

# Discovering OMEGAMON

## Volume 2

OMEGAMON DB2 V5.3.0 –

Enhanced 3270 User Interface and  
Classic Interface Lab Exercises



---

# Contents

<b>OVERVIEW</b>	.....	<b>3</b>
<b>LAB #1</b>	<b>ENHANCED 3270 USER INTERFACE OMEGAMON DB2 SCENARIO WALKTHROUGH</b> .....	<b>5</b>
	1.1 LOGON TO E3270UI .....	5
	1.2 OVERVIEW FROM THE DB2 PLEX PERSPECTIVE .....	5
	1.3 DB2 GROUP OBJECT ANALYSIS – I/O ANALYSIS .....	11
	1.4 DB2 THREAD ANALYSIS – LONG RUNNING THREADS .....	13
	1.5 DB2 THREAD ANALYSIS – CICS THREADS.....	23
	1.6 DB2 SUBSYSTEM ANALYSIS .....	28
	1.7 NAVIGATE TO OMEGAMON z/OS TOP CONSUMERS PANEL.....	32
<b>LAB #2</b>	<b>USING CLASSIC INTERFACE TO MONITOR CRITICAL DB2 SUBSYSTEM RESOURCES</b> .....	<b>34</b>
	2.1 VIEW DB2 SUBSYSTEM PERFORMANCE DATA .....	34
	2.2 USING DB2 HISTORICAL DATA TO ISOLATE SUBSYSTEM ISSUES .....	46
	2.3 ANALYSIS OF DB2 THREADS AND LOCK CONFLICTS.....	53
	2.4 HOW TO VIEW DB2 APPLICATION TRACE INFORMATION.....	62
<b>APPENDIX A.</b>	<b>NOTICES</b> .....	<b>69</b>
<b>APPENDIX B.</b>	<b>TRADEMARKS AND COPYRIGHTS</b> .....	<b>71</b>

---

## Overview

OMEGAMON XE for DB2 provides the ability to monitor DB2 subsystems, both in a datasharing and non-datasharing configuration. OMEGAMON XE for DB2 v5.3.0 includes a choice of user interfaces: Classic, CUA, enhanced 3270 and Tivoli Enterprise Portal Server (TEPS). This choice of user interfaces provides the user with option of using the optimal interface for a given technical requirement. This series of exercises will illustrate several of the features and functions available in the enhanced 3270 user interface and the Classic 3270 interface specific to monitoring DB2.




## Introduction

This lab will demonstrate how to utilize OMEGAMON XE for DB2 V5.3.0. In this lab's exercises, the user will perform a series of exercises focused on the following:

- Monitoring critical DB2 resources
- Analysis of DB2 lock conflicts
- DB2 application thread analysis
- Analysis of DB2 History
- Analysis of DB2 application traces

## Icons

The following symbols appear in this document at places where additional guidance is available.

Icon	Purpose	Explanation
	Important!	This symbol calls attention to a particular step or command. For example, it might alert you to type a command carefully because it is case sensitive.
	Information	This symbol indicates information that might not be necessary to complete a step, but is helpful or good to know.
	Trouble-shooting	This symbol indicates that you can fix a specific problem by completing the associated troubleshooting information.

---

# Lab #1 Enhanced 3270 User Interface OMEGAMON DB2 Scenario Walkthrough

## Introduction

This lab exercise will demonstrate how to logon, navigate, and use some of the primary features of the OMEGAMON DB2 V5.30 enhanced 3270 user interface. In this lab the user will perform a series of scenarios focused on the following:

- DB2 Sysplex level resource monitoring
- DB2 Group Object I/O analysis
- DB2 subsystem level monitoring
- DB2 thread activity analysis
- DB2-CICS thread activity analysis
- Navigate to another OMEGAMON z/OS product menu

### 1.1 Logon to e3270ui

- a) Enter the User ID and Password provided by the instructor and Press ENTER

Logon information will be provided by the lab instructors.

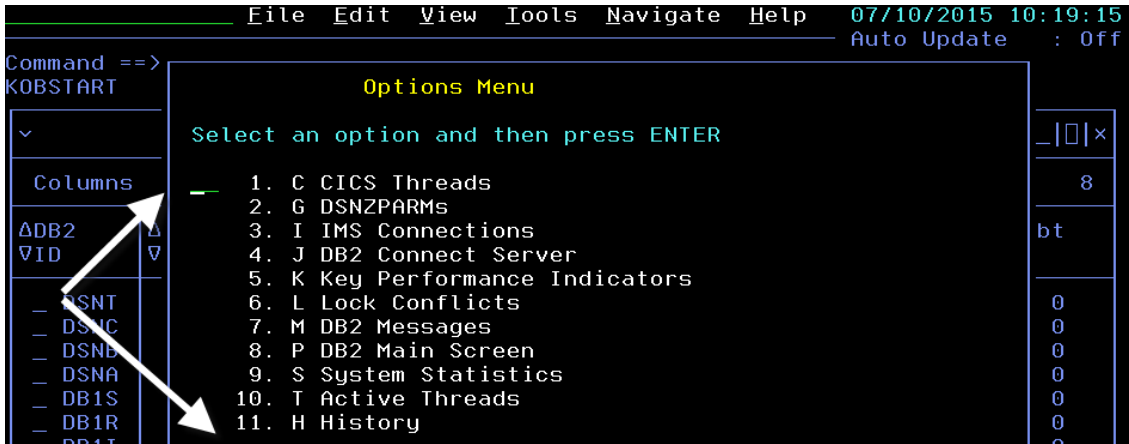
### 1.2 Overview from the DB2 Plex Perspective

The following is the e3270 ui (panelid KOBSTART). This panel contains overview information for whatever OMEGAMON monitoring agents are connected to the enhanced 3270 user interface (in this example you see z/OS, CICS, and DB2). From this panel you may scroll, filter, or drill down for additional information from any of the various monitoring agents.

First we will perform a brief overview of DB2 resource monitoring at the Sysplex/data sharing level now available in the new enhanced 3270 interface. Beginning from the KOBSTART panel we see a Sysplex level view of the enterprise.

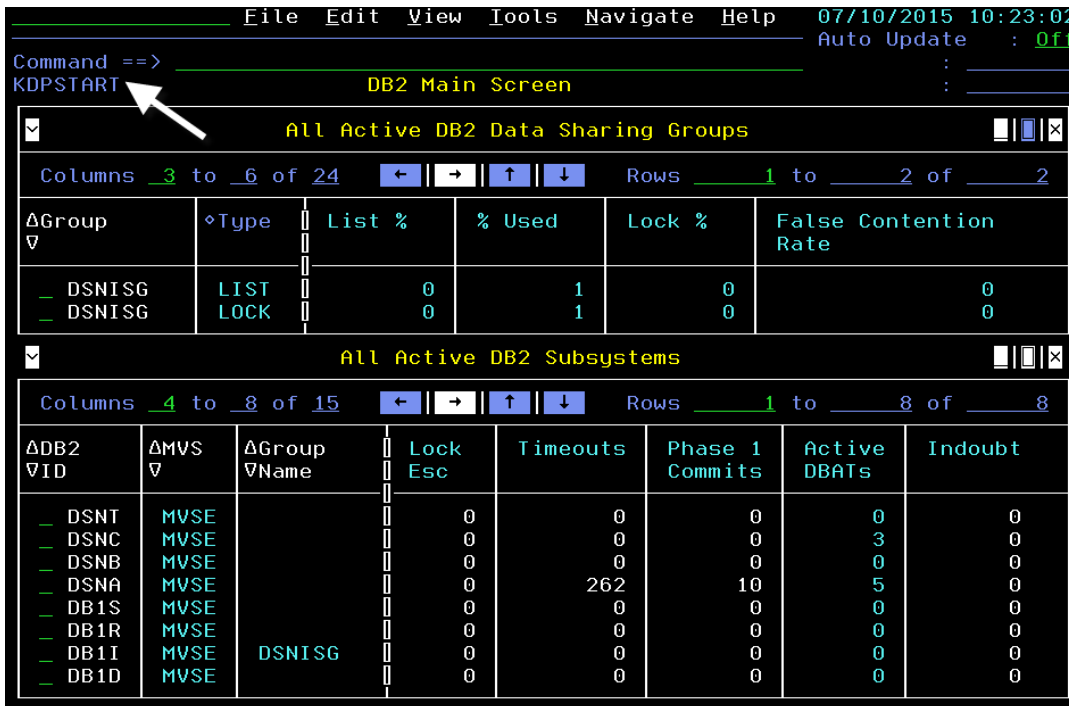
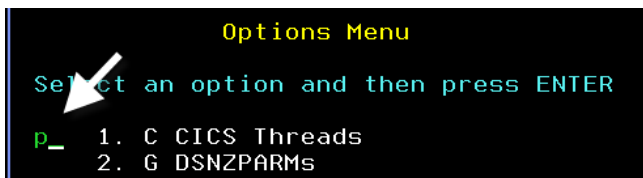
We will look at a few of the drill down options from this panel.

- a) **Position the cursor** by the one of the DB2s (DB2 ID), enter / and **Press Enter**. You will then see a popup with several navigation options.



From here you can look at several categories of DB2 level resources (Threads, Locks, Subsystem, Messages, History, and more). You also have option P to navigate to the OMEGAMON DB2 Main Screen.

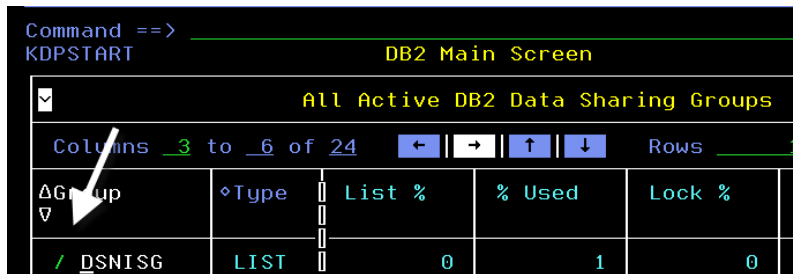
b) Enter **P** for DB2 Main Screen in the option popup and **Press Enter**.



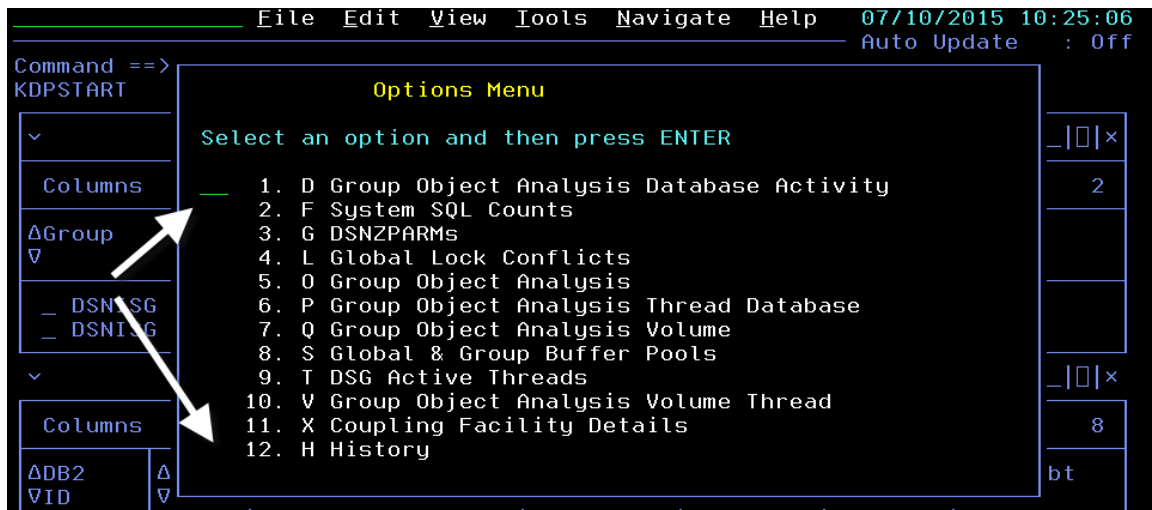
You are now looking at the DB2 Main Screen (KDPSTART). The DB2 Main Panel consists of two portions. The top portion shows the active data sharing groups in the environment (in this example DSNISG). The bottom portion of the screen shows the active DB2 subsystems.

First, let's explore the DB2plex level information available in the enhanced 3270 ui.

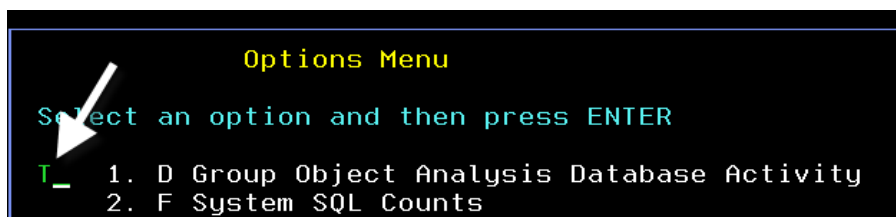
c) **Position the cursor** by the Data Sharing Group, enter / and **Press Enter**.



You are now looking at the Options Menu for DB2plex information. From here you can look at DB2plex level resources, such as Global Locks, Coupling Facility, Group Object Analysis, and a data sharing group level view of DB2 threads.



d) Enter **T** for DSG Active Threads in the option and **Press Enter**.



You are now looking at the active threads in the data sharing group. You may scroll the panel to the right to see additional information for the various threads active in the group. You may also drill in on one of the threads for additional detail. You may also click on the various tabs to see other data sharing level information.

```

File Edit View Tools Navigate Help 07/10/2015 10:27:22
Auto Update : Off
Command ==>
KDPPTHRD Data Sharing Group Information DSG Name : DSNISG
DB2 ID :

```

Threads Coupling GOA SQLC DSNZPARMS Lock conf Buf Pool

Data Sharing Group Active Threads

Columns 4 to 7 of 15 Rows 1 to 7 of 7

ΔPlan VName	◊MVS	◊DB2	ΔAuth ID	ΔElapsed	ΔCPU Time	+Wait Ti
— ?RRSAF	MVSE	DB1I	SYSSTC	14-14:14	00:00:15.671	00:00:
— ?RRSAF	MVSE	DB1I	SYSSTC	14-14:14	00:00:23.249	00:00:
— K02PLAN	MVSE	DB1I	DB2PM	08-00:09	00:00:08.207	00:00:
— K02PLAN	MVSE	DB1I	DB2PM	08-00:10	00:01:28.666	00:00:
— K02PLAN	MVSE	DB1I	DB2PM	08-00:10	00:00:07.006	00:00:
— K02PLAN	MVSE	DB1I	DB2PM	08-00:10	00:00:44.313	00:00:
— DSNREXX	MVSE	DB1I	STC	00:11:39.196	00:00:02.331	00:00:

e) Position the cursor by one of threads (suggestion – look at DSNREXX), enter **S** and Press Enter.

— K02PLAN	MVSE	DB1I	DB2PM
<b>S</b> DSNREXX	MVSE	DB1I	STC

You are now looking at additional detail for one of the active threads in the data sharing group.

```

File Edit View Tools Navigate Help 07/10/2015 10:29:50
Auto Update : Off
Command ==>
KDPTHDA2 DB2 Thread Detail Accounting SMF ID : MVSE
DB2 ID : DB1I

```

Acct Cts3 Dist WLM SQLC SQLI Locks Cancel >>

Thread Information

Plan.....	DSNREXX	Correlation ID.....	DB2READI
Authorization ID.....	STC	Connection.....	DB2CALL
Job Name.....	DB2READI	MVS Status.....	SWAPPED-
Status.....	SWAPPED-		

Class 1/2 Times

Elapsed class 1.....	13m 43s	In-DB2 Elapsed Class 2....	.407165s
Non Nested Class 1.....	13m 43s	In-DB2 Non-Nested Class 2/	.407165s
Stored Proc Class 1.....	0.00000s	In-DB2 SP Class 2/3.....	0.00000s
UDF Class 1.....	0.00000s	In-DB2 UDF Class 2/3.....	0.00000s
Triggers Class 1.....	0.00000s	CP CPU Time Class 1.....	2.72581s
In-DB2 CP CPU Time Class 2	.316928s	Agent Class 1.....	2.72581s
In-DB2 Agent CPU Time Clas	.316928s	Agent Non-Nested Class 1..	2.72581s
In-DB2 Non-Nested CPU Time	.316928s	SP CPU Class 1.....	0.00000s
In-DB2 SP CPU Time Class 2	0.00000s	UDF CPU Class 1.....	0.00000s
In-DB2 UDF CPU Time Class	0.00000s	Trigger CPU Class 1.....	0.00000s
Parallel Tasks CPU Class 1	0.00000s	In-DB2 Parallel CPU Time C	0.00000s
In-DB2 Waiting Time Class	.090236s	In-DB2 Suspend Time Class	.090236s
In-DB2 Suspend Time Agent	N/P	In-DB2 Suspend Time Parall	0.00000s
In-DB2 Not Accounted Class	N/P	Elapsed Outside DB2 Class	13m 42s
CP CPU Outside DB2 Class 2	2.40888s	Non-Nested Outside DB2 Cla	2.40888s



This panel shows many of the standard DB2 Accounting Class 1 and Accounting Class 2 counters for the thread. This includes such information as thread elapsed time, thread IN-DB2 time, and thread CPU time counters.

If you are unclear as to the meaning of a particular number, you may get help for the field.

- f) To see this help information, **position the cursor** on one of the fields (such as Elapsed Class 1), and **Press F1**.

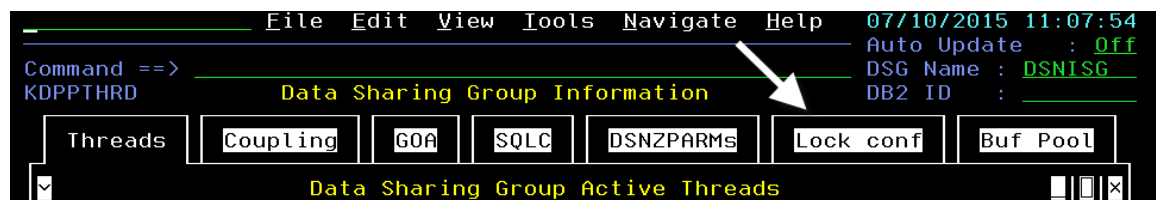


You now see help information, with an explanation of the meaning of the number.

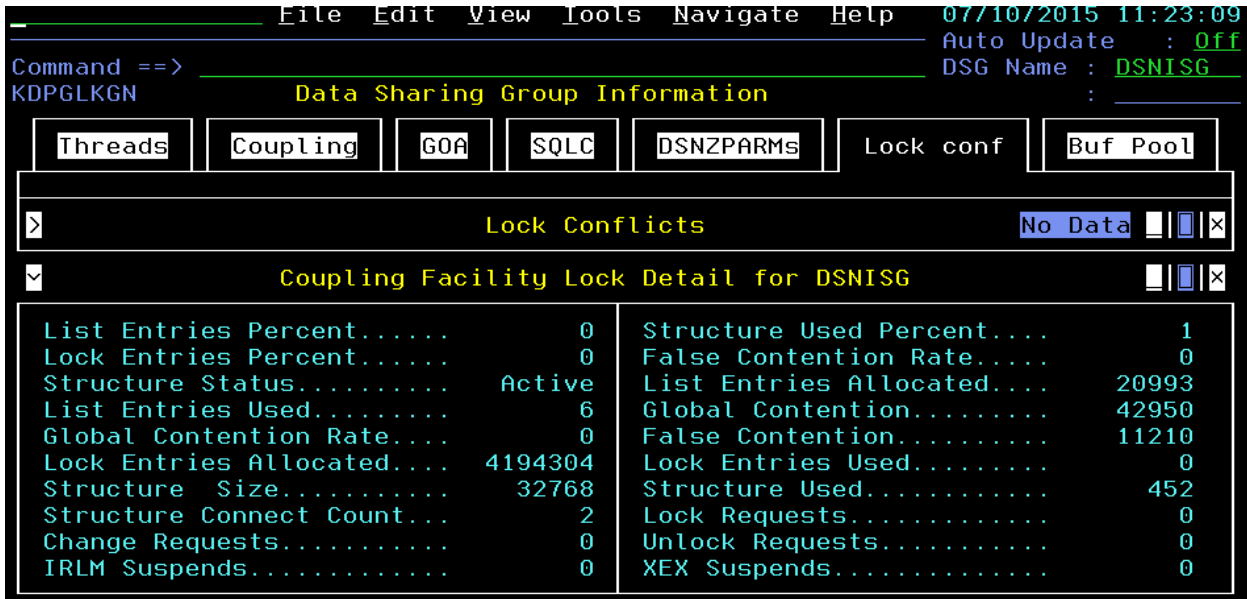
**Press F3** to make the help popup go away.

Now that you have seen the threads active in the data sharing group, you may want to more about the structures in the data sharing group.

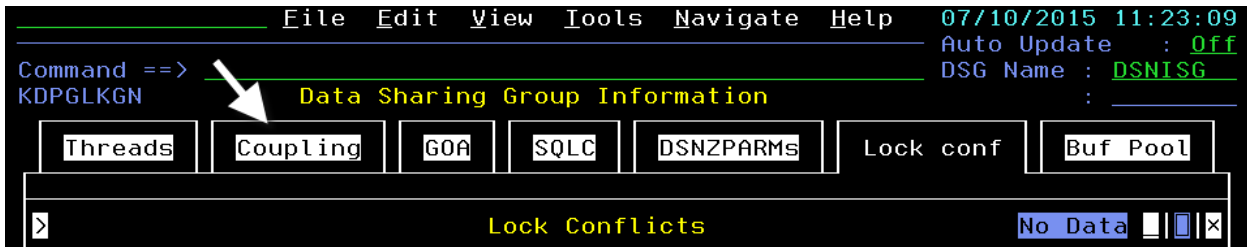
- g) **Press F3**, to return to the KDPPTHRD Data Sharing Group Active Threads panel. Note that from this panel you may use the tab navigation to look at other aspects of the data sharing group.
- h) To look at lock and coupling facility information. **Position the cursor on the Lock conf tab** and **Press Enter**.



You are now looking at locking information for the data sharing group, including lock and unlock requests, and global and false lock contention.



- i) To look at lock and coupling facility information. **Position the cursor on the Coupling tab** and **Press Enter.**



You are now looking at the DB2 Coupling Facility lock and list structure details for the data sharing group. This includes information such as structure size, utilization, global contention, false contention, and number of requests to the structures.



```

File Edit View Tools Navigate Help 02/07/2014 10:34:14
Auto Update : Off
Command ==> DSNISG
KDPXCFD DB2 Coupling Facility Detail
DSG ID : DSNISG

DB2 Coupling Facility List Detail for DSNISG
List Entries Percent..... 0
Lock Entries Percent..... 0
Structure Status..... Active
List Entries Used..... 176
Global Contention Rate.... 0
Lock Entries Allocated... 0
Structure Size..... 64512
Structure Connect Count... 2
Change Requests..... 0
IRLM Suspends..... 0
False Suspends..... 0
DB2 False Contention..... 0
Structure Used Percent.... 1
False Contention Rate.... 0
List Entries Allocated... 36203
Global Contention..... 0
False Contention..... 0
Lock Entries Used..... 0
Structure Used..... 800
Lock Requests..... 0
Unlock Requests..... 0
XEX Suspends..... 0
DB2 Global Contention.... 0

DB2 Coupling Facility Lock Detail for DSNISG
List Entries Percent..... 0
Lock Entries Percent..... 0
Structure Status..... Active
List Entries Used..... 7
Global Contention Rate.... 0
Lock Entries Allocated... 4194304
Structure Size..... 32768
Structure Connect Count... 2
Change Requests..... 0
IRLM Suspends..... 0
False Suspends..... 0
DB2 False Contention..... 0
Structure Used Percent.... 1
False Contention Rate.... 0
List Entries Allocated... 20993
Global Contention..... 75102
False Contention..... 12501
Lock Entries Used..... 0
Structure Used..... 452
Lock Requests..... 0
Unlock Requests..... 0
XEX Suspends..... 0
DB2 Global Contention.... 0

```

### 1.3 DB2 Group Object Analysis – I/O Analysis

Group Object Analysis is a facility of OMEGAMON DB2 that allows you to see DB2 Getpage and I/O activity in the DB2 data sharing group, and analyze that activity. This portion of the lab will look at how to use Group Object Analysis in the enhanced 3270 user interface.

- a) To see Group Object Analysis data **Position the cursor on the GOA tab** and **Press Enter**.

```

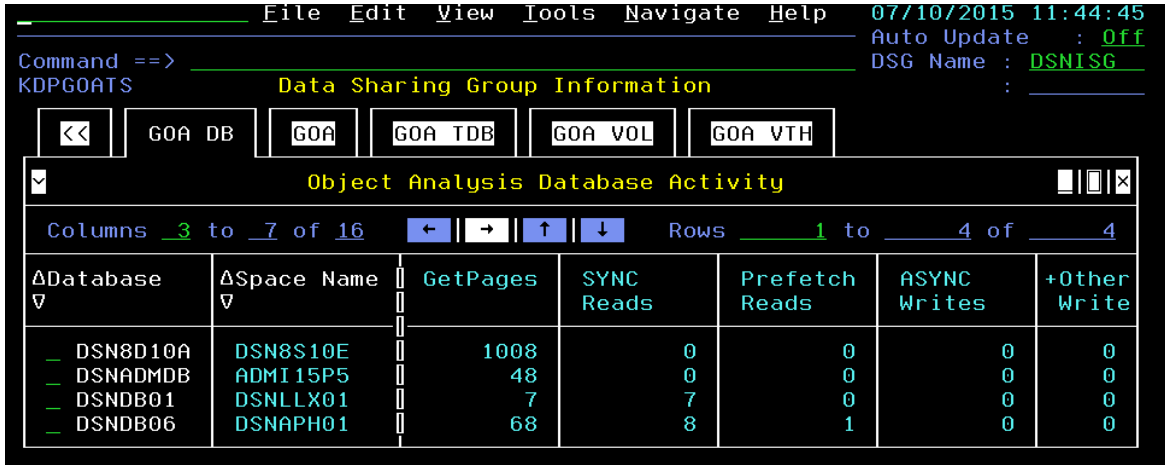
File Edit View Tools Navigate Help 07/10/2015 11:33:19
Auto Update : Off
Command ==> DSNISG
KDPXCFD Data Sharing Group Information
DSG ID : DSNISG

Threads Coupling GOA SQLC DSNZPARMs Lock conf Buf Pool

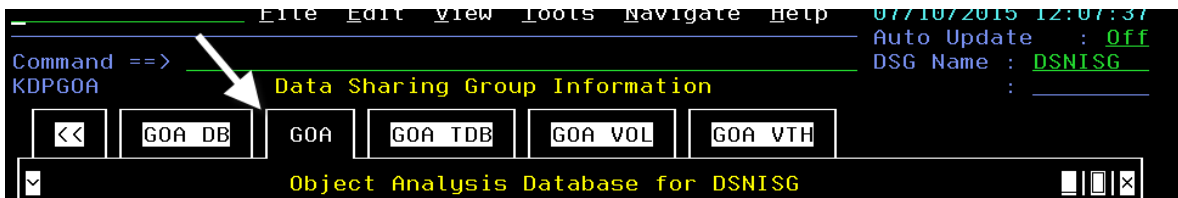
DB2 Coupling Facility List Detail for DSNISG

```

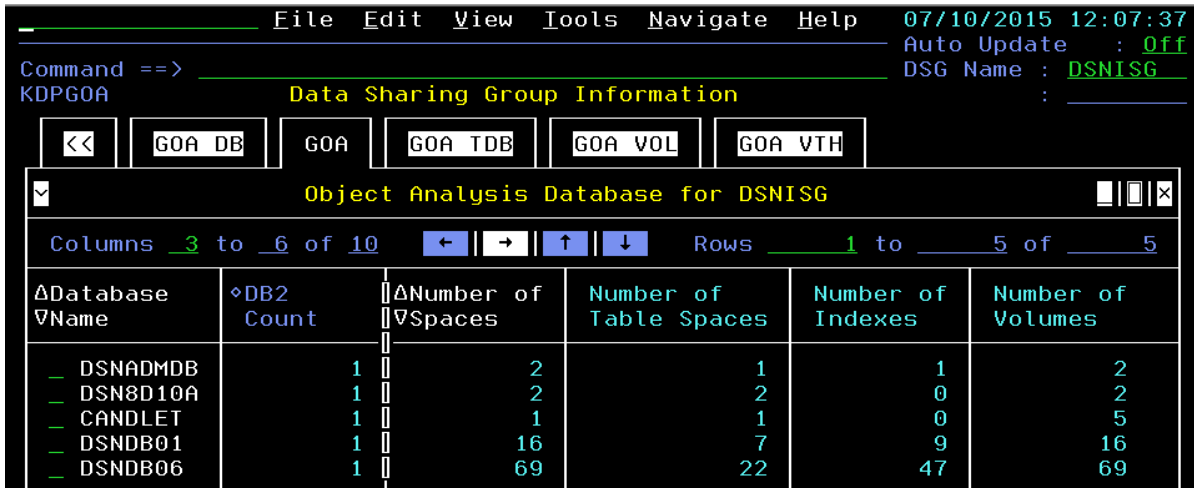
You are now looking at the Group Object Analysis database activity overview panel. This panel shows such information as Getpages and I/O counts by database and tablespace across the data sharing group.



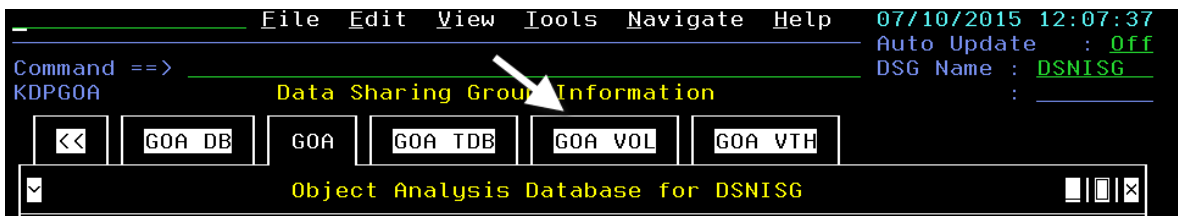
- b) To see database overview information, such as number of objects by type, Position the cursor on the **GOA DB** tab and Press Enter.



You are now looking at the database overview for the data sharing group.



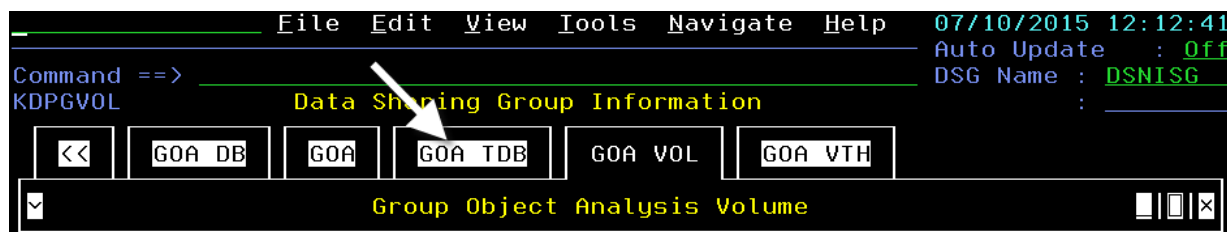
- c) To see DASD volume activity for the data sharing group, Position the cursor on the **GOA VOL** tab and Press Enter.



You are now looking at the DASD volume utilization for the data sharing group. This information includes utilization percent and millisecond response time (MSR time).

You may also see getpage and I/O activity correlated to the application threads running in the DB2 data sharing group.

- d) To see DB2 thread activity for the data sharing group, Position **the cursor on the GOA TDB tab** and **Press Enter**.



You are now looking at the listing of database and thread activity for the data sharing group. This shows the object name and the thread plan name and Corrid for the thread.

Database	Space Name	Plan Name	Auth ID	Corr ID	GetPage Reads
DSNDB06	DSNRTX01		SYSOPR		68
DSNDB01	DSNLLX02		SYSOPR		7
DSNADMDB	DSNADMTS	?RRSAF	SYSSTC	DB1IADMT_DMN	52
DSN8D10A	XEMP1	DSNREXX	STC	DB2READI	1092

We have looked at the core elements of Group Object Analysis. You have seen how Group Object Analysis shows DB2 object information, analyzes getpage and I/O activity, and correlates that information by object and by thread. Feel free to look at some of the other panel options.

- e) When you are finished, **Press F3** until you **return to the KDPSTART DB2 Main Screen**.

## 1.4 DB2 Thread Analysis – Long Running Threads

You have looked at how you can display DB2 threads in a data sharing group. Now let's look at some more detailed thread analysis scenarios. Let's begin at the DB2 Main Screen (KDPSTART). The bottom portion of the DB2 Main Screen shows a line of information for each monitored DB2 subsystem. To get information on a particular DB2 subsystem you use the standard navigation process we've demonstrated earlier in this lab exercise.

```

File Edit View Tools Navigate Help 07/10/2015 12:19:19
Auto Update : Off
Command ==>
KDPSTART DB2 Main Screen

```

All Active DB2 Data Sharing Groups					
Columns <u>3</u> to <u>6</u> of <u>24</u>		Rows <u>1</u> to <u>2</u> of <u>2</u>			
ΔGroup	◊Type	List %	% Used	Lock %	False Contention Rate
_ DSNISG	LIST	0	1	0	0
_ DSNISG	LOCK	0	1	0	0

All Active DB2 Subsystems							
Columns <u>4</u> to <u>8</u> of <u>15</u>		Rows <u>1</u> to <u>8</u> of <u>8</u>					
ΔDB2	ΔMVS	ΔGroup	Lock	Timeouts	Phase 1	Active	Indoubt
VID	▽	▽Name	Esc		Commits	DBATs	
_ DSNT	MVSE		0	0	0	0	0
_ DSNC	MVSE		0	0	0	4	0
_ DSNB	MVSE		0	0	0	1	0
_ DSNA	MVSE		0	278	10	5	0
_ DB1S	MVSE		0	0	0	0	0
_ DB1R	MVSE		0	0	0	0	0
_ DB1I	MVSE	DSNISG	0	0	0	0	0
_ DB1D	MVSE		0	0	0	0	0

a) Position the cursor next to the DB2ID (in this example DSNA), enter **T** for active threads and Press Enter.

All Active DB2 Subsystem					
Columns <u>4</u> to <u>8</u> of <u>15</u>		Rows <u>1</u> to <u>8</u> of <u>8</u>			
ΔDB2	ΔMVS	ΔGroup	Lock	Timeouts	
VID	▽	▽Name	Esc		
_ DSNT	MVSE		0	0	
_ DSNC	MVSE		0	0	
_ DSNB	MVSE		0	0	
<b>T</b> DSNA	MVSE		0	278	
_ DB1S	MVSE		0	0	

You are now looking at the Active Threads display for DB2 subsystem DSNA. Try shifting the screen to see additional thread information in the active thread overview (**Press F11** or use the arrow navigation option). Note that you will see many of the more relevant DB2 counters (Authid, CP rate, various IN-DB2 times, Getpage count, reads and prefetch counts, workstation name, and more). How may times you shift the screen will depend upon the resolution of your particular terminal screen.

File Edit View Tools Navigate Help 07/10/2015 12:29:26  
 Auto Update : Off  
 Command ==> SMF ID : MVSE  
 KDPTH52\* DB2 Active Threads DB2 ID : DSN

DB2 Active Threads for DSN

Columns 2 to 7 of 21 Rows 1 to 15 of 15

ΔPlan	P/C	ΔAuth ID	ΔCorr ID	ΔGet	ΔElapsed	ΔCP CPU
▽		▽	▽	▽Page	▽Time	▽Rate
-	DISTSERV	DDS1491	db2jcc_appli	772	2d 03h	0.0
-	DISTSERV	DDS1491	db2jcc_appli	1785	2d 03h	0.0
-	DISTSERV	DDS1491	db2jcc_appli	55	8d 04h	0.0
-	DISTSERV	DDS3716	db2jcc_appli	134	9d 23h	0.0
-	DISTSERV	ZILOGDB	db2jcc_appli	4895	14d 04h	0.0
-	?RRSAF	SYSSTC	DSNAADMT_II	0	14d 16h	0.0
-	?RRSAF	SYSSTC	DSNAADMT_DMN	126863	14d 16h	0.0
-	CICSDEMO	DNET314	POOLDBM00001	55929692	2h 13m	0.3
-	DB2PM	DB2PM		1630364	8d 02h	0.0
-	KO2PLAN	DB2PM	OMEGAMON	0	8d 02h	0.0
-	KO2PLAN	DB2PM		128444	8d 02h	0.0
-	KO2PLAN	DB2PM		1144	8d 02h	0.0
-	KO2PLAN	DB2PM		30189	8d 02h	0.0
-	DSNREXX	STC	DB2LOCK	1206	2h 13m	0.0
-	DSNREXX	STC	DB2READ	132	2h 13m	0.0

b) Once you have looked at the available columns, **shift the screen** to where you can see In-DB2 Elapsed Time, Wait Time, and DB2 Status. The screen should appear similar to below.

File Edit View Tools Navigate Help 07/10/2015 12:31:01  
 Auto Update : Off  
 Command ==> SMF ID : MVSE  
 KDPTH52\* DB2 Active Threads DB2 ID : DSN

DB2 Active Threads for DSN

Columns 7 to 10 of 21 Rows 1 to 15 of 15

ΔPlan	ΔCP CPU	ΔIn-DB2 Elapsed Time	ΔIn-DB2 CP CPU	ΔWait Time
▽	▽Rate	▽	▽	▽
-	DISTSERV	0.0	0.043s	0.038s
-	DISTSERV	0.0	0.250s	0.007s
-	DISTSERV	0.0	0.195s	0.005s
-	DISTSERV	0.0	0.260s	0.013s
-	DISTSERV	0.0	2.367s	0.004s
-	?RRSAF	0.0	0.000s	0.000s
-	?RRSAF	0.0	17.572s	14.491s
-	CICSDEMO	0.3	28m 37s	2m 56s
-	DB2PM	0.0	3m 29s	3m 08s
-	KO2PLAN	0.0	7.704s	6.739s
-	KO2PLAN	0.0	1m 40s	1m 29s
-	KO2PLAN	0.0	0.300s	0.068s
-	KO2PLAN	0.0	1m 52s	1m 31s
-	DSNREXX	0.0	0.305s	0.119s
-	DSNREXX	0.0	2h 06m	0.146s

The Wait Time column is a summary of the various DB2 wait times for the DB2 thread (including I/O, Lock/Latch and various other waits).

c) **Position the cursor** on the sort arrows for Wait Time and **Press Enter** to sort by Wait Time.

ΔPlan	ΔACP CPU Rate	ΔIn-DB2 Elapsed Time	ΔIn-DB2 CP CPU	▽Wait Time
— DSNREXX	0.0	2h 06m	0.146s	2h 06m
— CICSDEMO	0.3	28m 37s	2m 56s	25m 32s
— K02PLAN	0.0	1m 52s	1m 31s	16.236s
— DB2PM	0.0	3m 29s	3m 08s	5.684s

You are now looking at Active Threads display, sorted by Wait Time.

d) To see more detail about the thread, **position the cursor** by the thread (DSNREXX) and **Press Enter**.

ΔPlan	ΔACP CPU Rate	ΔIn-DB2 Elapsed Time	ΔIn-DB2 CP CPU	▽Wait Time
— DSNREXX	0.0	2h 06m	0.146s	2h 06m
— CICSDEMO	0.3	28m 37s	2m 56s	25m 32s
— K02PLAN	0.0	1m 52s	1m 31s	16.236s
— DB2PM	0.0	3m 29s	3m 08s	5.684s

You are now looking at the Thread SQL information. This panel shows the various counts and indicators showing what SQL has been executed by the thread. Note that there are multiple tabs highlighted at the top of the panel. Each tab represents different categories of thread information. Try placing the cursor on different tabs and press enter to see additional thread and SQL information for the thread.



File Edit View Tools Navigate Help 07/10/2015 12:35:05  
 Auto Update : Off  
 Command ==> KDPTSQL1  
 SMF ID : MVSE  
 DB2 ID : DSNB

**Thread Information**

Plan.....	DSNREXX	Correlation ID.....	DB2READ
Authorization ID.....	STC	Connection.....	DB2CALL
Job Name.....	DB2READ	MVS Status.....	WAIT-MIS
Status.....	WAIT-LOC		

**SQL Manipulative Counts**

Columns 1 to 2 of 2 Rows 1 to 16 of 16

Description	Value
Select	0
Insert	0
Rows Inserted	0
Update	0
Rows Updated	0
Delete	0
Rows Deleted	0
Describe	140
Prepare	140
Open Cursor	140
Close Cursor	0
Fetch	1382
Rows Fetched	1312
Describe Table	0
Merge	0
Total DML	1802

e) To see dynamic SQL information **Position the cursor on the PREP tab** and **Press Enter**.

File Edit View Tools Navigate Help 07/10/2015 12:42:49  
 Auto Update : Off  
 Command ==> KDPTSQL7  
 SMF ID : MVSE  
 DB2 ID : DSNB

**Prepared Statistics**

You are now looking at counts of Prepare activity for the DB2 thread.

File Edit View Tools Navigate Help 07/10/2015 12:42:49  
 Auto Update : Off  
 Command ==> KDPTSQL7  
 SMF ID : MVSE  
 DB2 ID : DSNB

**Thread Information**

Plan.....	DSNREXX	Correlation ID.....	DB2READ
Authorization ID.....	STC	Connection.....	DB2CALL
Job Name.....	DB2READ	MVS Status.....	WAIT-MIS
Status.....	WAIT-LOC		

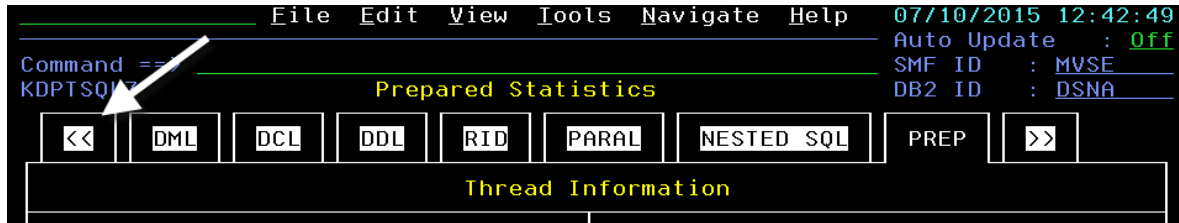
**Prepared Statistics Counts**

Columns 1 to 2 of 2 Rows 1 to 7 of 7

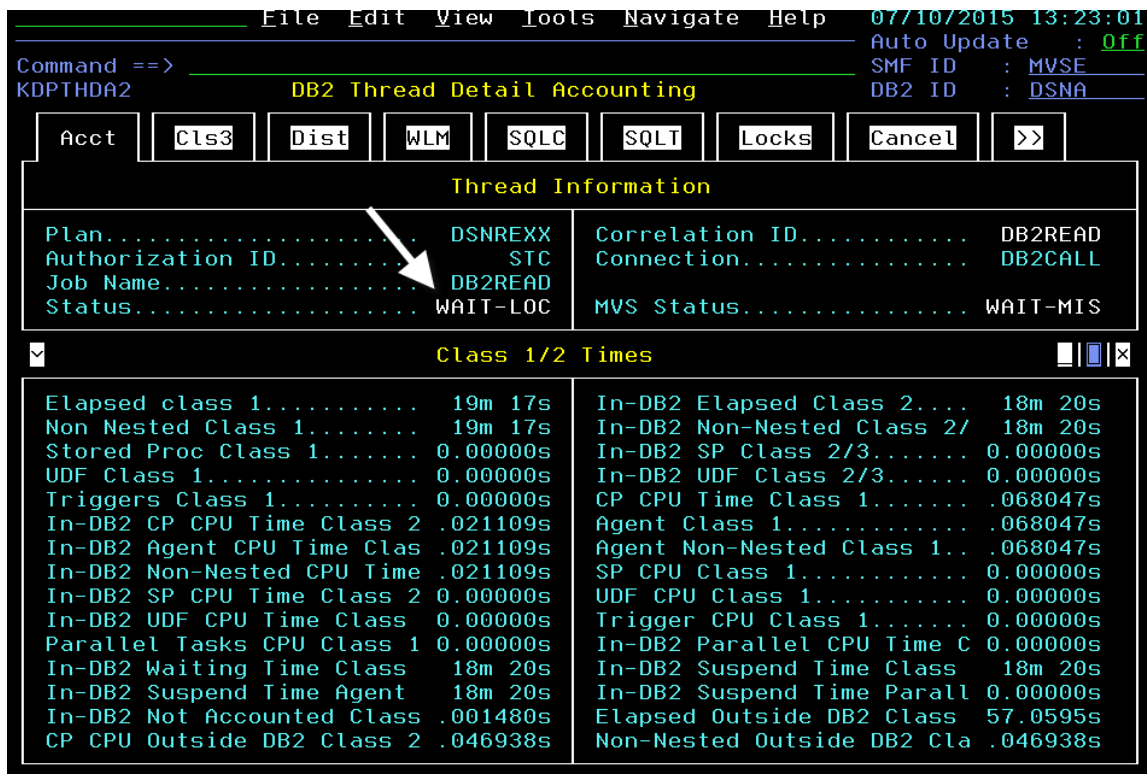
Description	Value
Prepare from Cache	147
Prepare No Match	0
Prepare Implicit KEEPDPYD(YES)	0
Prepare Avoided KEEPDPYD(YES)	0
Prepare Discarded-MAXKEEPD	0
Prepare Purged-DROP/ALT/REV	0
Prepare index restricted	0

You will want to look at other thread specific information, such as the DB2 Accounting information that shows thread elapsed, IN-DB2, and CPU times.

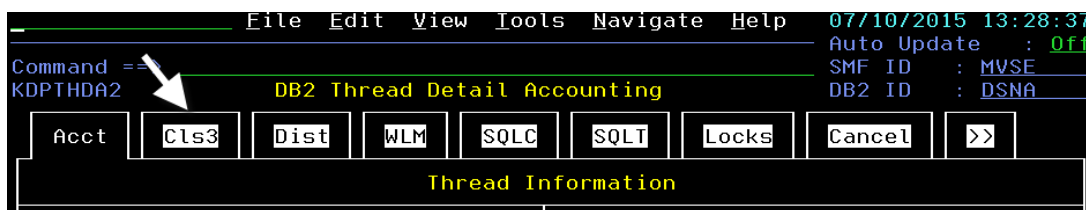
- f) To see thread accounting **Position the cursor on the << tab** and **Press Enter**.



You are now looking at the Thread Accounting display. This panel shows the thread elapsed, IN-DB2, and CPU information. Note the thread status of WAIT-LOC which indicates the thread is waiting for a lock.



- g) To see more information on what the thread is waiting for, position **the cursor on the Cls3 tab** and **Press Enter**.



You are now looking at the DB2 Class 3 wait time display. This panel shows the number of wait events by type, and time for the waits.

```

File Edit View Tools Navigate Help 07/10/2015 13:29:23
Auto Update : Off
Command ==>
KDPTHR3 DB2 Thread Detail Accounting SMF ID : MVSE
DB2 ID : DSNB

```

Acct	Cls3	Dist	WLM	SQLC	SQLT	Locks	Cancel	>>
------	------	------	-----	------	------	-------	--------	----

```

Thread Information
Plan..... DSNREXX Correlation ID..... DB2READ
Authorization ID..... STC Connection..... DB2CALL
Job Name..... DB2READ MVS Status..... WAIT-MIS
Status..... WAIT-LOC

```

Class 3 Times

Wait Time Locks..... 24m 24s	Lock Events..... 25
Wait Time Latches..... 0.00000s	Latch Events..... 0
Wait Time Sync I/O..... 0.00000s	Async I/O Events..... 0
Wait Time DB I/O..... 0.00000s	DB I/O Events..... 0
Wait Time Log Write..... 0.00000s	Log Write I/O Events.... 0
Other Read I/O..... 0.00000s	Other Read I/O Events.... 0
Other Write I/O..... 0.00000s	Other Write I/O Events.... 0
Service Task Switch..... .027443s	Service Task Switch Events 48
Update Commit..... .001467s	Update Commit Events.... 24
Open Close Dataset..... 0.00000s	Open Close Events..... 0
SYSLGRNG..... 0.00000s	SYSLGRNG Events..... 0
Extended Delete Define D 0.00000s	Extended Delete Define E 0
Other Services..... .025976s	Other Service Events.... 24
Archive Log Quiesce..... 0.00000s	Archive Log Quiesce Events 0
Archive Log Read..... 0.00000s	Archive Log Read Events... 0
Drain Lock..... 0.00000s	Drain Lock Events..... 0

Note that in the example the major wait reason is Wait Time Locks. In other words the thread is waiting for locks.

- h) To see more information on what DB2 resources are locked, position the cursor on the Locks tab and Press Enter.

```

File Edit View Tools Navigate Help 07/10/2015 13:32:04
Auto Update : Off
Command ==>
KDPTHRDL DB2 Thread Detail Locks Owner SMF ID : MVSE
DB2 ID : DSNB

```

Acct	Cls3	Dist	WLM	SQLC	SQLT	Locks	Cancel	>>
------	------	------	-----	------	------	-------	--------	----

```

Thread Information

```

You are now looking at the thread lock detail for the thread. This panel shows what objects the thread has locked, what is the lock type and intent level of the locks.

File Edit View Tools Navigate Help 07/10/2015 13:32:04  
 Auto Update : Off  
 Command ==> KDPTHRDL DB2 Thread Detail Locks Owned  
 SMF ID : MVSE  
 DB2 ID : DSNÁ

Acct Cls3 Dist WLM SQLC SQLT Locks Cancel >>

**Thread Information**

Plan.....	DSNREXX	Correlation ID.....	DB2READ
Authorization ID.....	STC	Connection.....	DB2CALL
Job Name.....	DB2READ	MVS Status.....	WAIT-MIS
Status.....	WAIT-LOC		

**Locks Ownership Information**

Percent NUMLKUS.....	0.00	Locks Owned.....	4
Catalog Locks.....	0	Pageset and Dataset Locks..	1
Catalog Pageset Locks.....	0	Page/ Row Locks.....	0
Catalog Page/ Row Locks...	0	Directory and Other Locks..	3
Bind ACQUIRE Option.....	ALLOCATE	Bind RELEASE Option.....	COMMIT
ISOLATION option.....	Cursor S		

**LOCKS Owned**

Columns 1 to 3 of 4 Rows 1 to 4 of 4

Lock Type	Lock Level	+Lock Resource
PageSet Lock	Intent share	DB=DSN8D61A
Skeleton Cursor Table Lock	Share	PLAN=DSNREX
Table Lock	Exclusive	DB=DSN8D61A
Skeleton Package Table Lock	Share	N/A

You may also want to see the SQL call being executed by thre thread.

- i) To see the SQL call text, position the cursor on the SQLT tab and Press Enter.

File Edit View Tools Navigate Help 07/10/2015 13:32:04  
 Auto Update : Off  
 Command ==> KDPTHRDL DB2 Thread Detail Locks Owned  
 SMF ID : MVSE  
 DB2 ID : DSNÁ

Acct Cls3 Dist WLM SQLC SQLT Locks Cancel >>

**Thread Information**

You now see the SQL call text being executed.

File Edit View Tools Navigate Help 07/10/2015 13:36:28  
 Auto Update : Off  
 Command ==> KDPTSQTL SQL Text  
 SMF ID : MVSE  
 DB2 ID : DSNÁ

Acct Cls3 Dist WLM SQLC SQLT Locks Cancel >>

**Thread Information**

Plan.....	DSNREXX	Correlation ID.....	DB2READ
Authorization ID.....	STC	Connection.....	DB2CALL
Job Name.....	DB2READ	MVS Status.....	WAIT-MIS
Status.....	WAIT-LOC		

**Active SQL Text**

Columns 1 to 1 of 1 Rows 1 to 1 of 1

Statement Text

SELECT \* FROM DSN8610.ACT

An indication of high DB2 lock wait time indicates the high likelihood of DB2 lock conflicts. Now that you know that lock waits is the main wait reason for this thread, you may investigate the source of the lock conflicts.

- h) **Press F3**, then **Press F3** again. You should be at the KDPSTART DB2 Main Screen.
- i) **Position the cursor** next to the DB2ID (in this example again choose DSNA), **enter L** for lock conflicts and **Press Enter**.

The screenshot shows a table titled "All Active DB2 Subsystems". The table has columns: ΔADB2 ∇ID, ΔMVS ∇, ΔGroup ∇Name, Lock Esc, Timeouts, and Pha Com. The rows are: DSNT, DSNC, DSNB, DSNA (highlighted with a cursor), and DSNA. The DSNA row shows a Lock Esc of 0 and Timeouts of 278.

ΔADB2 ∇ID	ΔMVS ∇	ΔGroup ∇Name	Lock Esc	Timeouts	Pha Com
DSNT	MVSE		0	0	
DSNC	MVSE		0	0	
DSNB	MVSE		0	0	
DSNA	MVSE		0	278	
DSNA	MVSE		0	0	

You are now looking at the Lock Conflict display for DB2 subsystem DSNA. This display will show the lock owner and the lock waiter for the lock conflict, and will show the DB2 resource in the conflict (which you can see in the Lock Resource column).

The screenshot shows a window titled "DB2 Lock Conflicts for DSNA". The window has a menu bar (File, Edit, View, Tools, Navigate, Help) and a status bar (07/10/2015 13:41:50, Auto Update: Off, SMF ID: MVSE, DB2 ID: DSNA). The main display shows a table with columns: ΔPlan ∇Name, ΔAuth ID ∇, ΔLock ∇Status, ΔElapsed ∇, ΔLock ∇Level, and ΔLock ∇Reso. The rows are: DSNREXX (Owner) and DSNREXX (Waiter). The Owner thread has an elapsed time of 0, and the Waiter thread has an elapsed time of 64. The lock level is Exclusive Intent share, and the lock resource is DB=.

ΔPlan ∇Name	ΔAuth ID ∇	ΔLock ∇Status	ΔElapsed ∇	ΔLock ∇Level	ΔLock ∇Reso
DSNREXX	STC	Owner	0	Exclusive	DB=
DSNREXX	STC	Waiter	64	Intent share	DB=

Note which thread is the owner, and which thread is the waiter, look for a column that shows Lock Status. From this display you see that the conflict is between two batch applications, each running the DSNREXX plan. Now let's look at what the other batch thread is doing.

- j) **Position the cursor** next to the Owner thread and **Press Enter**

The screenshot shows a close-up of the lock conflict table. The cursor is positioned on the Owner thread (DSNREXX).

ΔPlan ∇Name	ΔAuth ID ∇	ΔLock ∇Status	ΔElap ∇
DSNREXX	STC	Owner	
DSNREXX	STC	Waiter	

```

File Edit View Tools Navigate Help 07/10/2015 13:56:33
Auto Update : Off
Command ==>
KDPTHRDL DB2 Thread Detail Locks Owned SMF ID : MVSE
DB2 ID : DSNB

```

Acct Cls3 Dist WLM SQLC SQLT Locks Cancel >>

**Thread Information**

```

Plan..... DSNREXX Correlation ID..... DB2LOCK
Authorization ID..... STC Connection..... DB2CALL
Job Name..... DB2LOCK
Status..... SWAPPED- MVS Status..... SWAPPED-

```

**Locks Ownership Information** [Icons]

```


Percent NUMLKUS..... 0.00 Locks Owned..... 8
Catalog Locks..... 0 PageSet and Dataset Locks. 1
Catalog PageSet Locks.... 0 Page/ Row Locks..... 0
Catalog Page/ Row Locks... 0 Directory and Other Locks. 7
Bind ACQUIRE Option..... ALLOCATE Bind RELEASE Option..... COMMIT
ISOLATION option..... Cursor S

```

**LOCKS Owned** [Icons]

Columns 1 to 3 of 4 [Navigation] Rows 1 to 8 of 8

Lock Type	Lock Level	+Lock Resource
Database Lock	Share	DB=DSNDB06
PageSet Lock	Intent share	DB=DSN8D61A
Skeleton Cursor Table Lock	Share	PLAN=DSNREX
Partition Level Lock	Intent share	DB=DSNDB06
Partition Level Lock	Intent share	DB=DSNDB06
Partition Level Lock	Intent share	DB=DSNDB06
Table Lock	Exclusive	DB=DSN8D61A
Skeleton Package Table Lock	Share	N/A



Note that this thread is performing holding an exclusive level lock. You also see the resource locked to the right.

k) **Press F3**, then **Press F3** again. You should be at the KDPSTART DB2 Main Screen.

## 1.5 DB2 Thread Analysis – CICS Threads

In the prior thread analysis scenario you looked at batch threads and a lock conflict analysis scenario. Now, using OMEGAMON DB2 enhanced 3270 user interface, you can also look at CICS threads connected to DB2.

Begin at the KDPSTART DB2 Main Screen panel.

The screenshot shows the OMEGAMON DB2 Main Screen interface. At the top, there is a menu bar with 'File', 'Edit', 'View', 'Tools', 'Navigate', and 'Help'. The date and time are '07/10/2015 13:57:55', and 'Auto Update' is set to 'Off'. The command line shows 'KDPSTART' and the screen title is 'DB2 Main Screen'.

The first panel is titled 'All Active DB2 Data Sharing Groups'. It shows a table with the following columns: ΔGroup, ΔType, List %, % Used, Lock %, and False Contention Rate. The data is as follows:

ΔGroup	ΔType	List %	% Used	Lock %	False Contention Rate
DSNISG	LIST	0	1	0	0
DSNISG	LOCK	0	1	0	0

The second panel is titled 'All Active DB2 Subsystems'. It shows a table with the following columns: ΔDB2 ID, ΔMVS, ΔGroup Name, Lock Esc, Timeouts, Phase 1 Commits, Active DBATs, and Indoubt. The data is as follows:

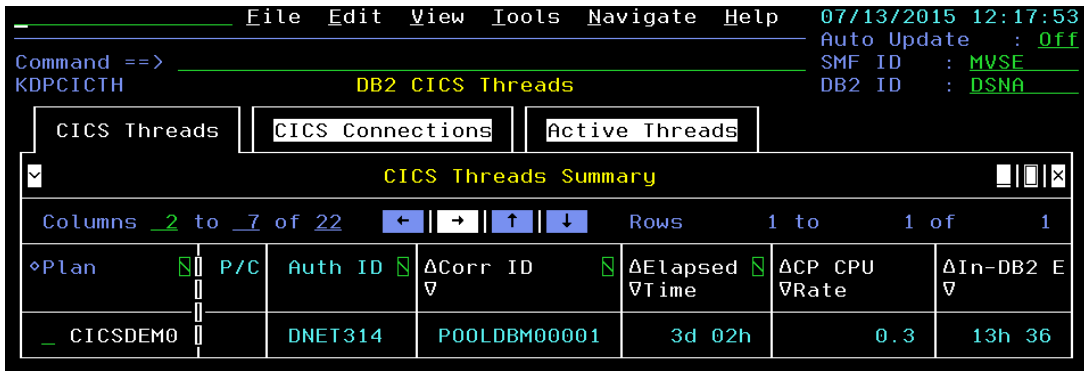
ΔDB2 ID	ΔMVS	ΔGroup Name	Lock Esc	Timeouts	Phase 1 Commits	Active DBATs	Indoubt
DSNT	MVSE		0	0	0	0	0
DSNC	MVSE		0	0	0	4	0
DSNB	MVSE		0	0	0	1	0
DSNA	MVSE		0	278	10	5	0
DB1S	MVSE		0	0	0	0	0
DB1R	MVSE		0	0	0	0	0
DB1I	MVSE	DSNISG	0	0	0	0	0
DB1D	MVSE		0	0	0	0	0

a) Position the cursor next to the DB2ID (in this example DSNA), enter C and Press Enter.

This is a close-up view of the 'All Active DB2 Subsystems' table. A white arrow points to the 'DSNA' row in the ΔDB2 ID column. The table structure is the same as in the previous screenshot.

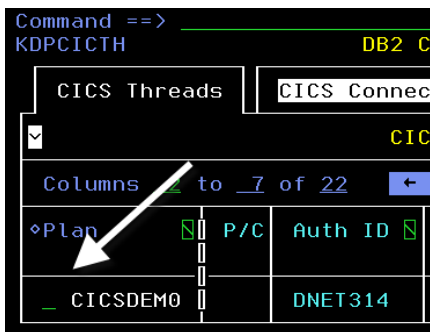
ΔDB2 ID	ΔMVS	ΔGroup Name	Lock Esc	Timeouts	Phase 1 Commits
DSNA	MVSE		0	0	
DSNC	MVSE		0	0	
DSNB	MVSE		0	0	
DSNA	MVSE		0	278	

You are now looking at a summary of DB2 threads from various CICS regions connected to DB2 subsystem. From this display you see summary detail for each thread.



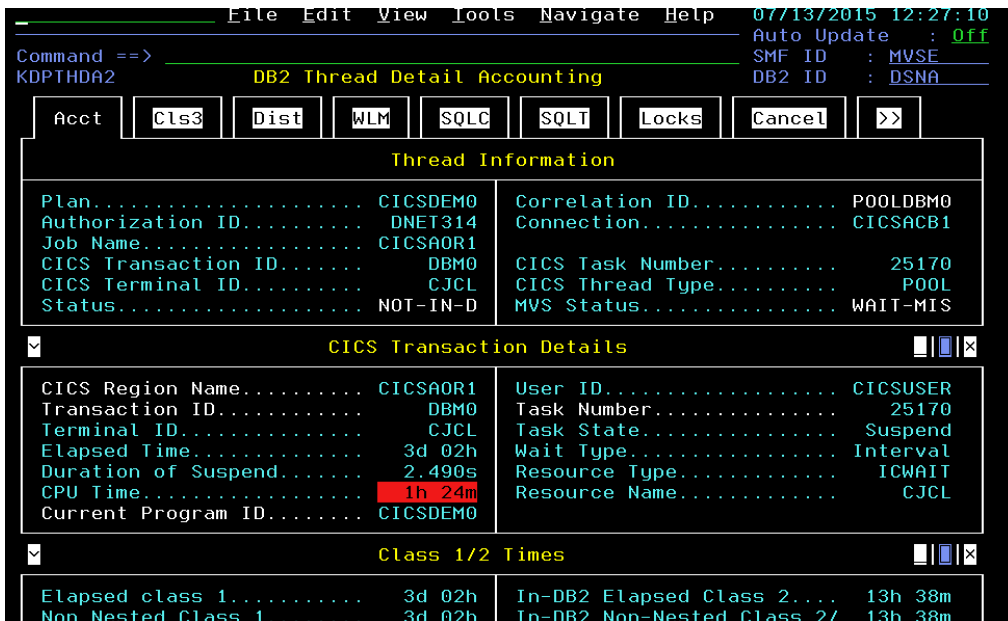
You may also drill down into the thread to see additional thread detail.

b) **Position the cursor** next to the thread and **Press Enter**.



You are now looking at the Accounting detail for the thread. You have seen examples of this information in prior exercises.

Note the CICS region name and CICS Transaction id being used by this DB2 thread (in this example the transaction ID is DBM0).





The enhanced 3270 user interface offers a feature called embedded data. Embedded data allows for easy cross component navigation across various OMEGAMON monitoring components. In this example you may navigate from the DB2 thread display to the OMEGAMON CICS region information.

- c) To see the CICS region information, **Position the cursor on the CICS Region Name label and Press Enter.**

CICS Transaction Details		
CICS Region Name.....	CICSA0R1	User ID.....
Transaction ID.....	DBM0	Task Number...
Terminal ID.....	CJCL	Task State....
Elapsed Time.....	3d 02h	Wait Type.....
Duration of Suspend.....	2.490s	Resource Type..
CPU Time.....	1h 24m	Resource Name..
Current Program ID.....	CICSDEM0	

You will be presented with a set of options from a popup.

- d) From the popup **Select option S** for CICS Region Overview and **Press Enter.**

Navigation Options for CICSA0R1	
Select an action and then press ENTER	
S	1. ! Take Actions on Task
D	2. D CICS DB2 Connection Summary
B	3. B CICS Bottlenecks
F	4. F CICS File/Data Resources
R	5. R CICS Resources
S	6. S CICS Region Overview
T	7. T CICS Task Summary

You are now looking the CICS Region overview information for the region. This is monitoring information collected by OMEGAMON CICS.

CICS Region Overview						
CICS Region		z/OS Address Space	Data Sources			
CICSA0R1 Overview						
System ID.....	MVSE	CICS Region Name.....	CICSA0R1			
Worst Region Service Class	n/a	Region's Worst Perf. Index	0.00%			
CPU Utilization.....	2.2%	CICS TOD Updated.....	Yes			
Transaction Rate.....	0/m	Maximum Tasks Percent....	2%			
Queued Remote Requests...	0	SOS.....	No			
Stg. Violations last hour.	0	AIDs.....	0			
ICEs.....	5	CICS TOD Clock.....	12:38:42			
Any Current WS Faults....	No	Any Current WS Timeouts...	No			
CICS Version.....	6.9.0					
Highest CPU Tasks						
Columns 2 to 7 of 19		Rows 1 to 5 of 6				
ΔTransaction VID	ΔCPU VTime	ΔElapsed VTime	Task State	Wait Type	Resource Type	+Resou Name
_ DBM0	1h 24m	3d 02h	Running	CPU	IN_DB2	L800

- e) You may drill down for more CICS transaction detail. To see this detail **Position the cursor** next to the transaction (DBM0) and **Press enter**.

CICSAOR1 Overview		
System ID.....	MVSE	CICS Region Name
Worst Region Service Class	n/a	Region's Worst P
CPU Utilization.....	2.2%	CICS TOD Updated
Transaction Rate.....	0/m	Maximum Tasks P
Queued Remote Requests...	0	SOS.....
Stg. Violations last hour.	0	AIDs.....
ICES.....	5	CICS TOD Clock.
Any Current WS Faults....	No	Any Current WS
CICS Version.....	6.9.0	

Highest CPU Tasks						
Columns	2 to 7 of 19	←	→	↑	↓	Rows
ΔTransaction VID	ΔCPU VTime	ΔElapsed VTime	Task State	Wait Type		
DBM0	1h 24m	3d 02h	Running	CPU		
COIE	1m 10s	17d 16h	Suspend	Task		

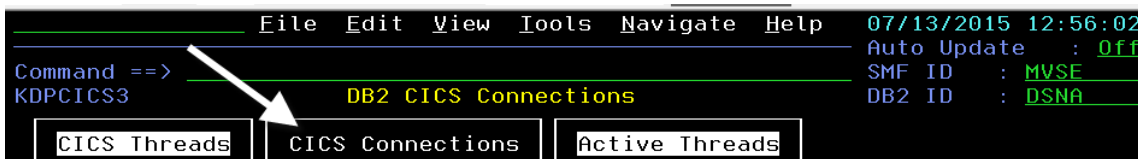
You are now looking at the CICS counters for the transaction.

File Edit View Tools Navigate Help		07/13/2015 12:48:30	
Command ==>		Auto Update : Off	
KCPTASD		CICSplex : CICSPLEX1	
Details for Transaction DBM0 Task 25170		Region : CICSAOR1	
Details	Statistics	Storage	
Timings	I/O	Definitions	
Transaction Details			
Transaction ID.....	DBM0	Time in Suspend.....	0.219s
CPU time.....	1h 24m	Elapsed Time.....	3d 02h
Storage Used Above 16M....	0K	Storage Used Below 16M....	2K
Attach time.....	10:15:49	Time of Suspend.....	12:48:29
Suspend Timeout Due.....	None	Facility Type.....	Term
Facility ID.....	CJCL	Task State.....	Suspend
Dispatcher Queue.....	TXN mstr	First Program ID.....	CICSDEM0
Current Program ID.....	CICSDEM0	Resource Type.....	ICWAIT
Resource Name.....	CJCL	User ID.....	CICSUSER
EXEC CICS Command.....	DELAY	Purgeable Suspend.....	No
Purge Status.....	No purge	Suspend Type.....	Suspend
UOW State.....	Inflight	Umbrella Transaction ID...	None
Originating Transaction ID	DBM0	Trace active.....	No
EIB Details			
EXEC CICS Command.....	DELAY	Function Code.....	x'1004'
EIBRESP Description.....	NORMAL	EIBRESP Value.....	0
EIBRESP2 Value.....	0	Resource Name.....	n/a
EIB Date and Time.....	10:15:49	Program Name.....	CICSDEM0
Program Offset.....	000001AE	Terminal ID.....	CJCL

- f) **Press F3 three times** to return to the DB2 CICS Threads display (KDPCICTH).

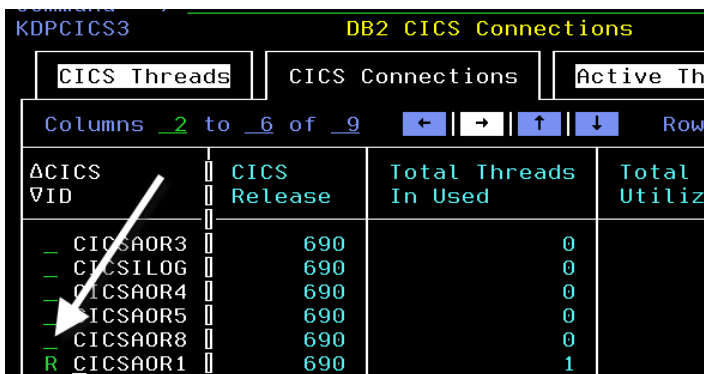
From the DB2 CICS Connections display you may navigate to see more information on the various CICS regions connected to the DB2 subsystem.

g) **Position the cursor** on the CICS Connections tab and **Press Enter**

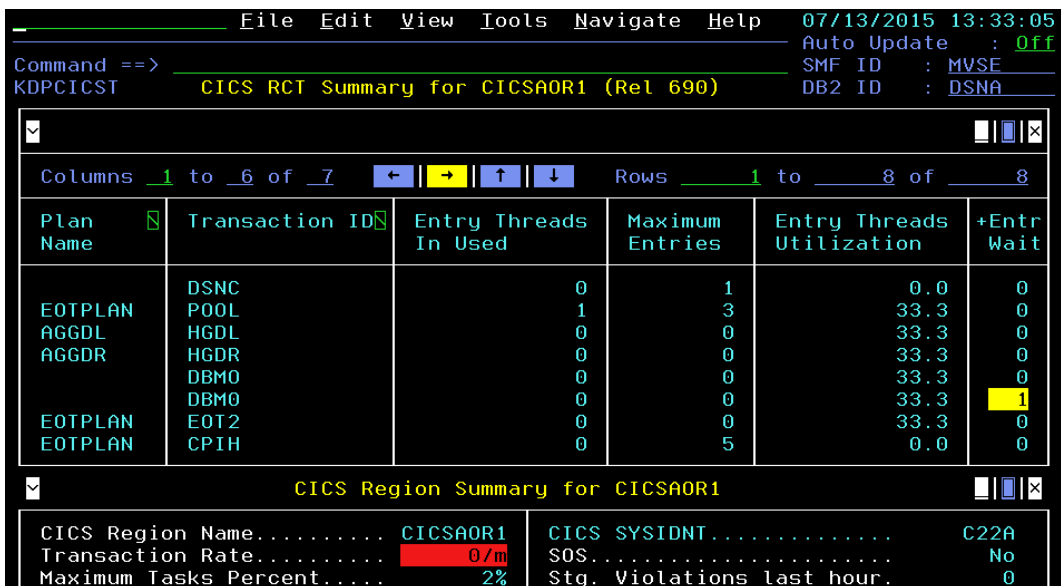


You are now looking at the overview of CICS regions connected to the DB2 subsystem. From this display you may see what CICS regions are connected to DB2, the number of CICS threads utilized.

h) To see information on the CICS RCT **Position the cursor** by the CICS region, **Enter R** and **Press Enter**



You are now looking at the CICS RCT summary for the CICS region, and also CICS region summary information. This display shows more detail on CICS threads used, and bu thread type.



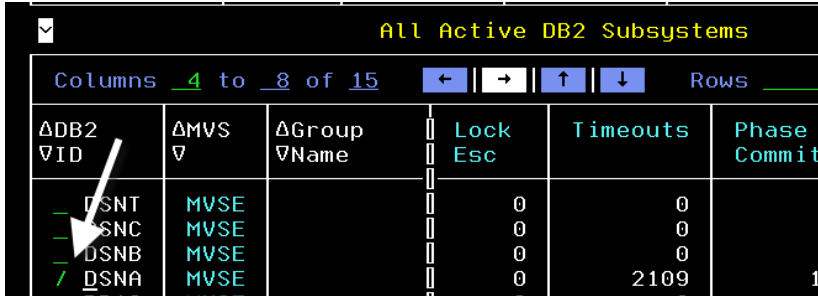
You have now seen the DB2 and CICS information available in OMEGAMON, and how to drill down and navigate between the monitoring tools within the enhanced 3270 user interface.

i) **Press F3 twice** to return to the KDPSTART panel.

## 1.6 DB2 Subsystem Analysis

The final phase of this lab exercise will look at resource usage from the subsystem perspective.

- a) **Position the cursor** next to the DB2ID (in this example DSNNA), enter / and **Press Enter**.

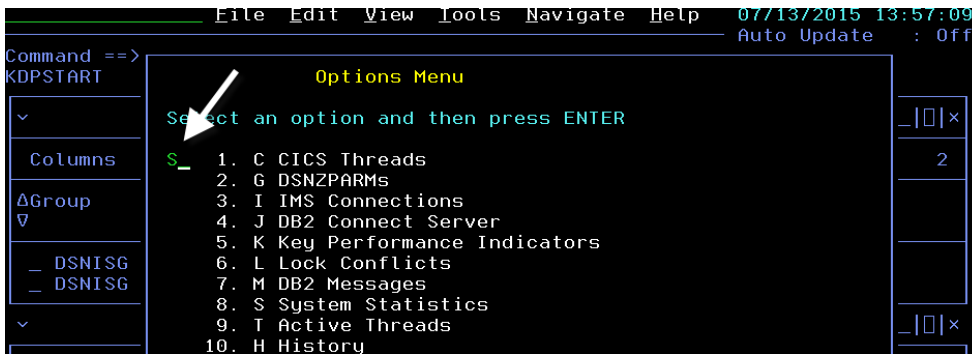


The screenshot shows a table titled "All Active DB2 Subsystems". The columns are ΔDB2 VID, ΔMVS, ΔGroup, Lock Esc, Timeouts, and Phase Commit. The row for DSNNA is highlighted with a cursor, and a white arrow points to the DB2 ID column.

ΔDB2 VID	ΔMVS	ΔGroup	Lock Esc	Timeouts	Phase Commit
DSNT	MVSE		0	0	
DSNC	MVSE		0	0	
DSNB	MVSE		0	0	
/ DSNNA	MVSE		0	2109	1

You are presented with a popup with various drill down options.

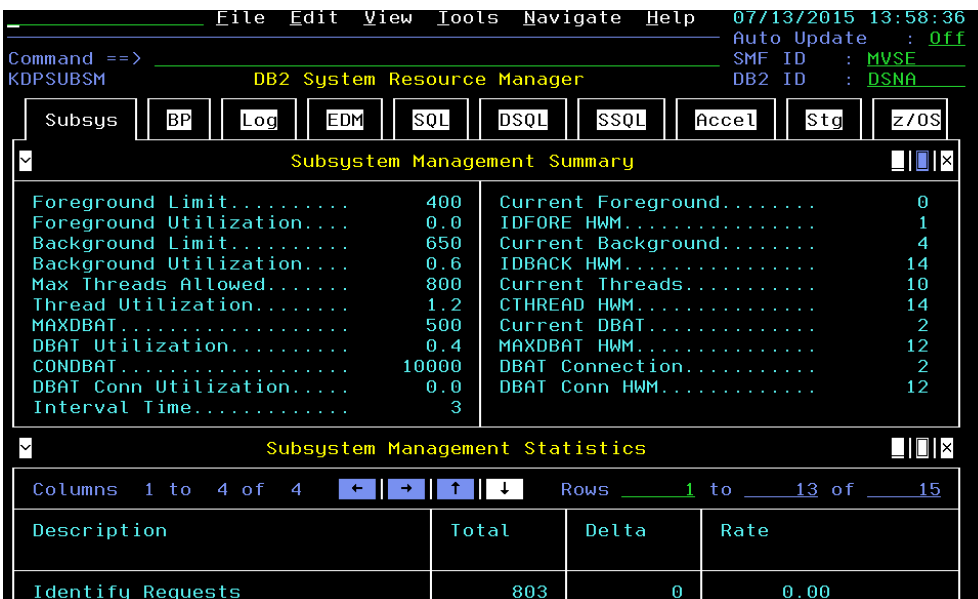
- b) **Enter S** for Subsystem Statistics in the popup option and **Press Enter**



The screenshot shows an "Options Menu" popup with a list of options. The letter 'S' is entered in the input field, and a white arrow points to the 'S' option in the list.

Option	Description
1. C	CICS Threads
2. G	DSNZPARMS
3. I	IMS Connections
4. J	DB2 Connect Server
5. K	Key Performance Indicators
6. L	Lock Conflicts
7. M	DB2 Messages
8. S	System Statistics
9. T	Active Threads
10. H	History

You are now looking at the DB2 subsystem statistics for the current interval.



The screenshot shows the "DB2 System Resource Manager" interface. It displays a "Subsystem Management Summary" table and a "Subsystem Management Statistics" table. The summary table shows various resource limits and current usage. The statistics table shows the total, delta, and rate for identify requests.

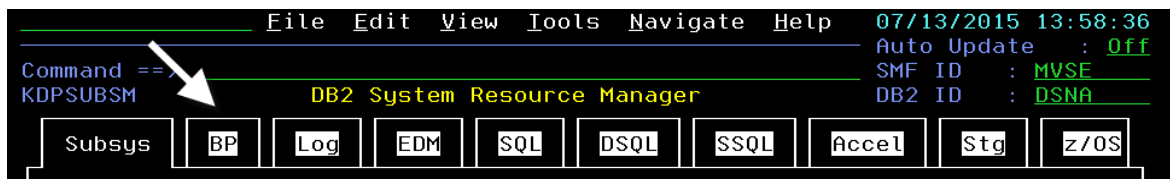
Subsystem Management Summary	
Foreground Limit.....	400
Foreground Utilization...	0.0
Background Limit.....	650
Background Utilization...	0.6
Max Threads Allowed.....	800
Thread Utilization.....	1.2
MAXDBAT.....	500
DBAT Utilization.....	0.4
CONDBAT.....	10000
DBAT Conn Utilization....	0.0
Interval Time.....	3
Current Foreground.....	0
IDFORE HWM.....	1
Current Background.....	4
IDBACK HWM.....	14
Current Threads.....	10
CTHREAD HWM.....	14
Current DBAT.....	2
MAXDBAT HWM.....	12
DBAT Connection.....	2
DBAT Conn HWM.....	12

Subsystem Management Statistics			
Description	Total	Delta	Rate
Identify Requests	803	0	0.00

Note that there are push button tabs at the top of the panel that will allow you to easily navigate to other relevant DB2 subsystem statistics level information. You may navigate from here to see information on DB2 buffer pools, logging, EDM pool utilization, SQL activity for the subsystem, and subsystem storage utilization.

- c) To see buffer pool information **Position the cursor on the BP tab** and **Press Enter.**



You are now looking at the DB2 Buffer Pool display for a given DB2 subsystem. If you scroll the panel to the right (either **Press F11** or use the **arrow navigation**) you will see a column labeled Getpage Rate (as in the example below).

ΔPool VID	ΔGet Page VRate	ΔRead I/O VRate	ΔPrefetch Rate	ΔWrite VI/O R
BP0	1	0	0	0
BP1	0	0	0	0
BP2	7561	237	237	0
BP3	0	0	0	0
BP32K	1	0	0	0
BP8K0	0	0	0	0
BP16K0	0	0	0	0

- d) You may drill in to see more detail on a specific buffer pool. To do so, **position the cursor** by one of the virtual pools and **Press Enter.**

You are now looking at the getpage and I/O information for the virtual pool, including hit ratios.

```

File Edit View Tools Navigate Help 07/13/2015 14:07:15
Auto Update : Off
Command ==>
KDPBPD52 Buffer Pool Detail for BP2 SMF ID : MVSE
DB2 ID : DSNB

Buffer Pool Status
Pool ID..... BP2
Virtual Buffer Pool Size..... 5000
VPOOL Buffers Allocated..... 5000
VPOOL Buffers In Use..... 32
VPOOL Buffers to be Deleted..... 0
Use Count..... 64
Castout Attribute..... YES
Virtual Page Steal Method..... LRU

Buffer Pool Thresholds
VP Sequential Thresh..... 80
Deferred Write Thresh..... 50
VP Parallel Sequential Threshold..... 50
Vert Deferred Write Thresh..... 10
Sysplex Parallel Thresh..... 0

Buffer Pool Ratio
GetPages Per Synchronous I/O..... 19930651
Prefetch Per I/O..... 1
Sequential Prefetch Per I/O..... 0
List Prefetch Per I/O..... 0
Dyn Prefetch Per I/O..... 1
Maximum Concurrent Prefetch..... 0
Buffer Pool Hit Percent Random..... 99.8
Buffer Pool Hit Percent Sequential..... 0.0
Page Writes Per Write I/O..... 2
Page Reads Per Prefetch..... 32
Page Reads Per Sequential Prefetch..... 0
    
```

- e) Press **F3**, to return to the DB2 Buffer Pools display.
- f) Position the cursor on the **<<** tab and Press **Enter**

```

File Edit View Tools Navigate Help 07/13/2015
Auto Update : Off
Command ==>
KDPBP58 DB2 Buffer Pools SMF ID :
DB2 ID :

<< Buffer Pools Group Buffer Pools Global Buffer Pools
    
```

You should now be back at the DB2 System Resource Manager panel (KDPSUBSM).

Another important structure to look at in the DB2 subsystem is the EDM pool.

- g) To see EDM pool information Position the cursor on the **EDM** tab and Press **Enter**.

```

File Edit View Tools Navigate Help 07/13/2015 14:11:25
Auto Update : Off
Command ==>
KDPSUBSM DB2 System Resource Manager SMF ID : MVSE
DB2 ID : DSNB

Subsys BP Log EDM SQL DSQL SSQL Accel Stg z/OS
    
```

You are now looking at the EDM pool utilization information for the DB2 subsystem. This includes structure size and usage, utilization rates, and storage utilization above and below the bar.

```

File Edit View Tools Navigate Help 07/13/2015 14:19:05
Auto Update : Off
Command ==> SMF ID : MVSE
KDPEDMB DB2 EDM Pool DB2 ID : DSNB

```

Subsys	BP	Log	EDM	SQL	DSQL	SSQL	Accel	Stg	z/OS
--------	----	-----	-----	-----	------	------	-------	-----	------

DBD Pages.....	10240	SKEL Pool Pages.....	20480
DBD Pages Held.....	1271	SKCT Pages Held.....	16
DBD Stealable pages.....	1160	SKPT Pages Held.....	7974
DBD Pages Free.....	8969	SKPT Stealable pages.....	7989
DBD in Use (MB).....	4.965	SKEL Pages Free.....	12490
DBD in Use Percent.....	1.08	SKEL in Use Percent.....	0.00
Stmt Pool Pages.....	30720	SKEL Pool in Use (MB)....	31.210
Stmt Pages Held.....	653	Storage alloc Plan ATB....	33792
Stmt Pages Free.....	30067	Storage alloc PKG ATB....	139648
Total stg alloc static SQL	7966040	Storage alloc Plan BTB....	12672
Statements in global cache	157	Storage alloc PKG BTB....	0
Statement Pool in Use (MB)	2.551	Shareable static SQL stmt.	4028

**EDM Pool Statistics**

Interval in seconds..... 0

Columns 2 to 4 of 4 Rows 1 to 18 of 18

Description	Value	Delta	+Rate
DBD Requests	2150903	0	0.00
DBD Loads	188	0	0.00
DBD Hit	100	0	0.00
CT Requests	230	0	0.00
CT Loads	11	0	0.00
CT Hit	95	0	0.00

You may also see more detailed information on storage utilization of the DB2 subsystem.

- h) To see storage consumption information **Position the cursor on the Stg tab** and **Press Enter**.

```

File Edit View Tools Navigate Help 07/13/2015 14:21:50
Auto Update : Off
Command ==> SMF ID : MVSE
KDPDSUBSM DB2 System Resource Manager DB2 ID : DSNB

```

Subsys	BP	Log	EDM	SQL	DSQL	SSQL	Accel	Stg	z/OS
--------	----	-----	-----	-----	------	------	-------	-----	------

You are now looking at a detailed display of storage consumption within the DB2 subsystem.

```

File Edit View Tools Navigate Help 07/13/2015 14:24:05
Auto Update : Off
Command ==>
KDPST02A DBM1 and MVS Storage Below 2 GB for DSNA SMF ID : MVSE
DB2 ID : DSNA

```

Below

MVS Storage Below 2 GB for DBM1 DSNA

Columns 2 to 5 of 20 Rows 1 to 2 of 2

AS Name	Avg Thread Footprint (MB)	Max Number of Threads	Total Storage (MB)	+Getmained Storage (
DBM1	0.243	3907	13.441	0.750
DIST	N/A	N/A	2.278	0.004

DBM1 MVS Storage Below 2GB for DSNA

```

Total Agent Local Storage (MB)..... 2
Total Agent System Storage (MB)..... 2
Number of Prefetch Engines..... 50
Number of Deffered Write Engines..... 123
Number of Castout Engines..... 0
Number of GBP Write Engines..... 0
Number of P-Lock/Notify Exit Engines..... 0
Total Agent Non-System Storage (MB)..... 0
Total Number of Active Allied Threads..... 13
Total Active and Disconn DBAT Threads..... 3
Number of active parallel child threads..... 0
Total Array Variable Storage (MB)..... 0
Total Alloc Shr Dyn SQL (MB)..... 1
Total Request Shr Dyn SQL (MB)..... 0
HWM Shr Dyn SQL (MB)..... 0
Total Alloc Shr Static SQL (MB)..... 10
Buffer Manager Storage Cntl BLks (MB)..... 0
Log Manager Wrt buff frames REAL (MB)..... 1034
Log Manager Control frames REAL (MB)..... 1
Log Manager Control frames Aux (MB)..... 0
    
```

k) Note that there are other tab options on the storage panel. Feel free to tab and enter to display the various panels.

## 1.7 Navigate to OMEGAMON z/OS Top Consumers Panel

Now that you have looked at the DB2 storage information, there is one more option you may explore to get relevant DB2 subsystem performance information.

a) From the command line **enter =KM5TOPC** and **Press Enter**.



```

File Edit View Tools Navigate Help 02/07/2014 12:39:36
Command ==> Auto Update : Off
KM5TOPC Top Consumers for Sysplex ESYSPLEX Plex ID : MVSE
SMF ID : DSN#
    
```

**Highest Consuming Address Spaces of CPU**

Columns 3 to 5 of 5    Rows 1 to 3 of 5

ΔAddress Space ▽Name	ASID	ΔCPU ▽Percent	Δ0..20..40..60..80..100 ▽	ΔLPAR ▽Name
WLM	000C	1.3	.....	ESYSMVS
CXEG02	01CD	0.9	.....	ESYSMVS
CXEGDSST	0142	0.9	.....	ESYSMVS

**Highest Consuming Address Spaces of Real Storage**

Columns 3 to 5 of 5    Rows 1 to 3 of 10

ΔAddress Space ▽Name	ASID	ΔCentral Frame ▽Count	Working Set Size	ΔLPAR ▽Name
CXEGDSST	0142	177884	711536K	ESYSMVS
BBOS001S	0183	160037	640148K	ESYSMVS
BBOS004S	0206	143686	574744K	ESYSMVS

**Highest Consuming Address Spaces of Virtual Storage**

Columns 3 to 5 of 5    Rows 1 to 3 of 10

ΔAddress Space ▽Name	ASID	ΔTotal ▽Virtual(Mb)	ΔTotal ▽Fixed(Mb)	ΔLPAR ▽Name
DSNTDBM1	00CA	1050193.0	5.6	ESYSMVS
DB1IDBM1	00C3	1049941.0	5.0	ESYSMVS
DB1RDBM1	0213	1049932.0	4.1	ESYSMVS

If you have done the OMEGAMON z/OS lab exercise you may already be familiar with this panel. The KM5TOPC panel shows the highest resource utilization tasks in the z/OS environment for CPU, storage, and I/O. Notice that you will probably see some DB2 address spaces show up in this display. From this display you may optionally drill in for additional detail.

**Congratulations.** You have now completed the OMEGAMON DB2 V5.30 enhanced 3270 user interface Test Drive.

Please feel free to ask your lab instructor for additional exercises.

## Lab #2 Using Classic Interface To Monitor Critical DB2 Subsystem Resources

The first lab focused on the OMEGAMON DB2 enhanced 3270 user interface. The second set of lab exercises will focus on the capabilities of OMEGAMON DB2 Classic Interface.

This lab is performed from the default 'start' panel, ZMENU. The first classic interface scenario illustrates several of the detailed displays available in OMEGAMON XE for DB2.

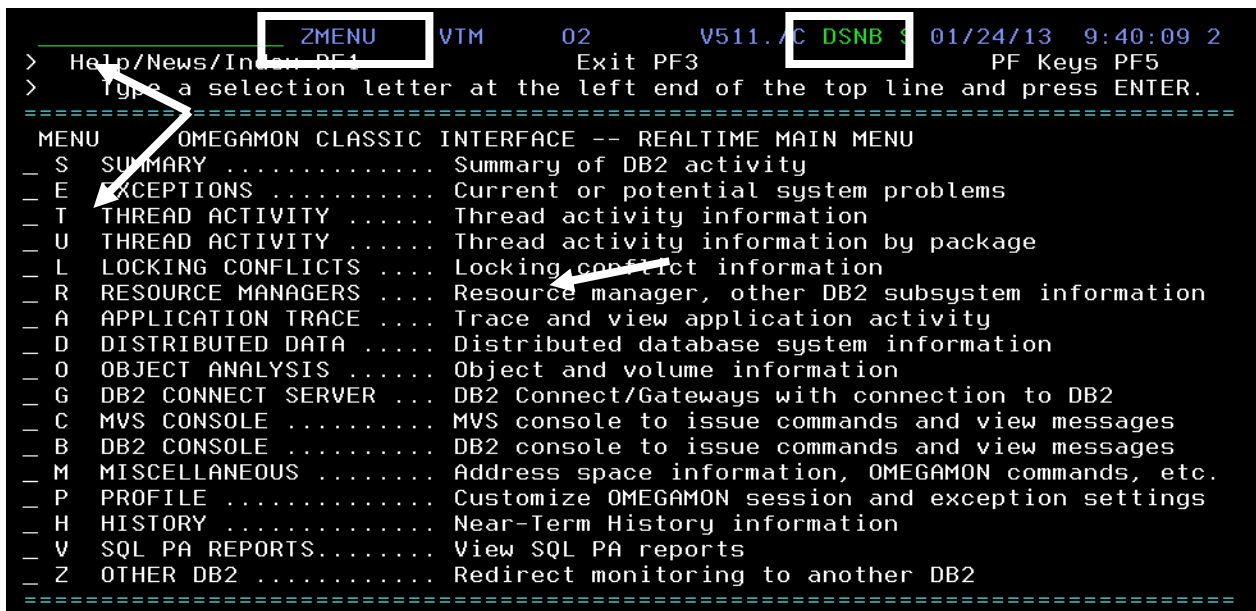
### 2.1 View DB2 subsystem performance data

- a) Sign on to the Classic 3270 user interface.



Press ENTER.

You are now looking at the default initial screen for OMEGAMON DB2 Classic Interface, ZMENU. This panel is the main panel for the OMEGAMON DB2 Classic interface and provides menu options for all the other various displays within the tool.



To navigate from the main panel you may enter the appropriate letter commands to the top left portion of the panel (to the left of the panel name), or you may select the letter by entering an S next to the panel option and pressing Enter.

Note that in the above example you are looking at DB2 subsystem DSNB. For purposes of the lab exercises we will be looking at DB2 workload running on DB2 subsystem DSNA.

To switch to DSNA, **position the cursor** on the command line (upper left corner of the panel). Enter **Z** and **Press Enter**.

```

ZRLOG      VTM      02      V511./C DSNB 01/24/13 9:46:01 2
> Help PF1  Back PF3  Up PF7   Down PF8      Redirect PF11
> Z.
=====
>
>          REDIRECT MONITORING TO ANOTHER DB2
>
> You can redirect OMEGAMON to another DB2 subsystem in one of the
> following ways:
> - Place the cursor on the line of the DB2 subsystem and press PF11.
> - Enter the name of the DB2 subsystem after RLOG.

RLOG  _
+-----+-----+-----+-----+-----+-----+-----+-----+
+ Name      Command      Scope      Group      Ver      Status      LPAR      Usable
+-----+-----+-----+-----+-----+-----+-----+-----+
+ DSNT      DSNT          S          -          1010     Active      ESYSMVS   Yes
+ DSNC      !              S          -          810      Active      ESYSMVS   Yes
+ DSNB      -              S          -          1010     Active      ESYSMVS   Yes
+ DSNA      @              S          -          910      Active      ESYSMVS   Yes
+ DB1S      DB1S          S          -          910      Active      ESYSMVS   Yes
+ DB1D      DB1D          S          -          1010     Active      ESYSMVS   Yes
+ DB1I      DB1I          M          DSNI       1010     Active      ESYSMVS   Yes
+ DB2I      DB2I          M          DSNI       1010     Active      ESYSMVS2  Yes
+ DSNI      S              S          -          -        Not Active  -         No
+ DB1R      S              S          -          -        Not Active  ESYSMVS   No
+
+          10 DB2 Subsystems found
=====

```

You are now looking at all the DB2 subsystems being monitored by OMEGAMON DB2. Understand that one OMEGAMON collector task may monitor multiple DB2 subsystems.

To switch to DSNA, **position the cursor** on DSNA and **Press F11**.

Next **Press Enter**.

```

=====
ZMENU      VTM      02      V511./ DSNAS 01/24/13 9:48:46 2
> Help/News/Index PF1      Exit PF3      PF Keys PF5
> Type a selection letter at the left end of the top line and press ENTER.
=====
MENU      OMEGAMON CLASSIC INTERFACE -- REALTIME MAIN MENU
- S SUMMARY ..... Summary of DB2 activity
- E EXCEPTIONS ..... Current or potential system problems
- T THREAD ACTIVITY ..... Thread activity information
- U THREAD ACTIVITY ..... Thread activity information by package
- L LOCKING CONFLICTS .... Locking conflict information
- R RESOURCE MANAGERS .... Resource manager, other DB2 subsystem information
- A APPLICATION TRACE .... Trace and view application activity
- D DISTRIBUTED DATA .... Distributed database system information
- O OBJECT ANALYSIS ..... Object and volume information
- G DB2 CONNECT SERVER ... DB2 Connect/Gateways with connection to DB2
- C MVS CONSOLE ..... MVS console to issue commands and view messages
- B DB2 CONSOLE ..... DB2 console to issue commands and view messages
- M MISCELLANEOUS ..... Address space information, OMEGAMON commands, etc.
- P PROFILE ..... Customize OMEGAMON session and exception settings
- H HISTORY ..... Near-Term History information
- V SQL PA REPORTS..... View SQL PA reports
- Z OTHER DB2 ..... Redirect monitoring to another DB2
=====

```

You should now be looking at the ZMENU panel for DB2 subsystem DSNAS (see above).

b) View the DB2 activity summary

**Position the cursor** on the command line (upper left corner of the panel). Enter **S** and **Press Enter**.

```

=====
ZSUMM      VTM      02      V511./C DSNAS 01/24/13 9:52:21 2
> Help PF1      Back PF3      Zoom PF11
> S.
=====
> SUMMARY OF DB2 ACTIVITY
DSYS
+ SSAS+DBAS+IRLM+DIST CPU = 00.0%      Thread Commit Rate = 1.3/sec
+ Create Thread Rate = .0/sec      Thread Signon Rate = .0/sec
+ Synch Read I/O Rate = .0/sec      Prefetch Req Rate = .2/sec
+ Update Request Rate = 5.6/sec      Write I/O Rate = .1/sec
+ Getpages/Read I/O = .00      Pages/Write I/O = 3.50
+ Current Lock suspensions = 1      Locking Timeouts = 404
+ Locking Deadlocks = 0      Locking Escalations = 0
+
+ Connection Type      Connections      Threads      CPU      Getpage Rate      Elapsed Time
+ -----
+ IMS      3      0      00.0%      .0/sec      00:00:00.0
+ CICS      6      0      00.0%      .0/sec      00:00:00.0
+ TSO Foreground      0      0      00.0%      .0/sec      00:00:00.0
+ Batch      4      8      00.0%      5.1/sec      03-14:42
+ Utilities      0      0      00.0%      .0/sec      00:00:00.0
+ Distributed      1      0      00.0%      .0/sec      00:00:00.0
+ Stored Procedures      0      0      00.0%      .0/sec      00:00:00.0
+ All Connections      14      8      00.0%      5.1/sec      03-14:42
=====

```

You are now looking at the DB2 summary activity display. From here you can see relevant information about how various threads are connecting to the DB2 subsystem. From this display you can use the F11 zoom option to drill into various threads.

**Press F3** to return to ZMENU.

c) View DB2 resources

**Position the cursor** on the command line (upper left corner of the panel). Enter **R** and **Press Enter**.

```

----- ZRMMENU  VTM      02      V511./C DSNB 01/24/13  9:57:54  2
>      Help PF1                               Back PF3
> R.
>
>      Enter a selection letter on the top line.
=====
>      RESOURCE MANAGERS AND OTHER DB2 SUBSYSTEM INFORMATION
-----
- A  BUFFER MANAGER ..... Buffer Manager Information
- B  LOG MANAGER ..... DB2 Log Manager Information
- C  EDM POOL ..... EDM Pool Information
- D  BIND STATISTICS ..... Bind Statistics
- E  SUBSYSTEM MANAGER ..... DB2 Subsystem Support Manager Statistics
- F  ACTIVE TRACES ..... Current Trace Activity
- G  START-UP OPTIONS..... IRLM and Stored Procedures Start-Up Options
- H  DSNZPARM ..... DB2 Installation Parameters
- I  LOCK/CLAIM/DRAIN..... Lock Manager/Claim/Drain Statistics
- J  SQL/RID POOL/PARALLEL... SQL/RID Pool/Parallelism/Stored Proc. Information
- K  OPEN/CLOSE STATISTICS... Dataset Open and Close Statistics
- L  DB2 COMMANDS ..... DB2 Command Statistics
- M  DB2 Storage ..... Storage Management Pool Summary
=====

```

You are now looking at the Resource manager selection panel (ZRMMENU). From here you can navigate to look at all the key DB2 subsystem resources, such as buffer pools, logging, EDM pool, and DB2 locking. The panel contains letter options for each of these resources.

d) View DB2 buffer pool activity

To see buffer manager information, **position the cursor** on the command line (upper left corner of the panel). Enter **A** and **Press Enter**.

```

ZBMGR      VTM      02      V511./C DSNA 01/24/13 10:02:27 2
> Help PF1  Back PF3      Up PF7      Down PF8      Sort PF10     Zoom PF11
> R.A.A
>
> *-BUFFER POOL          B-GROUP BUFFER POOL
=====
>                          BUFFER MANAGER INFORMATION

BMGR
+ Current Number Open Datasets      =      360
+ High Water Mark Open Datasets     =      360
+ Maximum Number Open Datasets Allowed = 32767
+ Open Dataset Count In Active Pools =      360
+
+ *
+ Pool      VP          Pages      Pages      Getp      Read      Prefetch      Write
+ ID        Size       Alloc      In Use    Rate      I/O Rate  Req Rate     I/O Rate
+ -----
+ BP0       8000       8000      20        5.20      .00       .00          .1
+ BP1       1000       1000      2          .00       .00       .00          .0
+ BP2       5000       5000      71        16.20     .03       .00          .3
+ BP32K     250           250       18         8.93     .00       .36          .0
+ BP8K0     1000          1000      24         4.84     .01       .09          .1
+ BP16K0    500            500       0          .00       .00       .00          .0
=====

```

You are now looking at the overview of virtual pools being used in the DB2 subsystem. From here you can see the number of pages currently in use, getpage activity for each buffer pool, and various I/O rates for each buffer pool.

To see more information on a specific pool **position the cursor** on a BP (such as BP0) and **Press F11** to zoom.

```

ZBP      VTM      02      V511./C DSNA 01/24/13 10:06:36  2
> Help PF1      Back PF3      Up PF7      Down PF8
>
> *-BUFFER POOL  B-GROUP BUFFER POOL  C-BUFFER POOL  SNAPSHOT  H-HISTORICAL
=====
>
>                                BUFFER POOL DETAIL
BP      0
+ Collection Interval:  REALTIME      Start:  01/24 10:02:27
+ Report Interval:    4 min          End:    01/24 10:06:36
+
+ Virtual Buffer Pool Size=      8000
+ VPOOL Buffers Allocated =     8000
+ VPOOL Buffers in Use =        18
+ VPOOL Buffers to be Del =      0
+ Use Count =                    90
+ VP Sequential Thresh =        80%
+ Deferred Write Thresh =       50%
+ VP Parallel Seq Thresh =      50%
+                               Vert Deferred Write Thresh =    10%
+                               Sysplex Parallel Thresh =       0%
+
+ Getpages per Sync I/O =     461.14
+ Prefetch per I/O =         378.00
+ Seq Prefetch per I/O =       1.67
+ List Prefetch per I/O =       3.00
+ Dyn Prefetch per I/O =     575.51
+ Max Concur Prefetch =         0
+ BP Hit % - Random =          99.7%
+ BP Hit % - Sequential =       97.7%
+                               Pages Written per Write I/O =     2.58
+                               Pages Read per Prefetch =         .05
+                               Pages Read per Seq Prefetch =    10.30
+                               Pages Read per List Prefetch=     8.39
+                               Pages Read per Dyn Prefetch =     .03
+                               Workfile Maximum =                0
+                               Virtual Page Steal Method = LRU
+
+                               TOTAL   INTERVAL   /SECOND   /THREAD   /COMMIT
+                               QUANTITY QUANTITY   ( 248)   ( 0)     ( 301)
+-----+-----+-----+-----+-----+
+ Getpage Requests              1295811      593      2.39      .00      1.97
+ Getpage Requests - Sequential    77779        62      .25      .00      .20
+ Getpage Requests - Random      1218032     531      2.14      .00      1.76
+ Getpage Failed - VPOOL Full      0            0        .00      .00      .00
+ Getpage Failed - Cond Request    0            0        .00      .00      .00
+ Getpage Failed - Cond SeqReq     0            0        .00      .00      .00
+
+ Sync Read I/O Operations         2810         0        .00      .00      .00
+ Sync Read I/Os - Sequential       5            0        .00      .00      .00
+ Sync Read I/Os - Random          2805         0        .00      .00      .00
+ Page-in Required for Read I/O    4539         0        .00      .00      .00

```

You are now looking at the buffer pool detail display for a specific buffer pool. From here you see many critical buffer pool measures, such as virtual pool size, getpage rates, and pool hit ratios. Note that you also see counts broken out in multiple columns. For example, you can see getpage requests since DB2 started in the "Total Quantity" column, and then the number of getpages for the current interval (meaning between screen refreshes).

From this detail display you can drill in for even more detail. Let's look at the Buffer Pool snapshot.

**Position the cursor** on the command line (upper left corner of the panel). Enter **C** and **Press Enter** .

```

ZBPSN      VTM      02      V511./C DSN 01/24/13 10:13:40 2
> Help PF1  Back PF3  Up PF7   Down PF8   Sort PF10  Zoom PF11
>
> A-BUFFER POOL      B-GROUP BUFFER POOL      *-BUFFER POOL SNAPSHOT      F-FILTER
-----
>
>          BUFFER POOL SNAPSHOT OPEN PAGESETS
>
BPSN 0
+ <<< The following BP snapshot was collected on 01/24/13 at 10:13:40. >>>
+
+ *
+ Pageset          Pageset      Use      Open      VP Pgs
+ Name             Type         Count    DS        Current
+ -----
+ CCM30.LGC4M9YX   TABLESPACE  0        1        953
+ CCM30.LGC4NSIE   TABLESPACE  0        1        126
+ DB2PM.IXRCODEI   INDEXSPACE   0        1         4
+ DB2PM.IXREVENT   INDEXSPACE   0        1         7
+ DB2PM.IXRP1KFQ   INDEXSPACE   0        1         4
+ DB2PM.UIXRDB2A   INDEXSPACE   0        1         5
+ DB2PM.UIXRDB2C   INDEXSPACE   0        1         5
+ DSNDB01.DBD01    TABLESPACE  0        1       723
+ DSNDB01.DSNLLX01 INDEXSPACE   0        1        73
+ DSNDB01.DSNLLX02 INDEXSPACE   0        1        36
+ DSNDB01.DSNSCT02 INDEXSPACE   0        1         8
+ DSNDB01.DSNSPT01 INDEXSPACE   2        1        46
+ DSNDB01.SCT02    TABLESPACE  0        1        26
+ DSNDB01.SYSLGRNX TABLESPACE  0        1        61
+ DSNDB01.SYSUTILX TABLESPACE  0        1         2
+ DSNDB06.DBRMX    INDEXSPACE   0        1         4
+ DSNDB06.DEPSX    INDEXSPACE   0        1         5
+ DSNDB06.DSNAPH01 INDEXSPACE   0        1         6
+ DSNDB06.DSNAPX01 INDEXSPACE   0        1         4
+ DSNDB06.DSNATX01 INDEXSPACE   0        1         6
+ DSNDB06.DSNATX02 INDEXSPACE   1        1        31
+ DSNDB06.DSNATX03 INDEXSPACE   0        1         4
+ DSNDB06.DSNATX04 INDEXSPACE   0        1         5
+ DSNDB06.DSNAUH01 INDEXSPACE   0        1         5
+ DSNDB06.DSNCAX01 INDEXSPACE   0        1         4
+ DSNDB06.DSNCDX01 INDEXSPACE   0        1         4
+ DSNDB06.DSNCNX01 INDEXSPACE   0        1        20
+ DSNDB06.DSNCTX03 INDEXSPACE   0        1         4
+ DSNDB06.DSNDCX01 INDEXSPACE   0        1        15

```

You are now looking at the snapshot of objects active within the particular DB2 buffer pool. This display will show such information as the number of pages currently used within the buffer pool for the given object.

To see detailed information about a specific object within the buffer pool, **position the cursor** on an object name and **Press F11** to zoom.



```

ZBPSD      VTM      02      V511./C DSNA 01/24/13 10:18:49 2
> Help PF1      Back PF3      Up PF7      Down PF8
>
=====
>
>          BUFFER POOL SNAPSHOT DATASETS
>
BPSD
+ BP: 0      Pageset Name: CCM30.LGC4M9YX      Type: TABLESPACE      Open Datasets: 1
+
+ Dataset Name: DSNACAT.DSNDBC.CCM30.LGC4M9YX.I0001.A001
+
+ VP Pages Current      =      953
+ VP Pages Maximum      =      953
+ VP Pages Changed      =      7      VP Pages Changed Maximum      =      20
+ Sync I/O Total Pages  =      1149
+ Sync I/O Average Delay =      0      Sync I/O Maximum Delay      =      7
+ Async I/O Average Delay =      0      Async I/O Maximum Delay      =      685
+ Async I/O Total Pages  =      50576      Async I/O Total I/O Count    =      19989
=====

```

You are now looking at the details for specific object in the virtual pool, including the number of pages in the pool, and how much I/O has been performed for this object as well as the type of I/O (sync versus async I/O).

**Press F3** then **Press F3** again and **Press F3** one more time to return to the resource manager menu, ZRMMENU.

e) View EDM pool activity

From the resource manager menu, ZRMMENU, you can also drill down to see EDM pool activity.

**Position the cursor** on the command line (upper left corner of the panel). Enter **C** and **Press Enter**.

```

ZEDMP      VTM      02      V511./C DSNA 01/24/13 10:35:31  2
> Help PF1      Back PF3      Up PF7      Down PF8
> R.C
>
> A-EDM POOL SNAPSHOT ←
H-HISTORICAL
=====
> EDM POOL INFORMATION
EDMP
+ Collection Interval: REALTIME      Start: 01/24 09:48:46
+ Report Interval: 57 sec           End: 01/24 10:35:31
+
+ Pool Usage      Pages      Pct
+ -----
+ RDS Pool      (Below)
+   In Use      38      0%
+   CTs         6      0%
+   PTs        32      0%
+   Free       7622 100%
+   Total      7660 100%
+ RDS Pool      (Above)
+   CTs         0      0%
+   PTs         0      0%
+   Free     524287 100%
+   Total     524287 100%
+ DBD Pool:
+   In Use      715  48%
+   Free       785  52%
+   Total     1500 100%
+ SKEL Pool:
+   In Use      313  24%
+   SKCTs       14   1%
+   SKPTs      299  23%
+   Free       967  76%
+   Total     1280 100%
+ STMT Pool:
+   In Use     1683   7%
+   Free     22256  93%
+   Total    23939 100%
+
+                               TOTAL   INTERVAL   /SECOND   /THREAD   /COMMIT
+                               QUANTITY QUANTITY   ( 57)     ( 0)     ( 74)
+
+ Failures due to RDS Pool Full 0         0         .00       .00       .00

```

You are now looking at the EDM pool information panel. From here you can see the breakdown of EDM pool activity by component of the EDM pool, including usage and amount of free space.

To see more detail on the EDM pool you can use the EDM pool snapshot facility. The snapshot facility will provide detail as to the usage of the various EDM pool structures.

**Position the cursor** on the command line (upper left corner of the panel). Enter **A** and **Press Enter** .

```

ZEDSN      VTM      02      V511./C DSNA 01/24/13 10:38:04 2
> Help PF1      Back PF3      Zoom PF11
> R.C.A
=====
>
>          EDM POOL SNAPSHOT SUMMARY
>
-EDSN
+ <<< The following EDM snapshot was collected on 01/24/13 at 10:38:04. >>>
+
+ EDM          % of      Pages      Count of      Avg Pages      Max Pages
+ Storage Type Pool      Alloc      Entries      Entry          Entry
+ -----
+ DBDs         47.7%      715.0       96            7.4            8.0
+ FREEDBD      52.3%      785.0        1           785.0         785.0
+
+ CTs          .1%         6.0         6             1.0            .0
+ PTs          .4%        32.0         2            16.0           16.0
+ FREERDSB     99.5%     7622.0       2           3811.0        7620.0
+
+ CTAs         .0%         .0           0             .0             .0
+ PTAs         .0%         .0           0             .0             .0
+ FREERDSA     100.0%    524287.0     1           524287.0     524287.0
+
+ CACHE        .5%         7.0         7             1.0            1.0
+ SKCTs        .5%         7.0         5             1.4            2.0
+ SKPTs        23.4%     299.0        23           13.0           40.0
+ FREESKEL     75.5%     967.0         1           967.0         967.0
+
+ SQL CACHE    7.0%     1677.0       406           4.1            16.0
+ FREESTMT     93.0%    22256.0       1           22256.0     22256.0
=====

```

You are now looking at the EDM pool snapshot display. From here you can see pages allocated for each component of the EDM pool. Plus, you can drill in to see details of usage within each component.

To see details, **position the cursor** on an EDM component (such as SQL cache) and **Press F11** to zoom.

```

ZEDDS      VTM      02      V511./C DSNA 01/24/13 11:48:28 2
> Help PF1      Back PF3      Up PF7      Down PF8      Sort PF10      Zoom PF11
>
>      *-DYNAMIC SQL CACHE BY AUTHID          B-CACHE STATISTICS
=====
>
>          DYNAMIC SQL CACHE BY AUTHID
>
EDDS
+
+ *
+ Auth id      Entries      Pages Alloc      Bytes Used
+ -----
+ DB2PM        39            119              389016
+ DDS2266      1              3                11368
+ DNET246      93            521             1969160
+ DNET581      1              3                11368
+ JAZZ301     271           1028            3708320
+ STC          1              3                11368
=====

```

You are now looking at a snapshot of the Dynamic SQL cache, with usage sorted by DB2 authid. Dynamic SQL cache is potentially important for DB2 dynamic SQL performance, and it is often useful to know what SQL calls reside within the dynamic SQL cache.

To see details on the usage for a given authid, **position the cursor** on an authid and **Press F11** to zoom.

```

> Help PF1      ZEDD2   VTM     02     V511./C DSNA 01/24/13 11:50:52  2
> Back PF3     Up PF7   Down PF8   Zoom PF11
>
=====
> EDM SNAPSHOT DYNAMIC SQL CACHE SQL DETAIL
>
EDD2
+ Authorization Id: DB2PM
+
+ Pages  Sql  Text
+ -----
+
+ 3 SELECT CI_DESCRIPTION, CI_ID FROM DB2PM.CODEINDEX WHERE CI_0
+
+ 4 UPDATE DB2PM.DB2C_GATEWAY SET DB2CG_STATUS = 'ACTIVE', DB2CG
+
+ 3 SELECT CI_DESCRIPTION, CI_ID FROM DB2PM.CODEINDEX WHERE CI_0
+
+ 3 UPDATE DB2PM.VERSION SET V_VALUE = ? WHERE V_FIELD = ?
+
+ 3 UPDATE DB2PM.HISTORYDATA SET HD_FLAG = ?, HD_MULTIPLIER = ?
+
+ 3 DELETE FROM DB2PM.DB2C_GATEWAY WHERE DB2CG_STATUS = 'INACTIV
+
+ 3 DELETE FROM DB2PM.DB2C_SYSTEM
+
+ 3 UPDATE DB2PM.HISTORYDATA SET HD_FLAG = ?, HD_MULTIPLIER = ?
+
+ 3 SELECT MAX(CI_ID) FROM DB2PM.CODEINDEX

```

You are now looking at the SQL statement contents of the dynamic SQL cache. This shows the text of the SQL calls within the cache. Each line represents an SQL call that is stored within the cache.

To see performance and usage details on a specific call, **position the cursor** on a SQL call text and **Press F11** to zoom.

```

ZEDD3    VTM    02    V511./C DSNA 01/24/13 11:54:29  2
> Help PF1    Back PF3    Up PF7    Down PF8
>
> A-SQL PA
=====
> EDM SNAPSHOT DYNAMIC SQL CACHE STATISTICS
> statistics require that monitor class 1 and ifcid 318 be started
EDD3
+ Authorization Id: DB2PM
+
+ Time Statement          01/19/2013 10:47:23.6888
+ When Collection Began  01/19/2013 10:45:39.06.4
+ Times Executed         0 Synchronous Buffer Reads      0
+ Getpages               0 Rows Examined                0
+ Rows Processed         0 Sorts Performed              0
+ Index Scans            0 Tablespace Scans            0
+ Parallel Groups Created 0 Synchronous Writes          0
+ Number of Current Users 0 Copies of Statement         0
+ RID List Not Used Number 0 RID List not Used Storage    0
+ Elapsed Time           00:00:00.000 CPU Time                      00:00:00.000
+ Wait for Synch I/O     00:00:00.000 Wait for Lock/Latch          00:00:00.000
+ Synch Exec Switch      00:00:00.000 Wait for Global Locks       00:00:00.000
+ Wait Othr Thread Read  00:00:00.000 Wait Othr Thread Write     00:00:00.000
+ Isolation Bind         UR Currentdata Bind            N
+ Dynamic rules Bind     R Current Degree              1
+ Current Rules          D Current Precision            Y
+ Cursor Hold            N
+ Status of Statement
+ Program Name           FPE@WRPA
+ Transaction Name
+ User Group             DB2PM Object Qualifier            DB2PM
+ Ref Table Qualifier    DB2PM Ref Table              CODEINDEX
+
+ SELECT CI_DESCRIPTION, CI_ID FROM DB2PM.CODEINDEX WHERE CI_OS = 'HPIA
+
=====

```

You are now looking at the performance details within the SQL cache for the specific SQL call.

Now please return to the ZRMMENU menu panel. **Press F3** multiple times until you get back to that panel.

f) View DB2 lock activity

From the resource manager menu, ZRMMENU, you can also drill down to see DB2 locking activity.

**Position the cursor** on the command line (upper left corner of the panel). Enter **I** and **Press Enter** .

```

----- ZLOKM      VTM      02      V511./C DSNB 01/24/13 12:00:41  2
> Help PF1      Back PF3      Up PF7      Down PF8
> R.I.A
>
> *-LOCK STATISTICS      B-GLOBAL LOCK STATISTICS      H-HISTORICAL
=====
> LOCK MANAGER INFORMATION

LOKM
+ Collection Interval:  REALTIME      Start:  01/24 10:34:31
+ Report Interval:     42 sec      End:    01/24 12:00:41
+
+          TOTAL      INTERVAL      /SECOND      /THREAD      /COMMIT
+          QUANTITY  QUANTITY  (  42)  (  2)  ( 312)
+          -----
+ Deadlocks Detected          0          0          .00          .00          .00
+ Timeouts Detected         452          25          .60         12.50          .08
+ Susp Detected - Lock Only   4126          74          1.76         37.00          .24
+ Susp Detected - Latch Only  3841          34          .81         17.00          .11
+ Susp Detected - Other     12589          63          1.50         31.50          .20
+
+ Lock Escalations - to Shared      0          0          .00          .00          .00
+ Lock Escalations - to Exclusive  0          0          .00          .00          .00
+
+ Lock Requests      4124540      56257      1339.45      28128.5      180.31
+ Unlock Requests    1667654      23124      550.57      11562.0      74.12
+ Query Requests      12588          63          1.50         31.50          .20
+ Change Requests    338388          4587      109.21      2293.50      14.70
+ Other IRLM Requests      3          0          .00          .00          .00
+
+ CLAIM/DRAIN INFORMATION
+ -----
+ Claim Requests      3587129      51198      1219.00      25599.0      164.10
+ Unsuccessful Claim Requests      0          0          .00          .00          .00
+ Drain Requests      1595          27          .64         13.50          .09
+ Unsuccessful Drain Requests      0          0          .00          .00          .00
=====

```

You are now looking at the DB2 subsystem level locking statistics display (ZLOKM) for a given time interval. This panel will show information on DB2 deadlocks and timeouts.

There are many other resource displays that you may review as part of the DB2 resource displays. We have looked at some of the representative examples.

Please remain on panel ZLOKM to continue with the next scenario.

## 2.2 Using DB2 historical data to isolate subsystem issues

This scenario continues to explore the Classic 3270 interface details. This lab will explore how the historical analysis facilities of OMEGAMON for DB2 Classic interface may be used to identify and isolate potential locking and performance issues.

## View DB2 Near Term History (NTH)

In this Scenario, you will view Near Term History that captures subsystem and thread activity in the past few hours.

Near Term History is an important component of OMEGAMON DB2. Near Term History captures DB2 subsystem statistics data and DB2 thread activity data, and stores the information in a set of VSAM files allocated to OMEGAMON DB2 for easy analysis and retrieval. History is an important mechanism for analyzing performance issues after the fact.

This Scenario begins on the ZLOKM panel where we finished the prior scenario.

- a) From the ZLOKM panel drill down to see historical data.

```

ZLOKM      VTM      02      V511./C DSNA 01/24/13 12:00:41  2
> Help F1      Back PF3      Up PF7      Down PF8
> R.I.A
>
> *-LOCK STATISTICS      B-GLOBAL LOCK STATISTICS      H-HISTORICAL
-----
>      LOCK MANAGER INFORMATION
LOKM
+ Collection Interval:  REALTIME      Start:  01/24 10:34:31
+ Report Interval:     42 sec      End:    01/24 12:00:41
+
+
+      TOTAL      INTERVAL      /SECOND      /THREAD      /COMMIT
+      QUANTITY  QUANTITY    ( 42)    ( 2)    ( 312)
+      -----
+ Deadlocks Detected          0          0          .00          .00          .00
+ Timeouts Detected         452          25          .60         12.50          .08
+ Susp Detected - Lock Only   4126          74          1.76         37.00          .24
+ Susp Detected - Latch Only  3841          34          .81         17.00          .11
+ Susp Detected - Other     12589          63          1.50         31.50          .20
+
+ Lock Escalations - to Shared          0          0          .00          .00          .00
+ Lock Escalations - to Exclusive       0          0          .00          .00          .00
+
+ Lock Requests             4124540          56257      1339.45      28128.5      180.31
+ Unlock Requests           1667654          23124       550.57      11562.0       74.12
+ Queue Requests            12588           63          1.50         31.50         20

```

**Position the cursor** on the command line (upper left corner of the panel). Enter **H** and Press Enter .

```

ZHLKS   VTM   02   V511./C DSNA 01/24/13 12:14:43  2
> Help PF1   Back PF3   Up PF7   Down PF8   Zoom PF11
> H.A.J
> Enter a selection letter on the top line.
>
> A-SUBSYSTEM SUPPORT      B-BIND      C-BUFFER POOL      D-GROUP BP
> E-DISTRIBUTED DATABASE  F-EDM POOL  G-LOG MANAGER      H-OPEN/CLOSE
> I-SQL/RID/PARALLEL/PROC *-LOCK/CLAIM/DRAIN K-GLOBAL LOCK      L-DB2 COMMANDS
> O-OPTIONS
=====
> LOCK MANAGER STATISTICS SUMMARY BY REPORT INTERVAL
HLKS
+ Collection Interval: 15 min      Start: 01/21 11:45
+ Report Interval: 15 min      Combine Level: NONE      End: 01/24 12:14
+
+
+ Interval      Deadlocks  Timeouts  Total Suspend  Total Lock Reqs  Escalate to SHR  Escalate to EXC
+-----
+ 01/24 12:14      0          7          60          13940           0                0
+ 01/24 11:45      0          0          45          14114           0                0
+ 01/24 11:30      0          0          5          15968           0                0
+ 01/24 11:15      0          4          18          14592           0                0
+ 01/24 11:00      0          8          27          12955           0                0
+ 01/24 10:45      0          7          28          14069           0                0
+ 01/24 10:30      0          8          71          15746           0                0
+ 01/24 10:15      0          7          153         14209           0                0
+ 01/24 10:00      0          8          65          14329           0                0
+ 01/24 09:45      0          7          97          14467           0                0
+ 01/24 09:30      0          8          38          16122           0                0
+ 01/24 09:15      0          7          42          14380           0                0
+ 01/24 09:00      0          8          2220        15408           0                0
+ 01/24 08:45      0          7          732         15126           0                0

```

You are now looking at the Near Term History for DB2 locking over several hours. Each line represents 15 minutes of locking statistics information.

Focus on information such as the timeout and deadlock columns. Here you can see a time interval where timeouts and/or deadlocks occurred.

To see details on locking for a specific time interval, **position the cursor** on a line (preferably where timeouts occurred) and **Press F11** to zoom to history detail.



```

ZHLKD  VTM  02  V511./C DSNB 01/24/13 12:19:32 2
> Help PF1      Back PF3      Up PF7      Down PF8
>
> Enter a selection letter on the top line.
>
> A-SUBSYSTEM SUPPORT      B-BIND      C-BUFFER POOL      D-GROUP BP
> E-DISTRIBUTED DATABASE  F-EDM POOL  G-LOG MANAGER      H-OPEN/CLOSE
> I-SQL/RID/PARALLEL/PROC *-LOCK/CLAIM/DRAIN K-GLOBAL LOCK  L-DB2 COMMANDS
> M-THREAD HISTORY
=====
> LOCK MANAGER STATISTICS DETAIL
HLKD
+ Collection Interval: 15 min           Start: 01/24 10:45
+ Report Interval: 15 min  Combine Level: NONE      End: 01/24 11:00
+
+
+ INTERVAL  /MINUTE  /THREAD  /COMMIT
+ QUANTITY  ( 15)    ( 0)    ( 1103)
+ -----
+ Deadlocks Detected          0          .00          .00          .00
+ Timeouts Detected           8          .53          .00          .01
+ Susp Detected - Lock Only   22         1.47          .00          .02
+ Susp Detected - Latch Only   5          .33          .00          .00
+ Susp Detected - Other        0          .00          .00          .00
+
+ Lock Escalations - to Shared 0          .00          .00          .00
+ Lock Escalations - to Exclusive 0          .00          .00          .00
+
+ Lock Requests             8664      577.60          .00          7.85
+ Unlock Requests           3578      238.53          .00          3.24
+ Query Requests             0          .00          .00          .00
+ Change Requests            713       47.53          .00          .65
+ Other IRLM Requests         0          .00          .00          .00
+
+ CLAIM/DRAIN INFORMATION
+ -----
+ Claim Requests             7727      515.13          .00          7.01
+ Unsuccessful Claim Requests 0          .00          .00          .00
+ Drain Requests              1          .07          .00          .00
+ Unsuccessful Drain Requests 0          .00          .00          .00
=====

```

You are now looking at the DB2 subsystem locking statistics for a specific time interval. From here you can see how many deadlocks and timeouts occurred. You can also see how many lock suspensions occurred and if any lock escalation occurred.

From this display you may also view other relevant subsystem statistics for this same time interval. For example you can easily navigate from locking statistics to buffer pool statistics.

### b) View Buffer pool history

To see buffer pool information, **position the cursor** on the command line (upper left corner of the panel). Enter **C** and **Press Enter** .



c) See an example of thread history

**Position the cursor** on the command line (upper left corner of the panel). Enter **M** and **Press Enter**.

```

ZHARP      VTM      02      V511./C DSNR 01/24/13 12:33:02  2
> Help PF1      Back PF3      Up PF7      Down PF8
>
> Type a selection letter next to an Interval and press Enter.
>
> A-BY PLAN      B-BY AUTHID      C-BY PLAN,AUTHID      D-BY AUTHID,PLAN
> E-THREAD SUMMARY  F-BY SUBINTERVAL  G-BY CORRID
=====
>
>                                THREAD HISTORY BY REPORT INTERVAL
HARP
+ Report Interval: 15 mins      Start: 01/24 11:30:00.000000
+ Report Filtered: NO          End: 01/24 12:29:59.999999
+
+
+      Time  Thrds  Commit  Abort  DML      Dlk/  In-DB2  In-DB2  In-DB2      GetP/
+      ----  ----  -----  ----  ---      TOut  Elap Tm  CPU Tm  Wait Tm  Getpage RIO
+
+ 11:15      No Thread Activity
+ 11:20      1      184      271      1830      0      .3      .00      .0      1109      .0
+ 11:45      No Thread Activity
+ 11:30      6      1652     2741     25137     80     9128.7    1.66    9124.9    112352    .5K
=====

```

You are now looking at a Near Term thread history display, sorted out by time interval. Note that in the middle of the display you can see the number of deadlocks/timeouts for that interval.

To see threads for a given time interval, **position the cursor** next to the desired time interval . Enter **E** (for Thread Summary) and **Press Enter**.

```

ZHATACT  VTM      02      V511./C DSNR 01/24/13 12:37:24  3
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
> Enter a selection letter on the top line.
>
> *-Summary      B-Buffer Pool      C-DB2 Time      D-Lock/Scan/Sort      E-Alt Summary
> 0-OPTIONS
=====
>
>                                Thread History Summary
HATH
+ Report Interval: 15 mins      Start: 01/24 11:30:00.000000
+ Report Filtered: NO          End: 01/24 11:44:59.999999
act
+
+
+      End Time      Plan      Authid      Elapsed  CPU      SQL      Commit  Abrt  Pkg  Status
+      ----  ----  -----  ----  ----  ----  -----  ----  ---  -----
+ 11:43:29.341  DISTSERV  JAZZ301  3600.22  .000  1830  184  271  2  DEALLO
+ 11:43:29.331  DISTSERV  JAZZ301  3600.21  .000  4  0  1  1  DEALLO
+ 11:43:29.331  DISTSERV  JAZZ301  3600.21  .000  8  0  2  2  DEALLO
+ 11:43:29.331  DISTSERV  JAZZ301  3600.21  .002  28  0  6  1  DEALLO
+ 11:42:38.545  DISTSERV  JAZZ301  3601.12  1.517  18094  1303  2297  2  DEALLO
+ 11:30:25.898  DSNREXX  DNET581  10.00K  1.208  4984  293  80  1  DEALLO
=====

```

You are now looking at the DB2 thread history summary. From here you can drill down into a specific thread to see more detail on the thread.

To see more detail for a given thread, **position the cursor** on the desired thread **Press F11** to zoom in for detail.

```

ZHTACT  VTM  02  V511./C DSNB 01/24/13 12:41:34  2
> Help PF1          Back PF3          Up PF7          Down PF8
>
  THREAD HISTORY:  Enter a selection letter on the top line.
> *-THREAD DETAIL  B-LOCK COUNTS  C-LOCK WAITS      D-GLOBAL LOCKS  E-SORT/SCAN
> F-DYNAMIC SQL    G-SQL COUNTS  H-DISTRIBUTED    I-BUFFER POOL   J-GROUP BP
> K-PACKAGE SUMMARY L-RES LIMIT  M-PARALLEL TASKS
=====
>
  THREAD HISTORY DETAIL
HPLN
+ Thread:  Plan=DSNREXX  Connid=DB2CALL  Corrid=DB2READ  Authid=DNET581
+ Attach:  CALLATCH     DB2=DSNA      MVS=MVSE
+ Time   :  Start=01/24/2013 08:43:45.437643  End=01/24/2013 11:30:25.898836
+ Luwid=USIBMNR.E0SDB201.CAD1A1F3DF75
act
+ Termination Status = DEALLOC          Commits = 293
+ Total Elapsed Time = 02:46:40.461      Aborts = 80
+ Total CP CPU Time  = 00:00:01.208
+ ZIIP CPU Time      = 00:00:00.000      Parallel Tasks = 0
+ Total Stored Proc CPU = 00:00:00.000
+ Stored Proc Wait   = 00:00:00.000      Stored Proc Wait Cnt = 0
+
+ In-DB2 Times
+ -----
+ Elapsed Time              Total
+ CP CPU Time               02:32:03.448
+ IIP CPU Time              00:00:00.364
+ Stored Procedure CPU Time 00:00:00.000
+ UDF CP CPU Time           00:00:00.000
+ UDF IIP CPU Time          00:00:00.000
+ UDF Elapsed Time Main    00:00:00.000
+
+ Waits          Count      Total
+ -----
+ Synchronous I/O Wait          0  00:00:00.000
+ Asynchronous Read I/O Wait    0  00:00:00.000
+ Asynchronous Write I/O Wait   0  00:00:00.000
+ Local Lock/Latch Wait        160 02:32:02.898
  
```

You are now looking at detail for a specific DB2 thread. This is DB2 accounting information that shows such information as DB2 elapsed time, In-DB2 time, and DB2 wait time. From here you can analyze what the thread was doing and what bottlenecks it incurred.

This completes the scenario. Please **Press F3** multiple times until you return to the ZMENU main panel.

## 2.3 Analysis of DB2 threads and lock conflicts

This scenario continues to explore the Classic 3270 interface details. This lab will explore how OMEGAMON for DB2 allows the user to identify and analyze DB2 lock conflicts in real time. From here we will also look at detailed thread analysis.

### 2.3.1 Identification and Isolation of Lock Conflicts

In this scenario you will see how to quickly identify DB2 threads experiencing lock conflicts while they are occurring.

- a) From the ZMENU main menu select the Lock Conflict display

**Position the cursor** on the command line (upper left corner of the panel). Enter **L** and **Press Enter**.

```

----- ZLOCKC  VTM  02  V511./C DSN A S 01/24/13 12:53:10 2
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
> L.
-----
> LOCKING CONFLICTS
-----
XLOK
+Stat Plan      Corrid      Type Lvl Resource
-----
+ OWN DSNREXX DB2LOCK  TABL  X DB=DSN8D61A PS=DSN8S61P
+WAIT DSNREXX DB2READ  TABL  IS DB=DSN8D61A PS=DSN8S61P
-----

```

You are now looking at the OMEGAMON DB2 lock conflict display. This display will show the holder thread and the waiter thread for a given DB2 resource.

- b) Determine what the thread is waiting on

From the lock conflict display you may drill down to see detail on the holder and waiter for the conflict resource. First note which thread is the OWNER and which thread is the WAITER. Also, note the resource being referenced in the lock conflict.

To see the detail, **position the cursor** on the WAIT thread and **Press F11** to zoom in for detail.

```

ZLOCK0  VTM  02  V511./C DSNA 01/24/13 12:57:38  2
> Help PF1          Back PF3          Up PF7          Down PF8

>      THREAD INFORMATION:  Enter a selection letter on the top line.

> A-THREAD DETAIL B-LOCK COUNTS C-LOCK WAITS      *-LOCKS OWNED  E-GLOBAL LOCKS
> F-CURRENT SQL   G-SQL COUNTS  H-DISTRIBUTED     I-BUFFER POOL  J-GROUP BP
> K-PACKAGES      L-RES LIMIT   M-PARALLEL TASKS N-UTILITY      O-OBJECTS
> P-CANCEL THREAD Q-DB2 CONSOLE R-DSN ACTIVITY    S-APPL TRACE   T-ENCLAVE
> U-LONG NAMES
=====
>      LOCKS/CLAIMS OWNED BY A THREAD
PLAN
+ Thread:  Plan=DSNREXX  Connid=DB2CALL  Corrid=DB2READ  Authid=DNET581
+ Attach:  BATCH        JOB Name=DB2READ  JOB Asid= 53
+ Package: DSNREXX      Collection=DSNREXX
+ Luid=USIBMNR.EOSDB201.CAD1CDBE86ED=824
own
+      Lock Ownership Information
+      Percent NUMLKUS      = .00      Total Locks Owned      = 4
+      Total Catalog Locks  = 0      Pageset and Dataset Locks = 1
+      Catalog Pageset Locks = 0      Page/Row Locks        = 0
+      Catalog Page/Row Locks= 0      Directory and Other Locks = 3
+      Bind ACQUIRE option  = USE      Bind RELEASE option    = COMMIT
+      ISOLATION option     = Cursor Stability
+
+      Type      Level      Resource      Number
+      ----      -
+      PSET      IS      DB=DSN8D61A PS=DSN8S61P      1
+      SKCT      S      Plan=DSNREXX      1
+      TABL      X      DB=DSN8D61A PS=DSN8S61P      1
+      SKPT      S      N/A      1
+
+
+      Total =      4
+
+      Thread currently does not own any claims
=====

```

You are now looking at the thread lock detail for thread that is waiting for the lock resource. Here you can see the resource being locked by the thread, and the level of the lock being requested.

From this display you may look at other aspects of the thread data to determine the impact of the lock conflicts on thread performance.

**Position the cursor** on the command line (upper left corner of the panel). Enter **A** and **Press Enter**.

```

ZDTL      VTM      02      V511./C DSNB 01/24/13 13:11:39  2
> Help PF1                                     Back PF3
>
>      THREAD INFORMATION:  Enter a selection letter on the top line.
> *-THREAD DETAIL  B-LOCK COUNTS  C-LOCK WAITS      D-LOCKS OWNED  E-GLOBAL LOCKS
> F-CURRENT SQL    G-SQL COUNTS  H-DISTRIBUTED    I-BUFFER POOL  J-GROUP BP
> K-PACKAGES       L-RES LIMIT   M-PARALLEL TASKS  N-UTILITY      O-OBJECTS
> P-CANCEL THREAD  Q-DB2 CONSOLE  R-DSN ACTIVITY    S-APPL TRACE   T-ENCLAVE
> U-LONG NAMES
=====
>
>      THREAD DETAIL
PLAN
+ Thread:  Plan=DSNREXX      Connid=DB2CALL  Corrid=DB2READ      Authid=DNET581
+ Attach:  BATCH            JOB Name=DB2READ    JOB Asid= 53
+ Package: DSNREXX          Collection=DSNREXX
+ Luwid=USIBMNR.EOSDB201.CAD1CDBE86ED=824
act
+ Thread Activity
+ -----
+ DB2 Status      =      WAIT-LOCK      TCB Time (SQL)      = 00:00:00.000
+ MVS Status      =      N/A            Wait for TCB Time   = 00:00:00.000
+ Total Elapsed Time = 01:11:59.130  Elapsed Time        = 00:00:00.000
+ CP CPU Utilization = 00.0%          Elapsed Time (SQL)  = 00:00:00.000
+ Total CP CPU Time = 00:00:00.253  SQL Events          = 0
+ IIP CPU Time     = 00:00:00.000
+ Total Parallel Tasks = 0
+ Current Parallel Tasks= 0
+
+ Stored Procedures
+ -----
+ Total CPU      = 00:00:00.000  TCB not in Enclave = 00:00:00.000
+ Elapsed time   = 00:00:00.000  Elapsed not in Enclave = 00:00:00.000
+ Elapsed Time (SQL) = 00:00:00.000  TCB prior to Enclave = 00:00:00.000
+ Wait for TCB Time = 00:00:00.000
+ Wait Event Count = 0
+ Curr Wait TCB Time = 00:00:00.000
+
+ SavePoints
+ -----
+ Savepoint Requests = 0
+ Release Savepoints = 0
+ Rollback Savepoints = 0

```

You are now looking at the thread detail display which shows the DB2 thread Accounting class 1 (DB2 elapsed), class 2 (In-DB2) and class 3 (DB2 wait) times. To see to what extent the lock conflicts have impacted the thread scroll down to see the DB2 class 3 wait times.

**Press F8** to scroll the display.

```

----- ZTDTL      VTM      02      V511./C DSNA 01/24/13 13:11:39 44
+
+ In-DB2 Times                               Total           Current
+ -----
+ Elapsed Time                               01:07:35.111     00:00:00.000
+ CP CPU Time                                00:00:00.085     00:00:00.000
+ IIP CPU Time                                00:00:00.000     N/A
+ Stored Procedure CPU Time                  00:00:00.000     00:00:00.000
+ UDF CP CPU Time                             00:00:00.000
+ UDF IIP CPU Time                            00:00:00.000
+ UDF Elapsed Time Main                      00:00:00.000
+
+ Waits                                     Count           Total           Current
+ -----
+ Synchronous I/O Wait                       0              00:00:00.000   00:00:00.000
+ Asynchronous Read I/O Wait                 0              00:00:00.000   00:00:00.000
+ Asynchronous Write I/O Wait                0              00:00:00.000   00:00:00.000
+ Local Lock/Latch Wait                      71             01:07:34.947   00:00:00.000
+ Page Latch Wait                            0              00:00:00.000   00:00:00.000
+ Drain Lock Wait                            0              00:00:00.000   00:00:00.000
+ Drain of Claims Wait                       0              00:00:00.000   00:00:00.000
+ Archive Log Mode(Quiesce) Wait             0              00:00:00.000   00:00:00.000
+ Archive Read from Tape Wait                0              00:00:00.000   00:00:00.000
+ Switch to Open/Close Wait                  0              00:00:00.000   00:00:00.000
+ Switch to SYSLGRNG Service Wait            0              00:00:00.000   00:00:00.000
+ Switch to DMS Waits                        0              00:00:00.000   00:00:00.000
+ Other Service Waits                        72             00:00:00.066   00:00:00.000
+ Force at Commit Waits                      0              00:00:00.000   00:00:00.000
+ Log Write I/O Wait                         0              00:00:00.000   00:00:00.000
+ Sync EX Unit Sw-com/abort/dealloc         72             00:00:00.005   00:00:00.000
+ LOB Materialization                        0              00:00:00.000   00:00:00.000
+ -----
+ Total Class 3 Wait Time                    01:07:35.020
=====

```

You are now looking at the Class 3 DB2 wait times for the thread. Here you can see that the thread experienced 71 waits in this example, and the amount of time that the thread was delayed by the waits.

By using other letter commands on the top of the thread panel, you can also see information such as the number of SQL calls excuted by the thread, and see the SQL call currently being executed.

To see the current SQL call being excuted, **position the cursor** on the command line (upper left corner of the panel). Enter **F** and **Press Enter**



```

ZSQL      VTM      02      V511./C DSNB 01/24/13 13:16:51 2
> Help PF1      Back PF3

>      THREAD INFORMATION:  Enter a selection letter on the top line.

> A-THREAD DETAIL  B-LOCK COUNTS  C-LOCK WAITS      D-LOCKS OWNED  E-GLOBAL LOCKS
> *-CURRENT SQL    G-SQL COUNTS  H-DISTRIBUTED  I-BUFFER POOL  J-GROUP BP
> K-PACKAGES       L-RES LIMIT  M-PARALLEL TASKS  N-UTILITY      O-OBJECTS
> P-CANCEL THREAD  Q-DB2 CONSOLE  R-DSN ACTIVITY   S-APPL TRACE   T-ENCLAVE
> U-LONG NAMES     V-SQL PA

=====
>      SQL CALL BEING EXECUTED
PLAN
+ Thread:  Plan=DSNREXX      Connid=DB2CALL  Corrid=DB2READ      Authid=DNET581
+ Attach:  BATCH            JOB Name=DB2READ      JOB Asid= 53
+ Package: DSNREXX          Collection=DSNREXX
+ Luwid=USIBMNR.EOSDB201.CAD1CDBE86ED=824
call
+      SQL call is active, call information is as follows :
+
+      Thread Status  = WAIT-LOCK      SQL Request Type    = DYNAMIC
+      Total SQL Reqs = 996            SQL Call Type       = FETCH
+      SQL DBRM Name  = DSNREXX        SQL Statement Number = 02202
+      Collection ID  = DSNREXX
+
+      SELECT * FROM DSN8610.ACT
=====

```

You may issue other letter commands to see other aspects of thread activity.

Once finished with the thread analysis, **Press F3** to return to the lock conflict display.

```

ZLOCKC    VTM      02      V511./C DSNB S 01/24/13 13:03:46 2
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
> L.
=====
>      LOCKING CONFLICTS

XLOK
+Stat Plan      Corrid      Type Lvl Resource
+-----
+ OWN DSNREXX    DB2LOCK     TABL  X DB=DSN8D61A PS=DSN8S61P
+ WAIT DSNREXX   DB2READ     TABL  IS DB=DSN8D61A PS=DSN8S61P
=====

```

You are back at the locking conflict display. Next you may look at the thread that is owning the resource in question.

To see the detail, **position the cursor** on the OWN thread and **Press F11** to zoom in for detail.

```

ZLOCKO  VTM  02  V511./C DSN 01/24/13 13:06:00 2
> Help PF1      Back PF3      Up PF7      Down PF8

>   THREAD INFORMATION:  Enter a selection letter on the top line.

> A-THREAD DETAIL  B-LOCK COUNTS  C-LOCK WAITS      *-LOCKS OWNED  E-GLOBAL LOCKS
> F-CURRENT SQL    G-SQL COUNTS  H-DISTRIBUTED    I-BUFFER POOL  J-GROUP BP
> K-PACKAGES       L-RES LIMIT  M-PARALLEL TASKS N-UTILITY      O-OBJECTS
> P-CANCEL THREAD Q-DB2 CONSOLE  R-DSN ACTIVITY  S-APPL TRACE   T-ENCLAVE
> U-LONG NAMES
=====
>   LOCKS/CLAIMS OWNED BY A THREAD
PLAN
+ Thread:  Plan=DSNREXX  Connid=DB2CALL  Corrid=DB2LOCK  Authid=DNET581
+ Attach:  BATCH        JOB Name=DB2LOCK  JOB Asid= 31
+ Package: DSNREXX      Collection=DSNREXX
+ Luwid=USIBMNR.EOSDB201.CAD1CDBE79C8=823
own
+   Lock Ownership Information
+   Percent NUMLKUS      = .00      Total Locks Owned      = 5
+   Total Catalog Locks  = 1      Pageset and Dataset Locks = 1
+   Catalog Pageset Locks = 1      Page/Row Locks        = 0
+   Catalog Page/Row Locks= 0      Directory and Other Locks = 3
+   Bind ACQUIRE option = USE      Bind RELEASE option    = COMMIT
+   ISOLATION option     = Cursor Stability

+   Type      Level      Resource      Number
+   ----      -
+   PSET      IS         DB=DSN8D61A PS=DSN8S61P      1
+             IS         DB=DSNDB06  PS=SYSDBASE                1
+   SKCT      S          Plan=DSNREXX                1
+   TABL      X         DB=DSN8D61A PS=DSN8S61P      1
+   SKPT      S          N/A                        1
+
+                                     Total = 5
    
```

You are now looking at the thread detail for the thread holding the resource. The same commands may be applied that were used on the waiting thread.

Now that we have looked at the lock conflict scenario and identified the holding and waiting threads, return to the main menu ZMENU.

**Press F3** and then **Press F3** again to return to ZMENU.

c) Look at DB2 thread activity

From the ZMENU main panel there are two ways to view DB2 threads. Option T shows threads listed by plan, Option U shows threads listed by DB2 package.

```

ZMENU      VTM      02      V511./C DSN S 01/24/13 13:22:39 2
> Help/News/Index PF1      Exit PF3      PF Keys PF5
> Type a selection letter at the left end of the top line and press ENTER.
=====
MENU      OMEGAMON CLASSIC INTERFACE -- REALTIME MAIN MENU
- S SUMMARY ..... Summary of DB2 activity
- E EXCEPTIONS ..... Current or potential system problems
- T THREAD ACTIVITY ..... Thread activity information
- U THREAD ACTIVITY ..... Thread activity information by package
- L LOCKING CONFLICTS .... Locking conflict information
- R RESOURCE MANAGERS .... Resource manager, other DB2 subsystem information
- A APPLICATION TRACE .... Trace and view application activity
- D DISTRIBUTED DATA .... Distributed database system information
- O OBJECT ANALYSIS ..... Object and volume information
- G DB2 CONNECT SERVER ... DB2 Connect/Gateways with connection to DB2
- C MVS CONSOLE ..... MVS console to issue commands and view messages
- B DB2 CONSOLE ..... DB2 console to issue commands and view messages
- M MISCELLANEOUS ..... Address space information, OMEGAMON commands, etc.
- P PROFILE ..... Customize OMEGAMON session and exception settings
- H HISTORY ..... Near-Term History information
- V SQL PA REPORTS..... View SQL PA reports
- Z OTHER DB2 ..... Redirect monitoring to another DB2
=====

```

To see an overview of threads executing in the subsystem, **position the cursor** on the command line (upper left corner of the panel). Enter **U** and **Press Enter**.

```

ZALLU      VTM      02      V511./C DSN S 01/24/13 13:26:56 2
> Help PF1      Back PF3      Up PF7      Down PF8      Sort PF10      Zoom PF11
> U.A
> Thread Activity: Enter a selection letter on the top line.
> *-All-Idle    B-TSO      C-CICS      D-IMS      E-Background    F-Dist Allied
> G-Dist DBAC   H-Util     I-Inact     J-Filter    K-Functions     L-Stored Proc
> M-Triggers    N-Sysplex  O-Enclaves P-Worksta  Q-All+Idle
=====
> Threads Summary Excluding Idle Threads
PTHDA
+ *
+ Elapsed      Package      CPU      Status      GetPg      Update      Commit      CORRID/JOBN
+ -----
+ 05-02:41     DSN A6DB2    00.0%    NOT-IN-DB2  44204      0           7363      DSN AADMT
+ 04-20:52     DGO@EXCP    00.2%    NOT-IN-DB2  83343      24138      7901      CXEG02
+ 04-20:52     DGO@SDOB    00.2%    NOT-IN-DB2  0666       88          7         CXEG02
+ 04-20:52     DGO@PC1     00.2%    NOT-IN-DB2  1830K      560392     490376    CXEG02
+ 01:27:16.1   DSNREXX     00.0%    SWAPPED-OUT 836        0           43        DB2LOCK
+ 01:27:16.0   DSNREXX     00.0%    WAIT-LOCK   86         0           87        DB2READ
+ 00:44:16.9   SYSLH200    00.0%    WAIT-REMREQ 46843      3899       522       db2jcc_appli
+ 00:43:27.3   SYSLH200    00.0%    WAIT-REMREQ 4928       1694       235       db2jcc_appli
+ 00:43:27.3   SYSLH200    00.0%    WAIT-REMREQ 5          0           0         db2jcc_appli
+ 00:43:27.3   SYSLH200    00.0%    WAIT-REMREQ 2          0           0         db2jcc_appli
+ 00:43:16.8   SYSLH200    00.0%    WAIT-REMREQ 730        0           181       db2jcc_appli
+ 00:23:01.5   SYSLH100    00.0%    WAIT-REMREQ 362        0           90        db2jcc_appli
=====

```

You are now looking at the DB2 thread overview listed by package. You have the ability to filter the threads viewed based on various criteria using option J as shown above.

**Position the cursor** on the command line (upper left corner of the panel). Enter **J** and **Press Enter**.

```

_____ ZFILU   VTM   02   V511./C DSNA 01/24/13 13:44:41  2
> Help PF1      Back PF3
> U.J
> Thread Activity: Enter a selection letter on the top line.

> A-All-Idle   B-TSO      C-CICS      D-IMS      E-Background  F-Dist Allied
> G-Dist DBAC  H-Util      I-Inact     *-Filter   K-Functions  L-Stored Proc
> M-Triggers   N-Sysplex   O-Enclaves P-Worksta Q-All+Idle
=====
> Filter Options for Thread Activity Displays
> To save filters in the user profile remove the > from the PPRF command and
> optionally add a 2 character profile suffix. Use IPRF for install profile
>PPRF SAVE
> To change profiles remove the > from the CPRF command and enter the 2
> character suffix. Use CPFI to switch to installation profile
>CPRF xx
THFL
+
+ Specify the values to be used as filtering criteria for Thread
+ Activity displays. Wildcard values * (multiple characters) or
+ ? (single character) may be specified for character values.
+
+ Specify the following filters to be applied within DB2
+
: PLAN          = _____ (plan name)
: AUTHID        = _____ (authorization id)
: CONNID        = _____ (connection id)
: LOCATION      = _____ (location)
: PARENTACE     = _____ (parent ace for parallel tasks)
: CORRID        = _____ (correlation id)
: ENDUSERID     = _____ (end user id)
: WORKSTATION   = _____ (workstation)
: TRANSACTIONID = _____ (transaction id)
+ Specify the following filters to be applied within OMEGAMON
+
: PACKAGE/DBRM = _____ (name )
: COLLECTION   = _____ (collect id)
: DB2STAT      = WAIT-LOCK____ (db2 status)
: GETPAGES     > _____ (number of getpages)
: UPDATES       > _____ (number of page updates)
: COMMITS       > _____ (number of commits)
: ELAPTIME     > _____ (elapsed time - in seconds)
: ELAPTIME/COMMIT > _____ (elapsed time per commit)

```

To filter the threads viewed and only view threads waiting for a lock, Enter **WAIT-LOCK** in the **DB2STAT** field.

**Position the cursor** on the command line (upper left corner of the panel). Enter **A** and **Press Enter**.

```

ZALLU      VTM      02      V511./C DSNAS 01/24/13 13:47:44 2
> Help PF1      Back PF3      Up PF7      Down PF8      Sort PF10      Zoom PF11
> U.A
> Thread Activity: Enter a selection letter on the top line
> *-All-Idle    B-TSO      C-CICS      D-IMS      E-Background  F-Dist Allied
> G-Dist DBAC   H-Util     I-Inact     J-Filter   K-Functions   L-Stored Proc
> M-Triggers    N-Sysplex  O-Enclaves P-Worksta Q-All+Idle
=====
> Threads Summary Excluding Idle Threads
PTHDA
+ Filtering is active. Profile /C is in use
+ *
+ Elapsed      Package CPU      Status      GetPg  Update Commit CORRID/JOBN
+ -----
+ 01:48:04.1   DSNREXX 00.0%  WAIT-LOCK   108    0    108 DB2READ
=====

```

You are now looking at the thread display filtered to just show threads in a wait for lock status.

To see thread detail, **position the cursor** on the specific thread **Press F11** to zoom in for detail

```

ZTDTL      VTM      02      V511./C DSNAS 01/24/13 13:30:13 2
> Help PF1      Back PF3
> THREAD INFORMATION: Enter a selection letter on the top line.
> *-THREAD DETAIL B-LOCK COUNTS C-LOCK WAITS      D-LOCKS OWNED  E-GLOBAL LOCKS
> F-CURRENT SQL   G-SQL COUNTS  H-DISTRIBUTED  I-BUFFER POOL  J-GROUP BP
> K-PACKAGES      L-RES LIMIT   M-PARALLEL TASKS N-UTILITY      O-OBJECTS
> P-CANCEL THREAD Q-DB2 CONSOLE  R-DSN ACTIVITY  S-APPL TRACE   T-ENCLAVE
> U-LONG NAMES
=====
> THREAD DETAIL
PLAN
+ Thread: Plan=DSNREXX Connid=DB2CALL Corrid=DB2READ Authid=DNET581
+ Attach: BATCH      JOB Name=DB2READ      JOB Asid= 53
+ Package: DSNREXX      Collection=DSNREXX
+ Luwid=USIBMNR.EOSDB201.CAD1CDBE86ED=824
act
+ Thread Activity      User Defined Functions
+ -----
+ DB2 Status           = WAIT-LOCK      TCB Time (SQL)      = 00:00:00.000
+ MVS Status           = N/A            Wait for TCB Time   = 00:00:00.000
+ Total Elapsed Time   = 01:30:32.792  Elapsed Time        = 00:00:00.000
+ CP CPU Utilization   = 00.0%         Elapsed Time (SQL)  = 00:00:00.000
+ Total CP CPU Time    = 00:00:00.323  SQL Events           = 0
+ IIP CPU Time         = 00:00:00.000
+ Total Parallel Tasks = 0
+ Current Parallel Tasks= 0
+
+ Stored Procedures    Triggers
+ -----
+ Total CPU            = 00:00:00.000  TCB not in Enclave  = 00:00:00.000
+ Elapsed time         = 00:00:00.000  Elapsed not in Enclave = 00:00:00.000
+ Elapsed Time (SQL)   = 00:00:00.000  TCB prior to Enclave = 00:00:00.000
+ Wait for TCB Time    = 00:00:00.000

```

You have now seen several ways to analyze DB2 lock conflicts, how to display threads with lock conflicts, how to determine the impact of lock conflicts on a thread, and finally how to filter and manage various thread views.

Once you are finished looking at the thread views, **Press F3** until you have returned to the ZMENU main menu.

You have now completed the scenario of the OMEGAMON DB2 module.

## 2.4 How to view DB2 application trace information

This scenario continues to explore the Classic interface details. One of the powerful features of the Classic interface is the OMEGAMON DB2 application trace facility. The OMEGAMON DB2 application trace facility is able to capture traces of DB2 application executions, and retain this detailed information for later analysis.

This scenario will explore how to navigate within OMEGAMON to use the application trace function.

### 2.4.1 Look at OMEGAMON DB2 trace information

- a) From the ZMENU main panel drill down to see Application trace information

**Position the cursor** on the command line (upper left corner of the panel). Enter **A** and **Press Enter**.

```

_____ ZATMENU  VTM      02      V511./C DSN# 01/24/13 13:54:03  3
>      Help PF1                                     Back PF3
> A.    Current Trace Status: INACTIVE
>      Enter a selection letter on the top line.
=====
>      APPLICATION TRACE FACILITY MENU

_ A  SPECIFY TRACE ..... Request and start an application trace
_ B  VIEW TRACE ..... View the active trace
_ C  STOP TRACE ..... Stop the active trace
_ D  SELECT DATASET ..... Specify a trace dataset to view
_ E  VIEW DATASET ..... View the selected trace dataset
_ F  STOP VIEW ..... Release the selected dataset
_ G  CREATE DSN ..... Create a new VSAM LDS for trace output
=====

```

You are now looking at the OMEGAMON DB2 application trace facility menu. From here you may go to panels to start/stop traces, and view the trace output. Traces may be done to memory buffers within the OMEGAMON task, or be traced to a dataset for later analysis.

In this lab Scenario 4 you will not be running traces, but will be looking at trace data already captured in an OMEGAMON DB2 trace dataset.

**Position the cursor** on the command line (upper left corner of the panel). Enter **D** and **Press Enter**.

```

ZATRD   VTM   02   V511./C DSN 01/24/13 13:58:37 3
> Help PF1                                     Back PF3
> A.D Current Trace Status: INACTIVE
> A-SPECIFY TRACE   B-VIEW TRACE   C-STOP TRACE   *-SELECT DSN
> E-VIEW DATASET   F-STOP VIEW    G-CREATE VSAM LDS
=====
> SELECT DATASET AND TRACE PARAMETERS
ATRDR
+ The following trace dataset has been selected, for viewing
+ press the ENTER key to proceed. to CANCEL use PF3 :
+
: DSN= CANDLET.XEGA.ESYSMVS.SAMPLE.DB2TRACE (Required)
: STARTDATE= _____ (MM.DD.YY) STARTTIME= _____ (HH.MM.SS)
: ENDDATE= _____ (MM.DD.YY) ENDTIME= _____ (HH.MM.SS)
: DB2ID= _____ DB2 Subsystem ID
: MVSID= _____ MVS System ID
: PLANNAME= _____
: AUTHID= _____
: DB2 authorization identifier(s)
: TSOUSER= _____ TSO USERID (TSO foreground application)
: JOBNAME= _____ Job Name (TSO batch application)
: CICSTRAN= _____ CICS transaction identifier
: CICSCONN= _____ CICS connection identifier
: PSBNAME= _____ IMS PSB name
: IMSID= _____ IMS ID of the IMS region
: STATICSQL= N Static SQL?(Y/N) HOSTVARS= N Host Variable?(Y/N)
=====

```

You are now looking at the DB2 trace specification panel. From here you can enter the trace dataset name.

**Position the cursor** in the DSN= field enter the dataset name CANDLET.XEGA.ESYSMVS.SAMPLE.DB2TRACE and **press Enter**.

```

ZATRD   VTM   02   V511./C DSN 01/24/13 14:01:02 3
> Help PF1                                     Back PF3
> A.D Current Trace Status: INACTIVE
> A-SPECIFY TRACE   B-VIEW TRACE   C-STOP TRACE   *-SELECT DSN
> E-VIEW DATASET   F-STOP VIEW    G-CREATE VSAM LDS
=====
> SELECT DATASET AND TRACE PARAMETERS
ATRDR
+ Initialization successful.
+ Please proceed to view dsn.
=====

```

b) View DB2 trace information

To view the trace information, position the cursor on the command line (upper left corner of the panel). Enter **E** and Press Enter.

```

ZATVD  VTM  02  V511./C DSN 01/24/13 14:02:35 3
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
> A.E Current Trace Status: INACTIVE
> A-SPECIFY TRACE  B-VIEW TRACE      C-STOP TRACE      D-SELECT DSN
> *-VIEW DATASET  F-STOP VIEW      G-CREATE VSAM LDS
=====
> APPLICATION TRACE THREAD SUMMARY -- VIEW DATASET
ATVD
+
+ DSN = CANDLET.XEGA.ESYSMVS.SAMPLE.DB2TRACE
+
+ Planname Connid Corrid Authid DB2 MVS InDB2 CPU Commits Aborts
+ -----
+ DSNREXX DB2CALL DB2READ DNET581 DSN MVSE .00166 2 2
+ DSNREXX DB2CALL DB2LOCK DNET581 DSN MVSE .00122 1 0
=====
    
```

You are now looking at the trace information. Here you see two threads that have been traced. To see trace detail, position the cursor on a specific thread and Press F11 to zoom in for trace detail.

```

ZATVC  VTM  02  V511./C DSN 01/24/13 14:04:53 3
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
> Current Trace Status: INACTIVE
=====
> APPLICATION TRACE UNIT OF WORK SUMMARY
ATVC
+ Planname=DSNREXX Connid=DB2CALL Corrid=DB2READ Authid=DNET581
+
+ Date Start Time Prognam InDB2 Time InDB2CPU SQL Sort Locks Rows
+ -----
+ 01/24 09:04:51.473 DSNREXX 00:00.00016 .00016 2 0 2 0
+ 01/24 09:03:45.506 DSNREXX 00:00.00018 .00016 2 0 2 0
+*01/24 09:02:51.468 DSNREXX 00:51.03326 .00060 21 0 3 18
+ 01/24 09:01:45.497 DSNREXX 00:00.00012 .00011 2 0 2 0
+*01/24 09:00:51.464 DSNREXX 00:51.02806 .00063 21 0 3 18
=====
    
```

You are now looking at the Unit of Work summary for the traced DB2 thread. The next step is to drill down to SQL call level detail. To see call level detail, position the cursor on a specific thread and Press F11 to zoom in for trace detail.



```

_____ ZATVS   VTM   02   V511./C DSN 01/24/13 14:07:02 3
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
> APPLICATION TRACE: Enter a selection letter on the top line.
> Current Trace Status: INACTIVE
> *-PROGRAM     B-SQL INDEX   C-SQL DETAIL   D-LOCK DETAIL   E-EVENT DETAIL
=====
> APPLICATION TRACE PROGRAM SUMMARY
ATVS
+ Planname=DSNREXX   Connid=DB2CALL   Corrid=DB2READ   Authid=DNET581
+
+ Programe   InDB2 Time   InDB2 CPU   SQL   Sorts   Locks   Pages   Rows
+ -----
+ DSNREXX    00:51.03326   .00060     21    0       2       2       18
=====

```

You are now looking at the summary for the application trace. To see more detail use the letter commands at the top of the panel.

To view the SQL Index, **position the cursor** on the command line (upper left corner of the panel). Enter **B** and **Press Enter**.

```

_____ ZATSI   VTM   02   V511./C DSN 01/24/13 14:09:21 3
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
> APPLICATION TRACE: Enter a selection letter on the top line.
> Current Trace Status: INACTIVE
> A-PROGRAM     *-SQL INDEX   C-SQL DETAIL   D-LOCK DETAIL   E-EVENT DETAIL
=====
> APPLICATION TRACE SQL INDEX
ATSI
+ Planname=DSNREXX   Connid=DB2CALL   Corrid=DB2READ   Authid=DNET581
+
+ Call Type         Stm#   Program   Count  InDB2 Time   MRet  Rws  Pc  Rws  DM  Rws  RD
+ -----
+ PREPARE           1849  DSNREXX   1 00:00.00021   0      0    0    0    0
+ OPEN CURSOR       2171  DSNREXX   1 00:00.00002   0      0    0    0    0
+ FETCH             2202  DSNREXX  19 00:51.03303  100    18   18   18
=====

```

You are now looking at the SQL Index for the trace. This shows what calls were executed, how many times a call statement was executed, and how many rows were processed by the calls.

To view the SQL Detail, **position the cursor** on the command line (upper left corner of the panel). Enter **C** and **Press Enter**.

```

_____ ZATD1      VTM      02      V511./C DSN8  01/24/13  14:11:28   3
> Help PF1      Back PF3      Up PF7      Down PF8
>
> APPLICATION TRACE: Enter a selection letter on the top line.
> Current Trace Status: INACTIVE
> A-PROGRAM      B-SQL INDEX      *-SQL DETAIL      D-LOCK DETAIL      E-EVENT DETAIL
=====
> APPLICATION TRACE SQL DETAIL
ATD1
+ Planname=DSNREXX      Connid=DB2CALL      Corrid=DB2READ      Authid=DNET581
+
+ Control= NEXT      Valid options are FIRST/LAST/NEXT/PREV/nnnnn/-nnnnn/Snnnnn
+ Current=000001 Total Number of SQL Calls=000021
+
+ Start Time      Programe      SQL Call      Stmt# Retcode      InDB2 Time      InDB2 CPU
+ -----
+ 09:02:54.469 DSNREXX      PREPARE      01849      0      00:00.00021      .00016
+
+ Data Rows      Rows      Rows      Rows      Rows      Rows      Rows      Rows      Pages      Pages
+ Type Proces      Looked      Qual/DM      Qual/RD      Update      Insert      Delete      De/Ref      Scand      Sc/Ref
+ -----
+ (No Data Activity Located For This Call)
+
+ Dynamic SQL Call Text :
+ -----
+ SELECT * FROM DSN8610.ACT
+
+ Miniplan Generated by DB2 :
+ -----
+ Miniplan Not Available
=====

```

Your are now looking at the SQL Detail, Here is where you can see information such as the SQL call text if the call is dynamic SQL.

To view the Lock Detail, **position the cursor** on the command line (upper left corner of the panel). Enter **D** and **Press Enter**.

```

_____ ZATD2      VTM      02      V511./C DSNA 01/24/13 14:13:21  3
> Help PF1      Back PF3      Up PF7      Down PF8
>
> APPLICATION TRACE: Enter a selection letter on the top line.
> Current Trace Status: INACTIVE
> A-PROGRAM      B-SQL INDEX      C-SQL DETAIL      *-LOCK DETAIL      E-EVENT DETAIL
=====
> APPLICATION TRACE LOCK DETAIL
ATD2
+ Planname=DSNREXX      Connid=DB2CALL      Corrid=DB2READ      Authid=DNET581
+
+ Control= FIRST      Valid options are FIRST/LAST/NEXT/PREV/nnnnn/-nnnnn/Snnnnn
+ Current=000001      Total Number of SQL Calls=000021
+
+ Start Time      Programe      SQL Call      Stmt#      PSET      DPAG      IPAG      OTHER
+ -----
+ 09:02:54.469      DSNREXX      PREPARE      01849      0      0      0      0
+
+ Locks Acquired By Sql Call
+ -----
+ (No Locks Were Acquired By SQL Call)
+
+ Locks Owned At Start Of SQL Call Execution
+ -----
+ Type      Level      Resource      Count
+ -----
+ SKPT      S      TOKEN=1847604208116CAA      1
+
+ Total Locks Owned =      1
=====

```

To view the Event Detail, **position the cursor** on the command line (upper left corner of the panel). Enter **E** and **Press Enter**.

```

_____ ZATD3      VTM      02      V511./C DSNA 01/24/13 14:15:02  3
> Help PF1      Back PF3      Up PF7      Down PF8
>
> APPLICATION TRACE: Enter a selection letter on the top line.
> Current Trace Status: INACTIVE
> A-PROGRAM      B-SQL INDEX      C-SQL DETAIL      D-LOCK DETAIL      *-EVENT DETAIL
=====
> APPLICATION TRACE EVENT DETAIL
ATD3
+ Planname=DSNREXX      Connid=DB2CALL      Corrid=DB2READ      Authid=DNET581
+
+ Control= NEXT      (FIRST/LAST/NEXT/PREV/nnnn/-nnnn/Snnnn/TOP/BOTTOM/UP/DOWN)
+ Current=000001      Total Number of SQL Calls=000021
+
+ Event Time      TN      Event Type      Event Resource Information
+ -----
+ 09:02:54.469      START PREPARE      PGM=DSNREXX      STMT=01849
+ 09:02:54.469      END PREPARE      ROWS=0000000      PAGES=0000000
=====

```

You are now looking at the event detail level of tracing for the application. The event detail will show the start stop times for each event as part of the DB2 application.

To see the next event in the trace **Press Enter**, then **Press Enter** again to see subsequent events. Note that the relative statement number increments each time you press enter.

```

ZATD3   VTM   02   V511./C DSNB 01/24/13 15:53:19 3
> Help PF1           Back PF3           Up PF7           Down PF8
>
> APPLICATION TRACE: Enter a selection letter on the top line.
> Current Trace Status: INACTIVE
> A-PROGRAM   B-SQL INDEX   C-SQL DETAIL   D-LOCK DETAIL   *-EVENT DETAIL
=====
> APPLICATION TRACE EVENT DETAIL
ATD3
+ Planname=DSNREXX   Connid=DB2CALL   Corrid=DB2READ   Authid=DNET581
+
+ Control= NEXT      (FIRST/LAST/NEXT/PREV/nnnn/-nnnn/Snnnn/TOP/BOTTOM/UP/DOWN)
+ Current=000002   Total Number of SQL Calls=000021
+
+ Event Time   TN Event Type           Event Resource Information
+ -----
+ 09:02:54.469   START OPEN CURSOR   PGM=DSNREXX   STMT=02171
+ 09:02:54.469   END OPEN CURSOR     ROWS=00000000 PAGES=00000000
=====

```

Feel free to step through the DB2 trace and look at the various events and records documented by the application trace.

**Congratulations!** You have completed the OMEGAMON DB2 Classic interface lab.

---

## Appendix A. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation  
Licensing  
2-31 Roppongi 3-chome, Minato-ku  
Tokyo 106-0032, Japan

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have

been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental. All references to fictitious companies or individuals are used for illustration purposes only.

#### COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

---

## Appendix B. Trademarks and copyrights

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM	AIX	CICS	ClearCase	ClearQuest	Cloudscape
Cube Views	DB2	developerWorks	DRDA	IMS	IMS/ESA
Informix	Lotus	Lotus Workflow	MQSeries	OmniFind	
Rational	Redbooks	Red Brick	RequisitePro	System i	
<i>System z</i>	<i>Tivoli</i>	<i>WebSphere</i>	<i>Workplace</i>	<i>System p</i>	

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

ITIL is a registered trademark, and a registered community trademark of The Minister for the Cabinet Office, and is registered in the U.S. Patent and Trademark Office.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

## Appendix C. Documentation Revision History

Date of Revision	Number	Completed by	Revision Log
9/9/2014	V6.0	Ed Woods	Principal author Lab design and lab document creation Combined into one integrated lab doc.
7/13/2015	V7.0	Ed Woods	Updated e3270 module for V5.30
8/6/2015	V7.1	Lih Wang	Edited for SHARE August-Orlando Lab Session











---

© Copyright IBM Corporation 2015.

The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. This information is based on current IBM product plans and strategy, which are subject to change by IBM without notice. Product release dates and/or capabilities referenced in these materials may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way.

IBM, the IBM logo and [ibm.com](http://ibm.com) are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml).



Please Recycle

---