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Planning and Migrating to z/VM Single System Image (SSI)

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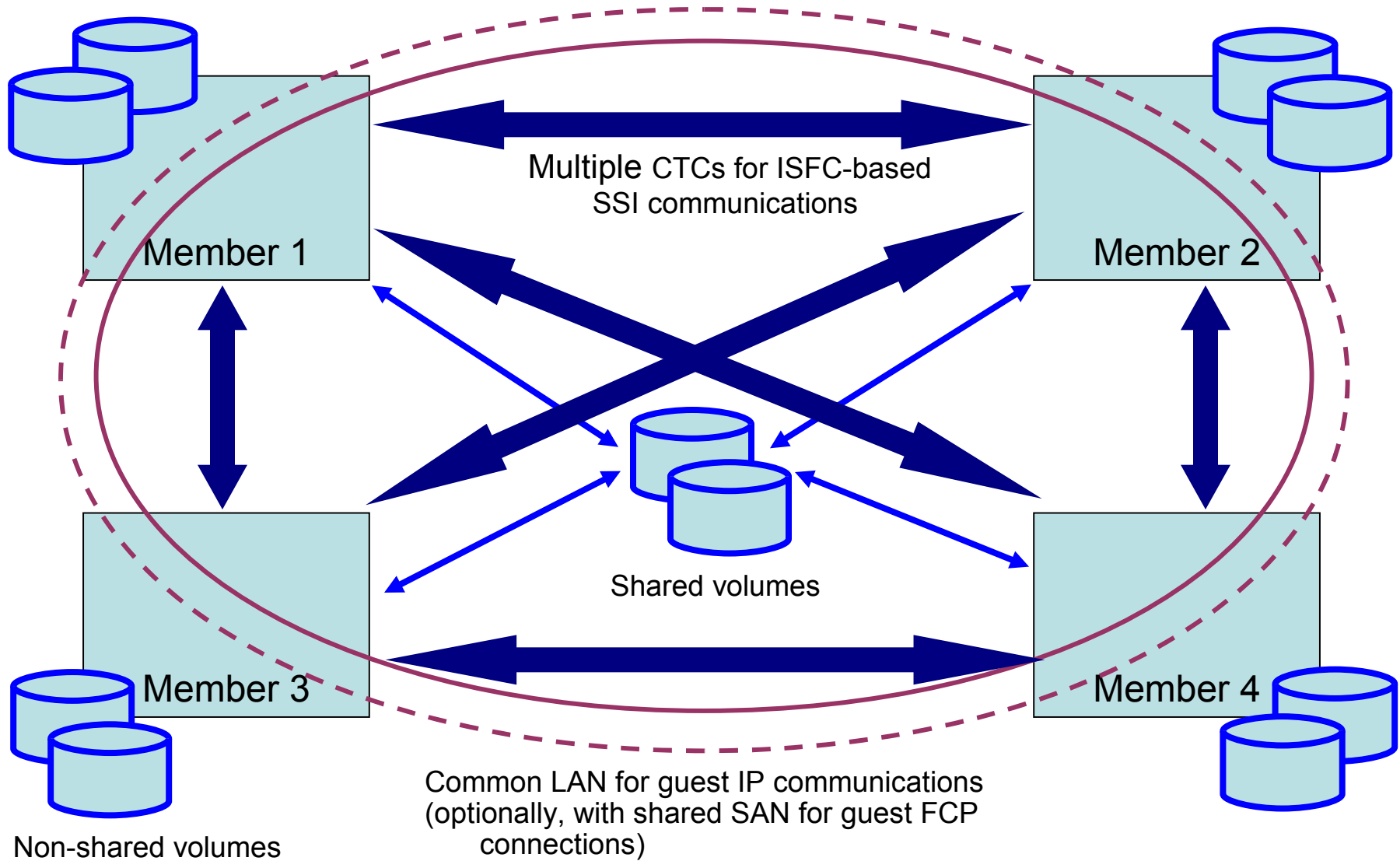
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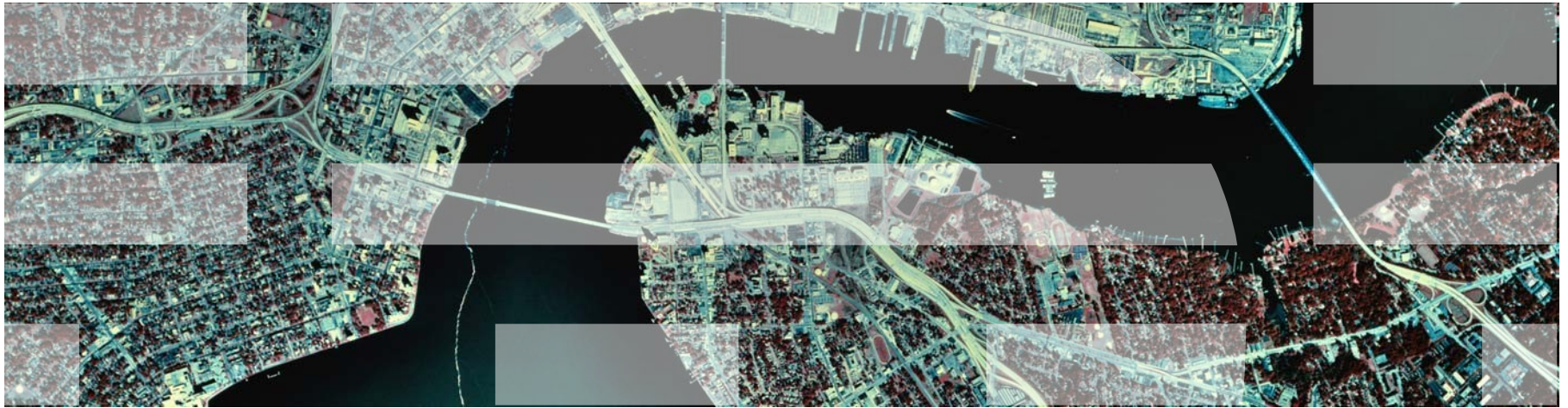
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z/VM SSI Cluster



Topics

- z/VM 6.2 Installation Planning
- Planning and Configuring your SSI Cluster
- Migrating to SSI



z/VM 6.2 Installation Planning

Which Type of Installation Should I Choose?

- SSI Installation
 - Single installation for multiple z/VM images
 - Can also install a single system configured as an SSI member
 - Installed and configured as an SSI cluster
 - Single source directory
 - Shared system configuration file
 - Creates Persistent Data Record (PDR) on Common volume
- Non-SSI installation
 - Single z/VM image
 - Can be converted to initial member of an SSI cluster later
 - Builds DASD layout, directory, and configuration file the same as SSI installation
- Both types of installation are different from previous releases of z/VM
 - Userids
 - Disks
 - Directory
 - System configuration file
- Review documented migration scenarios before deciding whether to do SSI or non-SSI install
 - CP Planning and Administration
 - SSI installation primarily for new or "from scratch" installs

New MAINT Userids

MAINT

PMAINT

MAINT620

Multi Configuration Virtual
Machine

Single Configuration Virtual
Machine

Single Configuration Virtual
Machine

Owns CF1, CF3 parm disks,
190, 193, 19D, 19E, 401, 402,
990 CMS disks

Owns CF0 parm disk,
2CC, 550, 551 disks

Owns the service disks (e.g.,
490, 493, 49D) and the CF2
parm disk

⁸ Use for work on a particular member, such as attaching devices, or relocating guests

Use for updating the system config, or for SSI-wide work, e.g.,

Use for applying 6.2.0 service
The CF2 parm disk contains
6.2.0 CP/OAD modules

Minidisks for New MAINT Userids

Parm Disks (*Owner*)

- CF0 (*PMAINT*)
 - Common system configuration file
- CF1 (*MAINT*)
 - Production CPLOAD MODULE
- CF2 (*MAINT620*)
 - Used by SERVICE to hold test CPLOAD MODULE
- CF3 (*MAINT*)
 - Backup of CF1

Full Pack Minidisks

- *MAINT*
 - 122 M01S01
 - 123 M01RES
 - 124 M01W01
- *MAINT620*
 - 131 620RL1
 - 132 620RL2
 - 133 620RL3
- *PMAINT*
 - 141 VMCOM1

Minidisks for New MAINT Userids (by volume)

Cluster-Wide Volume (VMCOM1)

– PMAINT

- CF0 - Common system configuration file
- 2CC - Single source directory
- 41D - VMSES/E production inventory disk
- 551 - SSI cluster common disk - contains utilities that must be at the highest level for all members of the SSI cluster, including
CPFMTXA, DIRECTXA, DIRMAP, DISKMAP

Release Volumes

– MAINT620

- 490 - Test CMS system disk
- 493 - Test system tools disk
- 51D - VMSES/E software inventory disk
- CF2 – Test parm disk

Select Installation Type

*** z/VM INSTALLATION PLANNING ***

Mark the product(s) selected to be installed into the filepool with an "F" and those selected to be installed to minidisks with an "M"

M	VM	M	OSA	M	PERFTK
M	VMHCD	M	RACF	M	DIRM
M	RSCS	M	ICKDSF	M	TCPIP

Select a System Default Language.

X AMENG _ UCENG _ KANJI

Select a System DASD model. FBA size can be changed.

X 3390 Mod 3 _ 3390 Mod 9 _ FBA DASD 6.0

Enter the nickname of common service filepool.

Filepool Nickname: VMPOOL

Select a System Type: Non-SSI or SSI (SSI requires the SSI feature)

_ Non-SSI Install: System Name _____

X SSI Install: Number of Members 4 SSI Cluster Name SAMPLE

F1 = HELP F3/F12 = QUIT F5 = Process ENTER = Refresh

SSI Installation

Select first or second level and identify SSI member systems

*** z/VM INSTALLATION PLANNING PANEL 3 ***

SSI Cluster Name: SAMPLE

After installation is complete, the SSI cluster will be IPLed:

x First-Level
- Second-Level

SSI Member Name(s):

SLOT #	MEMBER NAME	IPL LPAR/USERID
=====	=====	=====
1	MEMBER1_	LPAR1__
2	MEMBER2_	LPAR2__
3	MEMBER3_	LPAR3__
4	MEMBER4_	LPAR4__

F1 = HELP F3/F12 = QUIT F5 = Process ENTER = Refresh

SSI Installation (cont.)

Define CP-Owned and Release volumes for all members

```

*** z/VM INSTALLATION VOLUME DEFINITION ***

  TYPE      LABEL      ADDRESS      FORMAT (Y/N)
  =====
COMMON      VMCOM1      2000
RELVOL      620RL1      2001
RELVOL2     620RL2      2002
RELVOL3     620RL3      2003
                                     y

  TYPE      LABEL      ADDRESS      TYPE      LABEL      ADDRESS
  =====

MEMBER1
RES         M01RES      3000
SPOOL       M01S01      3001
PAGE        M01P01      3002
WORK        M01W01      3003

MEMBER2
RES         M02RES      4000
SPOOL       M02S01      4001
PAGE        M02P01      4002
WORK        M02W01      4003

MEMBER3
RES         M03RES      5000
SPOOL       M03S01      5001
PAGE        M03P01      5002
WORK        M03W01      5003

MEMBER4
RES         M04RES      6000
SPOOL       M04S01      6001
PAGE        M04P01      6002
WORK        M04W01      6003

F1 = HELP      F3/F12 = QUIT      F5 = Process      ENTER = Refresh
  
```

SSI Installation (cont.)

Define Common Volume and CTC Device addresses

*** z/VM INSTALLATION FIRST-LEVEL CONFIGURATION ***

Real addresses for the common volume on each member LPAR:

VOLUME TYPE	DASD LABEL	MEMBER1 ADDRESS	MEMBER2 ADDRESS	MEMBER3 ADDRESS	MEMBER4 ADDRESS
=====	=====	=====	=====	=====	=====
COMMON	VMCOM1	2000	2000	2000	2000

CTC device addresses:

From: MEMBER1

To: MEMBER1 N/A
 To: MEMBER2 0100 0101
 To: MEMBER3 0300 0301
 To: MEMBER4 0400 0401

From: MEMBER2

To: MEMBER1 0100 0101
 To: MEMBER2 N/A
 To: MEMBER3 0310 0311
 To: MEMBER4 0410 0411

From: MEMBER3

To: MEMBER1 0300 0301
 To: MEMBER2 0310 0311
 To: MEMBER3 N/A
 To: MEMBER4 0320 0321

From: MEMBER4

To: MEMBER1 0400 0401
 To: MEMBER2 0410 0411
 To: MEMBER3 0320 0321
 To: MEMBER4 N/A

F1 = HELP

F3/F12 = QUIT

F5 = Process

ENTER = Refresh

Non-SSI Installation

Identify CP-Owned and Release volumes

*** z/VM INSTALLATION VOLUME DEFINITION ***

TYPE	LABEL	ADDRESS	FORMAT (Y/N)
=====	=====	=====	=====
COMMON	VMCOM1	2000	Y
RELVOL	620RL1	2001	
RELVOL2	620RL2	2002	
RELVOL3	620RL3	2003	

TYPE	LABEL	ADDRESS
=====	=====	=====
EXAMPLE		
RES	M01RES	3000
SPOOL	M01S01	3001
PAGE	M01P01	3002
WORK	M01W01	3003

F1 = HELP
F3/F12 = QUIT
F5 = Process
ENTER = Refresh



Planning and Configuring your SSI Cluster

SSI Cluster Requirements

- Servers must be IBM System z10 or later (z/VM Version 6)
- Shared and non-shared DASD
 - 3390 volume required for the PDR
 - All volumes should be cabled to all members
 - Makes non-shared disks accessible to other members to fix configuration problems
- LPARs
 - 1-16 FICON CTC devices between LPARs
 - Provide direct ISFC links from each member to all other members
 - FICON channels to shared DASD
 - OSA access to the same LAN segments
 - FCP access to same storage area networks (SANs) with same storage access rights
- Shared system configuration file for all members
- Shared source directory containing user definitions for all members
- Capacity planning for each member of the SSI cluster
 - Ensure sufficient resources are available to contain shifting workload
 - Guests that will relocate
 - Guests that logon to different members

SSI Cluster Topography

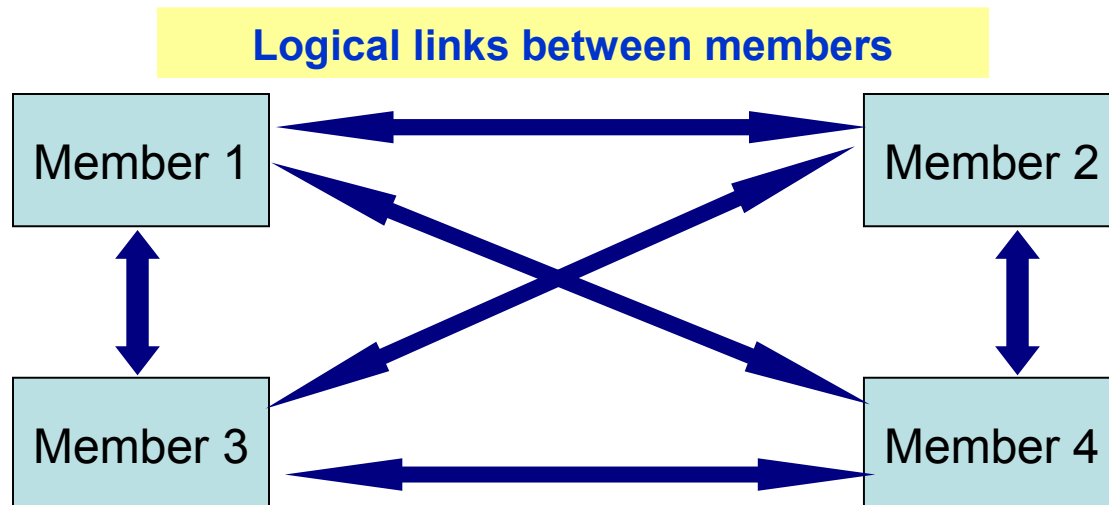
1. How many members in your cluster?
2. Production configuration
 - How many CECs?
 - How many LPARS/CEC?
 - *Suggested configuration for 4-member cluster is 2 LPARs on each of 2 CECs*
3. Test configuration
 - VM guests?
 - LPARs?
 - Mixed?
4. Virtual server (guest) distribution
 - Each guest's "home" member?
 - Where can each guest be relocated?
 - *Distribute workload so each member has capacity to receive relocated guests*
 - CPU
 - Memory

SSI Cluster Planning

- CTC connections
- DASD
- Networks
- Cluster and member configuration
- Shared Source Directory

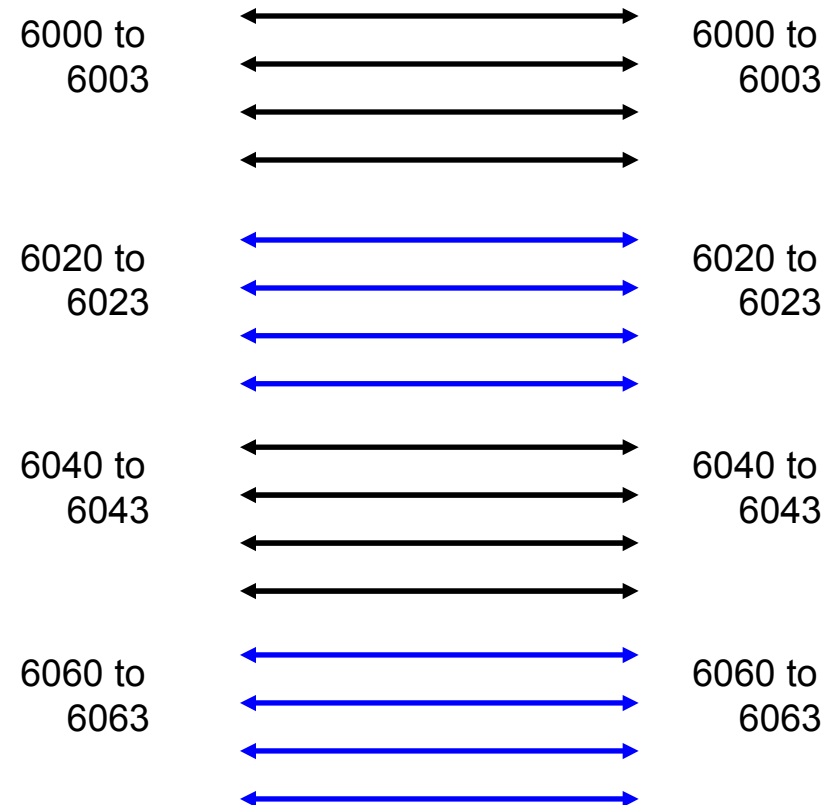
CTC Connections

- Each member of an SSI cluster must have a direct ISFC connection to every other member (logical link)
- Logical links are composed of 1-16 CTC connections
 - FICON channel paths
 - May be switched or unswitched
- Use multiple CTCs distributed on multiple FICON channel paths between each pair of members
 - Avoids write collisions that affect link performance
 - Avoids severing logical link if one channel path is disconnected or damaged
- *Recommended practice:* Use same real device number for same CTC on each member



CTC Connections – How Many Do I Need?

- 4 CTC devices per per FICON chpid
 - provides most efficient ISFC data transfer
- For large guests, relocation and quiesce times improve with more chpids
 - Up to 4 chpid paths, with 4 CTCs each
 - *Additional factors affect relocation and quiesce times*



CTC Connections – Defining in the IOCP

★

```
CHPID PATH=(CSS(0,1),4A),PCHID=222,TYPE=FC,SHARED    SX*FC4 11/LG04/D3
CHPID PATH=(CSS(0,1),4E),PCHID=282,TYPE=FC,SHARED    SX*FC4 16/LG02/D3
```

```
*** CHPID 4A SX FICON CTC ***
```

★

```
CNTLUNIT CUNUMBR=0C00,PATH=((CSS(0),4A)),UNIT=FCTC, *
```

```
UNITADD=((00,8)),CUADD=7
```

```
IODEVICE ADDRESS=(0C00,8),CUNUMBR=(0C00),UNIT=FCTC,UNITADD=00, *
```

```
PART=((CSS(0),TEST7,TESTC))
```

★

```
*** CHPID 4E SX FICON CTC ***
```

★

```
CNTLUNIT CUNUMBR=0D00,PATH=((CSS(0),4E)),UNIT=FCTC, *
```

```
UNITADD=((00,8)),CUADD=C
```

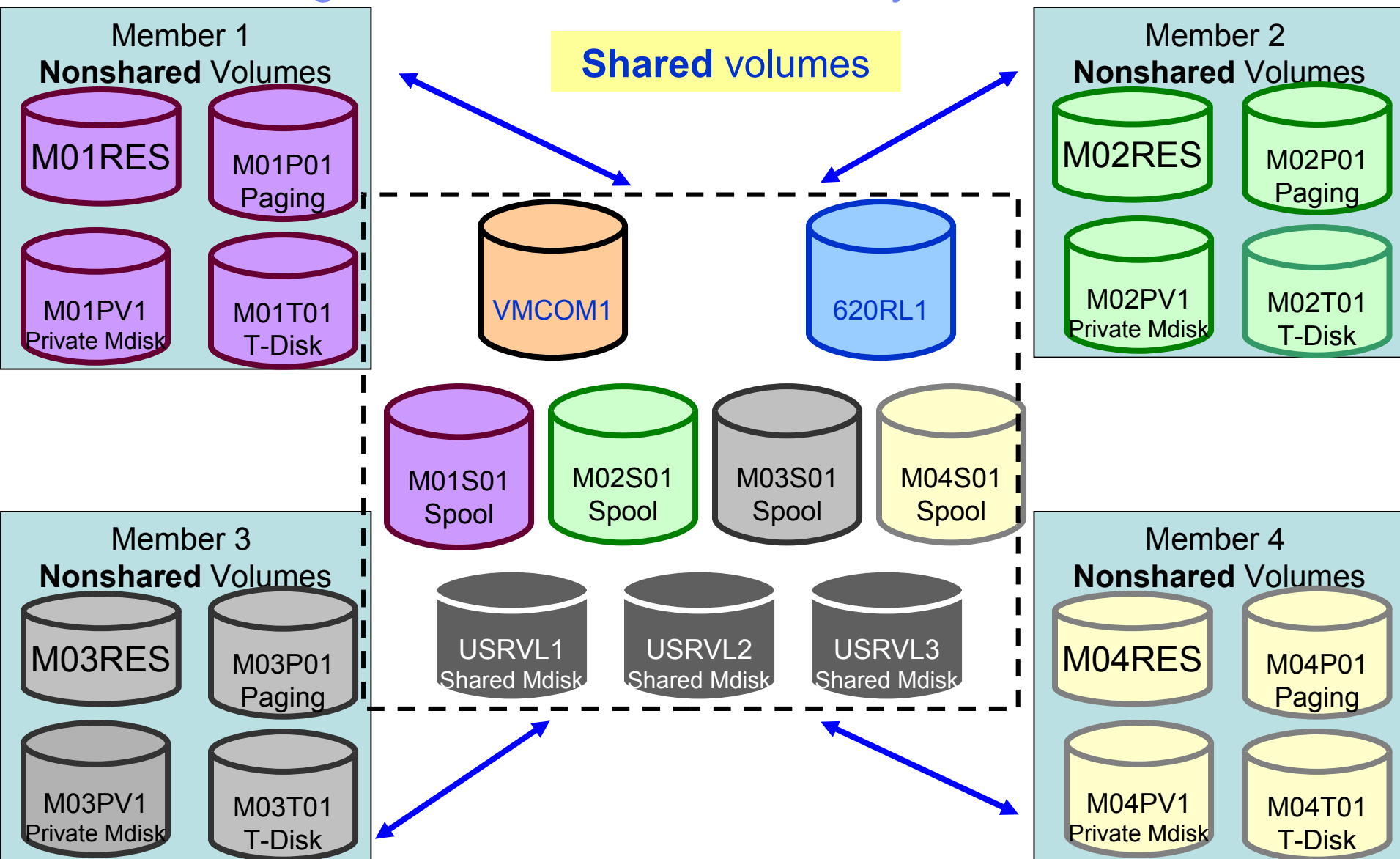
```
IODEVICE ADDRESS=(0D00,8),CUNUMBR=(0D00),UNIT=FCTC,UNITADD=00, *
```

```
PART=((CSS(0),TEST7,TESTC))
```

DASD Planning

- Determine which DASD volumes will be used for
 - Cluster-wide volume
 - Release volumes
 - System volumes
 - Shared
 - Non-shared
 - User data (minidisks)
 - Shared
 - Non-shared
- Determine which member owns each CP-Owned volume

DASD Planning – Non-Shared and Shared System Volumes



DASD Planning – CP_OWNED List

SSI

```

32 /*****
33 /*                                CP_Owned Volume Statements                                */
34 /*****
35 /*                                SYSRES  VOLUME                                */
36 /*****
37
38 MEMBER1:  CP_Owned  Slot   1  M01RES
39
40 /*****
41 /*                                COMMON VOLUME                                */
42 /*****
43
44     CP_Owned  Slot   5  VMCOM1
45
46 /*****
47 /*                                DUMP & SPOOL VOLUMES                                */
48 /*****
49
50     CP_Owned  Slot  10  M01S01
51
52 /*****
53 /*                                PAGE & TDISK VOLUMES                                */
54 /*****
55
56 MEMBER1:  CP_Owned  Slot 255  M01P01

```

DASD Planning - CP Volume Ownership

- CP-Owned volumes are marked with ownership information (CPFMTXA)
 - Cluster name
 - System name of owning member

**CP-Owned areas
brought online
in an SSI cluster**

Cluster Name on Volume	System Name on Volume	SPOL Extents (Owner or Shared)	DRCT, PAGE, and TDSK Extents and Checkpoint and Warm Start Areas (Nonshared)
None	None	No	No
None	Name of this member	Yes (owner, single-member cluster only)	Yes
None	Not the name of this member	No	No
Name of this cluster	None	No	No
Name of this cluster	Name of this member	Yes (owner)	Yes
Name of this cluster	Name of another member	Yes (shared)	No
Name of this cluster	Not the name of a member (probable configuration error)	No	No
Not the name of this cluster	Any value	No	No

- Ownership information may also be used on non-SSI systems
 - System name but no cluster name
 - Default on non-SSI installs

DASD Planning – Prepare the CP-Owned volumes

- Link the full pack overlay for each disk
- Use **CPFMTXA** to mark the volumes with ownership information

<u>Volume</u>	<u>Full pack overlay</u>	<u>Owner</u>
M01RES	MAINT 123	MYCLUSTER.MEMBER1
VMCOM1	PMAINT 141	MYCLUSTER.NOSYS
M01S01	MAINT 122	MYCLUSTER.MEMBER1
M01P01	\$PAGE\$ A01	MYCLUSTER.MEMBER1

DASD Planning – USER_VOLUME_LIST

SSI

```
58 /*****  
59 /*                               User_Volume_List                               */  
60 /*****  
61 /* These volumes contain the minidisks for your guests, as well as          */  
62 /* the product disks for z/VM. Volumes that are not intended to hold        */  
63 /* "local" minidisks, i.e., minidisks that would be unique to a            */  
64 /* single system, should be kept on separate volumes.                        */  
65  
66 /*****  
67 /* Shared User Volumes                                                       */  
68 /*****  
69                               User_Volume_List  620RL1 620RL2 USRVL1  
70  
71 /*****  
72 /* User volumes for local minidisks                                         */  
73 /*****  
74  
75 MEMBER1:      User_Volume_List  M01W01 M01PV1
```


Networks in an SSI

- All members should have identical network connectivity
 - Connected to same physical LAN segments
 - Connected to same SAN fabric

- Assign equivalence identifiers (EQIDs) to all network devices
 - Devices assigned same EQID on each member must be
 - same type
 - have the same capabilities
 - have connectivity to the same destinations

- Updates to the main TCPIP stack configuration
 - *PROFILE TCPIP* now can have member-specific names like *MEMBER1 TCPIP* and *MEMBER2 TCPIP*
 - *TCPIP DATA* file can be shared among SSI members, so you can add system qualifiers to statements like **HOSTNAME**

Networks in an SSI – Virtual Switches

- Define virtual switches with same name on each member
- For relocating guests:
 - Source and destination virtual switch guest NIC and port configurations must be equivalent
 - Port type
 - Authorizations (access, VLAN, promiscuous mode)
 - Source and destination virtual switches must be equivalent
 - Name and type
 - VLAN settings
 - Operational UPLINK port with matching EQID
 - Device and port numbers need not match, but connectivity to the same LAN segment is required

Networks in an SSI – MAC Addresses

- MAC address assignments are coordinated across an SSI cluster
 - VMLAN statement
 - MACPREFIX must be set to different value for each member
 - Default is 02-xx-xx where xx-xx is "system number" of member (e.g., 02-00-01 for member 1)
 - USERPREFIX must be set for SSI members
 - Must be identical for all members
 - Must not be equal to any member's MACPREFIX value
 - Default is 02-00-00
 - MACIDRANGE is ignored in an SSI cluster
 - Because MAC assignment is coordinated among members
 - Example:

```
VMSYS01: VMLAN MACPREFIX 021111 USERPREFIX 02AAAA
VMSYS02: VMLAN MACPREFIX 022222 USERPREFIX 02AAAA
VMSYS03: VMLAN MACPREFIX 023333 USERPREFIX 02AAAA
VMSYS04: VMLAN MACPREFIX 024444 USERPREFIX 02AAAA
```

Cluster and Member Configuration – SYSTEM_IDENTIFIER Statement

SSI

```
1  /*****  
2  /*          SYSTEM CONFIG FILE          */  
3  /*****  
4  /*          */  
5  /*  Refer to CP Planning and Administration for SYSTEM CONFIG rules  */  
6  /*          */  
7  /*  Warning - Always run CPSYNTAX after updating the SYSTEM CONFIG  */  
8  /*          */  
9  /*****  
10  
11 /*****  
12 /*          System_Identifier Information          */  
13 /*****  
14  
15 System_Identifier LPAR LP01 MEMBER1
```

Cluster and Member Configuration – SSI Statement

```
17 /*****  
18 /*                SSI Statement                */  
19 /*****  
20  
21 SSI MYCLUSTER PDR_Volume VMCOM1 ,  
22 Slot 1 MEMBER1  
23
```

Cluster and Member Configuration – SYSTEM_RESIDENCE Statement

Non-SSI

```
24 /*****  
25 /*          Checkpoint and Warmstart Information          */  
26 /*****  
27  
28 System_Residence,  
29     Checkpoint  Valid M01RES      From CYL 21  For 9 ,  
30     Warmstart   Valid M01RES      From CYL 30  For 9  
31
```

SSI

```
24 /*****  
25 /*          Checkpoint and Warmstart Information          */  
26 /*****  
27  
28 MEMBER1: System_Residence,  
29     Checkpoint  Valid M01RES      From CYL 21  For 9 ,  
30     Warmstart   Valid M01RES      From CYL 30  For 9  
31
```

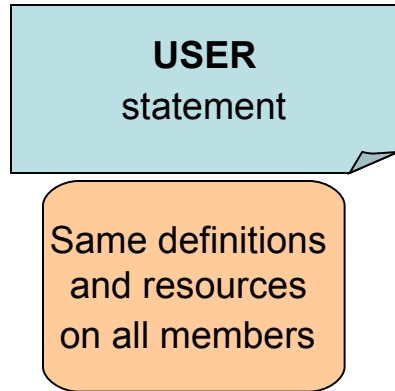
Cluster and Member Configuration – Additional Steps

- Enable the SSI feature
- If you're migrating from non-SSI to SSI, you'll want to enable the **PROMPT_AFTER_SHUTDOWN_REIPL** feature before you relPL, so you can do a cold start
- Run CPSYNTAX

```
cpsyntax sysnew config (system member1  
CONFIGURATION FILE PROCESSING COMPLETE -- NO ERRORS ENCOUNTERED.  
Ready; T=0.25/0.26 11:43:57
```

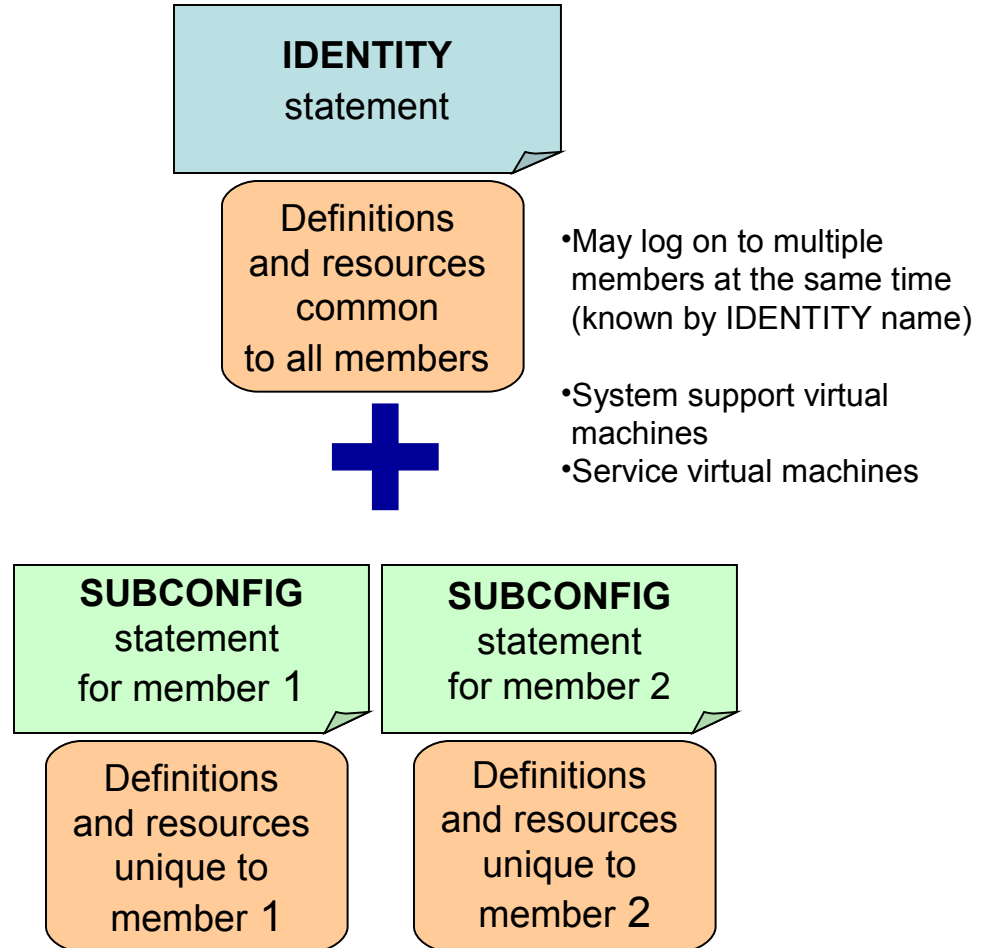

Shared Source Directory – Virtual Machine Definition Types

Single Configuration Virtual Machine (traditional)



- May log on to any member
 - Only one member at a time
- General Workload
 - Guest Operating Systems
 - Service virtual machines requiring only one logon in the cluster

Multiconfiguration Virtual Machine (new)



Shared Source Directory – Global and Local disks

- For each guest you're turning into a multiconfiguration virtual machine, decide which disks should be global and which should be local
 - You may want to split existing disks into global and local.

Global

- All instances have access
- Usually R/O
- EXECs
- Control files

Local

- Only one instance has access
- Usually R/W
- Log files
- Work files

Shared Source Directory - New Layout

- IBM-supplied directory will be significantly different than in previous releases
 - Both SSI and non-SSI installations
 - Directory for non-SSI installations will be in "SSI-ready" format
 - Facilitate future SSI deployment
- Many of the IBM-supplied userids will be defined as multiconfiguration virtual machines
- Determine if any of your guests should be defined as multiconfiguration virtual machines
 - Most will be single-configuration virtual machines
 - Userids defined on `SYSTEM_USERIDS` statements will usually be multiconfiguration virtual machines
- Merge your user definitions into the IBM-supplied directory

Shared Source Directory - Multiconfiguration Virtual Machine Definition

IDENTITY MAINT MAINTPAS 128M 1000M ABCDEFG

BUILD ON SSIMEMB1 **USING** SUBCONFIG MAINT-1
BUILD ON SSIMEMB2 **USING** SUBCONFIG MAINT-2
BUILD ON SSIMEMB3 **USING** SUBCONFIG MAINT-3
BUILD ON SSIMEMB4 **USING** SUBCONFIG MAINT-4

CONSOLE 009 3215 T
 SPOOL 00C 2540 READER *
 SPOOL 00D 2540 PUNCH A
 SPOOL 00E 1403 A
 LINK USER1 2CC 2CC RR
 LINK USER1 551 551 RR

These statements apply to all instances of MAINT on all members

SUBCONFIG MAINT-1
 MDISK 0191 3390 1000 20 MNTVL1 WR
 MDISK CF1 3390 100 20 M01RES RR
 * END OF MAINT-1

These statements only apply to MAINT on member SSIMEMB1

SUBCONFIG MAINT-2
 MDISK 0191 3390 1000 20 MNTVL2 WR
 MDISK CF1 3390 100 20 M02RES RR
 * END OF MAINT-2

These statements only apply to MAINT on member SSIMEMB2

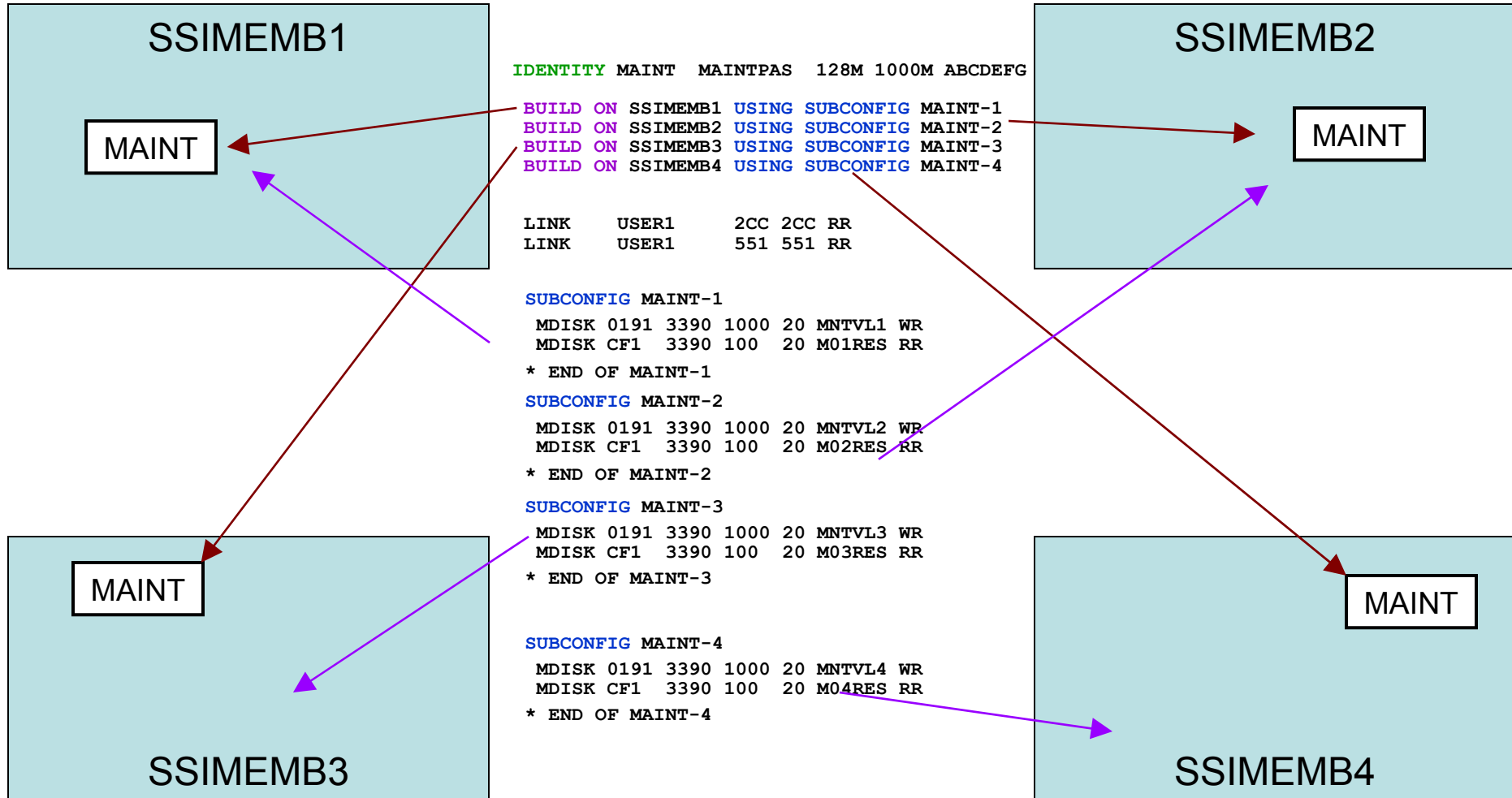
SUBCONFIG MAINT-3
 MDISK 0191 3390 1000 20 MNTVL3 WR
 MDISK CF1 3390 100 20 M03RES RR
 * END OF MAINT-3

These statements only apply to MAINT on member SSIMEMB3

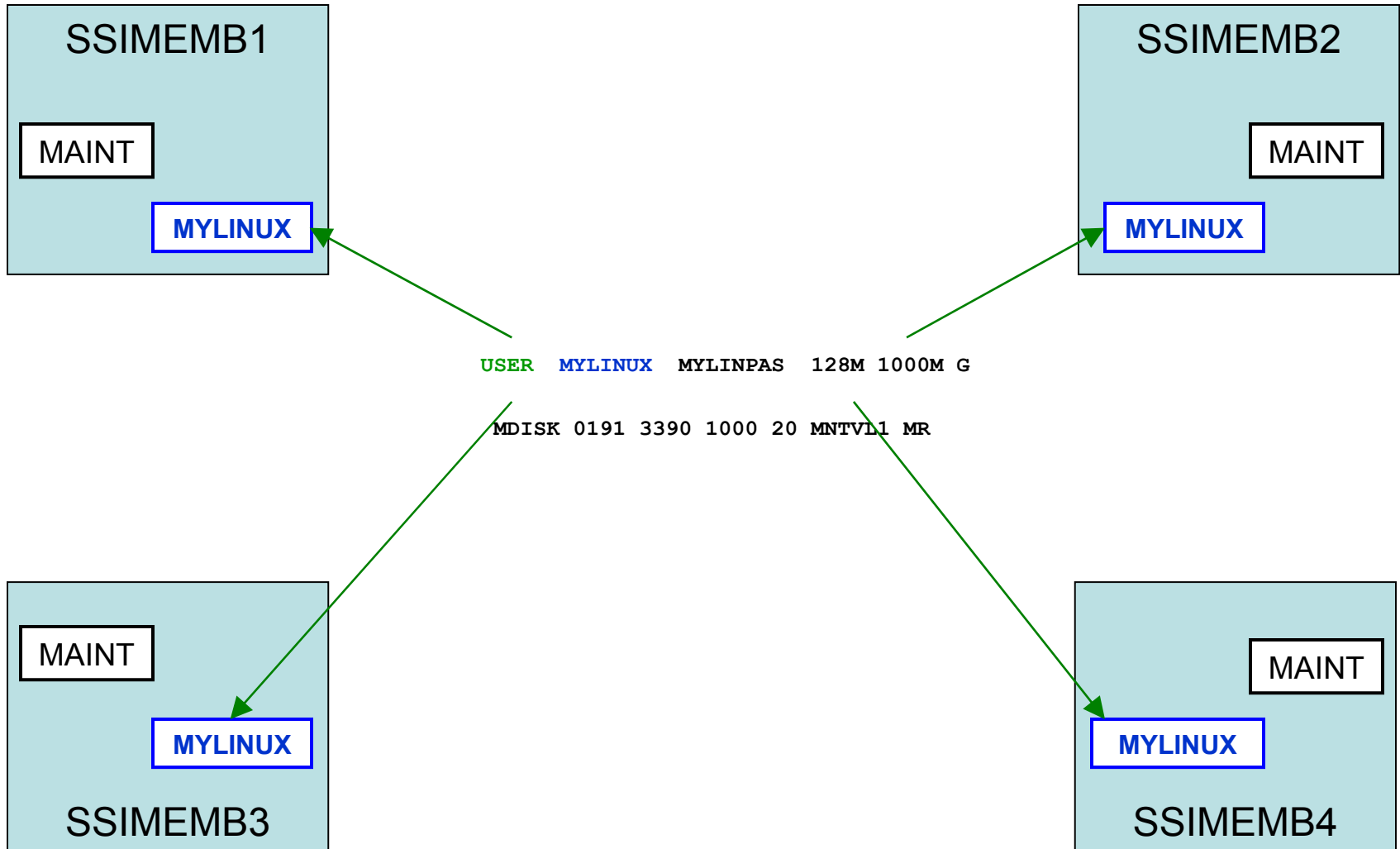
SUBCONFIG MAINT-4
 MDISK 0191 3390 1000 20 MNTVL4 WR
 MDISK CF1 3390 100 20 M04RES RR
 * END OF MAINT-4

These statements only apply to MAINT on member SSIMEMB4

Shared Source Directory – Multiconfiguration Virtual Machines

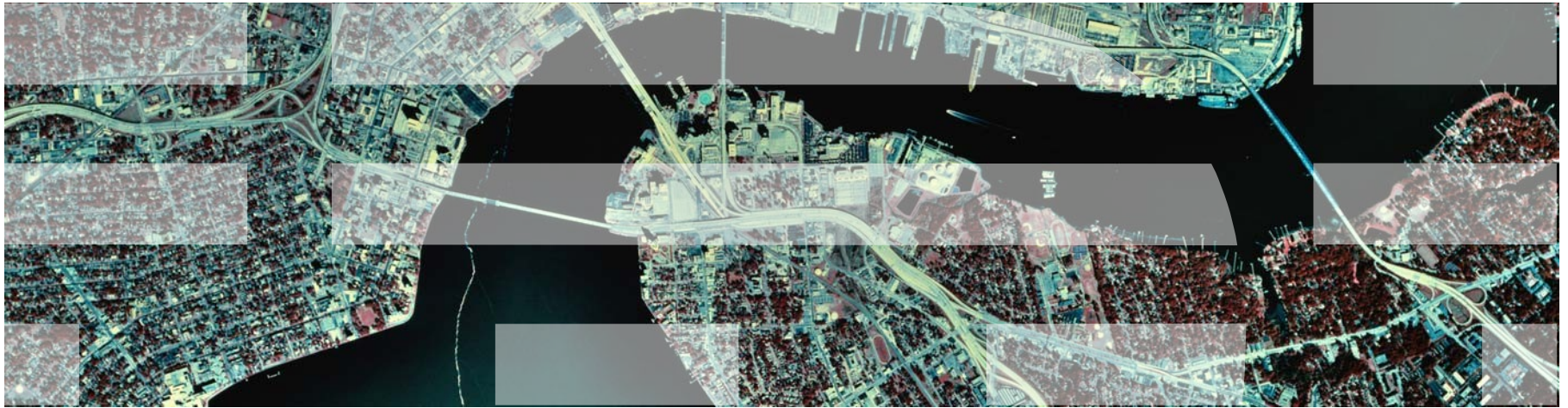


Shared Source Directory – Single Configuration Virtual Machines



Shared Source Directory – DISKMAP

17	VOLUME	USERID	CUU	DEVTYPE	START	END	SIZE	SUBCONFIG	MEMBER
18	M01RES	\$ALLOC\$	A04	3390	00000	00000	00001		*
19		\$DIRECT\$	A01	3390	00001	00020	00020		*
20		\$SYSCKP\$	A01	3390	00021	00029	00009		*
21		\$SYSWRM\$	A01	3390	00030	00038	00009		*
22		MAINT	CF1	3390	00039	00158	00120	MAINT-1	*
23		MAINT	CFD	3390	00159	00159	00001	MAINT-1	*
24		MAINT	CF3	3390	00160	00279	00120	MAINT-1	*
25		MAINT	190	3390	00280	00493	00214	MAINT-1	*
26		MAINT	191	3390	00494	00668	00175	MAINT-1	*
27		MAINT	193	3390	00669	01168	00500	MAINT-1	*
28		MAINT	19D	3390	01169	01460	00292	MAINT-1	*
29		MAINT	19E	3390	01461	01960	00500	MAINT-1	*
30		MAINT	401	3390	01961	02252	00292	MAINT-1	*
31		MAINT	402	3390	02253	02544	00292	MAINT-1	*
32		MAINT	990	3390	02545	02604	00060	MAINT-1	*



Migrating to SSI

Use Case Scenarios

- Migration procedures for existing z/VM environments
 - Documented in CP Planning and Administration
 - Converting a z/VM System to a Single-Member z/VM SSI Cluster
 - Adding a Member to a z/VM SSI Cluster by Cloning an Existing Member
 - Combining Two Non-SSI z/VM Systems to Create a z/VM SSI Cluster
 - Moving a Second-Level z/VM SSI Cluster to First-Level
 - Converting a CSE Complex to a z/VM SSI Cluster
 - Decommissioning a Member of a z/VM SSI Cluster
- Review documented procedures before deciding whether to do SSI or non-SSI install

Migrating from a Non-SSI 6.2.0 system to a Single Member SSI

1. Prepare the New DASD Volumes
2. Update the System Configuration File
3. Update the User Directory
4. Manage the User Spool Files
5. Prepare the CP-Owned Volumes
6. Create the PDR
7. Modify the Startup Parameters for the VMPSFS File Pool
8. Shut Down and Cold Start
9. Load the Spool Files
10. Change the User Directory to SSI-Enabled

"SSI-enable" the Shared Source Directory

SSI

```

1 *****
2 *   z/VM 6.2.0   SYSTEM DIRECTORY                               *
3 *****
4 *
5 *   THE ADDRESSES 123 THROUGH 133 ARE VIRTUAL ADDRESSES.       *
6 *
7 *   NOTES:                                                       *
8 *   REMEMBER THESE ARE ONLY VIRTUAL ADDRESSES NOT REAL        *
9 *   ADDRESSES, SO THERE IS NO NEED TO CHANGE THEM TO MATCH    *
10 *   YOUR HARDWARE ADDRESSES.                                     *
11 *
12 *
13 *****
14 *
15 *   FOR A DESCRIPTION OF DIRECTORY STATEMENTS SEE:             *
16 *       VM ENTERPRISE SYSTEM ARCHITECTURE                      *
17 *       PLANNING AND ADMINISTRATION MANUAL.                   *
18 *
19 *****
20 *
21 *
22 *
23 DIRECTORY SSI 123 3390 M01RES M02RES M03RES M04RES

```

"SSI-enable" the Shared Source Directory

- Update the **BUILD** statements with the actual member name
 - Multiconfiguration virtual machines will have asterisks instead of machine names
- Run **DIRECTXA** to put the new directory into production

Non-SSI

```
165 IDENTITY MAINT MAINT 128M 1000M ABCDEFG  
166 BUILD ON * USING SUBCONFIG MAINT-1
```

SSI

```
165 IDENTITY MAINT MAINT 128M 1000M ABCDEFG  
166 BUILD ON MEMBER1 USING SUBCONFIG MAINT-1
```

Create the Persistent Data Record (PDR)

- **LINK** the fullpack overlay of *VMCOM1*, **PMAINT 141**

```
formssi create 141 myclustr
HCPPDF6613R Device 0141 label is VMCOM1 - continue (Yes/No)?
yes
HCPPDF6614I Persistent Data Record created on device 0141
Ready; T=0.01/0.01 14:35:48

formssi display 141
HCPPDF6618I Persistent Data Record on device 0141 (label VMCOM1) is for MYCLUSTR
HCPPDF6619I PDR state: Unlocked
HCPPDF6619I time stamp: 09/23/11 14:35:48
HCPPDF6619I cross-system timeouts: Enabled
Ready; T=0.01/0.01 14:35:54
```

Changes to the VMPSYS file pool

- In the *VMSERVP DMSPARMS* file the **LOCAL** startup parameter has changed to **SSI**:

Non-SSI

```
00001 ADMIN MAINT MAINT620 AUTOLOG1
00002 NOBACKUP
00003 SAVESEGID CMSFILES
00004 LOCAL
00005 FILEPOOLID SERVPPOOL
00006 USERS 100
```

SSI

```
00001 ADMIN MAINT MAINT620 AUTOLOG1
00002 NOBACKUP
00003 SAVESEGID CMSFILES
00004 SSI
00005 FILEPOOLID SERVPPOOL
00006 USERS 100
```

IPL the Single (First) Member of your SSI Cluster

```
20:12:47 HCPAAU2700I System gateway MEMBER1 identified.  
20:12:47 HCPNET3010I Virtual machine network device configuration changes are permitted  
20:12:47 HCPPLM1697I The state of SSI system MEMBER1 has changed from DOWN to JOINED  
20:12:47 HCPPLM1698I The mode of the SSI cluster is STABLE
```

```
q ssi  
16:57:39 SSI Name: MYCLUSTR  
16:57:39 SSI Mode: Stable  
16:57:39 Cross-System Timeouts: Enabled  
16:57:39 SSI Persistent Data Record (PDR) device: VMCOM1 on E00A  
16:57:39 SLOT SYSTEMID STATE PDR HEARTBEAT RECEIVED HEARTBEAT  
16:57:39 1 MEMBER1 Joined 2011-10-13 16:57:17 2011-10-13 16:57:17  
16:57:39 2 ----- Available  
16:57:39 3 ----- Available  
16:57:39 4 ----- Available  
Ready; T=0.01/0.01 16:57:39
```

Adding a Second Member to Create a Two-member Cluster

1. Format the new member's volumes
2. Create the new member's services' configurations
3. Copy the member-specific volumes
4. Update the user directory
5. Update the shared system configuration
6. Enable the existing member to access the new member
7. IPL the new member
8. Update the Product Inventory Table
9. Build the saved segments
10. **XAUTOLOG AUTOLOG1** and check MEMBER2

Enable Existing Members to Accept the New Member

```
set ssi slot 2 member2
Ready; T=0.01/0.01 16:57:51
q ssi
16:57:53 SSI Name: MYCLUSTR
16:57:53 SSI Mode: Stable
16:57:53 Cross-System Timeouts: Enabled
16:57:53 SSI Persistent Data Record (PDR) device: VMCOM1 on E00A
16:57:53 SLOT SYSTEMID STATE          PDR HEARTBEAT          RECEIVED HEARTBEAT
16:57:53      1 MEMBER1  Joined      2011-10-13 16:57:47 2011-10-13 16:57:47
16:57:53      2 MEMBER2  Down (not IPLed)
16:57:53      3 ----- Available
16:57:53      4 ----- Available
Ready; T=0.01/0.01 16:57:53
```

```
activate islink 50 60 70
16:58:26 Link device 0050 activated.
16:58:26 Link device 0060 activated.
16:58:26 Link device 0070 activated.
Ready; T=0.01/0.01 16:58:26
```

Summary

- SSI is a new way to deploy z/VM images and resources
 - Benefit from clustering and virtual server mobility

- Planning and thought required
 - Capacity and equipment
 - Resource sharing
 - Virtual networks
 - Installation
 - SSI cluster configuration
 - Migrating from your current z/VM environment
 - User directory
 - Virtual machine (guest) definition and distribution
 - Live Guest Relocation

- New documentation to assist with
 - SSI Planning
 - Migrating to an SSI cluster

z/VM 6.2.0 information and documentation:
<http://www.vm.ibm.com/zvm620/>

Thanks!

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