



IMS 13

Migration to IMS V13: help reduce the costs and leverage the opportunities

- IMS Configuration Manager V2R1
- IMS Performance Analyzer V230
- IBM Transaction Analysis Workbench V110

Information Management software

© 2014 IBM Corporation

Please note

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

What would we do without these?

Agenda

- **Challenges for IMS migration**
- **Opportunities for IMS migration**
- **How IMS Configuration Manager can help**
- **Example use cases**
- **Measuring the results**
- **Resolving Issues**

These are the things we are going to talk about today but I will focus mainly on how to build and test an evaluation system using IMS and IBM tools so that the best migration plan for your company can be achieved.

IMS Migration: overview

- **Often done for reasons other than new release features**
 - This can minimize the value of release migration
 - Might be seen as additional cost with little benefit
- **Initial migration is with few (if any) changes to IMS configuration**
 - Seen as lowest risk approach
 - Has worked many times in the past
- **Results:**
 - New release features are not used to their full advantage.
 - TCO improvements by IMS might not utilized

It is very common that the primary reason for migration is for IMS currency rather than the new function provided in the target release. Since there is no perceived advantage to the migration other than continued support, there is often little if any urgency to complete the migration. Couple that with the tendency to migrate without changing the current IMS system there is often a long time between the start of the migration process and the yielding of any benefits from the new release. What if during the migration planning phase, the target IMS environment could be tested and evaluated easily, and the potential for improved performance and TCO could be determined? The results of this early evaluation process might justify a more aggressive migration plan or it might indicate that the benefits of the new system do not justify any increased emphasis on the duration of the migration process. Most of you have done several migrations and have old processes to fall back on that you have confidence in and that work. Just as with most things, time and innovation usually creates better ways to accomplish things. I think that today's tools can help the migration process be done much quicker and easier. You may find these tools can not only aid you in a successful version to version migration, but can also provide you with the ability to maintain your environments as you go forwards. For example, using them for test system creation and maintenance can simplify and reduce the time it takes to manage your test environments. With the reductions in staff sizes and experience, that is something we all should be looking for.

Inhibitors to Release Migration

- **Some changes are disruptive to existing processes**
 - For example, dynamic resource definition
- **Reliance on 3rd party tools that do not support the new IMS release**
- **Lack of understanding of the customer's own IMS environment**
- **Education and/or experience with new features**
 - Want to utilize the IMS CATALOG but have not implemented CSL for all their systems...

I do not think that I have to explain much of this chart to most of you. Most of you have gone through this and many of you more than once. The ability to easily and quickly create an evaluation system can provide significant benefits. If you have 3rd party tools, maybe a system without the tools can still be useful for the initial evaluation. It might allow evaluation of newer tools that **do** support the new release and or at least enable early performance and stability testing of the new release level. If it has been some time since the last migration, there may have been significant changes to your environments that are not well known. Using tools that automatically understand the source environments can save time during migration due to items not being missed during the migration process.

Release Migration Planning


- **Early evaluation of new release features**
 - May identify TCO opportunities in new release
- **Use of tools to quickly create evaluation system**
 - IMS Cloning tool can quickly create a 'cloned' system
 - Includes data sets and databases
 - IMS Configuration Manager eases 'cloned system configuration'
 - copy parameter members to 'cloned' IMS system and add new release keywords and/or members
 - Copy resources and create updated modblks for 'cloned' system.

This slide shows how you can actually use the target IMS level to provide input into the migration planning process. Using the tools I will talk about, you can be running the new evaluation system in a matter of hours or days. Lets begin to see how this process can work.

IMS Configuration Manager can help

- **A structured process for managing IMS systems, their resources, and parameters**
- **A version agnostic approach to introducing changes**
- **Near-instant discovery of all the IMS systems and their parameter configuration**
- **Intelligent reporting on IMS parameters and resources**
- **Graphical user interface for managing systems**

I will discuss the IMS Cloning tool later in the presentation but here are some ideas in terms of how the IMS Configuration manager can help you in both the planning and creation of the evaluation system(s). An important part of the support provided by ICM is its approach to both parameter and Modblocks resource management. The tool is aware of the features and capability of each IMS release and so you can manage resources and proclib parameter members for several IMS systems at different IMS levels. That means that implementing resource definitions at the evaluation systems level is easy, even if you need to add and/or change some of the resource definitions to take advantage of new IMS features. I know that we all think we know how many IMS systems and associated address spaces but often we are just close. Using ICM to discover all the IMS and related jobs such as IMS Connect can make the planning process much more accurate. I know that many of you are thinking, all I have to do is change my STEPLIBS and I am migrated. Maybe so, but to take advantage of new function that can yield benefits, you will actually need to migrate the systems sometime. In the old method, this is done after you have the release running on the current IMS systems. Especially for test systems, maybe it makes sense to do both the migration and release change at the same time.



Understanding your current environment

8

©2014 IBM Corporation

The first place to start might be to create a map of your current environment or at least the environment you need to migrate. That should give you an idea of the scope of the effort based upon how many IMS environments have to be converted.

Auto discovery of IMS Systems IBM

- IMS Configuration maps an entire IMS topology in seconds

Empty member list

```

File Help
-----
System Member List
Command ==> _____ Scroll ==> PAGE
Enter NEW to create a new Member

  Name      Type      IMSplex  VV.R  Description
  *         *         *       *    *
***** Bottom of data *****

```

```

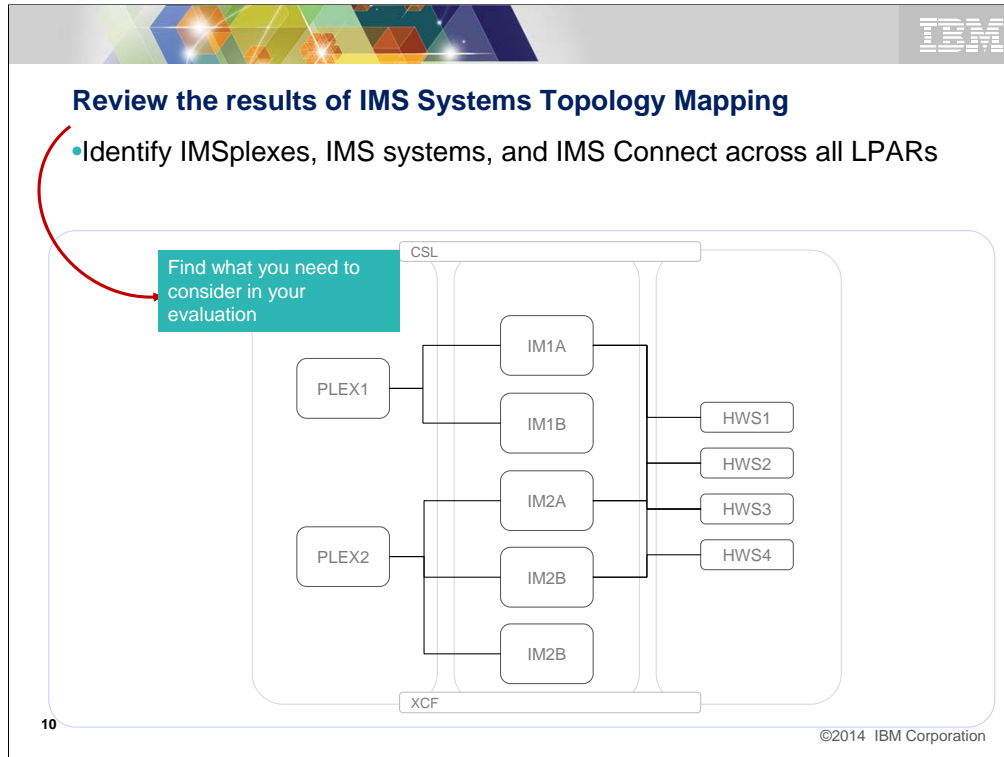
VIEW      GPL210.DEVT.SGPLSAMP(GPLDSCVR) - 01.25
Command ==>
***** ***** Top of Data *****
000001 //GPLDSCVR JOB ,CLASS=A,NOTIFY=&SYSUID
000002 //GPLUTIL EXEC PGM=GPLUTIL
000003 //STEPLIB DD DISP=SHR,DSN=<HLQ.V2R1M0.SGPLLINK>
000004 // DD DISP=SHR,DSN=<HLQ.VnRnMn.SDFSRESL>
000005 //SYSIN DD *
000006 *
000007 DISCOVER TO(REPOSITORY,GPLREPOS)
000008 /*
000009 //GPLREPOS DD DISP=SHR,
000010 // DSN=<HLQ.V2R1M0.REPOSTRY>
000011 //SYSPRINT DD SYSOUT=*
000012 //
***** ***** Bottom of Data *****

```

+ Discovery job

9 ©2014 IBM Corporation

A well planned migration requires identifying the IMS systems that are to be upgraded: their version, and their IMS configuration. Once these systems are identified, it is then possible to plan and validate the migration itself. IMS Configuration Manager allows you to start with an empty repository and use a DISCOVER job or an AUTODISCOVER server parameter to populate all the IMS systems. Here we can see that we start with a blank repository and then run a DISCOVER job. The job requires no additional parameters to perform an extensive discovery of your environment, but you can optionally set parameters to limit discover to certain plexes, system types, or to perform discovery specifically for IMS systems that are **not** part of a plex.



The discovery process then finds all the IMSplexes registered to XCF and the associated IMS systems.

- The IMSplexes must be registered to XCF
- Discovery of the IMS systems relies on an OM and SCI for each plex being available on the LPAR on which the DISCOVER job (or server) is run

The discovery process will also identify all associated IMS Connect systems. These IMS Connect systems *may* be member of the plex. But they do not have to be: all that is required is a DATASTORE association between any discovered IMS and the IMS Connect.

Today the auto discovery feature facilitates IMS parameter management, but the ability to include mod blocks data during discovery is being considered.

Complete IMS topology

File Help
System Member List
Row 1 of 103 More: <>

Command ==> _____ Scroll ==> PAGE

Enter NEW to create a new Member

/	Name	Type	IMSplex	VV.R	Description
---	*	*	*	*	*
---	CACTHWS0	IMSCON		10.1	
---	CDQ1SC	SCI	PLCDH	1.5	
---	DCH10D	ODBM	PLCDH	1.2	
---	DCJ10D	ODBM	PLCDJ	1.2	
---	DCJ10M	OM	PLCDJ	1.5	
---	DCJ20D	ODBM	PLCDJ	1.2	
---	DDH10M	OM	PLDDH	1.6	
---	DDJ10D	ODBM	PLDDJ	1.3	
---	DDJ10M	OM	PLDDJ	1.6	
→	P: IBDP	IMS	PLXDP	11.1	
---	IBDR	IMS	PLBDP	11.1	
---	ICDH	IMS	PLCDH	12.1	
---	ICDJ	IMS	PLCDJ	12.1	
---	ICDP	IMS	PLXDP	12.1	
---	ICDQ	IMS	PLDDQ	12.1	
---	ICDR	IMS	PLCDP	12.1	
---	ICMIC00	IMSCON	+3	12.1	
---	ICMIC01	IMSCON		12.1	
---	ICMIC02	IMSCON	PLXDP	13.1	

11 ©2014 IBM Corporation

The job itself typically takes no more than a couple of minutes to complete. At the end of the process IMS-related address spaces are mapped. Here, we can see the repository with the output of a DISCOVER job. It has found a number of IMSplexes across multiple MVS images and has mapped their IMS and IMS Connect address spaces, CSL address spaces, and the related PROCLIB settings for each of these systems.

Notice that in the case of IMS Connect, the discover job discovers systems that are not part of any plex (even if they relate to systems within a particular plex) and that it can also identify IMS Connect systems that serve multiple IMSplexes.

For IMS systems without a PLEX, you can run the DISCOVER job with the NOPLEX option. However, this type of discovery is restricted to the MVS image on which the job is executed.

Nevertheless, the result is likely to be a complete representation of even complex IMS environments and gives unique and instantaneous access to the active PROCLIB members for each of these systems.

You can now use a “p” line action against any of the systems in the System Member List(This View), or any of the IMSplexes(Via IMSplex Active Member view) and view the PROCLIB members for any of those member types.

```

Command ==> _____ IMSplex Active Members Row 1 of 35
Scroll ==> CSR

IMSplex . . . : PLXDP
Search . . . _____

/ System      Prompt      Description
- - - - -
- - IMS
+ - IBDP
+ - IDDP
- - IMSCON
+ - ICMIC00
- - ICMIC02
  - HWSCFG02
  - BPECFG11
  - HWSEXIT1
- - ODBM
  - S3XDPOD
  - CSLDIPS3
  - CSLDCPS3
  - BPECFPLP
- - OM
  - S1XDPOM
  - CSLOIPS1
  - BPECFPLP
- - RM
+ - S1XDPRM
+ - S3XDPRM
- - SCI
+ - S1XDpsc
+ - S3XDpsc
- - REPO
  - S1XDPRP
  - FRPCFGS1
  - BPECFPLP

```


12

After using a “p” line action against any of the systems, or any of the IMSplexes, the PROCLIB members for any of those systems or plexes are now displayed. But where it gets really interesting is when we start using the GUI to interrogate these objects. Remember that, through the Connection Server, both the GUI and ISPF can browse the same repositories. The main advantages of the ISPF – is the additional editing capabilities that it provides, including smart search, which lets you implement the features you want; the main advantages of the GUI is that it makes it easier to view and analyze configurations across plexes and that it provides better analytic capabilities including smart-compare (which we will look at in a minute), export configuration to a spreadsheet, as well as filtering, sorting, etc.... Let’s have a look at it now.

The screenshot shows the IBM GUI interface for viewing parameter members. At the top, there are navigation tabs for different systems: OCS0 [IMS], OCS5 [IMS], IPOCX [IMSplex], Compare, PLXDP [IMSplex], All Sources, and IPOCX [IMSplex]. Below the tabs, the main window displays a table titled "MBRLIST..ALL..ALL". The table has columns for IMSplex, IMSID, MemberName, DataSetName, Libr..., Size, CreateDate, ChangeTimestamp, ChangeUserID, MemberType, and Mes. A context menu is open over one of the rows, with options: Compare..., Show Configuration (highlighted with a red circle), Hide Blank Columns, and Show all Columns. A green callout box with white text is overlaid on the bottom left of the table, stating: "List all <active> parameter members across your enterprise and drill-down to parameter values". The page number "13" is visible in the bottom left corner, and the copyright notice "©2014 IBM Corporation" is in the bottom right corner.

IMSplex	MSID	MemberName	DataSetName	Libr...	Size	CreateDate	ChangeTimestamp	ChangeUserID	MemberType	Mes
IPOCX	OCS0	CQSP0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	9	2013-03-07	2013-05-01-07.31.47	NXU2	CQSP	
IPOCX	OCS0	CQSSG0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	14	2013-03-07	2013-05-01-08.07.23	NXU	CQSSG	
IPOCX	OCS0	DFSCG0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	7	2013-03-07	2013-05-01-07.05.26	NXU	DFSCG	
IPOCX	OCS0	DFSDC0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	10	2013-03-07	2013-03-07-12.45.03	AXW	DFSDC	
IPOCX	OCS0	DFSDSCMC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	66	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCM	
IPOCX	OCS0	DFSDSCTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	40	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCT	
IPOCX	OCS0	DFSPB0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	101	2013-03-07	2013-05-01-08.07.23	NXU	DFSPB	
IPOCX	OCS0	DFSSPM0C	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	5	2013-03-07	2013-03-07-12.45.05	AXW	DFSSPM	
IPOCX	OCS0	DFSSQ0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	1	2013-03-07	2013-05-01-08.07.23	NXU	DFSSQ	
IPOCX	OCS0	DFSVSMCT	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	15	2013-03-07	2013-03-07-12.45.06	AXW	DFSVSM	
IPOCX	OCS0	DFSYDTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	30	2013-03-07	2013-05-01-08.07.23	NXU	DFSYDT	
IPOCX	OCS0	OCS0C0D0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	2	2013-03-07	2013-05-01-08.19.54	NXU2	SSM	
IPOCX	OCS1	CQSP0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	9	2013-03-07	2013-05-01-07.31.47	NXU2	CQSP	
IPOCX	OCS1	CQSSG0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	14	2013-03-07	2013-05-01-08.07.23	NXU	CQSSG	
IPOCX	OCS1	DFSCG0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	7	2013-03-07	2013-05-01-07.05.26	NXU	DFSCG	
IPOCX	OCS1	DFSDC0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	10	2013-03-07	2013-03-07-12.45.03	AXW	DFSDC	
IPOCX	OCS1	DFSDSCMC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	66	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCM	
IPOCX	OCS1	DFSDSCTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	40	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCT	
IPOCX	OCS1	DFSPB0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	99	2013-03-07	2013-05-01-08.07.23	NXU	DFSPB	
IPOCX	OCS1	DFSSPM0C	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	5	2013-03-07	2013-03-07-12.45.05	AXW	DFSSPM	
IPOCX	OCS1	DFSSQ0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	1	2013-03-07	2013-05-01-08.07.23	NXU	DFSSQ	
IPOCX	OCS1	DFSVSMCT	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	15	2013-03-07	2013-03-07-12.45.06	AXW	DFSVSM	
IPOCX	OCS1	DFSYDTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	30	2013-03-07	2013-05-01-08.07.23	NXU	DFSYDT	
IPOCX	OCS1	OCS0C0D0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	2	2013-03-07	2013-05-01-08.20.09	NXU2	SSM	

Just like we just saw in the ISPF, the GUI lets you view the *active* PROCLIB members for an IMS system, an IMSplex, or for your entire Enterprise. The difference is that the GUI makes it easy to look at configurations across a number of IMSplexes. A consolidated result set is available for all the repositories in the scope of all defined servers within a given client install instance. The GUI is also able to provide context sensitive actions. For example, you can right-click a member to tabulate that particular PROCLIB's configuration. The tabulated form makes it easier to filter, export, and report on members, but perhaps the most powerful feature is compare...



Compare configuration across all plexes to make sure you are using the best system configuration for evaluation


Compare ...
 Show Configuration
 Hide Blank Columns
 Show all Columns

MemberName	APPLD1	CPLOG	CSAPSB	CSLG	DBRCNM	DBWP	DC	DLPSB	DMB	DSCT	FBP	FRE	IRLM	LSO	LUMC	LUMP	MAXPST	OTMAASY	OTMANM	PINCR	PIMAX
DFSPB00M	IMABMS0	500K	4500K	OBA	ABS0XDRG	32	00M	15M	400	M	7M	1200	Y	S			990	S	IMABMS0	4	2000
DFSPB01M	IMABMS1	500K	4500K	OBA	ABS1XDRG	32	01M	15M	400	M	7M	1200	Y	S			990	S	IMABMS1	4	2000
DFSPB02M	IMABMS2	500K	4500K	OBA	ABS2XDRG	32	02M	15M	400	M	7M	1200	Y	S			990	S	IMABMS2	4	2000
DFSPB03M	IMABMS3	500K	4500K	OBA	ABS3XDRG	32	03M	15M	400	M	7H	1200	Y	S			990	S	IMABMS3	4	2000
DFSPB00H	IMHMS0	16M	2000	OSH	HSS0XDRG	28	00H	6000	400	H	400	1000	N	S			800		IMHMS0	4	2000
DFSPB01H	IMHMS1	16M	2000	OSH	HSS1XDRG	28	01H	6000	400	H	400	1000	N	S			800		IMHMS1	4	2000
DFSPB00C	IMOCMS0	16M	3500	OC0	OCS0XDRG	32	00C	500	100	C	3000	4000	N	S	50M	500M	400	S	IMOCMS0	4	8000
DFSPB01C	IMOCMS1	16M	3000	OC0	OCS1XDRG	32	01C	300	100	C	3000	4000	N	S			400	S	IMOCMS1	4	8000
DFSPB04C	IMOCMS4	16M	3000	OC0	OCS4XDRG	32	04C	300	100	C	3000	4000	N	S			400	S	IMOCMS4	4	8000
DFSPB05C	IMOCMS5	16M	3000	OC0	OCS5XDRG	32	05C	300	100	C	3000	4000	H	S			400	S	IMOCMS5	4	8000
DFSPB008	IMVHMS0	16M		OHV	VHS0XDRG		008				8	7H	9000				990	S	IMVHMS0		
DFSPB018	IMVHMS1	16M		OHV	VHS1XDRG		018				8	7M	9000				990	S	IMVHMS1		
DFSPB028	IMVHMS2	16M		OHV	VHS2XDRG		028				8	7M	9000				800	S	IMVHMS2		
DFSPB038	IMVHMS3	16M		OHV	VHS3XDRG		038				8	7M	9000				800	S	IMVHMS3		

Only show differences; only highlight significant differences

14
©2014 IBM Corporation

Compare provides an intelligent function that compares the values for the member and allows you to highlight significant differences. Crucially, the compare function actually understands the members it is comparing and is able to differentiate between spurious differences and significant differences. The above display compares rows within the same list and highlights cells with functional differences between two consecutive rows.



Executing the Plan using IMS tools

15

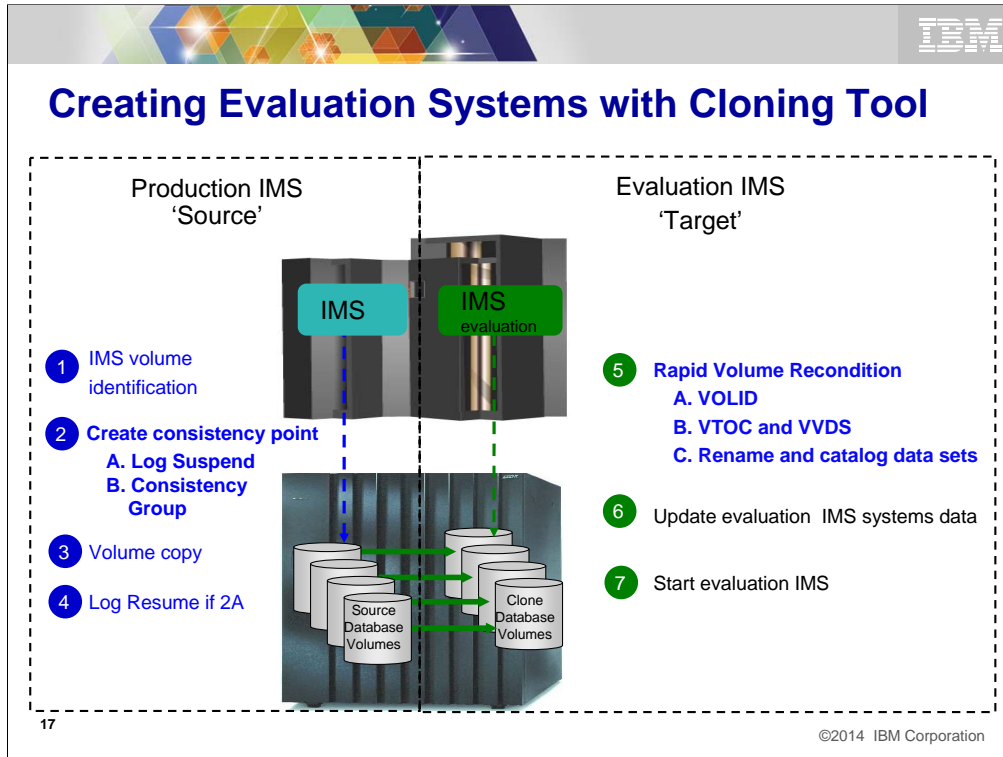
©2014 IBM Corporation

Once we have created a complete migration plan or just an plan to create and evaluate the new target IMS release, we can use these tools to quickly execute the plan.

IMS Cloning Tool Creates Evaluation System

- **Leverages Storage-based fast replication if available**
 - Large systems cloned in less than 30 minutes
- **If storage-based fast replication not available**
 - Cloning done using z/OS data movement tools
- **Resulting evaluation system after cloning**
 - The copied volumes updated for usability
 - Everything cloned RECON, PROCLIB, JOBS, MDA members – everything you need to bring up your cloned IMS
 - Databases are copied, underlying data sets renamed, DBRC updated

You start the process by cloning the IMS system that you wish to emulate as your evaluation system. If you have and can use storage-based fast replication the process is faster and maybe less disruptive than what I call the **standard** cloning process. Regardless of which method you use, the results are the same it just takes longer with the **standard** process. The final results is that you have an evaluation system that is ready for the final tailoring process.



This example shows cloning an existing production system using fast-replication capable hardware. It is not necessary to have or use fast-replication hardware to accomplish the cloning process but it makes it faster and less intrusive. If not using the fast-replication software, the source system must be inactive during the cloning process.

The left side of the slide represents the source IMS, in this case, a Production IMS system. The right side of the slide represents the target or cloned IMS system.

On the source,

Step 1 --- The disk volumes that make up the production IMS system are identified by using specific VOLSER IDs, VOLSER mask, or SMS storage group.

Step 2-4 ---To gain a static copy of your data and the source ICF catalog entries, there are several options:

a. IMS is up and the IMS log is suspended (this is proprietary code in IMS Cloning Tool and it works similar to DB2's log suspend.)

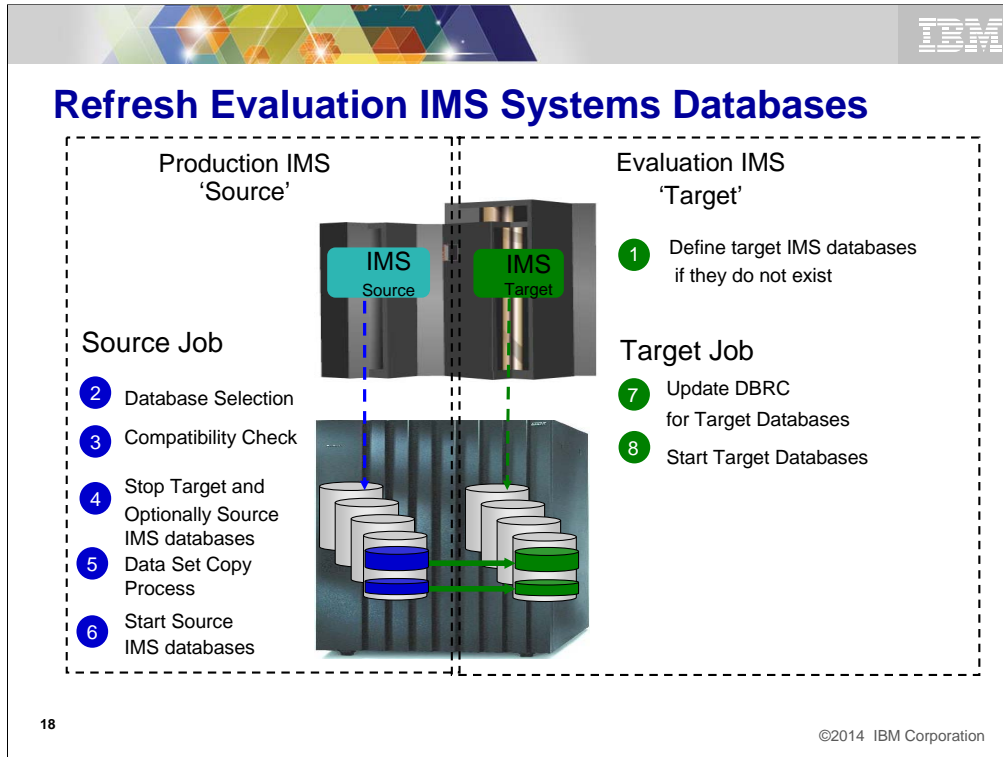
b. IMS is up and can use either IBM FlashCopy, FlashCopy Manager, or EMC consistency group support

---With either of these techniques, IMS Cloning Tool immediately invokes a DFSMSdss Copy to issue IBM FlashCopy or SnapShot commands to copy the data instantly and backs up the ICF catalogs that point to the data sets being copied.

---When cloning IMS systems that reside on EMC or Hitachi Storage Systems, an appropriate storage-based fast-replication process is performed before the IMS Cloning Tool cloning automation is invoked and a list of copied storage volumes is passed to IMS Cloning Tool for use in later processing steps.

---Once the copy is complete which is in seconds, IMS Cloning Tool can resume the source log. At this point, we are done using the production IMS system.

The following steps will be performed on the target or cloned IMS system shown on the right side of



This is just an example of the process that the Cloning tool uses to refresh the IMS databases that are needed for the new evaluation system that is created. If storage-based fast replication is available it is used, if not, traditional techniques are used to build the databases. The difference in the results is time not results. Either technique results in all the required databases being made available to the evaluation system.

The left side of the slide represents the source IMS, in this case, a Production IMS system. The right side of the slide represents the target IMS system – where you want to refresh the IMS data to.

Step 1 – is on the target side. The definitions need to exist in advance

Step 2 - The source databases to be refreshed are selected by database name. IMS Cloning Tool finds the IMS subsystem name and determines if it is active, then it finds the source and target databases and indexes (if the targets already exist), determines the data set names for each database and index and then verifies their existence

Step 3 - Checks are performed to ensure the characteristics of the source and target IMS databases are compatible. IMS Cloning Tool gets the attributes of the IMS databases and indexes from the source and target IMS RECON, ACBLIB, and MDALIB data sets. Some characteristics that are checked include: Type, Access Method, Number of segments, data set groups, Blocksize, Randomizer Parameters, etc.

Step 4 - The source and target databases are stopped (DBR commands automated). Optionally, the source databases can be copied while they are running to create a fuzzy copy. However, the fuzzy copy option does not guarantee transactional integrity on the refreshed copy.

Step 5 – Data sets are copied. For sites using FlashCopy or SnapShot, IMS Cloning Tool will invoke these copy facilities. For sites using EMC TimeFinder or Hitachi ShadowImage, IMS Cloning Tool will produce the output files describing source and target data set information so users can create their own data set fast-replication job streams.

Step 6 - The source IMS databases are started unless a fuzzy copy was specified in step four. The following steps will be performed on the target IMS system.

```

File Help
-----
Copy IMS System
C Command ==>
E Press PF3 or EXIT to copy the IMS system. PF12 or Cancel to cancel.

Source
/ Name . . . . : IADP   Version . . : 10.1
  Description . .
  IMSplex . . . : PLXNU

Target
Name . . . . . ICDP   Version . . . 10.1 + Discovered IMS version
Description . .
IMSplex . . . : PLXNU +
Repository . . . . .

----- IMS Release -----
Command ==>
Row 1 to 5 of 5
Scroll ==> CSR
Select IMS release then press Enter.

DDQ1RM R
DDQ1SC S
DDQ2OD O
HWSINST I
HWSIXD3 I
HWSIXD4 I
HWSIXD6 I
HWS1 I
C IADP I
IBDH I
V.V.R Description
. 9.1 IMS 9.1.0
. 10.1 IMS 10.1.0
. 11.1 IMS 11.1.0
. 12.1 IMS 12.1.0
S 13.1 IMS 13.1.0
***** Bottom of data *****
    
```

Having discovered your IMS environment, you can begin to plan and validate the migration to a newer version of IMS. A good starting point is to copy the discovered system into a new repository setting the IMS version to the target IMS version. The newly copied IMS system will contain the same PROCLIB configuration but these PROCLIBs will now be validated using IMS V13 rules, instead of the rules for the original system. This means you can quickly identify obsolete parameters as well as validate and introduce new values.

The advantage of this approach is that, as we have seen before, the GUI can consolidate information from multiple repositories (as well as multiple servers) so that as you build your proposed map you can view and interrogate the differences between the proposed configuration and the current, automatically discovered, configuration.

Update System Resource Definitions

- **Update definitions to new release specification**
 - Create Stage 1 out if Systems generation used
- **Activate DRD in evaluation IMS if needed**
 - Create System RDDS if DRD restart used for cold start
 - Import RDDS to IMS Catalog if Catalog used for cold start
- **If DRD active, resources can be changed using DRD if changes are needed**

Almost always you have to update your system resource definitions (i.e. MODBLOCKS) to the level of the new evaluation system. Using ICM you have several options on how you accomplish this. If you have the new system enabled for DRD, the quickest way to do this might be to just create system level RDDS datasets and cold start the evaluation system from these. That might remove the need to do a systems generation during initial evaluation system testing. If you need to activate DRD because your source system does not have it active, ICM will walk you through setting up the DRD environment for the parameter members that need to be changed to support. You have lots of options on how you make the new evaluation system capable of supporting the DRD environment.

Find Parameter changes needed for copied parameter members in evaluation system



The screenshot displays the IBM GUI interface for parameter validation. On the left, a navigation tree shows a hierarchy of sources including IMS, IMS Connect, IMSplex, and various system types like IMBAX, IMCIX, etc. The main window shows a table of parameter members with columns for SystemName, SystemType, MemberName, TYPE, MemberType, Message, Version, and ProclibDan. A warning message is visible for the member DDP.

SystemName	SystemType	MemberName	TYPE	MemberType	Message	Version	ProclibDan
IBDP	IMS	DFSDFPS1		DFSDF		11.1.0	IBDP.VB10.PROCLB
ICDP	IMS	DFSDFPS1		DFSDF		12.1.0	ICDP.VC10.PROCLB
DDP	IMS	DFSDFPS3		DFSDF	W-Parameter warnings	11.1.0	REA.PLXDP.PROCLB

Below the table, the source code for the parameter is displayed, showing various system parameters and their values, along with comments and error messages.

```

Line Source
10 DDDO=Y
11 MODEL=OYN /* TURN ON DDD */
12 ACBSR=H
13 /*****
14 <SECTION=DYNAMIC_RESOURCES>
15 AUTOIMPORT=AUTO
16 AUTOEXPORT=AUTO
17 DCLM=Y
18 IMPOSTER=CONTINUE /* DONT ABEND IF IMPOST ERROR */
19 MDDP=IMPOST /* DONT ABEND IF MDDP ERROR */
20 RDDP=IDG.VD10.RDDG01,
21 IDG.VD10.RDDG02,
22 IDG.VD10.RDDG03)
23 REPOB=IMPOST /* DONT ABEND CONTINUE TO INIT */
Position 9: Parameter/Value is for a future IMS release: REPOB
24 <SECTION=SHARED_OPTIONS>
25 QP=PLADPQ,
26 QP=CM,
27 MSQ=MSGLAD,
28 MSQ=MSGLAD,
29 QP=QPLP,
30 WAITBL=H
31 <SECTION=REPOSITORY>
Position 10: Parameter/Value is for a future IMS release: SECTION=header identifier
32 REPOSITORY=TYPE=MSRSC
Position 15: Parameter/Value is for a future IMS release: TYPE
    
```

21

©2014 IBM Corporation

Here we show an example of the GUI validation. If introduce a parameter member from the source system at an earlier version, the server will provide a Parameter Warning to the GUI for that particular member, and you can then retrieve the member to see exactly where and why the warnings have been generated. This allows you to update the parameter member as needed in the evaluation system.

File Help **Updating members for new release changes**

IMSPlex Active Members Row 5 of 56
 Command ==> _____ Scroll ==> CSR

IMSPlex . . . : PLXDP
 Description . :

Search . . V13 **Intelligent search for what is new in target release**

/ System	Prompt	Description
- IMSCON		
+ ICMIC00		
- ICMIC02		
- HWSCFG02		
- CICSAPPL=...		The Applid of the remote CICS system
- CICSNETID=...		The Netork ID of the remote CICS system
...		
- PORT=(ID=30330,KEEP		Insert new parameters straight into the right members
- PORT=(ID=30330,KEEP		
...		
- IMSPLEX (MEMBER=ICM		

- BPECFG11		
- CONDSRB=...		Conditional zIIP SRB option

- ODBM		
- S3XDPOD		
- CSLDCPS3		
- SOD=...		Output class for snap dumps
- **		<SECTION=GLOBAL_DATASTORE_CONFIGURATION>
- **		<SECTION=LOCAL_DATASTORE_CONFIGURATION>
- **		<SECTION=GLOBAL_DATASTORE_CONFIGURATION>

What is needed for CSL address spaces

22 ©2014 IBM Corporation

From the ISPF side, the capability of IMS Configuration Manager to support CSL member types and IMS Connect provides significantly more power to the existing intelligent search capabilities. For example, when you search for new V13 parameters for a particular PLEX, it will show you each PROCLIB with new parameters, that are applicable for each member identified in that PLEX. You can then select the PROCLIB for the appropriate member straight from the display and insert the new parameters.

Adding support for the new features you want using Semantic search

```

IMSplex . . . : PLXDP
Description . :

Search . . ISC

```

Intelligent search for new feature

System	Prompt	Description
- ICDP	- DFSDC000	
	- ISCTCPIP=...	Defines an LU 6.1 via TCPIP link
	- RCVYSTSN=...	STSN recovery? Yes or No

...		
- DFSDSCT0	- AUTLID=...	ISC other system half session qualifier
	- LCLICON=...	Local ICON that IMS communicates with via

- DFSHSB00	- LNK	Timing values for ISC link surveillance
	- SWITCH	Switch if a surveillance mechanism trigger

+ IDDP		
- IMSCON		
- ICMIC00	- HMSCFG00	
	- CICSAPPL=...	The Applid of the remote CICS system
	- CICSNETID=...	The Netork ID of the remote CICS system
...		
	- RESVSOC=...	The number of send sockets reserved for th
	- RMTICIS=...	Defines a TCP/IP connection to a remote IB
	- HWS (ID=ICMIC00,	Identifier
...		

Finds IMS Connect as well as IMS

Shows all parameters that are impacted

23 ©2014 IBM Corporation


The value of this is particularly apparent when you try to introduce new features that require changes to multiple members. You can see each member that is impacted by the given change in a single search and then proceed to implement your changes directly on each of those members.

```

File Edit Edit_Settings Add the new feature parameters using MODEL function
EDIT      GPL000.QAAUTO.HW 2
Command ==> MODEL          Scroll ==> CSR
CHECK Validate the member syntax
MODEL Insert a new parameter with syntax assistance
HELP Press F1 to request parameter sensitive help
***** ***** Top of Data *****
000001 *-----*
000002 * - HWS CONFIGURATION MEMBER FOR ICMIC00
000003 *-----*
000004 HWS (ID=ICMIC00,
----- Select a parameter -----
Command ==> _____ Row 1 to 11 of 11
Select one or more parameters then press EXIT.
Parameter      Description
. ADAPTER       Characteristics of adapters used
. DATASTORE   Defines connections to IMS systems
. HWS           Defines IMS Connect characteristics
. IMSPLEX      Defines the IMSplex
. * ISC        Defines ISC
. MSC          Defines MSC
. ODACCESS     Communication between ODBM, DRDA clients
. * RMTICICS    Defines a TCP/IP connection to a remote IBM CIC
. RMTIMSCON    Defines a TCP/IP connection to a remote IMS Con
. RUNOPTS      Language Environment (LE) runtime options
. TCPIP        Defines IMS Connect characteristics
***** Bottom of data *****

```

When you select a member you can edit it, just like in ISPF edit but with a few significant enhancements that aid version-to-version migration. The first is the MODEL function, that allows you to insert a basic template for the new parameters, and the second is the CHECK function which will validate the member based on the rules that are appropriate for the given version of the member. Hence you can validate the member both as a “Version Previous” member and as a “Version Next” member, simply by altering the IMS version.



Working with your evaluation system

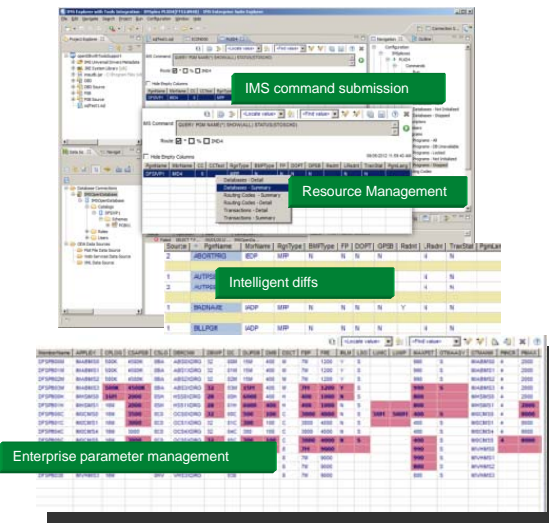
25

©2014 IBM Corporation

Once you get the evaluation system built, you want to do some initial testing of it as quickly as possible. You probably have ways of driving workload in your shop but if not, there are IVP's and other ways to do some initial testing. Once the evaluation system has proven to be stable, they you might want to do some actual performance testing. Usually your application teams can do this as a part of their release testing.

Centralized management of IMS systems

- Map IMS topology
- Analyze PROCLIB parameters across global sites
- Run CSL commands
- Manage MODBLK resources
- Search, filter, compare, and export results to spreadsheet applications
- Provides tight integration with IMS Connect Extensions GUI
- Works with z/OS Explorer, IMS Explorer, CICS Explorer, and Rational offerings

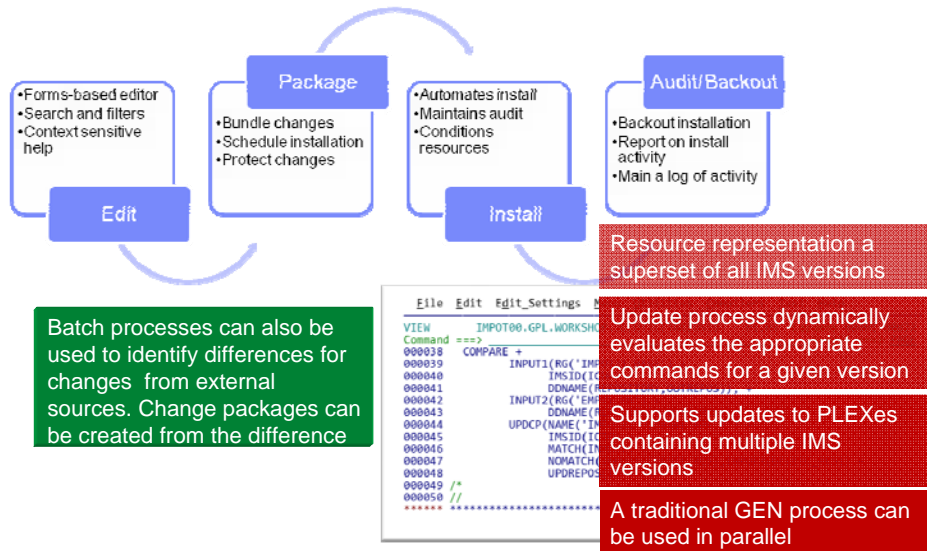


©2014 IBM Corporation


26

One of the things many customers are asking for is the ability to manage all or a group their systems from a single view. Using the ICM GUI enables a wide range of new function such as the items listed on the slide. You should take special notice of the fact that the GUI can shell share with several other Eclipse GUI offerings so it can also be a part of everything you need to do with IMS and or IMS Connect if you also have IMS Connect extensions.

ICM Processes: updating resources using DRD



The IMS DRD feature introduced in IMS V10 continues to be enhanced. It provides a lot of flexibility in dealing with IMS resource definitions and changes. It does however require the same level of management that we have with the system generation process today. It is easy to forget that when you make changes with DRD, the change process still has to be managed just like we do our systems generation process. Often our current processes have been in place for so long that we have forgotten all the things it provides. If we are making changes with DRD, we still need to honor traditional change control standards, maintain a history of what has changed, be able to automate installation of new changes, back out changes in error and create an environment where these dynamic changes are most likely to be successful. The ICM change process satisfies all of these requirements. You use ICM to make the changes to the required resource definitions. You then create a 'Change Package' that encompasses the changes you wish to make. Once the change package is complete and closed, it can no longer be updated. This satisfied one of the basic change control standards that what is submitted to the change control committee is what will be installed. Once approved, since the actual update of resources is done via a batch job, it can be scheduled using your job scheduling system. A key concept of changes made via DRD is that some changes require pre-conditioning of resources before they can be changed. The ICM batch install process does this using IMS supplied best practices to ensure that the changes are made successfully. The process gives you lots of flexibility to control the process when not all of the changes are successful. You can have the successful ones removed and/or rerun the job to accomplish installation of any changes that were not successful the first time. Of course, an audit log is produced of the installation process.



Evaluate performance of the evaluation system using IMSPA V230

29

©2014 IBM Corporation

Once you have run some application testing runs, you need to be able to quickly understand in high level terms if there is any significant change either way.

Performance Before and After Migration

Trancode	Proc Vers	Tran Count	Avg InputQ Time	Avg Process Time	Avg CPU Time	Avg OutputQ Time	Avg Total IMS Time	Avg IMS Resp Time	Avg DB Get Count	Avg DB Updat Count	Avg DB Wait Count	Avg DC Call Count
ACCOUNT	1210	167	0	345	30	0	345	341	14	135	0	3
	1310	178	0	356	31	0	356	347	14	135	0	3
BALANCE	1210	273	0	93	8	0	93	99	11	42	0	4
	1310	298	0	97	9	0	97	101	11	42	0	4
INVOICE	1210	546	0	174	43	0	174	182	710	67	0	4
	1310	563	0	177	45	0	177	185	710	67	0	4
LOGON	1210	444	0	274	9	0	274	282	14	40	0	3
	1310	423	0	281	11	0	281	287	14	40	0	3
MENU	1210	165035	6	134	16	0	140	84	50	0	0	1
	1310	167381	7	145	19	0	152	85	50	0	0	1
ORDER	1210	342	0	258	10	0	259	266	38	42	0	3
	1310	376	0	263	11	0	263	269	38	42	0	3
STOCK	1210	272	0	155	33	0	156	171	408	38	0	3
	1310	298	0	134	37	0	134	162				
WITHDRAW	1210	134	0	175	9	0	175	184				
	1310	156	0	182	11	0	182	191				

STOCK Transaction
9ms faster response
time

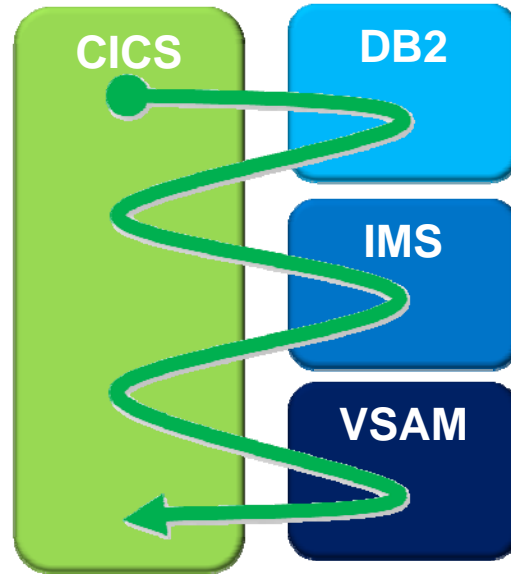
IMS PA allows you to quickly see on a transaction basis the results of the new run compared to the old one. You create this report by including logs from both level systems. For this example, you would want IMS logs from the same application testing runs. One set of logs from each application test.

Fixing problems in evaluation system using Transaction Analysis Workbench for z/OS

If there are issues with the evaluation system, you need to be able to find out what they are and fix them as easily and quickly as possible. The next slide show how you can use the IBM Transaction Analysis Workbench for this purpose.

Where did the delay occur?

- A single transaction can have activity across many subsystems
- To quickly identify performance issues, you need to track the entire transaction
- Subsystem-specific approaches and tools offer a limited perspective
- Each subsystem has its own activity log and SMF records



32

©2014 IBM Corporation


With the complexity of modern transactions, one of the first things we need to do when evaluating a transaction is find out what the transactions lifecycle looks like and where within the lifecycle the delay is occurring. That is one of the things that the IBM Transaction Analysis Workbench provides. It uses instrumentation data from all involved transaction managers and database subsystems to show the life cycle in terms of events with either the time between events or the event time relative to a point within the transactions life cycle.



Create Exception Index to identify problems

- **The exception index will identify transaction that need to be investigated**
 - Exceptions index entries can be built for
 - Transactions that abended
 - Transactions that exceeded a specified elapsed time
- **You probably want to know if any transactions abended as this might show a major issue**
- **Then you can see if there are performance issues**

One of the first things you might do is to use the exception process of TAW to process the log data from the application tests to see immediately where you stand compared to the same application runs using the current level IMS system. The exception process can identify from the IMS logs any transactions that either abended and/or exceeded your specified response time criteria. This process will break down all the transactions that executed into only those that might need additional investigation. Once the exception index is created, you can filter its contents many ways to find the transactions you want to investigate. For example, if you find a transaction that abended U3303 (i.e. deadlock), you might create a filter to see how many transactions abended with a U3303 abend. Maybe the changed performance of the new release has exposed an application issue that allows for more lock contention and deadlocks.



Subject-matter expert: Exception candidate investigation

```

BROWSE      FUW000.QADATA.FBOSP007.IMS.D131008.INDEX      Record 00000201 More: < >
Command ==>                                         Scroll ==> CSR
Navigate < 00.00.01.000000 >      Date/Time 2013-10-08 17.10.09.284086
/ Filtering _____      Tuesday 2013-10-08 LSN
-----
TX:CA01 IMS Transaction                                IMS-000000000021
UTC=17.10.09.284078 TranCode=FB0IAT41 Program=FB0IAP41 Userid=FUNTRM10
LTerm=FUNTRM10 Terminal=SC0TCP10 Region=0002
OrgUOWID=IDDG/CC1476B6713CB884 IMSRel=131
RecToken=IDDG/0000000400000000
CPU=45.699549 InputQ=0.000309 Process=72.612278 OutputQ=0.000356
TotalTm=72.612943 RegTyp=MPP
-----
CA01 IMS Transaction                                IMS-000000000025
UTC=17.15.19.060177 TranCode=FB0IAT41 Program=FB0IAP41 Userid=FUNTRM10
LTerm=FUNTRM10 Terminal=SC0TCP10 Region=0002
OrgUOWID=IDDG/CC1477DDDE2AF104 IMSRel=131
RecToken=IDDG/0000000600000000
CPU=11.512388 InputQ=0.000354 Process=18.105197 OutputQ=0.000039
TotalTm=18.105590 RegTyp=MPP
-----

```

This display has been filtered to show IMS x'CA01' Exception index records with excessive processing times. Use TX line command to show records related to a transaction

34

The next few slides are examples of how TAW displays the transaction life cycle. The foils are not related so you can see that TAW supports CICS, IMS, DB2, MQ, z/OS, and other instrumentation data. This is an example of looking at a set of IMS exception records. In this example a filter has been created that results in only those transaction exceptions that have exceeded .4 seconds being shown. You can adjust the filter to show transactions with greater and/or lower process times. Once you have determined a transaction you wish to evaluate by viewing the transactions lifecycle, you use the TX line command as shown against the exception entry. This results in the transactions lifecycle being displayed.

IMS/DB2 Transaction life cycle investigation


```

BROWSE FFW000.QADATA.FBOSP007.IMS.D131008.INDEX Record 00000201 More: < >
Command ==> Scroll ==> CSR
Navigate < 00.00.01.000000 > Date/Time 2013-10-08 17.10.09.284086
Tracking Tuesday 2013-10-08 Time (Elapsed)
CA01 IMS Transaction TranCode=FBOIAT41 Region=0002 0.000000
01 Input Message TranCode=FBOIAT41 0.000000
35 Input Message Enqueue TranCode=FBOIAT41 0.000023
08 Application Start TranCode=FBOIAT41 Region=0002 0.000256
5607 Start of UOR Program=FBOIAP41 Region=0002 0.000000
31 DLI GU TranCode=FBOIAT41 Region=0002 0.000022
5616 Start of protected UOW Region=0002 0.000189
5600 Sign-on to ESAF Region=0002 0.005896
5600 Thread created for ESAF 0.000012
112 Thread allocate FBOIAP41 DBA6 0.000572
073 Create thread end DBA6 0.000068
177 Package allocation FBOIAP41 DBA6 0.000227
233 SP entry FBOSP007 STMT=001031 DBA6 0.000234
380 SP entry FBOSP007 STMT=001031 DBA6 0.000023
177 Package allocation FBOSP007 DBA6 0.000184
061 SQL UPDATE STMT=000001 DBA6 0.000141
0020 Begin UR 0.001034
0600 Savepoint 0.000000
0600 Update in-place in a data page 0.000000
058 SQL UPDATE SQLCODE=0 STMT=000001 DBA6 0.000338
065 SQL OPEN C1 STMT=000001 DBA6 0.000090
058 SQL OPEN SQLCODE=0 STMT=000001 DBA6 0.000021
499 SP statement execution detail DBA6 0.000039
233 SP exit FBOSP007 SQLCODE=0 STMT=001031 DBA6 0.000016
380 SP exit FBOSP007 SQLCODE=0 STMT=001031 DBA6 0.000012
053 SQL request SQLCODE=466 STMT=001031 DBA6 0.000083
053 SQL request SQLCODE=0 STMT=001082 DBA6 0.000824
053 SQL request SQLCODE=0 STMT=001085 DBA6 0.000119
059 SQL FETCH C1 STMT=001090 DBA6 0.000107
0600 Savepoint 1.437546
35 0600 Savepoint 0.257680
0600 Savepoint 1.059456

```

1. Start tracking a transaction (here, a IMS transaction)
2. See the transaction life cycle events from the related logs (here, an IMS Index and log, SMF file, and a DB2 log), merged together with no preparation required
3. Notice the jump in elapsed time
4. In this case, the problem was caused by an inefficient table scan initiated by a DB2 stored procedure. A drill down of the DB2 trace was able to determine this.

This is an example of a transaction but in this instance it is a IMS/DB2 transaction. Note that the times shown in this example are elapsed from the beginning of the transaction. Using the elapsed time display, you can visually spot significant jumps in elapsed time that might indicate a delay in processing. This example is of a DB2 stored procedure spawned by a IMS transaction. Some of the trace events shown require some DB2 IFCID trace records that might not normally be collected by your installation. There is a tremendous amount of value to the information provided by the DB2 IFCID records but they can be so many that it is difficult to manually associate the ones that apply to a give transaction. TAW does this for you. When you track on a transaction using DB2 only the IFCID's for the transaction are shown in the life cycle view. This is what I meant in the earlier for that it is often easy to see where the delay occurred. It is not seen on this screen but TAW can also format the IMS internal traces for DLI Calls, Lock, Dispatcher, and other trace entries. If included in the instrumentation input, the lock entries are shown for the transaction in their relative position within the transactions life cycle.



Detail DB2 event data view using forms view

```

+029C Code... 058   SQL FETCH                               SQLCODE=0  STMT=001090 DBA6
+02A8 STCK... CC1476FBAF617906   LSN.... 000000000000049
Date... 2013-10-08 Tuesday   Time... 17.11.21.890327.563

+0000 SM102LEN... 03A6       SM102FLG... 1E       SM102RTY... 66
+0006 SM102TME... 005E6C9D   SM102DTE... 0113281F   SM102SID... 'FTS3'
+0012 SM102SSI... 'DBA6'       SM102STF... 0000

+0034 QW0058..... IFCID data
Package
Location... 'DB2ALOC'   Collection ID... 'FUNBOX'
+0056 Package name... 'FBOSP007'
+0068 Consistency token... 19718A5F136E9A24

+0072 SQLCA..... SQL communication area (SQLCA)
+0072 SQLCAID... 'SQLCA'   SQLCABC... +136       SQLCODE... +0
+0082 SQLERRML... +0       SQLERRM... '
+00CA SQLERRP... 'DSN'     SQLERRD1... +0       SQLERRD2... +0
+00DA SQLERRD3... +0       SQLERRD4... +4294967295
+00E2 SQLERRD5... +0       SQLERRD6... +0       SQLWARN0... '
+00EB SQLWARN1... '         SQLWARN2... '         SQLWARN3... '
+00EE SQLWARN4... '         SQLWARN5... '         SQLWARN6... '
+00F1 SQLWARN7... '         SQLWARN8... '         SQLWARN9... '
+00F4 SQLWARNA... '         SQLSTATE... '00000'

+00FC Statement number... +1090
+0106 Query command ID... 00000000
+010E Query instance ID... 00000000
+0116 Type of SQL request... 01

+0118 QW0058ID... Scan information
+0118 Scan type... !INDX! Rows processed... +1280799
+0128 Rows examined... +1595
+0130 Rows qualified after stage 1... +1275908
+0138 Rows qualified after stage 2... +1275908
+0140 Rows inserted... +0

```

Program statement number 1090 caused an index scan that processed 1,280,799 rows in the table

IBM Corporation

With literally 100's of individual instrumentation records supports, you will be able to see the content of the instrumentation record you are interested in. This is example of IFCID trace record type 58 contents. The record contents is displayed showing the DSECT name and the data contained in the record. Some of these records can be very large so in this case, a Form was created that displays only the fields within the record that you are interested in. You can create any number of forms for each individual record. You can change or turn forms on and off at will if you need to see a different set of fields or the entire record contents. In this example I have highlighted three fields that often contain useful information about the SQL call. First is the statement number, second is the scan type, and last is the number of rows processed by the SQL statement. All of these might be necessary when resolving and/or understanding how the individual SQL call is performing.

```

Zoom to see more detail about log record fields
File Menu Help
Field Zoom
BROWSE FJW000.QADATA.FBOSP007.IMS.D131008.INDEX + Line 00000000
Command ==> Scroll ==> CSR
*****
+0116 QW0058TOS... 01 Type of SQL request
On QW005801... 01 FETCH
Off QW005810... 10 INSERT
Off QW005811... 11 SELECT
Off QW005820... 20 UPDATE
Off QW005821... 21 UPDATE CURSOR
Off QW005830... 30 MERGE
Off QW005840... 40 DELETE
Off QW005841... 41 DELETE CURSOR
Off QW005850... 50 TRUNCATE
Off QW005880... 80 PREPARE
Off QW005881... 81 PREPARE CURSOR
Off QW005891... 91 OPEN
Off QW0058A1... A1 CLOSE
Off QW0058A0... A0 ALTER SEQUENCES
Off QW0058A2... A2 ALTER JAR

+00E2 SQLERRD5... +0 SQLERRD6... +0 SQLWARN0... ' '
+00E8 SQLWARN1... SQLWARN2... SQLWARN3... ' '
+00EE SQLWARN4... SQLWARN5... SQLWARN6... ' '
+00F1 SQLWARN7... SQLWARN8... SQLWARN9... ' '
+00F4 SQLSTATE... '00000'

+00FC State... +1090
+0106 Query... 00000000
+010E Query... 00000000
+0116 Type of SQL request... 01
+0118 QW0058ID... Scan information
+0118 Scan type... 'INDX' Rows processed... +1280799
+0128 Rows examined... +1595
+0130 Rows qualified after stage 1... +1275908
+0138 Rows qualified after stage 2... +1275908
+0140 Rows inserted... +0

```

37

When you are viewing the contents of a instrumentation record you might find a field that appears to contain interesting values but you might not know what the field represents. You can place the cursor in any DSECT name field of the record and by hitting enter key, you will be shown a 'Zoom' box display that contain additional information about the field and its contents. In this example, the field named 'Type of SQL request' contains a value of x'01'. In this case, the SQL request is a 'FETCH'. This can be a great teaching tool for the newer members of your team as well.

CICS/DB2 Transaction life cycle View

```

File Mode Filter Time Labels Options Help
FUWPRBRF GXH.FUW.JCH1.FUW745.UPDATE.CICS.EXTRACT Record 0000001 More: < >
Command ==> Scroll ==> CSR
Navigate < 00.05.00.000000 > Date/Time 2013-05-31 16.27.24.275202
/ Tracking Friday 2013-05-31 Time (Relative)
TX 6E13 CICS Transaction TranCode=FB66 Task=944 16.27.24.275202
  086 Signon start DBA6 +0.003469
  072 Create thread start DBA6 +0.003546
  112 Thread allocate DBA6 +0.003805
  073 Create thread end DBA6 +0.003830
  053 SQL DESCRIBE/COMMIT/ROLLBAC SQLCODE=0 STMT=000158 DBA6 +0.004096
  233 SP entry FBOSP006 STMT=000196 DBA6 +0.005104
  015 Index scan begin DBA6 +0.005874
  018 Scan end DBA6 +0.006097
  055 SQL set current SQLID DBA6 +0.006188
  053 SQL DESCRIBE/COMMIT/ROLLBAC SQLCODE=0 STMT=000281 DBA6 +0.006209
  060 SQL SELECT STMT=000344 DBA6 +0.006365
  017 Sequential scan begin DBA6 +0.006478
  006 Read I/O begin DBA6 +0.006582
  007 Read I/O end DBA6 +0.006950
  018 Scan end DBA6 +1.609979
  058 SQL call completion SQLCODE=0 STMT=000344 DBA6 +1.610035
  061 SQL UPDATE STMT=000423 DBA6 +1.610336
  017 Sequential scan begin DBA6 +1.610463
  0020 DB2 Unit of Recovery Control - Begin UR +1.610733
  0010 DB2 Savepoint +1.610733
  0020 DB2 Update In-Place in a Data Page +1.610749
  018 Scan end DBA6 +1.610771
  058 SQL call completion SQLCODE=0 STMT=000423 DBA6 +1.611141
  233 SP exit FBOSP006 SQLCODE=0 STMT=000196 DBA6 +1.611397
  053 SQL DESCRIBE/COMMIT/ROLLBAC SQLCODE=0 STMT=000196 DBA6 +1.611448

```

38

©2014 IBM Corporation

This is an example of a transaction but in this instance it is a CICS DB2 transaction. Note that the times shown in this example are relative from the beginning of the transaction. Using the relative time display, you can visually spot significant jumps in elapsed time that might indicate a delay in processing. This example is of a DB2 stored procedure spawned by a CICS transaction.


Conclusions

- **New Version evaluation can be an opportunity for feature exploitation and comparison early in the planning stage**
- **IMS Configuration Manager provides a guided approach for:**
 - Creating an inventory of your environment
 - Identifying areas of improvement
 - Validating parameters
 - Introducing resource changes in a version-agnostic process
 - Easier and quicker results if using the IMS Cloning tool
- **IMSPA and Transaction Analysis Workbench let you fix issues with new release**
 - Evaluate transaction performance at new release early in process
 - May provide justification due to TCO reduction for migration emphasis

We have covered a lot of things today with the perspective of release to release migration and how IBM tools can help. This is by no means a complete list of ways other tools might help. Also keep in mind that these tools can be used in your day to day workings with IMS and the job you do. One of the key things I hope to have accomplished is to show you how easy and quickly you can create an evaluation IMS system at the new release and provide a quick understanding of the benefits of migration to the new release.



Break for questions about every 20-30 minutes.



Contact Info:

james_martin@fundi.com.au

Jim_martin@fundi.com.au

RBisceglia@rocketsoftware.com

©2014 IBM Corporation

If you need more information or have questions later.



Thank
YOU



IMS 13

Leveraging IMS Tools to Migrate to and Deploy IMS 13

Information Management software

© 2014 IBM Corporation

Agenda

- **Challenges for IMS migration**
- **Opportunities for IMS migration**
- **How IMS Tools can help**
- **Example use cases**
- **Measuring the results**
- **Resolving Issues**

These are the things we are going to talk about today but I will focus mainly on how to build and test an evaluation system using IMS and IBM tools so that the best migration plan for your company can be achieved.

IMS Migration: overview

- **Often done for reasons other than new release features**
 - This can minimize the value of release migration
 - Might be seen as additional cost with little benefit
- **Initial migration is with few (if any) changes to IMS configuration**
 - Seen as lowest risk approach
 - Has worked many times in the past
- **Results:**
 - New release features are not used to their full advantage.
 - TCO improvements by IMS might not utilized

It is very common that the primary reason for migration is for IMS currency rather than the new function provided in the target release. Since there is no perceived advantage to the migration other than continued support, there is often little if any urgency to complete the migration. Couple that with the tendency to migrate without changing the current IMS system there is often a long time between the start of the migration process and the yielding of any benefits from the new release. If during the migration planning phase, the target IMS environment could be tested and evaluated easily, the potential for improved performance and TCO could be determined. An early look at the release quality and the potential value of new features could be assessed. The results of this early evaluation process might justify a more aggressive migration plan or it might indicate that the benefits of the new system do not justify any increased emphasis on the duration of the migration process. Most of you have done several migrations and have old processes to fall back on that you have confidence in and that work. Just as with most things, time and innovation usually creates better ways to accomplish things. I think that today's tools can help the migration process be done much quicker and easier. Once you have seen the success these tools can provide, you may find that these same tools are useful in maintaining your environments as you go forwards. Using them for test system creation and maintenance can simplify and reduce the time it takes to manage your test environments. With the reductions in staff sizes and experience, that is something we all should be looking for.

Inhibitors to Release Migration

- **Some changes are disruptive to existing processes**
 - For example, dynamic resource definition
- **Reliance on 3rd party tools that do not support the new IMS release**
- **Lack of understanding of the customer's own IMS environment**
- **Education and/or experience with new features**
 - Want to utilize the IMS CATALOG but have not implemented CSL for all their systems...

I do not think that I have to explain much of this chart to most of you. Most of you have gone through this and many of you more than once. The ability to easily and quickly create an evaluation system can provide significant benefits. If you have 3rd party tools, maybe a system without the tools can still be useful for the initial evaluation. It might allow evaluation of newer tools that **do** support the new release and or at least enable early performance and stability testing of the new release level. If it has been some time since the last migration, there may have been significant changes to your environments that are not well known. Using tools that automatically understand the source environments can save time during migration due to items not being missed during the migration process.

Release Migration Planning

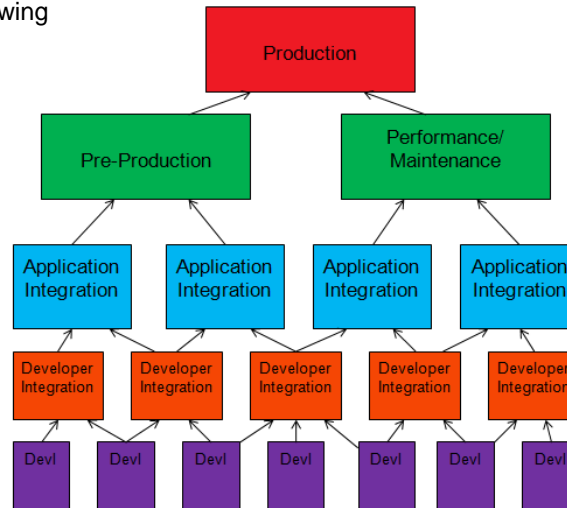
- **Early evaluation of new release features**
 - May identify TCO opportunities in new release
- **Use of tools to quickly create evaluation system**
 - IMS Cloning tool can quickly create a 'cloned' system
 - Includes data sets and databases
 - IMS Configuration Manager eases 'cloned system configuration'
 - copy parameter members to 'cloned' IMS system and add new release keywords and/or members
 - Copy resources and create updated modblks for 'cloned' system.

This slide shows how you can actually use the target IMS level to provide input into the migration planning process. Using the tools I will talk about, you can be running the new evaluation system in a matter of hours or days. Lets begin to see how this process can work.

Deployment is Always a Challenge

- Testing environments must support production stability while allowing for application changes
- Different testing levels need different environments
 - Environmental functionality/maintenance
 - Amount of data
 - Privacy
 - Other application dependencies


How do we keep test environments current?



IMS Configuration Manager can help

- **A structured process for managing IMS systems, their resources, and parameters**
- **A version agnostic approach to introducing changes**
- **Near-instant discovery of all the IMS systems and their parameter configuration**
- **Intelligent reporting on IMS parameters and resources**
- **Graphical user interface for managing systems**

I will discuss the IMS Cloning tool later in the presentation but here are some ideas in terms of how the IMS Configuration manager can help you in both the planning and creation of the evaluation system(s). An important part of the support provided by ICM is its agnostic approach to resource management. The tool is aware of the features and capability of each IMS release and so you can manage resources and proclib parameter members for several IMS systems at different IMS levels. That means that implementing resource definition at the evaluation systems level is easy, even if you need to add and/or change some of the resource definitions to take advantage of new IMS features. I know that we all think we know how many IMS systems and associated address spaces but often we are just close. Using ICM to discover all the IMS and related jobs such as IMS Connect can make the planning process much more accurate. I know that many of you are thinking, all I have to do is change my STEPLIBS and I am migrated. Maybe so, but to take advantage of new function that can yield benefits, you will actually need to migrate the systems sometime. In the old method, this is done after you have the release running on the current IMS systems. Especially for test systems, maybe it makes sense to do both the migration and release change at the same time.



Understanding your current environment

50

©2014 IBM Corporation

The first place to start might be to create a map of your current environment or at least the environment you need to migrate. That should give you an idea of the scope of the effort based upon how many IMS environments have to be converted.

- IMS Configuration maps an entire IMS topology in seconds

Empty member list

```

File  Help
-----
                        System Member List
Command ==> _____ Scroll ==> PAGE
Enter NEW to create a new Member

  Name      Type      IMSplex  VV.R  Description
  *         *         *       *   *
***** Bottom of data *****

```

```

VIEW      GPL210.DEVT.SGPLSAMP(GPLDSCVR) - 01.25
Command ==>
***** ***** Top of Data *****
000001 //GPLDSCVR JOB ,CLASS=A,NOTIFY=&SYSUID
000002 //GPLUTIL EXEC PGM=GPLUTIL
000003 //STEPLIB DD DISP=SHR,DSN=<HLQ.V2R1M0.SGPLLINK>
000004 // DD DISP=SHR,DSN=<HLQ.VnRnMn.SDFSRESL>
000005 //SYSIN DD *
000006 *
000007 DISCOVER TO(REPOSITORY,GPLREPOS)
000008 /*
000009 //GPLREPOS DD DISP=SHR,
000010 // DSN=<HLQ.V2R1M0.REPOSTRY>
000011 //SYSPRINT DD SYSOUT=*
000012 //
***** ***** Bottom of Data *****

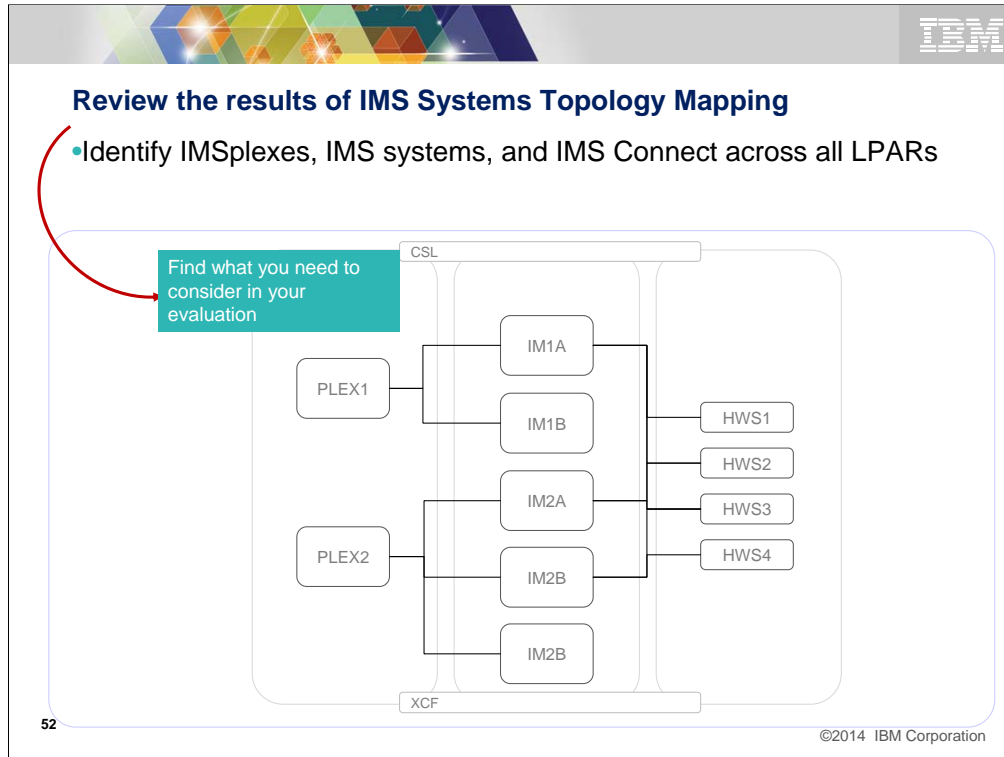
```

+ Discovery job

51

©2014 IBM Corporation

A well planned migration requires identifying the IMS systems that are to be upgraded: their version, and their IMS configuration. Once these systems are identified, it is then possible to plan and validate the migration itself. IMS Configuration Manager allows you to start with an empty repository and use a DISCOVER job or an AUTODISCOVER server parameter to populate all the IMS systems. Here we can see that we start with a blank repository and then run a DISCOVER job. The job requires no additional parameters to perform an extensive discovery of your environment, but you can optionally set parameters to limit discover to certain plexes, system types, or to perform discovery specifically for IMS systems that are **not** part of a plex.



The discovery process then finds all the IMSplexes registered to XCF and the associated IMS systems.

- The IMSplexes must be registered to XCF
- Discovery of the IMS systems relies on an OM and SCI for each plex being available on the LPAR on which the DISCOVER job (or server) is run

The discovery process will also identify all associated IMS Connect systems. These IMS Connect systems *may* be member of the plex. But they do not have to be: all that is required is a DATASTORE association between any discovered IMS and the IMS Connect.

Today the auto discovery feature facilitates IMS parameter management, but the ability to include mod blocks data during discovery is being considered.

```

File Help
-----
System Member List          Row 1 of 103 More: <>
Command ==>                Scroll ==> PAGE
Enter NEW to create a new Member

  Name      Type      IMSplex  VV.R  Description
  *         *         *         *         *
  /-----/
  CACTHWS0  IMSCON          *         10.1
  CDQ1SC    SCI          PLCDH          1.5
  DCH10D    ODBM          PLCDH          1.2
  DCJ10D    ODBM          PLCDJ          1.2
  DCJ10M    OM           PLCDJ          1.5
  DCJ20D    ODBM          PLCDJ          1.2
  DDH10M    OM           PLDDH          1.6
  DDJ10D    ODBM          PLDDJ          1.3
  DDJ10M    OM           PLDDJ          1.6

  IBDP      IMS          PLXDP          11.1
  IBDR      IMS          PLBDP          11.1
  ICDH      IMS          PLCDH          12.1
  ICDJ      IMS          PLCDJ          12.1
  ICDP      IMS          PLXDP          12.1
  ICDQ      IMS          PLDDQ          12.1
  ICDR      IMS          PLCDP          12.1
  ICMIC00   IMSCON          +3             12.1
  ICMIC01   IMSCON          12.1
  ICMIC02   IMSCON          PLXDP          13.1
  
```

The job itself typically takes no more than a couple of minutes to complete. At the end of the process IMS-related address spaces are mapped. Here, we can see the repository with the output of a DISCOVER job. It has found a number of IMSplexes across multiple MVS images and has mapped their IMS and IMS Connect address spaces, CSL address spaces, and the related PROCLIB settings for each of these systems.

Notice that in the case of IMS Connect, the discover job discovers systems that are not part of any plex (even if they relate to systems within a particular plex) and that it can also identify IMS Connect systems that serve multiple IMSplexes.

For IMS systems without a PLEX, you can run the DISCOVER job with the NOPLEX option. However, this type of discovery is restricted to the MVS image on which the job is executed.

Nevertheless, the result is likely to be a complete representation of even complex IMS environments and gives unique and instantaneous access to the active PROCLIB members for each of these systems.

```

Command ==> _____ IMSplex Active Members Row 1 of 35
Scroll ==> CSR

IMSpIex . . . : PLXDP
Search . . . _____

/ System      Prompt  Description
- - - - -
- - IMS
+ - IBDP
+ - IDDP
- - IMSCON
+ - ICMIC00
- - ICMIC02
  - HWSCFG02
  - BPECFG11
  - HWSEXIT1
- - ODBM
  - S3XDPOD
    - CSLDIPS3
    - CSLDCPS3
    - BPECFPLP
- - OM
  - S1XDPOM
    - CSLOIPS1
    - BPECFPLP
- - RM
+ - S1XDPRM
+ - S3XDPRM
- - SCI
+ - S1XDpsc
+ - S3XDpsc
- - REPO
  - S1XDPRP
    - FRPCFGS1
    - BPECFPLP

```

54

You can now use a “p” line action against any of the systems, or any of the plexes and view the PROCLIB members for any of those member types. But where it gets really interesting is when we start using the GUI to interrogate these objects. Remember that, through the Connection Server, both the GUI and ISPF can browse the same repositories. The main advantages of the ISPF – is the additional editing capabilities that it provides, including smart search, which lets you implement the features you want; the main advantages of the GUI is that it makes it easier to view and analyze configurations across plexes and that it provides better analytic capabilities including smart-compare (which we will look at in a minute), export configuration to a spreadsheet, as well as filtering, sorting, etc.... Let’s have a look at it now.

MBRLIST..ALL..ALL

Type: MBRLIST Show: ALL

IMSplex	MSID	MemberName	DataSetName	Libr...	Size	CreateDate	ChangeTimestamp	ChangeUserID	MemberType	Mes
IPOCX	OCS0	CQSP0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	9	2013-03-07	2013-05-01-07.31.47	NXU2	CQSP	
IPOCX	OCS0	CQSSG0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	14	2013-03-07	2013-05-01-08.07.23	NXU	CQSSG	
IPOCX	OCS0	DFSCG0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	7	2013-03-07	2013-05-01-07.05.26	NXU	DFSCG	
IPOCX	OCS0	DFSDC0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	10	2013-03-07	2013-03-07-12.45.03	AXW	DFSDC	
IPOCX	OCS0	DFSDSCMC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	66	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCM	
IPOCX	OCS0	DFSDSCTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	40	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCT	
IPOCX	OCS0	DFSPB0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	101	2013-03-07	2013-05-01-08.07.23	NXU	DFSPB	
IPOCX	OCS0	DFSSPM0C	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	5	2013-03-07	2013-03-07-12.45.05	AXW	DFSSPM	
IPOCX	OCS0	DFSSQ0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	1	2013-03-07	2013-05-01-08.07.23	NXU	DFSSQ	
IPOCX	OCS0	DFSVSMCT	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	15	2013-03-07	2013-03-07-12.45.06	AXW	DFSVSM	
IPOCX	OCS0	DFSYDTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	30	2013-03-07	2013-05-01-08.07.23	NXU	DFSYDT	
IPOCX	OCS0	OCS0C0D0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	2	2013-03-07	2013-05-01-08.19.54	NXU2	SSM	
IPOCX	OCS1	CQSP0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	9	2013-03-07	2013-05-01-07.31.47	NXU2	CQSP	
IPOCX	OCS1	CQSSG0C0	GPL210.QADATA.MAY2013.CSLPROC.04PREZ	1	14	2013-03-07	2013-05-01-08.07.23	NXU	CQSSG	
IPOCX	OCS1	DFSCG0C0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	7	2013-03-07	2013-05-01-07.05.26	NXU	DFSCG	
IPOCX	OCS1	DFSDC01C	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	10	2013-03-07	2013-03-07-12.45.03	AXW	DFSDC	
IPOCX	OCS1	DFSDSCMC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	66	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCM	
IPOCX	OCS1	DFSDSCTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	40	2013-03-07	2013-03-07-12.45.04	AXW	DFSDSCT	
IPOCX	OCS1	DFSPB01C	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	99	2013-03-07	2013-05-01-08.07.23	NXU	DFSPB	
IPOCX	OCS1	DFSSPM0C	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	5	2013-03-07	2013-03-07-12.45.05	AXW	DFSSPM	
IPOCX	OCS1	DFSSQ01C	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	1	2013-03-07	2013-05-01-08.07.23	NXU	DFSSQ	
IPOCX	OCS1	DFSVSMCT	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	15	2013-03-07	2013-03-07-12.45.06	AXW	DFSVSM	
IPOCX	OCS1	DFSYDTC	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	30	2013-03-07	2013-05-01-08.07.23	NXU	DFSYDT	
IPOCX	OCS1	OCS1C0D0	GPL210.QADATA.MAY2013.SYSPROC.04PREZ	2	2	2013-03-07	2013-05-01-08.20.09	NXU2	SSM	

55

©2014 IBM Corporation

Just like we just saw in the ISPF, the GUI lets you view the *active* PROCLIB members for the system. The difference is that the GUI makes it easy to look at configurations across a number of IMSplexes. A consolidated result set is available for all the repositories in the scope of all defined servers within a given client install instance.

The GUI is also able to provide context sensitive actions. For example, you can right-click a member to tabulate that particular PROCLIB's configuration. The tabulated form makes it easier to filter, export, and report on members, but perhaps the most powerful feature is compare...

Compare configuration across all plexes to make sure you are using the best system configuration for evaluation

Compare ...

Show Configuration

Hide Blank Columns

Show all Columns

MemberName	APPLD1	CPLOG	CSAPSB	CSLG	DBRCNM	DBWP	DC	DLPSB	DMB	DSCT	FBP	FRE	IRLM	LSO	LUMC	LUMP	MAXPST	OTMAASY	OTMANM	PINCR	PIMAX
DFSPB00M	IMABMS0	500K	4500K	OBA	ABS0XDRG	32	00M	15M	400	M	7M	1200	Y	S			990	S	IMABMS0	4	2000
DFSPB01M	IMABMS1	500K	4500K	OBA	ABS1XDRG	32	01M	15M	400	M	7M	1200	Y	S			990	S	IMABMS1	4	2000
DFSPB02M	IMABMS2	500K	4500K	OBA	ABS2XDRG	32	02M	15M	400	M	7M	1200	Y	S			990	S	IMABMS2	4	2000
DFSPB03M	IMABMS3	500K	4500K	OBA	ABS3XDRG	32	03M	15M	400	M	7H	1200	Y	S			990	S	IMABMS3	4	2000
DFSPB00H	IMHMS0	16M	2000	OSH	HSS0XDRG	28	00H	6000	400	H	400	1000	N	S			800	S	IMHMS0	4	2000
DFSPB01H	IMHMS1	16M	2000	OSH	HSS1XDRG	28	01H	6000	400	H	400	1000	N	S			800	S	IMHMS1	4	2000
DFSPB00C	IMOCMS0	16M	3500	OC0	OCS0XDRG	32	00C	500	100	C	3000	4000	N	S	50M	500M	400	S	IMOCMS0	4	8000
DFSPB01C	IMOCMS1	16M	3000	OC0	OCS1XDRG	32	01C	300	100	C	3000	4000	N	S			400	S	IMOCMS1	4	8000
DFSPB04C	IMOCMS4	16M	3000	OC0	OCS4XDRG	32	04C	300	100	C	3000	4000	N	S			400	S	IMOCMS4	4	8000
DFSPB05C	IMOCMS5	16M	3000	OC0	OCS5XDRG	32	05C	300	100	C	3000	4000	N	S			400	S	IMOCMS5	4	8000
DFSPB008	IMVHMS0	16M		OHV	VHS0XDRG		008				8	7H	9000				990	S	IMVHMS0		
DFSPB018	IMVHMS1	16M		OHV	VHS1XDRG		018				8	7M	9000				990	S	IMVHMS1		
DFSPB028	IMVHMS2	16M		OHV	VHS2XDRG		028				8	7M	9000				800	S	IMVHMS2		
DFSPB038	IMVHMS3	16M		OHV	VHS3XDRG		038				8	7M	9000				800	S	IMVHMS3		

Only show differences; only highlight significant differences

56
©2014 IBM Corporation

Compare provides an intelligent function that compares the values for the member and allows you to highlight significant differences. Crucially, the compare function actually understands the members it is comparing and is able to differentiate between spurious differences and significant differences. The above display compares rows within the same list and highlights cells with functional differences between two consecutive rows.

Executing the Migration Plan using IMS tools

Once we have created a complete migration plan or just an plan to create and evaluate the new target IMS release, we can use these tools to quickly execute the plan.

Stages of a Regular V2V Migration

▪ The Apply Process

- Applying the new release of IMS
- Applying vendor and home grown software upgrades needed to support the new release
- Activating new functionality

IMS System Skeleton
clone

▪ Application and Database testing

- Systems with a history of having issues during an upgrade
- Business critical systems
- Testing new functionality

IMS Database Refresh
clone

▪ New functionality

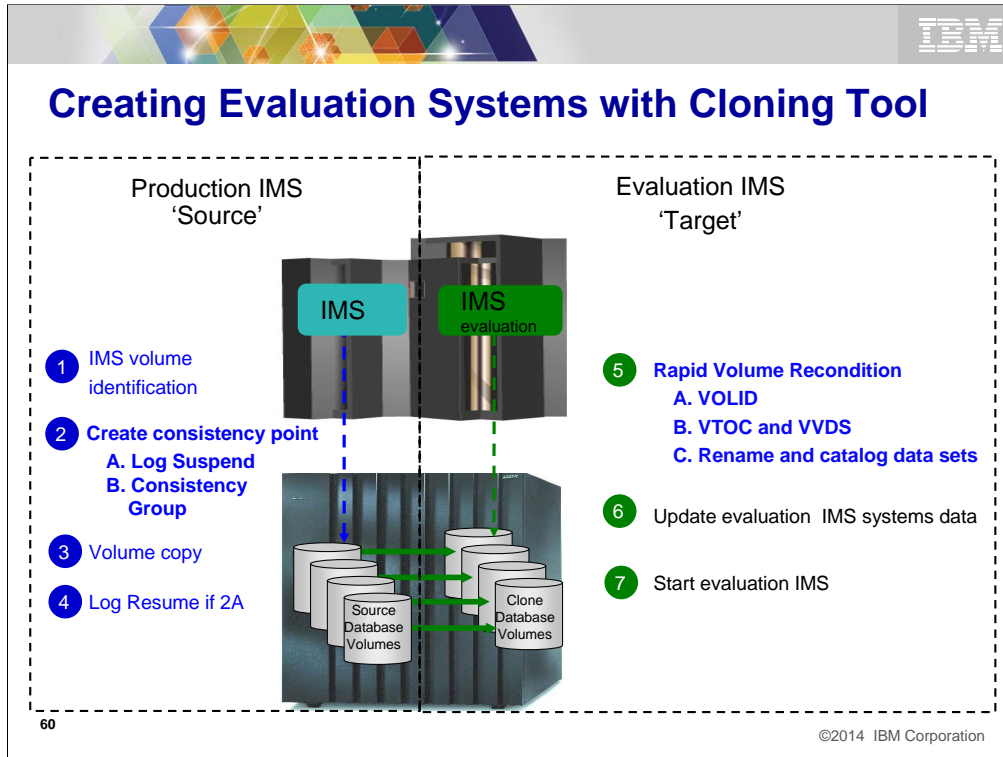
- Load level testing
- Performance statistics to push out new functionality

IMS Full System clone

IMS Cloning Tool Creates Evaluation Systems

- **Leverages Storage-based fast replication if available**
 - Large systems cloned in less than 30 minutes
- **If storage-based fast replication not available**
 - Cloning done using z/OS data movement tools
- **Resulting evaluation system after cloning**
 - The copied volumes updated for usability
 - Everything cloned RECON, PROCLIB, JOBS, MDA members – everything you need to bring up your cloned IMS
 - Databases are copied, underlying data sets renamed, DBRC updated

You start the process by cloning the IMS system that you wish to emulate as your evaluation system. If you have and can use storage-based fast replication the process is faster and maybe less disruptive than what I call the **standard** cloning process. Regardless of which method you use, the results are the same it just takes longer with the **standard** process. The final results is that you have an evaluation system that is ready for the final tailoring process.



This example shows cloning an existing production system using fast-replication capable hardware. It is not necessary to have or use fast-replication hardware to accomplish the cloning process but it makes it faster and less intrusive. If not using the fast-replication software, the source system must be inactive during the cloning process.

The left side of the slide represents the source IMS, in this case, a Production IMS system. The right side of the slide represents the target or cloned IMS system.

On the source,

Step 1 --- The disk volumes that make up the production IMS system are identified by using specific VOLSER IDs, VOLSER mask, or SMS storage group.

Step 2-4 ---To gain a static copy of your data and the source ICF catalog entries, there are several options:

a. IMS is up and the IMS log is suspended (this is proprietary code in IMS Cloning Tool and it works similar to DB2's log suspend.)

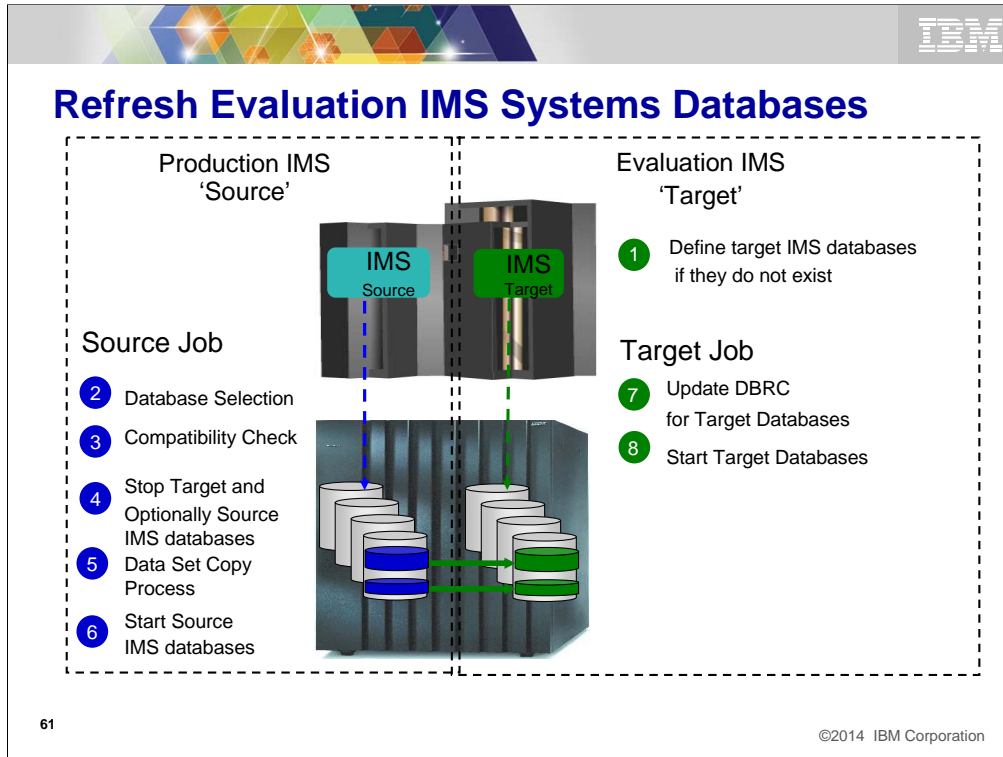
b. IMS is up and can use either IBM FlashCopy, FlashCopy Manager, or EMC consistency group support

---With either of these techniques, IMS Cloning Tool immediately invokes a DFSMSdss Copy to issue IBM FlashCopy or SnapShot commands to copy the data instantly and backs up the ICF catalogs that point to the data sets being copied.

---When cloning IMS systems that reside on EMC or Hitachi Storage Systems, an appropriate storage-based fast-replication process is performed before the IMS Cloning Tool cloning automation is invoked and a list of copied storage volumes is passed to IMS Cloning Tool for use in later processing steps.

---Once the copy is complete which is in seconds, IMS Cloning Tool can resume the source log. At this point, we are done using the production IMS system.

The following steps will be performed on the target or cloned IMS system shown on the right side of



This is just an example of the process that the Cloning tool uses to refresh the IMS databases that are needed for the new evaluation system that is created. If storage-based fast replication is available it is used, if not, traditional techniques are used to build the databases. The difference in the results is time not results. Either technique results in all the required databases being made available to the evaluation system.

The left side of the slide represents the source IMS, in this case, a Production IMS system. The right side of the slide represents the target IMS system – where you want to refresh the IMS data to.

Step 1 – is on the target side. The definitions need to exist in advance

Step 2 - The source databases to be refreshed are selected by database name. IMS Cloning Tool finds the IMS subsystem name and determines if it is active, then it finds the source and target databases and indexes (if the targets already exist), determines the data set names for each database and index and then verifies their existence

Step 3 - Checks are performed to ensure the characteristics of the source and target IMS databases are compatible. IMS Cloning Tool gets the attributes of the IMS databases and indexes from the source and target IMS RECON, ACBLIB, and MDALIB data sets. Some characteristics that are checked include: Type, Access Method, Number of segments, data set groups, Blocksize, Randomizer Parameters, etc.

Step 4 - The source and target databases are stopped (DBR commands automated). Optionally, the source databases can be copied while they are running to create a fuzzy copy. However, the fuzzy copy option does not guarantee transactional integrity on the refreshed copy.

Step 5 – Data sets are copied. For sites using FlashCopy or SnapShot, IMS Cloning Tool will invoke these copy facilities. For sites using EMC TimeFinder or Hitachi ShadowImage, IMS Cloning Tool will produce the output files describing source and target data set information so users can create their own data set fast-replication job streams.

Step 6 - The source IMS databases are started unless a fuzzy copy was specified in step four. The following steps will be performed on the target IMS system.

IMS System Skeleton Clone

- **IMS System Skeleton clone**
 - Clones an IMS system **without cloning any databases**
 - The replicated system is accessible and is usable in lieu of the original system **without requiring a system generation**
 - Contains all of the database and application definitions
 - Creates an IMS system to test the apply process

Update System Resource Definitions

- **Update definitions to new release specification**
 - Create Stage 1 out if Systems generation used
- **Activate DRD in evaluation IMS if needed**
 - Create System RDDS if DRD restart used for cold start
 - Import RDDS to IMS Catalog if Catalog used for cold start
- **If DRD active, resources can be changed using DRD if changes are needed**

Almost always you have to update your system resource definitions (i.e. MODBLOCKS) to the level of the new evaluation system. Using ICM you have several options on how you accomplish this. If you have the new system enabled for DRD, the quickest way to do this might be to just create system level RDDS datasets and cold start the evaluation system from these. That might remove the need to do a systems generation during initial evaluation system testing. If you need to activate DRD because your source system does not have it active, ICM will walk you through setting up the DRD environment for the parameter members that need to be changed to support. You have lots of options on how you make the new evaluation system capable of supporting the DRD environment.

File Help **Updating members for new release changes**

IMSPlex Members Row 5 of 56
 Command ==> _____ Scroll ==> CSR

IMSPlex . . . : PLXDP
 Description . :

Search . . V13 **Intelligent search for what is new in target release**

/ System	Prompt	Description
- IMSCON		
+ ICMIC00		
- ICMIC02		
- HWSCFG02		
- CICSAPPL=...		The Applid of the remote CICS system
- CICSNETID=...		The Network ID of the remote CICS system
...		
- PORT=(ID=30330,KEEP		
- PORT=(ID=30330,KEEP		
...		
- IMSPLEX (MEMBER=ICM		

- BPECFG11		
- CONDSRB=...		Conditional zIIP SRB option

- ODBM		
- S3XDPOD		
- CSLDCPS3		
- SOD=...		Output class for snap dumps
- **		<SECTION=GLOBAL_DATASTORE_CONFIGURATION>
- **		<SECTION=LOCAL_DATASTORE_CONFIGURATION>
- **		<SECTION=GLOBAL_DATASTORE_CONFIGURATION>

Insert new parameters straight into the right members

What is needed for CSL address spaces

64 ©2014 IBM Corporation

From the ISPF side, the capability of IMS Configuration Manager to support CSL member types and IMS Connect provides significantly more power to the existing intelligent search capabilities. For example, when you search for new V13 parameters for a particular PLEX, it will show you each PROCLIB with new parameters, that are applicable for each member identified in that PLEX. You can then select the PROCLIB for the appropriate member straight from the display and insert the new parameters.

Adding support for the new features you want using Semantic search

```

IMSplex . . . : PLXDP
Description . . :

Search . . ISC

```

Intelligent search for new feature

System	Prompt	Description
- ICDP	- DFSDC000	
	- ISCTCPIP=...	Defines an LU 6.1 via TCPIP link
	- RCVYSTSN=...	STSN recovery? Yes or No

- DFSDSCT0	- AUTLID=...	ISC other system half session qualifier
	- LCLICON=...	Local ICON that IMS communicates with via

- DFSHSB00	- LNK	Timing values for ISC link surveillance
	- SWITCH	Switch if a surveillance mechanism trigger

+ IDDP		
- IMSCON		
- ICMIC00	- HMSCFG00	
	- CICSAPPL=...	The Applid of the remote CICS system
	- CICSNETID=...	The Netork ID of the remote CICS system
....		
	- RESVSOC=...	The number of send sockets reserved for th
	- RMTICICS=...	Defines a TCP/IP connection to a remote IB
	- HWS (ID=ICMIC00,	Identifier
....		

Finds IMS Connect as well as IMS

Shows all parameters that are impacted

65 ©2014 IBM Corporation

The value of this is particularly apparent when you try to introduce new features that require changes to multiple members. You can see each member that is impacted by the given change in a single search and then proceed to implement your changes directly on each of those members.

IBM

Add the new feature parameters using MODEL function

```

File Edit Edit_Settings
EDIT      GPL000.QAAUTO.HWS.PROCLIB(HWSCFG00) - 01.25      Columns 00001 00072
Command ==> MODEL                                         Scroll ==> CSR
CHECK Validate the member syntax
MODEL Insert a new parameter with syntax assistance
HELP Press F1 to request parameter sensitive help
***** ***** Top of Data *****
000001 *-----*
000002 * - HWS CONFIGURATION MEMBER FOR ICMIC00
000003 *-----*
000004 HWS (ID=ICMIC00,
----- Select a parameter -----
Row 1 to 11 of 11
Command ==> _____
Select one or more parameters then press EXIT.

Parameter      Description
. ADAPTER       Characteristics of adapters used
. DATASTORE   Defines connections to IMS systems
. HWS           Defines IMS
. IMSPLEX       Defines the
. * ISC         Defines ISC link between local IMS and remote C
. MSC           Defines MSC link between IMS systems
. ODACCESS     Communication between ODBM, DRDA clients
. * RMTICICS    Defines a TCP/IP connection to a remote IBM CIC
. RMTIMSCON    Defines a TCP/IP connection to a remote IMS Con
. RUNOPTS      Language Environment (LE) runtime options
. TCPIP        Defines IMS Connect characteristics
***** Bottom of data *****
66 A00029 IMSPLEX=(MEMBER=ICMI00DP,TMEMBER=PLXDP))

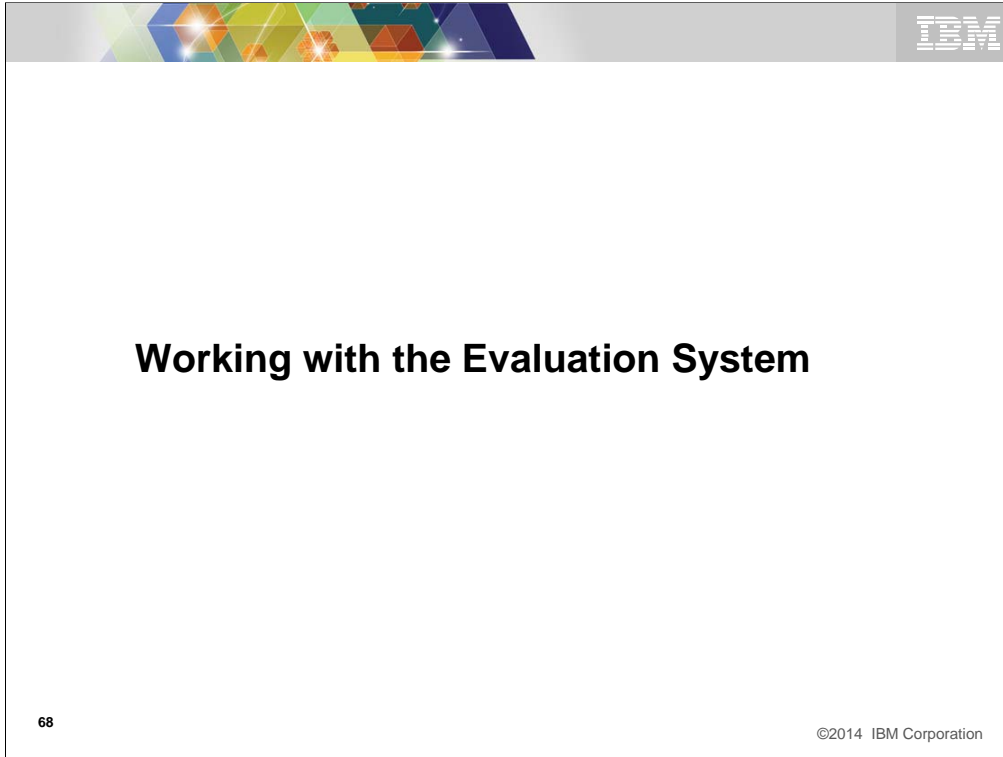
```

When you select a member you can edit it, just like in ISPF edit but with a few significant enhancements that aid version-to-version migration. The first is the MODEL function, that allows you to insert a basic template for the new parameters, and the second is the CHECK function which will validate the member based on the rules that are appropriate for the given version of the member. Hence you can validate the member both as a “Version Previous” member and as a “Version Next” member, simply by altering the IMS version.

IMS System Skeleton Clone

▪ Activating/Testing New Functionality

- IMS Connect Enhancements
- Synchronous Program Switch
- IMS to CICS via ISC over TCP/IP
- OTMA Early Termination Support
- Java Dependent Region use of External Subsystem Attach Facility
- User Exit Enhancements
 - Refreshable user exits
 - Security user exit removed from IMS Nucleus
 - New exit for IMS Monitor
- RECON
 - Coexistence
 - Changing the MINVERS



Working with the Evaluation System

68

©2014 IBM Corporation

Once we have created a complete migration plan or just an plan to create and evaluate the new target IMS release, we can use these tools to quickly execute the plan.


IMS System Skeleton Clone Plus IMS Database Refresh Clone

▪ IMS Database Refresh clone

- Refreshes specific databases
- The act of replicating the data, making the replica accessible, and then using the replica in lieu of the original data
- Copies by data set
- If you refresh into a System Skeleton Clone
 - All the database and application definitions will exist
 - All the ACB's, PSBs, and DBDs will exist
 - MDA and RECON will be conditioned

IMS System Skeleton Clone Plus IMS Database Refresh Clone

- **Test new functionality**
 - HALDB Alter
 - DEDB Alter
 - Database Versioning
 - Native SQL for COBOL
 - Further test your TM enhancements
 - Test your system enhancements
 - .NET access to IMS DB
 - Open DB Use of Native SQL Engine



Evaluate Impact of IMS 13

71

©2014 IBM Corporation

Once we have created a complete migration plan or just an plan to create and evaluate the new target IMS release, we can use these tools to quickly execute the plan.

Full System Clone

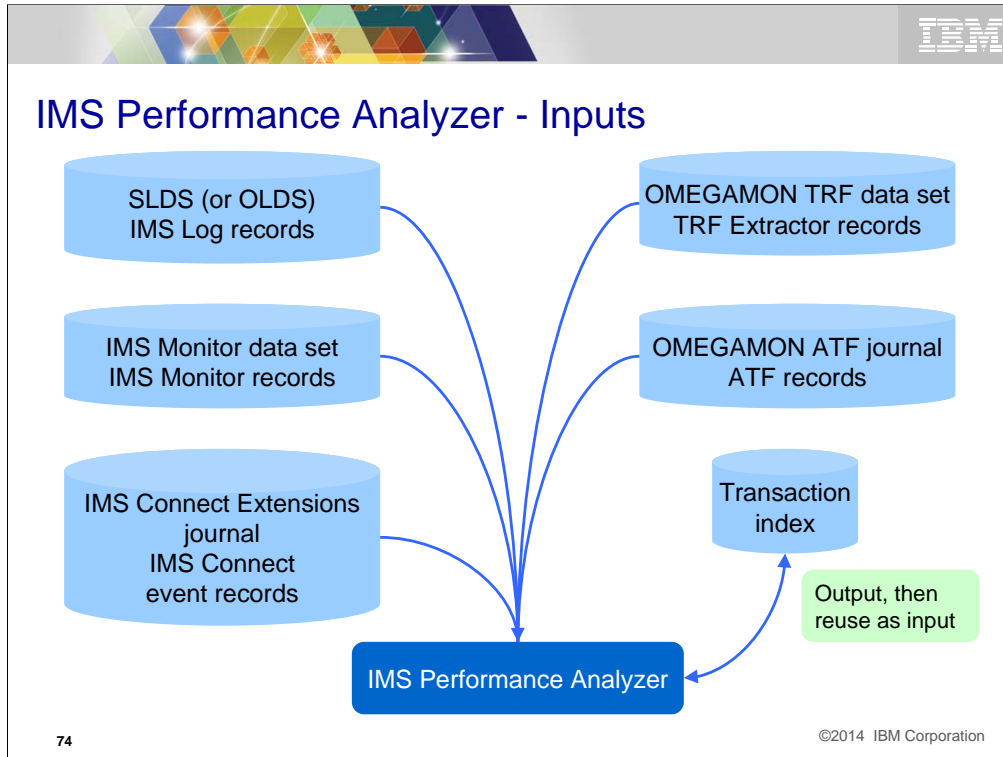
- **IMS Full System clone**

- Clones a complete IMS system including all its databases
- The act of replicating the data, making the replica accessible, and then using the replica in lieu of the original data *without requiring a system generation*
- *Less than 30 minutes average when using Fast Replication*

We have covered a lot of things today with the perspective of release to release migration and how IBM tools can help. This is by no means a complete list of ways other tools might help. Also keep in mind that these tools can be used in your day to day workings with IMS and the job you do. One of the key things I hope to have accomplished is to show you how easy and quickly you can create an evaluation IMS system at the new release and provide a quick understanding of the benefits of migration to the new release.

Full System Clone

- **Load testing and performance testing**
 - MAXPST increase to 4095
 - Log Latch Reduction
 - Type 47 Log Record Restructure
 - Support for more databases with uncommitted updates during system checkpoint
 - Improved Performance and Reduced TCO
 - QCF (Queue Control Facility)
 - IMS Performance Analyzer



This foil shows some of the instrumentation sources that IMSPA accepts as input. In some cases the type of input can limit the types of reports and/or fields that are available for use with Forms Based Reports. Let me draw your attention to the Transaction Index. This is a special output file of IMSPA that contains all of the transit data for every transaction found on the input logs (i.e. SLDS). Once created, we will see how it can be used with the IMS Problem investigator (IMSPI). The transaction index can also be used as input to additional transit and Forms Based reports thereby eliminating processing the original SLDS over and over. We will see a foil later that shows the benefit of using the transaction index as input to additional reporting.

A recent addition to IMSPA input data is the OMEGAMON ATF journal records. IMSPA provides specialized processing for ATF journal records that can create an Exception Transaction extract (in VSAM KSDS journal format), which you can later reuse as input to IMS PA in a similar but more efficient way to the original ATF journals.

Performance Comparison between Versions

Trancode	Proc Vers	Tran Count	Avg InputQ Time	Avg Process Time	Avg CPU Time	Avg OutputQ Time	Avg Total IMS Time	Avg IMS Resp Time	Avg DB Get Count	Avg DB Updat Count	Avg DB Wait Count	Avg DC Call Count
ACCOUNT	1210	167	0	345	30	0	345	341	14	135	0	3
	1310	178	0	356	31	0	356	347	14	135	0	3
BALANCE	1210	273	0	93	8	0	93	99	11	42	0	4
	1310	298	0	97	9	0	97	101	11	42	0	4
INVOICE	1210	546	0	174	43	0	174	182	710	67	0	4
	1310	563	0	177	45	0	177	185	710	67	0	4
LOGON	1210	444	0	274	9	0	274	282	14	40	0	3
	1310	423	0	281	11	0	281	287	14	40	0	3
MENU	1210	165035	6	134	16	0	140	84	50	0	0	1
	1310	167381	7	145	19	0	152	85	50	0	0	1
ORDER	1210	342	0	258	10	0	259	266	38	42	0	3
	1310	376	0	263	11	0	263	269	38	42	0	3
STOCK	1210	272	0	155	33	0	156	171	408	38	0	3
	1310	298	0	134	37	0	134	162				
WITHDRAW	1210	134	0	175	9	0	175	184				
	1310	156	0	182	11	0	182	191				

STOCK Transaction
9ms faster response
time

IMS PA allows you to quickly see on a transaction basis the results of the new run compared to the old one. You create this report by including logs from both level systems. For this example, you would want IMS logs from the same application testing runs. One set of logs from each application test.

IMS Performance Analyzer - Non-“transit” reports

- **Resource Usage & Availability**
 - Dashboard
 - Management Exception
 - Transaction Resource Usage
 - Resource Availability
 - CPU Usage
 - Internal Resource Usage
 - MSC Link Statistics
 - Message Queue Utilization
 - Database Update Activity
 - Region Histogram
 - OSAM Sequential Buffering
 - Deadlock
 - System Checkpoint
 - BMP Checkpoint
 - Gap Analysis
 - Cold Start Analysis
- **Fast Path Resource Usage**
 - Resource Usage & Contention
 - Database Call Statistics
 - IFP Region Occupancy
 - EMH Message Statistics
 - DEDB Update Activity
 - VSO Statistics
- **Trace**
 - DC Queue Manager Trace
 - Database Trace (Full Function)
 - DEDB Update Trace
 - ESAF Trace

This foil shows a summary of many of the reports that you can obtain using IMSPA. Many are not transit reports but report on IMS resource consumption and/or behavior such as BMP Checkpoint or Deadlocks. A couple of new reports analyze how your system would be impacted if an unplanned Cold Start was needed following an IMS abend. You can see the databases that have to be backed out or recovered as well as how many messages will be lost from the message Q. Another interesting new report is the Gap Analysis. It looks at the SLDS and find gaps that exceed your specified time interval. Gaps between log records on today's systems are usually rare and often caused by some external factor such a coupling facility failure, system dump, etc.

Fixing problems in evaluation system using Transaction Analysis Workbench for z/OS

©2014 IBM Corporation

If there are issues with the evaluation system, you need to be able to find out what they are and fix them as easily and quickly as possible. The next slide show how you can use the IBM Transaction Analysis Workbench for this purpose.

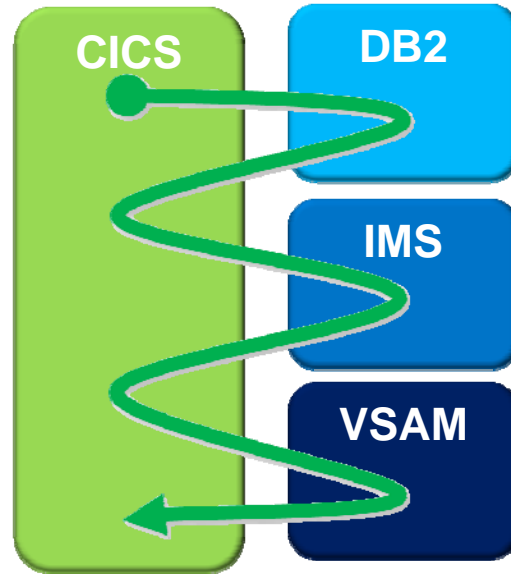
Create Exception Index to identify problems

- **The exception index will identify transaction that need to be investigated**
 - Exceptions index entries can be built for
 - Transactions that abended
 - Transactions that exceeded a specified elapsed time
- **You probably want to know if any transactions abended as this might show a major issue**
- **Then you can see if there are performance issues**

One of the first things you might do is to use the exception process of TAW to process the log data from the application tests to see immediately where you stand compared to the same application runs using the current level IMS system. The exception process can identify from the IMS logs any transactions that either abended and/or exceeded your specified response time criteria. This process will break down all the transactions that executed into only those that might need additional investigation. Once the exception index is created, you can filter its contents many ways to find the transactions you want to investigate. For example, if you find a transaction that abended U3303 (i.e. deadlock), you might create a filter to see how many transactions abended with a U3303 abend. Maybe the changed performance of the new release has exposed an application issue that allows for more lock contention and deadlocks.

Where did the delay occur?

- A single transaction can have activity across many subsystems
- To quickly identify performance issues, you need to track the entire transaction
- Subsystem-specific approaches and tools offer a limited perspective
- Each subsystem has its own activity log and SMF records



79

©2014 IBM Corporation

With the complexity of modern transactions, one of the first things we need to do when evaluating a transaction is find out what the transactions lifecycle looks like and where within the lifecycle the delay is occurring. That is one of the things that the IBM Transaction Analysis Workbench provides. It uses instrumentation data from all involved transaction managers and database subsystems to show the life cycle in terms of events with either the time between events or the event time relative to a point within the transactions life cycle.

Subject-matter expert: Exception candidate investigation

File	Mode	Filter	Time	Labels	Options	Help
BROWSE	IMPOT01.SESSION7.TRANIX +				Record 00004609	More: < >
Command	===>				Scroll ===>	CSR
Slice	.	Duration	00.03.00	Date	2012-06-24	Time 16.31.00.000000
Code	Description	<	00.05.00.000000	>	2012-06-24 Thursday	Time (LOCAL)
TX	CA01	Transaction				16.33.33.575325
		UTC=16.33.33.575316	TranCode=MQATREQ1	Program=MQATPGM	Userid=FUNTRM15	
		LTerm=FUNTRM15	Terminal=SC0TCP15	Region=0004		
		OrgUOWID=IADG/C62D2CB467860940	IMSID=IADG	IMSRel=101		
		RecToken=IADG/0000003600000000				
		CPU=0.041999	InputQ=0.000562	Process=0.497229		
		TotalTm=0.497791	RegTyp=MPP	DBCalls=5		
—	CA01	Transaction				16.33.59.157812
		UTC=16.33.59.157802	TranCode=MQATREQ1	Program=MQATPGM	Userid=FUNTRM15	
		LTerm=FUNTRM15	Terminal=SC0TCP15	Region=0004		
		OrgUOWID=IADG/C62D2CCCCD3E6F81	IMSID=IADG	IMSRel=101		
		RecToken=IADG/0000003A00000000				
		CPU=0.013980	InputQ=0.000543	Process=0.424378		
		TotalTm=0.424921	RegTyp=MPP			
—	CA01	Transaction				16.34.30.389305

This display has been filtered to show IMS transaction index (CA01) records with a process time of greater than 0.4 seconds. Enter TX to show records related to a transaction

The next few slides are examples of how TAW displays the transaction life cycle. The foils are not related so you can see that TAW supports CICS, IMS, DB2, MQ, z/OS, and other instrumentation data. This is an example of looking at a set of IMS exception records. In this example a filter has been created that results in only those transaction exceptions that have exceeded .4 seconds being shown. You can adjust the filter to show transactions with greater and/or lower process times. Once you have determined a transaction you wish to evaluate by viewing the transactions lifecycle, you use the TX line command as shown against the exception entry. This results in the transactions lifecycle being displayed.

Transaction life cycle investigation

File	Mode	Filter	Time	Labels	Options	Help
FUWPRBRF	GXH.FUW.JCH1.FUW745.UPDATE.CICS.EXTRACT		Record 00000001	More: < >		
Command ==> Scroll ==> CSR						
Navigate < 00.05.00.000000 > Date/Time 2013-05-31 16.27.24.275202						
/ Tracking Friday 2013-05-31 Time (Relative)						
TX	6E13	CICS Transaction TranCode=FB66 Task=944				16.27.24.275202
—	086	Signon start		DBA6		+0.003469
—	072	Create thread start		DBA6		+0.003546
—	112	Thread allocate		DBA6		+0.003805
—	073	Create thread end		DBA6		+0.003830
—	053	SQL DESCRIBE/COMMIT/ROLLBAC SQLCODE=0 STMT=000158		DBA6		+0.004096
—	233	SP entry FBOSP006 STMT=000196		DBA6		+0.005104
—	015	Index scan begin		DBA6		+0.005874
—	018	Scan end		DBA6		+0.006097
—	055	SQL set current SQLID		DBA6		+0.006188
—	053	SQL DESCRIBE/COMMIT/ROLLBAC SQLCODE=0 STMT=000281		DBA6		+0.006209
—	060	SQL SELECT STMT=000344		DBA6		+0.006365
—	017	Sequential scan begin		DBA6		+0.006478
—	006	Read I/O begin		DBA6		+0.006582
—	007	Read I/O end		DBA6		+0.006950
—	018	Scan end		DBA6		+1.609979
—	058	SQL call completion SQLCODE=0 STMT=000344		DBA6		+1.610035
—	061	SQL UPDATE STMT=000423		DBA6		+1.610336
—	017	Sequential scan begin		DBA6		+1.610463
—	0020	DB2 Unit of Recovery Control - Begin UR				+1.610733
—	0010	DB2 Savepoint				+1.610733
—	0020	DB2 Update In-Place in a Data Page				+1.610749
—	018	Scan end		DBA6		+1.610771
—	058	SQL call completion SQLCODE=0 STMT=000423		DBA6		+1.611141
—	233	SP exit FBOSP006 SQLCODE=0 STMT=000196		DBA6		+1.611397
—	053	SQL DESCRIBE/COMMIT/ROLLBAC SQLCODE=0 STMT=000196		DBA6		+1.611448

1. Start tracking a transaction (here, a CICS transaction)
2. See the transaction life cycle events from the related logs (here, an SMF file and a DB2 log), merged together with no preparation required
3. Notice the jump in elapsed time
4. In this case, the problem was caused by a table scan in a DB2 stored procedure.

A drill down of the DB2 trace was able to determine this.

81

©2014 IBM Corporation

This is an example of a transaction but in this instance it is a CICS DB2 transaction. Note that the times shown in this example are relative from the beginning of the transaction. Using the relative time display, you can visually spot significant jumps in elapsed time that might indicate a delay in processing. This example is of a DB2 stored procedure spawned by a CICS transaction. Some of the trace events shown require some DB2 IFCID trace records that might not normally be collected by your installation. There is a tremendous amount of value to the information provided by the DB2 IFCID records but they can be so many that it is difficult to manually associate the ones that apply to a give transaction. TAW does this for you. When you track on a transaction using DB2 only the IFCID's for the transaction are shown in the life cycle view. This is what I meant in the earlier for that it is often easy to see where the delay occurred. It is not seen on this screen but TAW can also format the IMS internal traces for DLI Calls, Lock, Dispatcher, and other trace entries. If included in the instrumentation input, the lock entries are shown for the transaction in their relative position within the transactions life cycle.

Detail DB2 event data view using forms view

```

+018C Code... 058   SQL Call completion           RC=0000 STMT=002896 DBA6
+0198 Date... 2012-11-21 Wednesday Time... 17.40.04.013647.813

Package
+0034 Location..... 'DB2ALOC'           Collection ID..... 'CSQ5L710'
+0056 Package name... 'CSQ5L710'       Consistency token... 193153A81425EA00

+0072 SQLCA..... SQL communication area (SQLCA)
+0072 SQLCAID.... 'SQLCA'   SQLCABC.... +136   SQLCODE.... +0
+0082 SQLERRML... +0       SQLERRM.... ' '
+00CA SQLERRP.... 'DSN'     SQLERRD1... +0       SQLERRD2... +0
+00DA SQLERRD3... +0       SQLERRD4... FFFFFFFF SQLERRD5... +0
+00E6 SQLERRD6... +0       SQLWARN0... ' '       SQLWARN1... 'N'
+00EC SQLWARN2... ' '       SQLWARN3... ' '       SQLWARN4... ' '
+00EF SQLWARN5... '1'       SQLWARN6... ' '       SQLWARN7... ' '
+00F2 SQLWARN8... ' '       SQLWARN9... ' '       SQLSTATE... '000

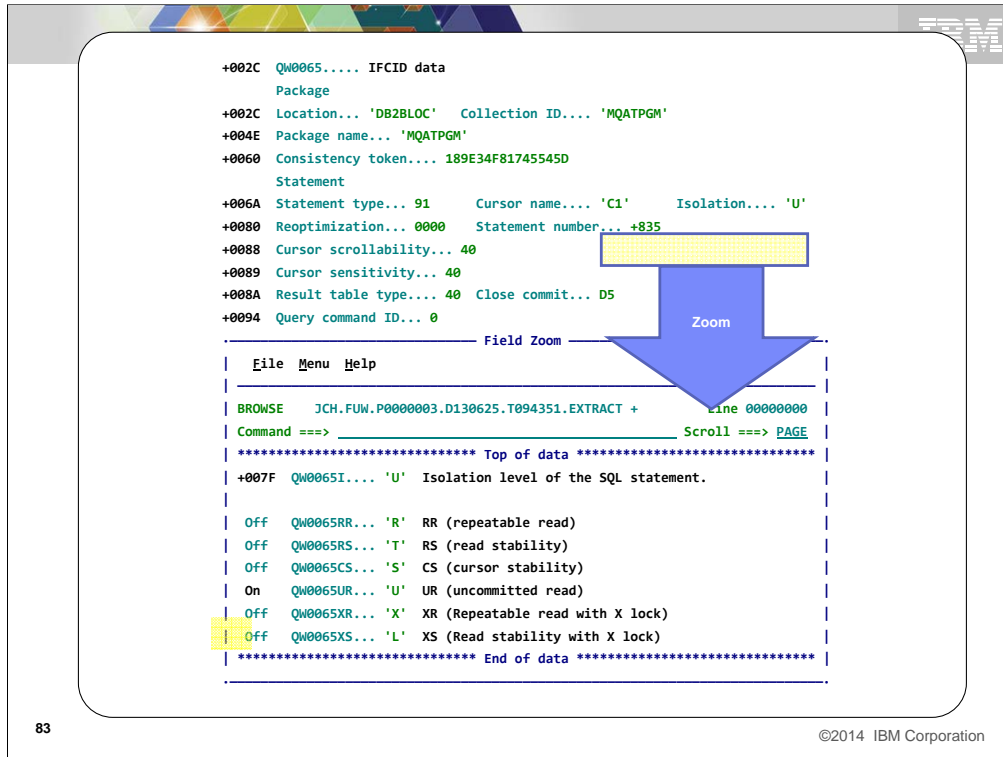
+00FC Statement number... +2896
+0106 Query command ID... 00000000   Query instance ID... 00000000

+0118 QM0058ID... Scantype
+0118 Data type.... 'INDX' Rows processed... +234   Rows examined.... +12
+012C Rows qualified... +7   After stage 1... +4   After stage 2.... +3
+0140 Rows inserted.... +17  Rows updated.... +12   Rows deleted..... +24
+0158 Pages scanned.... +76

```

Program statement number 2896 caused an index scan that processed 234 rows in the table

With literally 100's of individual instrumentation records supports, you will be able to see the content of the instrumentation record you are interested in. This is example of IFCID trace record type 58 contents. The record contents is displayed showing the DSECT name and the data contained in the record. Some of these records can be very large so in this case, a Form was created that displays only the fields within the record that you are interested in. You can create any number of forms for each individual record. You can change or turn forms on and off at will if you need to see a different set of fields or the entire record contents. In this example I have highlighted two fields that often contain useful information about the SQL call. One is the statement number and the other is the number of rows processed by the SQL statement. Both of these might be necessary to resolve and/or understand how the individual SQL call is performing.



When you are viewing the contents of a instrumentation record you might find a field that appears to contain interesting values but you might not know what the field represents. You can place the cursor in any DSECT name field of the record and by hitting enter key, you will be shown a 'Zoom' box display that contain additional information about the field and its contents. In this example, the field named 'Isolation' contains a value of 'U'. The zoom box display tells you that the field represents the Isolation level of the SQL statement. In this case, the Isolation level is uncommitted read. This can be a great teaching tool for the newer members of your team as well.

Conclusions

- **New Version evaluation can be an opportunity for feature exploitation and comparison early in the planning stage**
- **IMS Configuration Manager provides a guided approach for managing and implementing changes for new IMS versions**
- **IMS Cloning Tool automates creating of testing environments to aid in implementation and deployment processes**
- **IMSPA and Transaction Analysis Workbench lets you fix issues with new release**
- **Evaluate transaction performance at new release early in process**
 - May provide justification due to TCO reduction for migration emphasis

We have covered a lot of things today with the perspective of release to release migration and how IBM tools can help. This is by no means a complete list of ways other tools might help. Also keep in mind that these tools can be used in your day to day workings with IMS and the job you do. One of the key things I hope to have accomplished is to show you how easy and quickly you can create an evaluation IMS system at the new release and provide a quick understanding of the benefits of migration to the new release.



Break for questions about every 20-30 minutes.



Thank
YOU