



| z/TPF V1.1

# TPF Users Group Fall 2008 Online DASD Formatter z/TPF APAR PJ32688

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# Topics

- **Online DASD Formatter**
  - Overview and Basic Format Procedure
  - Expanded Format Procedure
  - Additional Formatter Displays and Controls
- **Module Copy and Formatting**
- **No Downtime Expansion**

## Online DASD Formatter Overview

- **Provides ability to format unused areas of online DASD modules**
  - New type of RAMFIL statement that defines areas in the SIP deck as eligible to be formatted
    - Referred to as format ranges
  - New ZFMTR CONTROL and ZFMTR ONLINE commands
    - Select format ranges and modules to format
    - Control the format process
      - Start, stop, pause, and resume the formatter
      - Manage formatter settings
    - Formatter status and displays

## Basic Format Procedure

- **Basic format procedure to format unused tracks across all modules for a device type (DEVx = DEVA/B/C/D)**
  1. Define format ranges in the SIP deck
    - RAMFIL RECID=IFORMAT
  2. Build and load a new FACE Table (FCTB)
    - ZFCTB LOAD/ACTIVATE
  3. Select all format ranges
    - ZFMTR ONLINE DEVx ADD IFORMAT-ALL
  4. Start the formatter for all modules
    - ZFMTR ONLINE DEVx START FMOD-ALL MODS-ALL
  5. Continue the format process
    - ZFMTR ONLINE DEVx CONTINUE
  6. Wait for the formatter to complete

## Define Format Ranges in the SIP deck

- **Define format ranges using RAMFIL macro statements with RECID=IFORMAT**
  - TYPE and DUPE parameters define the device type, record size, and record duplication
  - BASE parameter defines starting cylinder/track
  - RECNO parameter defines total number of records to format
    - Used to define number of tracks to format
    - RECNO must cover all records on this set of tracks to the last track on last module for this device type
  - Example: Define 2 tracks of 4K records starting at cylinder 200, track 11 (assumes device A has ten 3390 prime mods)

```
RAMFIL TYPE=4SA,RECID=IFORMAT,RECNO=240,  
DUPE=YES,BASE=20011
```

- **No limit to the number of format ranges defined or size of each format range**

# Select Format Ranges on z/TPF

- **Select format ranges to format by adding format ranges to the format table**
  - Format ranges must be defined in the FACE Table (FCTB) using RAMFIL RECID=IFORMAT to add them to the format table
  - Format ranges may not be added or deleted while the formatter is active or paused
- **Add all format ranges to the format table**
  - ZFMTR ONLINE DEVx ADD IFORMAT-ALL
- **Add one format range from the FCTB**
  - ZFMTR ONLINE DEVx ADD IFORMAT-cyl.trk
  - cyl.trk is the cylinder/track value from the BASE parameter on the RAMFIL RECID=IFORMAT statement
- **Example: Add one format range for DEVA**

```
ZFMTR ONLINE DEVA ADD IFORMAT-200.11
```

```
FMTR0001I 14.00.00 FORMAT RANGE 200 11 TO 200 12, SIZE 4K, DUPE  
YES, ADDED TO THE FORMAT TABLE FOR DEVA
```

## Select Format Ranges on z/TPF (cont.)

- **Delete all format ranges from the format table**
  - ZFMTR ONLINE DEVx DELETE INDEX-ALL
- **Delete one format range from the format table**
  - ZFMTR ONLINE DEVx DELETE INDEX-idx
  - idx is the item index from the format table display
- **Displays all format ranges to be formatted by the Online DASD Formatter**
  - ZFMTR ONLINE DEVx DISPLAY FORMAT
- **Example: Display the format table for DEVA**

```
ZFMTR ONLINE DEVA DISPLAY FORMAT
```

```
FMTR0017I 14.00.00 FORMAT RANGES FOR DEVA
```

	FROM		TO		TOTAL		
INDEX	CYLINDER	TRK	CYLINDER	TRK	TRACKS	SIZE	DUPE
1	200	11	200	12	2	4K	YES
2	2138	11	2145	05	100	SMALL	NO
3	2145	06	2265	13	1808	LARGE	YES
4	64000	00	65519	14	22800	4K	YES

```
END OF DISPLAY
```



# Start the Online DASD Formatter

- **Start command identifies modules to format**
  - ZFMTR ONLINE DEVx START FMOD-mod1 TMOD-mod2 MODS-type
    - FMOD/TMOD specifies the module range
      - FMOD-ALL
        - All modules for this device type
      - FMOD-mod1 TMOD-mod2
        - Symbolic modules from mod1 to mod2
    - MODS specifies which modules in the module range to format
      - MODS- [ ALL | PRIMES | DUPES ]
      - Includes all modules, just primes, or just dupes in the module range
      - For MODS-ALL, a prime and it's duplicate will not be formatted simultaneously
- **Example: Start all prime modules for DEVA**

```
ZFMTR ONLINE DEVA START FMOD-ALL MODS-PRIMES
```

```
FMTR0026I 14.00.00 START FORMAT REQUESTED FOR DEVA - VERIFYING  
MODULES AND FORMAT RANGES
```



# Formatter Verification

- **Starting the formatter verifies all input to the format process**
  - Format-2 globals used by the formatter must be defined and initialized
  - Formatter controls must be set (MPLSS and NMODS)
  - Formatter for this subsystem and device type may not be active or paused
    - Only one format process for a given subsystem and device type may be active at a time
  - All format ranges in the format table must be defined in the active FACE Tables (FCTB's) of all active processors
    - **During formatting, format ranges are continuously verified against the active FCTB in the current processor**
  - Modules being formatted must be in the specified device type with at least one module online
- **Issues informational messages if some modules are offline or in module copy**
- **If verification is successful, formatter waits for continue or cancel command**

```
FMTR0027A 14.00.00 START VERIFICATION COMPLETE FOR DEVA.  
TO START FORMATTING ENTER ZFMTR ONLINE DEVA CONTINUE  
TO CANCEL FORMATTING ENTER ZFMTR ONLINE DEVA CANCEL
```

# Continue the Format Process

- **Display and status commands are allowed while formatter is waiting for continue or cancel**
  - Use display command to display list of format ranges
  - Use status command to display list of modules
- **Cancel command stops the format process**
  - ZFMTR ONLINE DEVx CANCEL
- **Continue command starts the actual formatting**
  - ZFMTR ONLINE DEVx CONTINUE

```
ZFMTR ONLINE DEVA CONTINUE
```

```
FMTR0028I 14.00.00 FORMAT STARTED FOR DEVA
```

```
FMTR0030I 14.00.00 FORMAT STARTED FOR DEVA, MOD-0047, SDA-0EE5
```

```
FMTR0031I 14.01.00 FORMAT COMPLETED FOR DEVA, MOD-0047, SDA-0EE5
```

- **Wait for the formatter to complete**

```
FMTR0029I 14.02.00 FORMAT COMPLETED FOR DEVA
```

# Display Formatter Status

- **Overview of the formatter status**
  - Current formatter state (WAITING, STARTED, PAUSED, RESUMED, COMPLETED, etc.)
  - Date and time when current formatter state was reached
  - Processor ID where formatter is active or was last running
  - Module range and type of modules being formatted
- **Module summary contains counts for modules in each state**

```
ZFMTR ONLINE DEVA STATUS
```

```
FMTR0054I 14.02.00 FORMAT STATUS FOR DEVA
```

```
FORMATTER STARTED ON PROCESSOR B AT 14:00:00 ON 21 OCT 2008
```

```
FORMAT PRIME MODULES FROM 0047 TO 005A
```

```
MODULE SUMMARY
```

TOTAL	10
COMPLETE	3
FAILED	0
PENDING	6
INPROGRESS	1

```
END OF DISPLAY
```

# Display Module Status

- Use **LIST** parameter to display status for a list of modules
  - ZFMTR ONLINE DEVx STATUS LIST – [ ALL | COMPLETE | FAILED | INPROGRESS | PENDING ]
- Use **SDA** or **MOD** parameters to display status for a single module
  - ZFMTR ONLINE DEVx STATUS [ MOD-mod | SDA-sda ]

```
ZFMTR ONLINE DEVA STATUS LIST-ALL
```

```
FMTR0055I 14.02.00 FORMAT STATUS FOR ALL MODULES FOR DEVA
FORMATTER STARTED ON PROCESSOR B AT 14:00:00 ON 21 OCT 2008
FORMAT PRIME MODULES FROM 0047 TO 005A
```

```
MODULE SUMMARY
```

```
<Module summary counts displayed here - not shown due to space constraints>
```

MOD	SDA	VSN	STATUS	CYLINDER	TRK	TIME	DATE	COMMENT
0047	0EE5	TX0001	COMPLETE			14:01	21 OCT	
0049	0DE3	TX0003	PENDING			14:00	21 OCT	WAITING FOR MCPY
004B	0262	TX0005	INPROGRESS	2260	02	14:02	21 OCT	
004D	0EE0	TX0007	PENDING			14:00	21 OCT	

MORE DATA AVAILABLE, ENTER ZPAGE TO CONTINUE

# Manage the Format Process

- **MPLSS – Maximum number of mods per LSS (DASD Subsystem) being formatted at the same time**
  - ZFMTR CONTROL SET MPLSS-num
  - Use to avoid too many modules being formatted on the same LSS at the same time
  - Setting affects all format processes in the complex
- **NMODS – Maximum number of modules to format simultaneously**
  - ZFMTR ONLINE DEVx SET NMODS-num
  - Only affects the format process for this device type and MDBF subsystem
- **num is a decimal value 1-99 for both MPLSS and NMODS**
- **MPLSS and NMODS must be set before starting the formatter and may be changed at any time**

## Manage the Format Process (cont.)

- **Pause, Resume, or Stop the formatter**
  - ZFMTR ONLINE DEV<sub>x</sub> [ PAUSE | STOP | RESUME ]
- **Pause and stop must be issued on the processor where the formatter is active unless the processor is deactivated**
- **Pausing the formatter causes in-progress modules to record status and all formatter ECB's to exit**
- **Resuming the formatter continues a paused format process**
  - Formatter may be resumed on any processor in the complex
  - Resume repeats the verification step to verify the formatter input is still valid
  - Resume continues formatting with the format ranges and module ranges defined at start time
  - Modules are reformatted if their SDA has changed since the pause

# Module Copy and Formatting

- **Module copy (MCPY) always formats the target module**
  - For all standard records (pool, fixed, and spare), MCPY formats the track and writes the data
  - For all format ranges defined in the FCTB, (RAMFIL RECID=IFORMAT), MCPY formats the track and writes zeroes
- **Spare modules are only required to have VSN and VTOC tracks formatted by z/OS utility ICKDSF**
  - No longer required to pre-format MCPY spare modules using z/TPF FMTR utility
  - No need to reformat spare modules for a format change
- **No need to rerun the Online DASD Formatter for modules brought online after the formatter finishes**
  - MCPY formats everything defined in the FCTB, including format ranges
- **Applies to ZMCPY ALL and ZMCPY UP**



## No Downtime Expansion

- 1. If formatting previously in-use areas, complete any pool deactivation. Remove deactivated pools and obsolete fixed records from the SIP deck and build a new FACE Table (FCTB) using this SIP deck.**
- 2. Using the alternate FCTB loader (ZFCTB LOAD/ACTIVATE), load and activate the new FCTB to all processors.**
- 3. Using the RAMFIL macro with the RECID=IFORMAT parameter, define unused or previously in-used areas in the SIP deck as format eligible. Build a new FCTB using this SIP deck.**
- 4. Using the alternate FCTB loader (ZFCTB LOAD/ACTIVATE), load and activate the new FCTB to all processors.**

## No Downtime Expansion (cont.)

5. **Use the Online DASD Formatter (ZFMTR ONLINE) to format the format ranges**
  - a. Select the format ranges to be formatted
  - b. Start the formatter on all modules for the device type
  - c. Allow the formatter to complete
6. **In the SIP deck, change the format ranges (RAMFIL RECID=IFORMAT) that were formatted to fixed, pool, or spare records. Build a new FCTB using this SIP deck.**
7. **Using the alternate FCTB loader (ZFCTB LOAD/ACTIVATE), load and activate the new FCTB to all processors**
8. **Use the ZSVTT command to verify the format of new fixed and pool records**
9. **Perform a norm state pool reallocation (ZPOOL NORM GENERATION) to perform a pool reallocation and make the new pools available to z/TPF**

**This is all possible while the z/TPF complex is in NORM state!**

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# Appendix

# Setup Format-2 Globals for the Formatter

- **Format-2 globals must be defined and initialized prior to using the formatter commands**
- **IFMTCNTL**
  - Define in the BSS only
- **IFMTDEVx**
  - x = A, B, C, or D and represents device type being formatted
  - Define in the MDBF subsystem where formatting is taking place
  - Only have to define IFMTDEVx for device type and subsystem being formatted
- **See z/TPF Database Users' Guide for more information, including format-2 global sizes and characteristics**

# ZFMTR ONLINE

- **Primary command to run and manage the format process**
  - All operations are device type and MDBF subsystem unique

```

ZFMTR ONLine-- --DEVx-- ----->

>--++ADD-- --IFORmat--++cyl.trk+-----+><
|                '-ALL-----'                |
+-DELeTe-- --INDeX--++indx+-----+
|                '-ALL--'                |
+-DISPlay-- --++FORmat+-----+
|                '-DEVCTL-'                |
+-SET-- --NMods-nummods-----+
+-START-- --++FMOD-frommod-- --TMOD-tomod+--- --MODs - [ ALL | PRImes | DUPes ]--++
|                '-FMOD-ALL-----'                |
+-[ CONTInue | CANcel ]-----+
+-[ STOP | PAUSE | RESUme ]-----+
'-STATus--+-----+
      +- --LIST - [ ALL | COMplete | FAIled | INProGress | PENding ]-----+
      +- --[ MOD-mod | SDA-sda ]-----+'

```

# ZFMTR CONTROL

- **Set and display formatter controls across all device types and MDBF subsystems**
  - Valid in the BSS only

```
ZFMTR CONTROL-- ---+DISPLAY-----+-----><
                '-SET-- --MPLSS-modsper1ss-'
```