



What's new with CA MIM Resource Sharing -11.8 & 11.9?

An overview of CA MIM and our focus points

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February 8th 2013
Session #12887



CA MIM™ Resource Sharing Overview
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CA MIM Resource Sharing Agenda



CA MIM™ Resource Sharing

- CA MIM Basics
- 5 FOCUS Points
 - FOCUS – Striving for 24/7 – 365 up-time
 - FOCUS – Improved Integrity
 - FOCUS – Better Performance
 - FOCUS – Logging and Notifications
 - FOCUS – Ease of Configuration

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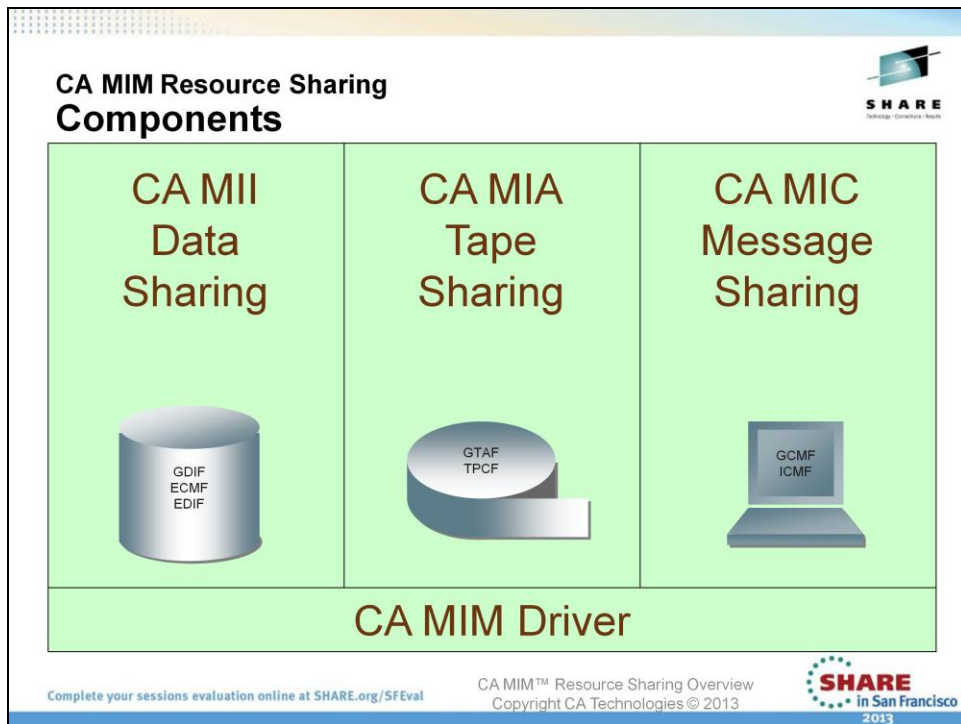
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Here are some of the things I'll be covering today:

A quick overview of CA MIM Resource Sharing.

Followed by an update on the focus points of development in the recent releases.



MIM is made up of 4 major components:

The driver portion, which is always active, on top of which runs these three components:

MII, MIA and MIC

MII (Multi Image Integrity) deals primarily with serialization of ENQs.

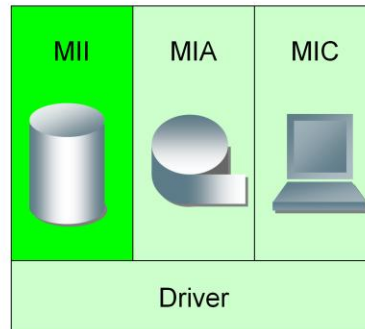
MIA (Multi Image Allocation) deals with serialization of allocation of devices.

MIC (Multi Image Console) as the name suggests allows you to control many systems from a single console.

CA MII Data Sharing Multi Image Integrity



- GDIF
 - Global Data Integrity Facility
- ECMF
 - ENQ Conflict Management Facility
- EDIF
 - Enhanced Data Set Integrity Facility



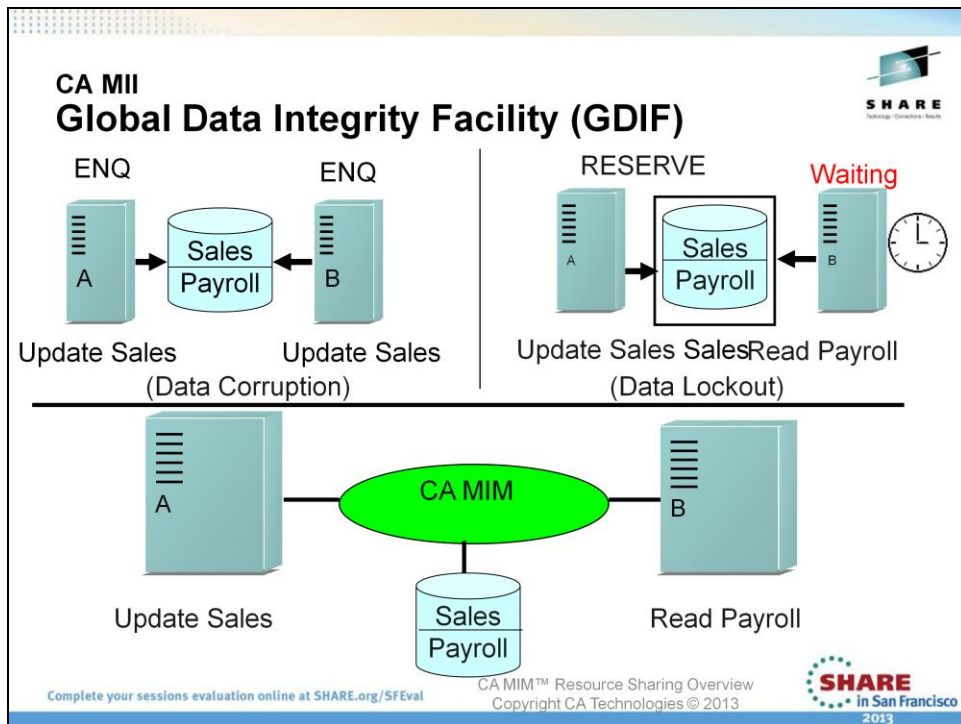
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Some background on MII:

GDIF is the Global Data Integrity Facility
ECMF is the ENQ Conflict Management Facility
and EDIF is the Enhanced Dataset Integrity Facilities.



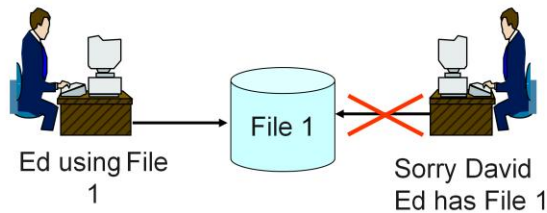
Here are two examples of problems with sharing DASD volumes with multiple systems.

Corruption: Assume, there are two separate systems and both want to update the Sales dataset on a shared DASD volume. System A will raise an ENQ to indicate to others on the same system that it is currently using the Sales dataset and is off limit to others. System B however, is not aware of this ENQ and will also update the same Sales dataset on the shared volume at the same time. This results on corruption of data.

Data Lockout: In this case, let's say that the user is aware of the risk in updating the Sales dataset while the other systems that share the DASD volume still have access to it. They issue a RESERVE on the volume and proceed to update the Sales dataset. But let's say another user on system B wants to read the Payroll dataset on the same DASD Volume. This request will be delayed as they will be forced to WAIT till System A releases the reserve it holds on the Volume. This results in unnecessary delays even though they are accessing different datasets.

If we bring CA MIM into the picture and activate GDIF System A will now be able to update the Sales dataset and at the same time System B will be able to read or update the Payroll dataset on the same DASD Volume.

CA MIM ENQ Conflict Management Facility (ECMF)



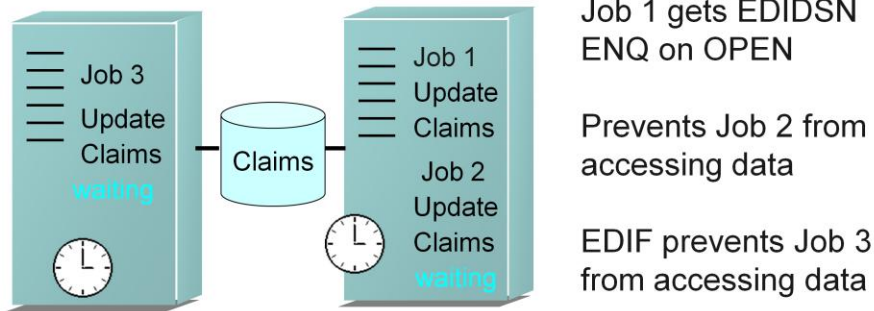
- Notifies TSO user or operator of data set contention
- Provides conflict, RESERVE, and ENQ displays for contention analysis
- Re-queues jobs requiring data sets in use

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ECMF's main purpose is to notify TSO users that a resource they are trying to access is currently in use and will also let the holder of the resource know that they are making someone else wait.



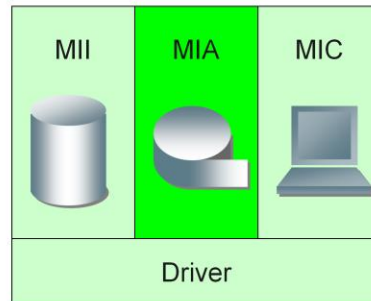
- ENQ prevents simultaneous update and data destruction when jobs operate outside standard integrity conventions

EDIF mainly deals with protecting datasets from being made unusable by incorrect use of DSCB attributes while OPEN'ing them.

CA MIA Tape Sharing



- GTAF
 - Global Tape Allocation Facility
 - Global tape drive allocation management
 - Across multiple sysplexes and VM systems
- TPCF
 - Tape Preferencing and Control Facility
 - Special allocation control
 - Automate allocation recovery



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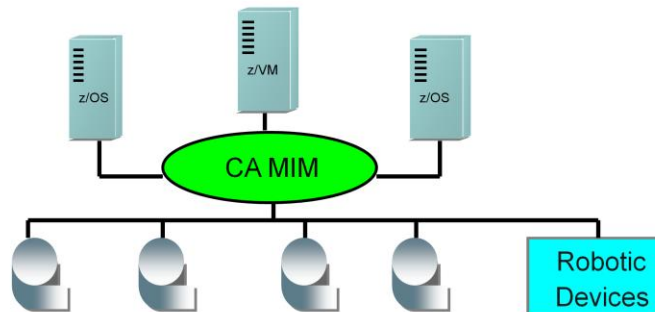
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The next component of CA MIM – MIA (Multi Image Allocation)

MIA consists of GTAF (Global Tape Allocation Facility)
and TPCF (Tape Preferencing and Control Facility)

CA MIA Global Tape Allocation Facility (GTAF)



- Allows sharing of Tape Drives (Real or Virtual) between multiple LPARs – any combination of z/OS and/or z/VM
- Prevents jobs on different systems from concurrently allocating the same tape device

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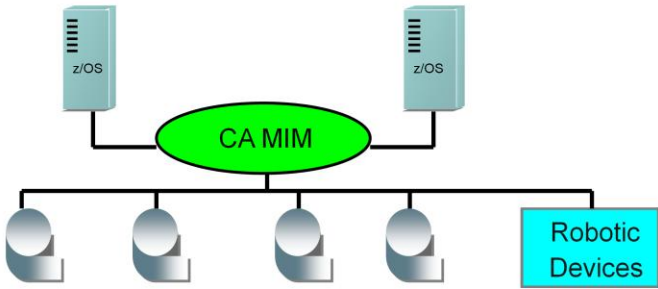
GTAF allows devices – real or virtual – to be shared between multiple z/OS or z/VM systems.

This means there is no need for devices to be dedicated to a system where they may sit idle due to low activity. With GTAF, these devices could be shared with busy systems that have a lot of tape device activity.

If GTAF was not used, operators must manually vary the devices offline on one system and then online on the other system to make it available for use.


GTAF provides serialization of tape devices across multiple systems – so it essentially stops different systems from concurrently allocating the same device.

CA MIA Tape Preferencing & Control Facility (TPCF)



```


graph TD
    zOS1[z/OS] --- CA_MIM((CA MIM))
    zOS2[z/OS] --- CA_MIM
    CA_MIM --- D1[ ]
    CA_MIM --- D2[ ]
    CA_MIM --- D3[ ]
    CA_MIM --- D4[ ]
    CA_MIM --- RD[Robotic Devices]
    style D1 fill:none,stroke:none
    style D2 fill:none,stroke:none
    style D3 fill:none,stroke:none
    style D4 fill:none,stroke:none
            
```



- Provides the ability to customize and influence z/OS tape device allocation
- Automatically responds to allocation recovery messages issued by z/OS whenever a job cannot allocate a suitable online device

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TPCF, another component of MIA - gives the ability to customize and influence z/OS tape device allocation.


It's possible to do things like:


- designating certain devices for either specific jobs or systems.
- directing allocations to remote devices
- assigning preference values to devices
- and more


TPCF also automatically responds to allocation recovery messages issued by the OS when a job cannot allocate a device. This eliminates the need for a manual response every time there is tape device contention.

CA MIC GCMF & ICMF

- GCMF (Global Command and Message Facility)
 - Console consolidation and control
 - Cross-system message selection and merging
 - Cross-system commands
 - Uses the MIM control file for communication
- ICMF (Intersystem Communication and Message Facility)
 - Extends GCMF's capability to 128 systems
 - Remote-system message selection and merging
 - Remote-system commands
 - Uses CA LSERV for communication








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MIC is the third component of MIM and it includes two facilities that do similar things.

GCMF – Global Command and Message Facility – allows you to route commands from one system to another, as well as see the messages from multiple consoles on a single console.

It uses the MIM control file for communication and is restricted to a maximum of 32 systems

ICMF – Intersystem Communication and Message Facility – extends GCMF's console sharing capability to a maximum of 128 systems. It uses CA LSERV for communication, which allows remote system consoles to be shared and controlled from a single console.

CA MIM Driver

- **Manages and Provides:**
 - Initialization
 - Cross-System communication
 - Address space management
 - Common functions
 - Dynamic addition of systems
 - Automatic restart manager

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MIM driver is the final component – although its not technically a component as it doesn't serve a purpose like sharing of DASD or tape devices.

But, the driver provides the basic framework on top which all the other components function.

Some of the things the driver provides include:

initialization of MIM

cross system communication

address space management

Common functions


ability to dynamically add systems to the MIMPLEX

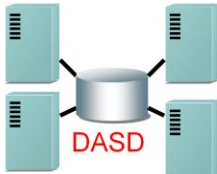
ability to restart MIM without interruption

and more

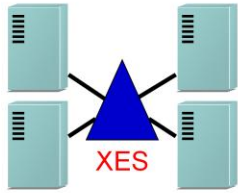
CA MIM Driver – Cross-system Communication

- VCF (Virtual Control File)
 - CTC – ESCON, FICON, or parallel
 - XCF
- DASD
 - DASD
 - Coupling Facility List Structure (XES)






DASD



XES

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Cross system communication is a key part of what the MIM driver provides and it's crucial to understand it to maximize CA MIM's performance.

It is important that the communication between systems be as fast and efficient as possible.

MIM uses the control file to communicate between different systems to propagate information about ENQs and device allocations.

The control file can be either a real control file or a virtual control file.

VCF or Virtual Control Files exist in the memory of MIM's address space and can use either CTC devices or XCF for communicating. In a VCF environment, data is transferred from clients to a MASTER and from the MASTER to a client.

Real Control Files can exist on either a DASD Volume or a XES Coupling Facility List Structure. In a real control file environment all the systems are able to directly access the control file without a MASTER system.

Covered so far? What's next?



- Covered so far?
 - CA MIM Basics
 - 4 different components of MIM
- Coming up next – Focus points
 - 5 focus points of last few releases



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FOCUS – Striving for 24/7 - 365 up-time



- Business need for large scale systems to be up 24/7 year-round
- Minor outages can cost a lot of money
- MIM must be up at all times or risk integrity exposures



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MIM provides data integrity and the systems must come to a halt if MIM is not active.

To most businesses, it is not acceptable to have a MIMPLEX-wide service outage for any length of time as it can cost them a lot of money.

This need for 24/7 – 365 up-time stops customers from experimenting with different MIM configurations that may provide much better performance for them.

MIM development is aware of these concerns and has produced features that aid with reducing the impact on service when making changes to MIM.

FOCUS – Striving for 24/7 - 365 up-time



- MIM must be active at all times.
- Presents these challenges:
 - Making configuration changes to MIM or adding new systems to the MIMPLEX
 - Upgrading and applying maintenance to MIM
 - Integrity exposures if MIM terminates while the system is active

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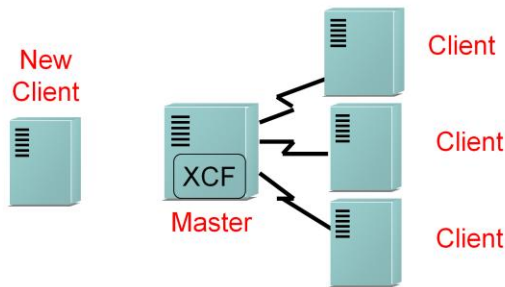


MIM development has been working towards allowing customers to upgrade and make changes to MIM without severe downtime.

FOCUS – Striving for 24/7 - 365 up-time Dynamic Addition of Systems with XCF



- Allows systems to be added to the MIMPLEX dynamically when running CA MIM with COMM=XCF
- Released in CA MIM 11.9



- No need to recycle MIM address space
- Systems can join or leave MIMPLEX's as needed

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Previously, to add a system to a COMM=XCF MIMPLEX, the entire MIMPLEX would have to be shut down and restarted to accommodate the new system.

This kind of MIMPLEX wide IPL requirement was unacceptable to most customers due to the associated down-time.

Newly joining system is not under any constraint and is even eligible to become the new XCF master if needed for MIM's VCF communication.

FOCUS – Striving for 24/7 - 365 up-time Restart Manager



CA MIM is protected against any fatal failure!

- The new Restart Manager will take control if CA MIM terminates
- Will ensure that there are no integrity exposures
- Automatically restart CA MIM
- Released in CA MIM 11.9

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All ENQ/RES activity will be stopped if CA MIM terminates.
The requestors will be made to wait until CA MIM is ready to service them again.

CA MIM is automatically restarted by the Restart Manager and all the ENQ requestors will be serviced once CA MIM initializes.
Normal activity will then resume on the system.

The MIM Restart Manager is also very easy to enable – the only change needed is to code PGM=MIMDRRM instead of PGM=MIMDRBGN in CA MIM's proc as the starting program.

FOCUS – Striving for 24/7 - 365 up-time Restart Manager



Planned restarts:

- Restart Manager allows for planned restarts of the MIM address space without integrity exposures
- Most maintenance can be applied to the MIM load library and activated with the Restart Manager
- Some configuration changes can also be activated in this way

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The CA MIM address space can be restarted by issuing the SHUTDOWN RESTART command.

It is recommended that planned restarts are performed during off hours.

FOCUS – Improved Integrity



- Preserving data integrity is CA MIM's greatest concern
- Integrity concerns before MIM is active on a system
- Integrity concerns if MIM is terminated on an active system



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CA MIM's objective is to provide the best possible data integrity protection to the customer.

We are adding features that provide additional ways to reduce the chance of integrity exposures.

FOCUS – Improved Integrity Early Start Mechanism



- Allows CA MIM to start as early as possible in the z/OS IPL process
- MIM ensures serialized access of resources is in place before other jobs are started on the system
- Released in CA MIM 11.8



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All RESERVE and SYSTEMS level ENQ requests are suspended until the CA MIM address space is fully initialized.

ENQ/RES requests will be serviced once CA MIM is initialized and normal ENQ activity can then begin.

FOCUS – Improved Integrity System Wait-State



- Upon termination of CA MIM, the system automatically enters a disabled Wait State
- Protects against the Operating System or other programs proceeding without data integrity
- Released in CA MIM 11.8



Note: The Restart Manager feature mentioned earlier can work together with the Wait-State feature to provide optimal protection

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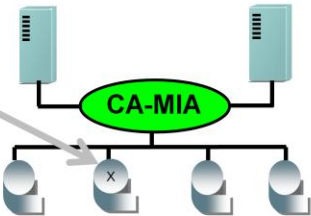


When used in conjunction with the Restart Manager, multiple restarts of the CA MIM address space will be attempted before entering a system Wait-State.

Best combination for maximum integrity protection is to use Wait-State in combination with the Restart Manager and the Early Start features.

FOCUS – Improved Integrity CA MIA - UNLOAD Serialization


Operator issues UNLOAD command



Job 1 attempts to allocate device.


Job 1 enters Allocation Recovery.

- CA MIA now globally serializes UNLOAD requests with
 - Allocation VARY processing
 - SWAP processing UNLOAD processing
- UNLOAD serialization prevents potential integrity exposures
- Released CA MIM 11.9



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Consider the following scenario (before):

1. UNLOAD issued by operator.
2. Job 1 attempts to allocate the same device.
3. Job 1 is allowed to allocate the device
4. Data corruption resulting from UNLOAD and Job 1 read/write access at the same time.

This is no longer the case after this enhancement:

When Job 1 tries to allocate the device that is being UNLOAD'ed, it will enter Allocation Recovery instead.

FOCUS – Better Performance

- MIM's service times and cross system communication speeds affect system performance
- Tape allocation delays prevent jobs from proceeding



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CA MIM's performance is crucial to the performance of the entire system.

The service times of ENQs and RESERVEs as well as TAPE device allocation can affect the amount of time other JOBS take to complete.

FOCUS – Better Performance

Automatic Control File Block Size Adjustment



- The MIM control file's block size can have an effect on MIM's performance
- MIM will now automatically optimize its control file block size
- Eliminates issues where the control file block size is too big or too small and other sizing constraints
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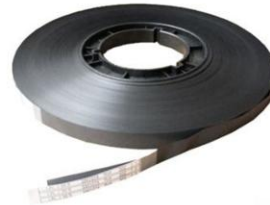


Although a performance boost is possible from this enhancement, the main objective was to eliminate the cases where coding a BLKSIZE that's too small resulting in an error condition.

FOCUS – Better Performance VARY command improvements



- Elimination of sequentially issued redundant VARY commands
 - VARY 78F,OFFLINE
 - VARY 78F,ONLINE
 - **VARY 78F,ONLINE** <- Deleted by MIA
 - VARY 78F,OFFLINE
- Released in CA MIM 11.9



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Elimination of these redundant VARYs will reduce the number of VARYs that are processed.

It also keeps the VARY queue in a clean condition, maximizing the number of VARYs that can be in the queue.

FOCUS – Better Performance VARY command improvements



- New VARY PURGE command
 - Ability to cancel pending VARY commands
 - VARY E20,PURGE
 - All pending VARY commands for device E20 will be deleted.
 - VARY E20-E2F, PURGE
 - All pending VARY commands for devices E20-E2F will be deleted.
- Released in CA MIM 11.9



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Purging a series of VARY commands deemed unnecessary can save processing time.

FOCUS – Logging and Notifications



- Messages from the CA MIM address space can provide crucial information
- Notifications from CA MIM can help avoid delays when accessing resources

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FOCUS – Logging and Notifications Logging and Tracing Facility



MIMLOG & MIMTRC:

- New logging and tracing facilities for MIM
- Logging/tracing of messages even when starting CA MIM with SUB=MSTR
- Buffers messages internally in case JES is not ready
- Logs will automatically wrap if they fill up or move on to a different dataset
- Released in CA MIM 11.9



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MIMLOG and MIMTRC are the new logging and tracing facilities for MIM.

They provide logging/tracing of messages even when starting CA MIM with SUB=MSTR.

MIM will internally buffer the message until JES is up and ready.

This feature also allows automatically wraps to the beginning of a log dataset if it fills up.

Multiple datasets can be defined for a log and in this case logging will automatically switch to the next dataset if one fills up. If all of them fill up – we will wrap to the beginning of the first dataset.

Logs can also be redirected to a different dataset or SYSOUT if needed at any point.

FOCUS – Logging and Notifications **VARY Re-queue notifications**



Before:

- VARYs affected by serialization delays retried perpetually
- VARY failures due to serialization delays not surfaced

Now:

- CA MIM provides notifications of VARY Serialization delays
- User controlled VARY REQUEUE notification and frequency
- Released in CA MIM 11.8



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It was possible for VARYs to retry forever causing performance degradation.

This issue will now be detected by MIA and the operator will be alerted that requeuing of VARYs is happening.

The number of re-queues after which the notification should be sent is set as an option.

This feature is also able to notify CA OPS/MVS automation software that delays are occurring and CA MIM is able to take corrective action depending on the response from CA OPS/MVS.

The VARY re-queue problem does not happen on z/OS releases 1.12 or higher.

FOCUS – Ease of Configuration



- Simplification of CA MIM installation
- Flexible configuration methods for MIM facilities

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The need for easier configuration and installation of mainframe software is rising as new professionals enter the field.

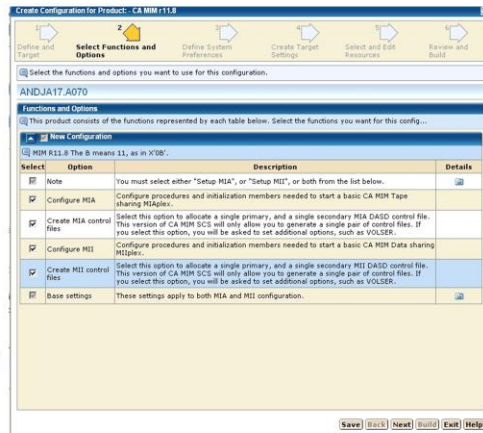
CA is aware of this need and is taking steps to make installation and other procedures driven by more intuitive interfaces.

FOCUS – Ease of Configuration Install and Configure with CA MSM



CA MSM Compatibility:

- Install CA MIM with the GUI driven CA MSM (Mainframe Software Manager)
- Configure some portions of CA MIM using CA MSM
- Released in CA MIM 11.8




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CA MIM added the ability for installation via CA MSM in Release 11.8.

Partial configuration capability via CA MSM was added in Release 11.9.




What was covered?

- CA MIM Basics
- 5 Focus points of MIM development
 - FOCUS - Striving for 24/7 – 365 up-time
 - FOCUS – Improved Integrity
 - FOCUS – Better Performance
 - FOCUS – Logging and Notifications
 - FOCUS – Ease of Configuration



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That brings to an end this overview and update on “What’s new with CA MIM?”

What we covered today:

CA MIM Basics

5 Focus points of MIM development

FOCUS - Striving for 24/7 – 365 up-time

FOCUS – Improved Integrity

FOCUS – Better Performance

FOCUS – Logging and Notifications

FOCUS – Ease of Configuration

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