

High Availability for IDMS™ with Data Sharing

JOHN SIRACO, MANAGER IDMS ENGINEERING

Disclaimer

- Certain information in this presentation may outline CA's general product direction. This presentation shall not serve to (i) affect the rights and/or obligations of CA or its licensees under any existing or future license agreement or services agreement relating to any CA software product; or (ii) amend any product documentation or specifications for any CA software product. This presentation is based on current information and resource allocations as of September 2021 and is **subject to change or withdrawal by CA at any time without notice. The development, release and timing of any features or functionality described in this presentation remain at CA's sole discretion.**
- Notwithstanding anything in this presentation to the contrary, upon the general availability of any future CA product release referenced in this presentation, CA may make such release available to new licensees in the form of a regularly scheduled major product release. Such release may be made available to licensees of the product who are active subscribers to CA maintenance and support, on a when and if-available basis. The information in this presentation is not deemed to be incorporated into any contract.
- Copyright © 2021 Broadcom. All rights reserved. The term "Broadcom" refers to Broadcom Inc. and/or its subsidiaries. Broadcom, the pulse logo, Connecting everything, CA Technologies and the CA Technologies logo are among the trademarks of Broadcom.
- **THIS PRESENTATION IS FOR YOUR INFORMATIONAL PURPOSES ONLY.** Broadcom assumes no responsibility for the accuracy or completeness of the information. TO THE EXTENT PERMITTED BY APPLICABLE LAW, BROADCOM PROVIDES THIS DOCUMENT "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. **In no event will Broadcom be liable for any loss or damage, direct or indirect, in connection with this presentation, including, without limitation, lost profits, lost investment, business interruption, goodwill, or lost data, even if Broadcom is expressly advised in advance of the possibility of such damages.**

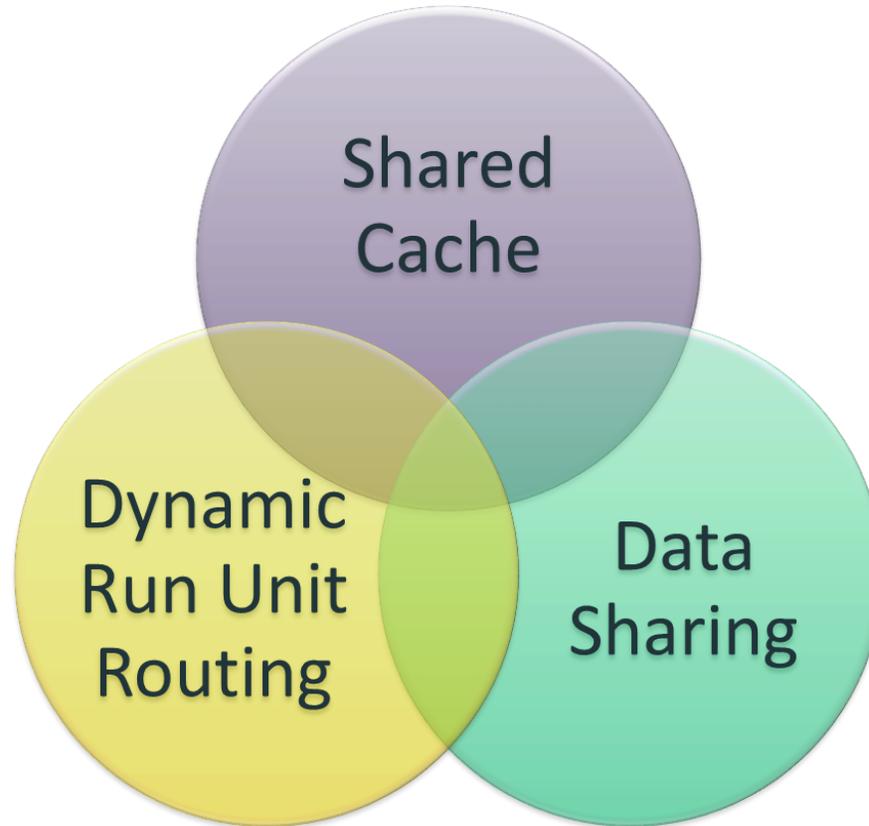
Agenda

- Parallel Sysplex Features
- Shared Cache
- Data Sharing
- Dynamic Run Unit Routing
- CV Cloning
- Generic VTAM Resources
- Announcements, Education, and Events

Parallel Sysplex Features



Parallel Sysplex Features

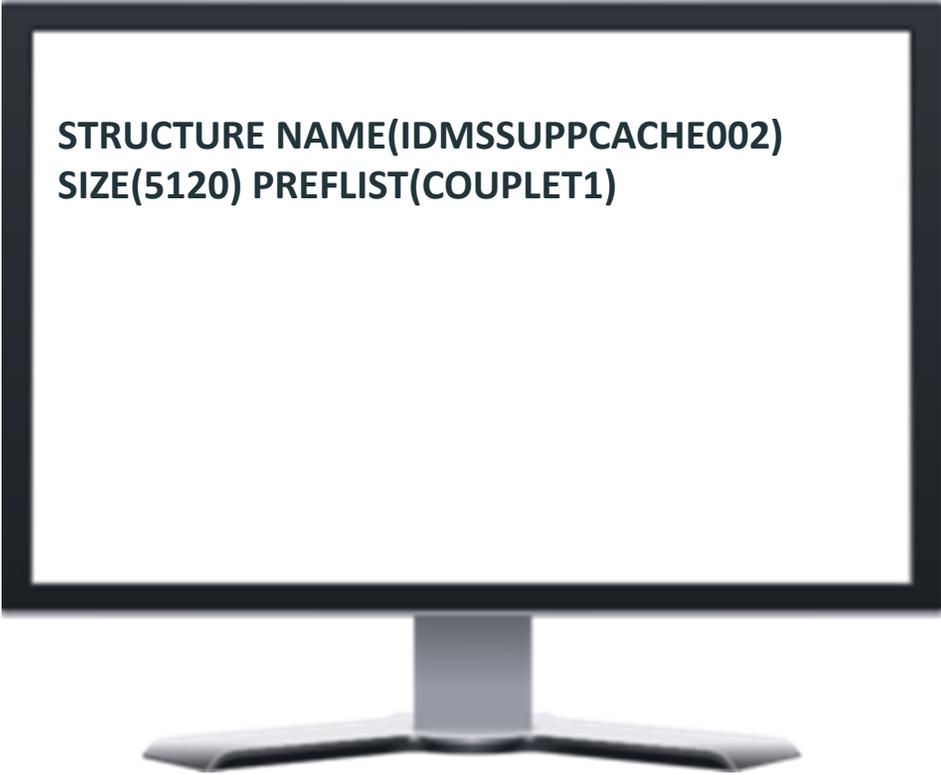


Shared Cache Definition

- Large, high-speed buffer in a Coupling Facility
- Contains database pages from files assigned to the cache and accessed by the CVs running in a Sysplex
- Cornerstone of the Coupling Facility features
- Used by CA IDMS/DB Data Sharing to allow multiple central versions to simultaneously update the same physical database

Shared Cache Implementation

- Define shared cache to the Coupling Facility



**STRUCTURE NAME(IDMSSUPPCACHE002)
SIZE(5120) PREFLIST(COUPLET1)**

Shared Cache Implementation continued

```
ALTER
  DMCL GLBLDMCL
  DATA SHARING DEFAULT
  SHARED CACHE IDMSSUPPCACHE002
  LOCK ENTRIES 100000 MEMBERS 5
  ON CONNECTIVITY LOSS NOABEND

INCLUDE SEGMENT DBCR
  DATA SHARING YES
  DEFAULT SHARED CACHE
  IDMSSUPPCACHE002
```

Shared Cache Implementation continued

- DCMT VARY commands

```
DCMT VARY SEGMENT NAME SHARED CACHE NAME/NO
```

```
DCMT VARY FILE NAME SHARED CACHE NAME/NO
```

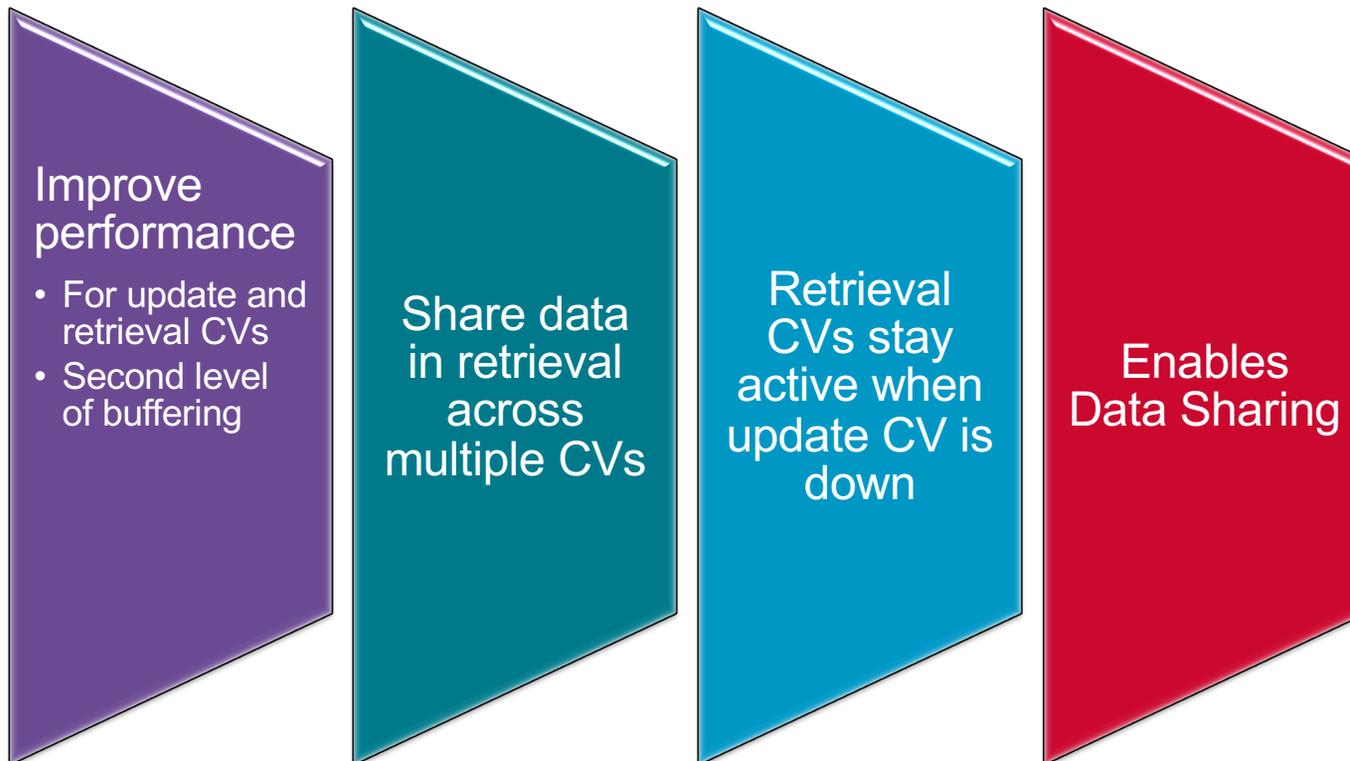
```
DCMT VARY AREA NAME SHARED CACHE NAME/NO
```

```
DCMT Vary SHARED CAche cache-name ON/OFF
```

Shared Cache Tuning and Monitoring

- Tuning
 - Increase shared cache size
 - Define additional shared cache
- Monitoring
 - DCMT
 - CA IDMS Performance Monitor
 - SREPORTS

Shared Cache Benefits



Data Sharing Definition

- *Multiple CVs update to the same DB*
- *Share common resources across CVs*
- *Broadcast task to multiple CVs*



Key elements

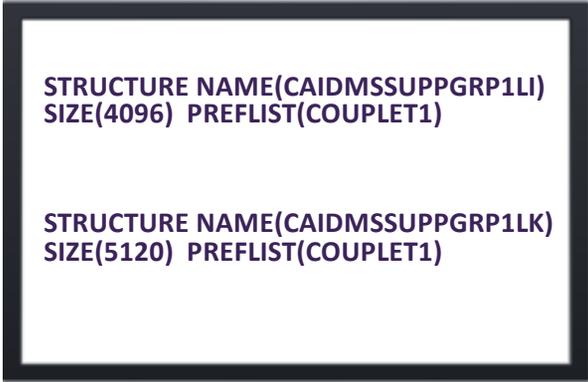
- **Data sharing group**
 - Named collection of CA IDMS systems in a Sysplex
 - Each CA IDMS system is a member of that group
- **Shared Cache** maintains file data

Not the same as a DBGROUP

Data Sharing Definition Continued

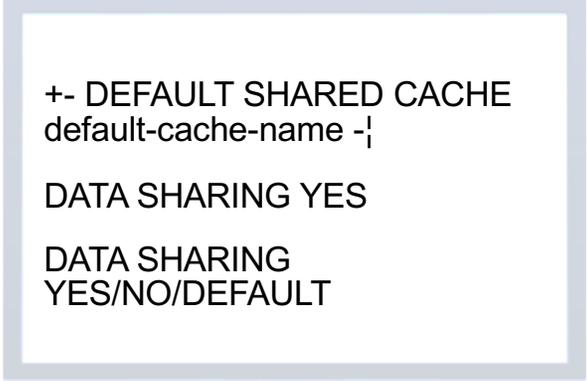
Definitions

- Coupling facility in K bytes
 - Define a list structure
 - Define a lock structure
- Definition in DMCL
 - Default data sharing attribute
 - Segment or file data sharing attribute
- SYSIDMS (next slide)



```
STRUCTURE NAME(CAIDMSSUPPGRP1LI)  
SIZE(4096) PREFLIST(COUPLET1)
```

```
STRUCTURE NAME(CAIDMSSUPPGRP1LK)  
SIZE(5120) PREFLIST(COUPLET1)
```



```
+ - DEFAULT SHARED CACHE  
default-cache-name -;  
DATA SHARING YES  
DATA SHARING  
YES/NO/DEFAULT
```

Data Sharing Implementation continued

- DMCL definition:

```
ALTER
DMCL R170DMCL
DATA SHARING DEFAULT SHARED CACHE IDMSSUPPCACHE002
                      LOCK ENTRIES 100000 MEMBERS 5
                      ON CONNECTIVITY LOSS NOABEND
```

```
INCLUDE SEGMENT DBCR
```

```
DATA SHARING YES
```

```
DEFAULT SHARED CACHE IDMSSUPPCACHE002
```

Data Sharing Implementation continued

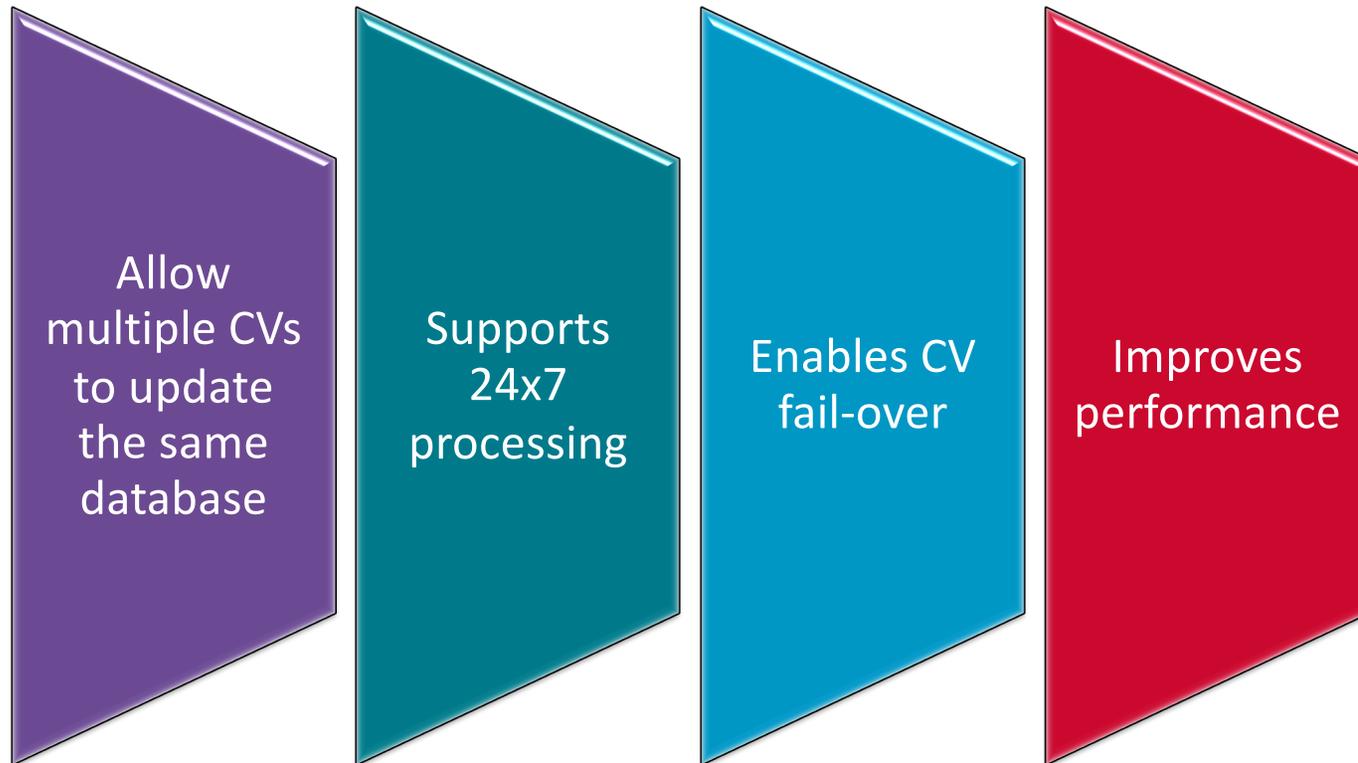
SYSIDMS definition in CV JCL

```
//SYSIDMS DD *  
  DSGROUP=SUPPGRP1  
  DCNAME=TECHD120
```

Coupling Facility Structures

- CA IDMS Visual DBA
 - Modeling tool
 - Uses CV's DMCL definition
 - Generates Coupling Facility-ready syntax for:
 - Cache, List, and Lock structures

Data Sharing Benefits



Dynamic Database Session Routing Definition

Workload balancing

- Between CA IDMS/DB systems in a Sysplex
- Dynamic based on actual system load
- DBGROUP

- Definitions
 - Backend and frontend IDMS
 - Coupling facility structure



Dynamic Database Session Routing Implementation

DBGROUPs

- **Backend definitions**

- Add DBGROUP statement(s) to Database Name Table
- CREATE DBGROUP assigns the backend(s) to a DBGROUP(S)

```
CREATE DBGROUP R185DBTB.SPGROUP1 ENABLED
```

- **Frontend definitions**

- Define backend DBGROUP as a node in the Resource name table

```
ADD NODE SPGROUP1 GROUP DEFAULT NODE TECHD110.
```

- You can optionally map a DBNAME to a group by using the VIA “GROUP NAME” parameter of the Resource Table statement within SYSGEN

```
MODIFY RESOURCE TABLE
```

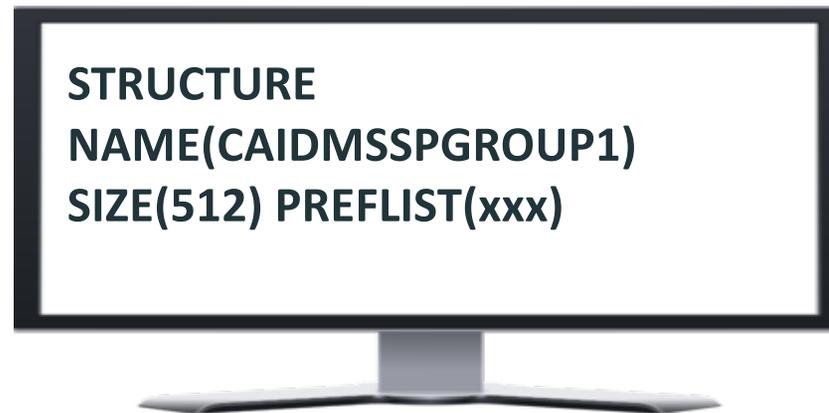
```
DBNAME IS DBCR VIA SPGROUP1.
```

Dynamic Database Session

Routing Implementation

Coupling facility definition

- Define a Coupling Facility structure for each DBGROUP
- DBGROUP name prefixed with "CAIDMS"
- Size is in K bytes



Dynamic Database Session Routing Implementation

- Work will be dynamically routed when one or both of the following are true:
 - The DBNODE used is defined as a group via the NODE statement of SYSGEN
 - The DBNAME used is defined in the Resource Table as a Group
- The DBNAME and/or the DBNODE are set by
 - The application
 - Via a DCUF SET command
 - Via EXIT23

Dynamic Database Session

Routing Implementation

```
TITLE `EXIT 23 - PRE BIND EXIT`
XIT23      #MOPT ENV=SYS,AMODE=31,RMODE=ANY
XIT23      CSECT
XIT23EP1   #START MPMODE=ANY
           USING CSA,R10
           L     R2,4(,R1)          40 BYTE DATA AREA
           USING PARMAREA,R2
           CLC   PSSCNAME(4),=DBCR'  IS THIS FOR DBCR
           BNE   RETURN              NO! JUST EXIT
           MVC   PDBNODE,=CL8'SPGROUP1'  OVERRIDE DBNAME
***        MVC   PDBNAME,=CL8'DBCR      ` OR OVERRIDE DBNAME
RETURN     #RTN                       RETURN TO CALLER
           LTORG
```

Dynamic Database Session

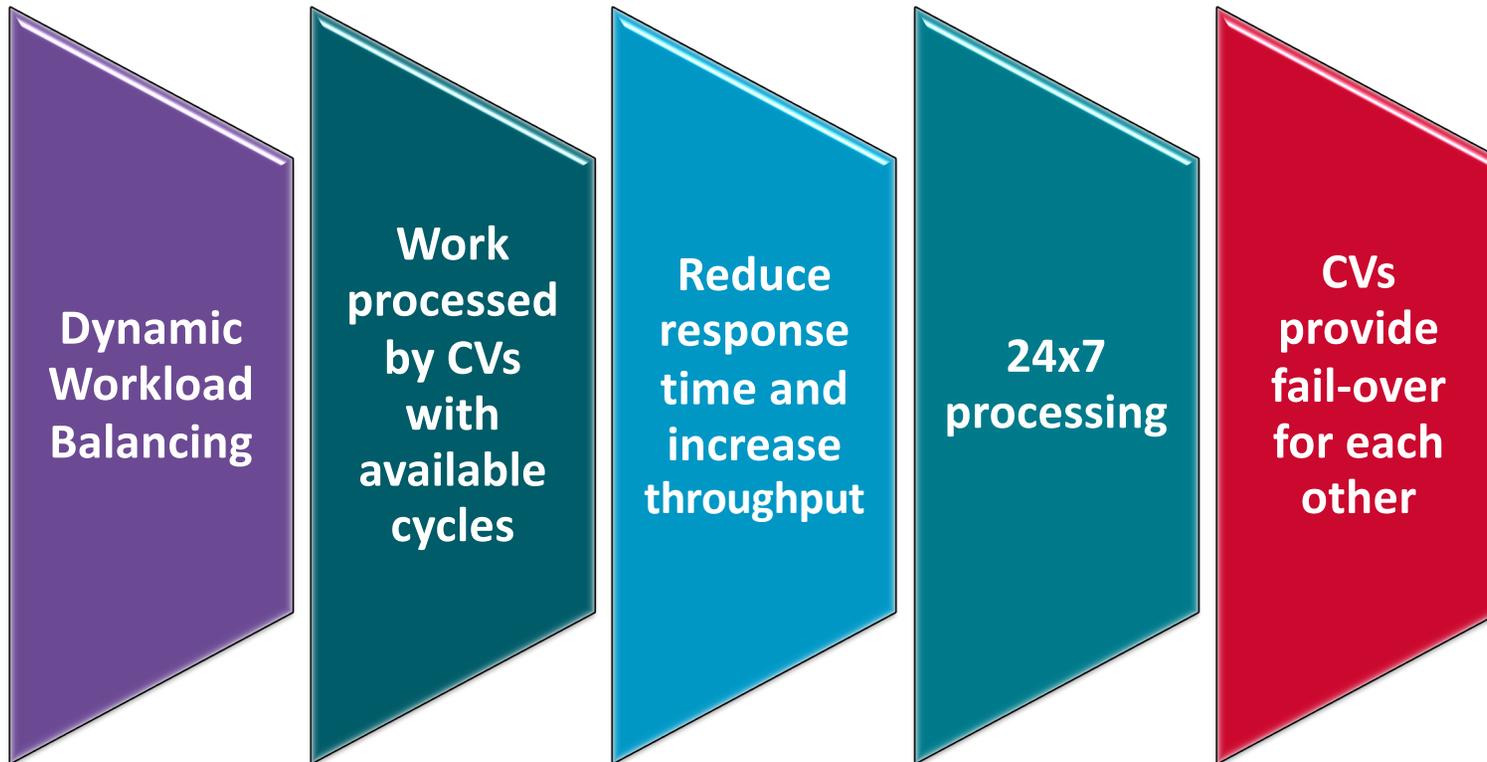
Routing Implementation

```
COPY                #CSADS
PARMAREA DSECT
PSSCNAME DS        CL8          SSC NAME
PDBNODE  DS        CL8          DATABASE NODE
PDBNAME  DS        CL8          DATABASE NAME
PDICNOD  DS        CL8          DICTIONARY NODE
PDICNAM  DS        CL8          DICTIONARY NAME
END
```

Dynamic Database Session Routing Implementation

- Monitoring
 - DCMT commands
 - LOOK
 - CA IDMS Performance Monitor's Interval Component (online and Batch)

Dynamic Database Session Routing Benefits



CV Cloning Definition

- Allows you to start multiple CVs that are copies (clones) of an existing CA IDMS/DB system
- System definition and files
 - Same physical entities as the system being cloned with a few exceptions

CV Cloning Naming Conventions

- CV Number, DC System Number, VTAM APPLID, and System Node Name for a CV must conform to specific naming conventions
- By adhering to these naming conventions, CA IDMS/DB can implement clones without generating multiple physical copies of a system definition

CV Cloning Naming Conventions

- DC system number must match CV number
- Must be in range of 0 through 255
- All VTAM Applids must follow the convention of xxxxxnnn
 - xxxxx can be any five characters
 - nnn is the sysgen'd CV number and is overlaid at runtime with the number determined during start up of the cloned CV

CV Cloning Naming Conventions

- CA IDMS/DB system node names must follow the convention of yyyynnn
 - where the first five characters (i.e., yyyy) can be any characters you need to make the name unique within your environment
 - nnn is the number specified for the CV at system generation

```
SYSGEN 17.0 ONLINE    PAGE 1 LINE 1    DICT=SYSTEM
```

```
ADD SYSTEM 120
```

```
SYSTEM ID IS TECHD120
```

```
CVNUMBER IS 120
```

```
ADD LINE VTAM
```

```
APPLICATION ID IS A31II120
```

CV Cloning

- Special File Requirements
 - Each cloned CV requires its own copy of the following files:
 - DDLDCLOG, DDLDCSCR, DDLDCQUE, All Journals

CV Cloning

- Use the “CLON=” and “CLONES= ” parameter in the JCL parm for the IDMS system startup.

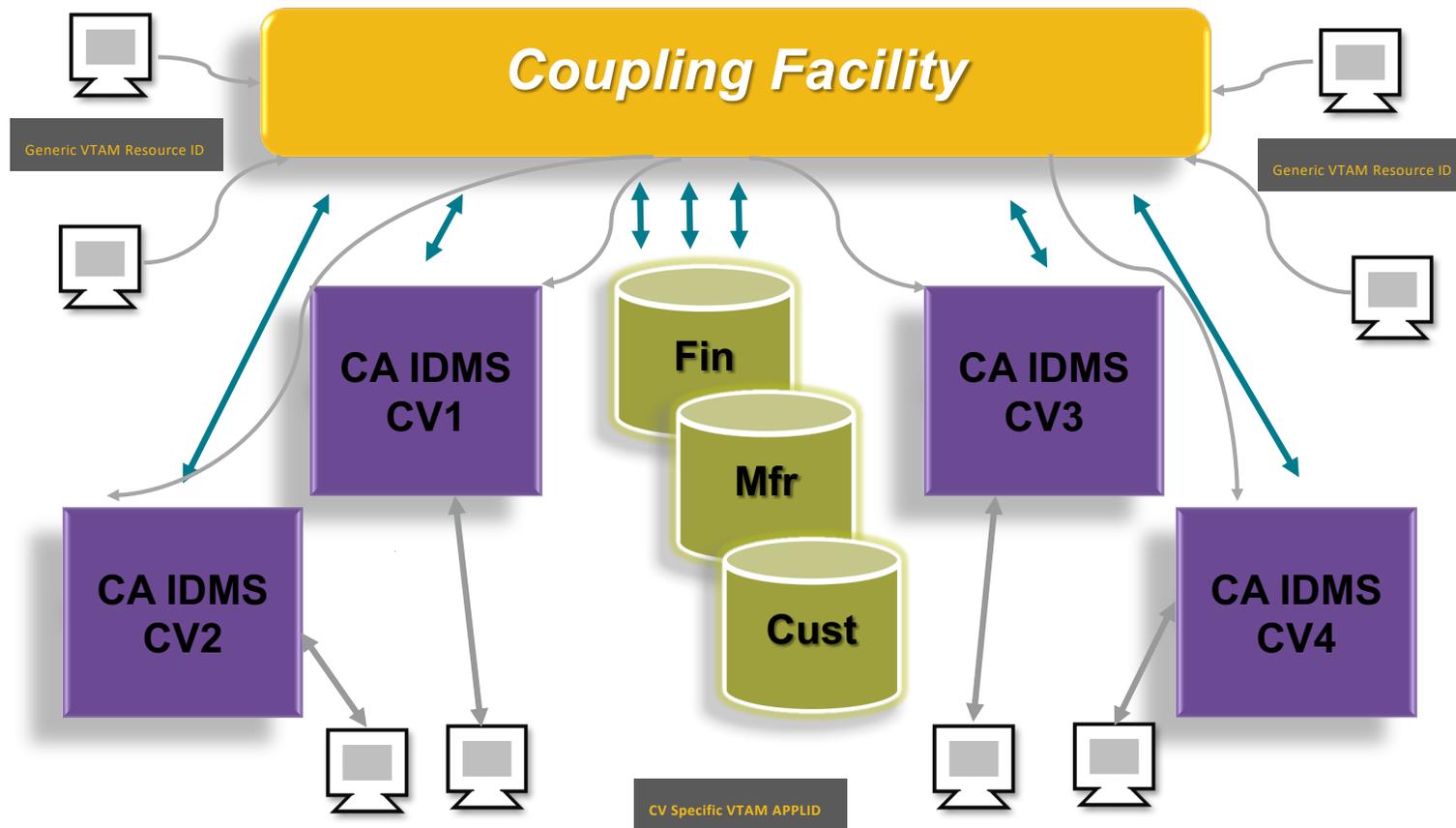
```
//R170DC99 EXEC PGM=IDMSDC99,REGION=0K,TIME=1440,  
//          PARM='S=110,CLON=Y,CLONES=9'
```

- When used in a data sharing group, a clone may have update access to all database files

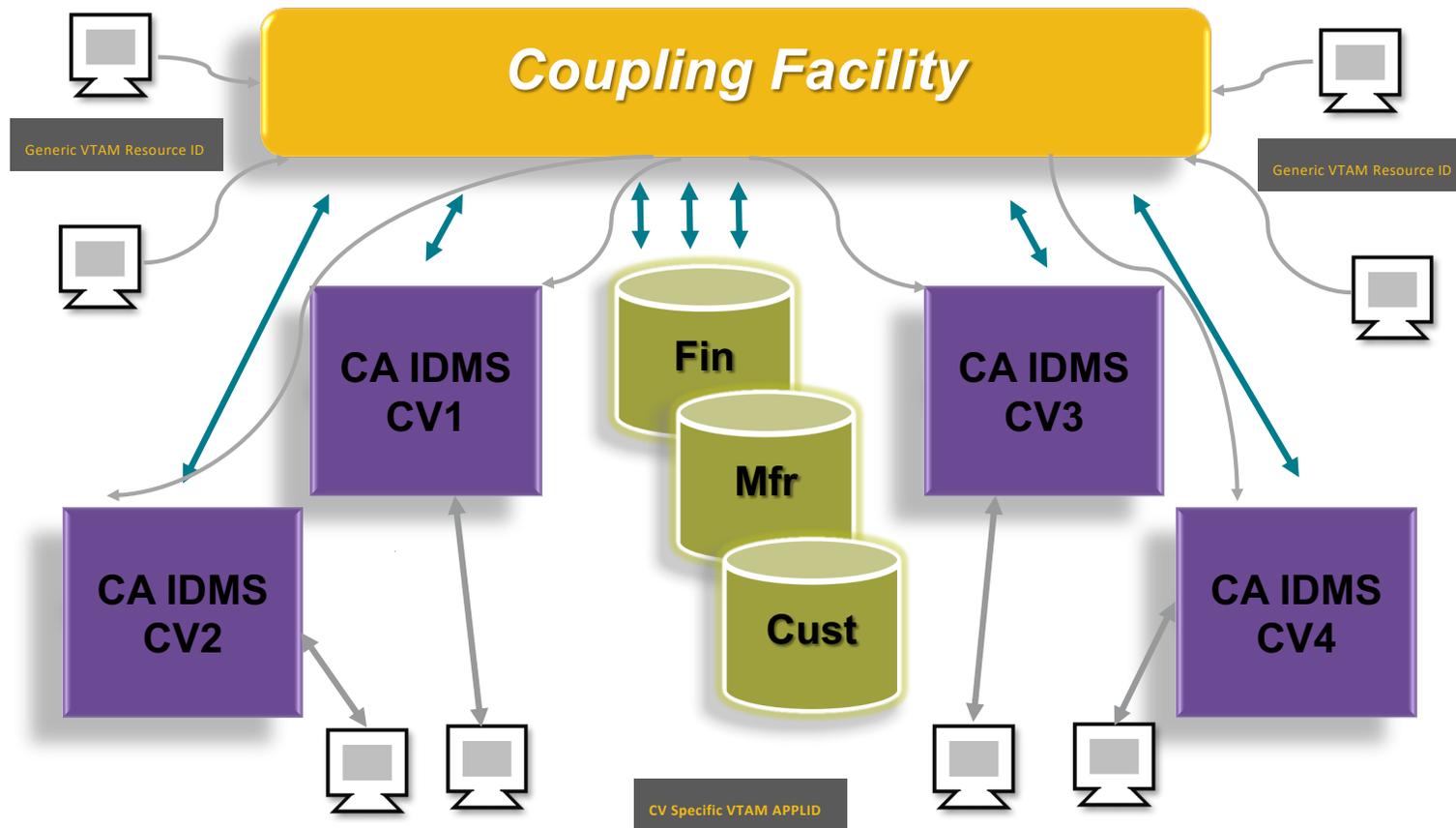
CV Cloning Benefits

- 24X7 processing
 - Fault Tolerance
 - System Maintenance
- Scalability
 - Additional CVs have update access to files when used with data sharing
- Dynamic workload balancing
 - Additional CVs can be started and stopped as needs change; work is routed to other CVs defined in the DBGroup
- Easy way to add additional CVs
- No additional system definitions for the DBA to maintain

CA IDMS in a Parallel Sysplex and Generic VTAM Resources



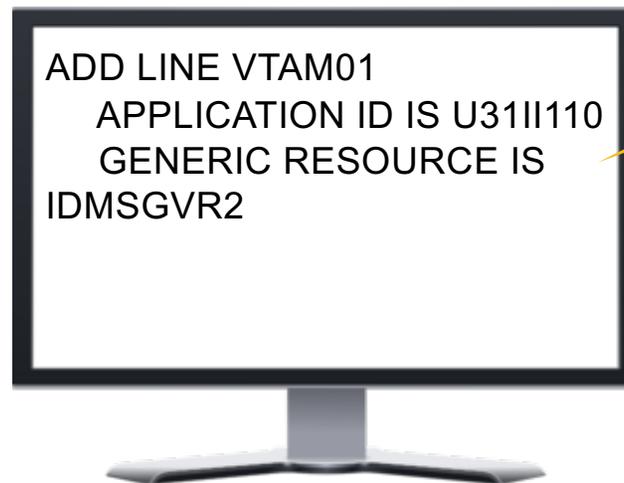
CA IDMS in a Parallel Sysplex and Generic VTAM Resources



Generic VTAM Resources

Definitions and Specifics

- Definition of the Generic VTAM Resource on the VTAM line definition is the only IDMS specification required to use Generic VTAM resources



Generic VTAM
Resource value

Generic VTAM Resources

Definitions and Specifics

- Generic VTAM resource value cannot be defined in the VTAMLST data set for VTAM

Generic VTAM Resources

Definitions and Specifics

- Generic VTAM resource and the standard VTAM application ID are both required when defining a Generic VTAM resource



VTAM Application ID
and Generic VTAM
resource

Generic VTAM Resources

Definitions and Specifics

- Generic ID can be thought of as another name that can be used to connect to any IDMS system that is using the same Generic VTAM resource
- Generic Resource ID allows one or more IDMS systems to be known to VTAM using the same Generic value ID

Generic VTAM Resources

Definitions and Specifics

- The use of Generic VTAM Resources does not require the use of IDMS Parallel Sysplex features
- Since a connection is going to be routed to any IDMS instance running on any LPAR within the SYSPLEX the IDMS regions must have all transactions defined and must have the required Database access to support the transaction
- Inflight transactions on CA IDMS systems that are taken offline or fail will not automatically be restarted on another CA IDMS system sharing the same Generic VTAM resource
 - These transaction will ABEND and rollout as necessary just as they would without the use of Generic VTAM Resources

Generic VTAM Resources

Benefits

- Removes a single point of failure
 - Users do not connect to a specific instance of an IDMS system
 - If one or more of the IDMS systems using the generic id are taken down, fail, or even if the LPAR is taken down or lost, users will still be able to connect to any remaining IDMS systems on any of the LPARs that are part of the SYSPLEX
- Provides an additional level of Workload Balancing
 - The Work Load Manager (WLM) will attempt to balance and route work to the IDMS systems that are using the Generic VTAM resource if WLM=YES is specified in the GRPREFS file contained in the VTAMLST used by VTAM (Discussed later)

Generic VTAM Resources

Naming

- Generic Resource is
 - Must follow VTAM definitional guidelines.
 - Cannot start with a numeric value
 - For example, 1 (Starting with a numeric is invalid) but A1 would be ok.
 - Any Character or Special character can be used.
 - For example, @@@@ is acceptable.
 - A (just the letter A) is acceptable.
 - The words OFF or NONE cannot be used since these values are used to drop or remove an existing Generic VTAM Resource specification.
 - Generic Resource is " " also clears the value in SYSGEN

Generic VTAM Resources

XCF Definitions (non-IDMS)

- XCF group ISTCFS01 and XES Structure ISTGENERIC are used
- ISTCFS01 is provided by IBM for VTAM when using XCF
 - Talk to VTAM, SYSPROG, or person at your site responsible for creating or maintaining IBM provided definitions

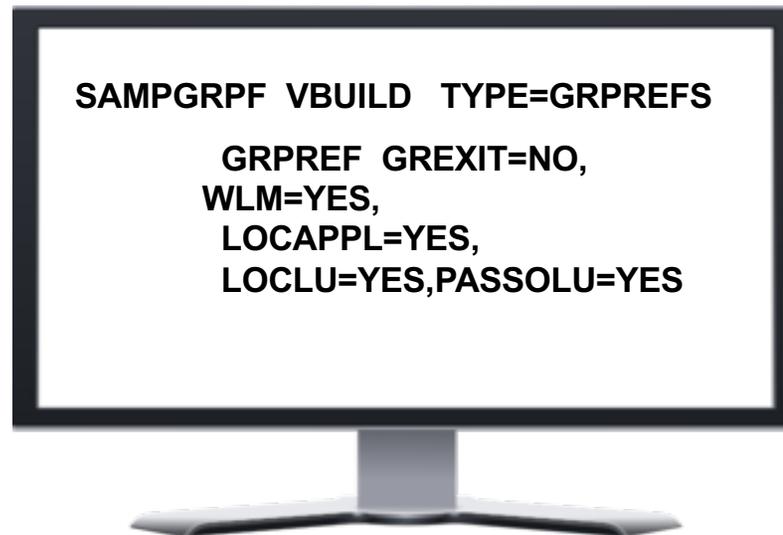


Sample ISTGENERIC
definition

Generic VTAM Resources

VTAM Definitions (non-IDMS)

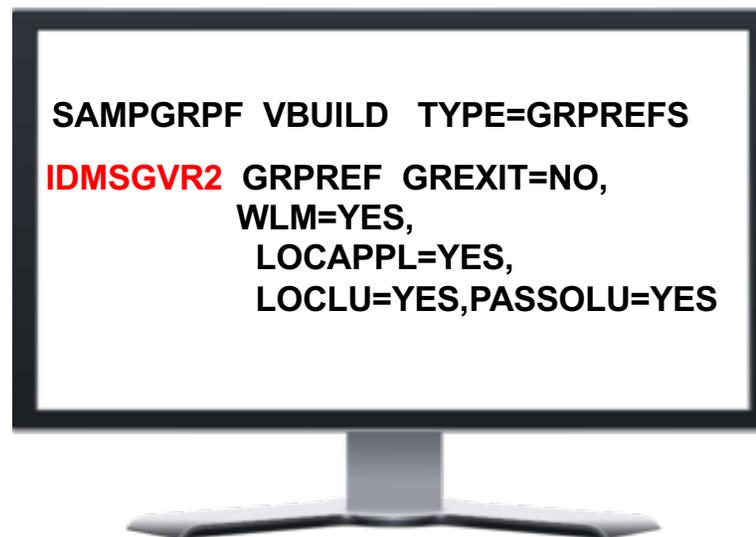
- To allow the WLM to balance and route requests to systems in the SYSPLEX
 - Requires a definition in the VTAMLST “GRPREFS” dataset
 - Definition can be a default definition (not specifically named and shown below)



Generic VTAM Resources

VTAM Definitions (Optional -IDMS)

- To allow the WLM to balance and route requests to systems in the SYSPLEX
 - Requires a definition in the VTAMLST “GRPREFS” dataset
 - Or Specifically named for the IDMS Generic VTAM resource (as shown here)



Generic VTAM Resources

VTAM Definitions (non-IDMS)

- GRPREFS

WLM=YES is needed to use the WLM for Generic VTAM resource resolution

See [z/OS Communications Server SNA Resource Definition Reference](#) for additional information

Generic VTAM Resources

Problems or Failures

- Failures when trying to connect to the Generic VTAM resource at line open time will result in the following message being displayed:

CA IDMS - Request for VTAM Generic Resource failed - not supported by this environment

- Some of the probable causes of this message are:
 - No Coupling Facility being used
 - The LPAR is not a member of a SYSPLEX
 - One or more of the required Coupling Facility definitions are missing
 - XES structure ISTGENERIC and/or XCF Group ISTCFS01
 - Value specified for Generic VTAM resource is invalid

Generic VTAM Resources – VTAM Displays

```
Command: D NET,ID=IDMSGVR2 <-- VTAM Generic Resource Name used in CA IDMS a CV line definition
```

```
Display:
```

```
IST097I DISPLAY ACCEPTED
```

```
IST075I NAME = IDMSGVR2, TYPE = GENERIC RESOURCE
```

```
IST1359I MEMBER NAME      OWNING CP  SELECTABLE  APPC
```

```
IST1360I USILDA01.U31II110  A31X99                DEL          NO
```

```
IST1360I USILDA01.U11ITCH8  A11X99                YES          NO
```

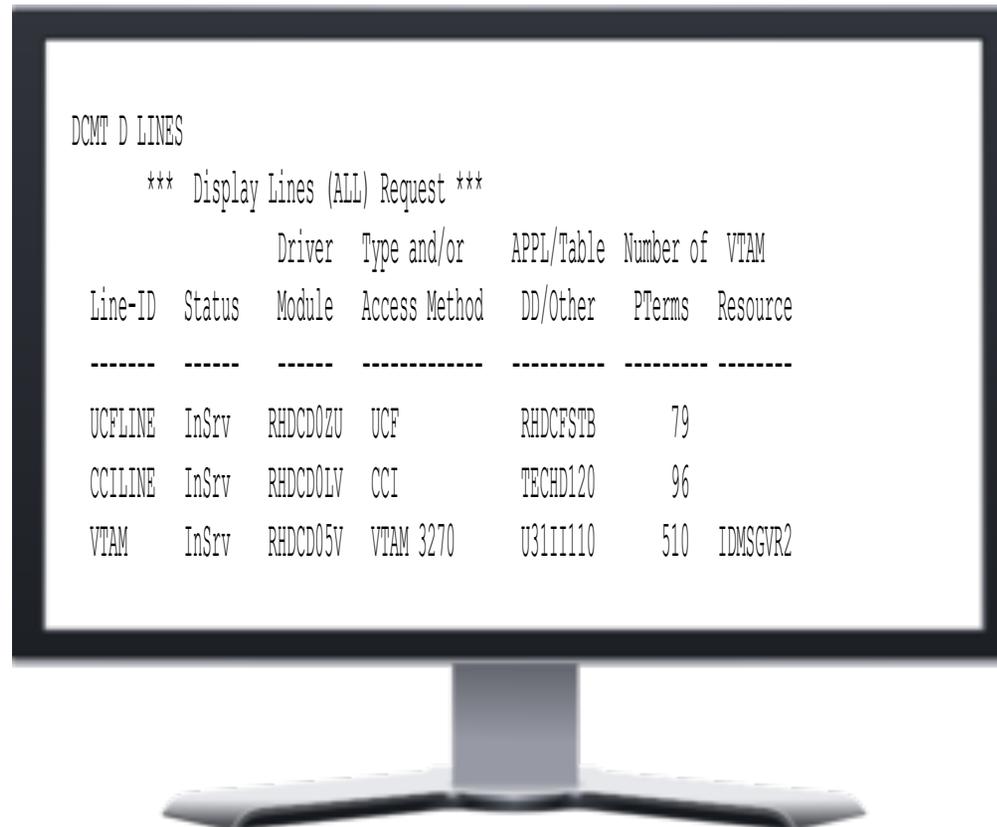
```
IST2210I GR PREFERENCE TABLE ENTRY = **DEFAULT**
```

```
IST2202I GREXIT = NO      WLM      = YES    LOCLU    = YES
```

```
IST2204I LOCAPPL = YES    PASSOLU  = NO
```

```
IST314I END
```

Generic VTAM Resources DISPLAYS



DCMT D LINES

*** Display Lines (ALL) Request ***

Line-ID	Status	Driver Module	Type and/or Access Method	APPL/Table DD/Other	Number of PTerms	VTAM Resource
UCFLINE	InSrv	RHDCD0ZU	UCF	RHDCFSTB	79	
CCILINE	InSrv	RHDCD0LV	CCI	TECHD120	96	
VTAM	InSrv	RHDCD05V	VTAM 3270	U31II110	510	IDMSGVR2

Generic VTAM Resources DISPLAYS

```
DCMT D LINE VTAM
    *** Physical Line Display ***
PLine-ID VTAM
  Status InSrv
  Module 5V
  Compact 23.45%
  Appl-ID U31III10
  GenRsrc IDMSGVR2
LTerm-ID PTerm-ID Type/M Status Term-
ID
VL500001 VP500001 3279 5 InSrv
A01TE001
```

Generic VTAM Resources Implementation

- Included in version 19.0

Summary of Benefits

- Shared Cache
 - Improved Performance
 - Share data in retrieval across multiple CVs
 - Retrieval CVs stay active when update CV is down
 - Enables Data Sharing
- Data Sharing Benefits
 - Allow multiple CVs to update the same database
 - Work processed by CVs with available cycles
 - Reduce response time and increase throughput
 - CVs provide fail-over for each other
- Dynamic Database Routing Session Benefits
 - Dynamic Workload Balancing
 - Work processed by CVs with available cycles
 - Reduce response time and increase throughput
 - 24x7 processing
 - CVs provide fail-over for each other

Summary of Benefits ... Continued

- CV Cloning
 - 24X7 processing
 - Scalability
 - Dynamic workload balancing
 - Easy way to add additional CVs
 - No additional system definitions for the DBA to maintain
- Generic VTAM Resources
 - Removes a single point of failure
 - Provides an additional level of Workload Balancing

Session Questions

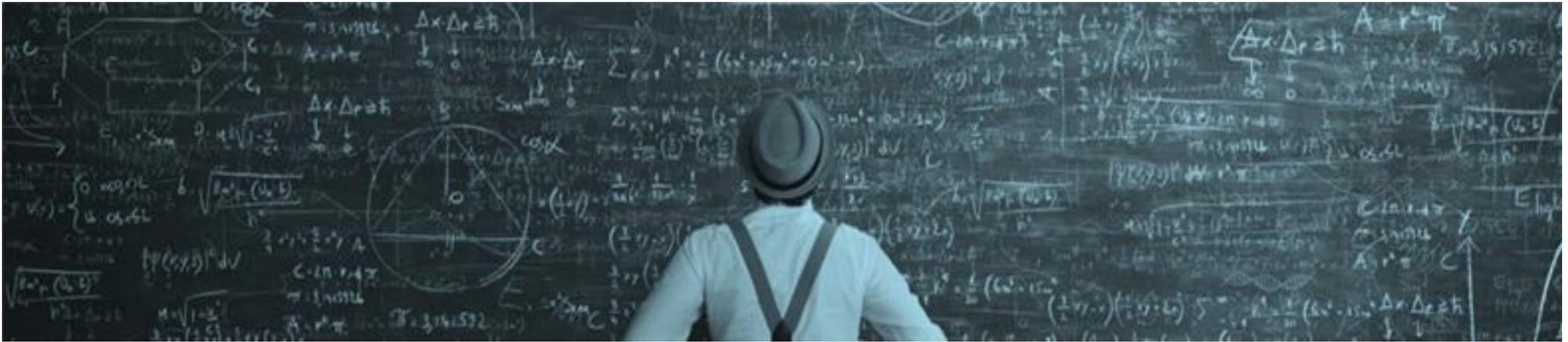


Announcements, Education, and Events



Partnering with You – How you Can Get Involved

We're Interested In Your Thoughts



Join us on our **journey** to achieve our ongoing **vision**, we are **actively seeking feedback and suggestions from our customers**. We want to hear your voice!

- Submit your ideas on CA IDMS/IUA communities.broadcom.com
- Vote and comment on ideas that are important to you
- Join our [validation program](#) to influence our product direction
 - End-of-Sprint review meetings
 - Early access to new features and enhancements
- Attend our monthly [webcasts](#) – check out the Communities site for upcoming sessions
 - 3rd Thursday each month in 2021

Education – Web-based Training & Videos

CA IDMS™



Course Name	Code	Type	Length
CA IDMS YouTube Playlist	Videos		
CA IDMS/DB: New DBA Fundamentals 200 Bundle	06IDM2053B	Web-Based	14.25 Hours
CA IDIMS Version 19.x: New DBA Foundations 200	06IDM20311	Instructor Led	32 Hours
CA IDMS/DB Database Version 19.x: Database Navigation 200 Bundle	06IDM2052B	Web-Based	5 Hours
SQL and Web Connectivity for IDMS and Datacom	06IDM2048B	Web-Based	5.25 Hours
CA IDMS™ Version 19.0: Implementation and Use of Generic VTAM Resources with Parallel Sysplex Features	06IDM10060	Video	.50 Hours
CA IDMS™ Version 19.0 Web Services for Modernization	06IDM20490	Video	.75 Hours
CA IDMS™ Version 19.0: SQL Enhancements for Modernization	06IDM20500	Video	.75 Hours
CA IDMS™ REST API: APIs and Integration Using Open Source Monitoring Tools 200	06IDM20540	Video	.75 Hours
CA IDMS Web Services Release 19.x: Introduction 100	06IDM10050	Web-Based	1.5 Hours
An Introduction to CA ADS™ Application Development	06IDM20570	Video	.75 Hours
Installing CA IDMS 19.0 with z/OSMF 200	06IDM20600	Video	.25 Hours

Web-based training is provided at no cost for customers on active maintenance.

Customers: To learn more about the training options and to take web-based training, visit Mainframe Education and click TRAINING LOGIN.
After logging in, search by course name or course code

Introducing Broadcom Digital Badges

- Credly Digital Badging Platform
 - [Broadcom Page](#)
- CA IDMS
 - [Database Navigation and Fundamentals](#)



Mainframe Vitality Program

Databases (IDMS/Datacom), Endeavor, Security



ATTRACT

Supplement skills in the market

- **Broadcom to HIRE Mainframe Talent; Trained by SME's; Made Available for Hire**
 - Endeavor support, ACF2 & TopSecret support, Database Admins
 - Focus on Technical Knowledge and Technical Attributes



GROW

Partner with training specialist – THAT'S all of us... customers and vendors !

- **Develop and Deliver Specialized Training** onsite at CA
 - **Education** - Mainframe Basic Training, Intermediate & Product Specific
 - **Residency:** Assign Resident field work at customer sites (with mentors)
 - **Make Graduates Available for Hire** - Priority to Residency Host



RETAIN

Supervised learning to 'harvest' institutional knowledge

- **Customers as Training Partners** for engagement / mentorship
 - Health Checks, Learn infrastructure/applications
 - Production monitoring, performance and operational reviews
- **SELECT CUSTOMERS:** No or Low Cost for Training and Onsite programs

Vitality – Building a Mainframer

Broadcom Hired	Customer Hired	Site Engagements
<ol style="list-style-type: none"> Broadcom Hires qualified resources for admin/ops role Trained by Product Experts Mainframe Bootcamp & Product Specific in onsite class at Broadcom. Customer Partnership for Field Residency & Mentorship: Collocate Broadcom employee at customer site with customer assigned mentor to do unique knowledge transfer. (Note: Requires dedicated commitment by customer to train and hire) 	<ol style="list-style-type: none"> Customer Hires for admin/ops role. Comply with corp. security, regulatory or salary restrictions. Customer sends this employee to Broadcom Training by Product Experts in North America Employee returns to Customer with short term field support assistance & mentorship from Broadcom. Established relationships with product experts; deliver best practice and recommendations. 	<ol style="list-style-type: none"> Leverage Broadcom Database Field team, support a unique project need; conduct infrastructure health check. Establish Tighter Relationships; Direct connection with product experts. Define projects for existing or future personnel. Customer Benefits directly from database management best practices, performance tuning, health checks and upgrade support.

Upcoming Vitality Dates: IDMS Product Specific

- EMEA

- October 25, 2021 – December 3, 2021

- If interested please email:

- mainframe.vitality@broadcom.com & Sheila.miller2@broadcom.com

Customer Poll

Do you have an open IDMS requisition for an IDMS new hire now or over next 6 months?

- Yes – Please contact me
- No – But please contact me to further discuss Vitality
- No

Mainframe Technical Exchange October 5-7, 2021

- Connect virtually with peers and Mainframe technical experts
- Over 140 technical education, product update and ideas sessions
- No registration fee! Open to all Broadcom customers
- **REGISTER TODAY:** <http://bit.ly/2021TechExchange>



AI/ML



DevOps



Infrastructure
Management



Security

Mainframe Technical Exchange

Must See IDMS Sessions!

- **IDMS**

- **Tuesday, October 5 @ 11:00am (ET): [“IDMS New Features”](#)** (Nakesha Newbury, Product Owner)
- **Wednesday, October 6 @ 8:00am (ET): [“VS Code integration with IDMS and Datacom”](#)** (Teri Schnitt, IDMS Software Engineer; Lukas Zima, DevOps Product Owner)
- **Wednesday, October 6 @ 9:00am (ET): [“IDMS REST API & Zowe CLI Plug-in: Overview and Benefits”](#)** (Matt Ball, IDMS Software Engineer)
- **Wednesday, October 6 @ 11:00am (ET): [“IDMS SQL Introduction and Overview”](#)** (Carla Pereira, IDMS Software Engineer)
- **Thursday, October 7 @ 9:00am (ET): [“IDMS ETL & Test Data Manager”](#)** (Nakesha Newbury, Product Owner; Rick Rhodes, IDMS Software Engineer; Billy Keefer, Client Services Consultant)
- **Thursday, October 7 @ 11:00am (ET): [“Getting Started with IDMS Server”](#)** (Ken Grant, IDMS Software Engineer)

Mainframe Technical Exchange

Calling all Customers!!



- ["IDMS User Experience" on Thursday, October 7 @ 12:00pm \(ET\).](#)
- Customer feedback and direction is invaluable to our overall strategic direction. We are interested in hearing your voice and providing us with insight based on real-world experiences and requirements. Please join us for an interactive user experience (UX) session where we look to you – our customers – to assist in shaping the future of our products.



Thank You

john.siraco@broadcom.com

sheila.miller2@broadcom.com