

# HyperPAV Support on z/TPF

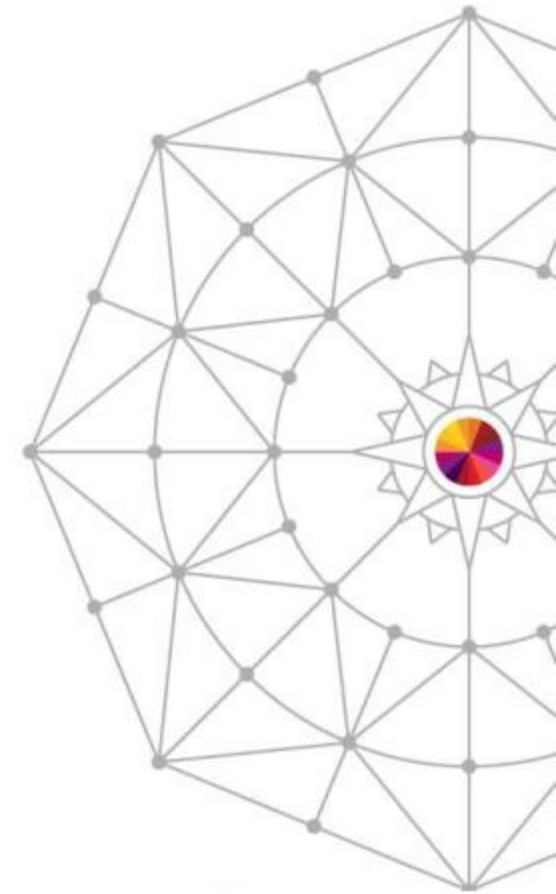
Chris Filachek  
TPF Development Lab

System Control Program Subcommittee  
March 10, 2014



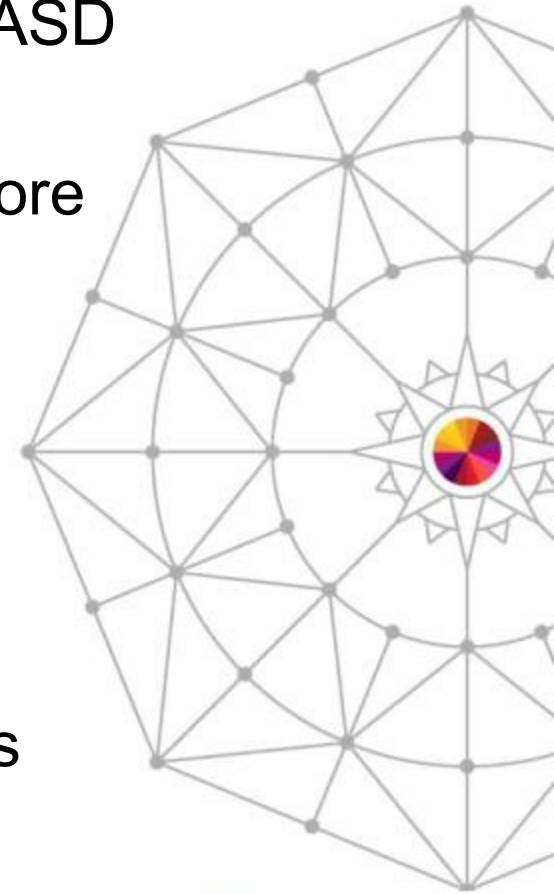
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## Why Hyper Parallel Access Volumes (HyperPAV)?

- Allow multiple, concurrent I/Os to a single DASD volume
- Allow z/TPF to start waiting I/O requests before the first I/O in queue completes
  - Improve DASD I/O throughput
  - Reduce time spent waiting in the z/TPF module queue
  - I/O growth without adding DASD volumes



## What Would HyperPAV on z/TPF look like?

- Set of Alias SDAs for each LSS
  - Defined in
    - DASD Control Unit
    - IOCDS
    - Keypoint 0
  - Separate MFST entries for aliases
  - Enabled through ZSONS command or ONLFIL SIP macro
  - Alias used automatically when base SDA has module queue greater than 1 and eligible I/O exists
- HyperPAV will be transparent to applications
- Order of I/O will be maintained when necessary
  - Multiple operations on same record
  - Control I/Os and FDCTCs

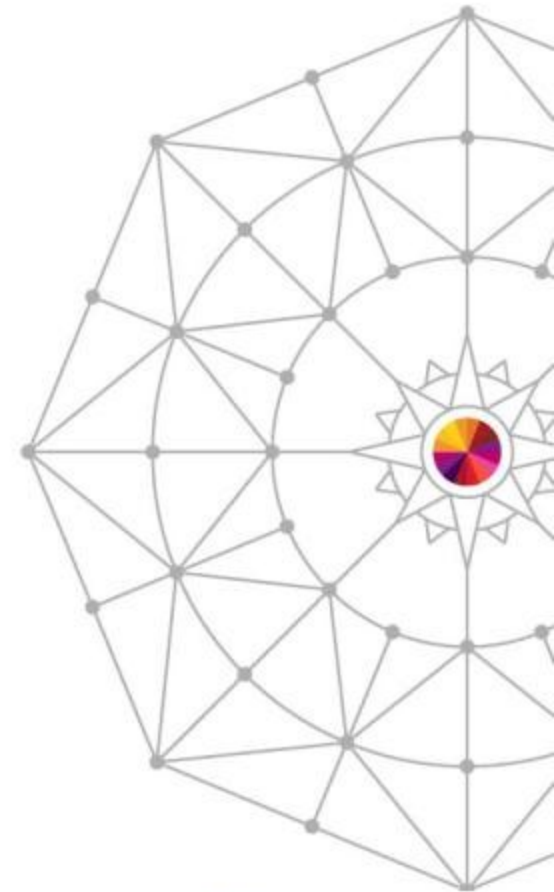
# How Do I Manage Aliases on z/TPF?

- Display and enable/disable HyperPAV
  - ZSONS DISPLAY HPAV
  - ZSONS ALTER HPAV
- New information in ZDMOD displays
  - ALS use type for aliases
  - SDA of device where each I/O is executing
- Formatted I/O trace in dumps contains base and alias SDAs
- Data reduction Random File Access Summary updates
  - Number of aliases for each LSS
  - SSID for each LSS



# What Do I Need to Use HyperPAV?

- Processor
  - Any System z processor supported by z/TPF
- FICON connections
- DASD control unit that supports HyperPAV
  - Check with your vendor for appropriate code and/or hardware levels
  - Enable the LIC feature
- Future z/TPF support
  - Planned for APAR PJ41092



# ZDMOD DISPLAY Base

## ZDMOD DISP SDA-8C20

DMOD0021I 15.45.22 DASD MODULE QUEUE DISPLAY  
 INPUT FILTERS: SDA-8C20

SDA	MOD	VSN	DUPE	SS	USE/T	SSID	QUEUE	SERVTIME	STATUS
8C20	0047	HB0001	004F	BSS	RLT/A	424C	3	1159	NORMAL

MFST SECTION 0: 03A77000  
 MFST SECTION 1: 03A77400  
 SSST ADDRESS: 03A60178

### IOB QUEUE FOR BASE SDA 8C20:

IOB ADDR	MACRO	ECB ADDR	PGM	FILE	ADDRESS	ID	SVC	TOD	SDA
0F989200	FILNC	0FD06000	QHT1	000000005910001F	C8E3/HT	14:01:22.066874	8C20		
0F96EA00	FILNC	0FD30000	QHT1	000000005910005F	C8E3/HT	14:01:22.066914	8CC0		
0F992600	FILNC	0FD2D000	QHT1	000000005910009F	C8E3/HT	14:01:22.067298	8CD0		
0F8D6200	FINDC	0FD72000	QHT1	0000000059100037	C8E3/HT	16:01:22.443152			

END OF DISPLAY+

Two aliases doing I/O for  
base 8C20

# ZDMOD DISPLAY Alias

ZDMOD DISP SDA-8CC0

DMOD0021I 15.45.22 DASD MODULE QUEUE DISPLAY

INPUT FILTERS: SDA-8CC0

SDA	MOD	VSN	DUPE	SS	USE/T	SSID	QUEUE	SERVTIME	STATUS
8CC0	0052	HB0012	N/A	BSS	ALS	424C	-	0	NORMAL

MFST SECTION 0: -----

Inherited from Base volume

MFST SECTION 1: 03AA2400

SSST ADDRESS: 03A60178

IOB QUEUE FOR ALIAS SDA 8CC0:

IOB ADDR	MACRO	ECB ADDR	PGM	FILE ADDRESS	ID	SVC	TOD	SDA
0F8D6200	FILNC	0FD72000	QHT1	0000000059100037	C8E3/HT	16:10:54.443152		8CC0

END OF DISPLAY+



# ZDMOD DISPLAY SSID Command

## ZDMOD DISP SSID-424C

DMOD0024I 15.45.22 DASD MODULE DISPLAY BY SSID

INPUT FILTERS: SSID-424C

NUMBER OF BASE MODULES: 8

NUMBER OF ALIAS MODULES: 3

SDA*	MOD	VSN	DUPE	SS	USE/T	SSID	QUEUE	SERVTIME	STATUS
8C20	0047	HB0001	004F	BSS	RLT/A	424C	2	1230	NORMAL
8C21	004B	HB0005	0053	BSS	RLT/A	424C	0	897	NORMAL
8C22	0057	HB0017	005F	BSS	RLT/B	424C	0	0	NORMAL
8C23	005B	HB0021	0063	BSS	RLT/B	424C	0	0	NORMAL
8C24	0066	HB0032	005E	BSS	RLT/B	424C	0	0	NORMAL
8C25	0052	HB0012	004A	BSS	RLT/A	424C	1	883	NORMAL
8C26	0056	HB0016	004E	BSS	RLT/A	424C	2	1239	NORMAL
8C27	0062	HB0028	005A	BSS	RLT/B	424C	0	0	NORMAL
8CC0	0047	HB0001	N/A	BSS	ALS	424C	-	0	NORMAL
8CD0			N/A		ALS	424C	-	0	NORMAL
8CE0	0056	HB0016	N/A	BSS	ALS	424C	-	0	NORMAL

END OF DISPLAY+

Two of 3 aliases  
currently doing I/O  
for a base

# Trademarks

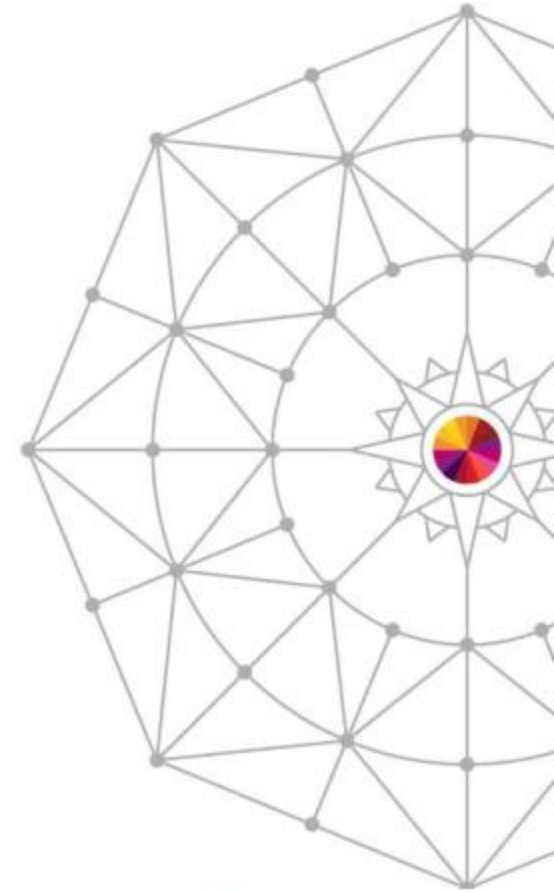
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## Notes

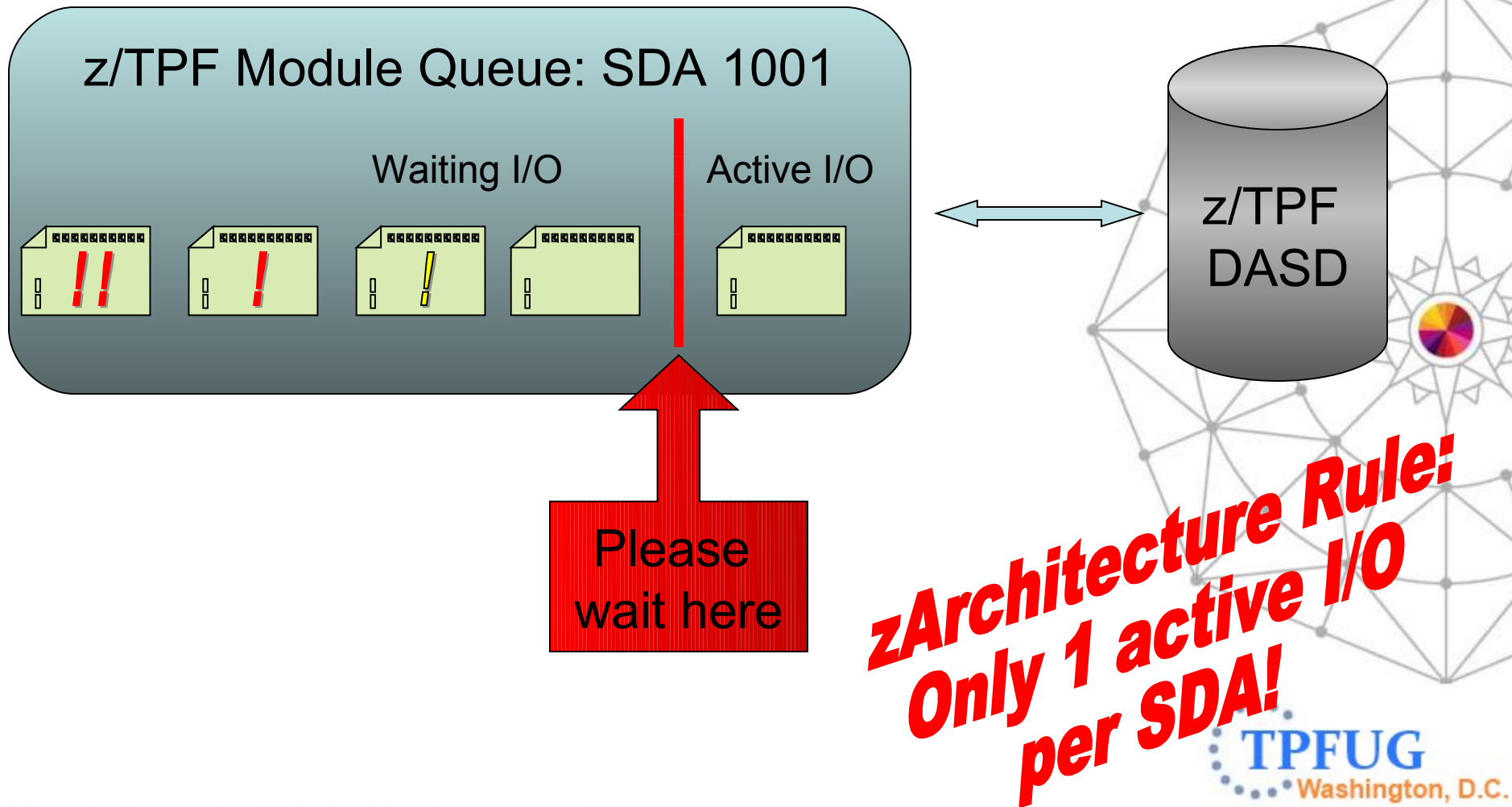
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# Backup Slides

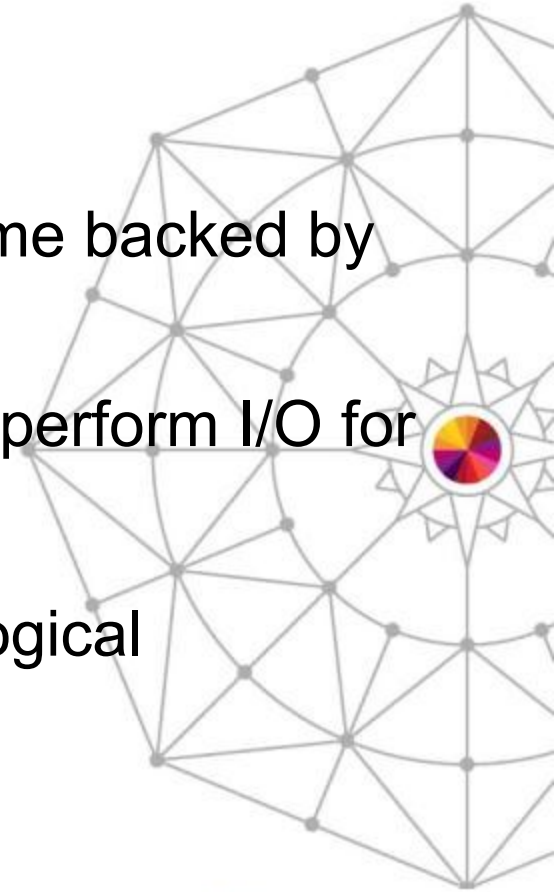


# Current z/TPF Module Queuing



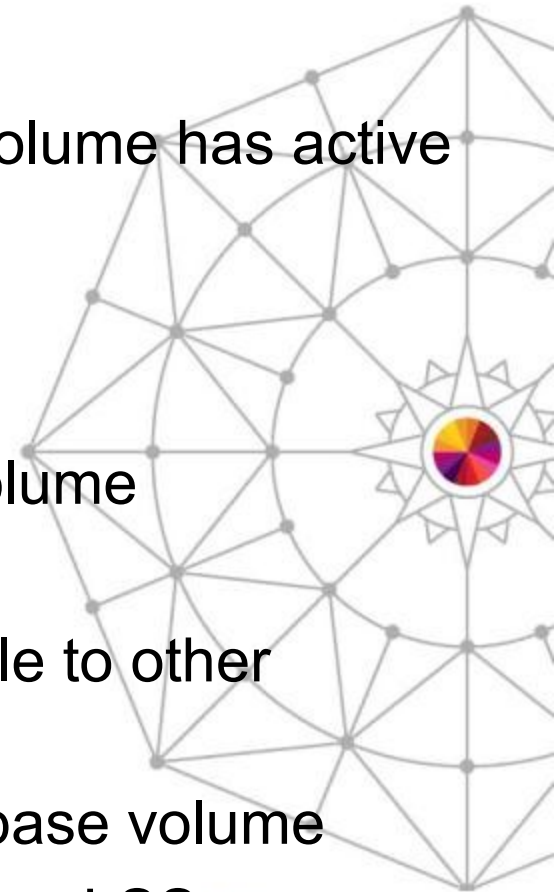
# HyperPAV Definitions

- Definitions
  - Base Volume: Traditional DASD volume backed by storage
  - Alias: Device without storage used to perform I/O for a base volume
- Define multiple aliases for each DASD logical subsystem (LSS)
  - Defined in DASD control unit
  - Assign SDAs to aliases in IOCP

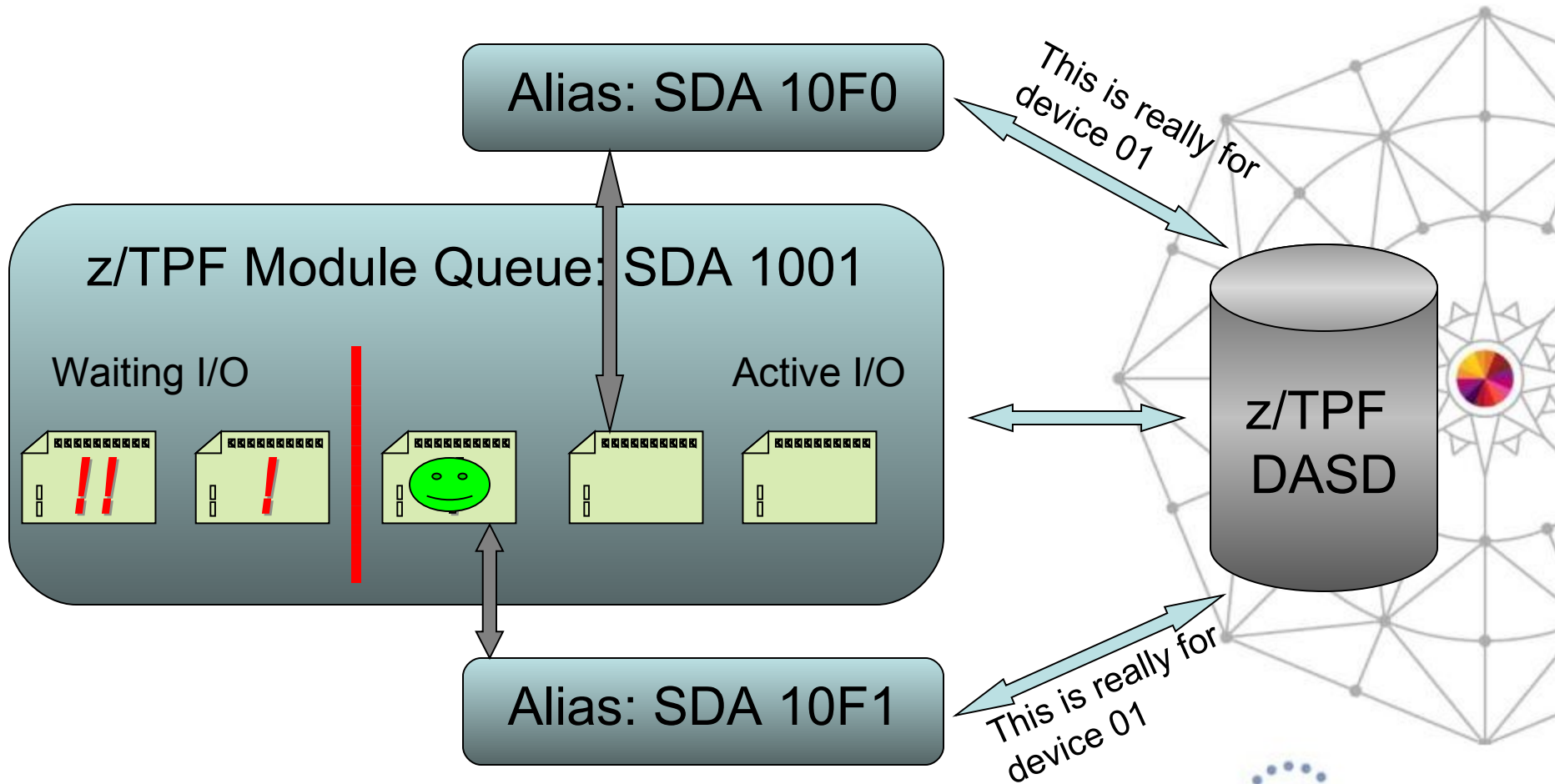


# HyperPAV Operation

- When adding I/O to module queue and base volume has active I/O...
  - Get available alias
  - Start I/O using alias SDA
    - I/O request contains address of base volume
  - Interrupt comes back on alias SDA
  - Start next waiting I/O or make alias available to other modules
- Multiple aliases can perform I/O for the same base volume
- Aliases perform I/O for any base volume in same LSS



# z/TPF Module Queuing with HyperPAV



# ZSONS command examples

## ZSONS DISPLAY HPAV

```
SONS0055I 15.45.22 HYPERPAV SUPPORT IS DISABLED
ALIASES FOUND - 0

ALIASES ALLOCATED - 30
MAX CONFIGURED ALIASES - 30
```

## ZSONS ALTER HPAV DISCOVER

```
SONS0057I 15.45.22 HYPERPAV SUPPORT DISCOVERY COMPLETE
ALIASES FOUND - 12
ALIASES ALLOCATED - 30
MAX CONFIGURED ALIASES - 30
```

## ZSONS DISPLAY HPAV

```
SONS0055I 15.45.22 HYPERPAV SUPPORT IS DISABLED
ALIASES FOUND - 12
ALIASES ALLOCATED - 30
MAX CONFIGURED ALIASES - 30
```





## ZSONS command examples (cont.)

### ZSONS ALT HPAV ENABLE

CPAV0002W 15.45.22 HYPERPAV SUPPORT UNDER VM IS FOR TEST  
ENVIRONMENT ONLY+

SONS0057I 15.45.22 HYPERPAV SUPPORT IS ENABLED

ALIASES FOUND -	12
ALIASES ALLOCATED -	30
MAX CONFIGURED ALIASES -	30

### ZSONS ALT HPAV DISABLE

SONS0059I 15.45.22 HYPERPAV SUPPORT IS DISABLED+

### ZSONS D HPAV

SONS0055I 15.45.22 HYPERPAV SUPPORT IS DISABLED

ALIASES FOUND -	0
ALIASES ALLOCATED -	30
MAX CONFIGURED ALIASES -	30

