

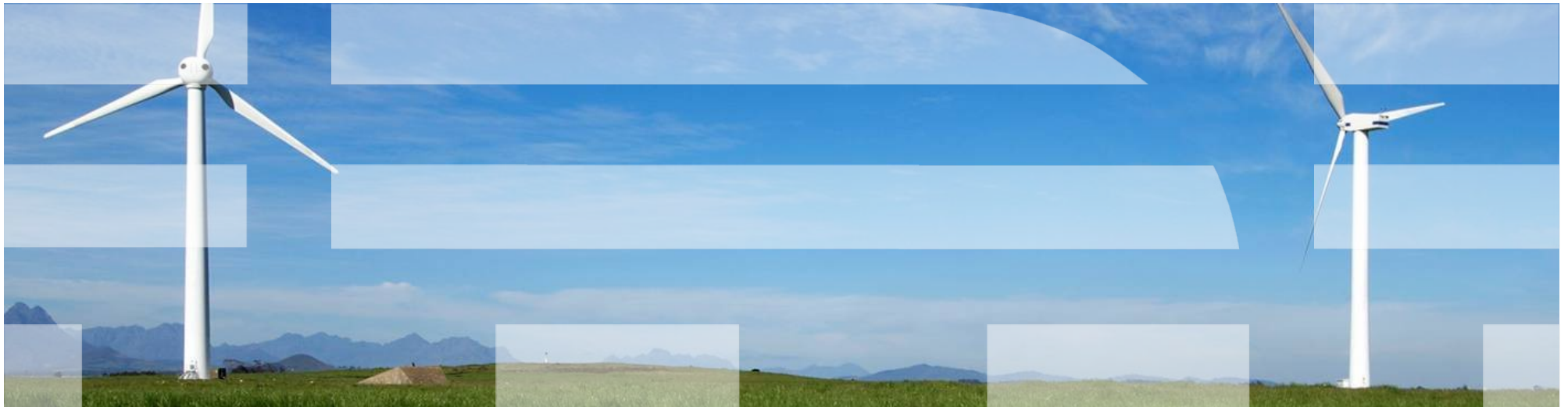
zFlash Setup, Management, and Configuration

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SHARE in San Francisco

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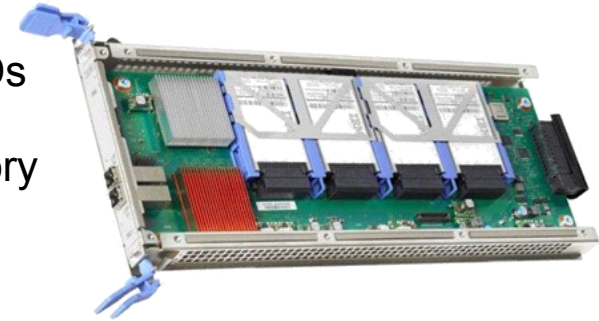
Abstract

The IBM zFlash introduces non-volatile memory in a disk-like package on an I/O card that can be used by Operating systems like z/OS for paging storage and to ultimately improve overall z/OS performance. Because zFlash is both non-volatile storage and an I/O device, there are some unique aspects of zFlash as compared to traditional DASD and I/O adapters. This “how-to” presentation will cover these unique aspects, including setup, configuration, management, monitoring and eventual discontinuance of zFlash by covering the z/OS, Hardware Management Console (HMC) and Support Element (SE) controls for zFlash.

What is zFlash (aka Flash Express)?

- FLASH Express

- Flash Express is a PCIe IO adapter with NAND Flash SSDs
- Physically comprised of internal storage on Flash SSDs
- Used to deliver a new tier of memory- storage class memory
- Uses **PCIe I/O drawer**



One Flash Express Card

- Sized to accommodate all LPAR paging
 - Each **card pair** provides **1.4 TB** usable storage (2.8 TB total)
 - Maximum 4 card pairs (4 X 1.4 = 5.6 TB)
- Supported on z/OS V1.13 plus web deliverable

- **Designed for continuous availability**

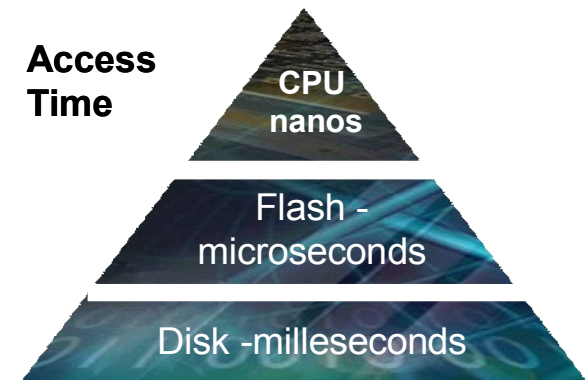
- Concurrent Firmware update for service
- RAID 10 design

- **Immediately usable**

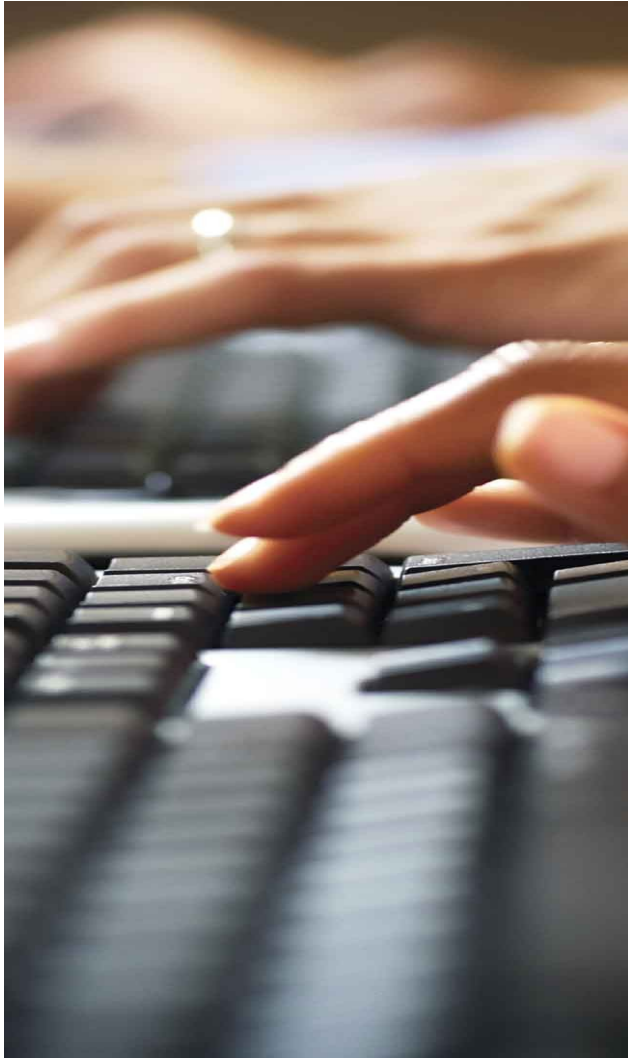
- No capacity planning needed
- No intelligent data placement needed

- **Secured**

- Flash Express adapter is protected with 128-bit AES encryption.
- Key Management provided based on a Smart Card
- Secure Cryptographic Erase meets audit requirements



Representative Use Cases - Flash Express



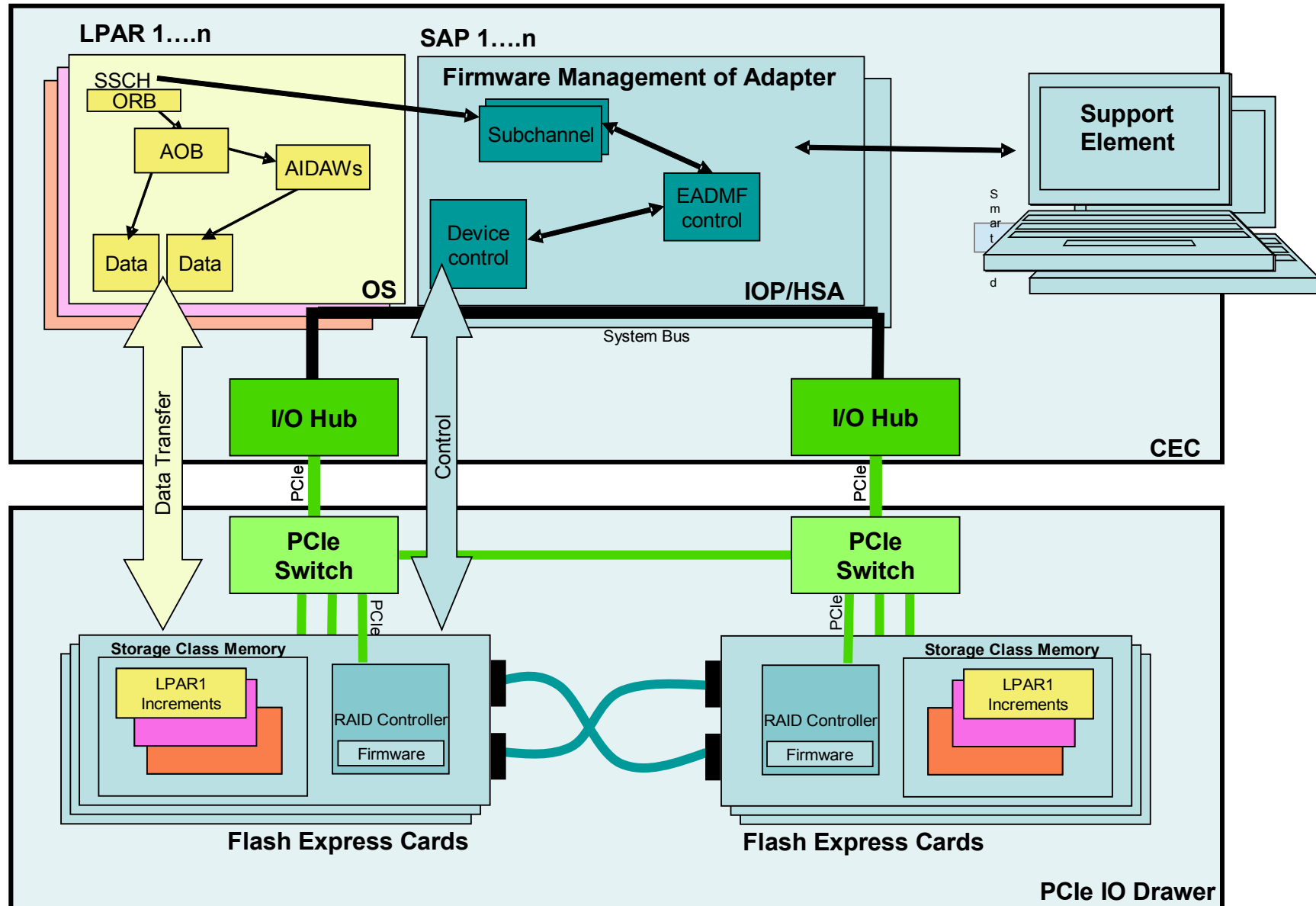
Flash Express can reduce latency delays from paging to bring system availability to new heights and improve overall service levels

Application related errors will require collection of diagnostics. These diagnostics can be collected faster with Flash Express, reducing paging related delays that can impact your overall system availability.

Having your working data resident in Flash can help accelerate start of day processing, and improve service for many industries at the busiest time of their work day- a time when they cannot afford disruptions.

DB2 and Java in memory buffer pools work to store and process application data. DB2 and Java can benefit from 1MB pageable large pages with Flash Express, improving overall performance.

z FLASH Implementation

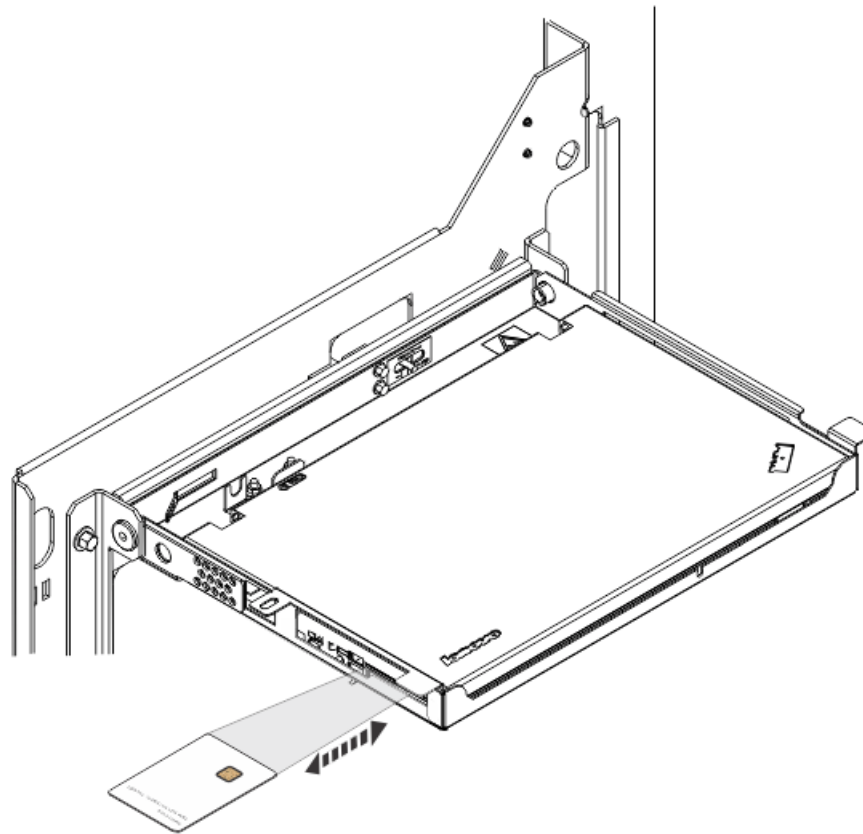


Outline

- Introduction to zFlash
- Initial Setup
 - Customer Service Representative (CSR) Portion
 - Install Smart Cards in Support Elements (SE)
 - Install zFlash cards if necessary
 - Create Pair
 - Customer Portion
 - No IOCDS changes
 - Allocate zFlash memory to partition(s)
 - Configure z/OS to use zFlash
- Management
 - Management of zFlash Allocations
 - zFlash PCHID details
 - View Partition to PCHID map
 - View Flash Allocations for a specific Partition
 - View Flash (details)
 - System Activity Display (SAD) / Monitors Dashboard
 - Console Events
 - Security Logs
 - Status (Service Personnel Only)
 - Configure On/Off (Service Personnel Only)
 - Service On/Off (Service Personnel Only)
- Terminating Flash
 - Change all instances of z/OS to no longer use zFlash
 - Disband all zFlash pairs
 - Remove SE Smart Cards and destroy (optional)

Install Smart Cards in Support Elements (CSR responsibility)

- Cards will be installed by the CSR
 - During machine installation if zFlash shipped with the machine
 - Before installing the first zFlash adapters (if the machine was not shipped with zFlash)



More on Smart Cards

- The data on the zFlash cards is encrypted. This is done to prevent access to the data if a zFlash card is removed from the system, such as for a repair action or thru some malicious action (i.e. theft).
- The Smart Cards are an essential part of managing the encryption keys.
- The blank Smart Card is the same one used by the TKE device.
- The Primary SE will create an authentication key using the smart card and store it on the SE. The Alternate SE will use the smart card in it to store the key sent from the primary.
- The smart card, the SE hardware, the CEC, and the generated Key are tightly coupled in order to prevent access to the data on the zFlash card in any place other than the CEC it was formatted for.
- If for some reason the smart card fails on the primary an automatic switch to the alternate will happen and a service call will occur to have the smart card or the SE serviced. There are procedures to ensure the repaired SE or Smart Card is properly updated with the encryption keys.
- The keys will not be preserved during migrations/upgrades. So, persistence of data on the zFlash adapters is thus not guaranteed. The zFlash adapters are therefore good for things like paging storage but should not be used for situations where persistence is required.
- Bottom line: The Smart Cards must be installed so that the SE is prepared to store and handle the encryption keys used to protect the data on the zFlash adapters.

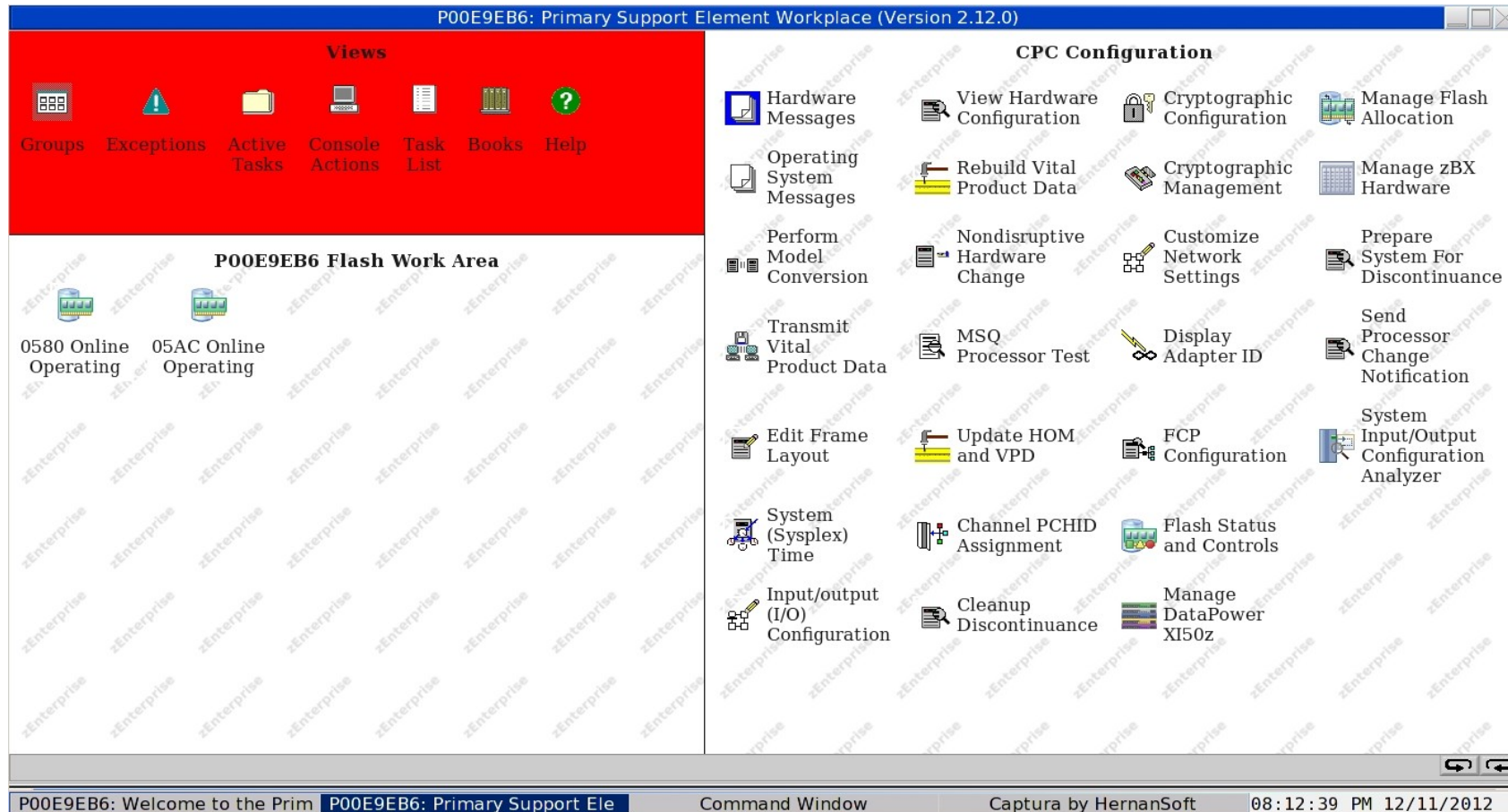
Install zFlash cards if necessary (CSR responsibility)

- Installed in pairs in Seneca cages, one per I/O domain
- Pairs are cabled together with 2 SAS cables



Install zFlash cards if necessary (CSR responsibility)

- Once installed, the cards are visible on the Support Element's User Interface as a PCHID



Create pair(s) of zFlash adapters (CSR Responsibility)

- A “create pair” operation must be performed that allows the paired adapters to initialize themselves into a pair and format the storage.
- Done via a new SE task, **Flash Status and Controls**
- Service Personnel only

GUSRDAD6: Flash Status and Controls

Flash Status and Controls - GUSRDAD6

Options ▾

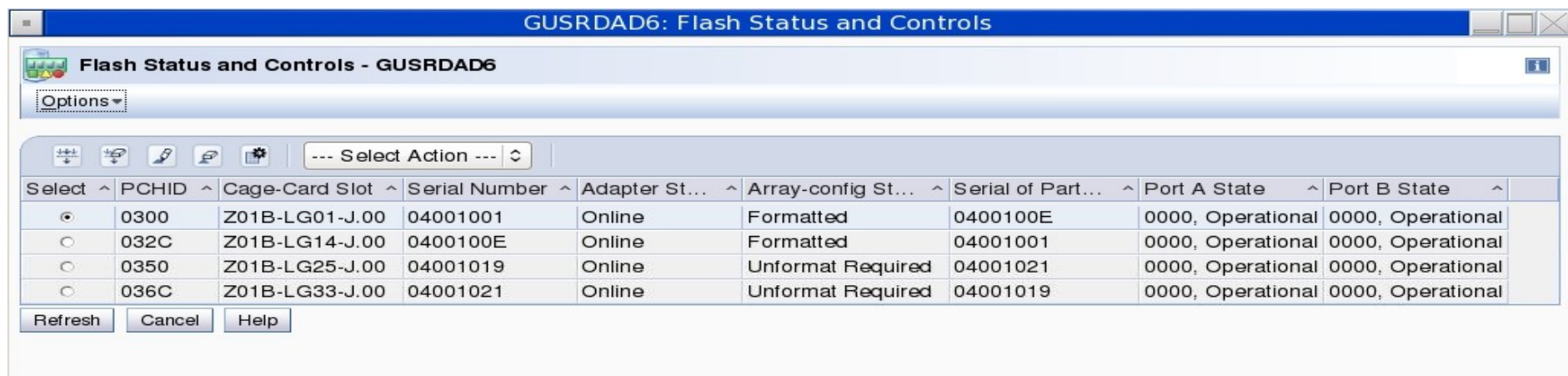
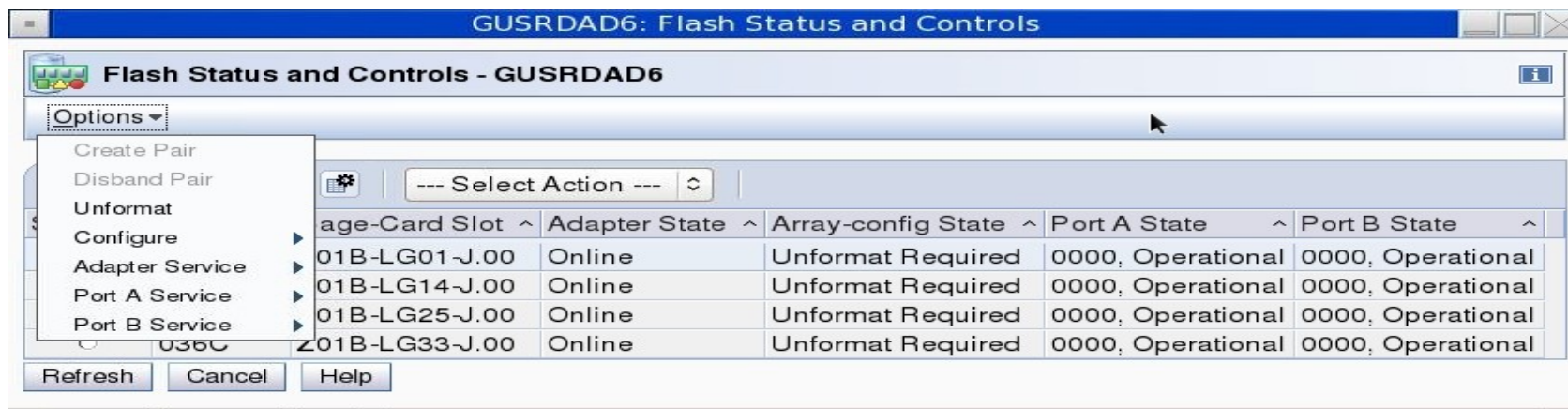
--- Select Action --- ▾

Select ^	PCHID ^	Cage-Card Slot ^	Serial Number ^	Adapter State ^	Array-config State ^	Serial of Partner ^	Port A State ^	Port B State ^
<input checked="" type="radio"/>	0300	Z01B-LG01-J.00	04001001	Online	Not formatted	0400100E	0000, Operational	0000, Operational
<input type="radio"/>	032C	Z01B-LG14-J.00	0400100E	Online	Not formatted	04001001	0000, Operational	0000, Operational
<input type="radio"/>	0350	Z01B-LG25-J.00	04001019	Online	Not formatted	04001021	0000, Operational	0000, Operational
<input type="radio"/>	036C	Z01B-LG33-J.00	04001021	Online	Not formatted	04001019	0000, Operational	0000, Operational

Refresh Cancel Help

Create Pair

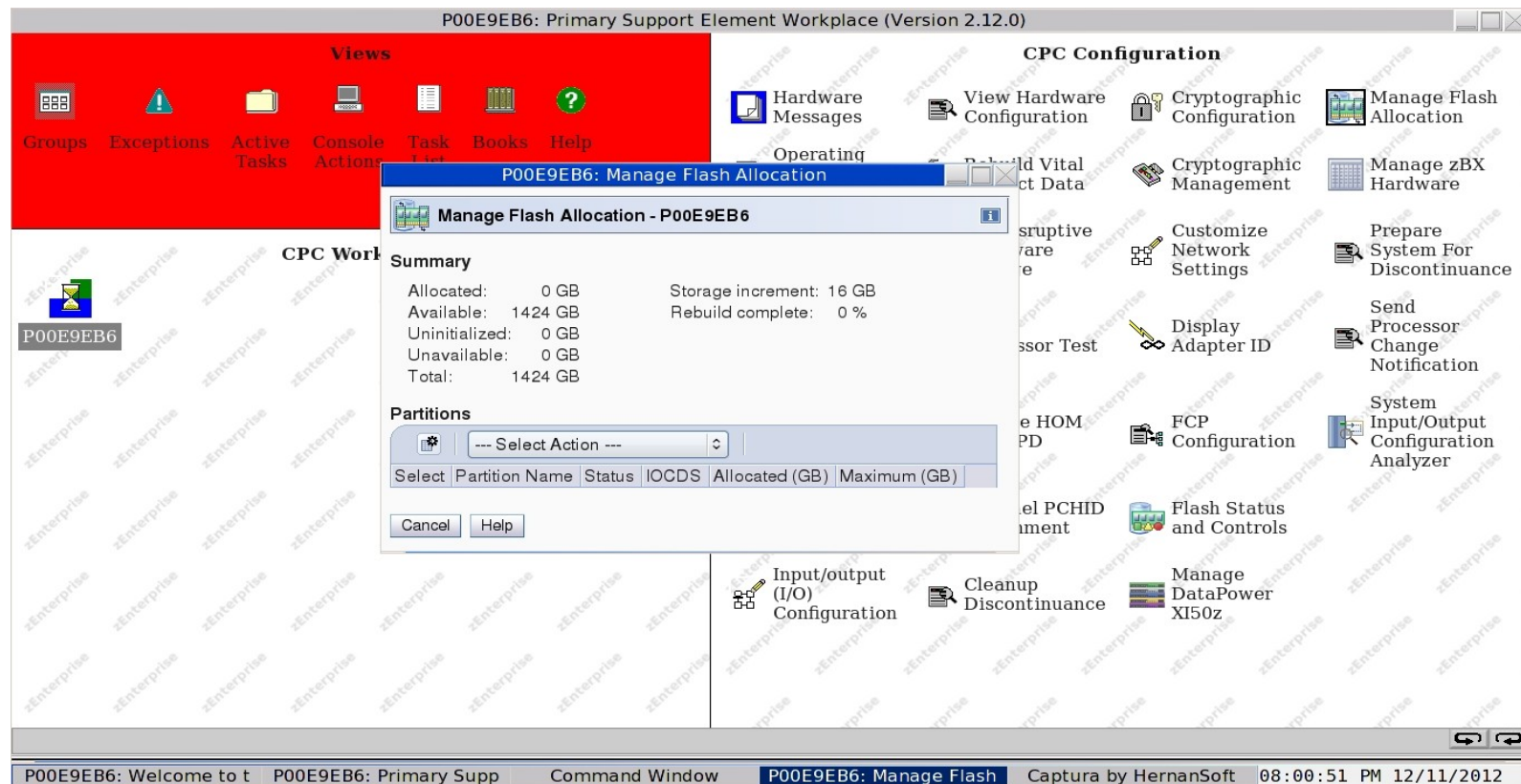
- Select **Create Pair** to create and format a pair
- Use the Refresh button to monitor the progress of the formatting.
- It takes a while (15 to 20 minutes) to complete the pairing/formatting operation.



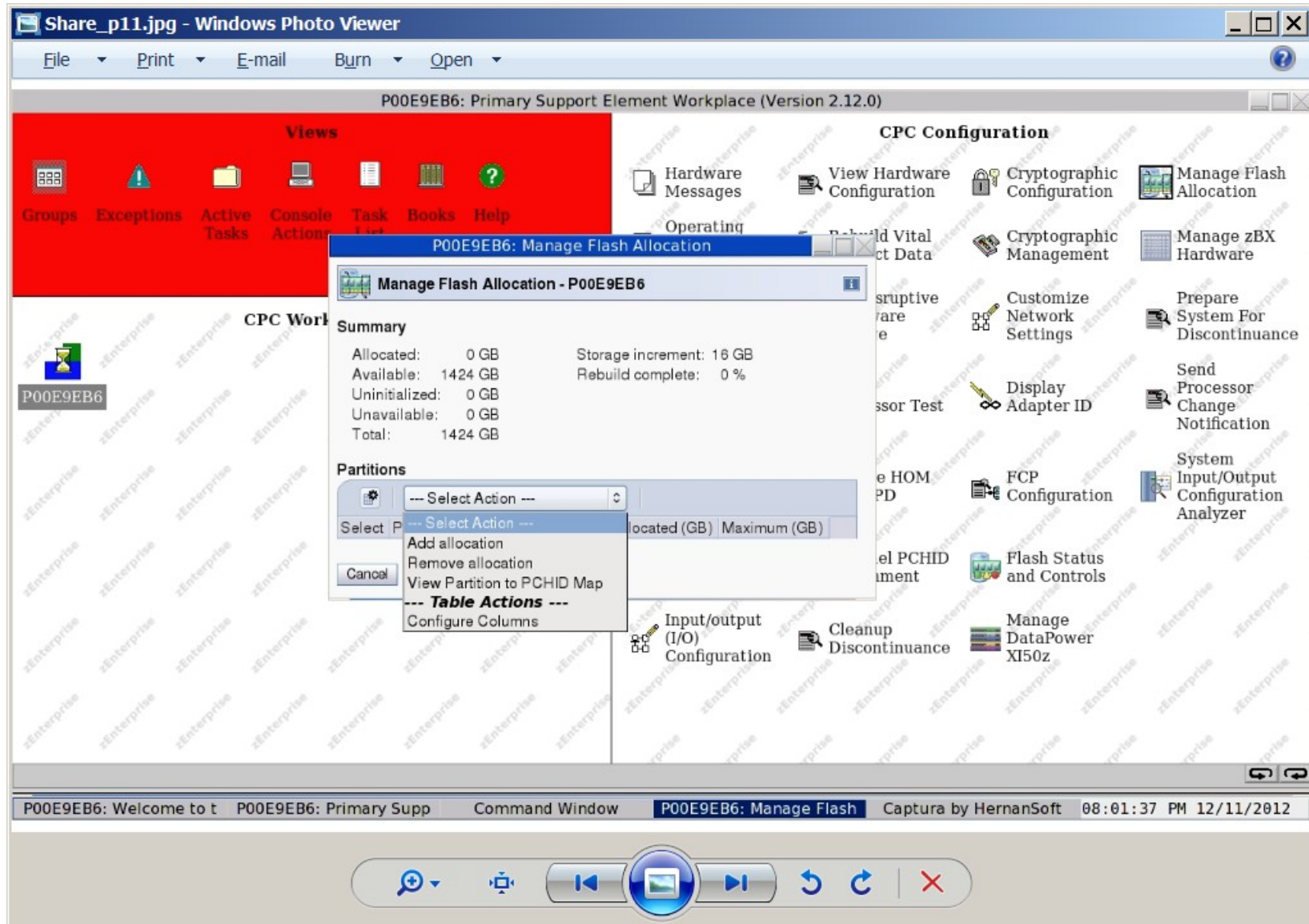
Allocate zFlash Memory to partition(s)

Manage Flash Allocation SE and HMC task

- Available on both the HMC and SE.
- Displays current summary Flash information for the system.
- Displays current Flash information by partition.
- Use to Add, Change or Remove allocations to a partition.

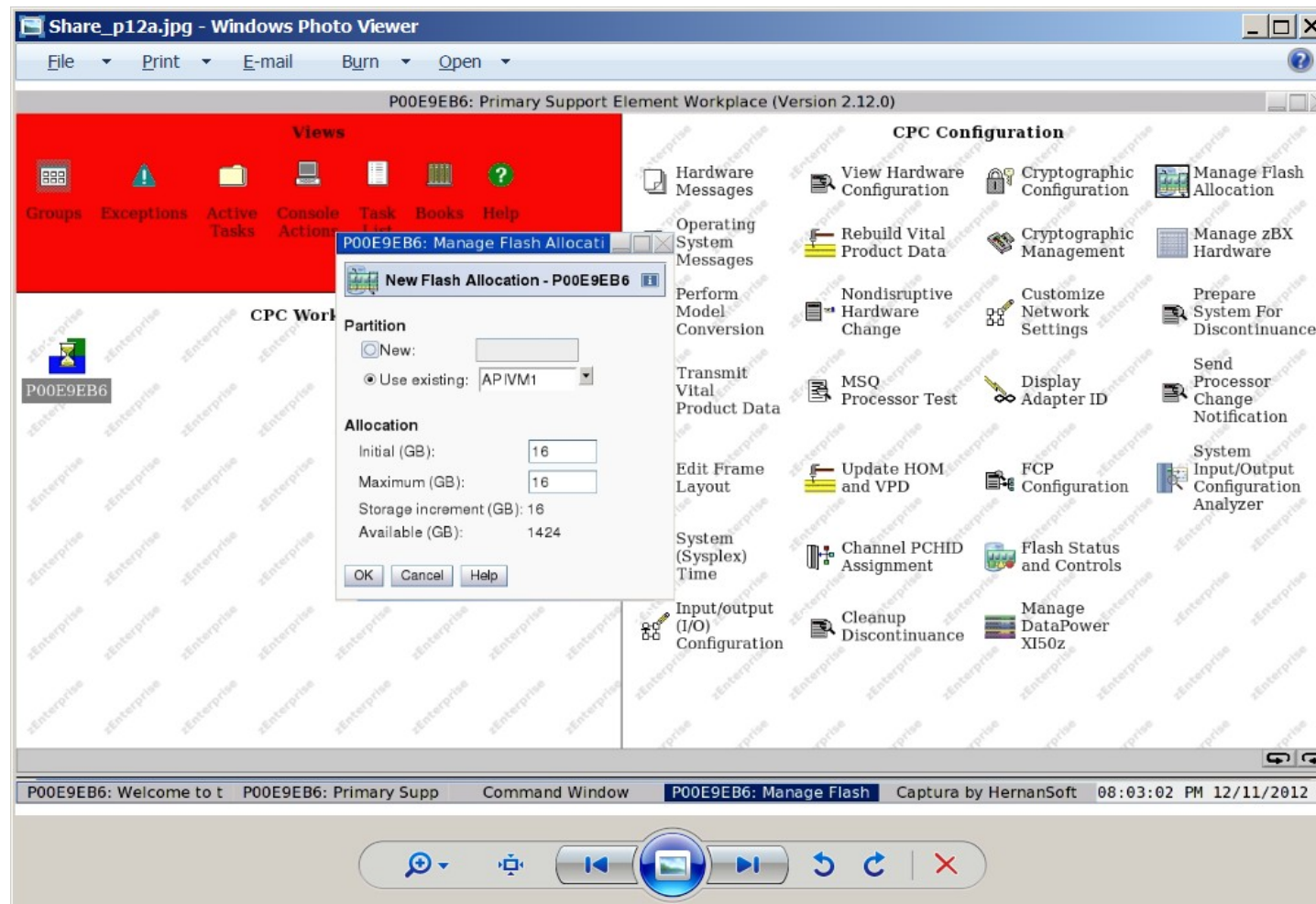


Manage Flash Allocation Task's Actions



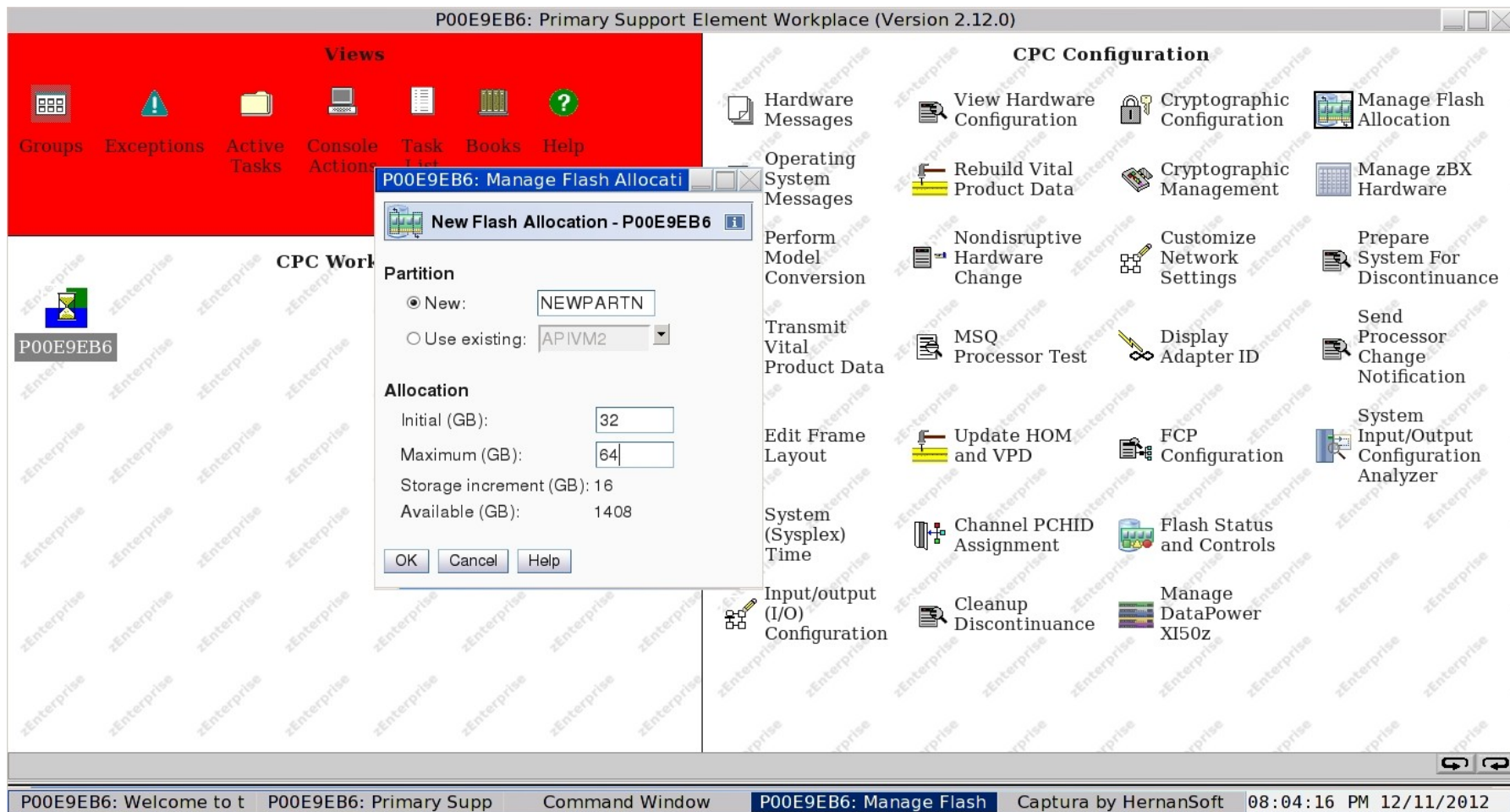
Manage Flash Allocation - Add zFlash Allocation

- Allocation can be done for a partition defined in any IOCDs or a partition not currently defined.
- May be done after initial zFlash setup as necessary (such as when a new partition is defined).
- Example of picking an existing partition:



Manage Flash Allocation - Add zFlash Allocation

- Example of typing in a new partition name:



z/OS Configuration

Allocating Flash to a partition

- The initial and maximum amount of Flash Memory available to a particular logical partition is specified at the SE or HMC via a Flash Memory Allocation panel
- Dynamically change maximum amount of Flash Memory available to a logical partition
- Additional Flash Memory (up to the maximum allowed) can be **configured online** to a logical partition dynamically at the SE or HMC
 - This can also be done via an operator command
- Can dynamically configure Flash Memory **offline** to a logical partition at the SE or HMC
 - For z/OS this can also be done via an operator command
- Predefined subchannels, no IOCDS needed

Manage Flash Allocation - P87

Summary

Allocated:	976 GB	Storage increment:	16 GB
Available:	1872 GB	Rebuild complete:	0 %
Uninitialized:	0 GB		
Unavailable:	0 GB		
Total:	2848 GB		

Partitions

--- Select Action ---

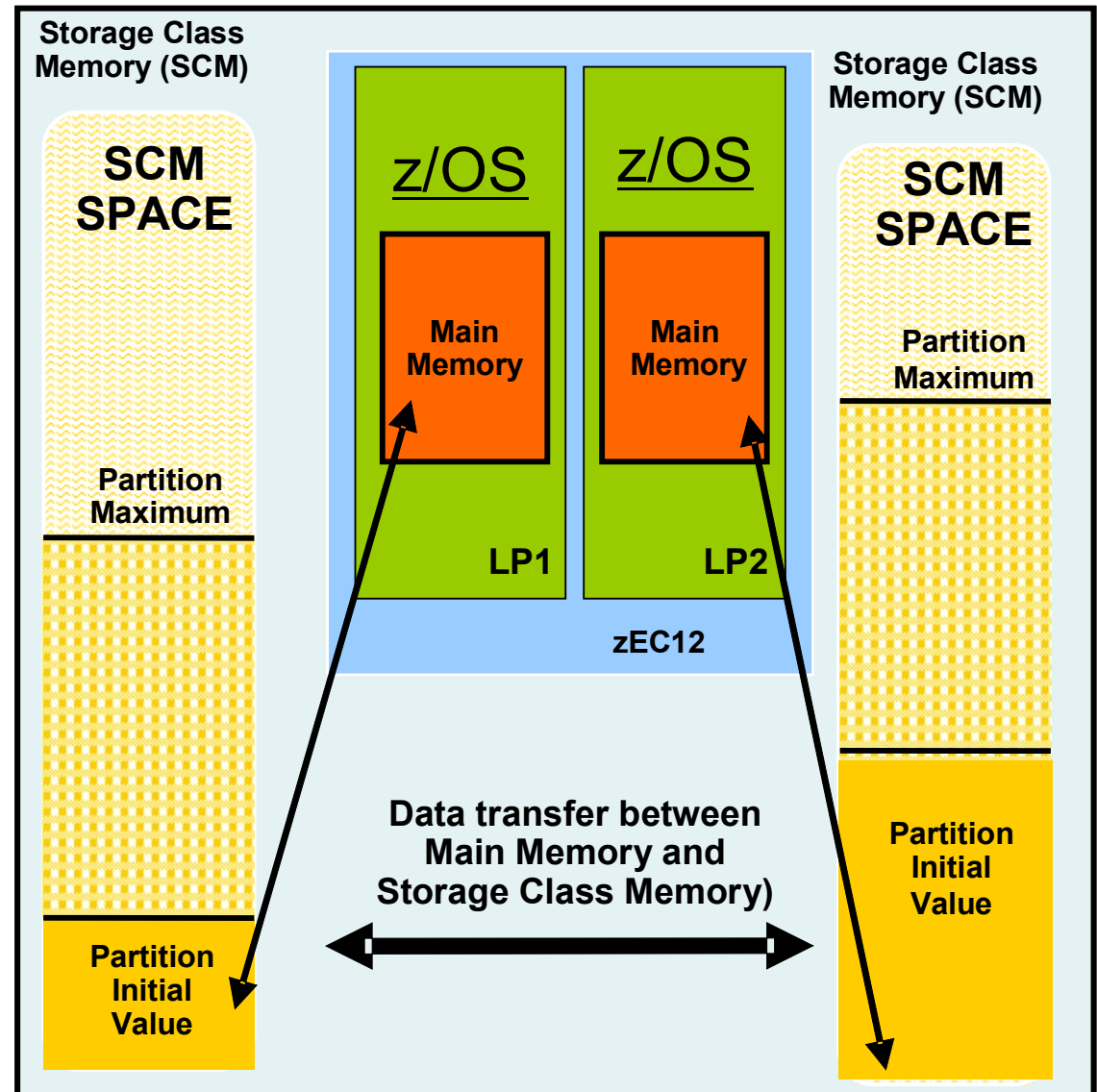
Select	Partition Name	Status	IOCDS	Allocated (GB)	Maximum (GB)
<input checked="" type="radio"/>	R70	Active	A0,A1,A2,A3	48	2848
<input type="radio"/>	R71	Active	A0,A1,A2,A3	128	2848
<input type="radio"/>	R72	Active	A0,A1,A2,A3	48	2848
<input type="radio"/>	R73	Active	A0,A1,A2,A3	32	2848
<input type="radio"/>	R74	Active	A0,A1,A2,A3	80	2848
<input type="radio"/>	R75	Active	A0,A1,A2,A3	80	2848
<input type="radio"/>	R76	Active	A0,A1,A2,A3	64	2848
<input type="radio"/>	R77	Active	A0,A1,A2,A3	64	80
<input type="radio"/>	R7B	Inactive	A0,A1,A2,A3	128	128
<input type="radio"/>	R7F	Active	A0,A1,A2,A3	32	64

Refresh

OK Apply Cancel Help

System z Flash Virtualization

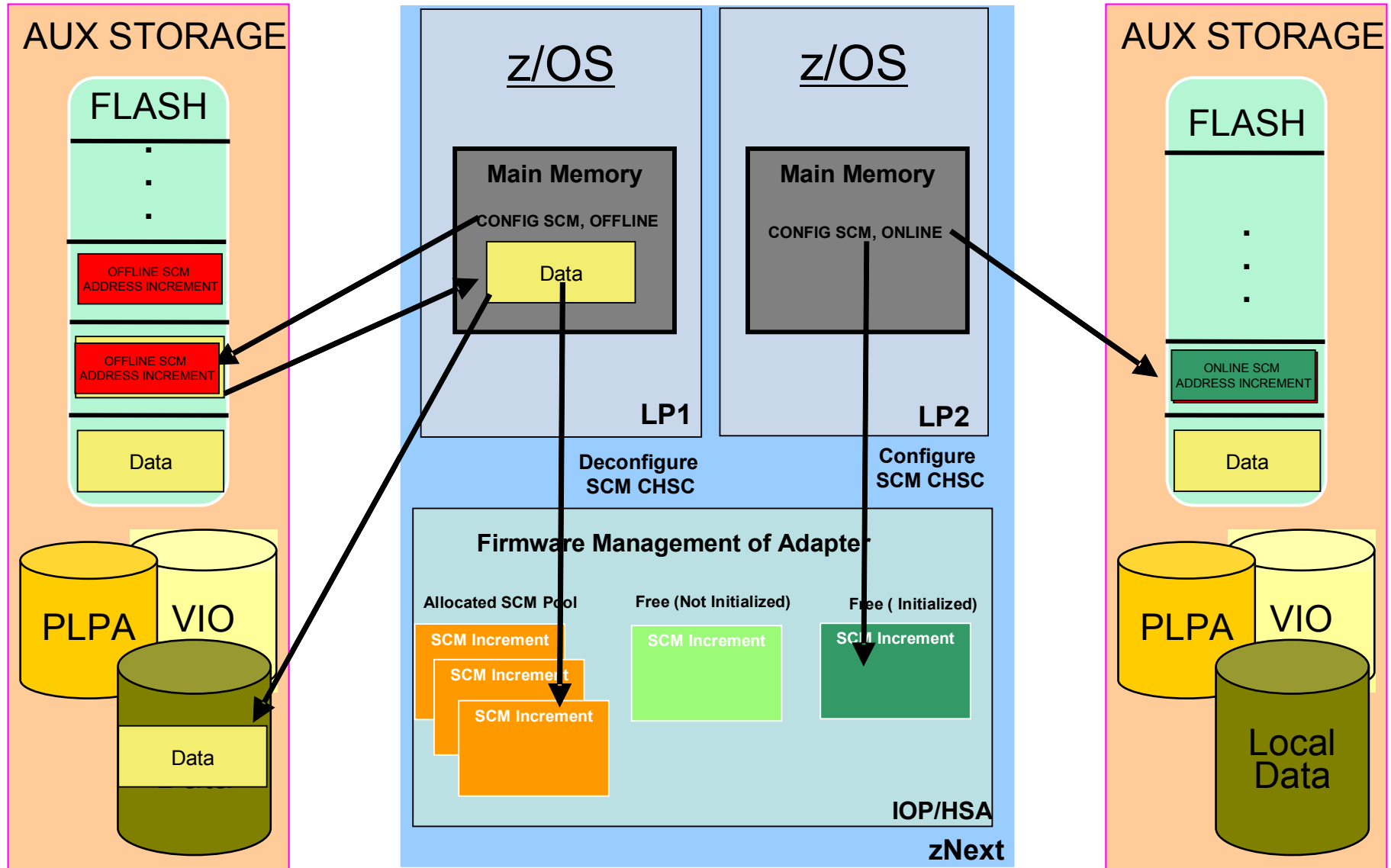
- Full virtualization of physical Flash cards across partitions
- To Software, Flash is an abstracted Storage Class Memory Space
 - Each LPAR can be configured with its own SCM address space
 - Allocate Flash to partitions by amount, not by card size
- Qualities of Service are Built in
 - Error Isolation, Transparent mirroring, Centralized diagnostics, etc.
 - Hardware Logging, FRU Call, Recovery: Independent of software
 - Underlying technology is transparent



zFlash for z/OS Paging Value

- **Flash Memory is a faster paging device as compared to HDD**
 - The value is NOT in replacing memory with Flash but replacing disk with Flash
 - Flash is suitable for workloads that can tolerate paging and will not benefit workloads that cannot afford to page
 - The z/OS design for Flash Memory does not completely remove the virtual storage constraints created by a paging spike in the system. (Some scalability relief is expected due to faster paging I/O with Flash Memory.)

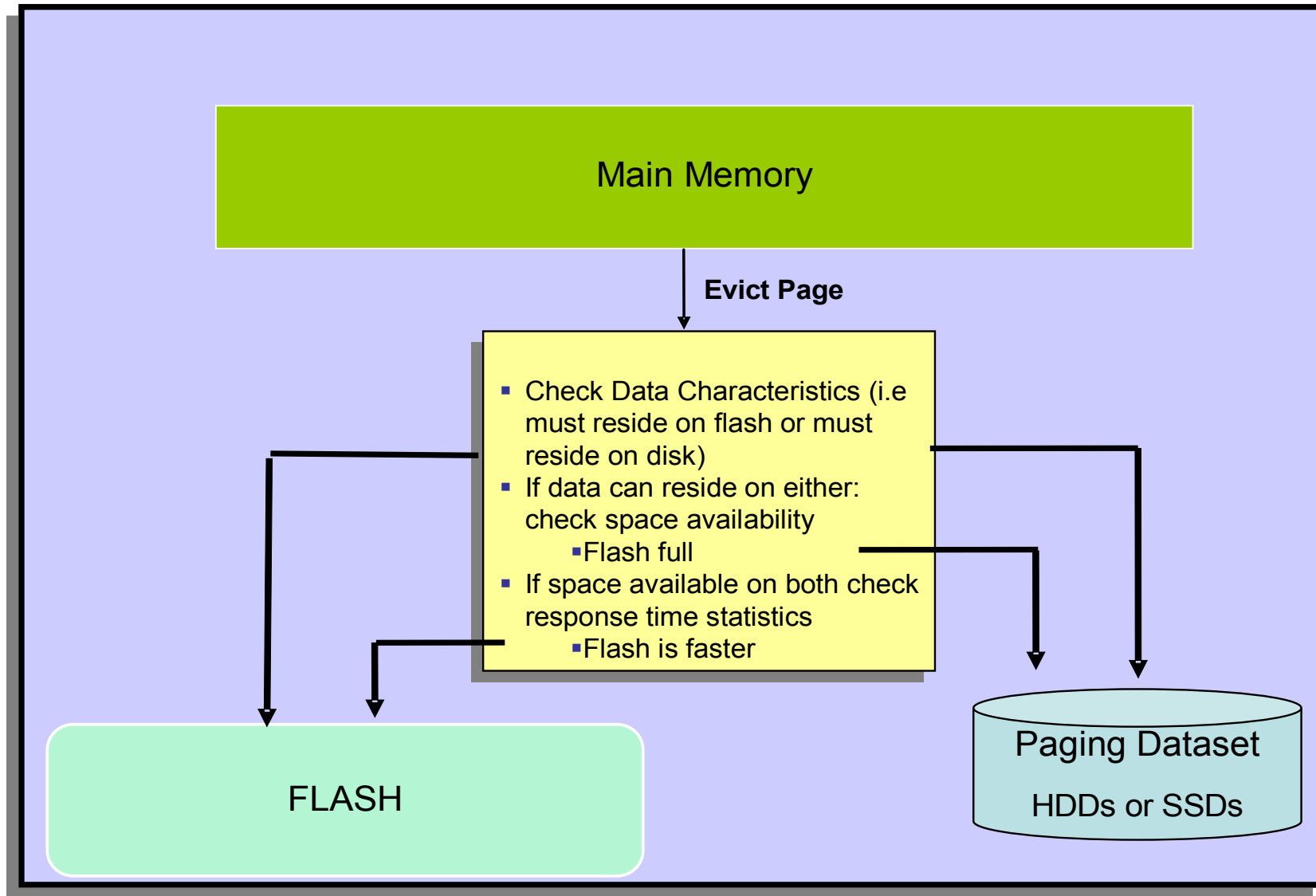
A z/OS zFlash Configuration



Typical Customer Configurations for zFlash

- Flash card pair memory size is 1.4TB
 - Min: 1 Card Pair
 - Max: 4 Card Pairs
- **Typical customer configuration is 6 to 8 LPARs per CEC and 40GB - 80GB for paging configuration dataset size**
- **Even with 10 LPARs per CEC, each LPAR has 160 GB of Flash Memory available for its paging datasets, more than double the current typical customer configuration.**
 - **All paging data can easily reside on Flash**
 - Data will preferably go to Flash and only go to disk (if any) when Flash is full
 - No intelligent placement of data on internal Flash needed

zFlash vs Disk Placement Criteria



Flash vs Disk Placement

Data Type	Data Page Placement
PLPA	At IPL/NIP time PLPA pages will be placed both on Flash and disk.
VIO	VIO data will always be placed on disk (First to VIO accepting datasets with any spillover flowing to nonvio datasets)
Pageable Large Pages	<p>If contiguous Flash space is available, pageable large page will be written to Flash.</p> <p>If Flash is not available in the system configuration pageable large pages will be backed with 4k page frames.</p>
All other data	If available space exists on both Flash and disk then make a selection based on response time.

z/OS zFlash Use Cases

▪ Paging

–z/OS paging subsystem will work with mix of internal Flash and External Disk

- Self Tuning based on measured performance
- Improved Paging Performance, Simplified Configuration

–Begin Paging 1 MB Large Pages only on Flash

- Exploit Flash's random IO read rate to get CPU performance by enabling additional use of Large Pages. Currently large pages are not pagable.

–Begin Speculative Page-In of 4K Pages, 1MB Pages only on Flash

- Exploit Flash's random IO read rate to get Improved Resilience over Disruptions.
- Market Open, Workload Failover

New z/OS Message

IAR031I USE OF STORAGE-CLASS MEMORY FOR PAGING IS ENABLED -
PAGESCM=ALL, ONLINE=xxxxxxxxM

- Issued during IPL to indicate whether SCM is in use for paging, what value was used for the PAGESCM parameter, and the amount of SCM that is in use for paging

Manage Flash Allocation - Change zFlash Allocation

- Allocated can only be changed for inactive partitions (APIVM2) or undefined partitions (NEWPARTN)
- Changing Allocated results in loss of data
- Changing allocations for an inactive partition:

P00E9EB6: Primary Support Element Workplace (Version 2.12.0)

Views

Groups Exceptions Act

Hardware Messages

CPC Configuration

View Hardware Configuration Cryptographic Configuration Manage Flash Allocation

Rebuild Vital Product Data Cryptographic Management Manage zBX Hardware

Nondisruptive Hardware Change Customize Network Settings Prepare System For Discontinuance

MSQ Processor Test Display Adapter ID Send Processor Change Notification

Update HOM and VPD FCP Configuration System Input/Output Configuration Analyzer

Channel PCHID Assignment Flash Status and Controls

Cleanup Discontinuance Manage DataPower XI50z

Manage Flash Allocation - P00E9EB6

Summary

Allocated: 64 GB Storage increment: 16 GB
 Available: 1360 GB Rebuild complete: 0 %
 Uninitialized: 0 GB
 Unavailable: 0 GB
 Total: 1424 GB

Partitions

--- Select Action ---

Select	Partition Name	Status	IOCDs	Allocated (GB)	Maximum (GB)
<input type="radio"/>	APIVM1	Active	A0	16	16
<input checked="" type="radio"/>	APIVM2	Inactive	A0	16	32
<input type="radio"/>	NEWPARTN			32	64

Refresh

OK Apply Cancel Help

P00E9EB6: Welcome to t P00E9EB6: Primary Supp Command Window P00E9EB6: Manage Flash Captura by HernanSoft 08:07:27 PM 12/11/2012

Manage Flash Allocation - Change zFlash Allocation

- Changing allocations for an active partition (notice only the maximum can be altered):

P00E9EB6: Primary Support Element Workplace (Version 2.12.0)

Views

Groups Exceptions Act Tab

P00E9EB6: Manage Flash Allocation

Manage Flash Allocation - P00E9EB6

Summary

Allocated: 64 GB Storage increment: 16 GB
 Available: 1360 GB Rebuild complete: 0 %
 Uninitialized: 0 GB
 Unavailable: 0 GB
 Total: 1424 GB

Partitions

--- Select Action ---

Select	Partition Name	Status	IOCDs	Allocated (GB)	Maximum (GB)
<input checked="" type="radio"/>	APIVM1	Active	A0	16	16
<input type="radio"/>	APIVM2	Inactive	A0	16	32
<input type="radio"/>	NEWPARTN			32	64

Refresh

OK Apply Cancel Help

CPC Configuration

View Hardware Configuration Cryptographic Configuration Manage Flash Allocation
 Rebuild Vital Product Data Cryptographic Management Manage zBX Hardware
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 Update HOM and VPD FCP Configuration System Input/Output Configuration Analyzer
 Channel PCHID Assignment Flash Status and Controls
 Cleanup Discontinuance Manage DataPower XI50z



P00E9EB6: Welcome to t P00E9EB6: Primary Supp Command Window P00E9EB6: Manage Flash Captura by HernanSoft 08:06:57 PM 12/11/2012



Manage Flash Allocation - Remove zFlash Allocation

- Remove Allocation can only be performed for an inactive partition
- All data will be lost
- A warning message will be issued and confirmation required before the Remove Allocation is done

Manage Flash Allocation - View Partition to PCHID Map

- Shows information for all PCHIDs
- SE and HMC

 **View Partition to PCHID Map - P00MN XK4** 

 --- Select Action --- 

Partition Name	Status	Adapter A PCHID	Adapter B PCHID
LP01	Inactive	0300	032C
LP02	Active	0300	032C
NEWPARTN		0300	032C
Total: 3			

Close Help

zFlash PCHID Details

- Display information for one PCHID
- SE only

P00E9EB6: Primary Support Element Workplace (Version 2.12.0)

Views

Groups Exe

P00E9EB6: PCHID Details

PCHID 0580 Details - PCHID0580

Instance Information **Acceptable Status**

Instance information

Status: Operating
Type: Flash Express
Cage-Slot-Jack: Z22B-LG01-J.01 - 02

Apply Advanced Facilities... Cancel Help

0580 Online Operating

Change Management

Hardware Messages

Operating System Messages

Change Internal Code

Define Clonable Internal Code Levels

Analyze Internal Code

System Information

Edit LPAR Internal Code Change

LPAR Internal Code Change Utility

Force Channel Internal Code Change

Authorize Internal Code Changes

Nondisruptive Ucode Apply

Alternate Support Element

Query Coupling Facility Reactivations

Check Dependencies

Manage zBX Internal Code

Query Channel/Crypto Configure Off/On Pending

Query Internal Code Changes Pending Power-on Reset

Save/Restore Feature On Demand

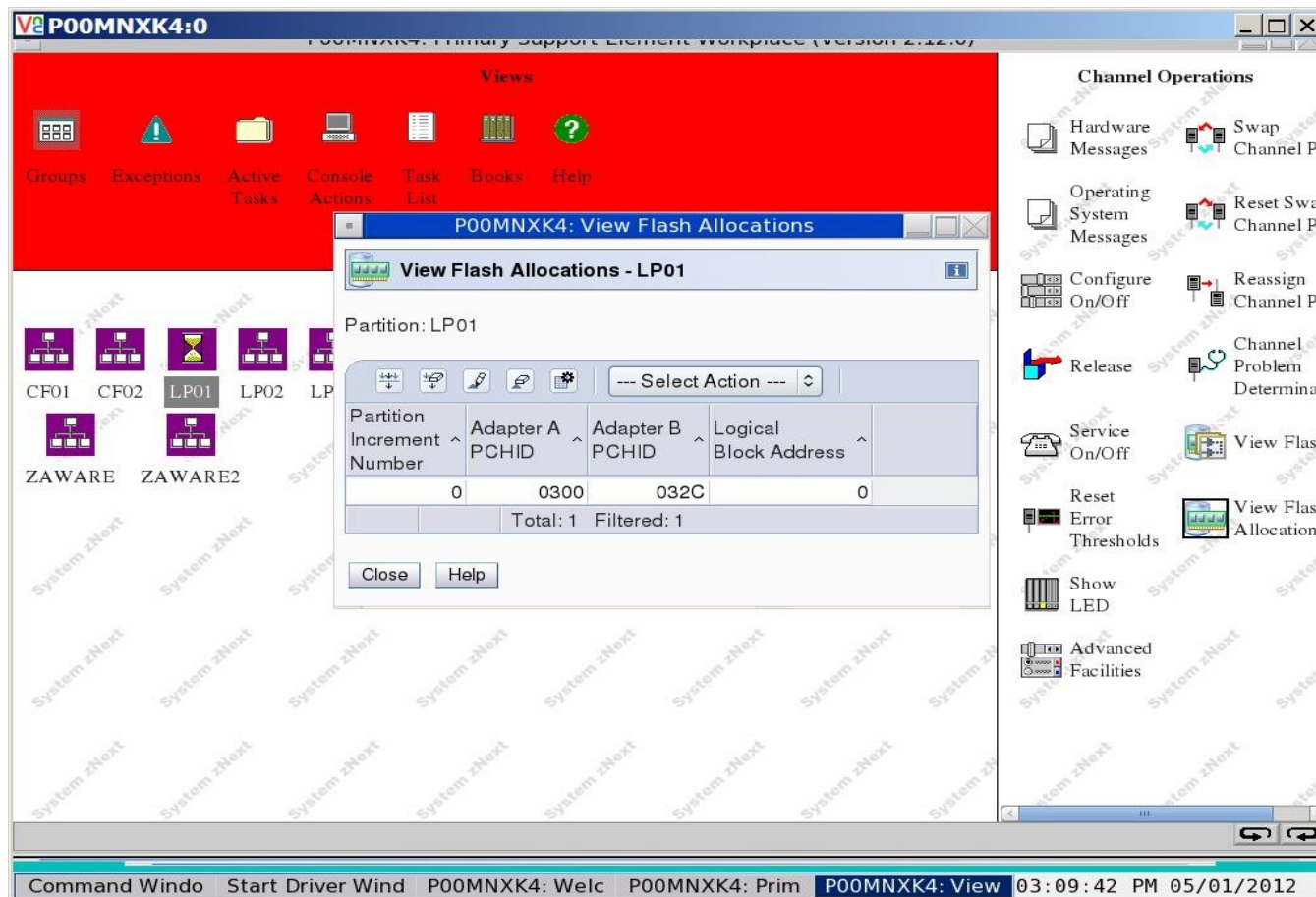
Selective Channel Patch Controls

Specify Concurrent Upgrade Sync Point

P00E9EB6: Welco P00E9EB6: Prima Command Windo P00E9EB6: Perfor P00E9EB6: Altern **P00E9EB6: PCHID** Captura by Herna 08:54:32 PM 12/11/2012

View Flash Allocations Task

- Display information for one partition
- SE only



View Flash

- For the selected PCHID, shows you some physical and allocation details
- SE Only

The screenshot displays the "P00E9EB6: Primary Support Element Workplace (Version 2.12.0)" application window. The main interface has a red header bar with "Views" and "Channel Operations" tabs. Below the header, there are several icons and labels: "Groups", "Exceptions", "Act", "Tas", "P00E", "0580 Online Operating", and "05AC Online Operating".

A modal dialog box titled "P00E9EB6: View Flash" is open, showing details for "View Flash - PCHID0580". The dialog contains the following information:

- PCHID: 0580
- Serial number: 26L034
- Card location: Z22B-LG01-J.01 - 02
- Partner PCHID: 05AC
- Serial number: 26L085
- Card location: Z22B-LG14-J.01 - 02
- Increment size: 16 GB

Below this information is a section titled "Select Action ---" with a dropdown menu. Underneath is a table with columns "Logical Block Address", "Partition Name", and "Partition Increment Number".

Logical Block Address	Partition Name	Partition Increment Number
0	APIVM1	0
1	NEWPARTN	1
2	NEWPARTN	2
3	APIVM2	3
Total: 4		

At the bottom of the dialog are "Close" and "Help" buttons.

In the background, the "Channel Operations" panel lists several actions with corresponding icons: Swap Channel Path, Reset Swap Channel Path, Reassign Channel Path, Channel Problem Determination, View Flash, and View Flash Allocations.

The status bar at the bottom shows: "P00E9EB6: Welcome to the Prim", "P00E9EB6: Primary Support Ele", "P00E9EB6: View Flash", "Captura by HernanSoft", and "09:43:08 PM 12/12/2012".

System Activity Display (SAD) / Monitors Dashboard

- Zflash is not supported by System Activity Display (SAD)
- It is supported by Monitors Dashboard. Refer to the new “Adapters” table in the lower right.

P99: Monitors Dashboard

Monitors Dashboard

Aggregated Processors

Select	Type	All Processor Usage (%)	Shared Processor Usage (%)
<input type="checkbox"/>	All Types	4	4
<input type="checkbox"/>	CP	4	4

Page 1 of 1 Max Page Size: 100 Total: 2 Filtered: 2 Displayed: 2 Selected: 0

Processors

Select	Name	Processor Usage (%)
<input type="checkbox"/>	CP00	4
<input type="checkbox"/>	CP01	4
<input type="checkbox"/>	CP02	4
<input type="checkbox"/>	CP03	6
<input type="checkbox"/>	CP05	1

Page 1 of 1 Max Page Size: 100 Total: 44 Filtered: 44 Displayed: 44 Selected: 0

System Assist Processors

Select	Name	Processor Usage (%)
<input type="checkbox"/>	SAP00	1
<input type="checkbox"/>	SAP01	1
<input type="checkbox"/>	SAP02	1
<input type="checkbox"/>	SAP03	1
<input type="checkbox"/>	SAP04	1

Page 1 of 1 Max Page Size: 100 Total: 7 Filtered: 7 Displayed: 7 Selected: 0

Logical Partitions

Select	Name	Processor Usage (%)	z/VMM Paging Rate (pages/second)
<input type="checkbox"/>	SAK09	5	
<input type="checkbox"/>	SAK0A	6	
<input type="checkbox"/>	SAK19	5	
<input type="checkbox"/>	SAK1A	7	
<input type="checkbox"/>	SAK29	0	

Page 1 of 1 Max Page Size: 100 Total: 8 Filtered: 8 Displayed: 8 Selected: 0

Channels

Select	CSS.CHPID	LPARs	Total Channel Usage (%)
<input type="checkbox"/>	0.00	Shared	1
<input type="checkbox"/>	0.01	Shared	1
<input type="checkbox"/>	0.02	Shared	0
<input type="checkbox"/>	0.03	Shared	0
<input type="checkbox"/>	0.09	Shared	0

Page 1 of 1 Max Page Size: 100 Total: 44 Filtered: 44 Displayed: 44 Selected: 0

Adapters

Select	Channel ID	Type	Adapter Usage (%)
<input type="checkbox"/>	O380	Flash Express	34
<input type="checkbox"/>	O3AC	Flash Express	34
<input type="checkbox"/>	O500	Flash Express	32
<input type="checkbox"/>	O52C	Flash Express	32

Page 1 of 1 Max Page Size: 100 Total: 4 Filtered: 4 Displayed: 4 Selected: 0

Close Help

P99: Prim Command Logloop P99: Vie ODT - My P99: Har P99: Har P99: Mon P99: Acti 10:59:24 AM 05/01/2012

Console Events

- Event logs will be generated when a flash allocation is added, changed or removed:

The screenshot shows a window titled "View Console Events". It contains a table with two columns: "Date" and "Events". The table lists various system events with their timestamps and descriptions. At the bottom of the window, there is a status bar showing "Page 1 of 1", "Max Page Size: 500", "Total: 266", "Filtered: 266", and "Displayed: 266". Below the status bar are three buttons: "Cancel", "Refresh", and "Help".


Date	Events
05/03/2012 21:05:10.080	A Flash Memory Allocation was removed for logical partition LP1.
05/03/2012 21:04:36.970	A Flash Memory Allocation was changed for logical partition LP1.
05/03/2012 20:58:36.520	Not in Service Required State.
05/03/2012 20:58:03.650	A Flash Memory Allocation was added for logical partition LP1.
05/03/2012 20:53:44.070	Not in Service Required State.
05/03/2012 20:53:42.110	A change of system performance values has completed successfully.
05/03/2012 20:53:36.840	Not in Service Required State.
05/03/2012 20:53:36.150	A change of system performance values has started that will restore performance to normal capacity.
05/03/2012 20:53:05.220	Cleanup discontinuance ended
05/03/2012 20:53:05.210	Cleanup discontinuance started
05/03/2012 20:53:04.950	The system clock has changed.
05/03/2012 20:51:58.060	Rebuild of VPD is only partially complete.
05/03/2012 20:51:58.050	Not in Service Required State.
05/03/2012 20:51:49.080	The CP Cryptographic Assist functions have been enabled successfully.
05/03/2012 20:51:46.950	Rebuild VPD started.
05/03/2012 20:48:47.350	Not in Service Required State.
05/03/2012 20:48:43.080	A0 was made the active input/output configuration data set (IOCDs).
05/03/2012 20:48:07.760	The following disruptive operation started: Power on reset. It was requested by

Page 1 of 1 Max Page Size: 500 Total: 266 Filtered: 266 Displayed: 266

Cancel Refresh Help

Security Logs

- Appropriate security logs will be generated for zFlash-related actions.
- Examples:

View Security Logs i			
File ▾ Search ▾ Options ▾ Help ▾			
Select	Date	Time	Security Event
<input checked="" type="radio"/>	4/29/12	19:03:40.320	*A Flash Memory Allocation was changed for logical partition CF01.
<input type="radio"/>	4/29/12	19:02:59.460	*A Flash Memory Allocation was added for logical partition CF01.
<input type="radio"/>	4/29/12	18:58:33.020	*A Flash Memory Allocation was removed for logical partition LP02.
<input type="radio"/>	4/29/12	18:57:16.500	A concurrent resource change has resulted in a change to the processor speed.
<input type="radio"/>	4/29/12	18:57:11.630	*Power-on reset was successful.
<input type="radio"/>	4/29/12	18:41:58.720	A1 was made the active input/output configuration data set (IOCDS).
<input type="radio"/>	4/29/12	18:41:58.680	Changed write protect of input/output configuration data set (IOCDS) STARTER in A1 to ON.
<input type="radio"/>	4/29/12	18:41:58.660	Changed write protect of input/output configuration data set (IOCDS) STARTER in A1 to OFF.
<input type="radio"/>	4/29/12	18:41:55.060	Power-on reset started. 
<input type="radio"/>	4/29/12	18:41:19.250	User pedebug has logged on from the console to session id 2. The user's maximum role is "Product Engineering Tasks".
<input type="radio"/>	4/29/12	18:38:47.610	Power-on was performed.
* - Denotes additional data for an event. Click "Details..." to display.			
Details...	Show Earlier Events	Show Later Events	Security log is 1% full

Flash Status and Controls States (Service Personnel Only)

- Adapter States:
 - Not Installed
 - Online
 - Online in progress
 - Offline
 - Offline check stopped
 - Offline in progress
 - Online check stopped
 - Service
 - Configuration error
- Array States:
 - Not formatted
 - Format in progress #% complete
 - Unformat in progress
 - Formatted
 - Configuration error
 - Rebuild in progress #% complete
 - Exposed
 - Unformat required
- Port States:
 - Unknown
 - Operational
 - Service
 - Dangling
 - Check stopped
 - Configuration error
 - Entering service mode
 - Exiting service mode
 - Repair in progress
 - Not installed

Configure the zFlash Adapter On/Off (Service Personnel Only)

Configure the adapter online or offline.

GUSRDAD6: Flash Status and Controls

Flash Status and Controls - GUSRDAD6

Options ▾

- Create Pair
- Disband Pair
- Unformat
- Configure** ▸
 - On
 - Off
- Adapter Service ▸
- Port A Service ▸
- Port B Service ▸

--- Select Action --- ▾

Card Slot ^	Adapter State ^	Array-config State ^	Port A State ^	Port B State ^
01-J.00	Online	Unformat Required	0000, Operational	0000, Operational
01B-LG14-J.00	Online	Unformat Required	0000, Operational	0000, Operational
01B-LG25-J.00	Online	Unformat Required	0000, Operational	0000, Operational
01B-LG33-J.00	Online	Unformat Required	0000, Operational	0000, Operational

Refresh Cancel Help

Adapter Service Mode (Service Personnel Only)

Enter adapter service mode or exit adapter service mode, they are both disabled right now because the adapter status in Online.

GUSRDAD6: Flash Status and Controls

Flash Status and Controls - GUSRDAD6

Options ▾

- Create Pair
- Disband Pair
- Unformat
- Configure
- Adapter Service** ▸
 - Enter
 - Exit
- Port A Service ▸
- Port B Service ▸

--- Select Action --- ▾

Image-Card Slot ^	Adapter State ^	Array-config State ^	Port A State ^	Port B State ^
036C	Online	Unformat Required	0000, Operational	0000, Operational
036C	Online	Unformat Required	0000, Operational	0000, Operational
036C	Online	Unformat Required	0000, Operational	0000, Operational
036C	Online	Unformat Required	0000, Operational	0000, Operational

Refresh Cancel Help

Port Service Mode (Service Personnel Only)

- Enter Port A service mode or exit Port A service mode, the exit is disabled currently because the port is currently in operational state.
- Port B Service behaves the same way.

GUSRDAD6: Flash Status and Controls

Flash Status and Controls - GUSRDAD6

Options ▾

- Create Pair
- Disband Pair
- Unformat
- Configure
- Adapter Service
- Port A Service**
 - Enter
 - Exit
- Port B Service

--- Select Action --- ▾

Image-Card Slot ^	Adapter State ^	Array-config State ^	Port A State ^	Port B State ^
01B-LG01-J.00	Online	Unformat Required	0000, Operational	0000, Operational
02B-LG02-J.00	Online	Unformat Required	0000, Operational	0000, Operational
03B-LG03-J.00	Online	Unformat Required	0000, Operational	0000, Operational
04B-LG04-J.00	Online	Unformat Required	0000, Operational	0000, Operational

Refresh Cancel Help

You should now understand the steps to set up IBM zFlash.

Questions?



Backup Material

Registering for IBM Resource Link Access

- Registering for IBM Resource Link Access
- To view the documents on the Resource Link Web site, you need to register your IBM Registration ID (IBM ID) and password with Resource Link.
- To register:
 - Open the Resource Link sign-in page: <http://www.ibm.com/servers/resourcelink/>
 - You need an IBM ID to get access to Resource Link.
 - If you do not have an IBM ID and password, select the "Register for an IBM ID" link in the "Your IBM Registration" menu. Return to the Resource Link sign-in page after you get your IBM ID and password.
 - Note: If you're an IBM employee, your IBM intranet ID is not an IBM ID.
 - Sign in with your IBM ID and password.
 - Follow the instructions on the subsequent page.

Reference Documentation

- Available from “Books” group of Classic Style UI and the Welcome page of the Tree Style UI (& IBM Resource Link: Library->zEC12->Publications)
 - IBM SC28-6919: Hardware Management Console Operations Guide (Version 2.12.0)
 - IBM SC28-6920: Support Element Operations Guide (Version 2.12.0)
 - IBM SB10-7030: Application Programming Interfaces
 - IBM SC28-2605: Capacity on Demand User’s Guide
 - IBM SB10-7154: Common Information Model (CIM) Management Interfaces
 - IBM SB10-7156: PR/SM Planning Guide
 - IBM SA22-1088: System Overview
 - IBM SC27-2623 Advanced Workload Analysis Reporter (IBM zAware) Guide
- Available from IBM Resource Link: Library->zEC12->Technical Notes
 - System z Hardware Management Console Security
 - System z Hardware Management Console Broadband Remote Support Facility
 - System z Activation Profile Update and Processor Rules

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zFlash Setup, Management, and Configuration

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