 cylinders in size). Most reports will identify disks larger than a 3390-9 as a “3390-27” (for 27GB capacity).

The FASTCPK recovery log has been enhanced to handle a larger number of relocated tracks, enabling it to support large disks and 3390-9 disks without special processing or multiple executions.

In FDREPORT, “ENABLE=LARGEDISK” is required to support devices larger than a 3390-9.

FDREPORT

- FDREPORT can now access and report on offline disk volumes. Offline volumes may be used with point-in-time backups (such as FDRINSTANT) or with other special volume replication functions (PPRC, SRDF, BCVs, ShadowImage, FlashCopy, SnapShot, etc).
- The new option FASTPATH (ENABLE=FASTPATH) significantly reduces the overhead of allocating and opening disk volumes, improving FDREPORT efficiency when processing large numbers of disk volumes. FASTPATH can reduce FDREPORT execution time from 25% to 75% when processing many disk volumes, depending on the type of report you have requested. FASTPATH is required when reporting on offline volumes.

MULTI-VOLUME VSAM RESTORE

FDRDSF, FDRCOPY and FDRABR have been enhanced when restoring or copying multi-volume VSAM clusters. FDR will now continue searching the available output volumes (NVOL=) for a volume with sufficient space to allocate each piece of the cluster, for SMS as well as non-SMS. As long as volumes are available in the NVOL list or SMS storage group with sufficient free space (and size) to handle the extents of the cluster, the restore/copy will be successful.

ARCHIVE CONTROL FILE SIZE

The Archive Control File (ACF) can now contain records for up to 5,701,632 data sets or VSAM components.

FDRREORG

FDRREORG has been updated to handle all currently supported types of IAM and VSAM data sets. The CONVERTINDEX operand can be used to convert VSAM files which were originally allocated with IMBED or REPLICATE to NOIMBED and NOREPLICATE, since IBM no longer recommends those options.

EMC CONCURRENT BCV SUPPORT

FDRINSTANT for EMC now supports Concurrent BCVs, a new feature in TimeFinder which allows 2 BCVs to be connected to the same standard volume at once. FDRINSTANT can SPLIT and RE-ESTABLISH either BCV.

FDRINSTANT now uses EMC Instant Split as a default. FDRINSTANT customers running V5.4 Level 20, 21 or 22 should request zap P-54.2034 to improve the performance of Instant Split. Zap is automatically applied on V5.4 L23 or higher.

E-MAIL NOTIFICATION

You have the option of sending e-mail messages when an FDR, FDRDSF, FDRCOPY or FDRABR operation is unsuccessful (and if you like, for successful operations as well). An optional FDRMAIL DD statement in an FDR step will invoke the facility; it points to control statements defining the message and its recipients. A mail server that supports SMTP (Simple Mail Transport Protocol) is required. Messages can also be sent to alphanumeric pagers and cell phones.

The Concepts and Facilities Guides are a detailed overview of how a particular INNOVATION component works, with helpful hints.

<http://www.innovationdp.fdr.com/uscfg.cfm>

WHITE PAPER

For important technical information about FDRINSTANT, ask for a copy of our latest White Paper on Corporate Data Protection with a Special Focus on DB2.

NEW Features for FATS/FATAR V4.8L20

- 3590-H (triple density) tape drives are supported.
- VTS AND COPYCROSS SUPPORT—Tape volumes in an IBM VTS (virtual tape server) and EMC's CopyCross product will now be identified as device type VIRTUAL. The capacity and used percentage for an IBM VTS virtual tape volume will be reported.

NEW Features for FATSCOPY V4.8L20

- File statistics (bytes, blocks, etc.) will be printed for each file copied.
- FDRABR backup tape files and DFSMSHsm backup and migration tape files will be automatically excluded by matching the tape data set name against various masks.
- Data sets can be selected based on their size in megabytes (MB).
- Copy the "volume assigned" date/time for RMM.
- Copy the "creating program name" with CA-1.
- Selection can be limited to data sets cataloged to EMC CopyCross virtual tape volumes.
- In a simulation run, the capacity of the output tapes that will be used can be specified. The report will display the estimated number of volumes of that capacity required to hold the data selected by the simulation.

NEW Features for IAM V8.0L08

- Single System Record Level Sharing (RLS)—No programming changes.
- Full Journaling and Recovery Tools when files are used under IAM RLS.
- Hardware Compression Support.
- Improved PAV Support and Backup While Open Support.
- IAM files can now be defined as DFSMS extended format sequential datasets.
- 3390-27 (27 GB DASD) support allows IAM to use all available space on the large volume.

NEW Features for IAM V8.0L20

(Available 2nd Qtr, 2003)

- IAM Support for RRDS files will be available at no additional charge to all IAM users who are licensed for IAM/AIX.

NEW Features for UPSTREAM V3.2 & V3.2.1

- UPSTREAM/SOS local backup volumes supports bi-directional operations for backups AND restores and for file transfer operations, providing the high-speed data transfer and reduced network overhead of UPSTREAM/SOS.
- UPSTREAM features logical file level support for S/390 Linux as well as new non-disruptive online database agents for Oracle and DB2 UDB. These agents provide non-disruptive online support for backups of the databases without having to take the databases offline. An additional benefit is the ability to perform incremental processing.
- The S/390 Linux Rescuer is a stand alone system recovery facility for SuSE S/390 Linux systems. The S/390 Linux Rescuer allows administrators to completely restore a system from data that is saved in FDR/UPSTREAM without separate system backups.
- The UPSTREAM Rescuer also supports Sun Solaris.
- FDR/UPSTREAM provides sophisticated cluster support for Windows NT, Windows 2000 and NetWare 6 cluster servers.
- UPSTREAM provides support for cluster specific information—for example, the Cluster Quorum database for Windows 2000. Backups started on a cluster-aware UPSTREAM system can be automatically restarted when a cluster server failover occurs—providing the highest possible availability for your backup services.
- The new UPSTREAM DB2 (UDB) agent now supports multiple, simultaneous backup and restore operations resulting in the fastest possible operations.
- UPSTREAM now has the ability to send e-mail and SNMP Trap notifications. By configuring your backups and restores to send notifications of specific events, you can add another valuable management tool to your data management capabilities.

NEW Features for FDRPAS V5.4L20

- JES3-Managed Disk Volumes can now be Swapped with FDRPAS.

FDREPORT

How can I produce a report with just one line for each multi-volume data set or cluster?

In FDREPORT V5.4, it is possible to obtain a report that contains only one line per data set, even if the data set extends across multiple volumes and/or is a VSAM cluster with multiple components. Fields that are additive, such as extents, bytes, and tracks, will show the total for all parts of the component, cluster, or non-VSAM data set. Percentages will be calculated based on these totals. Other fields, such as record length and key position, will be taken from the first volume. In a report line for a cluster, fields that are not totaled will be taken from the data component.

This new feature is called RECORDSUMMARY, because each record (report line) may be a summary of multiple volumes and/or components. This is different from the summaries controlled by the SUMMARY command and the SUM= operand, which are produced at control breaks *between* sets of report lines. RECORDSUMMARY can be requested if you are processing with any of these three data types: CATARCH, CATVTOC, or EXTRACT. The RECORDSUMMARY operand is valid on either the DEFAULT or the PRINT command. There are two values for RECORDSUMMARY: RECORDSUMMARY=CLUSTER specifies that each report line will represent a VSAM cluster or non-VSAM data set, and RECORDSUMMARY=COMPONENT specifies that each report line will reflect a VSAM component or non-VSAM data set.

For this feature to work, the input must be sorted by cluster and data set name. The output from CATARCH and CATVTOC is always sorted in this sequence; when running with DATATYPE of EXTRACT, you may need to provide the appropriate SORT command. Note: The BREAK option of the SORT command will not be honored when RECORDSUMMARY is in effect. It is possible, however, to use the SUM=YES operand or the SUMMARY command to obtain final totals and to control their format.

Example 1a:

Collect and report information about multi-volume clusters:

```
XSELECT XDSN=TEST.MV.**
PRINT DATATYPE=CATVTOC,RPTYPE=DATA
CANCEL
REPORT FIELD=(NAME,VOL,VOLSQ,COMPTYPE,CATVOLCT,SIZE,SIZEFREE,SIZEUSED)
PRINT DATATYPE=EXTRACT
```

This results in the following output:

ENTRY NAME	VOLSER	VSQ	CPTYP	CVC	ALLOC	FREE	USED
TEST.MV.A.CLUSTER	SMS812	1	DATA	1	135	15	120
TEST.MV.A.CLUSTER	SMS812	1	INDEX	1	3	2	1
TEST.MV.B.CLUSTER	SMS811	1	DATA	3	720	0	720
TEST.MV.B.CLUSTER	SMS812	2	DATA	3	1020	0	1020
TEST.MV.B.CLUSTER	SMS813	3	DATA	3	930	30	900
TEST.MV.B.CLUSTER	SMS813	1	INDEX	1	6	2	4

Example 1b:

Continuing to use the same extract file, you can summarize the clusters like this:

```
PRINT DATATYPE=EXTRACT,RECORDSUMMARY=CLUSTER
```

This results in the following output:

ENTRY NAME	VOLSER	VSQ	CPTYP	CVC	ALLOC	FREE	USED
TEST.MV.A.CLUSTER	SMS812	1	DATA	1	138	17	121
TEST.MV.B.CLUSTER	SMS811	1	DATA	3	2676	32	2644

Example 2:

Summarize multi-volume data sets from an extract file:

```
DEFAULT SORTALLOCATE=(YES,CYL),WORKDD=5,WORKSPACE=500
SORT     FIELD=(NAME,DSN,VOLSQ)
REPORT   FIELD=(NAME,VOL,VOLSQ,CATVOLCT,SIZE,SIZEFREE,SIZEUSED)
PRINT    DATATYPE=EXTRACT,RECORDSUMMARY=COMPONENT
```

This results in the following type of output:

ENTRY NAME	VOLSER	VOL		ALLOC	FREE	USED
		SEQ	CVC			
TEST.N179.N1790CDC.COMSPEC2.G0313V00	LRG015	1	4	990	1	989
TEST.N179V.CICS.KDFILE05.TESTA19	DVL425	1	1	21510	1304	20206

How can I report on OFFLINE units?

A new field, UCBSTATS, has been added for reporting as well as for XSELECT/XEXCLUDE. UCBSTATS has two possible values—ONLINE and OFFLINE.

Example:

Report on all offline units with addresses of 20Cx.

```
REPORT   FIELD=(UCBSTATS,VLDEFAULT)
XSELECT  UNIT>=20C0,UNIT<=20CF,UCBSTATS=OFFLINE
PRINT    DATATYPE=VOLDATA,ENABLE=FASTPATH
```

This results in the following output:

UCBSTAT	VOLSER	DEVTYPE	UADR	VTINDX	USEATTR	USERS	ALOTR	%TU	FRTRK	LFCYL	LFTRK	FREXT	FRAG
OFFLINE	SH20C7	3390	20C4	NONE	UNKNOWN	0	2	1	33388	2225	33388	1	0
OFFLINE	SH20CE	3390	20CA	NONE	UNKNOWN	0	16230	98	465	31	465	1	0

Can I report on both OFFLINE and ONLINE data sets?

Yes, ENABLE=SELECTOFFLIN specifies that offline DASD units selected using the UNIT or VLUNIT operand on the XSELECT command(s) be included in the processing.

Note that SELECTOFFLIN is only honored if FASTPATH is enabled and when DATATYPE=VTOC or VOLDATA is active.

Example:

Summarize the number of data sets that are on OFFLINE and ONLINE units in the range 20C0-20FF:

```
XSELECT  UNIT>=20C0,UNIT<=20FF
DEFAULT  ENABLE=(FASTPATH,SELECTOFFLIN)
SUMMARY  FIELD=(UCBSTATS,DSN,SIZE,SIZEFREE,SIZEUSED)
SORT     FIELD=(UCBSTATS),BREAK=YES
PRINT    RPTYPE=NONE
```

This results in the following output:

```
SUBTOTAL -- UCBSTATS--OFFLINE
  DSN-----40  SIZE-----21304  SIZEFREE-----19929  SIZEUSED-----1375
  VALUE SUMMARY OF UCBSTATS SUBTOTAL NUMBER OF VALUES-----1
    UCBSTATS--OFFLINE (    40)
SUBTOTAL -- UCBSTATS--ONLINE
  DSN-----67  SIZE-----46429  SIZEFREE-----45872  SIZEUSED-----557
  VALUE SUMMARY OF UCBSTATS SUBTOTAL NUMBER OF VALUES-----1
    UCBSTATS--ONLINE (    67)
FINAL TOTALS --
  DSN-----107  SIZE-----67733  SIZEFREE-----65801  SIZEUSED-----1932
  VALUE SUMMARY OF UCBSTATS--- TOTAL NUMBER OF VALUES-----2
    UCBSTATS--OFFLINE (    40)  ONLINE (    67)
```

How does FDRPAS handle multi-volume data sets?

FDRPAS is not sensitive to multi-volume data sets. Since FDRPAS swaps one volume at a time, to a like device, in a manner that is transparent to the system and applications, it can swap volumes containing pieces of multi-volume data sets with no special considerations. Applications will be unaware that part of the data set has been moved to a new device and part may still be on an older device.

How does FDRPAS handle HFS and zFS data sets?

HFS (Hierarchical File System) data sets are used with z/OS UNIX System Services (USS), the UNIX component of z/OS and OS/390. FDRPAS is not sensitive to HFS data sets. Volumes containing HFS data sets can be swapped even when they are in use.

Likewise, zFS data sets are a new format used by USS, based on a VSAM linear cluster. Volumes containing zFS data sets can also be swapped without problems or any special considerations.

What FDR & ABR RESTORE parameters are recommended at a disaster recovery site?

SMSPROT=NONE and CONFMESS=NO are strongly recommended.

By default, FDR and ABR full-volume restore requires confirmation from the operator, to prevent accidental overlay of a volume. But at a disaster site, where hundreds or thousands of volumes must be restored, this confirmation is useless. CONFMESS=NO will suppress it and speed up the restores.

Likewise, backups of SMS volumes can normally only be restored to SMS-managed volumes. But at a DR site, you are probably restoring under a starter system where the target volumes are not marked as SMS. SMSPROT=NONE allows the SMS volumes to be restored. The SMS volumes will have the correct SMS attributes when the full system is IPLed.

Note: ABR users who license FDRDRP can significantly reduce elapsed time when recovering from incremental backups on high capacity tape.

How can I improve the performance of FDRINSTANT for ABR (the SPLIT, PSPLIT, SNAP, or FCOPY step)?

The number of //TAPEX DD DUMMY statements controls how many FDRINSTANT subtasks execute concurrently; each subtask processes one disk volume at a time. To increase the number of volumes that are processed concurrently, add more //TAPEX DD DUMMY statements (and TAPEXX DDs if needed to specify retentions). Up to 9 TAPEX DDs are supported. The number of TAPEX DDs in the SPLIT/PSPLIT/SNAP/FCOPY step can be more than are used in the actual DUMP step.

If you run several ABR jobs in parallel, each with a number of TAPEX DDs, you can usually process hundreds of volumes in just a few minutes.

How can I release an FDRINSTANT copy?

Sometimes you want to backup an FDRINSTANT point-in-time copy with PGM=FDR or FDRDSF, but you don't want to release the copy immediately, perhaps because you want to use it for another purpose. To do so, you omit the REL or RET subparameter of BCV=, FCOPY=, SNAP= or PPRC=, e.g., code SNAP=USE instead of SNAP=(USE,REL).

To release the point-in-time copy, use a simple FDRDSF step like this:

```
//RELEASE EXEC PGM=FDRDSF,REGION=0M
//SYSPRINT DD SYSOUT=*
//TAPE1 DD DUMMY
//DISK1 DD UNIT=SYSALLDA,
// VOL=SER=vvvvvvv,DISP=OLD
DUMP TYPE=DSF,DSN=VTOC,SNAP=(USE,REL)
```

How can I improve FDR's backup performance?

The DUMP parameter RTC=YES is strongly recommended, especially if the disks are attached via FICON channels. RTC=YES:

- Reads and writes up to 1 cylinder of data per I/O.
- Moves disk buffers above the line, allowing more backups to run concurrently in one DUMP step.

Custom zap C-54.0905 will make RTC=YES the default in V5.4. You can download the zap from the Innovation FTP site or request it from Innovation.

CONCEPTS & FACILITIES

Concepts and Facilities Guides

The Concepts and Facilities Guides are a halfway house between the sales flyer and the product manual, providing a good level of commercial and technical information. Currently available for the following Innovation products:

- **FDRPAS:** Non-disruptive movement of OS/390 disk volumes from one disk device to another.
- **FDRINSTANT:** Non-disruptive backup of offline DASD.
- **ABR Incremental Backup:** ABR's high-performance, low resource using, Volume Incremental backup function.
- **ABR Application Backup:** ABR's high-performance, Application backup function.
- **FDREPORT:** A powerful DASD Management reporting system providing unparalleled input field support, Customized Reports, Health Check "Canned" Reports and Real Time Reports.
- **FDR/UPSTREAM:** A powerful product designed to safely backup Open Systems and LAN-based data.
- **IAM:** An alternative for VSAM. Uses 20%-70% less CPU, 50%-80% less EXCPs and runs in 50%-80% less elapsed time.
- **FATS/FATAR:** The revised guide, available shortly, highlights the Key components of this very useful Tape certification, tape copy and tape stacking program.

E-mail us today for your **FREE** copy of any of the above Concepts and Facilities Guides at: sales@fdrinnovation.com



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PRODUCT UPDATES

This table shows, for each current release of OS/390 and z/OS, the minimum levels of each Innovation product that should be installed. Use the table when upgrading your OS/390 or z/OS system, to verify that you have the correct Innovation software in use. If not, you should install the latest version. If you already are using the indicated minimum level, you may wish to install the latest version anyway in conjunction with the Operating System upgrade. If not, please review the Product Notes that follow the table on our website at www.innovationdp.fdr.com/osreq.cfm for ZAPs that may be required depending on the hardware and software in use at your installation.

NOTE: While prior versions might still work, the versions listed are the minimum supported versions.

As of February 2003

	OS/390 2.4-2.10	z/OS 1.1 & z/OS 1.2	z/OS 1.3 z/OS 1.4	
PRODUCT	Minimum	Minimum	Minimum	Latest Version
FDR	V5.3/50	V5.3/50	V5.3/50	V5.4/23
COMPAKTOR	V5.3/50	V5.3/50	V5.3/50	V5.4/23
ABR	V5.3/56	V5.3/56	V5.3/56	V5.4/23
FDREPORT	V5.3/56	V5.3/56	V5.3/56	V5.4/23
FDRINSTANT	V5.3/50	V5.3/50	V5.3/50	V5.4/23
FDRCLONE/FDRDRP	V5.3/56	V5.3/56	V5.3/56	V5.4/23
FDRREORG	V5.3/50	V5.3/50	V5.3/50	V5.4/23
FDRPAS	V5.4/17	V5.4/17	V5.4/17	V5.4/23
FATS/FATAR/FATSCOPY	V4.7.1	V4.7.1	V4.7.1	V4.8.20
FDRSOS	V5.3/50	V5.3/50	V5.3/50	V5.4/23
IAM	V6.4/12	V7.0/18	V7.0/18	V8.0/11
UPSTREAM CLIENT	V3.1.5	V3.1.5	V3.1.5	V3.2.1
UPSTREAM z/OS & OS/390	V3.1.5	V3.1.5	V3.1.5	V3.2.1

For minimum requirements and up-to-date information visit the website at: [http:// www.innovationdp.fdr.com/osreq.cfm](http://www.innovationdp.fdr.com/osreq.cfm)



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- FDR IAM FATS UPSTREAM FDRPAS FDRSOS
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