



IBM Software

IBM Backup and Restore Manager for z/VM

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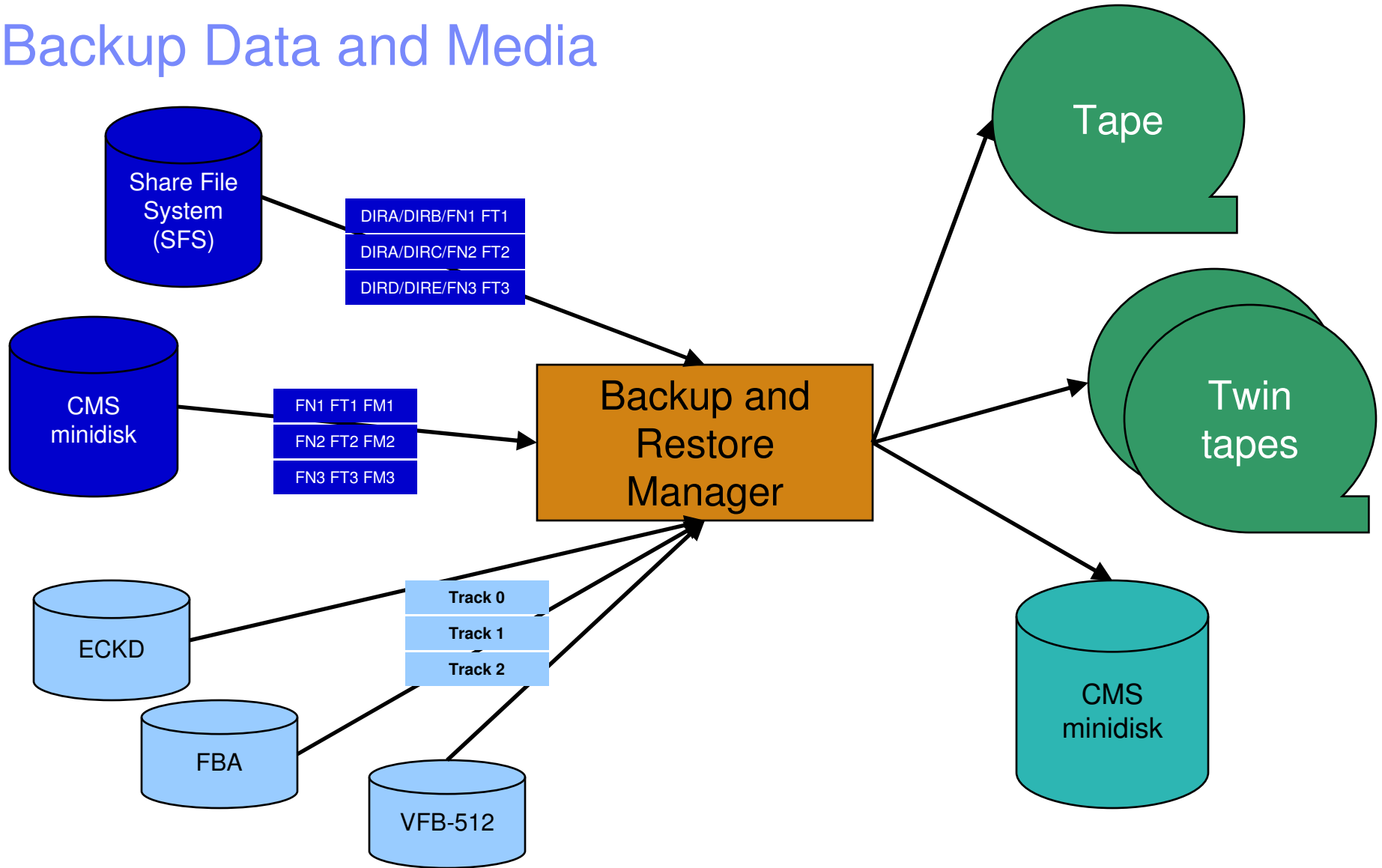
Agenda

- **Backup and Restore Manager for z/VM**
 - Overview
 - Key benefits
 - Features and functions
 - Summary
 - Demo

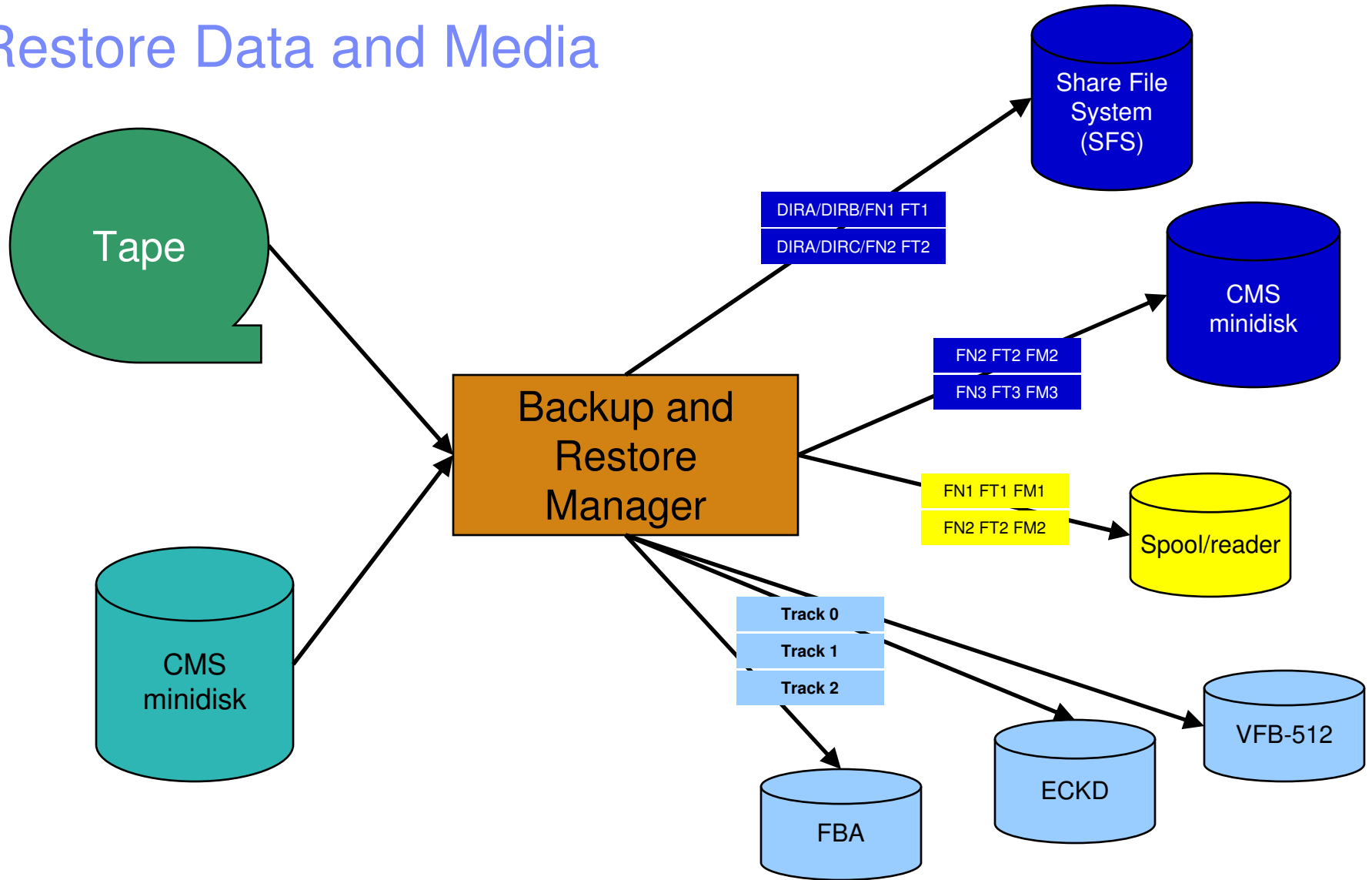
Product Overview

- **Backup**
 - Requested by administrators
 - Full or incremental
 - Integration with Tape Manager for z/VM
 - Include/exclude minidisks or filepools
 - Mask by filename
- **Restore**
 - Performed by users for their own data, or administrators for any data
 - Selection of data to restore
 - Full screen interface or command
 - Individual files, with wildcard support
- **Backup catalog maintained in Shared File System (SFS)**

Backup Data and Media

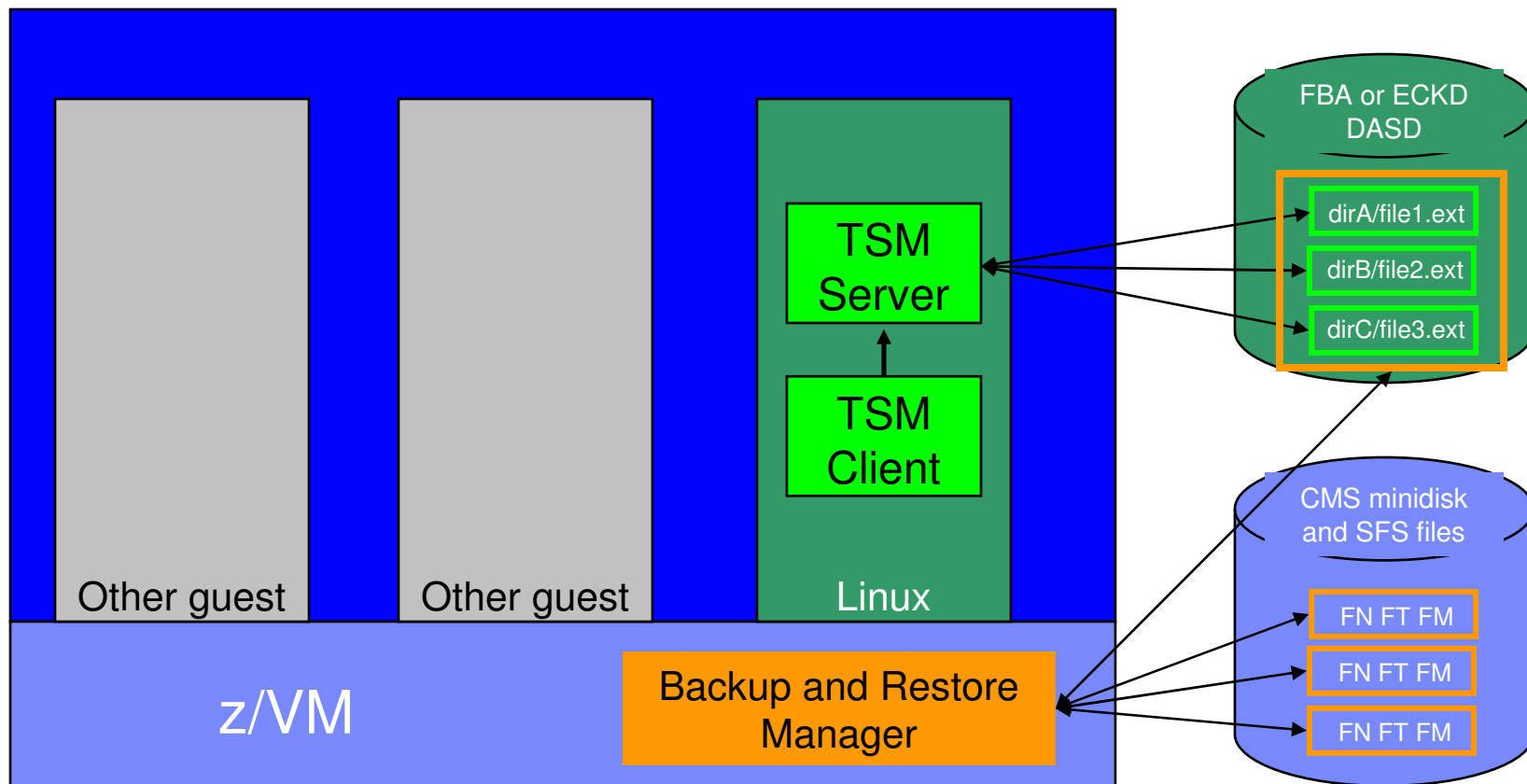


Restore Data and Media



Backup and Restore Manager and Linux Guests

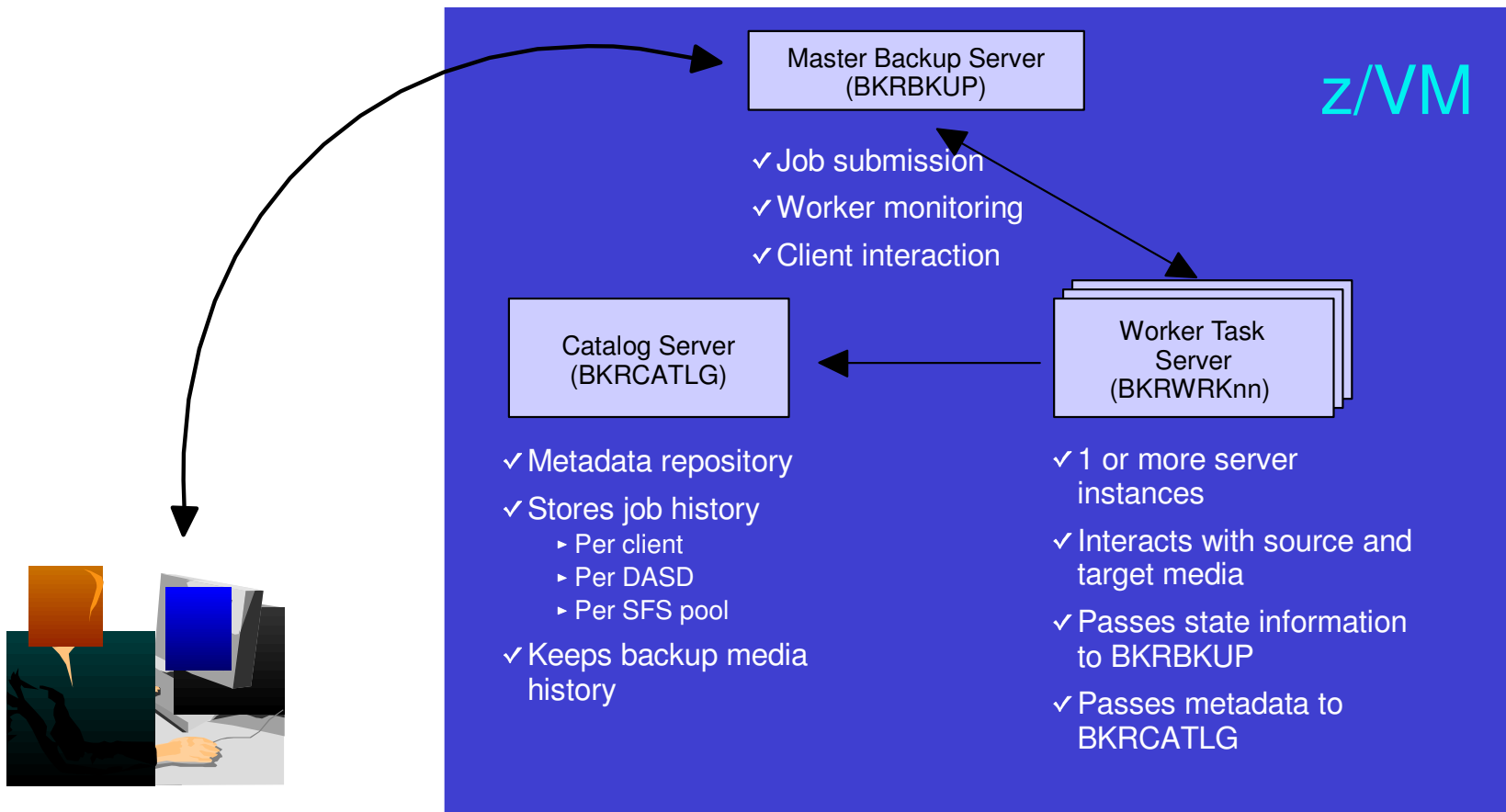
Using Backup and Restore Manager with Tivoli Store Manager



Key Benefits

- **System backups available for Disaster Recovery**
- **Guest backups available for restoring to a previous state/level**
- **Backups of user data available for**
 - Restoring to a previous state/level
 - Replacing files accidentally erased
- **Users restore their own data**
 - No administrator interaction required
- **Flexible selection of data to back up**
 - Include/exclude minidisks, directories, extents
 - Mask by filename, filetype, or SFS path
 - Review of a defined backup job before submission
- **Management of backup data**
 - Retention set as part of the backup job
 - Automatic aging and pruning of the backup catalog
- **Reduced backup window with concurrent processing**
 - Multiple worker service machines sharing the job
 - Suggest one worker service machine for each available tape drive

Backup and Restore Manager



Features and Functions

- **Backups requested by administrators only**
 - Incremental or full backups
- **Restores requested by**
 - Users for their own data
 - Administrators for any data
- **Data compression**
- **Encryption exits**
- **Reserving worker machines for specific tasks**
- **Integration with IBM Tape Manager for z/VM**

Backups Requested by Administrators

- **Define a backup job**
- **Submit the job for review**
- **Verify the results**
- **Submit the job for backup**
- **Copy and modify the job for incremental backups**
 - Includes only files that have changed since last full backup
- **Submit full and incremental jobs on a regular schedule for future backups**
 - Use Operations Manager for z/VM to automate

Define a Backup Job

Job template: FULLBKUP TEMPLATE

```
CONFIG BKR_OUTPUT_SPEC = IBMTAPE SCRATCH RW 1
*CONFIG BKR_OUTPUT_SPEC = IBMTWIN SCRATCH RW 1 SCRATCH
*CONFIG BKR_OUTPUT_SPEC = CMSFILE DISK POOL X
*
CONFIG BKR_JOB_WORKERS = 3
CONFIG BKR_JOB_NAME = FULLBKUP
*
CONFIG BKR_JOB_CMS_FILEMASK = * * *
CONFIG BKR_JOB_SFS_PATHMASK = *
*
CONFIG BKR_JOB_CATALOG = Y
CONFIG BKR_CATALOG_RETENTION = 30
CONFIG BKR_CATALOG_VERBOSE = N
CONFIG BKR_OUT_EDF_VERBOSE = N
CONFIG BKR_OUT_TAPE_VERBOSE = N
*
CONFIG BKR_EDF_INCR_TOGGLE = N
CONFIG BKR_SFS_INCR_TOGGLE = N
CONFIG BKR_JOB_BACKUP_RESERVED_AS_IMAGE = NO
CONFIG BKR_OUT_EDF_UDPE1 = BKREXT3A
```

Define a Backup Job

Job template: FULLBKUP TEMPLATE

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```

Backup to tape,
twin tapes, or disk

Number of worker
service machines to use

Filter for files and paths
included in backup

Define a Backup Job

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```

Number of days to retain each instance of this backup

Incremental or full backup

Compress data during backup

... Define a Backup Job

```

/* Include/Exclude definitions */
/*****/
FUNCTION MEDIATYPE OWNER VDEV VOLUME DEVTYPE START END SIZE
|-----|-----|-----|-----|-----|-----|-----|-----|
INCLUDE MINIDISK * = * * * = * = * = *
EXCLUDE MINIDISK FDISK = * * * = * = * = *
EXCLUDE MINIDISK $ALLOCS = * * * = * = * = *
EXCLUDE MINIDISK *LNX* = * * * = * = * = *
EXCLUDE MINIDISK MAINT = 0123 * * = * = * = *
EXCLUDE MINIDISK MAINT = 0124 * * = * = * = *
EXCLUDE MINIDISK VMSERV* = * * * = * = * = *
INCLUDE MINIDISK VMSERV* = 019* * * = * = * = *
EXCLUDE MINIDISK * = * * * = * = * = * > 3300
INCLUDE MINIDISK MAINT = 012* * * = * = * = *

FUNCTION MEDIATYPE POOLNAME OWNER FS
|-----|-----|-----|-----|-----|
INCLUDE SFS VMSYSU: * SFS
EXCLUDE SFS VMSYSU: VMSERVU *

FUNCTION MEDIATYPE ADDRESS
|-----|-----|-----|
INCLUDE RDEVICE 0800-090F
EXCLUDE RDEVICE 081*

FUNCTION MEDIATYPE VOLSER
|-----|-----|-----|
INCLUDE RDEVVOL 510*
EXCLUDE RDEVVOL 510PAG
EXCLUDE RDEVVOL 510SPL
    
```

Restores Requested by Users

- **Full screen interface**
 - Use filters to find the files they wish to restore
 - Start filtering
 - By minidisk
 - By volume
 - By backup instance
 - All data
 - Select files to restore
 - Select restore location
 - Minidisk
 - SFS
 - Reader
- **No administrator intervention required**

Compression and Encryption

- **Two general purpose User Data Processing Exits (UDPE)**
- **Intended for compression and encryption**
- **Each called with a block of data**
 - Accepts more, less, or no data in return
 - Output of exit 1 (compression) is input to exit 2 (encryption)
 - Output of exit 2 is appended to current block of data ready to write to tape, twin tapes, or disk
- **Name of exit(s) specified at the job level**
 - Compression and/or encryption routines can be unique to each backup job
 - TEXT deck loaded dynamically when initially required
- **Compression routines provided**
 - Supported routine using CMS compression services provided Object Code Only
 - Can replace supplied dictionaries with ones you create using VM-supplied routines and your data
 - Sample routine using basic run-length encoding provided as source code
 - Demonstrates how to write your own exit if you prefer
- **Compression recommended for disk only**
 - Use hardware features of tape devices for compression on tape
 - Be aware of increased CPU consumption
- **Requirement for supported encryption routine understood**

Reserving Workers for Specific Tasks

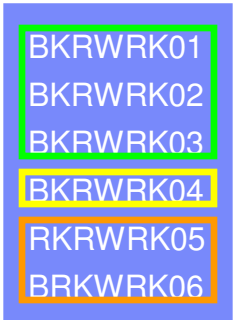
- **Reserve worker service machines for**
 - Backup only
 - Restore only
 - Both
 - (Neither)
- **Master server still performs include/exclude processing and worker assignment**

In BKRUSERS NAMES:

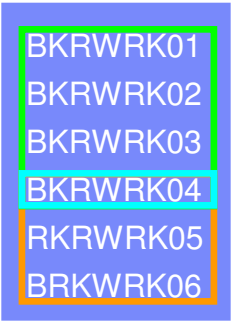
```
:nick.WORKERS :list.BKRWRK01 BKRWRK02 BKRWRK03 BKRWRK04 BKRWRK05 BRKWRK06
```

In BKRSYSTEM CONFIG:

```
Workers_reserved_for_backup = 3
Workers_reserved_for_restore = 2
```



Backup only
Restore only
Both
Neither



In BKRSYSTEM CONFIG:

```
Workers_reserved_for_backup = 4
Workers_reserved_for_restore = 3
```

Integration with Tape Manager for z/VM

- **Request scratch tapes when a new backup is performed**
 - Can include tape pool name as part of backup job to pull scratch tapes from a specific tape pool
 - Can be unique to each backup job
 - Default specified at system level
- **Request tape by specific volser when a restore is requested**
- **Set tape retention to match backup retention**
- **Expire tapes when backup content expires**

Backup and Restore Manager Summary

- **Flexibility**

- Backup only what is needed via include, exclude, and masking statements
- Mix and match source and target types

- **Productivity**

- Review of backup job before submission
- User driven restores with no administrator interaction

- **Control**

- Each user can only access restore data owned by him/her
- Automatic aging and pruning of backup catalog
- Consistent backups using the object directory (not source)

- **Demo**

Demo

- **User modifies a file**
- **Administrator performs an incremental backup**
 - Uses Operations Manager to monitor the progress
- **User restores the original file from an earlier backup**