

# Improving Application Availability with IBM System Automation Scenarios

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14076



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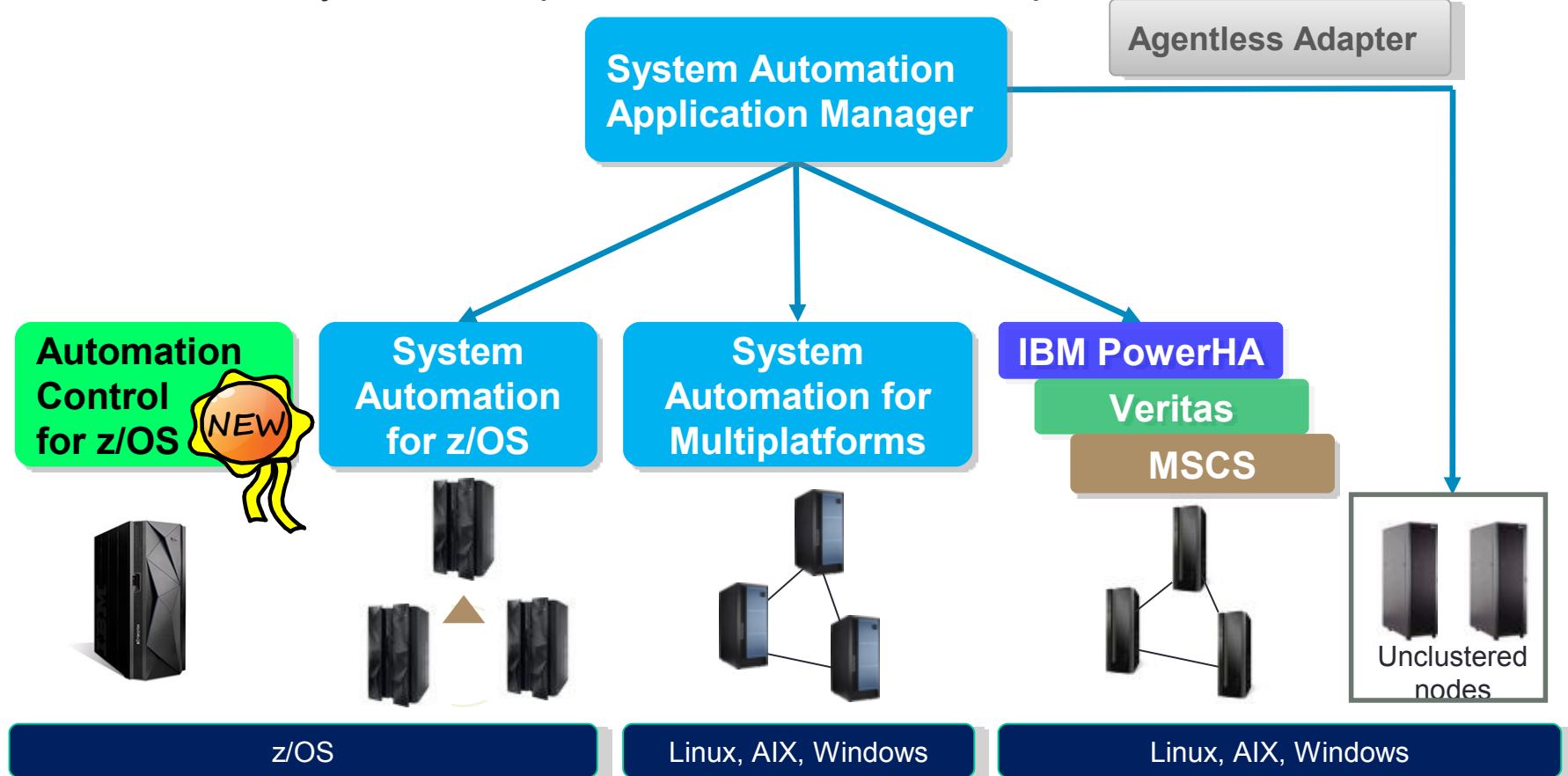
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# Agenda

- SA z/OS Overview
- Scenario 1 - Cross System Dependency
- Scenario 2 - System Failover
- Scenario 3 - Preferred System
- Scenario 4 - Planned Move
- Scenario 5 - Staged IPL
- Latest new Functions

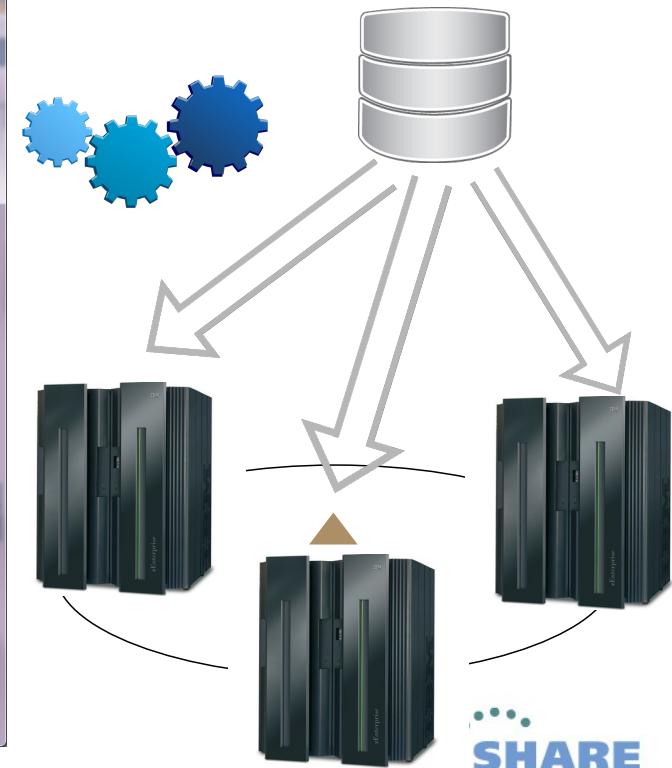
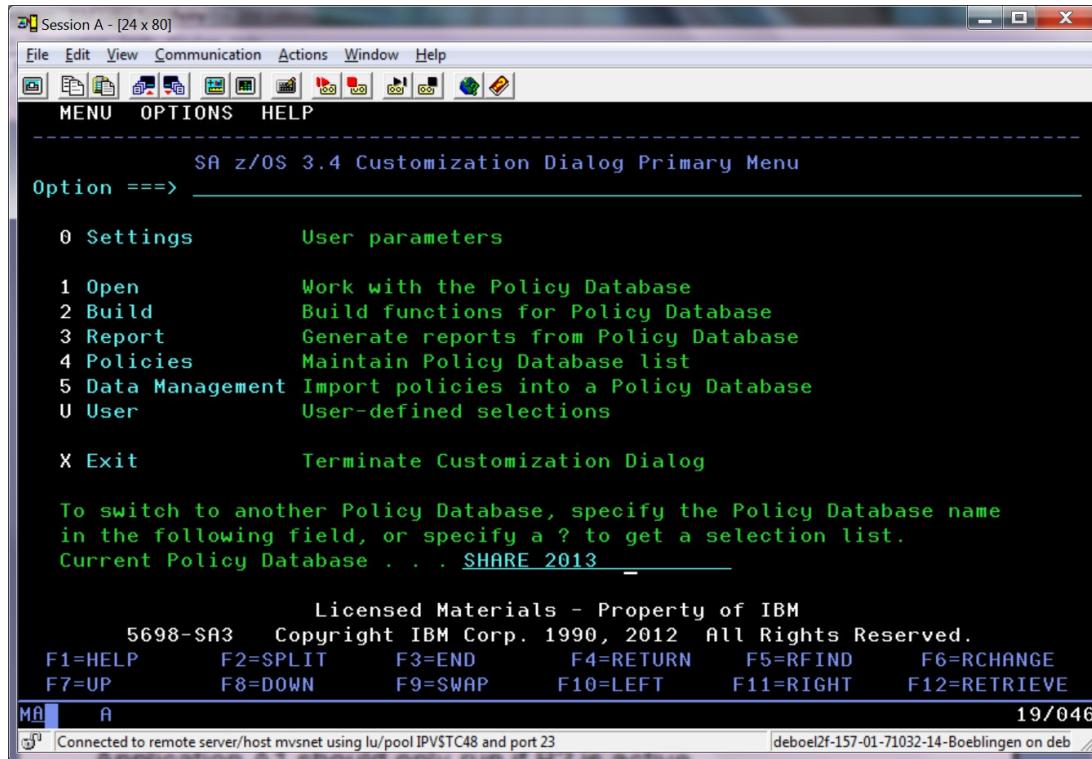
# IBM System Automation family

IBM only vendor to provide end-to-end, cross-platform Automation

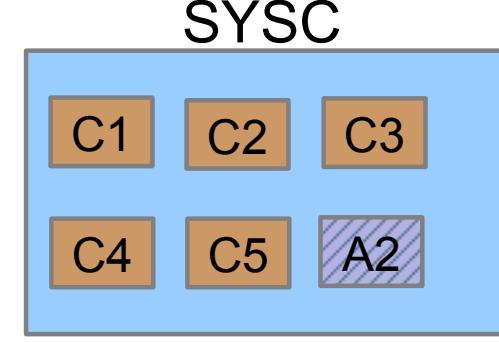
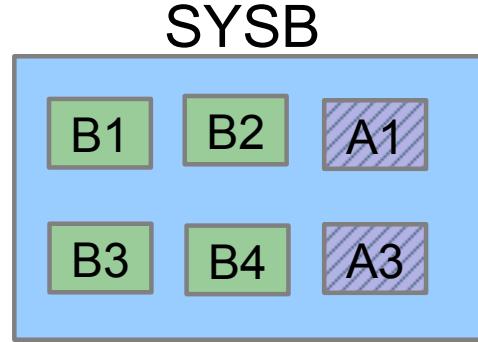
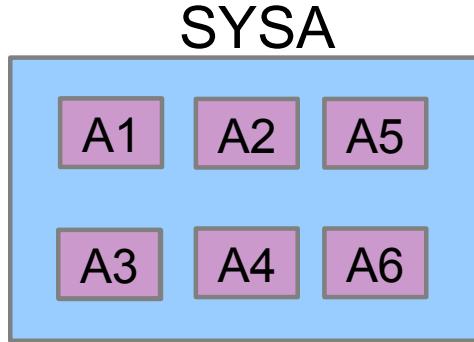


# SA z/OS Concepts

- Goal driven automation
- Policy defined and built in ISPF application
- Policy activation in NetView environment



# System Setup for the Scenarios



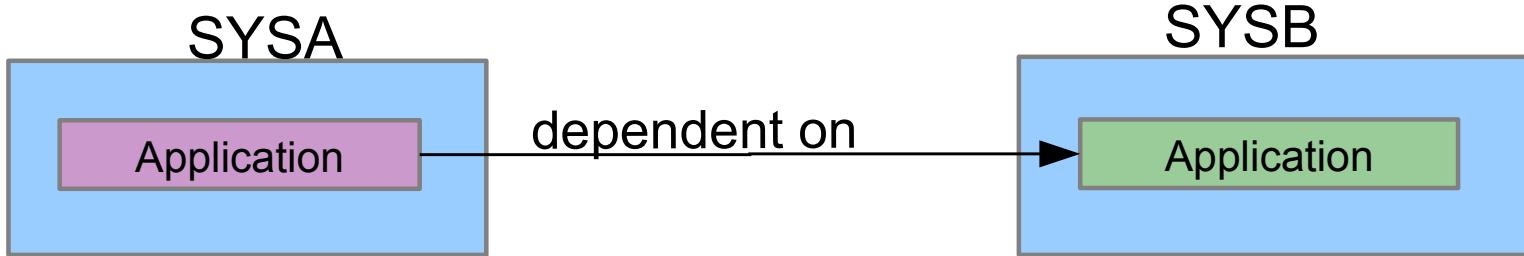
Sysplex comprising 3 systems

Application A1, A2 and A3 usually run on SYSA, but can move to SYSB / SYSC

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# Scenario 1 – Cross System Dependency

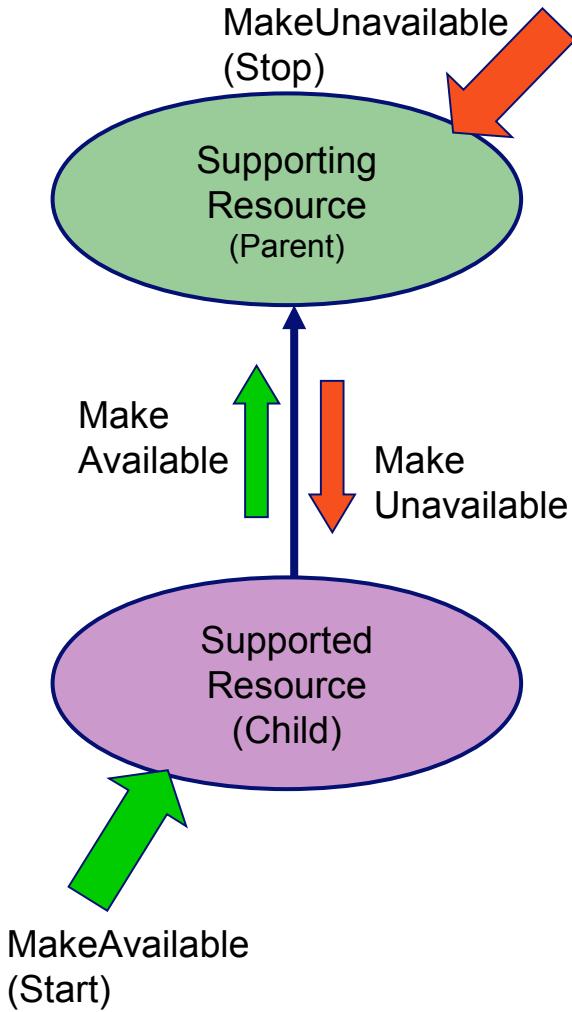


Example:

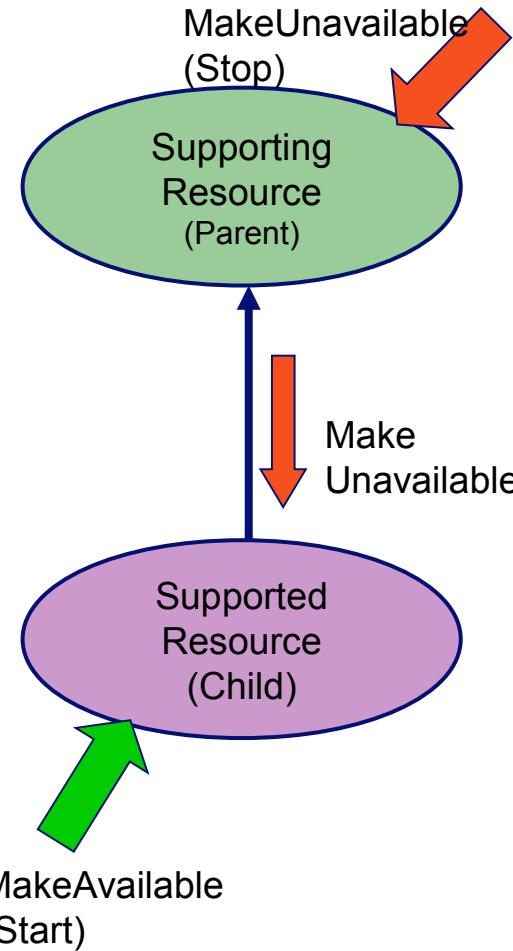
An application on SYSA is only startable if an Application on SYSB is active

# Relationships

## HasParent



## HasPassiveParent

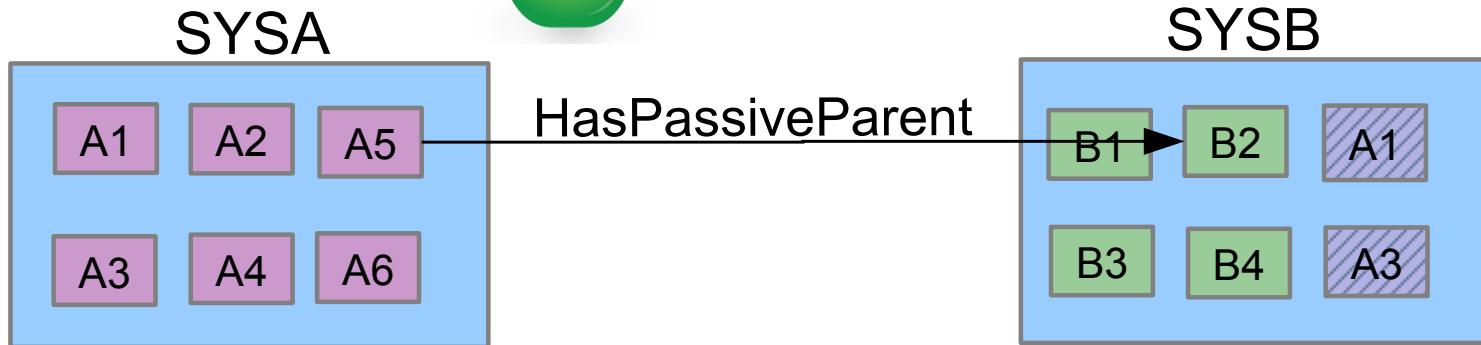


- MakeAvailable
- MakeUnavailable
- PrepAvailable
- PrepUnavailable
- HasParent
- HasPassiveParent
- HasMonitor
- PeerOf
- ForceDown
- Externally

# Scenario 1 – Cross System Dependency



Request: Start of A5



Application A5 is only startable if Application B2 is active

A5 and B2 are down



A5 does not start

A5 is down, B2 is up



A5 starts

# Scenario 1 – Cross System Dependency

Policy Selection		Row 18
Entry Type : Application	PolicyDB Name : SCENARIO	
Entry Name : A5	Enterprise Name :	
Action	Policy Name	Policy Description
	SERVICE PERIOD	Select service period
	RELATIONSHIPS	Define relationships
	MESSAGES/USER DATA	Define messages and user data
	STARTUP	Define startup procedures
	SHUTDOWN	Define shutdown procedures

Relationship Selection List		
Command ==>	_____	
Entry Type : Application	PolicyDB Name : SCENARIO	
Entry Name : A5	Enterprise Name :	
External Startup . . . _____	(INITIAL ALWAYS NEVER)	
External Shutdown . . . _____	(FINAL ALWAYS NEVER)	
Action #	Type	Supporting Resource
_____	HASPASSIVEPARENT	B2/APL/=

# Scenario 1 – Cross System Dependency



Request: Start of A6



Application A6 is only startable if Application B4 is active

A6 and B4 are down



B4 and A6 start

# Scenario 1 – Cross System Dependency

Policy Selection			Row 1 to 1
Entry Type : Application	PolicyDB Name : SCENARIO		
Entry Name : A6	Enterprise Name :		
Action	Policy Name	Policy Description	
_____	DESCRIPTION	Enter description	
_____	UPWARD CLASS	Select a class to inherit data from	
_____	APPLICATION INFO	Define application information	
_____	AUTOMATION FLAGS	Define application automation flags	
_____	APPLICATION SYMBOLS	Define application symbols	
_____	TRIGGER	Select trigger	
_____	SERVICE PERIOD	Select service period	
_____	RELATIONSHIPS	Define relationships	

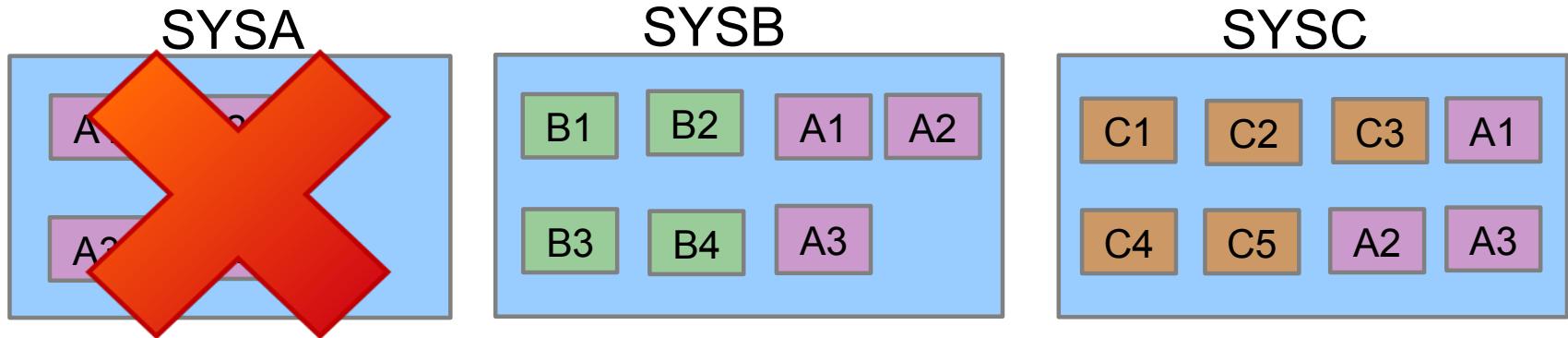


Relationship Selection List		
Command ==>		
Entry Type : Application	PolicyDB Name : SCENARIO	
Entry Name : A6	Enterprise Name :	
External Startup . . .	(INITIAL ALWAYS NEVER)	
External Shutdown . . .	(FINAL ALWAYS NEVER)	
Action #	Type	Supporting Resource
_____	HAS PARENT	B4/APL/=

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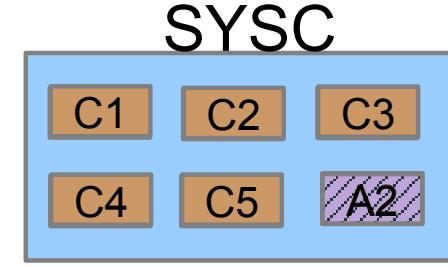
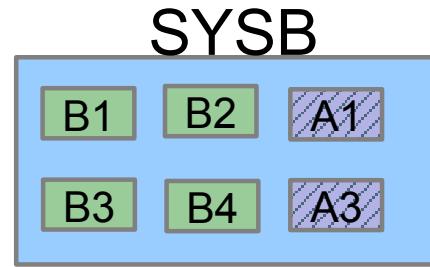
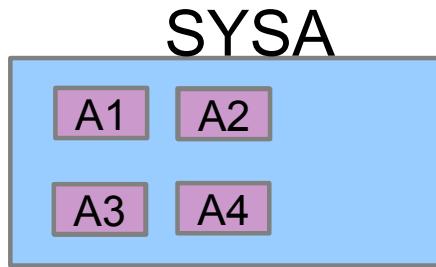
# Scenario 2 – System Failover



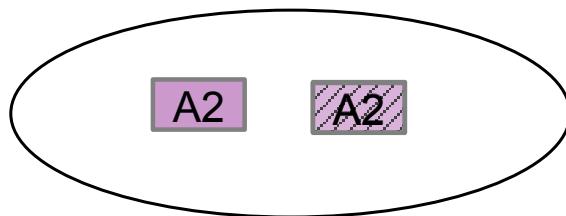
SYSA fails  Applications A1, A2 and A3 start on alternate systems

# SA z/OS Groups - Type

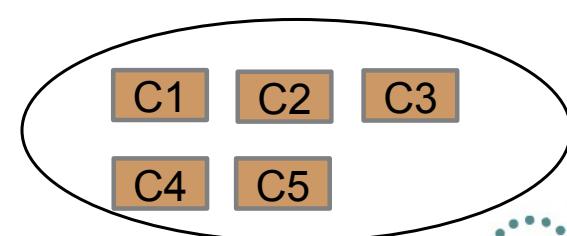
Application Groups	
Type	System
	Sysplex



Type Sysplex:

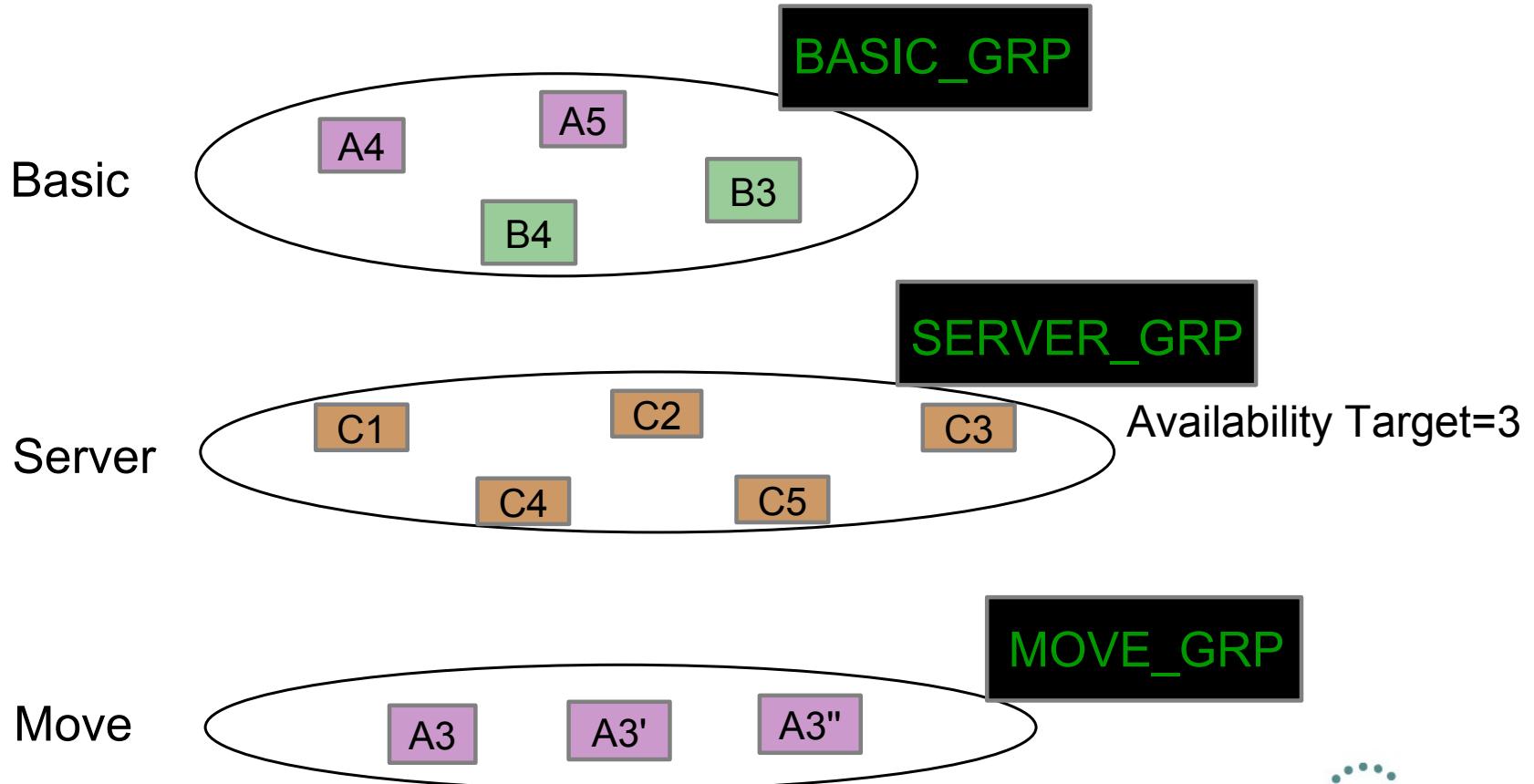


Type System:

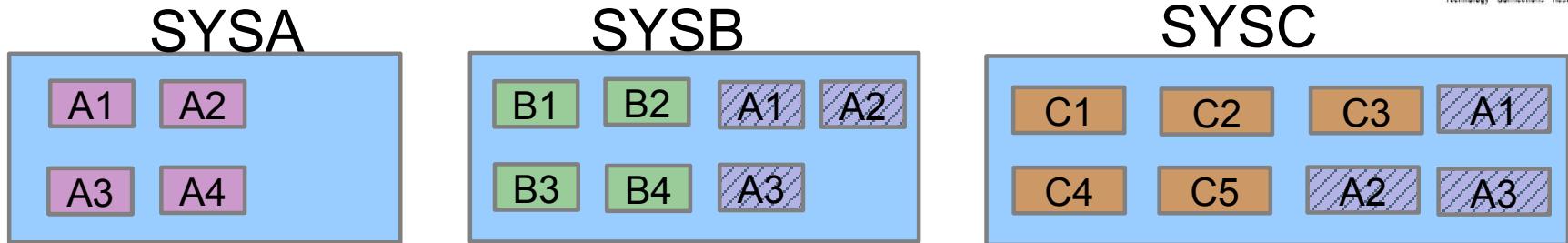


# SA z/OS Groups - Nature

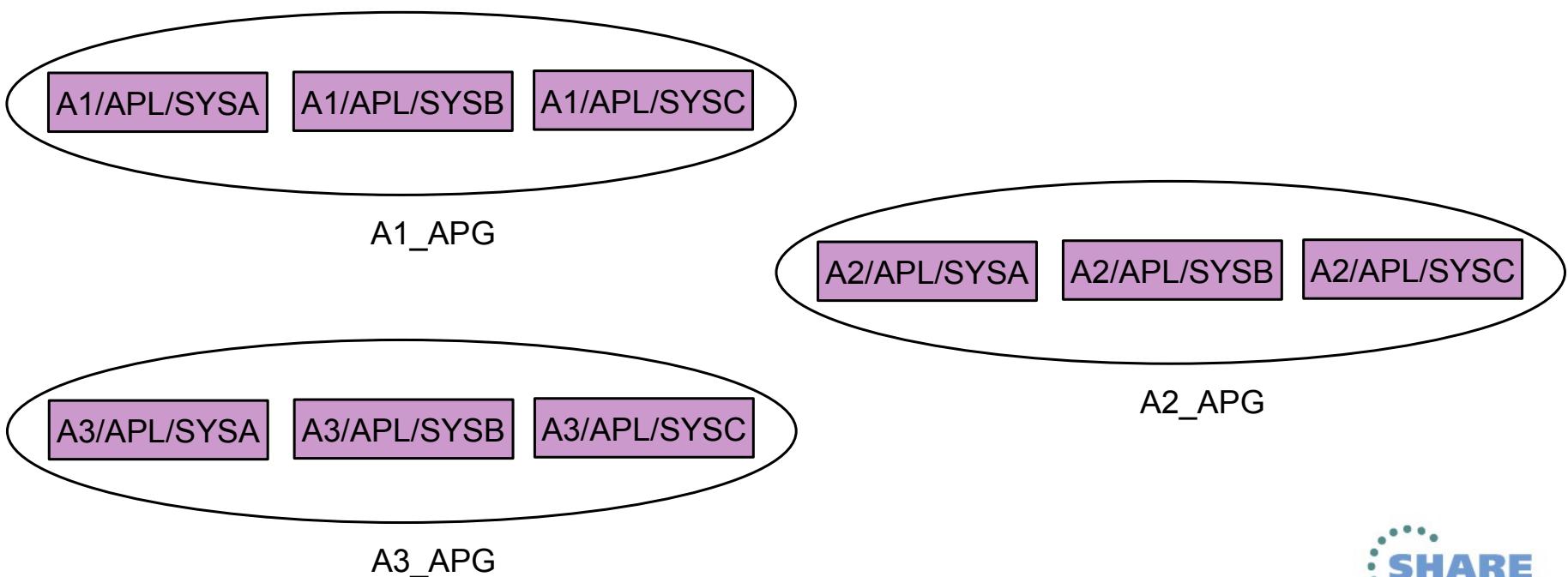
Application Groups			
Nature	Basic	Server	Move
Active members	all	any	one



# SA z/OS Groups



To move applications A1 – A3: Sysplex groups of Nature Move



# SA z/OS Groups – Customization Dialog

## Entry Name Selection

Entry Type : ApplicationGroup

PolicyDB Name : SCENARIO

Enterprise Name :

Action	Entry Name	Short Description
	A1_APG	Move group for Application A1
	A2_APG	Move group for Application A2
	A3_APG	Move group for Application A3

## Application Group Information

Command ==> \_\_\_\_\_

Entry Type : ApplicationGroup

PolicyDB Name : SCENARIO

Entry Name : A1\_APG

Enterprise Name :

The following field was specified when the Application Group was defined and cannot be modified:

Application Group Type : SYSPLEX

Nature . . . . . . . . . . MOVE

(BASIC MOVE SERVER)

# Linkage – Customization Dialog

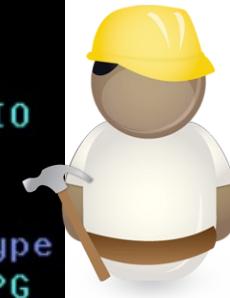
Where Used			
Entry Type : Application		PolicyDB Name : SCENARIO	
Entry Name : A1		Enterprise Name :	
Action	Status	Name	Type
	SELECTED	A1_APG	APG
		A2_APG	APG
		A3_APG	APG

Where Used			
Entry Type : ApplicationGroup		PolicyDB Name : SCENARIO	
Entry Name : A1_APG		Enterprise Name :	
Action	Status	Name	Type
	SELECTED	SAM7PLEX	GRP

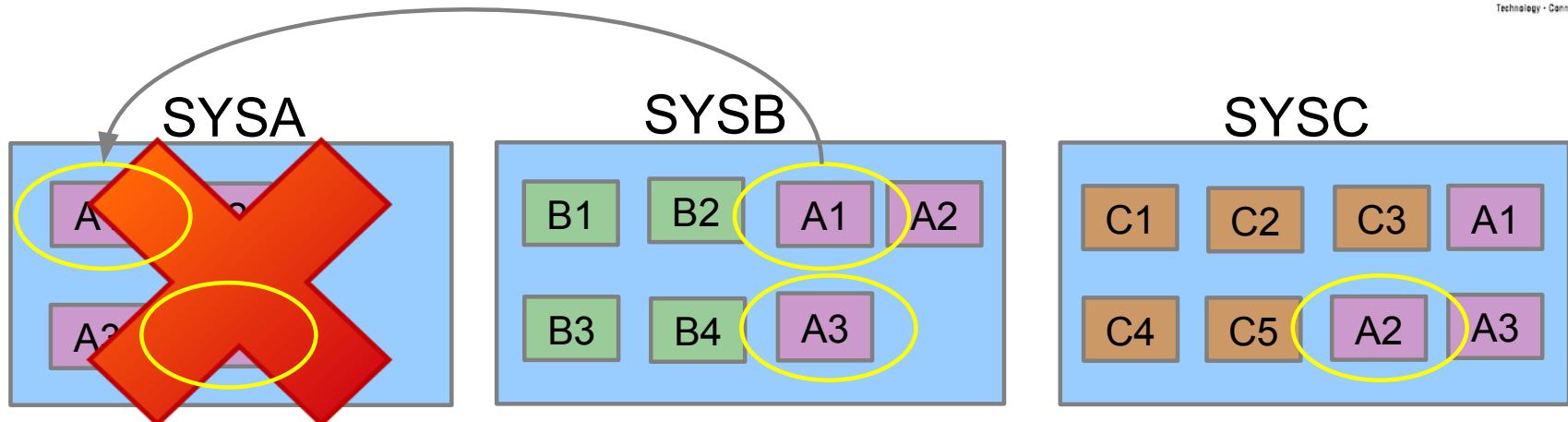
Systems for Group			
Entry Type : Group		PolicyDB Name : SCENARIO	
Entry Name : SAM7PLEX		Enterprise Name :	
Action	Status	System	
	SELECTED	SAM7	
	SELECTED	SAM8	
	SELECTED	SAM9	



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# Scenario 3 - Preferred System



**After** System failure – when SYSA is up again

A1 should move back to SYSA

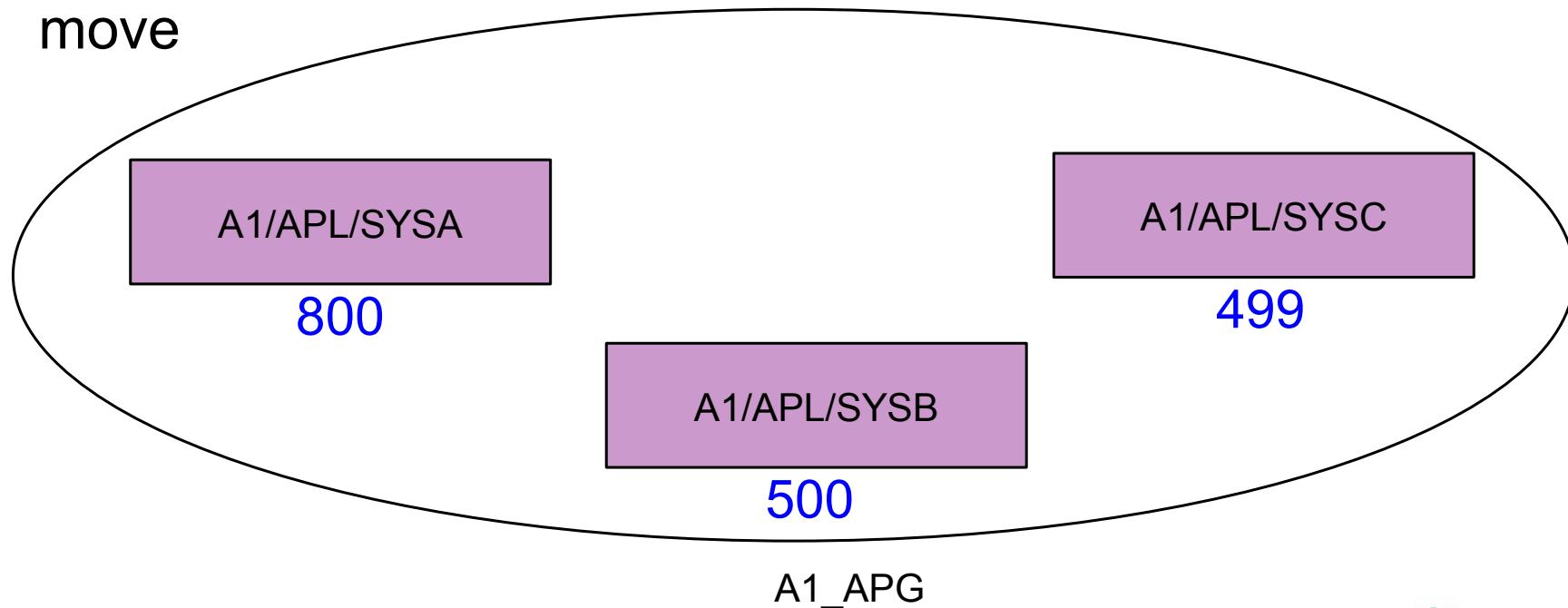
A2 should stay on SYSC

A3 should stay on SYSB

A4 should just start again on SYSA

# Preference Values

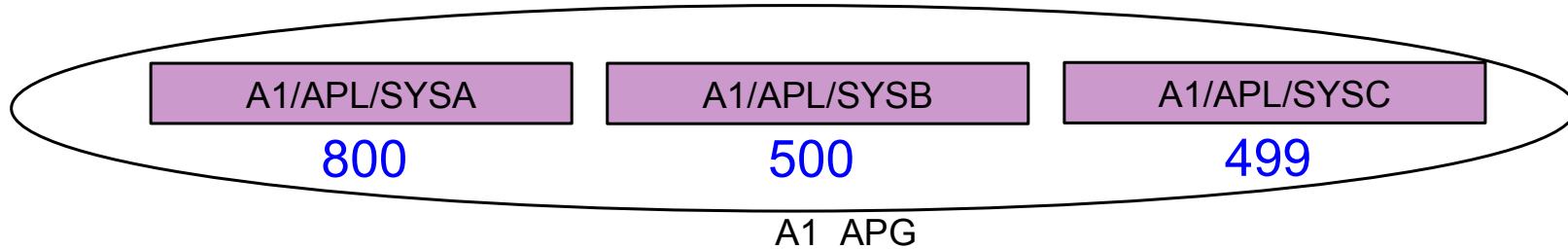
- To prefer special members in a group
- Values between 0 and 3200 are valid
- The higher the value, the more preferred
- Usually a preference difference greater than 250 initiates a move



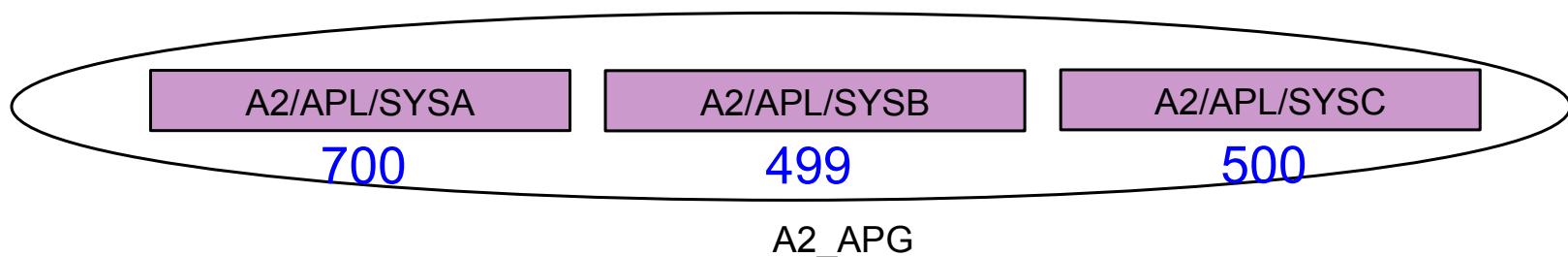
# Preference Values - continued

After System restart of SYSA:

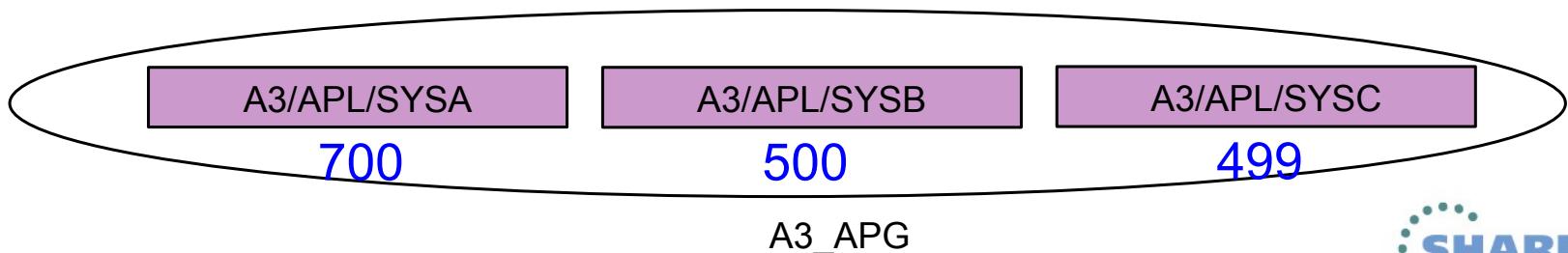
A1 should move back to system SYSA



A2 should remain on its alternate system SYSC



A3 should remain on its alternate system SYSB



# Preference Value – Customization Dialog

Select Resources

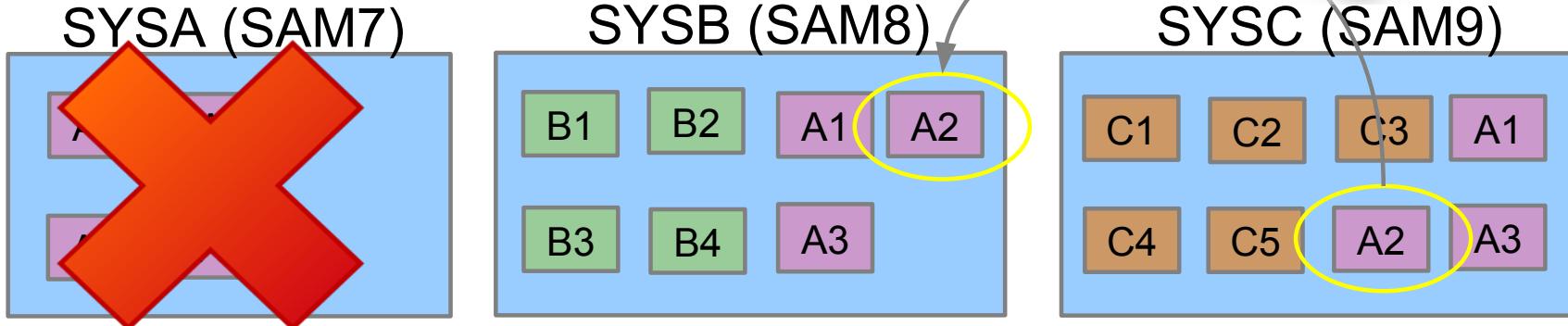


Entry Type : ApplicationGroup	Entry Name : A3_APG		
Sysplex : SAM7PLEX			
Number of selected Resources : 3			
Availability Target	: 1 (Move Application Group)		
Show all Resources . . . . .	<u>NO</u> (YES NO)		
Show only Resources with String: _____			
Action	Preference	Resource Name	Entry Name
_____	700	A3/APL/SAM7	A3
_____	500	A3/APL/SAM8	A3
_____	499	A3/APL/SAM9	A3

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# Scenario 4 – Planned Move



Application A2 should move to SYSB (SAM8)

→ INGMOVE

INGKYMVO		SA z/OS - Command Dialogs				Group 1 of 3	
Domain ID = IPCNG		----- INGMOVE -----				Date = 07/22/13	
Operator ID = BUMU		Sysplex = SAM7PLEX				Time = 14:26:34	
B Start	C Stop	D INGRELS	E INGVOTE	F INGINFO	G Members	I INGSCHED	/ scroll
J INGGROUP	M Move	P Prepare	R Reset	X Box Group			Move to
Cmd	Group name	Obs	Status	----- Systems -----			
	A1_G		AVAILABLE	SAM7	SAM8	SAM9	SAM9
	A2_G		AVAILABLE	SAM7	SAM8	SAM9	SAM8
	A3_G		AVAILABLE	SAM7	SAM8	SAM9	SAM9

SAM8 is preselected; can be overtyped

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# Scenario 5 – Staged IPL



SYSB



Runmode	Applications
BASE_ELEMENT	B1, B2, B3, B4
BUSINESS	B1, B2, B3, B4, A1, A2, A3

At System Start on SYSB only z/OS **Base** Elements B1, B2, B3 and B4 should come up

→ Have Runmode set to **BASE\_ELEMENT**

At end of Maintenance all business applications should be started again

→ Set Runmode to **BUSINESS** via INGRUN

# Scenario 5 – Staged IPL



## Runmode and Runtoken Definitions in Policy

```
UET Keyword-Data Specification          Line 00000001

Entry: INGRUN                         Type: MODE
Mixed case . . . NO    (YES NO)      Keyword length. . . 20  (1-64)

Cmd Keyword                            Data
   BASE ELEMENT                   BASIC
   BUSINESS                     'BASIC WEBSPHERE IMS CICS DB2'
```



```
Application Information

Entry Type : Application
Entry Name : TSO
PolicyDB Name   : BASE_34
Enterprise Name : BASE_34

Runtokens . . . .
BASIC
```



# Agenda

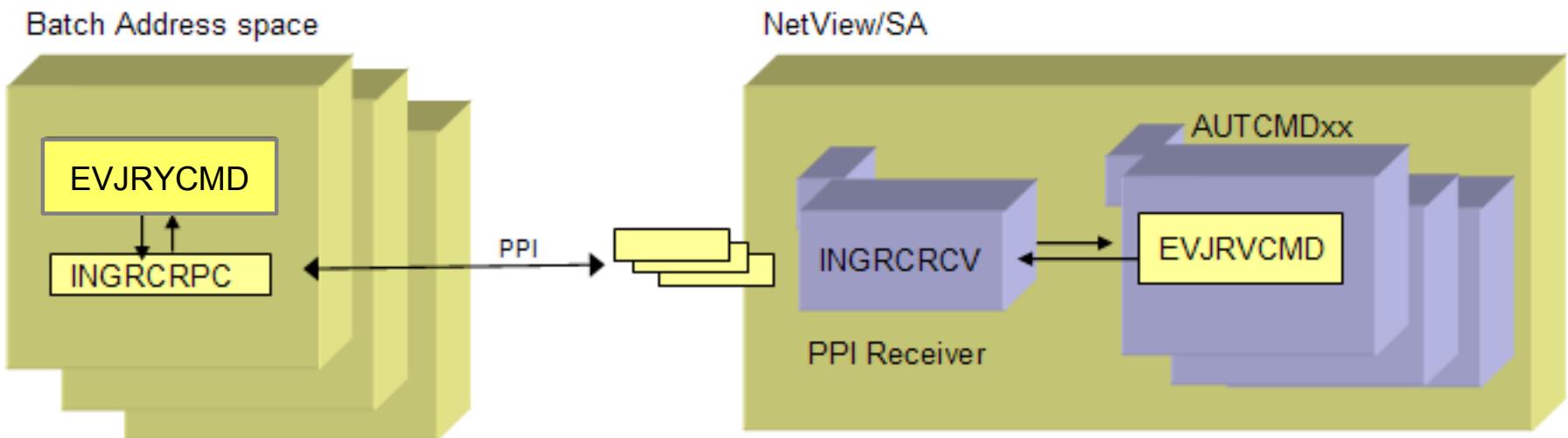
- SA z/OS Overview
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## Batch Command Receiver – Parallel execution

# Batch Command Receiver – Parallel execution

- Processing no longer tied to TWS workstation (optionally)
- Eliminates deficiency that only one command can be processed at a time
  - New support allows concurrent processing of commands originated from multiple jobs
  - Triggered by SERVER=\* parameter

Prereqs TSO REXX function package -> INGTXFPG



## Support of Screen Width > 80 Characters

# Support of Screen Width > 80 Characters

- Provided for all Commands that have horizontal scrolling
  - INGLIST
  - DISPGW
  - DISPSTAT
  - DISPMTR
  - INGIMS (dependent regions)
  - INGAMS

INGKYST0 SA z/OS - Command Dialogs Line 1 of 107														
Domain ID	= IPXFG	----- INGLIST -----			Date = 02/05/11									
Operator ID	= WAS	Sysplex = KEYAPLEX			Time = 19:44:08									
A Update	B Start	C Stop	D INGRELS	E INGVOTE	F INGINFO	G Members	H DISPTRG	I INGSCHED	J INGGROUP	K INGCICS	L INGIMS	M DISPMTR	T INGTWS	
U User	X INGLKUP	/ scroll												
CMD Name	Type	System	Compound	Desired	Observed	Nature	Automation	Startable	Health	Auto	Hold	Starttype	Stoptype	Trigger
AM	APL	KEYA	SATISFACTORY	AVAILABLE	AVAILABLE		IDLE	YES	N/A	YES	NO			
AM	APL	KEYB	SATISFACTORY	UNAVAILABLE	SOFTDOWN		IDLE	YES	N/A	YES	NO			
AM	APL	KEYC	SATISFACTORY	AVAILABLE	AVAILABLE		IDLE	YES	N/A	YES	NO			
AM_X	APG		SATISFACTORY	AVAILABLE	AVAILABLE	SERVER	INTERNAL	YES	N/A	YES	NO			
AM2	APL	KEYA	SATISFACTORY	UNAVAILABLE	SOFTDOWN		IDLE	YES	N/A	YES	NO			
AM3	APL	KEYA	SATISFACTORY	UNAVAILABLE	SOFTDOWN		IDLE	YES	N/A	YES	NO			

Panel body supports 132  
and 160 chars width

## SDF Enhancements

# SDF Enhancements

- Support for multiple BODY sections in panel
  - BODYHEADER statement defines how to format the header
  - BODYTITLE statement defines the title text of the section.

Body header

- New Forward/Backward command

- New exit AOFEXX05 to support User symbols

```

KEY4          A   I
==>
Subsystem Sta 61/113(113) Jobname Reply ID / Message text ---
OMIIM2Z     IMS1_DB_CTL  IMS941C4 054 DFS9961 *IMS READY* M941
OMIIM2CS    IMS1_DB_MPX  NETASYST 027 DS1802A IPSFP REPLY WITH VALID NCCF SYSTEM OPERATOR COMMAND
OMIIM2HD    IMS1_DB_MPX  IMS942C4 044 DFS9961 *IMS READY* M942
OMIIM2HC    IMS1_DB_DLS  INGAR0P1
OMIIM2RC    JLM501
OMV5        JLM502
RACF        JLM503
RESOLVER    JLM504
RNF         JLM505
RMFGAT      JLM506
RRS         JLM507
SNH4DBM1    JLM508
SNH4D1ST    JLM701
SNH4IRLM    JLM702
SNH4MSTR    JLM703
SYS4PPPL    JLM704
SYSVSP1    MSM
TCP/IP      NETCDHV
TSO         RDM
VLF         RDMLOAD
VTAM        SNA3_LITE
ZFS

BLSJPRMI
IRRDPTE
SNSVSPLC
CONKEY4
GMFHS
TMS_DB_IRLM

Application Group 1/20(4)
SNA_X       IMS_SUPPORT
BASE_SUPP   IMSA_CSLMGR
BASE_SYS    IMS1_CTRL
BASE_USS    IMS2_CTRL
CICS        IMS2_SUPPORT
CPSM        LOOKASIDE
DB2         NETWORK
DB2_X       OMII_CICS
IMS         OMII_GROUP

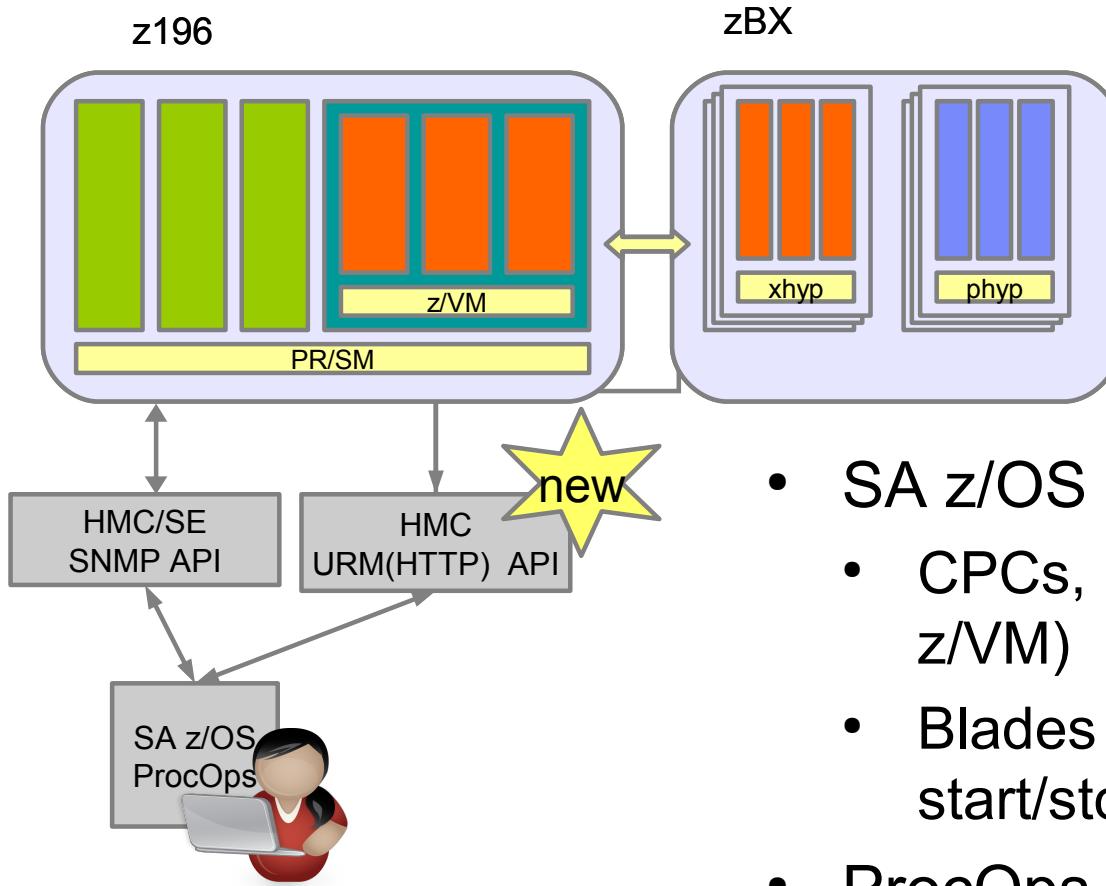
Monitor Status
C1CS1DB21  C1CS45ABEND
C1TORDB21  CI41TRABEND
C1TORDB22  CI42TRABEND
C1TORDB23  CI43TRABEND
C1CS1CON1  C145TRABEND
C1CS1CON2  C145TRABEND
C1CS41SOS  IMS1DC
C1CS43SOS  IMS1OLD51
C1CS44ABEND IMS1OLD52
C1CS44SOS  IMS2DC

Date      Time      Subsystem  Message text
1=HELP   2=DETAIL  3=UP      6=ROLL
13=EXPLAIN 14=SDFCONF 15=INGMSG 16=DISPGW 17=SETSTATE 18=INGVOTE 19=INGREQ 20=OPC
10=PREVIOUS 11=NEXT 12=TOP
22=DISPMTR 23=INGLST 24=INGINFO
FU0U2044 006/007

```

# zEnterprise support within ProcOps

# zEnterprise support within ProcOps



- SA z/OS ProcOps controls:
  - CPCs, LPARs, Systems (incl. z/VM)
  - Blades (incl. automated start/stop of Virtual Servers)
- ProcOps provides a command interface

# Example: List + Activate Virtual Server

NV54 SA34 NM	Tivoli NetView	TPSN7 YDR	12/09/11 10:52:39
* IPSN7	<b>ISQECMD ENSR35 LIST VS</b>		
U IPSN7	ISQ801I ENSR35 SC ISQ417I LIST STATUS(SUCCESS)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 LIST ENSR35 STATUS(SUCCESS)		
	TSTIME(111209105237)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 ENSR35 CPC(R35) VH(C.1.12) TYPE(power-vm)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 VS(cloudpocvs1)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 ENSR35 CPC(R35) VH(C.1.12) TYPE(power-vm)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 VS(cloudpocvs2)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 ENSR35 CPC(R35) VH(C.1.13) TYPE(power-vm)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 VS(pbxerictst1)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 ENSR35 CPC(R35) VH(C.1.13) TYPE(power-vm)		
U IPSN7	ISQ801I ENSR35 SC AOFB0021 VS(pbxerictst2)		

NV54 SA34 NM	Tivoli NetView	TPSN7 YDR	12/09/11 15:33:30
* IPSN7	<b>ISQECMD ENSR35 ACTIVATE VS NAME(SA34XSRV)</b>		
U IPSN7	ISQ801I ENSR35 SC ISQ417I ACTIVATE STATUS(SUCCESS)		
U IPSN7	ISQ801I ENSR35 SC AOFB0001 ACTIVATE ENSR35 HMC(hmctrx)		
	STATUS(ACCEPTED) TSTIME(111209153240)		
U IPSN7	ISQ856I ISQECMD: ACTIVATE ENSR35 TSTIME(111209153240)		
	STATUS(SUCCESS)		
U IPSN7	ISQ801I ENSR35 AOFB0100 VS CLASS(virtual-server) CPC(R35)		
	VH(C.1.02) NAME(SA34XSRV) TYPE(x-hyp) NEWSTATUS(starting)		
	OLDSTATUS(not-operating)		
U IPSN7	ISQ801I ENSR35 AOFB0100 VS CLASS(virtual-server) CPC(R35)		
	VH(C.1.02) NAME(SA34XSRV) TYPE(x-hyp) NEWSTATUS(operating)		
	OLDSTATUS(starting)		
U IPSN7	ISQ801I ENSR35 AOFB0100 VS CLASS(virtual-server) CPC(R35)		
	VH(C.1.01) NAME(sazbx111) TYPE(x-hyp) NEWSTATUS(starting)		
	OLDSTATUS(not-operating)		
U IPSN7	ISQ801I ENSR35 AOFB0300 VS CLASS(virtual-server) CPC(R35)		
	VH(C.1.02) NAME(SA34XSRV) TYPE(x-hyp) JOB(ACTIVATE VS)		
	STATUS(complete) CODE(200) REASON(0) ERROR(*)		

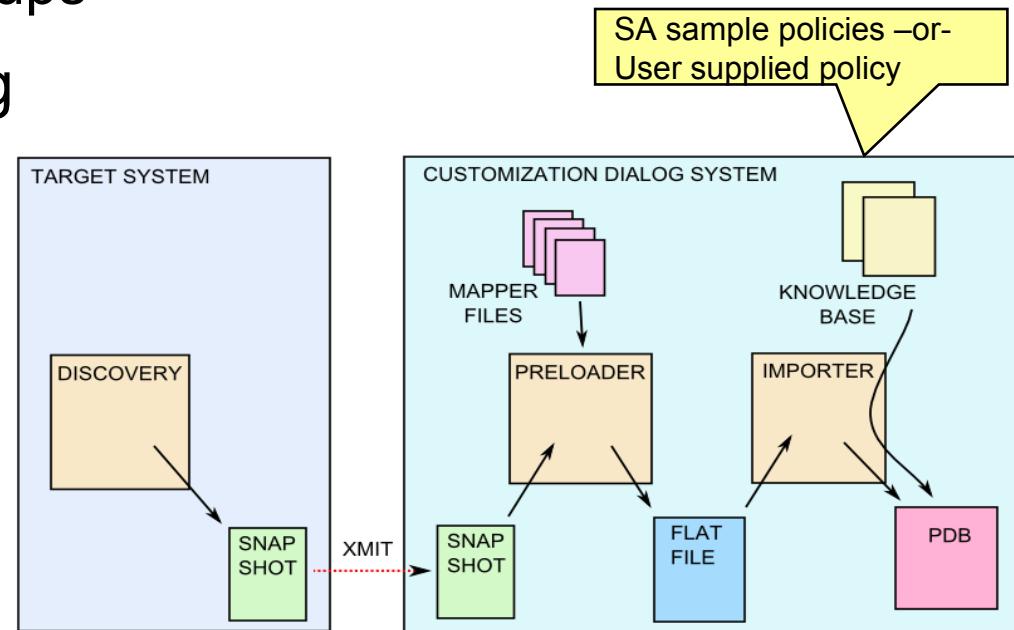
**'ISQXDST ensemble\_name' command showing zBX Info....**



# Auto Discovery

# Auto Discovery

- Simplifies & accelerates the PDB creation using predefined and proven models
- Gathers data about a customer system environment
  - All address spaces incl USS processes
  - XCF Groups & ARM Groups
- Generates PDB leveraging SA's best practice policies
  - Allows manual adjustments
  - Allows refine + extend the model process



# Extended Status Commands

# Extended Status Commands

Provider Application:  
(e.g.TCPIP)

Consumer Application:  
(e.g. WebSphere MQ)



MESSAGES/USER DATA:  
Msg ID:  
**ISUP\_TCPIP** or  
**ISDN\_TCPIP**  
Command: `your_cmd`

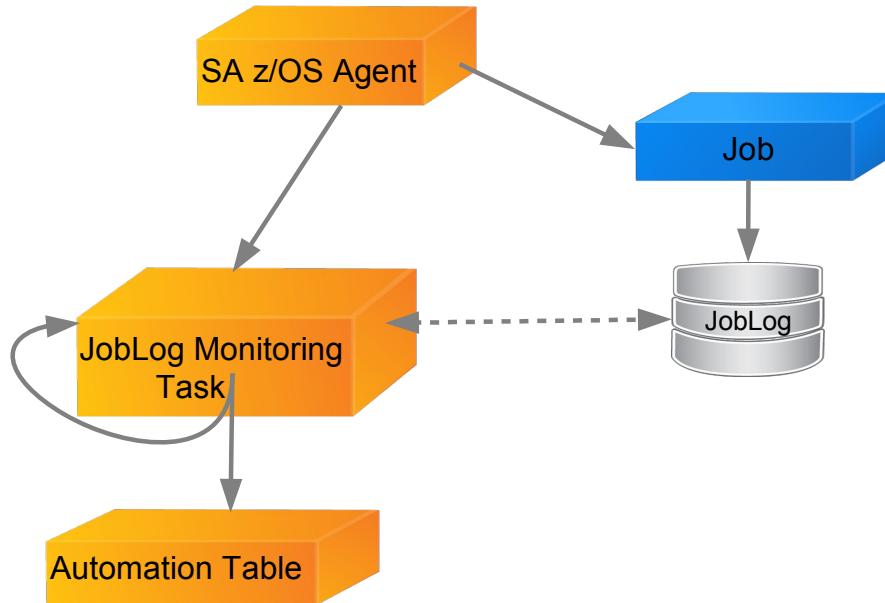
- Commands are executed for a 'consumer' application reaching the UP status when the 'provider' application is either in an UP or a DOWN state.

# JobLog Monitoring

# JobLog Monitoring

Monitors JES2 spool data sets: default JESMSGGLG

- Monitor interval 1 s –1h → Application Info policy
- Message specification → Message/UserData policy



# File Update Enhancements

# File Update Enhancements

- MVC, SYS and GRP entry types can be updated
- WHERE\_USED links can be added to existing entries
- Existing APIs can be linked to a class (LINK\_TO\_CLASS)
- New Option to generate NEW & DEL structures for ALL entry types

```

          Policy Database Update Selection
Option ==> 6

1 Write selected data from Policy Database to file
  Entry Type . . . . . API      (? or type)
  Output File Name . . . . . 'THIE.IMS.WORK.PDB.UPD'

2 Perform syntax check for data in file
3 Update Policy Database with data from file
  Input File Name. . . . . 'THIE.IMS.WORK.PDB.UPD'
  Mode . . . . . . . . . ONLINE      (ONLINE BATCH)

4 View write / update report
5 Edit output file
6 Append NEW/DEL templates to output file

```

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Thank  
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