

# “What changed? Managing client/data server configurations during DB2 for z/OS migrations”

Using Optim Configuration Manager for DB2 on z/OS  
during migrations and beyond

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# Agenda

- **Introduction**
  
- **DB2 for z/OS Migration**
  - Overview
  - Use cases and common pain-points
  
- **InfoSphere Optim Configuration Manager (OCM)**
  - Feature Summary and Architecture
  - Features Useful Before/During Migration
  - Features Useful After Migration



## Migration overview

- **DB2 migration process comprises three progressive catalog levels**
  1. Conversion mode
  2. Enabling-new-function mode
  3. New-function mode
- Until in new-function mode, DRDA protocols don't change
- DRDA protocols don't revert back to the previous level even if you revert back to conversion mode\*
- Until the group is in new-function mode, Sysplex aware clients are not aware of members who have moved to conversion mode



## Migration use-case 1

- **DB2 10 extended support for implicit casting**
  - Capability implicitly enabled when DB2 is in new-function mode.
  - Statements started to fail causing an application outage
    - The cause is the application is passing an empty string or a string that contains all blank characters but the target has a numeric SQL type.
  - Implicit casting function detects the data mismatch and returns a -420 which was previously reported as a -301 in conversion mode
  - However, the .net application successfully executed the statements when accessing the previous version of DB2
  - .Net driver replays data type mismatches when -301 error detected by issuing a describe and then casting the data type before sending to DB2
  - Optim Configuration Manager can perform client property change as a work around on problems introduced by migration



## Migration use-case 2

- **DB2 10 new system parameters to manage inbound requests**
  - New parameters available in conversion mode
  - Previous DB2 version required low connection limits to prevent runaway application from consuming all threads
  - Low connection limits prevent workload Sysplex work load balancing from efficiently Managing connections causing connection storms when demand exceeds limit
  - However, client properties prevent Sysplex workload balancing from fully exploiting transport pools these new controls after migrating to DB2 10
  - Require client property changes to exploit new DB2 system parameters



## Migration use-case 3

- **DB2 10 new application profiling support**
  - Provides more granular ways to set limits to applications accessing DB2
  - Can set individual connection, thread limits, idle thread timeout per application
  - Requires setting up a profile for each application server on DB2
  - Exploitation requires Managing client info fields used to define a profile on each application server



## Migration use-case 4

- **After migrating to a new version start reviewing your client inventory and look into upgrading your clients in order to exploit new and existing features**
  1. Review your gateways configurations
    - Look into moving applications of gateway configurations
  2. Review clients out of service
  3. Review HA clients who have not enabled Sysplex features
  4. Review client properties that impact scalability
  5. Review the use of location alias to subset work across the sysplex
  6. Review WLM classification used to classify work
- **Optim Configuration Manager can help you understand your remote applications in order to achieve the most out of DB2**



# InfoSphere Optim Configuration Manager for DB2 on z/OS





## Optim Configuration Manager (OCM)

- **What is Optim Configuration Manager?**
- **Useful Features Before/During Migration**
  - Understand your client and server environment
  - Create a baseline snapshot of client/server properties
  - Build an inventory of clients eligible for upgrade
- **Useful Features After Migration**
  - Compare migrated server with baseline snapshot
  - Compare migrated clients, including drivers
  - Enforce best practices configuration settings for clients
  - Knobs to deal with Application issues
    - Throttle, Penalty Box, Application Profiles
  - Redirect clients – a special case of migration



## Optim Configuration Manager – Feature summary

### Understand Your Environment

- **Explore** client and database server properties
- **Create** a baseline inventory of clients for upgrades

### Solve Problems Faster

- **Prevent** problems by scheduling configuration compare jobs that issue Alerts for differences
  - Keep configurations in synch
- **Debug** problems faster by reviewing recent changes made to client or server configurations

### Control Clients (JCC, CLI, .NET)

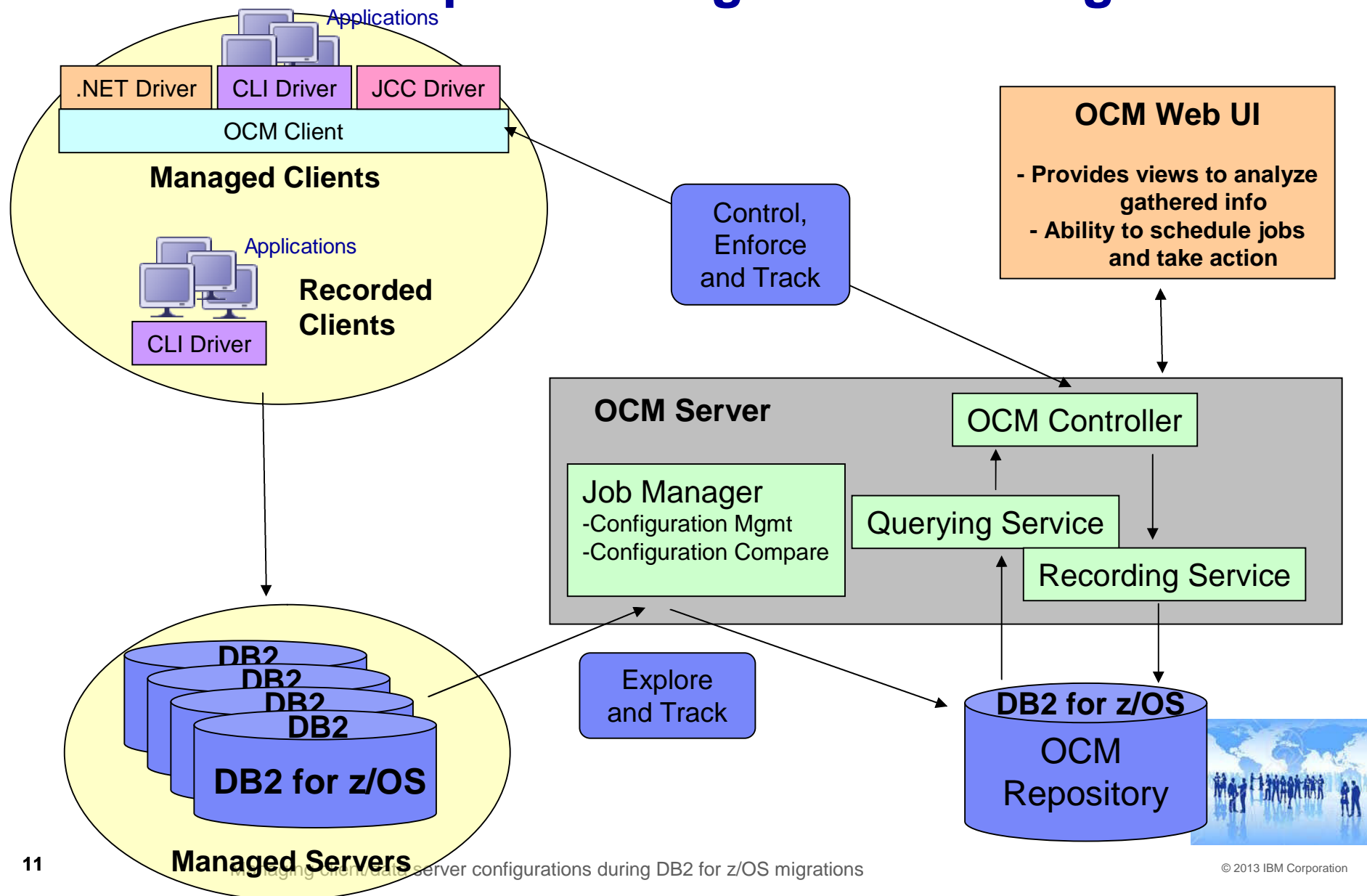
- **Isolate/Throttle** “rogue” Apps to limit impact on the SYSPLEX
- **Enforce** best practices configuration – WLM, WLB, WAS Pool or any driver, data source, special register settings
- **Redirect** client connections for high availability or staged roll-out

*Note: With OCM client install*

### Centrally Manage Entire DB2 z/OS Environment

- **Deploy** Location Aliases or Application Profiles with DB2 for z/OS v10
- **Define** zParms with DB2 for z/OS v9 or DB2 for z/OS v10
- **Show** changes made via z Admin Tool and z Admin OC Tool

# Architecture of Optim Configuration Manager



# InfoSphere Optim Configuration Manager:

## Features useful before/during migration



# Understand your environment

What is the host-name/IP address of my DB server?

Where are my clients located?

Server Upgrades: What is the **DB version** of each member in my group?

Client Upgrades: What **driver versions** are used by my clients?

OCM UI

OCM Server 1

DB2 for z/OS  
OCM  
Repository

Can I find clients that are **non-compliant**? i.e. not setting client accounting string?

What **WAS versions** are currently in use?

What **driver properties** are set for a particular driver?

What **data source properties** are set for a particular data source?

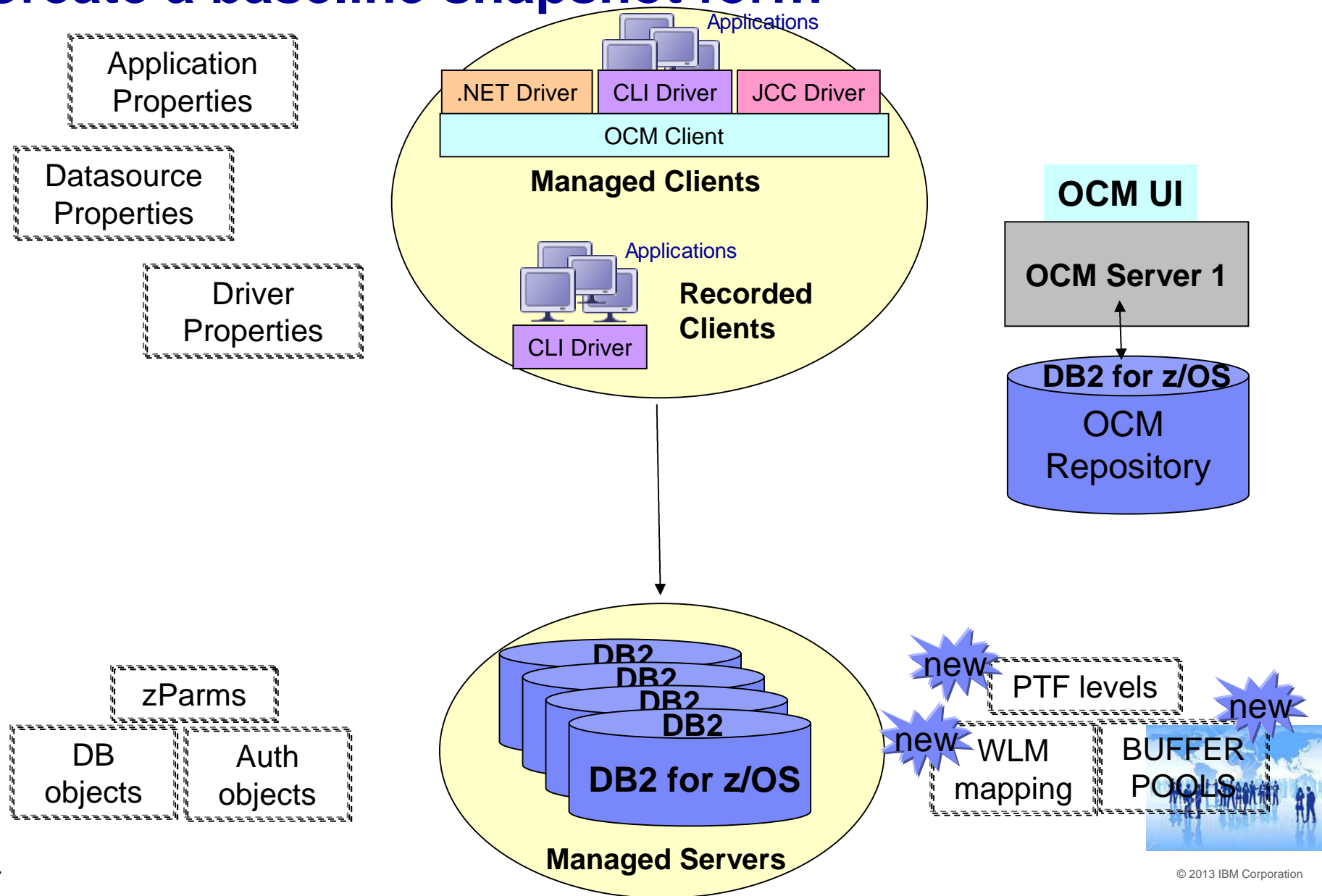
Can I build an inventory of data servers & clients over time?

and more...



*With OCM client install*

# Create a baseline snapshot for...



# Explore server information

## Enterprise-wide System Information

Host Name	IP Address	Databases or Subsys	Recorded Clients	OS Name	OS Version
FVTEC783.vmec.svl.ibm.com	9.30.221.102	2	2	z/OS	z/OS 01.07.01
LABEC416.vmec.svl.ibm.com	9.30.220.30	2	2	z/OS	z/OS 01.11.00
LABEC417.vmec.svl.ibm.com	9.30.220.31	2	0	z/OS	z/OS 01.11.00

## Subsystem Information

Name	Shared	Main Location	Managed Connection Plan	Recorded C	Group Name	Host Name:Port	IP Address	Version
V91A	true	STLEC1	MYLABEC416	1	DSNCAT	LABEC416.vmec.svl.ibm.com:446	9.30.220.30	910
V91A	false	STLEC1	MY_ZPARMS_SYSTEM	4		M10EC5.vmec.svl.ibm.com:446	9.30.115.141	910
V91A	true	STLEC1	MYFVTEC	1	DSNCAT	FVTEC783.vmec.svl.ibm.com:446	9.30.221.102	910
V91B	true	STLEC1	MYLABEC416	1	DSNCAT	LABEC416.vmec.svl.ibm.com:446	9.30.220.30	910

## zParms, PTF Information

zParm Properties			
PTF Information			
Module Name	Link Module Name	PTF Level	Date Applied
DSN3AMGP	DSN3AAES	UK54113	2010-01-03
DSN3AMGP	DSN3AB00	UK20431	2006-01-08



## Build an inventory of clients

- OCM gathers information about currently connected clients
  - **Ability to run this job more frequently**
  - **Low overhead to grab this information**
- What's collected:
  - Origin, driver information (type, version), connection information

Name	Host Name	Drivers Used	Last Connection Start Time	Last Connection Auth	Last Connection System	Last Connected Name	Last Connection Driver	Last Connection
DS_ConnMgt_	127.0.0.1	JCC03630	2013-05-14 17:27:37	DB2ADMIN	192.168.65.131	SPOKE2	JCC03630	127.0.0.1
DS_ConnMgt_	9.55.157.188	JCC03630	2013-05-14 10:52:38	ADMFO01	UTE730.vmec.svl.ibm.com	VA1A	JCC03630	G9379
db2jcc_application	9.30.187.213	JCC04120	2013-05-14 10:22:53	ADMFO01	FVTEC783.vmec.svl.ibm.com	V91A	JCC04120	G91EE

- Use information to identify 'impacted' clients
  - Driver upgrades (who uses an unsupported driver?)
  - Migrations (who accesses a server?)

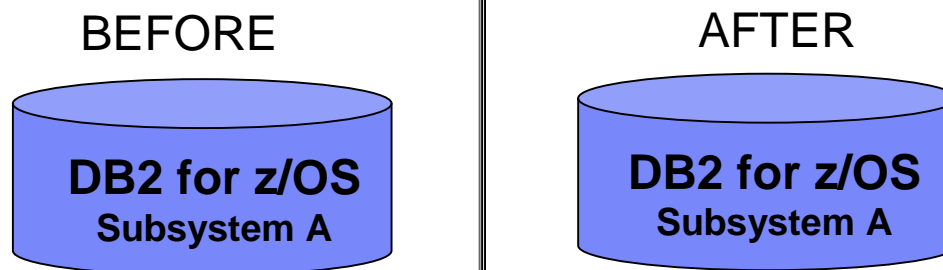




# **InfoSphere Optim Configuration Manager:**

## **Features useful after migration**

# Compare configurations after server migration



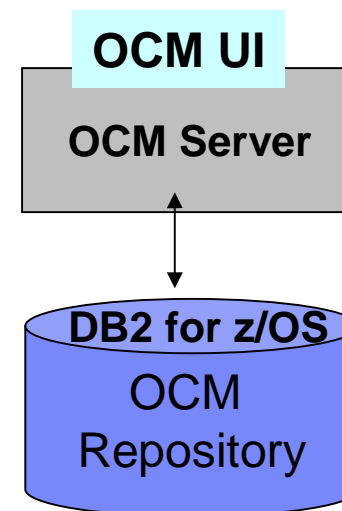
Bob uses data already discovered by **OCM** to easily identify the two data server environments

Bob defines a **Compare Job** to run every night against the **OCM Repository**

Bob receives an **Alert**:  
**2 differences found!**

Bob looks at the **OCM report** to discover and take action on:

- (a) A **zParm** with different values on the two subsystems
- (b) An **index** defined on the same table with different sets of columns



**Pick Subsystems**

**Pick Objects**

**Specify Filters**

**Create a Schedule**

Open ▾

Task Launcher x Clients and Servers x Managed Clients x Job Manager x

Job List Schedules Notifications History

View the job status details for all jobs or select a job and open the log file to see more detailed information.

**Check Job Status**

Job History Settings... View log in browser Cancel Run Job...

Job ID	Job Name	Start Time	End Time	Status	Database Name	Run Time	Details
1348782104597	MY_LABEC_COMP_JOB	2012-10-04 14:11:44	2012-10-04 14:11:48	Succeeded	META_DB_CONNECT	00:00:04	Differences found: 25
1348782141890	MY_LUW_COMPARE_JOB	2012-10-04 14:11:53	2012-10-04 14:11:56	Succeeded	META_DB_CONNECT	00:00:03	Differences found: 671
1348782719905	MY_CUSTOM_COMPARE_JOB	2012-10-04 14:12:03	2012-10-04 14:12:06	Succeeded	META_DB_CONNECT	00:00:02	Differences found: 2
1348782719905	MY_CUSTOM_COMPARE_JOB	2012-10-04 16:01:17	2012-10-04 16:01:18	Succeeded	META_DB_CONNECT	00:00:01	Differences found: 2

Open ▾

Task Launcher x Clients and Servers x Managed Clients x Job Manager x Alerts x

Recent 60 minutes Last refresh: Fri Oct 5 2012 12:25:26 PM

Configure... Send... Add Comment... Configure Alerts Purging...

Severity	Alert Type	Start Time	End Time	Data Source	Category	Alert Group
Information	Compare Job Alert	10/05/2012 12:25:46 PM	10/05/2012 12:25:46 PM	MYLABEC416	Configuration Man...	Configuration Manager

**Check Alerts**

1 total items 10 Items per page Page 1 of 1

Alert Details

Alert Details		Alert Description	
Category	Configuration Manager Specific Alerts	Report	Compare Job Report
Severity	Information		
Source Connection	MYLABEC416		
Target Connection	MYLABEC416		



Comparison Report Summary

Job Details:

Job Id:	1348782104597
Job Type:	SystemConfigCompare
Job Run Time:	2012-10-04 14:11:44.495
Properties to exclude:	%LOG%,%NAME%
Maximum differences:	Unlimited
Show only differences:	Yes

See Quick Summary

Managed Connection Details:

	Database Details	Managed Connection Name	Timestamp
Source	V91A (LABEC416.VMEC.SVL.IBM.COM:446/STLEC1 (9.1.5)) (Group : DSNCAT)	MYLABEC416	2012-10-04 14:11:44.495 (Latest)
Target	V91B (LABEC416.VMEC.SVL.IBM.COM:446/STLEC1 (9.1.5)) (Group : DSNCAT)	MYLABEC416	2012-10-04 14:11:44.495 (Latest)

Results

Object	# Total Rows	# Total Diff	# Matches	Additional Message
zParms	282	25 (8.87%)	257 (91.13%)	

[Comparison Report Summary](#)

Configuration Properties zParms Comparison Report

Job Details:

Job Id:	1348782104597
Job Name:	MY_LABEC_COMP_JOB
Job Type:	SystemConfigCompare
Job Run Time:	2012-10-04 14:11:44.495
Properties to exclude:	%LOG%,%NAME%
Maximum differences:	Unlimited
Show only differences:	Yes

See Detailed Report

Managed Connection Details:

	Connection Details	Managed Connection Name	Timestamp
Source	V91A (LABEC416.VMEC.SVL.IBM.COM:446/STLEC1 (9.1.5)) (Group : DSNCAT)	MYLABEC416	2012-10-04 14:11:44.495 (Latest)
Target	V91B (LABEC416.VMEC.SVL.IBM.COM:446/STLEC1 (9.1.5)) (Group : DSNCAT)	MYLABEC416	2012-10-04 14:11:44.495 (Latest)

Sub System System Parameters (zParms) Comparison

#	Properties	Source: V91A	Target: V91B
1	/DSN6GRP/DSHARE/DSNTIPA1/DATA SHARING FUNCTION/2	NO	YES
2	/PRLM21/IRLM MAXIMUM CSA USAGE ALLOWED	0000000000	
3	/PRLM21/LOCAL CYCLES PER GLOBAL CYCLE/DSNTIPJ/DEADLOCK CYCLE/6	00001	
4	/PRLM21/PC SPECIFIED	YES	

Database Objects Column Comparison Report

Job Details:

Job Id:	1348782141890
Job Name:	MY_LUW_COMPARE_JOB
Job Type:	SystemConfigCompare
Job Run Time:	2012-10-04 14:11:53.089
Maximum differences:	Unlimited
Show only differences:	Yes

**Compare Two Database/Subsystem Column Objects**

Managed Connection Details:

	Database Details	Managed Connection Name	Timestamp
Source	localhost:50000/SOURCE (9.7.4)	MYSOURCE	2012-10-04 14:11:53.089 (Latest)
Target	localhost:50000/TARGET (9.7.4)	MYTARGET	2012-10-04 14:11:53.089 (Latest)

Difference #	DATABASE	TIMESTAMP	TABSCHEMA	TABNAME	COLNAME	CODEPAGE	COLNO	COMPACT	COMPRESS	DEFAULT	GENERATED	IDENTITY	IMPLICITVALUE	INLINE LENGTH	LENGTH	LOGGED
1	MYSOURCE	2012-09-27 14:30:23.0	DB2ADMIN	MYTABLE	DATA	1208	1		0			N		0	30000	
Missing In Target																
2	MYSOURCE	2012-09-27 14:30:23.0	DB2ADMIN	MYTABLE	ID	0	0		0			N		0	4	
Missing In Target																
3	MYSOURCE	2012-09-27 14:30:23.0	DB2ADMIN	TMP	C1	0	0		0			N		0	4	
3	MYTARGET	2012-09-27 14:30:47.0				1208									1	
4	MYSOURCE	2012-09-27 14:30:23.0	DB2ADMIN	TMP	C2	1208	1		0			N		0	1	
4	MYTARGET	2012-09-27 14:30:47.0				0									4	

[Comparison Report Summary](#)

Database Objects Index Comparison Report

Job Details:

Job Id:	1348782719905
Job Name:	MY_CUSTOM_COMPARE_JOB
Job Type:	SystemConfigCompare
Job Run Time:	2012-10-04 14:12:03.979
Maximum differences:	Unlimited
Show only differences:	Yes

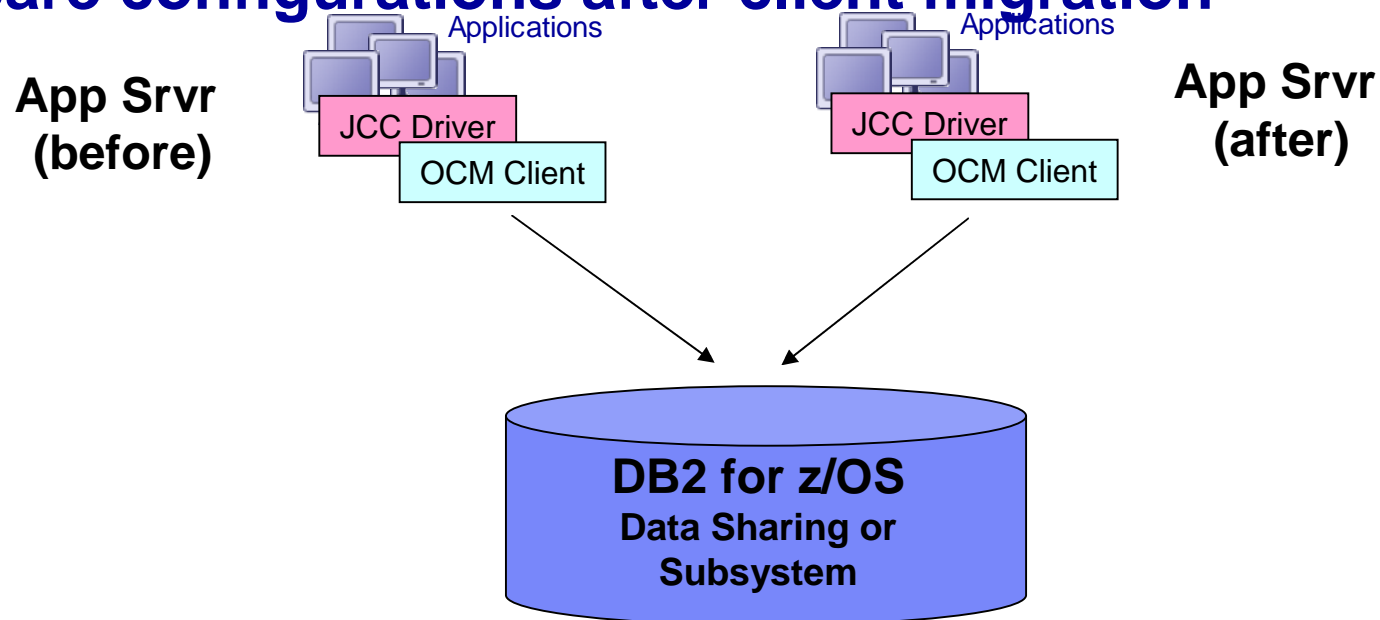
**Or Compare a Database/Subsystem With Prior Snapshot**

Managed Connection Details:

	Database Details	Managed Connection Name	Timestamp
Source	localhost:50000/SOURCE (9.7.4)	MYSOURCE	2012-10-04 14:12:03.979 (Latest)
Target	localhost:50000/SOURCE (9.7.4)	MYSOURCE	2012-09-27 14:54:26.609

Difference #	DATABASE	TIMESTAMP	INDSCHEMA	INDNAME	CLUSTERFACTOR	CLUSTERRATIO	COLCOUNT	COLLECTSTATISTICS	COLNAMES	COMPRESSION	CREATE TIME	DATAPARTITION CLUSTERFACTOR	IND
Missing In Source													
1	MYSOURCE	2012-09-27 14:48:08.0	DB2ADMIN	MY_INDEX	-1.0	-1	1		+C1	N	2012-09-27 14:46:59.484001	1.0	REG

# Compare configurations after client migration

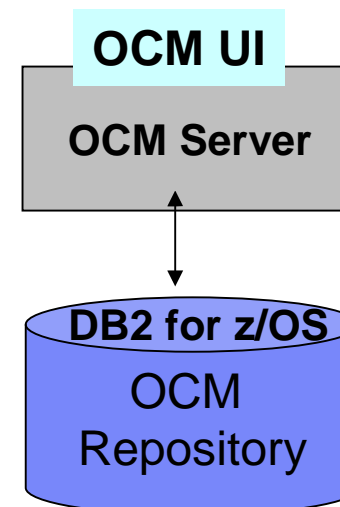


Bob uses data already discovered by **OCM** to easily identify the two client applications

Bob defines a **Compare Job** to run every night against the **OCM Repository**

Bob receives an **Alert: 2 differences found!**

Bob contacts the Application Team **with a report** to resolve the differences



Open

Task Launcher | Clients and Servers | Managed Clients

Connection: All managed connectio

Clear source | Add Application Profile... | **Add Compare Job...** | Add Rule...

**Pick Clients**

UUID	IP Addresses	Target IP	Target Port	Target Database/Subsystem Name	Client Accounting Info	Client Application Info	Client U
f6d215d1-a787-4e44-b5b1-e76ded7e175c	192.168.65.130	labec416.vmec.svl.ibm.com	8000	STLEC1ALIAS			UNI
f6d215d1-a787-4e44-b5b1-e76ded7e175c	192.168.65.130	labec416.vmec.svl.ibm.com	8000	STLEC1ALIAS			UNI
f6d215d1-a787-4e44-b5b1-e76ded7e175c	192.168.65.130	labec416.vmec.svl.ibm.com	8000	STLEC1ALIAS			

1 - 7 of 7 items

10 | 25

Show only differences

Source: Clear source

Current Selection:

Data Source Descriptors  
 Driver Properties  
**Properties (1 difference)**

**Compare Two Clients In Live Viewer**

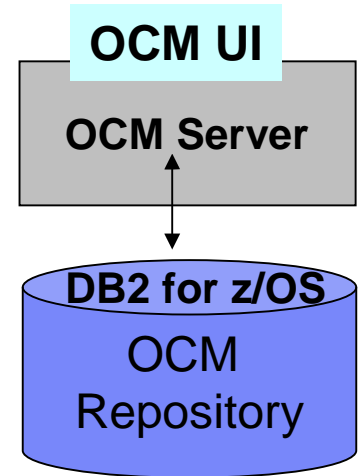
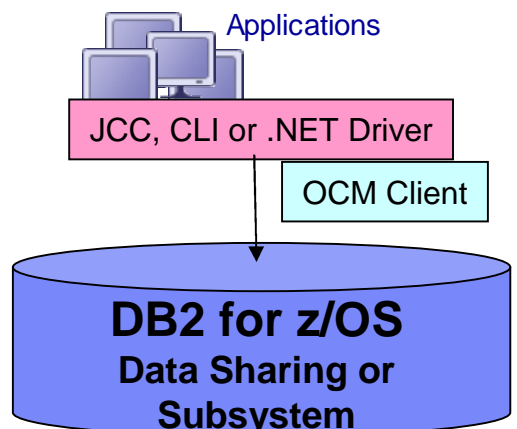
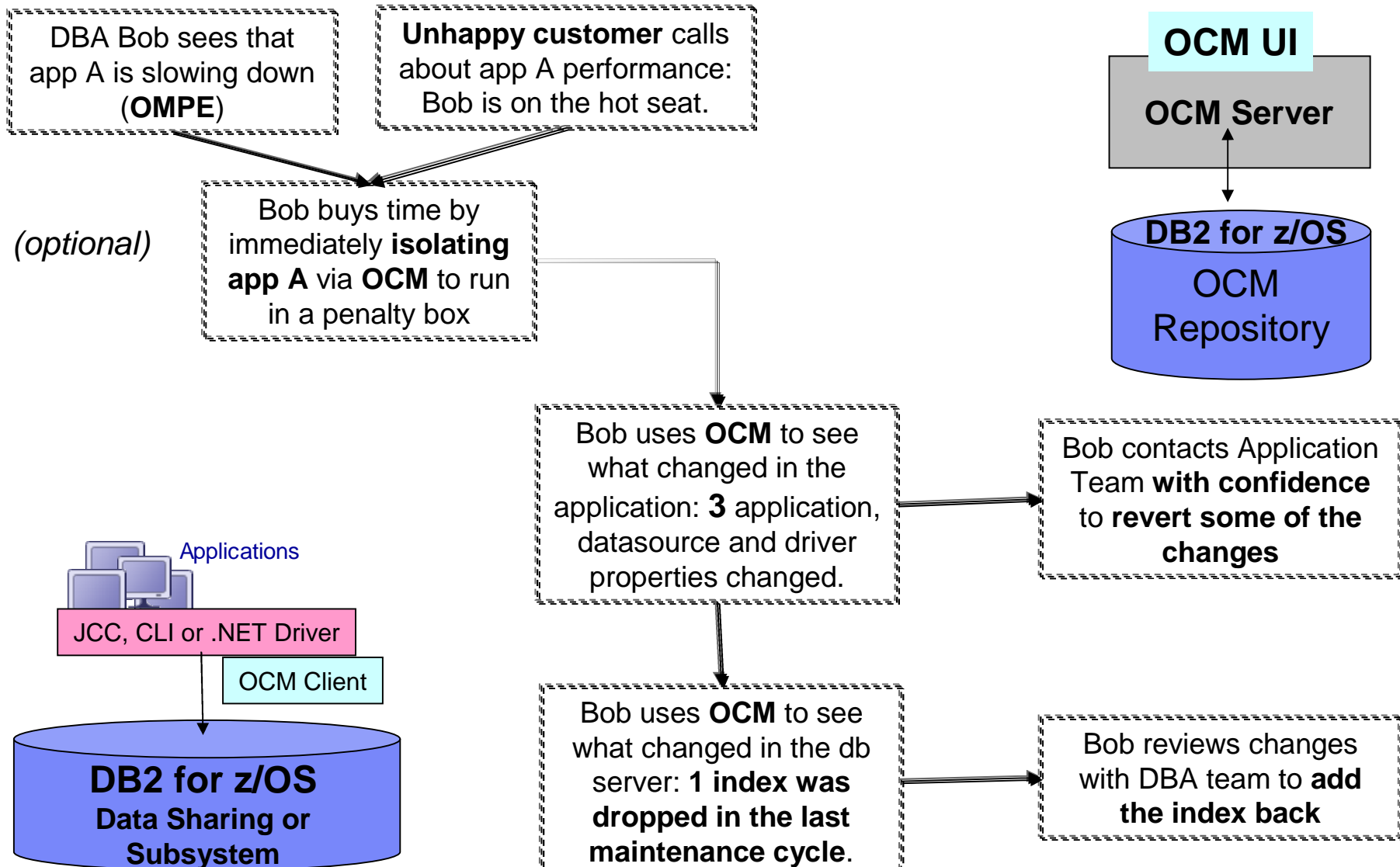
Client Accounting Info		
Client Application Info		
Client Driver Build Qualifier	0	0
Client Driver Major Version	3	3
Client Driver Micro Version	106	106
Client Driver Minor Version	64	64
<b>Client User</b>	Somil Kulkarni	UNKNOWN555
Client Workstation		

#	Properties	Source : labec416.vmec.svl.ibm.com:8000/STLEC1ALIAS (data source ID: 1)	Target: localhost:5000/SOURCE (data source ID: 2)
1	DB_NAME	STLEC1ALIAS	
2	DSDID	1	
3	JDBC_DATASOURCE_NAME	IsolateExampleDataSource	RedirectExampleDataSource
4	PORT	8000	50000
5	SERVER_NAME	labec416.vmec.svl.ibm.com	localhost
6	USER	Somil Kulkarni	[Missing In Target]
7	WORKSTATION	[Missing In Source]	ibm-b8ccae07100

**Or Review Client Comparison Report**



# Determine “what’s changed” after migration



# Review changes

- Review changes in a specific time-range
- Allow filters by Item Type

Connection:

Object type:

From:

Duration:

---

**Configuration Changes > MY\_ZPARMS\_SYSTEM:** Select an object type below to view the controls to refine the start date and duration, select a different managed connection, or change object type to view.

**Discovery Objects**

Object type	New	Modified	Deleted
<b>PTF</b>	3,993 (99.5%)	-	22 (0.5%)
<b>WLM</b>	-	-	-
<b>ZPARM</b>	305 (100.0%)	-	-

**Subsystem Objects**

Object type	New	Modified	Deleted
<b>BUFFERPOOL</b>	80 (100.0%)	-	-
<b>COLUMN</b>	2,021 (100.0%)	-	-
<b>DATABASE</b>	16 (100.0%)	-	-
<b>INDEX</b>	53 (100.0%)	-	-
<b>PACKAGE</b>	389 (100.0%)	-	-

**Object type dropdown menu:**

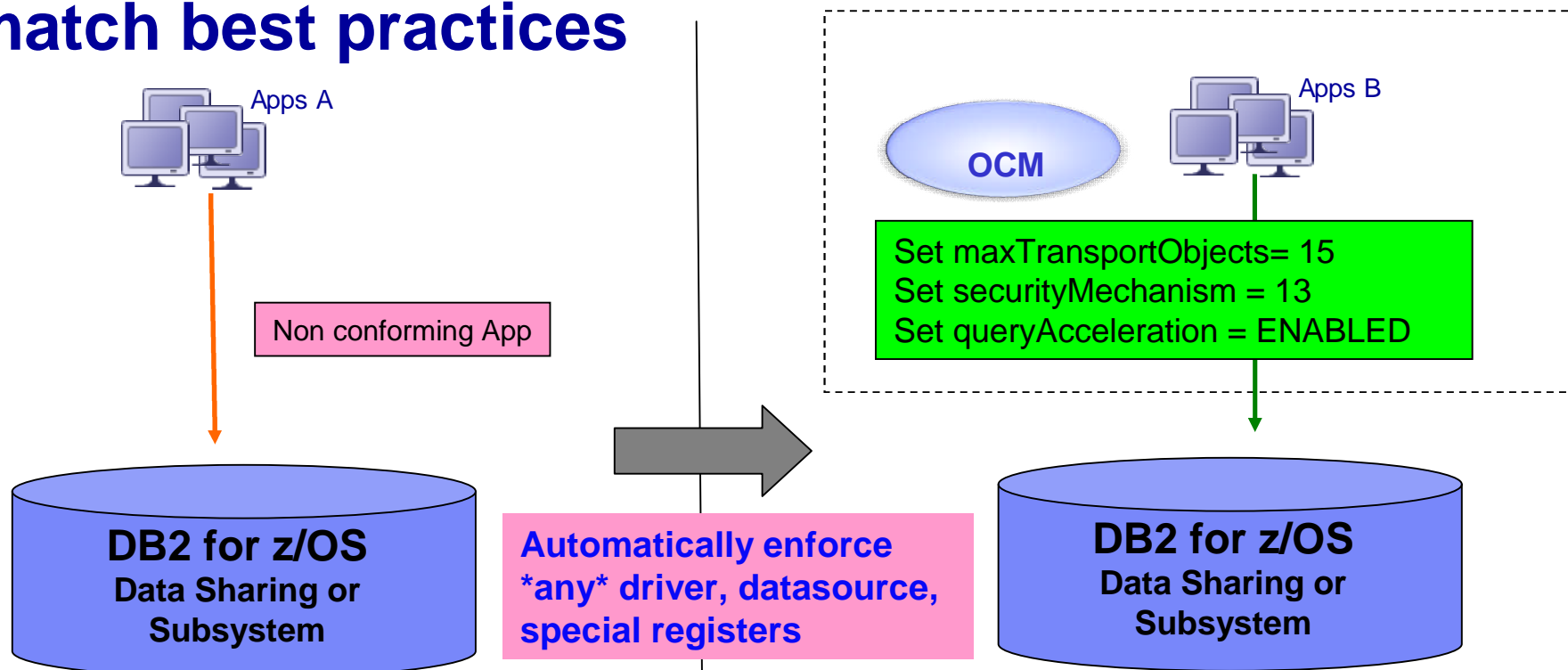
- Select an object type
- BUFFERPOOL
- COLUMN
- COLUMNAUTH
- DATABASE
- DBAUTH
- INDEX
- PACKAGE
- PACKAGEAUTH
- PTF
- ROUTINE
- ROUTINEAUTH
- SCHEMAAUTH

## Explore managed clients

- Detailed client information
- What's collected:
  - Connection information
  - Driver type, driver version, ...
  - Driver configuration
  - Data source configuration
  - If applicable, WAS info

▼ Details	
<b>Row Information:</b>	
UUID	1a906109-7f6c-4c71-b8fd-cd992696dfcc
IP Addresses	, 192.168.88.133
Target IP	demomvs.demopkg.ibm.com
Target Port	5446
Target Database Name	NDCDB205
Client Accounting Info	appAcctValue
Client Application Info	BadApplication
Client User	
Client Workstation	
Driver Properties	<b>ccsid1390Mapping=1</b> <b>ccsid943Mapping=1</b> <b>dumpPool=0</b> <b>enableT2zosLBF=0</b> <b>maxRefreshInterval=30</b> <b>minTransportObjects=0</b> <b>traceFileAppend=false</b> <b>traceOption=0</b>
Data Source Descriptors	<b>currentQueryOptimization=-2147483647</b> <b>databaseName=NDCDB205</b> <b>decimalSeparator=0</b> <b>downgradeHoldCursorsUnderXa=false</b> <b>enableAlternateServerListFirstConnect=0</b> <b>enableMultirowInsertSupport=true</b> <b>enableSysplexWLB=true</b> <b>encryptionAlgorithm=0</b> <b>fullyMaterializeInputStreams=false</b> <b>implicitRollbackOption=0</b> <b>keepDynamic=0</b>

# Enforce driver, datasource, special registers to match best practices

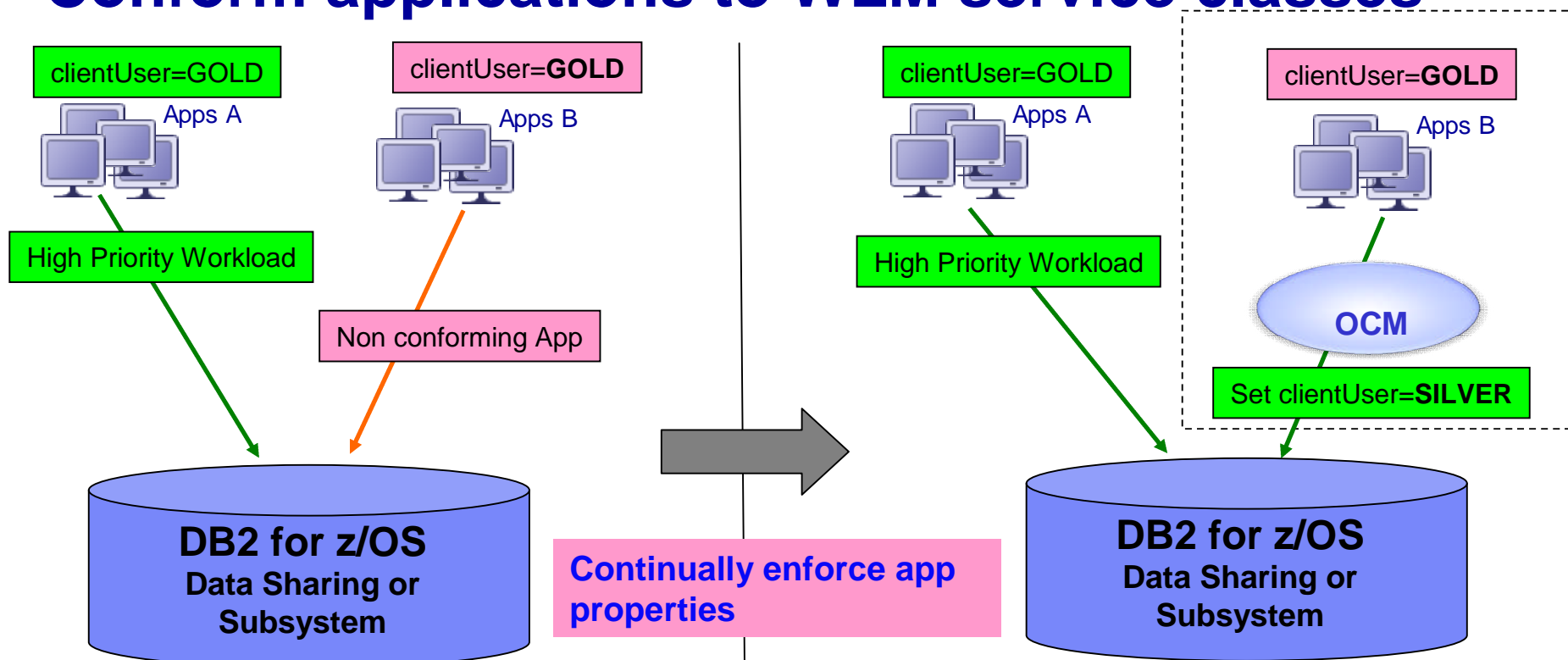


**OCM** provides a simple interface to find non conforming apps!  
**Review** which driver, datasource, application properties are currently in effect.

**OCM** allows you to centrally and remotely enforce properties to match best practices!  
 Properties set via OCM take precedence over manual changes made in the app or driver configuration files!

**No** application changes are required!

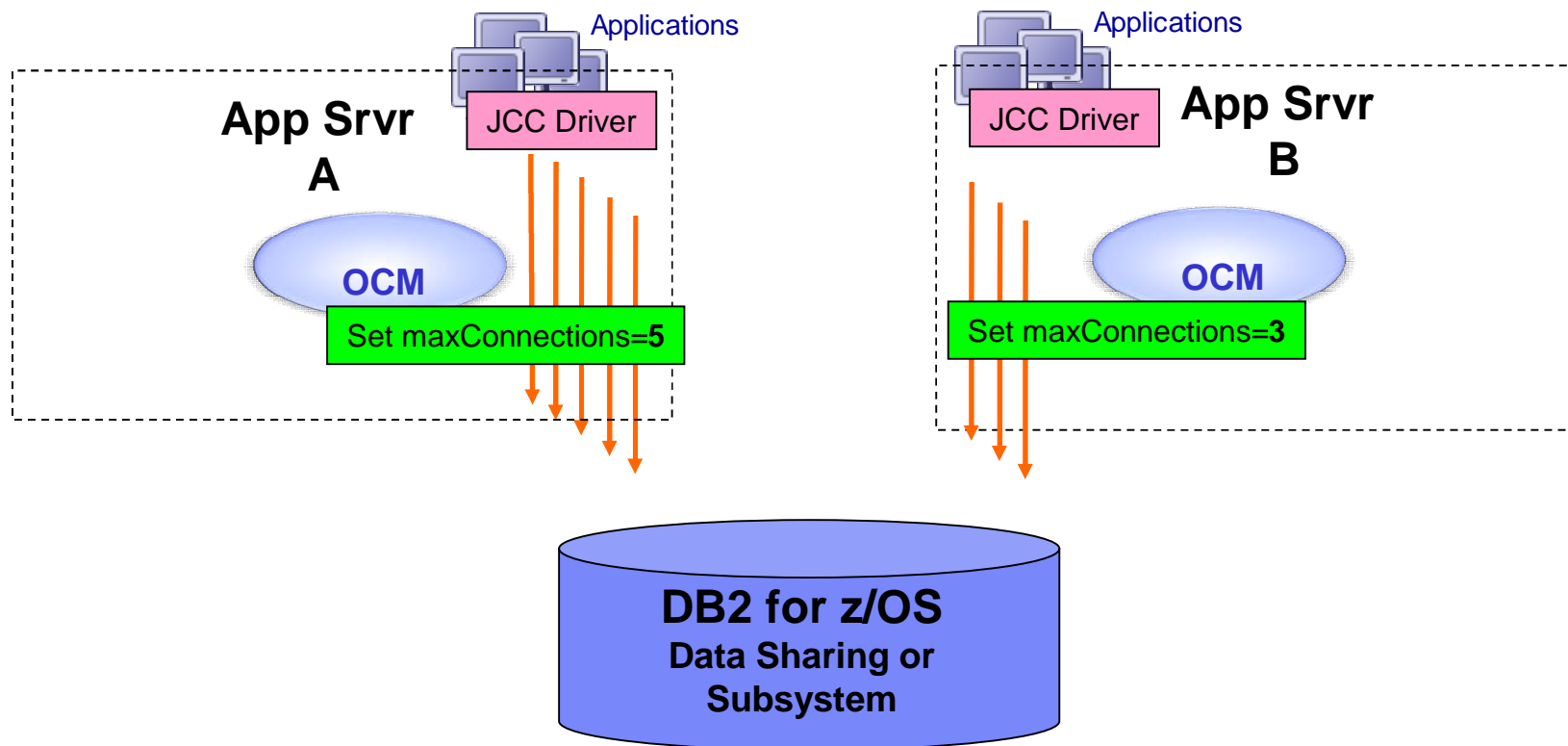
# Conform applications to WLM service classes



OCM provides a simple interface to find non conforming apps!

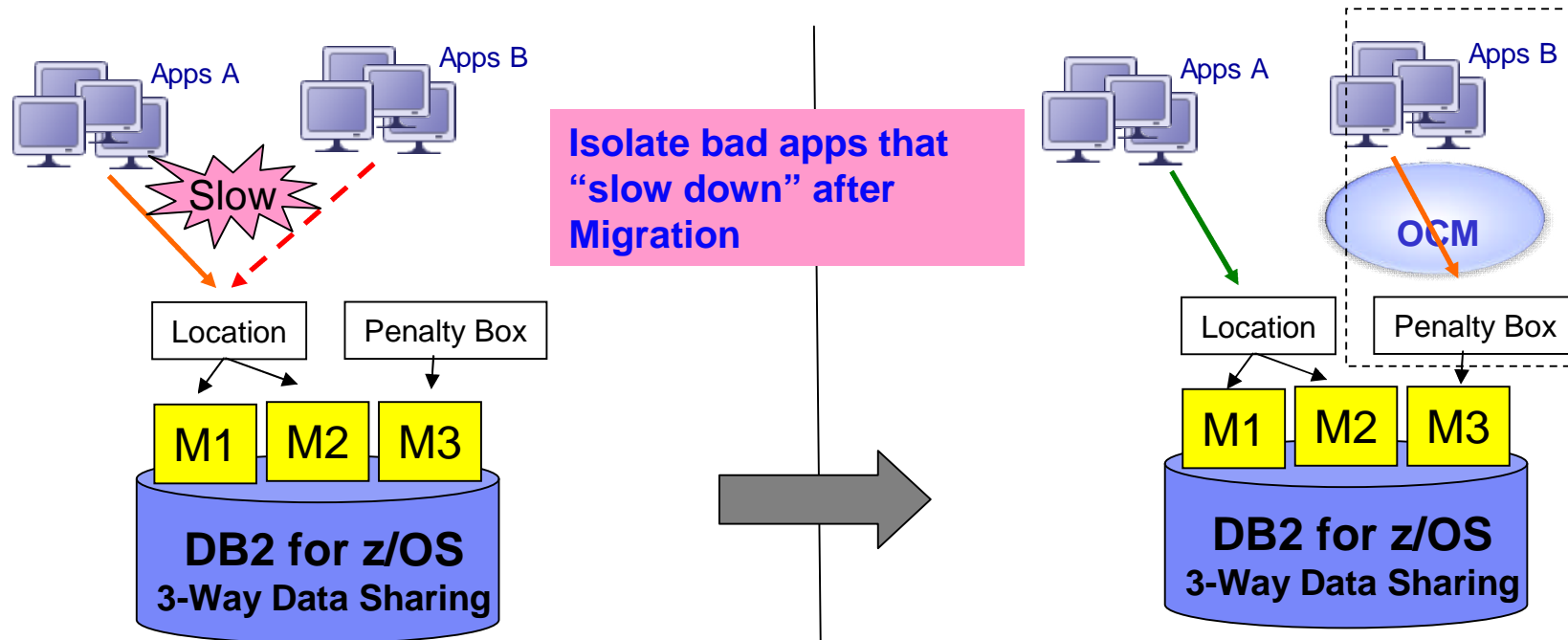
OCM allows you to centrally modify/enforce application properties at transaction boundaries!  
**No** application changes or outages are required!

# Remotely manage WAS connection pool



**OCM** allows you to centrally modify/enforce/tune Websphere Application Server connection pool size!

# Isolate “rogue” apps or Test “new” apps - datasharing



OMPE alerts user that Apps B is using excessive CPU!

OMPE shows that Apps A is also affected!

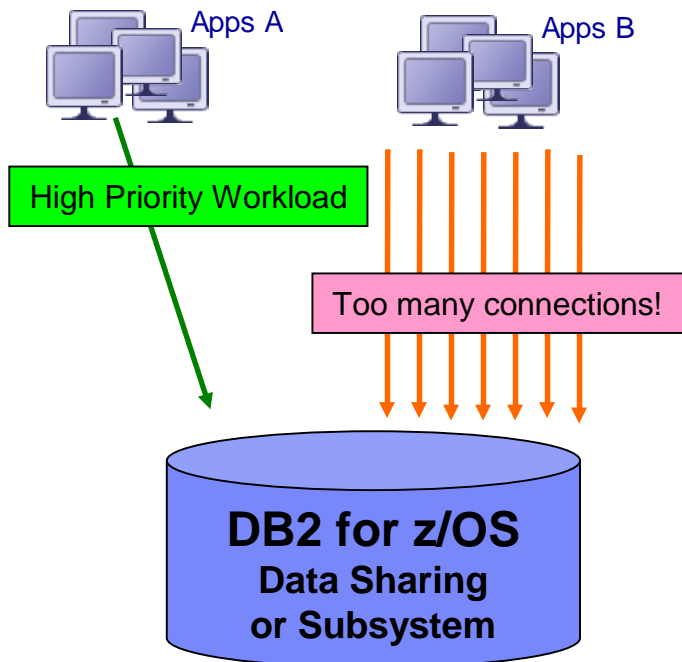
**OCM** isolates Apps B to a restricted environment w/o any outages!

Apps A works as before!

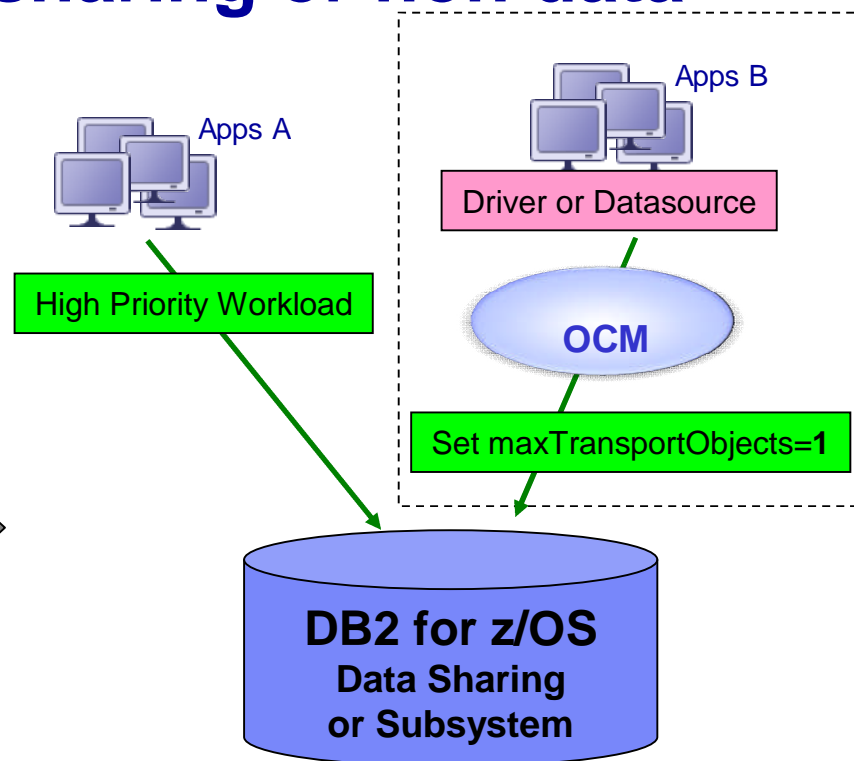
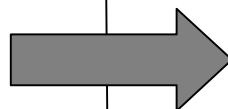
Instantly save costs; allow more time to debug!



# Throttle connections (data sharing or non data sharing)



**Apps B** opens up too many connections, starving other apps for resources!



**OCM** allows you to centrally modify/enforce/tune driver and datasource properties!  
**No** application changes or outages are required!



# Key server management tasks

## 1 Manage Location Aliases (zV10)

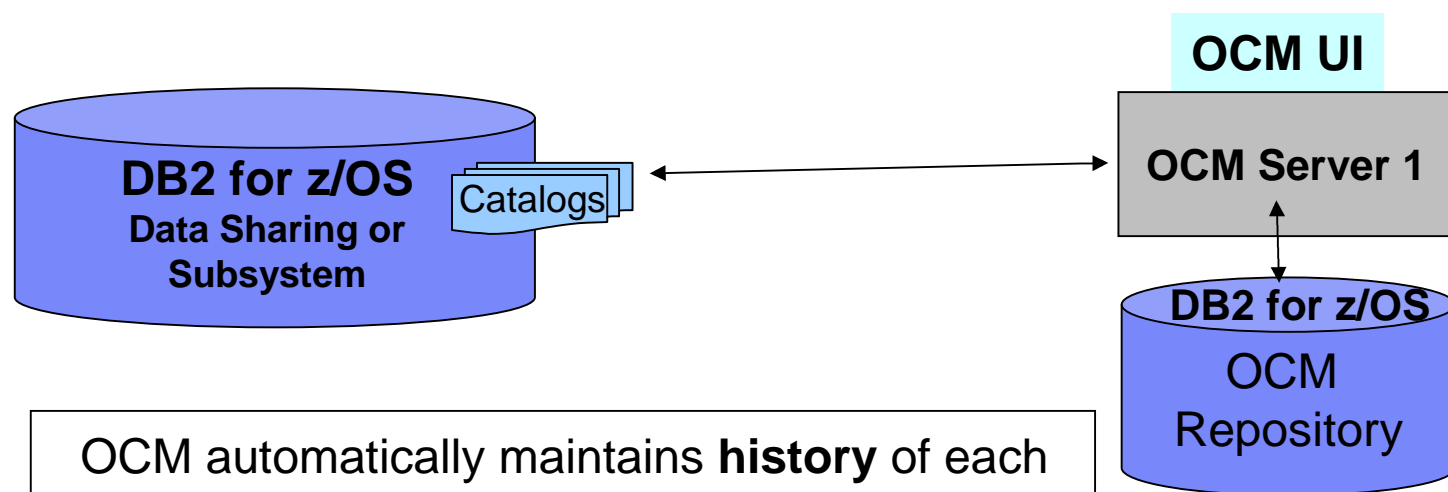
- View and Report Status
- Start, Stop, Edit and Cancel

## 2 Manage zParms setting

- Edit zV9 ONLINE parameters
- Edit zV10 ONLINE parameters

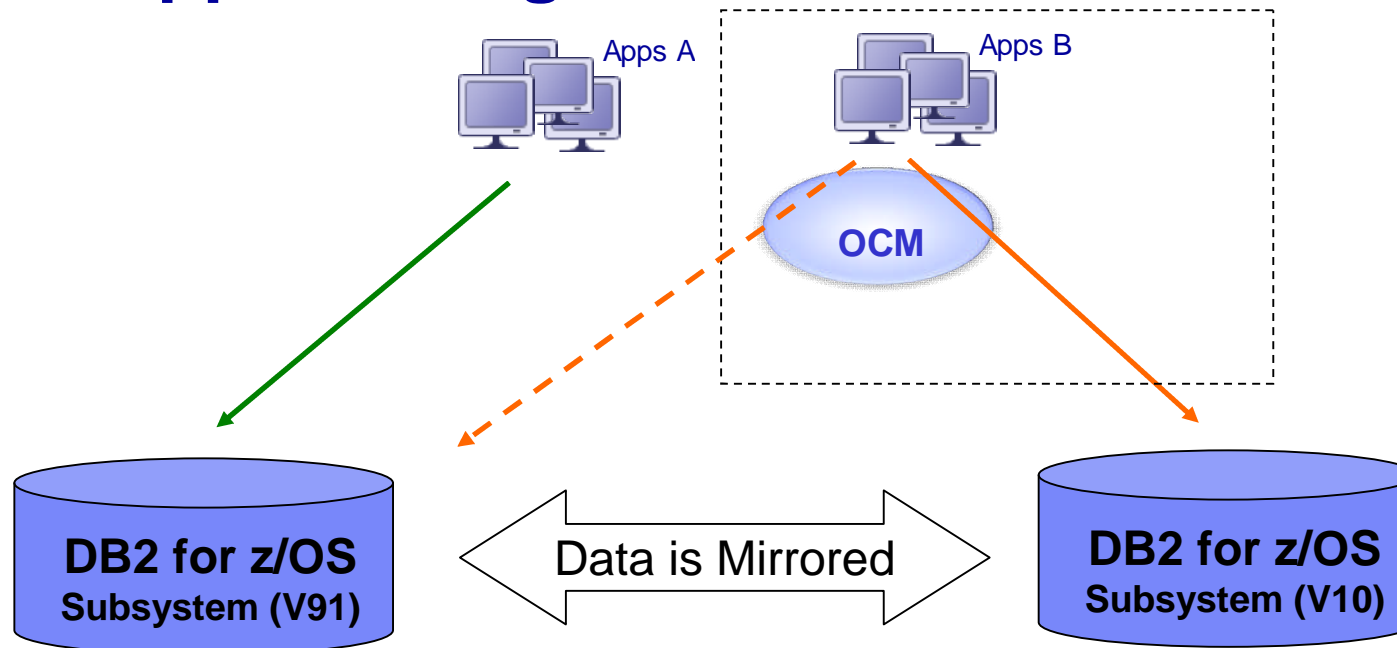
## 3 Manage Application Profiles (zV10)

- Deploy catalogs, if missing
- Start all, Stop all, View Status
- Easily identify clients using info already discovered by OCM
- Set thresholds to Monitor Connections or Active/Idle Threads – DB2 issues warning/exception
- Ability to clone profiles and apply them to different clients



OCM automatically maintains **history** of each activity – who did it, what was done, and when

# Redirect apps for migration – non-datasharing



**OCM** allows you to stage the migration (pick Apps B first), observe performance, and even rollback the app if it does not perform w/o requiring any changes to the app!

**OCM** also allows you to route selective apps for High Availability or Load Balancing across two subsystems!



## How to get Optim Configuration Manager?

- **Optim Configuration Manager is a standalone product**
- **Optim Configuration Manager is part of the z Admin Solution Pack**
  - Integrated with z Admin Tool
  - Best value for our customers
- **Optim Configuration Manager is currently part of the Sequoia BETA program**
  - Get nominated and try Optim Configuration Manager out
- Ask about Optim Configuration Manager's Concierge Program ! Its free !
  - Customized roadmaps
  - Help from the Lab with initial up & running
- **Be a Development Partner**
  - Work with the Lab (1-2 calls a month) to influence product direction



## References

Optim Configuration Manager for DB2 on z/OS External Site

<http://www-03.ibm.com/software/products/us/en/infosphere-optim-configuration-manager-z>

Optim Configuration Manager Roadmap

[http://www.ibm.com/developerworks/data/roadmaps/roadmap\\_ocm\\_22.html](http://www.ibm.com/developerworks/data/roadmaps/roadmap_ocm_22.html)

Short demo highlighting some key features of Optim Configuration Manager

<http://www.ibm.com/developerworks/offers/lp/demos/summary/im-iocm21overview.html>

Information Center

<http://publib.boulder.ibm.com/infocenter/cfgmgr/v3r1/index.jsp>

Optim Configuration Manager Forum

<https://www.ibm.com/developerworks/forums/forum.jspa?forumID=2695>

**Ask about Optim Configuration Manager's  
Concierge Program ! Its free !**





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