

CA MIM™ Resource Sharing for z/OS

How to Dynamically Change CA MIM Communication Methods

Release 12.0



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Chapter 1: Dynamically Change CA MIM Communication Methods

Introduction

Product: CA MIM™ Resource Sharing for z/OS

Version: 12.0

This document illustrates the processes z/OS systems programmers can use to:

- Dynamically change communication methods
- Verify z/OS and CA MIM environments before changing the method
- Verify the changes
- Undo the changes

CA MIM offers the flexibility to change communication methods dynamically using operator commands and parameter updates. This feature provides the required 24x7 availability that is required of data centers today.

Choosing an optimal communication method can involve many factors. Each communication method has different strengths. The performance of CA MIM varies at each data center depending on the following factors:

- Number of processors
- Speed of the processors
- Goals for WLM
- Activated CA MIM facilities and features
- Number of systems in the MIMplex
- Activity of the global ENQ
- Response time of your DASD hardware
- Response time of your CTC hardware
- Response time of your XCF signaling
- Response time of your XES list structure

Note: You cannot dynamically change communication methods when COMMUNICATION=NONE. This method is used primarily on a single system for testing.

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Prerequisites

We recommend that you review the following items and have them in place before you change communication methods:

- Install and activate CA MIM Version 12.0 on all systems.
Use the DISPLAY FACILITY command for confirming of the currently installed release.
- Set the MIMINIT COMPATLEVEL=12.0.
Use the DISPLAY MIM INIT command for confirming the current level.
- Test the changes in a sandbox test MIMplex before implementing the changes on your production system.
- Although not a firm requirement, we recommend that you activate the MIM SMF recording before you begin your changes.

To activate the MIM SMF recording, use the following set commands:

- SET MIM STATCOLLECT=SUBTYPE(CF,FC)
- SET GDIF STATCOLLECT=SUBTYPE(EC)

Compare a 24-hour period before the change and after the change. You can use these reports to report on ENQ Service time and control file AVG CYCLE time. You can also use IBM RMF reports to measure the MIM CPU usage.

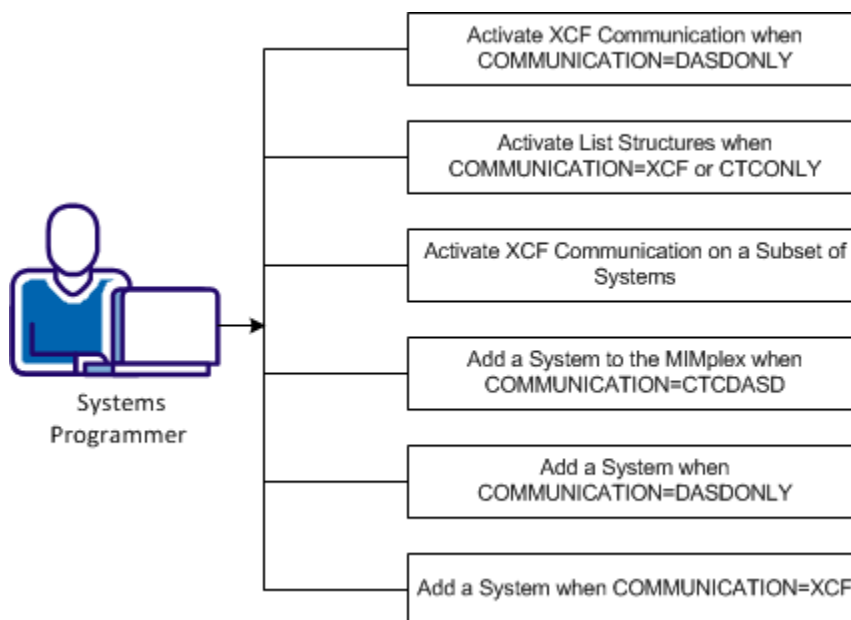
See the *CA MIM Programming Guide* for information about:

- Different communication methods
- Performance and tuning
- Activating and reviewing the SMF records

How You Dynamically Change CA MIM Communication Methods

Global ENQ response time is dependent on the CA MIM communication method. As a z/OS systems programmer, using an alternate method can improve response time. By supporting dynamic configuration changes, you can more easily try different configurations and measure the results.

Equation 1: How you dynamically change CA MIM communication methods



The following is a list of supported dynamic procedures.

- [Activate XCF Communication when COMMUNICATION=DASDONLY](#) (see page 11)
 - [Revert to the Original Communication Method](#) (see page 13)
- [Activate List Structures when COMMUNICATION=XCF or CTCONLY](#) (see page 14)
 - [Revert to the Original List Structures](#) (see page 16)
- [Activate XCF Communication on a Subset of Systems](#) (see page 17)
 - [Revert to CTC Communication](#) (see page 22)
- [Add a System to the MIMplex when COMMUNICATION=CTCDASD](#) (see page 24)
 - [Revert to the Original MIMplex](#) (see page 28)
- [Add a System when COMMUNICATION=DASDONLY](#) (see page 29)
- [Add a System when COMMUNICATION=XCF](#) (see page 30)

Activate XCF Communication when COMMUNICATION=DASDONLY

This procedure dynamically activates the XCF communication and works with either DASD control files or XES list structures. The MIMplex is three systems using XES list structures with the MIM system names of GK03, GK13, and GK62.

Note: Be sure that your COMPATLEVEL is set to 12.0 or higher.

The following steps demonstrate how to dynamically activate the XCF communication when COMMUNICATION=DASDONLY.

Follow these steps:

1. Set up your XCF communication:
 - Confirm that all systems in the MIMplex are also within the same sysplex.
 - Set MIMINIT VCFBUFFERSIZE to 32768 or larger.
 - Review the XCF configuration and options in the SYS1.PARMLIB(COUPLExx) member.
 - You do not need to define a special transport class to CA MIM. However, we recommend at least one CLASSLEN of 32768 or larger to avoid possible performance problems. CLASSLEN is an XCF parameter and is coded in the SYS1.PARMLIB(COUPLExx) member.
 - If some of the LPARS are geographically remote, then IBM recommends that XCF use both CTC and list structures.

Note: You do not need to create the Checkpoint files. However, CA MIM has no issues when you are already using them.

2. Activate your XCF communication.
 - a. Verify that CA MIM automatically created your XCF paths on XE03:

```
@D PATH
MIM0067I Command DISPLAY 960
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 14:30:23 ON 2013.171
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
XCF GK62 USABLE 0 0 0
XCF GK13 USABLE 0 0 0
N/A GK03 LOCAL 0 0 0
```

- b. Verify that CA MIM automatically created your XCF paths on GK13:

```
@D PATH
MIM0067I Command DISPLAY 444
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 14:30:45 ON 2013.171
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
XCF GK62 USABLE 0 0 0
N/A GK13 LOCAL 0 0 0
```

```
XCF GK03 USABLE      0  0      0
```

- c. Verify that CA MIM automatically created your XCF paths on GK62:

```
@D PATH
MIM0067I Command DISPLAY 837
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 14:30:53 ON 2013.171
DEV SYSTEM STATE IO-STAT  READS  WRITES  ERR TIME/RSV CYCLES
N/A GK62  LOCAL      0  0      0
XCF GK03  USABLE    0  0      0
XCF GK13  USABLE    0  0      0
```

CA MIM automatically creates a GLOBALVALUE, when not already coded in the INIT member:

```
@D GLOBALVALUE
MIM0067I Command DISPLAY 956
MIM0373I MIM GLOBALVALUE display:
  ANYELIGIBLE=YES  MOSTPREFERRED=NO  NOMASTER=WAIT
  VCFMASTER=NONE
  ELIGIBLE MASTER LIST: GK03, GK13, GK62
```

3. Order the VCFMASTER list from the busiest system to the least busy system.

Performance is improved as it reduces the total amount of I/O.

4. Enter the DISPLAY IO command on all systems and pick the system with the largest RATE: CYC.

In this example, we have determined that GK62 is the busiest, followed by GK13, followed by GK03.

5. Enter the GLOBALVALUE command on one system only:

```
@GLOBALVALUE VCFMASTER(GK62,GK13,GK03)
MIM0067I Command GLOBALVALUE 263
MIM0193I GLOBALVALUE command processing initiated
MIM0363I GLOBALVALUE command changes pending on external systems
MIM0362I GLOBALVALUE command processing complete
```

6. Verify the new VCFMASTER list:

```
@D GLOBALV
MIM0067I Command DISPLAY 273
MIM0373I MIM GLOBALVALUE display:
  ANYELIGIBLE=YES  MOSTPREFERRED=NO  NOMASTER=WAIT
  VCFMASTER=( GK62, GK13, GK03 )
  ELIGIBLE MASTER LIST: GK62, GK13, GK03
```

7. Update the initialization member with the new GLOBALVALUE statement.

8. Use the MIGRATE command and move the control file up to the VCF on GK62.

```
@MIGRATE MASTER=GK62
MIM0067I Command MIGRATE 307
MIM0232I VCF migration SCHEDULED - MASTER=GK62
```

```
MIM0377I VCF migration IN PROGRESS - MASTER=GK62
MIM0342I system GK62 VCF activation  COMPLETE - MASTER=GK62
```

9. Confirm that the Virtual Control file is active on GK62:

```
@D SYS
MIM0067I Command DISPLAY 211
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
01 03 GK03 EXTERNAL ACTIVE zOS 2013.171 14:54:51.19
02 13 GK13 EXTERNAL ACTIVE zOS 2013.171 14:54:51.14
03 62 GK62 LOCAL MASTER zOS 2013.171 14:54:51.22
```

The XCF communication is activated and GK62 is now the VCFMASTER.

Revert to the Original Communication Method

You can revert CA MIM to the original DASD file or XES list structure using the MIGRATE command.

Follow these steps:

1. Use the MIGRATE command:

```
@MIG CF=00
MIM0067I Command MIGRATE 531
MIM0227I Migration initiated to control file 00
MIM0088I migration to file 00 IN PROGRESS
MIM0242I system GK62 VCF deactivation  COMPLETE
MIM0080I migration to file 00 COMPLETE
MIM0638I Global Copy Received
```

2. Display the files and confirm that the original DASD file or XES structure is in-use:

```
@D FILES
MIM0067I Command DISPLAY 610
MIM0102I Control File Display:
File Unit Status Volser Data Set
00 IN-USE CFCCMIM2 KERGL01#TABLE00
01 USABLE CFCCMIM1 KERGL01#TABLE01
```

You have reverted to the original DASD file or XES structure.

Activate List Structures when COMMUNICATION=XCF or CTCONLY

This procedure dynamically activates XES list structures when COMMUNICATION=XCF or CTCONLY. The CA MIM system names are GK03, GK13, and GK62.

Note: Be sure that your COMPATLEVEL is set to 12.0 or higher.

The following steps create a primary and a secondary list structure. The primary list structure is the size of the largest DISPLAY CFSIZE command. The secondary list structure is about 20 percent larger.

Follow these steps:

1. Set up your list structures:
 - a. Confirm that all systems in the MIMplex are also within the same sysplex.
 - b. Enter the DISPLAY CFSIZE command on all systems and determine the optimal size for the new XES list structures.

```
@D CFSIZE
MIM0067I Command DISPLAY 726
MIM1154I GDIF CFSIZE Display:
```

The recommended primary GDIF control file size is 10240 KB.

- c. Allocate the list structures using the sample JCL contained in the ALLOCSTR member of the MIM.CNTL library.

2. Activate the list structures.

- a. Allocate the new XES list structures to the MIM address space by using the ALLOCATE command:

```
@ALLOC XESFILEID=00 STRNAME=KERGL01#TABLE00
IXL014I IXLCONN REQUEST FOR STRUCTURE KERGL01#TABLE00 920
WAS SUCCESSFUL. JOBNAME: MIM12MIM ASID: 0088
CONNECTOR NAME: MIM12MIMGK62 CFNAME: CFCCMIM2
MIM0472I 2049 blocks formatted on KERGL01#TABLE00
MIM0067I Command ALLOCATE 922
MIM0153I ALLOCATION successful
```

```
@ALLOC XESFILEID=01 STRNAME=KERGL01#TABLE01
IXL014I IXLCONN REQUEST FOR STRUCTURE KERGL01#TABLE01 925
WAS SUCCESSFUL. JOBNAME: MIM12MIM ASID: 0088
CONNECTOR NAME: MIM12MIMGK62 CFNAME: CFCCMIM1
MIM0067I Command ALLOCATE 926
MIM0153I ALLOCATION successful
```

- b. Enter the ALLOCATE commands on all systems.
 - c. Confirm the successful allocation with the following DISPLAY FILES command on all systems:

```
@D FILES
```

```
MIM0067I Command DISPLAY 937
MIM0102I Control File Display:
  File Unit Status  Volser  Data Set
    00  USABLE  CFCCMIM2 KERGL01#TABLE00
    01  USABLE  CFCCMIM1 KERGL01#TABLE01
```

- d. Use the MIGRATE command for migrating to the XES list structure.

```
@MIG CF=00
MIM0067I Command MIGRATE 767
MIM0227I Migration initiated to control file 00
MIM0088I migration to file 00 IN PROGRESS
MIM0242I system GK62 VCF deactivation  COMPLETE
MIM0080I migration to file 00 COMPLETE
MIM0638I Global Copy Received
```

The migration is now complete.

3. Verify that CA MIM is using the proper file by issuing the following DISPLAY FILES command:

```
@D FILES
MIM0067I Command DISPLAY 780
MIM0102I Control File Display:
  File Unit Status  Volser  Data Set
    00  IN-USE  CFCCMIM2 KERGL01#TABLE00
    01  USABLE  CFCCMIM1 KERGL01#TABLE01
MIM0104I Checkpoint File Display:
  File Unit Status  Volser  Data Set
    00 2064 IN-USE  TSO23C  KERGL01.XE62.CKPT00
    01 2064 USABLE  TSO23C  KERGL01.XE62.CKPT01
```

The list structures are activated and file 00 is being used, which is correct.

Revert to the Original List Structures

You see a problem and want CA MIM to revert to use the XCF signaling(if COMMUNICATION=XCF) or the CTC communication (if COMMUNICATION=CTCONLY).

Follow these steps:

1. Issue the MIGRATE command:

```
@MIGRATE MASTER=GK03
MIM0067I Command MIGRATE 813
MIM0232I VCF migration SCHEDULED - MASTER=GK03
MIM0377I VCF migration IN PROGRESS - MASTER=GK03
MIM0342I system GK62 VCF activation COMPLETE - MASTER=GK03
MIM0241I VCF migration COMPLETE - MASTER=GK03
MIM0637I Global Copy Sent to GK03 GK13
```

2. Confirm that GK03 is now the VCFMASTER by using the DISPLAY SYSTEMS command:

```
@D SYSTEMS
MIM0067I Command DISPLAY 825
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
01 03 GK03 EXTERNAL MASTER zOS 2013.172 11:39:35.68
02 13 GK13 EXTERNAL ACTIVE zOS 2013.172 11:39:35.61
03 62 GK62 LOCAL ACTIVE zOS 2013.172 11:39:35.69
```

Activate XCF Communication on a Subset of the Systems

This procedure dynamically activates XCF communication on a subset of the MIMplex when COMMUNICATION=CTCDASD or CTCONLY. The MIMplex is four systems with system names of GK03, GK13, GK23, and GK62. GK03, GK13, and GK62 are in one sysplex. GK23 is in a different sysplex.

Note: Be sure that your COMPATLEVEL is set to 12.0 or higher.

Follow these steps:

1. Set up your XCF communication on a subset of systems:
 - Set MIMINIT VCFBUFFERSIZE to 32768 or larger.
 - Review the XCF configuration and options in the SYS1.PARMLIB(COUPLExx) member.
 - You do not need to define a special transport class to CA MIM. However, we recommend at least one CLASSLEN of 32768 or larger to avoid possible performance problems. CLASSLEN is an XCF parameter and is coded in the SYS1.PARMLIB(COUPLExx) member.
 - If some of the LPARS are geographically remote, then IBM recommends that XCF use both CTC and list structures.

Note: You do not need to create the Checkpoint files. However, if you are already using them CA MIM has no issues.

2. Confirm the current paths by entering the DISPLAY PATH command on all four systems.

- On GK03:

```
@D PATH
MIM0067I Command DISPLAY 422
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:10 ON 2013.176
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
XCF GK62 USABLE 0 0 0
XCF GK13 USABLE 0 0 0
N/A GK03 LOCAL 0 0 0.000382 3,269
184A GK62 USABLE IDLE 3,268 3,268 0
180A GK62 USABLE IDLE 0 0 0
0B4A GK62 USABLE IDLE 0 0 0
186A GK23 USABLE IDLE 3,268 3,268 0
182A GK23 USABLE IDLE 0 0 0
0B6A GK23 USABLE IDLE 0 0 0
183A GK13 USABLE IDLE 3,254 3,254 0
154A GK13 USABLE IDLE 0 0 0
0B3A GK13 USABLE IDLE 0 0 0
```

In the previous display, CA MIM automatically created the XCF paths to external systems that are in the same sysplex as the local system. No actions were required to accomplish this task. Also notice that CA MIM does not show the path currently IN-USE. The behavior of the DISPLAY PATH command is required to use the command on the client systems to determine the current path.

- On GK13:

```
@D PATH
MIM0067I Command DISPLAY 673
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:20 ON 2013.176
DEV SYSTEM STATE IO-STAT  READS  WRITES  ERR TIME/RSV  CYCLES
XCF GK62  USABLE          0    0          0
N/A GK13  LOCAL           0    0          0
187A GK62  USABLE IDLE     0    0          0
0BFA GK62  USABLE IDLE     0    0          0
0B7A GK62  USABLE IDLE     0    0          0
185A GK23  USABLE IDLE     0    0          0
181A GK23  USABLE IDLE     0    0          0
0B5A GK23  USABLE IDLE     0    0          0
>183A GK03  IN-USE BUSY    3,540  3,540  0.001925  3,540
RESERVE
154A GK03  USABLE IDLE     0    0          0
0B3A GK03  USABLE IDLE     0    0          0
XCF GK03  USABLE          0    0          0
```

Note the XCF paths to GK03 and GK62 in the previous display.

- On GK23:

```
@D PATH
MIM0067I Command DISPLAY 327
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:29 ON 2013.176
DEV SYSTEM STATE IO-STAT  READS  WRITES  ERR TIME/RSV  CYCLES
N/A GK23  LOCAL           0    0          0
183A GK62  USABLE IDLE     0    0          0
154A GK62  USABLE IDLE     0    0          0
0B3A GK62  USABLE IDLE     0    0          0
185A GK13  USABLE IDLE     0    0          0
181A GK13  USABLE IDLE     0    0          0
0B5A GK13  USABLE IDLE     0    0          0
>186A GK03  IN-USE IDLE    3,657  3,657  0.002053  3,657
182A GK03  USABLE IDLE     0    0          0
0B6A GK03  USABLE IDLE     0    0          0
```

The previous display shows no XCF paths to GK03, GK13, and GK62 because GK23 is in a different sysplex.

- On GK62:

```

@D PATH
MIM0067I Command DISPLAY 136
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:36 ON 2013.176
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
N/A GK62 LOCAL 0 0 0
183A GK23 USABLE IDLE 0 0 0
154A GK23 USABLE IDLE 0 0 0
0B3A GK23 USABLE IDLE 0 0 0
187A GK13 USABLE IDLE 0 0 0
0BFA GK13 USABLE IDLE 0 0 0
0B7A GK13 USABLE IDLE 0 0 0
>184A GK03 IN-USE IDLE 3,796 3,796 0.002015 3,796
180A GK03 USABLE IDLE 0 0 0
0B4A GK03 USABLE IDLE 0 0 0
XCF GK03 USABLE 0 0 0
XCF GK13 USABLE 0 0 0

```

So, all four systems are currently using CTCs to communicate, but systems GK03, GK13, and GK62 can now communicate through XCF. Use the SET MIM VCFPREFERENCE=CTC/XCF command for specifying whether CA MIM uses the CTC or XCF connection. The default is CTC when COMMUNICATION=CTCONLY or CTCDASD.

3. Activate your XCF communication

- Issue the SET MIM VCFPREFERENCE=XCF command on GK13 and GK62 to switch from CTC to XCF. The command is not needed on the current VCFMASTER(GK03) because it detects the switch from the clients.

- On GK13:

```

@SET MIM VCFPREF=XCF
MIM0067I Command SETOPTION 169
MIM0052I SETOPTION MIM processing complete
MIM0292I VCF switched to alternate VCF path XCF

```

- On GK62:

```

@SET MIM VCFPREF=XCF
MIM0067I Command SETOPTION 169
MIM0052I SETOPTION MIM processing complete
MIM0292I VCF switched to alternate VCF path XCF

```

The activation is now complete.

4. Update the commands member with:

```

IFSYS GK03,GK13,GK62
SET MIM VCFPREFERENCE=XCF
ENDIF

```

Note: GK23 was not included in the command as we want it to continue using CTC which is the default for COMMUNICATION=CTCDASD or CTCONLY.

- 5. Verify the current connectivity by entering the DISPLAY PATH command on all client systems.

- On GK62:

```
@D PATH
MIM0067I Command DISPLAY 180
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:36 ON 2013.176
DEV SYSTEM STATE IO-STAT  READS  WRITES  ERR TIME/RSV CYCLES
N/A GK62  LOCAL          0    0          0
183A GK23  USABLE IDLE      0    0          0
154A GK23  USABLE IDLE      0    0          0
0B3A GK23  USABLE IDLE      0    0          0
187A GK13  USABLE IDLE      0    0          0
0BFA GK13  USABLE IDLE      0    0          0
0B7A GK13  USABLE IDLE      0    0          0
184A GK03  USABLE IDLE    4,769  4,769  0.001856  4,769
180A GK03  USABLE IDLE      0    0          0
0B4A GK03  USABLE IDLE      0    0          0
>XCF GK03  IN-USE        95    95  0.000408   95
XCF GK13  USABLE          0    0          0
```

Notice how the XCF path is now being used between GK62 and GK03.

- On GK13:

```
@D PATH
MIM0067I Command DISPLAY 776
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:20 ON 2013.176
DEV SYSTEM STATE IO-STAT  READS  WRITES  ERR TIME/RSV CYCLES
XCF GK62  USABLE          0    0          0
N/A GK13  LOCAL          0    0          0
187A GK62  USABLE IDLE      0    0          0
0BFA GK62  USABLE IDLE      0    0          0
0B7A GK62  USABLE IDLE      0    0          0
185A GK23  USABLE IDLE      0    0          0
181A GK23  USABLE IDLE      0    0          0
0B5A GK23  USABLE IDLE      0    0          0
183A GK03  USABLE IDLE    5,266  5,266  0.001632  5,266
154A GK03  USABLE IDLE      0    0          0
0B3A GK03  USABLE IDLE      0    0          0
>XCF GK03  IN-USE       105   105  0.001399   105
```

Notice how the XCF path is now being used between GK13 and GK03.

- On GK23:

```
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:29 ON 2013.176
DEV SYSTEM STATE IO-STAT  READS  WRITES  ERR TIME/RSV CYCLES
N/A GK23  LOCAL          0    0          0
```

183A GK62	USABLE IDLE	0	0	0
154A GK62	USABLE IDLE	0	0	0
0B3A GK62	USABLE IDLE	0	0	0
185A GK13	USABLE IDLE	0	0	0
181A GK13	USABLE IDLE	0	0	0
0B5A GK13	USABLE IDLE	0	0	0
>186A GK03	IN-USE IDLE	3,657	3,657	0.002053 3,657
182A GK03	USABLE IDLE	0	0	0
0B6A GK03	USABLE IDLE	0	0	0

GK23 is still using a CTC connection to GK03 because there are no XCF paths between GK23 and GK03.

Revert to CTC Communication

You decide to revert CA MIM back to using the CTC communication.

Follow these steps:

1. Use the SET MIM VCFPREFERENCE=CTC command.

- On GK13:

```
@SET MIM VCFPREFERENCE=CTC
MIM0067I Command SETOPTION 035
MIM0052I SETOPTION MIM processing complete
MIM0292I VCF switched to alternate VCF path 183A
@D PATH
MIM0067I Command DISPLAY 039
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:51:19 ON 2013.176
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
N/A GK13 LOCAL 0 0 0
187A GK62 USABLE IDLE 0 0 0
0BFA GK62 USABLE IDLE 0 0 0
0B7A GK62 USABLE IDLE 0 0 0
185A GK23 USABLE IDLE 0 0 0
181A GK23 USABLE IDLE 0 0 0
0B5A GK23 USABLE IDLE 0 0 0
>183A GK03 IN-USE IDLE 29 29 0.000692 29
154A GK03 USABLE IDLE 0 0 0
0B3A GK03 USABLE IDLE 0 0 0
XCF GK03 USABLE 46,770 46,770 0.002763 46,770
XCF GK62 USABLE 0 0 0
```

In the previous display, you can see that GK13 is now using CTC address 183A to GK03.

- On GK62:

```
@SET MIM VCFPREF=CTC
MIM0067I Command SETOPTION 635
0052I SETOPTION MIM processing complete
MIM0292I VCF switched to alternate VCF path 184A
@D PATH
MIM0067I Command DISPLAY 697
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 08:38:36 ON 2013.176
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
N/A GK62 LOCAL 0 0 0
183A GK23 USABLE IDLE 0 0 0
154A GK23 USABLE IDLE 0 0 0
0B3A GK23 USABLE IDLE 0 0 0
187A GK13 USABLE IDLE 0 0 0
0BFA GK13 USABLE IDLE 0 0 0
```

```
0B7A GK13  USABLE IDLE      0  0      0
>184A GK03  IN-USE IDLE    4,794 4,794 0.001852 4,794
180A GK03  USABLE IDLE      0  0      0
0B4A GK03  USABLE IDLE      0  0      0
XCF GK03   USABLE      60,408 60,408 0.003041 60,408
XCF GK13   USABLE      0  0      0
```

In the previous display, you can see that GK62 is now using CTC address 184A to GK03.

No commands are required for GK23 because it was already using CTCs. The command is not needed on the current VCFMASTER(GK03) because it detects the switch from the clients.

Add a System to the MIMplex when COMMUNICATION=CTCDASD

This procedure dynamically adds a system to an existing MIMplex when COMMUNICATION=CTCDASD or CTONLY.

Note: Be sure that your COMPATLEVEL is set to 12.0 or higher.

Follow these steps:

1. Set up your new system.
 - a. Review the current configuration.

In this example, we have a two system MIMplex with systems GK03 and GK13. We are going to add system GK62.

The current INIT member contains the following statements:

```
DEFSYS (GK03,03,XE03,INIT=FREED),
      (GK13,13,XE13,INIT=FREED)
```

```
GLOBALVALUE VCFMASTER=(GK03,GK13),
      MOSTP=YES,
      NOMASTER=WAIT,
      ANYELIG=YES
```

```
CTCPATH FROMSYS=GK03 TOSYS=GK13 ADDR=(183A,154A,B3A)
CTCPATH FROMSYS=GK13 TOSYS=GK03 ADDR=(183A,154A,B3A)
```

- b. Confirm the current configuration on GK13 using the DISPLAY command:

```
@D SYS
```

```
MIM0067I Command DISPLAY 355
```

```
MIM0108I SYSTEMS DISPLAY
```

```
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
 01 03 GK03 EXTERNAL MASTER zOS 2013.175 14:40:17.11
 02 13 GK13 LOCAL ACTIVE zOS 2013.175 14:40:17.20
```

```
@D PATH
```

```
MIM0067I Command DISPLAY 359
```

```
MIM0176 MIM PATH DISPLAY:
```

```
LAST RESTART AT 14:39:35 ON 2013.175
```

```
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
N/A GK13 LOCAL 0 0 0
>183A GK03 IN-USE IDLE 305 305 0.001085 305
154A GK03 USABLE IDLE 0 0 0
0B3A GK03 USABLE IDLE 0 0 0
```

```
@D GLOBALV
```

```
MIM0067I Command DISPLAY 372
```

```
MIM0373I MIM GLOBALVALUE display:
```

```
ANYELIGIBLE=YES MOSTPREFERRED=YES NOMASTER=WAIT
VCFMASTER=( GK03, GK13)
```

ELIGIBLE MASTER LIST: GK03, GK13

- c. Confirm the current configuration on GK03 using the DISPLAY command:

```
@D PATH
MIM0067I Command DISPLAY 237
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 14:39:23 ON 2013.175
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
N/A GK03 LOCAL 0 0 0.000024 624
183A GK13 USABLE IDLE 621 621 0
154A GK13 USABLE IDLE 0 0 0
0B3A GK13 USABLE IDLE 0 0 0
```

2. Activate the new system GK62 using the DEFSYS command on one system only:

```
@DEFSYS (GK62,62,XE62)
MIM0067I Command DEFSYS 319
MIM0099I DEFSYS command is processing
MIM0408I System Add Successful - GK62
```

3. Confirm that GK62 has been added successfully:

```
@D SYS
MIM0067I Command DISPLAY 327
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
01 03 GK03 LOCAL MASTER zOS 2013.175 14:44:03.55
02 13 GK13 EXTERNAL ACTIVE zOS 2013.175 14:44:03.55
03 62 GK62 EXTERNAL FREED <- new system
```

4. (Optional) Update the VCFMASTER parameter on the GLOBALVALUE statement. This list shows the systems from busiest to least busy (in terms of the global ENQ activity).

In this example, GK62 has the least amount of activity, so we want to put this system last in the list:

```
@GLOBALVALUE VCFMASTER(GK03,GK13,GK62)
MIM0067I Command GLOBALVALUE 360
MIM0386W System GK62 is ineligible to become VCF MASTER
MIM0193I GLOBALVALUE command processing initiated
MIM0363I GLOBALVALUE command changes pending on external systems
MIM0362I GLOBALVALUE command processing complete
```

5. Confirm the change:

```
@D GLOBALV
MIM0067I Command DISPLAY 367
MIM0373I MIM GLOBALVALUE display:
ANYELIGIBLE=YES MOSTPREFERRED=YES NOMASTER=WAIT
VCFMASTER=( GK03, GK13, *GK62 )
ELIGIBLE MASTER LIST: GK03, GK13
```

GK62 becomes eligible when it is started.

Test the connectivity of the devices using the PROCCTC utility before you use the CTCPATH command.

6. Create the CTCPATH definitions on GK03 and GK13.

■ On GK03:

```
@CTCPATH FROMSYS=GK03 TOSYS=GK62 ADDR=(184A,180A,B4A)
MIM0067I Command CTCPATH 500
MIM0703I Path added for device 184A
MIM0703I Path added for device 180A
MIM0703I Path added for device 0B4A
```

Confirm the new paths:

```
@D PATH
MIM0067I Command DISPLAY 520
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 14:39:23 ON 2013.175
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
0B4A GK62 USABLE BUSY 0 0 0
WRITHDS
180A GK62 USABLE BUSY 0 0 0
WRITHDS
184A GK62 USABLE BUSY 0 0 0
WRITHDS
N/A GK03 LOCAL 0 0 0.000055 4,980
183A GK13 USABLE IDLE 4,969 4,969 0
154A GK13 USABLE IDLE 0 0 0
0B3A GK13 USABLE IDLE 0 0 0
```

■ On GK13:

```
@CTCPATH FROMSYS=GK13 TOSYS=GK62 ADDR=(187A,BFA,B7A)
MIM0067I Command CTCPATH 685
MIM0703I Path added for device 187A
MIM0703I Path added for device 0BFA
MIM0703I Path added for device 0B7A
```

Confirm the new paths:

```
@D PATH
MIM0067I Command DISPLAY 695
MIM0176 MIM PATH DISPLAY:
LAST RESTART AT 14:39:35 ON 2013.175
DEV SYSTEM STATE IO-STAT READS WRITES ERR TIME/RSV CYCLES
0B7A GK62 USABLE BUSY 0 0 0
WRITHDS
0BFA GK62 USABLE BUSY 0 0 0
WRITHDS
187A GK62 USABLE BUSY 0 0 0
WRITHDS
N/A GK13 LOCAL 0 0 0
>183A GK03 IN-USE IDLE 4,859 4,859 0.001026 4,859
```

```
154A GK03 USABLE IDLE 0 0 0
0B3A GK03 USABLE IDLE 0 0 0
```

7. Update the INIT member with the contents of the previous commands and add the CTCPATHs from GK62:

```
DEFSYS (GK03,03,XE03,INIT=FREED),
(GK13,13,XE13,INIT=FREED),
(GK62,62,XE62,INIT=FREED)
```

```
GLOBALVALUE VCFMASTER=(GK03,GK13,GK62),
MOSTP=YES,
NOMASTER=WAIT,
```

```
CTCPATH FROMSYS=GK03 TOSYS=GK13 ADDR=(183A,154A,B3A)
CTCPATH FROMSYS=GK03 TOSYS=GK62 ADDR=(184A,180A,B4A)
```

```
CTCPATH FROMSYS=GK13 TOSYS=GK03 ADDR=(183A,154A,B3A)
CTCPATH FROMSYS=GK13 TOSYS=GK62 ADDR=(187A,BFA,B7A) <-new
```

```
CTCPATH FROMSYS=GK62 TOSYS=GK03 ADDR=(184A,180A,B4A)
CTCPATH FROMSYS=GK62 TOSYS=GK13 ADDR=(187A,BFA,B7A) <-new
```

Note: If COMM=CTCDASD, ensure that the control files or list structures are allocated or cataloged on the new system.

8. Start MIM on GK62:

```
S MIM,FORMAT=CHKPT
```

The new system joins the existing MIMplex.

Note: COMMUNICATION=CTCDASD does not require a checkpoint file. However, if you have one allocated due to using ECMF QUEUE, then format it.

9. Verify that the new system joined the MIMplex by entering some verification commands on the new system/GK62:

```
@DCSF
MIM0023I system GK62 in file VCF synchronization COMPLETE
MIM0067I Command DISPLAY 676
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
01 03 GK03 EXTERNAL MASTER zOS 2013.175 14:53:19.61
02 13 GK13 EXTERNAL ACTIVE zOS 2013.175 14:53:19.66
03 62 GK62 LOCAL ACTIVE zOS 2013.175 14:53:19.67
```

GK62 is now ACTIVE.

```
MIM0373I MIM GLOBALVALUE display:
ANYELIGIBLE=YES MOSTPREFERRED=YES NOMASTER=WAIT
VCFMASTER=( GK03, GK13, GK62 )
ELIGIBLE MASTER LIST: GK03, GK13, GK62
```

GK62 is now an eligible master.

MIM0176 MIM PATH DISPLAY:

LAST RESTART AT 14:52:58 ON 2013.175

DEV	SYSTEM	STATE	IO-STAT	READS	WRITES	ERR	TIME/RSV	CYCLES
N/A	GK62	LOCAL	0	0	0			
187A	GK13	USABLE	IDLE	0	0			0
0BFA	GK13	USABLE	IDLE	0	0			0
0B7A	GK13	USABLE	IDLE	0	0			0
>184A	GK03	IN-USE	IDLE	3	3	0.001479		3
180A	GK03	USABLE	IDLE	0	0			0
0B4A	GK03	USABLE	IDLE	0	0			0

All 6 CTC addresses have been allocated and 184A is the path currently IN-USE to the VCFMASTER(GK03).

Revert to the Original MIMplex

When the new system does not join the MIMplex:

1. Shut down CA MIM on that system.
2. Enter the FREE command from one of the active systems.

Once the system has been added with the DEFSYS command, there is no way to remove it. You may need to restore the INIT member to the original state, and perform a global shutdown and control file/checkpoint file format.

Add a System when COMMUNICATION=DASDONLY

You want a system dynamically added to the established MIMplex using COMMUNICATION=DASDONLY. The CA MIM name and alias are honored as coded on the DEFSYS statement.

Follow these steps:

1. Ensure that no systems have been REMOVED from the MIMPLEX by reviewing the DISPLAY SYSTEMS command output:

```
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
01 03 GK03 EXTERNAL ACTIVE zOS 2012.013 12:25:45.38
02 13 GK13 LOCAL ACTIVE zOS 2012.013 12:25:45.91
03 23 GK23 EXTERNAL FREED
```

Verify that there are no gaps between the index numbers. If there are no gaps, then it is safe to proceed with the next step. Otherwise, update the DEFSYS statement, shut down globally, then restart globally with a control file format.

2. Update the DEFSYS statement in the CA MIMINIT member:

```
DEFSYS (GK03,03,XE03,INIT=FREED),
(GK13,13,XE13,INIT=FREED),
(GK23,23,XE23,INIT=FREED),
(GK62,62,XE62,INIT=FREED) /* new system
```

3. Start MIM on the new LPAR (GK62 in this example) with FORMAT=CHKPT or FORMAT=NONE if no checkpoints exist.

The new system joins the established MIMplex and honors the CA MIM name and alias as coded on the DEFSYS statement.

4. Confirm the new system joined with the DISPLAY SYSTEMS command:

```
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
01 03 GK03 EXTERNAL ACTIVE zOS 2012.013 12:26:26.39
02 13 GK13 EXTERNAL ACTIVE zOS 2012.013 12:26:26.88
03 23 GK23 EXTERNAL FREED
04 62 GK62 LOCAL ACTIVE zOS 2012.013 12:26:27.36
```

The new system has been added to the MIMplex.

Add a System when COMMUNICATION=XCF

You want a system dynamically added to the established MIMplex using COMMUNICATION=XCF. The CA MIM name and alias are honored as coded on the DEFSYS statement.

Follow these steps:

1. Issue the DISPLAY INIT command to ensure that the MIMPLEX is running with COMMUNICATION=XCF and COMPATLEVEL= 11.9 or greater.
2. Issue the DISPLAY SYSTEMS command to verify that you have an active MIMPLEX. The new system cannot be the first active system in the MIMPLEX.

```
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
 01 03 MIMMC003 LOCAL MASTER zOS 2012.026 10:52:21.82
 02 13 MIMMC013 EXTERNAL FREED
```

3. Issue the DEFSYS command with your preferred parameters.

```
DEFSYS (MIMMC062,62,XE62)
```

Verify that the following message appears:

```
MIM0408I – System Add Successful – MIMMC062
```

4. Issue the DISPLAY SYSTEMS command to ensure that the new system was added correctly.

```
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
 01 03 MIMMC003 LOCAL MASTER zOS 2012.026 10:57:06.16
 02 13 MIMMC013 EXTERNAL FREED
 03 62 MIMMC062 EXTERNAL FREED
```

For a new system to become a VCFMASTER system, update the GLOBALVALUE parameter.

5. Issue a DISPLAY GLOBALVALUE command. Note the list of eligible master systems.

```
MIM0373I MIM GLOBALVALUE display:
ANYELIGIBLE=YES MOSTPREFERRED=YES NOMASTER=WAIT
VCFMASTER=(MIMMC003, MIMMC013)
ELIGIBLE MASTER LIST: MIMMC003, MIMMC013
```

6. Issue the following command on one system only:

```
GLOBALVALUE VCFMASTER={LIST}
```

Note: Copy the VCFMASTER list from the prior command and add the desired system.

```
GLOBALVALUE VCFMASTER=(MIMMC003, MIMMC013, MIMMC062)
```

7. Verify Output:

```
MIM0363I GLOBALVALUE command changes pending on external systems
GLOBALVALUE command processing complete
```

- Issue a DISPLAY GLOBALVALUE command again to verify that the desired system was added to the VCFMASTER list.

```
MIM0373I MIM GLOBALVALUE display:
ANYELIGIBLE=YES  MOSTPREFERRED=YES  NOMASTER=WAIT
VCFMASTER=(MIMMC003, MIMMC013, MIMMC062)
ELIGIBLE MASTER LIST: MIMMC003, MIMMC013, MIMMC062
```

- Update the GLOBALVALUE statement in the MIMINIT member to match the exact text of the operator command.

```
GLOBALVALUE VCFMASTER=(MIMMC003,MIMMC013, MIMMC062),
  ANYELIGIBLE=YES,
  NOMASTER=WAIT,
  MOSTPREFERRED=YES
```

- Update the DEFSYS statement in the MIMINIT member. Be sure to code the new system last on the system list.

```
DEFSYS (MIMMC003,03,XE03,INITIAL=FREED),
  (MIMMC013,13,XE13,INITIAL=FREED),
  (MIMMC062,62,XE62)
```

- Allocate checkpoint files for the new system. Defined them using the CHKPTDSN statement in the MIMINIT member.

```
MIMINIT CHKPTDSN=CHIMA14.MIMMC0&SYSCLONE..MIMCKP
```

- Start the new system with FORMAT=CHKPT.

- Confirm that the new system has been added by entering a DISPLAY SYSTEMS command.

```
MIM0108I SYSTEMS DISPLAY
INDEX ALIAS SYSTEM RELATION STATUS OPSYS LAST ACCESS
01 03 MIMMC003 EXTERNAL MASTER zOS 2012.026 11:05:55.14
02 13 MIMMC013 EXTERNAL FREED
03 62 MIMMC062 LOCAL ACTIVE zOS 2012.026 11:05:55.2
```

The new system has been added.