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Getting Started with IBM Backup and Restore Manager for z/VM

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Agenda

- **Assumptions**
- **Preparing to install**
- **Installing using VMSES/E**
- **Configuring**
- **Verifying installation and configuration**

Assumptions

- **DIRMAINT is installed for directory management**
 - MAINT is authorized to issue AMDISK commands
 - AUTOG is available for group USER for minidisk definitions
- **Shared File System is available**
- **Installation ID is 5697J06B**
 - No PPF overrides
- **3390 DASD**
- **REXX Library (5695-014) is installed and available**
 - Alternatively use free download of REXX Alternate Library at:
<http://www.ibm.com/software/awdtools/rexx/rexxzseries/altlibrary.html>
- **Installing from tape (not an envelope file)**
- **Installing on minidisk (not SFS)**
- **Operations Manager is running on user ID OPMGRM1**
- **This is not the only way to perform the install**
 - Not all options are discussed
 - See product documentation for full details



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Preparing to Install

Create installation ID

Create an SFS server

Prepare system for VMSES/E installation

Where do I Start ???



- In the Program Directory ??



- In the Installation Guide ??



- Because we require SFS, we recommend you start with this presentation



Define the Installation ID: 5697J06B

- **From MAINT**

- Create a file called 5697J06B DIRECT

```
USER 5697J06B password 64M 256M BG
* 5697-J06 - SES install & admin for Backup Mgr V1.2
MACHINE ESA
IPL CMS
OPTION LNKNOPAS
CONSOLE 01F 3215
SPOOL 00C 2540 READER A
SPOOL 00D 2540 PUNCH A
SPOOL 00E 1403 A
LINK MAINT 190 190 RR
LINK MAINT 19D 19D R
LINK MAINT 19E 19E RR
LINK MAINT 51D 51D MR
LINK MAINT 5E5 5E5 RR
```

- Issue the command

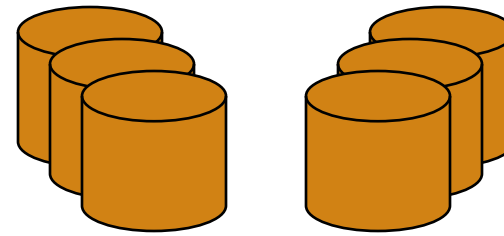
```
DIRM ADD 5697J06B
```

Define the Installation ID: 5697J06B

- **Add required minidisks**

- From MAINT, issue

```
DIRM FOR 5697J06B AMD 191 3390 AUTOG 10 USER MR
DIRM FOR 5697J06B AMD 198 3390 AUTOG 2 USER MR
DIRM FOR 5697J06B AMD 199 3390 AUTOG 5 USER MR
DIRM FOR 5697J06B AMD 2A2 3390 AUTOG 1 USER MR
DIRM FOR 5697J06B AMD 2B2 3390 AUTOG 5 USER MR
DIRM FOR 5697J06B AMD 2C2 3390 AUTOG 2 USER MR
DIRM FOR 5697J06B AMD 2D2 3390 AUTOG 10 USER MR
DIRM FOR 5697J06B AMD 2A6 3390 AUTOG 1 USER MR
DIRM FOR 5697J06B AMD 491 3390 AUTOG 5 USER MR
DIRM FOR 5697J06B AMD 492 3390 AUTOG 5 USER MR
DIRM FOR 5697J06B AMD 591 3390 AUTOG 5 USER MR
DIRM FOR 5697J06B AMD 592 3390 AUTOG 5 USER MR
DIRM FOR 5697J06B AMD 49D 3390 AUTOG 5 USER MR
```



Format All Minidisks

- **From MAINT, issue**

```
link 5697J06B 191 333 MR
```


```
format 333 z
```

```
release z (det
```

- **Repeat for each 5697J06B disk**

Create New SFS Server and File Pool

■ Background

- Backup catalog is stored in SFS
 - Separate file pool dedicated to Backup is recommended
 - Should not use VMSYS: or VMSYSU:
 - We'll use **BKRSFS:** here, with **BKRSVSFS** as the server
- Recommend starting with at least 3000 cylinders
 - Large sites will need more
 - Your mileage may vary 
- Need space for service machine work areas also
 - We'll use BKRSFS: for this also
- BKRSVSFS is a repository file pool server
 - Does not perform Coordinated Resource Recovery (CRR)
- Reference: “CMS File Pool Planning, Administration, and Operation” (SC24-6074)

Create New SFS Server: BKRSVSFS

- From MAINT, create and add directory entry for BKRSVSFS, using most of the sample values
 - Same procedure used to create user ID 5679J06B
 - Do not format the disks after you've added them

BKRSVSFS DIRECT

```
USER BKRSVSFS password 32M 32M BG
OPTION MAXCONN 2000 NOMDCFS APPLMON QUICKDSP SVMSTAT
SHARE REL 1500
MACHINE XC
IUCV ALLOW
IUCV *IDENT RESANY GLOBAL
IPL CMS
CONSOLE 009 3215 T OPMGRM1
SPOOL 00C 2540 READER *
SPOOL 00D 2540 PUNCH A
SPOOL 00E 1403
LINK MAINT 190 190 RR
LINK MAINT 193 193 RR
LINK MAINT 19D 19D RR
```

Make Ops Mgr the secondary console

BKRSVSFS Directory Entry (continued)

- From MAINT, issue

DIRM FOR BKRSVSFS AMD 191 3390 AUTOG 2 USER W	Work disk
DIRM FOR BKRSVSFS AMD 250 3390 AUTOG 30 USER R PW readpw writepw	Control disk
DIRM FOR BKRSVSFS MINIOPT 250 NOMDC	
DIRM FOR BKRSVSFS AMD 405 3390 AUTOG 10 USER R PW readpw writepw	Repository log disks
DIRM FOR BKRSVSFS AMD 406 3390 AUTOG 10 USER R PW readpw writepw	
DIRM FOR BKRSVSFS MINIOPT 405 NOMDC	
DIRM FOR BKRSVSFS MINIOPT 406 NOMDC	
DIRM FOR BKRSVSFS AMD 260 3390 AUTOG 10 USER R PW readpw writepw	Initial catalog disk
DIRM FOR BKRSVSFS AMD 310 3390 AUTOG 750 USER R PW readpw writepw	User data disks
DIRM FOR BKRSVSFS AMD 311 3390 AUTOG 750 USER R PW readpw writepw	
DIRM FOR BKRSVSFS AMD 312 3390 AUTOG 750 USER R PW readpw writepw	
DIRM FOR BKRSVSFS AMD 313 3390 AUTOG 750 USER R PW readpw writepw	

Initial SFS Server Setup: BKRSVSFS

- **Format 191 disk**

- From BKRSVSFS, issue

- ```
format 191 a
```

- **Create a PROFILE EXEC on the 191 disk, containing**

```
/* */
'ACCESS 193 C'
'CP SET EMSG ON'
Exit 0
```

- **Run the PROFILE**

- profile

## Define Startup Parameters for SFS Server: BKRSVSFS

- **On BKRSVSFS 191 disk, create a file called BKRSVSFS DMSPARMS**

```
ADMIN 5697J06B
ADMIN BKRADMIN
ADMIN BKRBKUP
ADMIN BKRWRK01
ADMIN BKRWRK02
ADMIN BKRWRK03
ADMIN BKRWRK04
NOBACKUP
FILEPOOLID BKRSFS
NOCRR
NOLUNAME
SAVESEGID CMSFILES
USERS 700
```

## Generate the File Pool BKRSFS

- **From BKRSVSFS, issue**  
fileserv generate
- **When prompted in \$\$TEMP \$POOLDEF, enter**

```
MAXUSERS=1000
MAXDISKS=500
DDNAME=CONTROL VDEV=250
DDNAME=LOG1 VDEV=405
DDNAME=LOG2 VDEV=406
DDNAME=MDK00001 VDEV=260 GROUP=1 BLOCKS=0
DDNAME=MDK00002 VDEV=310 GROUP=2 BLOCKS=0
DDNAME=MDK00003 VDEV=311 GROUP=2 BLOCKS=0
DDNAME=MDK00004 VDEV=312 GROUP=2 BLOCKS=0
DDNAME=MDK00005 VDEV=313 GROUP=2 BLOCKS=0
```

- **Then** FILE

## Final SFS Server Tasks for BKRSVSFS

- **Start the server**
  - From BKRSVSFS, issue

```
fileserv start
#cp disc
```



## Authorize Users and Create Directories in SFS

- **Authorize administrators and service machines**

- From 5697J06B, issue

```
enroll user bkradmin bkrsfs (blocks 4000 storgroup 2
enroll user bkrbkup bkrsfs (blocks 4000 storgroup 2
enroll user bkrcatlg bkrsfs (blocks 500000 storgroup 2
enroll user bkrwrk01 bkrsfs (blocks 20000 storgroup 2
enroll user bkrwrk02 bkrsfs (blocks 20000 storgroup 2
enroll user bkrwrk03 bkrsfs (blocks 20000 storgroup 2
enroll user bkrwrk04 bkrsfs (blocks 20000 storgroup 2
```

- **Create required directory entries**

- From 5697J06B, issue

```
create directory bkrsfs:bkradmin.workarea
create directory bkrsfs:bkrcatlg.workarea
create directory bkrsfs:bkrbkup.workarea
create directory bkrsfs:bkrwrk01.workarea
create directory bkrsfs:bkrwrk02.workarea
create directory bkrsfs:bkrwrk03.workarea
create directory bkrsfs:bkrwrk04.workarea
```

## Authorize Users and Create Directories in SFS

- Create required directory entries for service machines

- From 5697J06B, issue

```
enroll user bkradmin bkrsfs (blocks 4000 storgroup 2
enroll user bkrbkup bkrsfs (blocks 4000 storgroup 2
enroll user bkrcatlg bkrsfs (blocks 4000 storgroup 2
enroll user bkrwrk01 bkrsfs (blocks 4000 storgroup 2
enroll user bkrwrk02 bkrsfs (blocks 4000 storgroup 2
enroll user bkrwrk03 bkrsfs (blocks 4000 storgroup 2
enroll user bkrwrk04 bkrsfs (blocks 20000 storgroup 2
create directory bkrsfs:bkrcatlg.workarea
create directory bkrsfs:bkrwrk01.workarea
create directory bkrsfs:bkrwrk02.workarea
create directory bkrsfs:bkrwrk03.workarea
create directory bkrsfs:bkrwrk04.workarea
```

It's okay if these user  
IDs don't actually  
exist yet

## Take a Breath – New SFS Server is Set Up

If you've never set up SFS before,  
this is the hardest part of the product install

## Prepare for VMSES/E Installation

- **From 5697J06B**

- Mount installation tape at virtual address 181

- Link and access MAINT disks

```
link MAINT 5e5 5e5 rr
```

```
access 5e5 b
```

```
link MAINT 51d 51d mr
```

```
access 51d d
```

- Load product control files

```
vmfins install info (nomemo
```

- Obtain planning info

```
vmfins install ppf 5697J06B BKUPMGR (plan nomemo
```

- Review for errors

```
vmfview install
```

## Create Directory Entries for All Required Users

- **Use directory entry samples in 5697J06B PLANINFO**
  - Located on 5697J06B 191 disk
- **Follow steps outlined earlier for creating 5697J06B user ID to create directory entries for**
  - BKRADMIN
  - BKRCATLG
  - BKRBKUP
  - BKRWRK01
  - BKRWRK02
  - BKRWRK03
  - BKRWRK04

## Format All Minidisks

- **From 5697J06B, issue**

```
link BKRADMIN 191 333 MR
```

```
format 333 z
```

```
release z (det
```

- **Repeat for each disk**



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## Installing using VMSES/E

## Initial VMSES/E Install

- **From 5697J06B**

- Create and run a PROFILE EXEC

```
xedit profile exec a
===> input /**/
===> input 'access 5e5 b'
===> input 'access 51d d'
===> input 'CP SET PF12 RETRIEVE'
===> file
profile
```

- Mount product tape at virtual address 181

- If not already done

- Load the product code to disk and install

```
vmfins install ppf 5697J06B BKUPMGR (nomemo nolink
```



## Initial VMSES/E Install (continued)

- Review for errors

```
vmfview install
```

- Update Build Status Table

```
vmfins build ppf 5697J06B BKUPMGR (serviced nolink
```

- Review for errors

```
vmfview install
```

## Where Code is Installed for Configuration and Testing

| <b>Disk on<br/>5697J06B</b> | <b>Description</b>                                                                                                                  |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>2C2</b>                  | <b>Sample files</b>                                                                                                                 |
| <b>491</b>                  | <b>Service machine executables for</b> <ul style="list-style-type: none"><li>-BKRBKUP</li><li>-BKRCATLG</li><li>-BKRWRKxx</li></ul> |
| <b>492</b>                  | <b>End user and administrator executables</b>                                                                                       |
| <b>198</b>                  | <b>Configuration files</b>                                                                                                          |
| <b>199</b>                  | <b>Backup job templates</b>                                                                                                         |
| <b>49D</b>                  | <b>Help files for test system</b>                                                                                                   |

## VMSES/E Installation is Complete

- **All code is installed from tape**
- **Standard install commands used by most z/VM products**
- **This was the easy part**



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# Configuring

## Verify System Access Privileges for Backup Servers

| <b>User ID</b>  | <b>Privileges Required and <i>Recommended</i></b>                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BKADMIN</b>  | <ul style="list-style-type: none"> <li>➤ <b>OPTION LNKNOPAS</b> (or equivalent, such as <b>RACF OPERATIONS</b>)</li> <li>➤ <b>Privilege Class G</b></li> <li>➤ <i>Privilege Class B (for CP MSGNOH)</i></li> </ul>                                                                                                                                                                                                               |
| <b>BKRBKUP</b>  | <ul style="list-style-type: none"> <li>➤ <b>OPTION LNKNOPAS</b> (or equivalent, such as <b>RACF OPERATIONS</b>)</li> <li>➤ <b>Privilege Class G</b></li> <li>➤ <b>Privilege Class A</b> (for CP FORCE)</li> <li>➤ <b>Privilege Class B</b> (CP MSGNOH)</li> <li>➤ <b>Privilege Class D</b> (CP PURGE)</li> </ul>                                                                                                                 |
| <b>BKRCATLG</b> | <ul style="list-style-type: none"> <li>➤ <b>Privilege Class G</b></li> <li>➤ <b>Privilege Class B</b> (CP MSGNOH)</li> <li>➤ <i><b>OPTION LNKNOPAS</b> (or equivalent, such as <b>RACF OPERATIONS</b>) if backing up to disk</i></li> </ul>                                                                                                                                                                                      |
| <b>BKRWRKxx</b> | <ul style="list-style-type: none"> <li>➤ <b>OPTION LNKNOPAS</b> (or equivalent, such as <b>RACF OPERATIONS</b>)</li> <li>➤ <b>Privilege Class G</b></li> <li>➤ <b>Privilege Class B</b> (for CP MSGNOH)</li> <li>➤ <i><b>OPTION DEVINFO</b> (if you have minidisks defined with DEVNO or &amp;SYSRES options)</i></li> <li>➤ <i><b>OPTION LNKSTABL</b> (if you want to link disks in STABLE mode during a backup)</i></li> </ul> |

## Create PROFILE EXECs for Test Service Machines

- **PROFILE EXEC for BKRADMIN**

- From 5697J06B

```
link bkradmin 191 291 mr
acc 291 z
acc 2c2 e
copy admprof sampexec e profile exec z
xedit profile exec z
```

- **Change**

```
'ACCESS' SFS_Pool':BKRADMIN.CONFIGURATION B/B'
'ACCESS' SFS_Pool':BKRADMIN.RUNTIME C/C'
'ACCESS' SFS_Pool':BKRADMIN.JOBDEFS E'
```

- **To**

```
'ACCESS 198 B/B'
'LINK 5697J06B 491 491 RR'
'ACCESS 491 C/C'
'ACCESS 199 E'
```

- **Change**

```
SFS_Pool = 'ROCKSFS1'
```

- **To**

```
SFS_Pool = 'BKRSFS'
```

- **Add**

```
'ACCESS 592 F' /* Access end user and admin routines */
```

```
file
```

## Create PROFILE EXECs for Test Service Machines

- **PROFILE EXEC for BKRCATLG**

- From 5697J06B

```
link bkrcatlg 191 292 mr
acc 292 z
acc 2c2 e
copy catprof sampexec e profile exec z
xedit profile exec z
```

- **Change**

```
'ACCESS' SFS_Pool':BKRADMIN.CONFIGURATION B/B'
'ACCESS' SFS_Pool':BKRADMIN.RUNTIME C/C'
```

- **To**

```
'ACCESS 198 B/B'
'LINK 5697J06B 491 491 RR'
'ACCESS 491 C/C'
```

- **Change**

```
'ACCESS ROCKSFS2:RVBCATLG.WORKAREA D (FORCERW'
```

- **To**

```
'ACCESS .WORKAREA D (FORCERW'
```

- **Change**

```
SFS_Pool = 'ROCKSFS1'
```

- **To**

```
SFS_Pool = 'BKRSFS'
```

```
file
```

## Create PROFILE EXECs for Test Service Machines

- **PROFILE EXEC for BKRBKUP**

- From 5697J06B

```
link bkrbkup 191 293 mr
acc 293 z
acc 2c2 e
copy mastprof sampexec e profile exec z
xedit profile exec z
```

- **Change**

```
'ACCESS' SFS_Pool':BKRADMIN.CONFIGURATION B/B'
'ACCESS' SFS_Pool':BKRADMIN.RUNTIME C/C'
'ACCESS' SFS_Pool':BKRADMIN.JOBDEFS E/E'
```

- **To**

```
'ACCESS 198 B/B'
'LINK 5697J06B 491 491 RR'
'ACCESS 491 C/C'
'ACCESS 199 E/E'
```

- **Change**

```
SFS_Pool = 'ROCKSFS1'
```

- **To**

```
SFS_Pool = 'BKRSFS'
```

file



## Create PROFILE EXECs for Test Service Machines

- **PROFILE EXEC for BKRWRK01**

- From 5697J06B

```
link bkrwrk01 191 294 mr
acc 294 z
acc 2c2 e
copy wrkprof sampexec e profile exec z
xedit profile exec z
```

- **Change**

```
'ACCESS' SFS_Pool':BKRADMIN.CONFIGURATION B/B'
'ACCESS' SFS_Pool':BKRADMIN.RUNTIME C/C'
```

- **To**

```
'ACCESS 198 B/B'
'LINK 5697J06B 491 491 RR'
'ACCESS 491 C/C'
```

- **Change**

```
SFS_Pool = 'ROCKSFS1'
```

- **To**

```
SFS_Pool = 'BKRSFS'
```

File

- **Repeat for BKRWRK02, BKRWRK03, and BKRWRK04**

## Define Special Users to Backup Manager

- **From 5697J06B**

```
access 198 z
```

```
access 2c2 e
```

```
copy bkrusers namesamp e = names z
```

```
xedit bkrusers names z
```

- Add additional administrators:
  - BKRBKUP
  - Others as required by your site
- Use defaults for other fields
- Copy BKRUSER NAMES to a shared disk for user and server access
  - E.g. MAINT 19E (Y disk) or 5697J06B 492

## Update the Configuration File: BKRSYSTEM CONFIG

- **From 5697J06B**

```
access 198 z
```

```
access 2c2 e
```

```
copy bkrsystem confsamp e = config z
```

```
xedit bkrsystem config z
```

## Update the Configuration File: BKRSYSTEM CONFIG

- **Choose local options for**

```
Local_SVM_Contact = System Administrator - sysadmin@some.corp.com
```

- Contact name displayed on service machines
- Not used for automated e-mails or messages

```
Template_MDISK_Buffer_Pages = 512
```

- Increase this value if you have more than 30,000 minidisks on the system

```
BKR_Allow_EDF_Target_Format = 0
```

- Change to 1 if you want Backup Manager to format unformatted minidisks on restore

```
CatalogPool = RS54QA02
```

- Change to BKRSFS

- **Copy BKRSYSTEM CONFIG to a shared disk**

- E.g. MAINT 19E (Y disk) or 5697J06B 492

## Complete SFS Configuration and Authorization

- **Create backup catalog structure in SFS**
  - From 5697J06B, issue

```
acc 591 c
setupcat
```
  - Issue all SFS CREATE DIRECTORY commands displayed by SETUPCAT
- **Give all users access to the catalog for restore requests**
  - User access is limited to catalog directories for their own data
  - From 5697J06B, issue

```
enroll public bkrsfs:
```

## Create Backup Job to Test

- **Use a shipped sample template as a model**

- From 5697J06B, issue

```
access 2c2 e
```

```
access 199 z
```

```
copy sampfull tempsamp e testfull template z
```

```
xedit testfull template z
```

## Customize the Backup Job: TESTFULL

- **Choose local options for**

```
CONFIG BKR_JOB_WORKERS = 1
```

- Increase the number of workers based on the number of items to backup

```
CONFIG BKR_JOB_NAME = SAMPFULL
```

- Change to TESTFULL

```
CONSOLE * Sample full backup generated
```

- Change “Sample full” to indicate name of backup job TESTFULL

```
CP_QUIET SPOOL CONSOLE CLOSE NAME SAMPFULL $$SDATE$$
```

- Change SAMPFULL to TESTFULL

- **Many other options available**

- See job statements and comments in SAMPFULL TEMPSAMP

# Customize the Backup Job: TESTFULL

- **Update INCLUDE and EXCLUDE statements**

- Delete or replace the following entries for Linux guests

```
EXCLUDE MINIDISK MACK0* = *
INCLUDE MINIDISK MACK0* = 019*
EXCLUDE MINIDISK R54TUX* = *
INCLUDE MINIDISK R54TUX* = 019*
```

- Delete the following entries

```
EXCLUDE MINIDISK MAINT = 0123
EXCLUDE MINIDISK MAINT = 0124
INCLUDE MINIDISK MAINT = 012*
INCLUDE SFS VMDEVU: * *
```

- Change the following to reflect BKRSVSFS instead of SAMPSFS

```
EXCLUDE MINIDISK SAMPSFS* = *
INCLUDE MINIDISK SAMPSFS* = 019*
```

- Modify the following to exclude large minidisks

```
EXCLUDE MINIDISK * = * * * = * = * > 3300
```

- **FILE to save changes**



## Configuration is Complete

- **Now let's see if it actually works!**





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# Verifying

# Start Backup Manager Service Machines

- **Start required Backup Manager servers**
  - From MAINT, issue

```
cp xautolog bkrcatlg
cp xautolog bkrbkup
```
- **Starting workers is recommended when product is first installed to verify configuration**
  - From MAINT, issue

```
cp xautolog bkrwrk01
```
  - Repeat for other workers
- **Starting workers (BKRWRKxx) is not required in general**
  - BKRBKUP will start them when needed
- **Verify servers are up and running**
  - From MAINT, issue

```
cp msg bkrbkup status
cp msg bkrwrk01 status
```
  - Repeat for other workers
- **Workers automatically logged off when idle timeout expires**

## Submit a Backup Job

- **Submit a job for review**

- From BKRADMIN, issue

```
msg bkrbkup review testfull
```

- Review files returned to BKRADMIN's reader

- TESTFULL LINKFAIL

- All errors linking to disks included in backup job

- TESTFULn JOB

- One file for each backup worker assigned

- All configuration statements with (most) variables resolved

- All DUMPxxx statements for data that would be backed up

- > xxx = CKD, EDF, SFS, FBA

## Submit a Backup Job

- **Submit a job and perform real backup**
  - From BKRADMIN, issue

```
msg bkrbkup submit testfull
```
  - Review files returned to BKRADMIN's reader
  - Review consoles of BKRWRKxx servers
    - From BKRADMIN, issue

```
GOMCMD OPMGRM1 VIEWCON USER(BKRWRKxx)
```

# Backup and Restore Manager is Up and Running



- **Major task is SFS setup**
  - Especially if you aren't familiar with SFS
- **VMSES/E install is straightforward**
- **Configuration is quick for initial testing**
  - Use the defaults for most things
  - Give all options some thought before production use
- **Use your in-house procedures to move it to production**

## References and More Information

- **Backup and Restore Manager for z/VM Web site**
  - <http://www.ibm.com/software/stormgmt/zvm/backup>
    - Publications
    - Pre-requisites
    - Announcements
    - Support
- **e-mail: Tracy Dean, [tld1@us.ibm.com](mailto:tld1@us.ibm.com)**
- **Publications**
  - CMS File Pool Planning, Administration, and Operation (SC24-6074)
  - Directory Maintenance Facility Commands Reference (SC24-6133)
  - Backup and Restore Manager for z/VM Program Directory (GI10-8662)
  - Backup and Restore Manager for z/VM Administration Guide (SC18-9346)
  - Backup and Restore Manager for z/VM User Guide (SC18-9523)