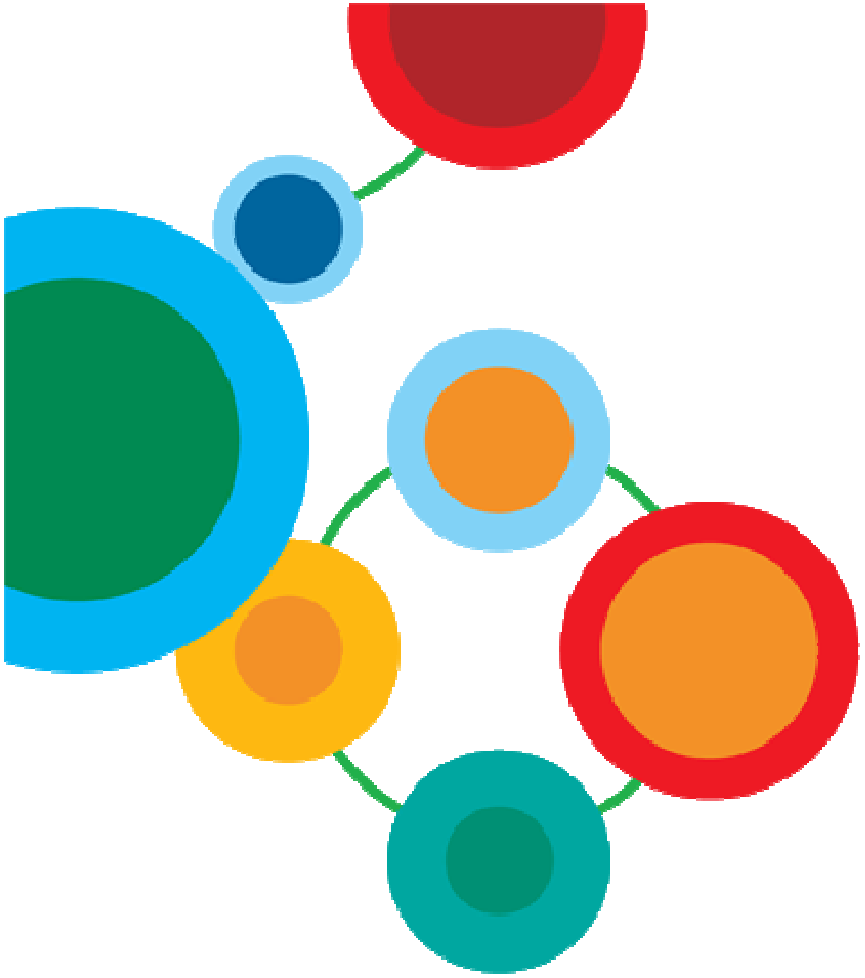

IMS 12 System Enhancements with Installation and Migration Considerations

Session Number 1861

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IBM Software

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Agenda

- IMS 12 System Enhancements
- IMS 12 Installation and Migration Considerations

IMS 12 System Enhancements

- Dynamic resource definition (DRD) enhancements
- zAAP/zIIP times in accounting log records
- Member online change enhancement
- Extended address volume (EAV) enhancement
- IMS logger enhancements
- System pools storage enhancement
- Command enhancements
- CQS traceability enhancements
- IMS Dump Formatter enhancements
- /DIAGNOSE SNAP command enhancements
- MIPS reduction enhancements

Dynamic Resource Definition (DRD) Enhancements

- New UPDATE option for IMPORT command
  - Previously, IMPORT could only be used for adding runtime resource definitions/descriptors that did not exist in the target IMS system
  - New IMPORT .. OPTION(UPDATE) allows existing runtime resource definitions/descriptors in the the target IMS to be changed
    - Command fails if changed definition is in use

- DRD usage of the IMS repository function
  - Previously, stored resource definitions/descriptors were kept in resource definition data sets (RDDSs)
  - New IMS repository function provides an additional method for storing stored resource definitions/descriptors
  - IMS repository will be described later in another session

- Benefits
  - Improved manageability for DRD

zAAP/zIIP Times in Accounting Log Records

- zAAP/zIIP time field is added to the x'07', x'0A07' and x'56FA' log records
  - X'07' program termination
  - X'0A07' CPIC program termination
  - X'56FA' optional transaction level statistics record
- CPU time field is changed to include only the standard CP (central processor) time, not zAAP/zIIP time
  - Sum of CP and zAAP/zIIP times is the total CPU time
- Benefits
  - Users can distinguish between CP and zAAP/zIIP times
    - Could be used for accounting or charge out purposes
    - Significant for software licensing
    - Most significant for JMP and JBP regions

Member Online Change Enhancement

- OPTION(NAMEONLY) added for member online change
  - Command processes only the named member(s) of the staging ACBLIB
    - Without this option, the command processes related members which have been changed
      - For example, DBDs in intent list of PSB
  - OPTION(NAMEONLY) may be used for:
    - New DBDs
      - These DBDs cannot reference existing DBDs which have been modified
    - New or changed PSBs which do not reference changed DBDs in their intent lists
- Benefits
  - Performance enhancement with large staging/active ACBLIBs

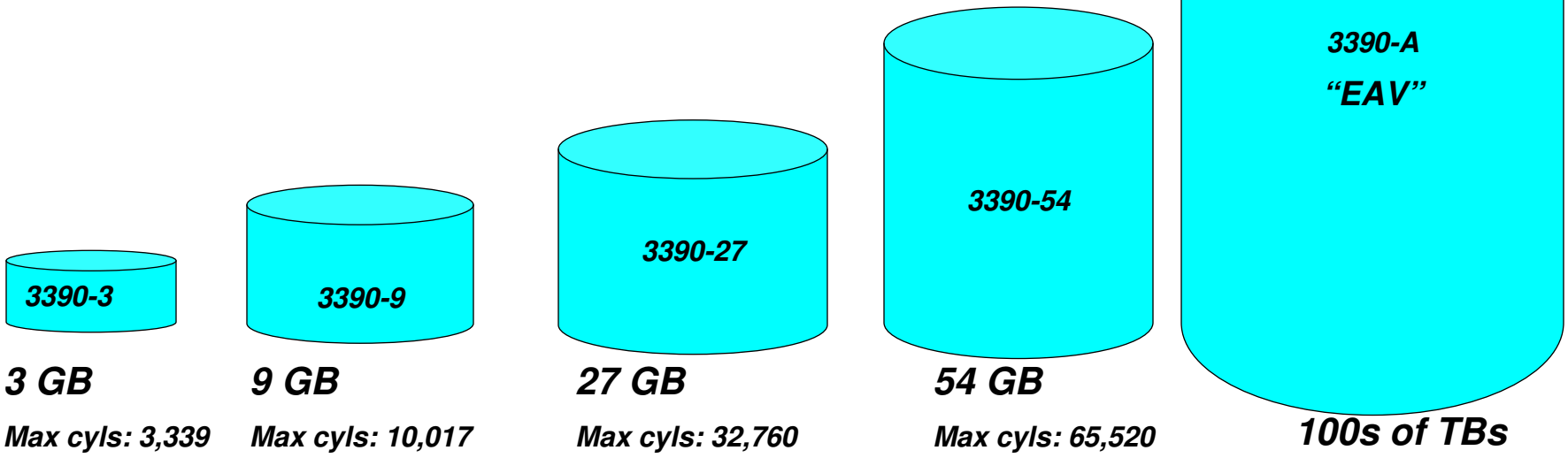
Extended Address Volume (EAV) Enhancement

- IMS 12 allows certain non-VSAM IMS data sets to use EAV volumes
  - Data sets can reside in Extended Address Space (EAS) on EAV volumes
  - z/OS addressable disk storage increased beyond 65K cylinders
    - New architecture will support 100's of Terabytes on single volume
    - Storage is addressed using new 28-bit cylinder/track address
  - Requires z/OS 1.12

- IMS 11 provided support for IMS VSAM data sets to use EAV volumes

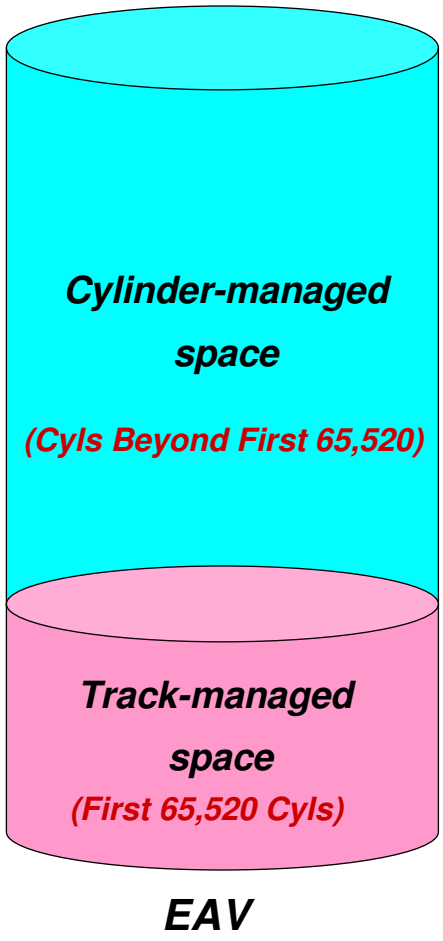
Extended Address Volume (EAV)

- A volume with more than 65,520 cylinders
  - 3390 Model A
  - 1 to 268,434,453 cylinders
    - Architectural EAV maximum



Maximum Sizes

EAV Key Design Points



- EAV maintains 3390 track format
  - Track-managed space:
    - Area on EAV within the first 65,520 cyls
    - Space allocated in track or cyl increments
    - Storage for “small” data sets
  - Cylinder-managed space:
    - Area on EAV located above first 65,520 cyls
    - Space is allocated in multicylinder units
    - Storage for “large” data sets
  - New DSCB format types identify EAS data sets
    - New formats (Format 8 and 9) in VTOC
    - Data set resides in cylinder-managed space

Non-VSAM IMS Data Sets Supported

- OSAM database data sets
- Online Log Data Sets (OLDS)
- Write Ahead Data Sets (WADS)
- Restart data sets (RDSs)
- Message queue blocks data sets
- Long and short message data sets
- Terminal devices with UNITTYPE=SPOOL or DISK
- IMS OLR data sets
- BPE External Trace Data Sets

Extended Address Volume (EAV) Enhancement for non-VSAM data sets

- Prerequisites
  - Software requirements
    - z/OS 1.12
  - Hardware requirements
    - DS8000, DS8700
    - 3390 Model A

- Benefits
  - Supports the placement of more data sets on a single volume
  - Allow users to manage fewer numbers of larger volumes
  - Less need for multi-volume OSAM

IMS Logger Enhancements …

- Extended Format Support for OLDS and SLDS (optional)
- Option for log buffers above the 2-gigabyte boundary (“bar”) in virtual
- WADS management changed to be more efficient

IMS Logger Enhancements …

- New optional capability for OLDS and SLDS
  - IMS 12 allows OLDS and SLDS to be defined as extended format data sets
  - Use of extended format data sets allows striping
    - Striping allows multiple concurrent I/Os for sequential processing
      - Data set is spread across multiple volumes
  - Increases maximum log write bandwidth
  - Lessens the likelihood of logging bandwidth being a limiting factor during times of high-volume logging

IMS Logger Enhancements …

- Option for log buffers above the 2-gigabyte boundary (“bar”) in virtual
  - Frees substantial amount of ECSA
  - OLDS must be in extended format with BLKSIZE 4K multiple
  - BUFSTOR=64 on OLDSDEF statement in DFSVSMxx
  - IMS will use large (1M) pages (if available) to back log buffers above the bar for improved performance

IMS Logger Enhancements

- WADS management changed to be more efficient
  - Track groups no longer used
  - WADS written in wrap around fashion
  - WADS should be sized to provide enough space for any OLDS buffers not yet written at any time plus one track
  - WADS should be kept in cache in storage subsystem

- Benefits
  - Increased logging bandwidth / improved logging performance
  - ECSA constraint relief
  - Simplified WADS management for improved performance

System Pools Storage Enhancement

- Storage for selected database pools is obtained in 31-bit virtual storage, backed by 64-bit real storage
  - DBWP – Database work pool
  - DLDP – DMB pool
  - DLMP – CSA PSB pool
  - DPSB – DLI PSB pool
  - PSBW – PSB work pool

- Benefits
  - Reduction in 31-bit fixed real frames for fixed pools
  - Some users will now be able to fix these pools
    - Previously, they were constrained by 31-bit real storage

Command Enhancements

- Enhancements to existing commands and new commands
  - CQS trace command enhancements
  - DBRC command enhancements
  - Dynamic database buffer pool command enhancements
  - Dynamic resource definition (DRD) command enhancements
  - Fast Path secondary index command enhancements
  - HALDB command enhancements
  - IMS Connect command enhancements
  - MSC command enhancements
  - IMS repository function command enhancements
  - OTMA command enhancements

Command Enhancements

- Enhancements are focused on type-2 commands for the Operations Manager (OM) environment

- Benefits
  - Support of new IMS 12 functions
  - Improved manageability

CQS Traceability Enhancements

- Existing CQS structure trace table (STR) can quickly fill, wrap around, and lose critical trace entries
- Two new BPE trace tables are available to track CQS structure events
  - One for overflow events (OFLW), one for structure events (SEVT)
  - Retain critical trace data for longer periods of time

- Benefits
  - Improves CQS serviceability

IMS Dump Formatter Enhancements

- Supports the Repository Server and Repository Server client address spaces
- Supports any OTMA Callable interface client

- Benefits
  - Easier problem diagnosis and quicker problem resolution

/DIAGNOSE command enhancements

- /DIAGNOSE Command SNAP Function Enhancements
  - Added six new resource types to the SNAP function
  - Provided DISPLAY option to route output back to issuing LTERM
  - Provided LIMIT option to restrict number of lines of output going to LTERM
  - Provided SHOW parameter to control type and amount of output produced

- Benefits
  - Diagnose problems interactively
  - Help reduce time to resolve problems

MIPS reduction enhancements

- CICS Threadsafe support
- CICS and ODBA users have new DFSRAS00 exit capability to designate a user as trusted, bypassing RACF or equivalent security checks
- Usage of newer, more efficient hardware instructions when available
  - Long displacement facility / Store Clock Fast (STCKF) facility
- Replacing GETMAIN storage allocation calls with more efficient IMS internal storage management calls for APPC/OTMA scheduling
- Supporting native 64-bit invocation of several highly used IMS internal macro services, reducing AMODE switching for 64-bit modules
- Efficiency/pathlength reductions in CQS inform exit processing and OTMA processing
- Improving IMS shutdown time by reducing OTMA/APPC shutdown quiesce waits

- Benefits
  - Improved performance

IMS 12 System Enhancements

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Installation and Migration for IMS 12

- Packaging, Prerequisites and Coexistence
- IMS Publications Changes
- IMS Tools support
- IVP and Syntax Checker Enhancements
- Installation and Migration Tasks

IMS 12 Packaging

- IMS 12 product number: 5635-A03

FMID	Feature Description
HMK1200	System Services
JMK1201	Database Manager
JMK1202	Transaction Manager
JMK1203	Extended Terminal Option (ETO)
JMK1204	Recovery Level Tracking (RSR)
JMK1205	Database Level Tracking (RSR)
JMK1206	IMS Java and On Demand
HIR2220	IRLM 2.2
HIR2230	IRLM 2.3

IMS 12 Hardware Prerequisites

- IMS 12 requires the following hardware:
  - A 64-bit IBM zSeries® processor running in z/Architecture® mode (ESA mode is not supported by IMS 12)
  - Capable of running z/OS Version 1 Release 11 or later
  - A processor that supports the Long Displacement Facility of the z/Architecture
- Sysplex data sharing
  - Requires Coupling Facility (CF) level 9 or later
- Shared Queues and Shared EMH
  - Require Coupling Facility (CF) level 9 or later
  - System managed duplexing requires CF level 12 or later and bidirectional CF to CF links

IMS 12 Software Prerequisites

- Minimum software level prerequisites
  - z/OS V1R11 (5694-A01) is minimum level
  - DFSMS APAR OA33409 / UA55338 for z/OS V1R11
  - High Level Assembler Toolkit (5696-234), Version 1 Release 5
  - SMP/E V3R5
  - RACF, or equivalent, if security is used
  - IRLM 2.2, if IRLM is used
- Minimum software levels for optional functions:
  - Parallel RECON Access requires Transactional VSAM
  - Java Dependent Regions require JDK 6.0
  - The IMS Universal Drivers require JDK 6.0
  - CA Reclaim requires z/OS V1R12
  - EAV support for non-VSAM data sets requires z/OS V1R12

Additional IMS 12 Prerequisites

- See the IMS 12 Release Planning (GC19-3019) for additional requirements
  - Available at: https://www-304.ibm.com/support/docview.wss?uid=swg27019860
  - Available in the Information Center at: http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp

Support Status of IMS Versions

- IMS Version 9
  - End of service was November 7, 2010
- IMS Version 10
  - Generally available on October 26, 2007
  - End of service is November 5, 2012 - NEW
- IMS Version 11
  - Generally available on October 30, 2009
  - End of service has not been announced
- IMS Version 12
  - Generally availability announced for October 28, 2011
  - End of service has not been announced

Withdrawn Support

- IMS 11 is the last release to support the SMU-to-RACF utilities
  - IMS 9 was the last version of IMS to support SMU
  - Migration from SMU to RACF or an equivalent product should be done on IMS 9 or earlier

- IMS 10 is the last release to support z/OS-based batch DLIModel utility
  - IMS Enterprise Suite V1.1 DLI Model Utility plug-in should be used with IMS 12

- IMS 12 is the last release to support the SECURITY macro in system definition
  - Use the initialization parameters

Withdrawn Support

- IMS V11 is the last release to support the Knowledge Based Log Analysis (KBLA) facility
  - Customers using this function should migrate to use other IMS-provided analysis utilities and reports, such as
    - Fast Path Log Analysis utility (DBFULTA0)
    - File Select and Formatting Print utility (DFSERA10)
    - IMS Monitor Report Print utility (DFSUTR20)
    - Log Transaction Analysis utility (DFSILTA0)
    - Offline Dump Formatter utility (DFSOFMD0)
    - Statistical Analysis utility (DFSISTS0),
    - Other complementary products, such as IMS Problem Investigator, IMS Performance Analyzer, or similar products.

IMS 12 Supported Connections

- DB2 connections are supported with
  - DB2 for z/OS 10, 9 and 8
- DBCTL connections are supported with
  - CICS Transaction Server V 4.2, V4.1, V3.2 and V3.1
- Java application programs using JDBC access to IMS DB from WebSphere Application Server for z/OS require
  - WebSphere Application Server for z/OS 7.0.1 or later
- IRLM 2.3 and IRLM 2.2 are supported
  - IMS 12, IMS 11 and IMS 10 may use either IRLM 2.2 or IRLM 2.3
  - IRLM 2.3 and IRLM 2.2 may participate in the same data sharing group and connect to the same lock structure

IMS 12 Supported Connections

- ISC is supported with
  - IMS 12, IMS 11, and IMS 10
  - CICS Transaction Server V 4.2, V4.1, V3.2 and V3.1
  - User-written software
- MSC is supported with
  - IMS 12
  - IMS 11
  - IMS 10
- Shared Queues is supported with
  - IMS 12
  - IMS 11
  - IMS 10

Supported Migrations and Coexistence - DBRC

- IMS 11 to IMS 12
  - Upgrade RECONs from IMS 11 to IMS 12
    - IMS 11 SPE PM05244 / UK62971 allows IMS 11 to use IMS 12 RECONs
  - Databases are compatible
  - Application programs are compatible

- IMS 10 to IMS 12
  - Upgrade RECONs from IMS 10 to IMS 12
    - IMS 10 SPE PM05243 / UK62970 allows IMS 10 to use IMS 12 RECONs
  - Databases are compatible
  - Application programs are compatible

IRLM 2.3

- IRLM 2.3 and IRLM 2.2 are both shipped with IMS 12
- IRLM 2.3 and IRLM 2.2 may be used with any supported version of IMS
  - IRLM 2.3 is required by DB2 Version 10
    - IRLM 2.3 has 64-bit caller interface
      - IMS continues to use the 31-bit caller interface
  - IRLM 2.3 requires z/OS 1.10 or higher
- IRLM 2.3 provides improved performance for some requests
  - We do not expect a substantial performance improvement with IRLM 2.3 with IMS

DBCTL, ODBA and ODBM Migration

- The DRA interface modules must be at the same version as IMS
  - Copy DFSPRRC0 and DFSPZPxx load modules to the address spaces which communicate with IMS
    - Include these modules from IMS 12 in the CICS, ODBM and ODBA (DB2 Stored Procedures, WebSphere Application Server, etc.) address spaces

Migration with DRD

- IMS 12 system may be cold started with RDDS from IMS 11 or IMS 10
  - IMSID must remain the same

- IMS 11 or IMS 10 system may be cold started with RDDS from IMS 12 for fall back
  - IMSID must remain the same

CSL Coexistence

- IMS 12, IMS 11 and IMS 10
  - CSL address spaces and IMS may be at mixed levels
    - SCI, OM, RM, ODBM and IMS subsystems may be at IMS 12, IMS 11 and IMS 10
  - IMS 12 is recommended for the CSL address spaces

- IMS Repository requires IMS 12 RM
  - Migration SPEs for IMS Repository:
    - Ensure that all RMs are at IMS 12 level for users of Repository

Coexistence Maintenance

- See Chapter 4 of IMS 12 Release Planning (GC19-3019) for coexistence maintenance requirements
  - Available at: https://www-304.ibm.com/support/docview.wss?uid=swg27019860
  - Available in the Information Center at: http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp

Coexistence - IMS Utilities

- Batch Backout, Log Archive, and Log Recovery
  - Use the utility from the IMS release that created the log
- IMS 12 Database Recovery utility
  - Accepts Image Copies produced by IMS 12, IMS 11 and IMS 10
  - Accepts HISAM Unloads produced by IMS 12, IMS 11 and IMS 10
  - Accepts Change Accum data sets produced by IMS 12, IMS 11 and IMS 10
  - Accepts logs produced by IMS 12, IMS 11 and IMS 10
- IMS 12 Change Accumulation utility
  - Accepts logs produced by IMS 12, IMS 11 and IMS 10
  - Accepts Change Accum data sets produced by IMS 12, IMS 11 and IMS 10

Remote Site Recovery (RSR) Migration/Coexistence

- IMS 12 RSR tracking system can process logs created by IMS 12, IMS 11, or IMS 10
- IMS 12 RSR Isolated Log Sender can send logs created by IMS 12, IMS 11, or IMS 10
- Logs created by IMS 12 cannot be processed by IMS 11 or IMS 10 tracking system or Isolated Log Sender

- Migration steps
  - Upgrade the RSR tracking system RECONs to IMS 12
  - Migrate RSR tracking system to IMS 12
  - Upgrade the active system RECONs to IMS 12
  - Migrate active system Transport Manager Subsystem (TMS) running Isolated Log Sender to IMS 12
  - Migrate active IMS to IMS 12

Log Records

- Change in log record suffix
  - Timestamp in log record suffix is no longer necessarily unique
    - Previous versions produced unique timestamps
- Some log records have changed
- New log records have been added
- DSECTS for most IMS log records may be generated by assembling:
  - ILOGREC RECID=ALL

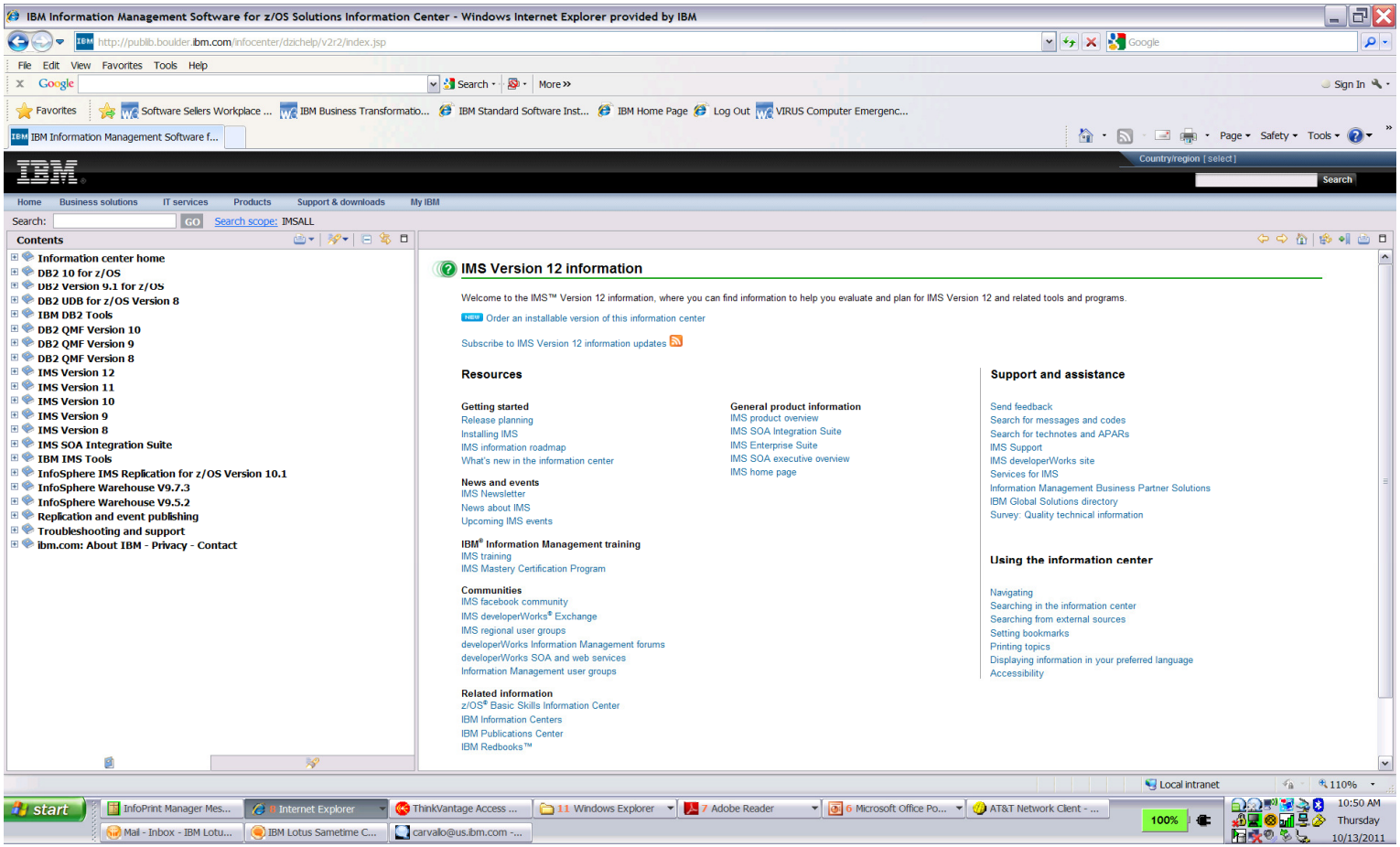
IMS Publication Changes

- IMS publications structure and titles remain the same as in IMS 11
  - PDF master index and glossary are not available
  - Master index and glossary are included in the information center
  - Bookmanager format publications will not be published (same as IMS 11)

- All publications will be available in hardcopy for an additional charge

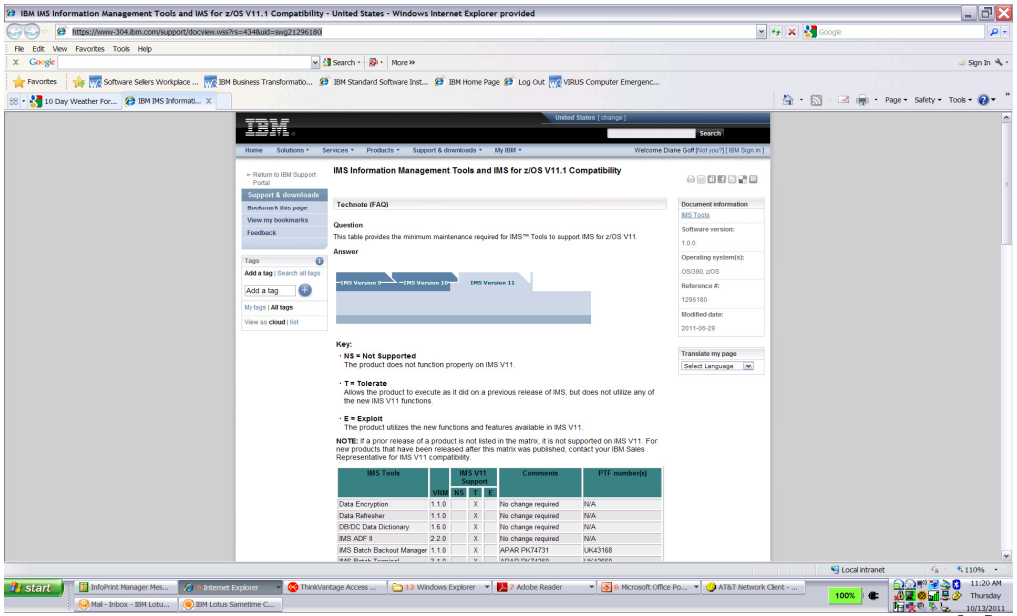
IMS Library

- Information Center will contain information on IMS 12
- http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp



IMS Tools Migration/Coexistence

- Some products may require updates
  - Contact your vendors for information on requirements
  - IBM has a web site with consolidated information about requirements for IBM IMS tools with IMS 12
    - https://www-304.ibm.com/support/docview.wss?rs=434&uid=swg21296180



IBM IMS Tools - Highlights

- New IMS Tools Solution Packs
  - In general, IBM will support the latest stand-alone version of every tool as well as their Solution Pack counterpart if one exists
    - Special circumstances not withstanding
  - Latest versions of TOSI, Generic Exits, IMS Tools Knowledge Base, and HD Compression Extended are only supported in the IBM Tools Base
  - Fast Path Secondary Index creation tool will be included in FP Solution Pack

IVP Enhancements

- Repository usage for DRD is added to IVP
  - IVP provides sample JCL to create repository catalog data sets and the IMS repository
  - IVP provides sample repository server PROC and its configuration file
  - Sample JCL is provided to:
    - Add an IMS repository into the repository catalog
    - Rename a repository in the repository catalog
    - Delete a repository in the repository catalog
    - List the status information for all repositories
    - List the detailed information for a single repository

Syntax Checker Enhancements

- Syntax Checker supports PROCLIB members for IMS 12, IMS 11 and IMS 10
  - IMS 9 PROCLIB members are not supported
- All previously supported members are supported
  - Newly added parameters of these members are supported
- Support added for Repository Server configuration member
- Support added for dynamic full-function database buffer pools
- Support added to view and save parameters of members in a custom order
  - Formerly, only alphabetical order was used
  - Delivered through the IMS service process

Installation and Migration Tasks

- Migration Tasks
  - Review the IMS 12 *Release Planning* publication
  - Check PSP bucket
    - PSP upgrade name is IMS1200
  - Review the Program Directory
    - Available through the Info Center
  - Review the installation information in Chapter 1 of the *Installation* publication
  - Install prerequisite software and maintenance
    - Check your IMS tools and related products
  - Apply coexistence maintenance to other IMS systems

Installation and Migration Tasks

- Migration Tasks (continued)
  - Evaluate and update IMS exit routines
    - RECON I/O Exit Routine (DSPCEXT0)
    - If migrating from IMS 10
      - DFSMSCE0 must be reassembled
      - All IMS Connect exits must be reassembled when migrating IMS Connect
      - HWSIMSO0 and HWSIMSO1 are not shipped with IMS 12
    - Recommendation
      - Reassemble all exit routines which use IMS macros
  - Install IMS 12 using SMP/E installation process
  - System definition
    - “ALL” sysgen

Installation and Migration Tasks

- Migration Tasks (continued)
  - Install the Type 2 and Type 4 SVCs
  - Upgrade RECONs
  - ACBGEN
  - Run the IVP

IMS 11 Installation and Migration Considerations

- Packaging, Prerequisites, and Coexistence
- IMS Library Changes
- IMS Tools support
- IVP and Syntax Checker Enhancements
- Installation and Migration Tasks

Summary

- IMS 12 System Enhancements
- IMS 12 Installation and Migration Considerations

Communities

- **On-line communities, User Groups, Technical Forums, Blogs, Social networks, and more**
  - Find the community that interests you …
    - **Information Management** **ibm.com**/software/data/community
    - **Business Analytics** **ibm.com**/software/analytics/community
    - **Enterprise Content Management** **ibm.com**/software/data/content-management/usernet.html

- **IBM Champions**
  - Recognizing individuals who have made the most outstanding contributions to Information Management, Business Analytics, and Enterprise Content Management communities
    - **ibm.com**/champion

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