

CICS VSAM Recovery (CICSVR) New Release!



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Abstract

Automate your VSAM recovery procedures with the new enhancements to CICSVR/VSE! Release 2 provides new support for CICS TS as well as ongoing support for CICS/VSE V2R3. Set up CICS to automatically call the CICSVR archive utility to copy your journal and to create a summary report on all the VSAM files on that journal. Use this report to create a CICSVR forward recovery job and/or a CICSVR backout job. In most cases, CICSVR forward recovery is needed when a user has deleted or changed his/her VSAM file and wants to get an earlier version of the file. CICSVR backout is needed when an online CICS TS backout has failed (CICSVR backout is only supported for CICS TS).



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Agenda

- How does your data get corrupted?
- CICSVR 1.2 limitations
- File Recovery, is it necessary?
- What do I need to do?
 - Get on your mark...perform initial setup
 - Get set...practice using CICSVR
 - GO! Now you're ready!
- Summary



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How does your data get corrupted?

- HW failures are a thing of the past (RAID)
- More likely damaged by:
 - A user program
 - An incorrect CICS transaction

CICSVR recovers lost or damaged VSAM spheres/files (data, index, AIXs). It uses the after-images and before-images recorded in the CICS system log or user journals.



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CICSVR 1.2 Limitations

CICSVR cannot:

- Forward Recover a VSAM file which does not have an associated journal containing after-images
- Backout a VSAM file which does not have an associated journal containing before-images
- Perform a forward recovery when no backup exists
- Recover batch (non-CICS) updates



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File Recovery - Is it necessary?



NO - Then what?

- Rekey in the changes?
 - Error prone and time consuming
 - May not be possible

YES - Then what?

- Use CICSVR Forward Recovery/Backout
 - Know that you can recover your data
 - Automate the recovery as much as possible
 - Get CICS production up and running ASAP



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What Do I Need To Do?



1. Get on your mark...perform some initial set up
2. Get set...practice using CICSVR
3. GO! Now you're ready!



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Get on your mark...Initial Setup

Get setup now...before the crisis!
Follow these steps:

1. Regularly backup your VSAM files
2. Decision: Journal to disk or tape?
3. Decision: Use CICSVR Archive or not?
4. Setup CICS



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Get on your mark...Initial Setup

STEP 1: Regularly backup your VSAM files

- Use VSAM BACKUP/RESTORE to create backups and retrieve the backup of the VSAM file (BACKUP and RESTORE are much faster than EXPORT/IMPORT or REPRO)
- CICSVR uses the restored VSAM sphere as the starting point for the forward recovery



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Get on your mark...Initial Setup

STEP 2: Decision: Journal to disk or tape?

	Disk	Tape *3
MOUNTs/ Interventions	NO *1	YES
Number of devices	OK	Limited
Write Performance	OK	Immediate WRITES to 3480/3490 is very limited in performance
Storage Suitability	Not suited for long term but OK with Archive to tape	Suited for long term
Archiving	Needed and *2	Not needed, but *2
*1) If JOUROPT PAUSE set, operator response needed when journal is full and will be switched. *2) CICSVR reblocks the journal (for faster forward recovery when needed) and provides an archive report with important VSAM file information. *3) Using an IBM 3494 VTS eliminates operator intervention.		



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Get on your mark...Initial Setup

STEP 2: Decision: Journal to disk or tape? (cont)

Recommendation:

Set up the CICS JCT to journal to 2 disk journals (JTYPE=DISK2) and use CICSVR Archive to copy the journal to tape (so you get the benefits of reblocking)



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Get on your mark...Initial Setup

STEP 3: Decision: Use CICSVR Archive or not?

You can setup CICS to automatically run CICSVR Archive. Archive produces:

- **An Archive report**, which lists information about the VSAM spheres on that journal: a) The VSAM data set names, b) The FCTNAMEs, and c) The tie-up records.
- **1-9 copies of the journal**. CICSVR reblocks every copy (*1), resulting in faster reading of the journal copies during the recovery.

*1) CICSVR reblocks the copy of the journal according to the ALLOCATE COPY...BLKSIZE parameter in the Archive job. So, be sure to specify a large BLKSIZE, like 32760. If * is specified for the BLKSIZE, 6000 is used.

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Get on your mark...Initial Setup

STEP 3: Decision: Use CICSVR Archive or not? (cont)

Archive jobs are easy to setup:

```
// JOB LOGCOPY
// LIBDEF PHASE,SEARCH=(PRD2.PR0111NL)
// ASSGN SYS010,292
// DLBL CICSLOG,'PRODCICS.DFHJ03A',,SD
// EXTENT SYS010,VOL001
// ASSGN SYS011,381
// TLBL CPY1,'PRODCICS.COPY1'
// ASSGN SYS003,SYSLST
// EXEC DWWAR,SIZE=4024K
      ALLOCATE LOG(CICSLOG)
      ALLOCATE COPY (CPY1) -
        DEVTYPE(TAPE) -
        DEVADDR(SYS011) -
        BLKSIZE(32760)
      ARCHIVE COPIES(1)
```

```
/*
/ &
```

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Get on your mark...Initial Setup

STEP 3: Decision: Use CICSVR Archive or not? (cont)

You could use VSE FASTCOPY to copy disk journals to tape instead of using CICSVR Archive. FASTCOPY:

Advantages:

- Reads disk journals FAST

Disadvantages:

- Has to RESTORE the copy before you can use it.
- Does not create an Archive report so **you don't know**:
 - What spheres are on that journal
 - Any tie-up info for the journal so you cannot tell if an earlier journal is needed for the recovery.
- Does not reblock the records so CICSVR cannot read journals as fast as it would have been able to with an Archive copy.



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Get on your mark...Initial Setup

STEP 4: Setup CICS

CICS TS:

- Use RDO to specify recovery attributes for your files.
- Define a JCT entry for each journal.
- Setup automatic archiving.

CICS/VSE:

- Use the FCT to specify recovery attributes for your files.
- Define a JCT entry for each journal.
- Setup automatic archiving.



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Get on your mark...Initial Setup

STEP 4: Setup CICS (cont)

For **CICS TS**, use RDO to specify recovery attributes for your files:

```
CEDA DEFINE FILE(name) GROUP(groupname)
```

```
VSAM PARAMETERS
```

```
....
```

```
DSNAME(file name)
```

```
RECOVERY PARAMETERS
```

```
RECOVERY(BACKOUTONLY|ALL)
```

```
FWDRECOVLOG(NO|1-99)
```

```
....
```

```
AUTO JOURNALING
```

```
JOURNAL(NO|value)
```

```
....
```

Recommendations:

CICSVR.TEST1

ALL

2 *1

NO

*1) Be sure to limit the number of journals that are defined. We recommend that you define less journals than the total # of tape drives available.

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Get on your mark...Initial Setup

STEP 4: Setup CICS (cont)

For **CICS TS** define a JCT entry for each journal and set up automatic archiving:

```
DFHJCT TYPE=ENTRY,
```

```
JFILEID=(SYSTEM|nn),
```

```
BUFSIZE=nnnnn,
```

```
DEVADDR=(SYSnnn[,SYSmmm]),
```

```
JOUROPT=(AUTOARCH),
```

```
ARCHJCL=(DFH$ARCH|member),
```

```
JTYPE=(TAPE1|TAPE2|DISK1|DISK2)
```

Recommendations:

2

32760 *1

AUTOARCH

DWWARCH

DISK2

*1) For more info on BUFSIZE, see Dr. Kraemer's and Dan Janda's CICS TS Performance Considerations paper, the CICS TS Journaling section.

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Get on your mark...Initial Setup

STEP 4: Setup CICS (cont)

CICS TS provides automatic journal archiving. To help you, we have provided:

- A job to create a journal archive control data set.
- A sample job skeleton for calling the CICSVR archive utility.

See the CICSVR/VSE 1.2 User's Guide and Reference, Chapter 3, Setting Up Automatic Archiving with CICS TS, for more details.



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Get on your mark...Initial Setup

STEP 4: Setup CICS (cont)

For **CICS/VSE**, use the FCT to specify recovery attributes for each of your files:

```
DFHFCT TYPE=FILE,  
FILE=name,  
ACCMETH=VSAM,  
JID=(SYSTEM|nn),  
JREQ=(WN,WU)
```

Recommendations:

```
BASE1  
VSAM  
2  
WN,WU
```



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Get on your mark...Initial Setup

STEP 4: Setup CICS (cont)

For **CICS/VSE**, define a JCT entry for each journal and set up automatic archiving:

```
DFHJCT TYPE=ENTRY,  
        JFILEID=(SYSTEM|nn),  
        BUFSIZE=nnnnn,  
        DEVADDR=(SYSnnn[,SYSmmm]),  
        JOUROPT=(CRUCIAL,PAUSE),  
        JTYPE=(TAPE1|TAPE2|DISK1|DISK2)
```

Recommendations:

2
32760 *1

CRUCIAL
DISK2

*1) For more info on BUFSIZE, see Dr. Kraemer's and Dan Janda's CICS TS Performance Considerations paper, the CICS TS Journaling section.



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Get on your mark...Initial Setup

STEP 4: Setup CICS (cont)

CICS/VSE does not have an automatic archiving function so we have implemented it in CICSVR and provided you with everything you need:

- A job to create an archive tracking file so you can list the names of the journals you want to archive.
- CICSVR's version of DFHXJCO and DFHXJCC (CICS/VSE user-replaceable programs) that provide automatic archiving.

See the CICSVR/VSE 1.2 User's Guide and Reference, Chapter 7, Setting Up CICS/VSE V2 to Call CICSVR Archive Automatically, for more details.



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Get set...Practice

You're all set! Let's do a practice run. Here's what we'll do:

1. **Restore the backup** copy of the VSAM file, CICSVR.TEST1
2. **Review the CICSVR archive reports** to find out:
 - Which journals contain the after-images for CICSVR.TEST1.
 - How many journals are needed.
 - The FCTNAME associated with the CICSVR.TEST1 file.
3. **Run a CICSVR forward recovery job** to apply the after-images from the forward recovery journal copy to the restored VSAM sphere, CICSVR.TEST1
4. **Run a CICSVR backout job** to remove all uncommitted changes to CICSVR.TEST2.



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Get set...Practice

Use **VSAM RESTORE** to retrieve the backup of the CICSVR.TEST1 file.



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Get set...Practice

Review the CICSVR **Archive report:**

```

CICSVR - ARCHIVE UTILITY

ARCHIVE STATISTICS FOR A CICS/TS JOURNAL
=====
CICS VERSION      :3
FIRST TIME       :00.159 14:15:30
LAST TIME        :00.159 17:23:28
...

VSAM DATA SET STATISTICS
=====
VSAM DATA SET NAME   DATE/TIME OF FIRST REFERENCE   DATE/TIME OF LAST REFERENCE
-----
CICSVR.TEST1         00.159 14:19:23             00.159 16:47:18
CICSVR.TEST2         00.159 14:21:37             00.159 17:23:27

TIE-UP STATISTICS
=====
FCT   DATE/TIME OF   FCT   BASE DATA SET NAME   PATH DATA SET NAME
NAME  TIE-UP RECORD   FORMAT
-----
BASE1 00.159 14:19:23   FIX   CICSVR.TEST1
BASE2 00.159 14:21:37   FIX   CICSVR.TEST2
...

```

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Get set...Practice

Review the CICSVR **Archive report (cont):**

```

CICSVR - ARCHIVE UTILITY

REDO FILE ID WITHOUT TIE-UPS
=====
FCT   DATE/TIME OF   DATE/TIME OF
NAME  FIRST REFERENCE  LAST REFERENCE
-----
BASE3 00.159 14:17:33   00.159 14:38:21

BACKOUT FAILING LOG RECORDS FOUND
=====
BASE DATA SET NAME   DATE/TIME OF   RECORD
                      LAST BOFLREC   TYPES
-----
CICSVR.TEST2         00.159 17:23:27   NONE

```

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Get set...Practice

Create a CICSVR **Forward Recovery job:**

```
// JOB CICSVR
// LIBDEF PHASE,SEARCH=(PRD2.PR0111NL)
// DLBL VSESPUC,'VSESP.USER.CATALOG',,VSAM
// DLBL BKUP1,'CICSVR.TEST1',,VSAM,CAT=VSESPUC
// TLBL CPY1,'PRODCICS.COPY1'
// ASSGN SYS011,181
// ASSGN SYS003,SYSLST
// EXEC DWWCO,SIZE=4024K
      ALLOCATE SPHERE(BKUP1)
      ALLOCATE LOG(CPY1) -
        DEVTYPE(TAPE) -
        DEVADDR(SYS011)
      RECOVER SPHERE(CICSVR.TEST1) -
        STARTTIME(00.159/14:19:23) -
        STOPTIME(00.159/16:47:18)
      BLDVRP B32K(100)
/*
/ &
```

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Get set...Practice

Create a CICSVR **Backout job:**

```
// JOB CICSVR
// LIBDEF PHASE,SEARCH=(PRD2.PR0111NL)
// DLBL VSESPUC,'VSESP.USER.CATALOG',,VSAM
// DLBL BKUP1,'CICSVR.TEST2',,VSAM,CAT=VSESPUC
// TLBL CPY1,'PRODCICS.COPY1'
// ASSGN SYS011,381
// ASSGN SYS003,SYSLST
// EXEC DWWCO,SIZE=4024K
      ALLOCATE SPHERE(BKUP1)
      ALLOCATE LOG(CPY1) -
        DEVTYPE(TAPE) -
        DEVADDR(SYS011)
      BACKOUT SPHERE(CICSVR.TEST2)
      BLDVRP B32K(100)
/*
/ &
```

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Go! Now you're ready!

You're now ready
to recover any VSAM data set
that needs recovering!



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Summary

Recovery is important...be prepared with CICSVR. All you have to do is:

1. **Get on your mark**...perform some initial setup
 - Regularly backup your VSAM files
 - Decide to journal to disk or tape
 - Decide to use CICSVR Archive or not
2. **Setup CICS**
3. **Get set**...practice using CICSVR
4. **GO!** Now you're ready!



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