

# IBM Db2 Data Management Console

## Deep Dive

—

Jason Sizto  
Senior Engineer

# Agenda

Introduction to Data Management Console

DMC Functions

Why DMC?

Supported offerings and platforms

Demo – Monitoring and Tuning Deep Dive



# IBM Db2 Data Management Console

Manage, monitor and optimize performance of hundreds of Db2 databases from ground to cloud with the next generation of IBM Data Server Manager

[Take the product tour](#)

[Try it for free](#)

# Key Functions

Real-time and historical monitoring

Alerts, User-defined Alerts and notifications

Monitor Reports

WLM Dashboard

Tuning

Fully integrated SQL Editor

Database object exploration and management

Job scheduler

Auditing

Blackout

Collaboration

RESTful APIs

Why DMC?

# Modernize



# Supported Db2 offerings and platforms

	On-premises			IBM Cloud		Cloud Pak for Data			Red Hat OpenShift		
	<i>Db2 10.1.0.2 and up</i>	<i>IIAS</i>	<i>Db2 Big SQL</i>	<i>Db2</i>	<i>Db2 Warehouse</i>	<i>Db2</i>	<i>Db2W</i>	<i>Data Virtualization</i>	<i>Db2 Big SQL</i>	<i>Db2</i>	<i>Db2W</i>
DMC on premises	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
DMC on Cloud Pak for Data	No			No		Yes			No		

Deploy through Docker or install on Windows, Linux, MacOS, AIX, Linux on z/OS, Cloud Pak for Data

# Demo

## Monitor

- Systematic Drill Down
- Divide and Conquer
- WLM

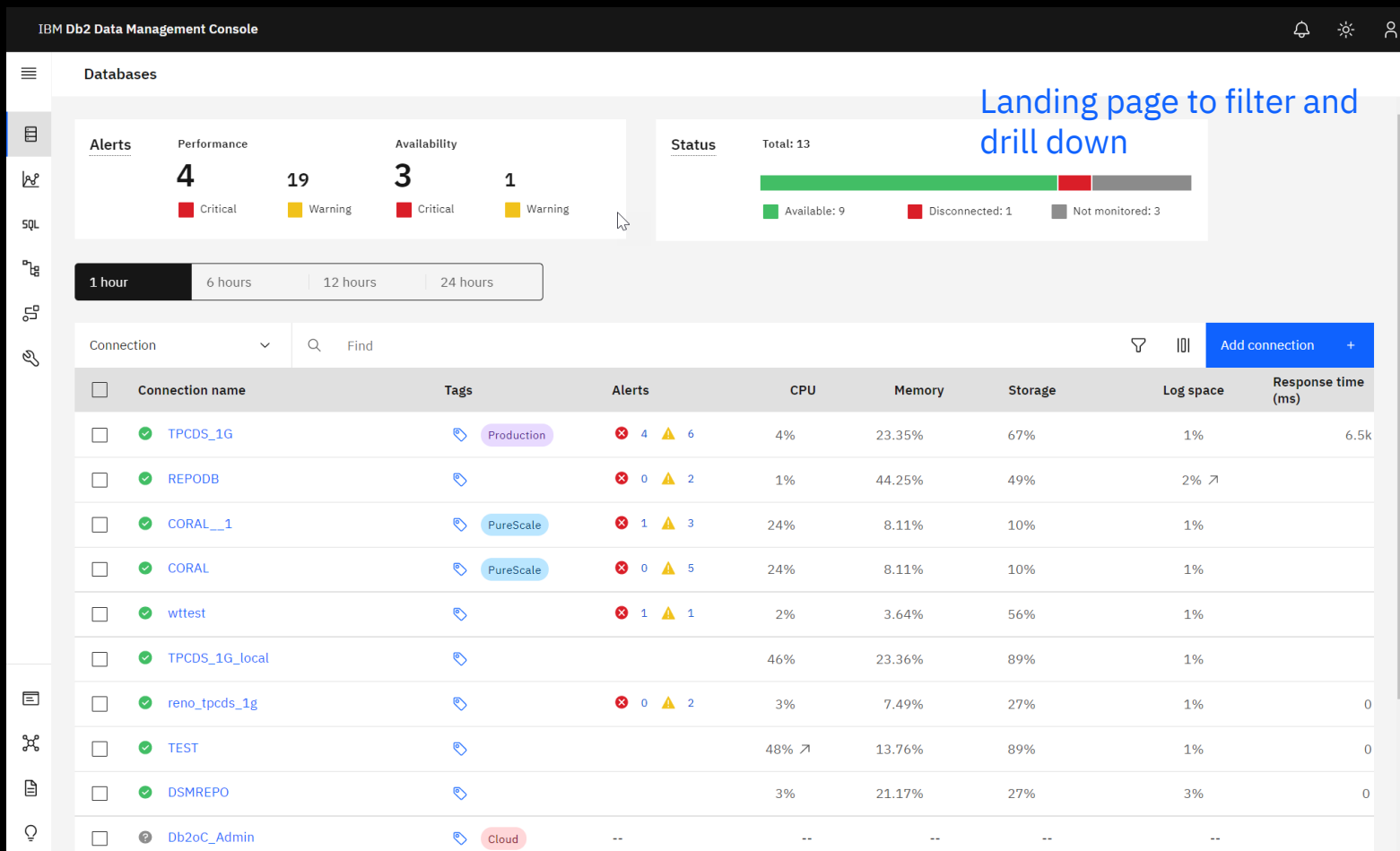
## Tuning

- Recommendations
- Access Plan

## Historical Reports

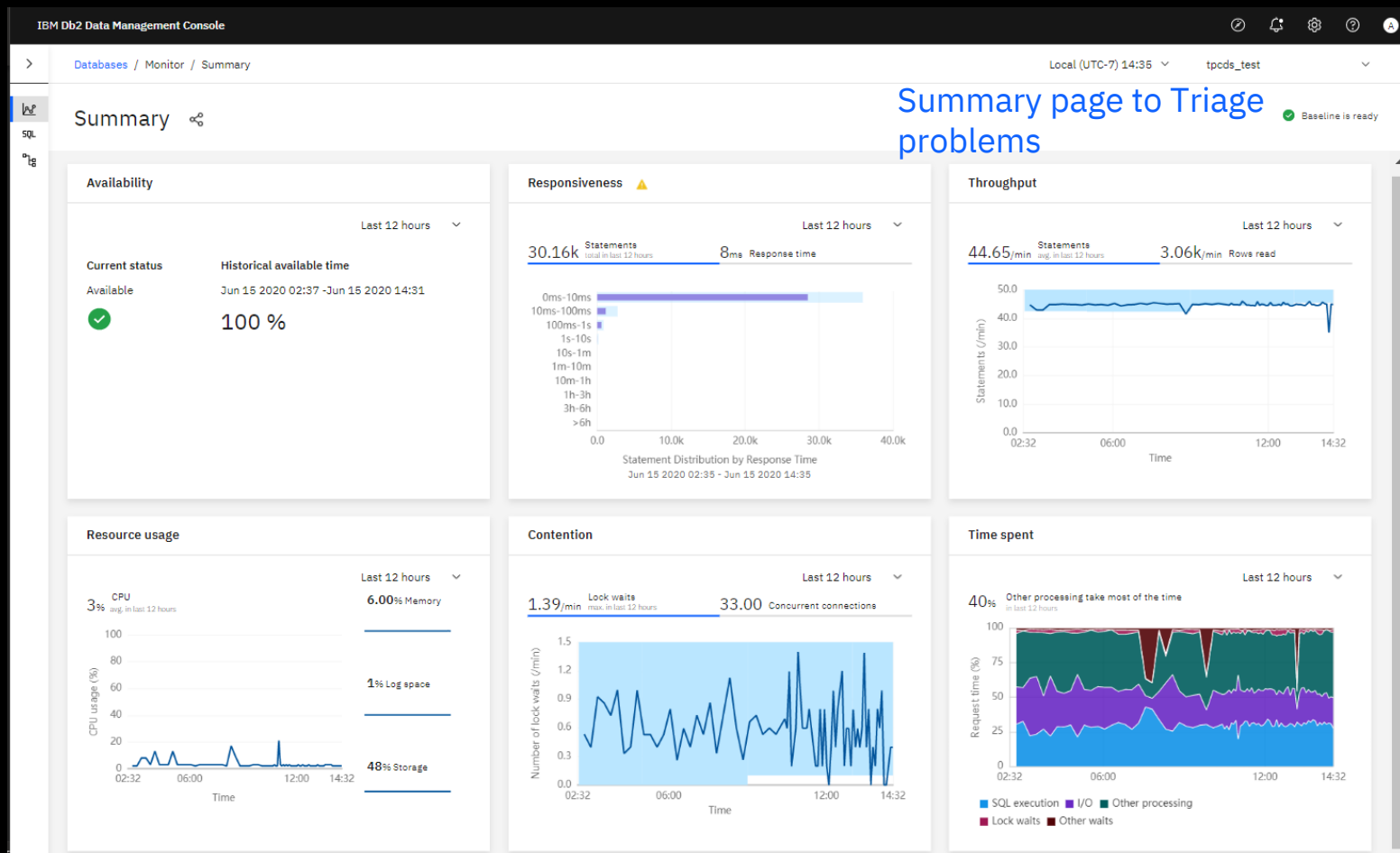
\*\* We will go through the following screenshots during the demo

# Enterprise at a glance

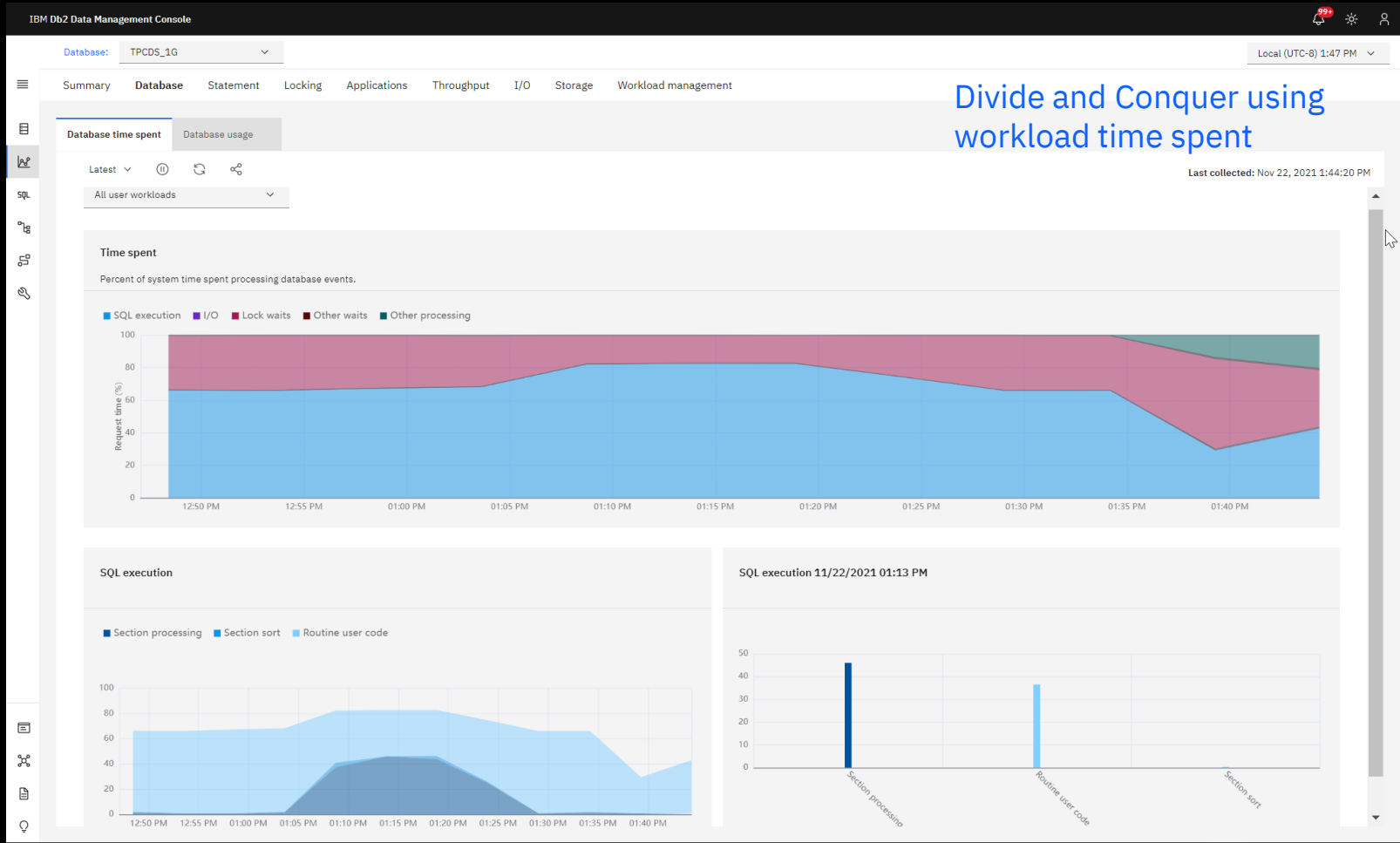




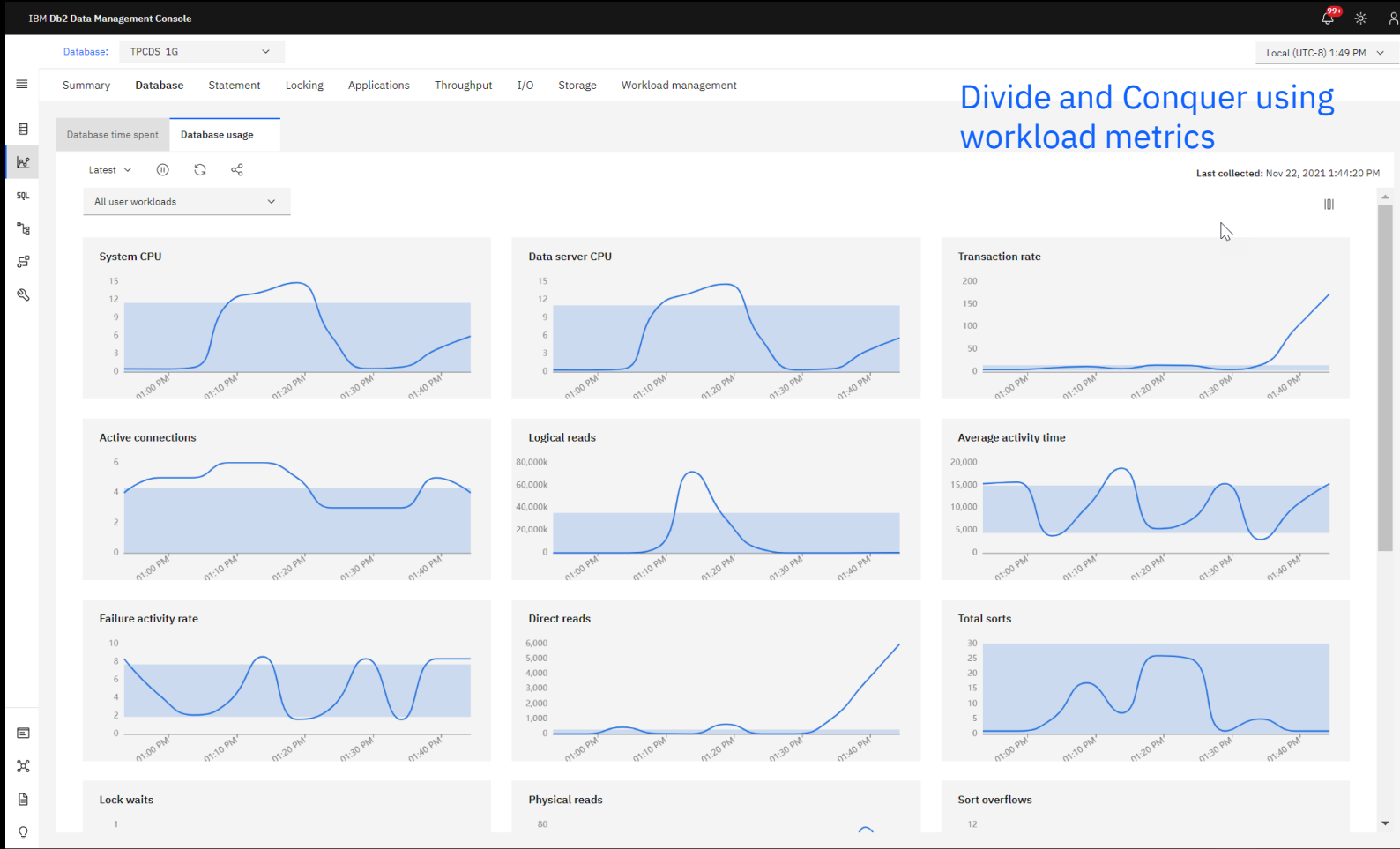
# Information at your fingertips



# Workload time spent drill down



# Workload metrics drill down



# Current running statements

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 2:33 PM

Summary Database **Statement** Locking Applications Throughput I/O Storage Workload management

In-flight executions Individual executions Package cache Stored procedures

Latest ▾ ⏸ ↺ ↻

Last collected: Nov 22, 2021 2:32:56 PM

Search SQL

	CPU time	Coordinator Statement execution time	Client IP address	Application name	User ID	Start time	Activity state	SQL
<input type="checkbox"/>	0.000	0.000	9.30.219.16	UC_MYMON	DB2INST1	Nov 22, 2021 2:32:55 PM	EXECUTING	<a href="#">/* IBM_DSSNAP */ WITH</a>

messi1.fyre.ibm.com:11080/console/#/monitor/inflight\_executions

Statements comes from  
MON\_GET\_ACTIVITY

# Targeted statements history



IBM Db2 Data Management Console

Database: TPCDS\_1G


Local (UTC-8) 2:34 PM

SummaryDatabaseStatementLockingApplicationsThroughputI/OStorageWorkload management

In-flight executionsIndividual executionsPackage cacheStored procedures

Latest  

Last collected: Nov 22, 2021 2:30:03 PM

Filter by: Default  Search SQL and application name

<input type="checkbox"/>	SQL	Client IP address	Workload name	Session authorization ID	SQL code	Statement execution time	CP
<input type="checkbox"/>	<a href="#">CALL dbms_alert.sleep(?)</a>		JOHN	JOHN	0	0:02:00.000	0:
<input type="checkbox"/>	<a href="#">delete from results where cnt &gt; ?</a>		JOSEPH	JOSEPH	-911	0:01:02.417	0:
<input type="checkbox"/>	<a href="#">delete from results where cnt &gt; ?</a>		JOSEPH	JOSEPH	-911	0:01:02.401	0:
<input type="checkbox"/>	<a href="#">select iss.i_brand_id as brand_id,iss.i_class_id class_id,iss...</a>		PAUL	PAUL	0	0:00.671	0:
<input type="checkbox"/>	<a href="#">select iss.i_brand_id as brand_id,iss.i_class_id class_id,iss...</a>		PAUL	PAUL	0	0:00.647	0:
<input type="checkbox"/>	<a href="#">select iss.i_brand_id as brand_id,iss.i_class_id class_id,iss...</a>		PAUL	PAUL	0	0:00.613	0:
<input type="checkbox"/>	<a href="#">select iss.i_brand_id as brand_id,iss.i_class_id class_id,iss...</a>		PAUL	PAUL	0	0:00.607	0:
<input type="checkbox"/>	<a href="#">select iss.i_brand_id as brand_id,iss.i_class_id class_id,iss...</a>		PAUL	PAUL	0	0:00.604	0:
<input type="checkbox"/>	<a href="#">create external table '/opt/splunk/data/splunk_outputs/splunk_d...</a>		SYSDEFAULTUSER WORKLOAD	DB2INST1	0	0:00.153	0:
<input type="checkbox"/>	<a href="#">INSERT INTO "DB2INST1"."SYSTEM54421" select current_timestamp a...</a>		SYSDEFAULTUSER WORKLOAD	DB2INST1	0	0:00.131	0:

Items per page: 10 1-10 of 35 items

1 1 of 4 pages

## Statements from Activity Event Monitor

# High Impact statements history

IBM Db2 Data Management Console

Database: TPCDS\_1G

Local (UTC-8) 2:34 PM

SummaryDatabaseStatementLockingApplicationsThroughputI/OStorageWorkload management

In-flight executionsIndividual executionsPackage cacheStored procedures

Latest

Last collected: Nov 22, 2021 2:34:25 PM

Filter by: Average

Search SQL

Alert	SQL	Number of executions	Statement execution time (ms)	CPU time (ms)	Rows read	Rows return
<input type="checkbox"/>	<a href="#">CALL dbms_alert.sleep(?)</a>	1	0:02:00.000	0.000	0	:
<input type="checkbox"/>	<a href="#">select iss.i_brand_id as brand_id ,iss.i_class_id class_id ,iss...</a>	1	0:00.621	0:00.615	0	3,8:
<input type="checkbox"/>	<a href="#">CALL SYSPROC.SYSINSTALLOBJECTS(CAST (? AS VARCHAR(10)),CAST (? ...</a>	1	0:00.040	0:00.029	17	:
<input type="checkbox"/>	<a href="#">lock table results in exclusive mode</a>	1	0:00.008	0:00.007	4	:
<input type="checkbox"/>	<a href="#">insert into results select avg(a.card) from sysibm.systables a ...</a>	1	0:00.001	0.000	499	:
<input type="checkbox"/>	<a href="#">SELECT POLICY FROM SYSTOOLS.POLICY WHERE MED=? AND DECISION=? A...</a>	1	0:00.001	0.000	1	:
<input type="checkbox"/>	<a href="#">SELECT MAX(POSSTR(D_USER    D_GROUP    D_PUBLIC    ROLE_USER   ...</a>	0	0.000	0.000	0	:
<input type="checkbox"/>	<a href="#">create external table '/opt/splunk/data/splunk_outputs/splunk_H...</a>	0	0.000	0.000	0	:
<input type="checkbox"/>	<a href="#">SELECT VALID INTO :H00030 FROM SYSCAT.VIEWS WHERE VIEWNAME = ? ...</a>	0	0.000	0.000	0	:
<input type="checkbox"/>	<a href="#">VALUES (CURRENT TIMESTAMP) INTO :H00183</a>	0	0.000	0.000	0	:

Items per page: 101-10 of 45 items

11 of 5 pages

## Statements from Package Cache

# Monitor profile

IBM Db2 Data Management Console

99%

ReportsBlackoutsJobsUsers and privilegesConnection profileMonitoring profileEvent monitor profileSettings

Filter table

Create profile +

	Profile name	Default	Active	Database list	Last updated	Description
<input type="checkbox"/>	default	Yes	Yes	reno_tpcds_1g,TEST,DSMREPO,...	2021-11-22 13:06:59	This monitoring profile collects ...
<input type="checkbox"/>	pureScale	No	Yes	CORAL__1,CORAL	2021-08-25 18:39:48	
<input type="checkbox"/>	HADR	No	Yes		2021-10-02 11:25:05	This monitoring profile is applie...
<input type="checkbox"/>	TPCDS_1G	No	Yes	TPCDS_1G	2021-08-25 18:40:10	
<input type="checkbox"/>	REPODB	No	Yes	REPODB	2021-08-25 18:40:21	
<input type="checkbox"/>	default_IIAS	No	Yes	IIAS	2021-08-25 18:40:33	
<input type="checkbox"/>	No Alerts	No	Yes		2021-11-22 13:03:57	

Customization for monitoring options

# Collection and retention settings

The screenshot displays the IBM Db2 Data Management Console interface. The top navigation bar includes links for Reports, Blackouts, Jobs, Users and privileges, Connection profile, **Monitoring profile**, Event monitor profile, and Settings. The left sidebar contains icons for various database management tasks. The main content area is titled 'Monitor settings' and is divided into two sections: 'Collection' and 'Persistence'.

**Collection Section:**

- General:** Collect data every (minutes) is set to 5.
- Package cache:** SQL statements captured is set to 100.
- Table data read for a collection:** Set to 1600.
- Locks:** Lock wait threshold (milliseconds) is set to 30000.
- Table data read for a collection:** Set to 1000.
- ☒ Normalize captured SQL statements

**Persistence Section:**

- Persistence:** Toggle is turned On.
- ☒ Monitoring data
- Keep data for (weeks):** Set to 16.
- ☒ Package cache (Note: It is collected for smart alerts as well)
- Keep data for (days):** Set to 7.

At the bottom of the settings area are three buttons: Cancel, Restore to default, and Save.

**Control amount of data collected and stored**



# Configure Alert rules

IBM Db2 Data Management Console

ReportsBlackoutsJobsUsers and privilegesConnection profileMonitoring profileEvent monitor profileSettings

GeneralMonitor settingsAlerts settingsNotificationCustom alerts

Alerts monitoring is on.

Search Type, Category and Threshold

Alert type	Alert category	Activated	Critical threshold	Warning threshold	Information threshold
▼ Availability		<input checked="" type="checkbox"/>			
Performance		<input checked="" type="checkbox"/>			
Connections	Connections	<input type="checkbox"/>		150	100
Buffer pool asynchronous read ratio	I/O	<input type="checkbox"/>		90%	95%
Buffer pool asynchronous write ratio	I/O	<input type="checkbox"/>		90%	95%
Buffer pool hit ratio	I/O	<input type="checkbox"/>		90%	95%
Buffer pool hit ratio degrades	I/O	<input type="checkbox"/>			4x
Catalog cache hit ratio	I/O	<input type="checkbox"/>		60%	70%
Application connections with excessive lock waits over request time	Locking	<input type="checkbox"/>		10%	5%
Increased table lock wait and lock timeout event hit rate.	Locking	<input type="checkbox"/>	5x	3x	
Table deadlock occurred	Locking	<input type="checkbox"/>	One or more tables are in deadlock		
Degree of secondary log allocation	Logging	<input type="checkbox"/>	95%	90%	
Log space used by dirty pages	Logging	<input checked="" type="checkbox"/>	95%	90%	

Customize alerts and thresholds

CancelRestore to defaultSave

# Setting up notifications

IBM Db2 Data Management Console

99%

ReportsBlackoutsJobsUsers and privilegesConnection profileMonitoring profileEvent monitor profileSettings

GeneralMonitor settingsAlerts settingsNotificationCustom alerts

Customize notifications based on alert rules

Add +

If the Email server or SNMP is not configured, the rule will not take effect.

Rule name	Notification type	Alerts	Severity	Enabled	Email address	Notification timing	
email	Email	Log space, Log space used b...	Critical	Yes	jsizto@us.ibm.com	Immediate	:
2gmail	Email	Log space, Log space used b...	Critical,Warning,Information	Yes	jasonsizto@gmail.com	Immediate	:

Cancel

Restore to default

Save

# Create user defined alerts

IBM Db2 Data Management Console

99+

ReportsBlackoutsJobsUsers and privilegesConnection profileMonitoring profileEvent monitor profileSettings

GeneralMonitor settingsAlerts settingsNotificationCustom alerts

Create custom in house alerts

Find alert

Create alert +

<input type="checkbox"/>	Alert	Script type	Created by	Scheduled	Ends on	Last ran	Status
<input type="checkbox"/>	Runstats	Shell	jsizto@us.ibm.com	Every day at 4:49 PM	--	Wednesday, September 8, 2021 4:49 PM	<div></div>
<input type="checkbox"/>	sleep10_10	Shell	jsizto@us.ibm.com	Once on Jul 22nd at 8:10 AM	--	Thursday, July 22, 2021 8:10 AM	<div></div>
<input type="checkbox"/>	unilever	Shell	jsizto@us.ibm.com	Once on Jul 22nd at 8:21 AM	10 8 22 7 ?	Thursday, July 22, 2021 8:21 AM	<div></div>

Cancel

Restore to default

Save

# Event monitor setup

IBM Db2 Data Management Console

Reports Blackouts Jobs Users and privileges Connection profile Monitoring profile **Event monitor profile** Settings

Top 20 databases by tablespace usage

Database	Percentage (%)
REPODB	~16
wttest	~11
TPCDS_1G	~5
reno_tpcds_1g	~3
CORAL	~2
TPCDS_1G_local	~1
DSMREPO	~0.5
TEST	~0.5

Setting up console managed event monitors

Find database or profile

Databases with profiles	Type	Source	Created by	Status
Db2oC_Admin				
IIAS				
REPODB				
TEST				
TPCDS_1G				
RTMON_EVMON_ACTIVITIES_1637777287245	ACTIVITIES	Console	DB2INST1	Enabled
RTMON_EVMON_STATS	STATISTICS	Console	DB2INST1	Enabled
THRES_ACT_TOTAL_TIME	THRESHOLDVIOLATIONS	User	DB2INST1	Enabled
DB2DETAILDEADLOCK	DETAILDEADLOCKS	Db2	DB2INST1	Enabled
TPCDS_1G_local				
reno_tpcds_1g				
wttest				

# Identify lock holder and requester

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 2:14 PM

Summary Database Statement **Locking** Applications Throughput I/O Storage Workload management

Blocking and waiting connections Connection statistics Locked objects with waiting connections Find locked objects Locking event monitor

Last 1 hour

Search application handle and application name

	Type	Application handle	Application name	User ID	Lock wait time	Number of locks held	Lock mode	Event timestamp	Number of waiting connecti
^	BLOCKER	570	db2bp	JOHN	0:11.029	10	X	Nov 22, 2021 2:09:38 PM	:
	WAITER	569	db2bp	JOSEPH	0:11.029	3	IX	Nov 22, 2021 2:09:38 PM	:
v	BLOCKER	533	db2bp	JOHN	0:22.047	10	X	Nov 22, 2021 2:04:18 PM	:
v	BLOCKER	486	db2bp	JOHN	0:33.082	10	X	Nov 22, 2021 1:59:03 PM	:
v	BLOCKER	441	db2bp	JOHN	0:55.123	10	X	Nov 22, 2021 1:53:43 PM	:
v	BLOCKER	426	db2bp	JOHN	0.000	10	X	Nov 22, 2021 1:51:03 PM	:
v	BLOCKER	129	db2bp	JOHN	0:11.023	10	X	Nov 22, 2021 1:13:39 PM	:

Find blocking and waiting connections

# Drill down to find locking objects

IBM Db2 Data Management Console

Database: TPCDS\_1G

Local (UTC-8) 2:14 PM

SummaryDatabaseStatementLockingApplicationsThroughputI/OStorageWorkload management

Blocking and waiting connectionsConnection statistics**Locked objects with waiting connections**Find locked objectsLocking event monitor

Last 1 hour

Search application handle or application name

Application handle	Application name	User ID	Object type	Table schema	Table name	Lock name	Time spent waiting	Number of waiting connections	Dat
570	db2bp	JOHN	TABLE	TPCDS	RESULTS	02001F0000 0000000000 000054	0:10.000	1	:
533	db2bp	JOHN	TABLE	TPCDS	RESULTS	02001F0000 0000000000 000054	0:24.000	1	:
486	db2bp	JOHN	TABLE	TPCDS	RESULTS	02001F0000 0000000000 000054	0:39.000	1	:
441	db2bp	JOHN	TABLE	TPCDS	RESULTS	02001F0000 0000000000 000054	0:55.000	1	:

Drill down to the locked objects

# Locked object details

IBM Db2 Data Management Console

Database: TPCDS\_1G

Local (UTC-8) 10:26 AM

SummaryDatabaseStatementLockingApplicationsThroughputI/OStorageWorkload management

Blocking and waiting connectionsConnection statisticsLocked objects with waiting connectionsFind locked objectsLocking event monitor

Latest

Last collected: Nov 24, 2021 10:26:12 AM

Search table schema or table name

Application handle	Application name	Session authorization ID	Object type	Table schema	Table name	Lock name	Number of waiting connections	Lock wait time of waiting trar
14157	db2bp	JOHN	PLAN			4141414141 454A696C17 1C12C1	0	:
14157	db2bp	JOHN	ROW	SYSIBM	SYSTOGROU PS	0000A50004 0000000000 000052	0	:
14157	db2bp	JOHN	CATALOG	SYSIBM	SYSTABLES	000005000E 0E0000E0BA 76ABC3	0	:
14157	db2bp	JOHN	VARIATION			B101000001 0000000100 A036D6	0	:
14157	db2bp	JOHN	ROW	SYSIBM	SYSTABLESPA CES	0000210006 0000000000 000052	0	:
14157	db2bp	JOHN	TABLE	SYSIBM	SYSTABLESPA CES	0000210000 0000000000 000054	0	:
14157	db2bp	JOHN	TABLE	TPCDS	RESULTS	02001F0000 0000000000 000054	0	:
14157	db2bp	JOHN	TABLE	SYSIBM	SYSTOGROU PS	0000A50000 0000000000 000054	0	:
14154	db2bp	MARY	VARIATION			0100000001 0000000100 A042D6	0	:
14154	db2bp	MARY	PLAN			4141414141 454A696C17 1C12C1	0	:

Items per page: 10 1~10 items

1 page 1

Go to last page to load more items.

Finding details for the  
locked objects

# Identify top consumer connections

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 2:17 PM

Summary Database Statement Locking **Applications** Throughput I/O Storage Workload management

Top consumers Connections Utilities Utilities event monitor Units of work(UOW)

Top resource usage at connection level

Last collected: Nov 22, 2021 2:16:59 PM

Server resource	Application handle	Application name	Rank #	Top UOW ID	Value of top UOW	Average excluding top UOW	Session authorization ID	Workload name
Longest UOW	62476	db2bp	2	582	07:47:07.082	0:10:37.552	LUKE	SYSDEFAULTUSERW ORKLOAD
Estimated SQL cost	608	UC_MYMON	1	1	89,759 timerons	--	DB2INST1	CONSOLE_WORKLOA D
Num locks held	608	UC_MYMON	1	1	1	--	DB2INST1	CONSOLE_WORKLOA D
Memory	427	db2bp	3	118	192 KB	128 KB	MARY	MARY
Remote table wait time			--		0	0		
Log space used			--		0	0		
Rows written			--		0	0		
Remote table rows read			--		0	0		
Lock wait time			--		0	0		
CPU time			--		0	0		

Items per page: 10 1-10 of 20 items 1 1 of 2 pages

messi1.fyre.ibm.com:11080/console/#/monitor/top\_consumers



# Drill down for connection details

IBM Db2 Data Management Console

Database: TPCDS\_1G

Local (UTC-8) 2:17 PM

SummaryDatabaseStatementLockingApplicationsThroughputI/OStorageWorkload management

Top consumersConnectionsUtilitiesUtilities event monitorUnits of work(UOW)

Latest 11 12 13

Last collected: Nov 22, 2021 2:17:23 PM

Search application handle or application name

Application name	Application handle	Aborted activities /min	Client user ID	Client IP address	Connection start time	Workload name	Service superclass name	
db2bp	62476	0			Nov 22, 2021 6:10:37 AM	SYSDEFAULTUSER WORKLOAD	SYSDEFAULTUSERCLASS	:
db2bp	635	0			Nov 22, 2021 2:17:16 PM	PAUL	SYSDEFAULTUSERCLASS	:
db2bp	427	0			Nov 22, 2021 1:50:52 PM	MARY	SYSDEFAULTUSERCLASS	:
db2bp	382	0			Nov 22, 2021 1:45:07 PM	SYSDEFAULTUSER WORKLOAD	SYSDEFAULTUSERCLASS	:

Current running connection details

# Drill down for transaction details

IBM Db2 Data Management Console

99+

Local (UTC-8) 2:18 PM

Database: TPCDS\_1G

SummaryDatabaseStatementLockingApplicationsThroughputI/OStorageWorkload management

Top consumersConnectionsUtilitiesUtilities event monitorUnits of work(UOW)

Current running transaction details

Last collected: Nov 22, 2021 2:18:13 PM

Search application handle or application name

Application handle	Application name	UOW ID	UOW state	Activities completed	Activities aborted	Activities rejected	Log space used (KB)	Total activity time
62476	db2bp	582	UOWWAIT	0	0	0	0	0.000
638	db2bp	1	UOWEXEC	0	0	0	0	0.000
637	db2bp	2	UOWEXEC	0	0	0	0	0:33.086
635	db2bp	3	UOWWAIT	0	0	0	0	0.000
427	db2bp	118	UOWWAIT	0	0	0	0	0.000
382	db2bp	500	UOWWAIT	0	0	0	0	0.000

# Utilities details

IBM Db2 Data Management Console

Database: REPODB

Local (UTC-8) 1:14 PM

Summary

Database

Statement

Locking

Applications

Throughput

I/O

Storage

Workload management

Utilities execution details

Top consumers

Connections

Utilities

Utilities event monitor

Units of work(UOW)

Last week

Search utilities type, object schema

Type	State	Start time	Estimated percentage complete	Application name	Object type	Object schema	Object name	Phase start time	Phase	Invocation type
RUNST ATS		Nov 24, 2021 11:40:33 AM	--	DB2HMON	TABLE	IBMCONSOLE	SQL_FACT_MD C	--		AUTO
REORG	COMPLE TED	Nov 23, 2021 11:56:33 AM	100.00%					Nov 23, 2021 11:56:33 AM		
REORG	COMPLE TED	Nov 16, 2021 10:42:35 AM	100.00%					Nov 16, 2021 10:42:35 AM		

# Look at Throughput via connection dimension

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 1:57 PM

Summary Database Statement Locking Applications **Throughput** I/O Storage Workload management

Connection summary Partition summary WLM workload summary WLM service class summary Operating system time spent

Latest ▾ ⏸ ↺ 🔗 Last collected: Nov 22, 2021 1:57:27 PM

Search application handle and application name 🔍

Application name	Application handle	CPU time /min	Completed activities /min	Rows read /min	Rows modified /min	Rows returned /min	Logical reads /min	Di
db2bp	382	0.000	0	0	0	0	0	⋮
db2bp	427	0:56.417	0	24,400,675	0	0	0	⋮
db2bp	471	0.000	0	0	0	0	0	⋮
db2bp	476	0.000	0	0	0	0	0	⋮
UC_MYMON	485	0.000	0	0	0	0	0	⋮
db2bp	62476	0.000	0	0	0	0	0	⋮

# Look at Throughput via partition dimension

IBM Db2 Data Management Console

Database: IIAS

Local (UTC-8) 11:26 AM

Summary Database Statement Locking Applications **Throughput** I/O Storage Workload management

Connection summary **Partition summary** WLM workload summary WLM service class summary Operating system time spent Partition skew

Latest

Last collected: Nov 24, 2021 11:26:41 AM

Search database member

Database member	CPU time /min	Activities completed /min	Rows read /min	Rows modified /min	Rows returned /min	Logical reads /min	Direct reads /min	Direct writes /min
10	0:00.732	0.00	1,112.00	22.00	0.00	279.00	0.00	0.00
9	0:00.726	0.00	1,112.00	1.00	0.00	161.00	0.00	0.00
8	0:00.772	0.00	1,112.00	1.00	0.00	165.00	0.00	0.00
7	0:00.442	1.00	1,112.00	2.00	4.00	168.00	0.00	0.00
6	0:00.424	0.00	1,112.00	2.00	0.00	167.00	0.00	0.00
5	0:00.819	0.00	1,112.00	1.00	0.00	164.00	0.00	0.00
4	0:00.438	0.00	1,112.00	7.00	0.00	191.00	0.00	0.00
3	0:00.826	1.00	1,112.00	1.00	3.00	162.00	0.00	0.00
2	0:00.422	0.00	1,112.00	1.00	0.00	168.00	0.00	0.00
1	0:00.778	0.00	1,112.00	17.00	0.00	246.00	0.00	0.00

Items per page: 10 1-10 of 11 items

1 1 of 2 pages

Look at throughput at  
partition angle

# Look at Throughput via WLM workload dimension

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 1:58 PM

Summary Database Statement Locking Applications **Throughput** I/O Storage Workload management

Connection summary Partition summary **WLM workload summary** WLM service class summary Operating system time spent

Latest ⓘ ↺ ↻ Last collected: Nov 22, 2021 1:58:24 PM

Search Workload name

Workload name	Total CPU time /min	Activities completed /min	Rows read /min	Rows modified /min	Rows returned /min	Logical reads /min	Sorts /min	Total a
SYSDEFAULTUSER WORKLOAD	0.000	0	0	0	0	0	0	:
SYSDEFAULTADM WORKLOAD	0.000	0	0	0	0	0	0	:
PETER	0.000	0	0	0	0	0	0	:
PAUL	0:00.623	2	4	0	3,685	17,167	1	:
MARY	0:53.102	0	25,274,001	0	0	76,679,281	0	:
JOSEPH	0.000	0	0	0	0	0	0	:
JOHN	0:00.030	5	28,753	1	2	230	0	:
CONSOLE_WORKLOAD	0:00.116	4	50	0	18	183	5	:

4

# Look at Throughput via WLM service class dimension

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 1:58 PM

Summary Database Statement Locking Applications **Throughput** I/O Storage Workload management

Connection summary Partition summary WLM workload summary **WLM service class summary** Operating system time spent

Latest ▾ ⓘ ↺ ↻

Last collected: Nov 22, 2021 1:58:44 PM

Search service class name and service subclass name

Service class name	Service subclass name	Total CPU time /min	Activities completed /min	Rows read /min	Rows modified /min	Rows returned /min	Logical reads /min
SYSDEFAULTUSERCLASS	SYSDEFAULTSUBCLASS	0:58.585	8	27,670,648	1	2,889	84,047,014
SYSDEFAULTUSERCLASS	SYSDEFAULTMANAGEDSUBCLASS	0.000	0	0	0	0	0
SYSDEFAULTSYSTEMCLASS	SYSDEFAULTSUBCLASS	0.000	0	0	0	0	0
SYSDEFAULTMAINTENANCECLASS	SYSDEFAULTSUBCLASS	0:07.696	66	10,531,442	14,023	60	136,958

Look at throughput at service class angle

# I/O – Bufferpool

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 2:19 PM

Summary Database Statement Locking Applications Throughput **I/O** Storage Workload management

Buffer pools Prefetchers Logging performance

Latest (II) (refresh) (share)

Last collected: Nov 22, 2021 2:19:14 PM

Search buffer pool

Buffer pool	Hit ratio	Prefetch ratio	Cleaner ratio	Logical reads /min	Physical reads /min	Number of pages	Self tuning enabled	Writes /min	Direct reads
IBMDEFAULT BP	100.00 %	0.00%	0.00%	1,080	0	384,074	YES	0	:
CONSOLEPOOL	0.00%	0.00%	0.00%	0	0	1,500	YES	0	:

messi1.fyre.ibm.com:11080/console/#/monitor/buffer\_pool



# I/O – Prefetcher

IBM Db2 Data Management Console

99%

Local (UTC-8) 2:21 PM

Database: TPCDS\_1G

Summary Database Statement Locking Applications Throughput I/O Storage Workload management

Buffer pools Prefetchers Logging performance

⏏ ↺ 🔗

Last collected: Nov 22, 2021 2:21:10 PM

Filter by: Buffer pool 🔽 🔍 Search Buffer pool name

Buffer pool name	Prefetch ratio	Cleaner ratio	Asynchronous reads /min	Prefetch wait time	Page size	Is self tuning enabled	Main usage	
CONSOLEPOOL	0.00%	0.00%	0.00	0.000	32,768.00	YES	TEMPORARY	⋮
IBMDEFAULTBP	0.00%	100.00%	0.00	0.000	8,192.00	YES	--	⋮

## Prefetcher statistics

# I/O – Logging Performance

IBM Db2 Data Management Console




Database: TPCDS\_1G

Local (UTC-8) 2:21 PM




Summary Database Statement Locking Applications Throughput **I/O** Storage Workload management

Logging statistics

Buffer pools Prefetchers **Logging performance**

Latest   

Last collected: Nov 22, 2021 2:21:47 PM

Search log writes / min   

Database member	Log writes / min	Average log write time (ms)	Log reads / min	Average log read time (ms)	Log hit ratio	Log buffer full events / min	Commits / min
0	14.00	0:00.002	0.00	0.000	0.00%	0.00	4.00

# Table performance

IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 2:27 PM

Summary Database Statement Locking Applications Throughput I/O **Storage** Workload management

Table performance Storage Table space performance

Last 1 hour

Filter by: Tables Search schema or table name

Schema name	Table name	Table type	Table space name	Table scans /min	Rows read /min ↓	Access /min	
TPCDS	CUSTOMER	USER_TABLE	USERSPACE1	0	3,648,069	3,648,069	:
TPCDS	ITEM	USER_TABLE	USERSPACE1	0	3,587,059	3,587,059	:
TPCDS	STORE_SALES	USER_TABLE	USERSPACE1	0	1,118,049	1,118,049	:
TPCDS	INVENTORY	USER_TABLE	USERSPACE1	0	657,536	657,536	:
TPCDS	CUSTOMER_DEMOGRAPHICS	USER_TABLE	USERSPACE1	0	233,884	233,884	:
TPCDS	CATALOG_SALES	USER_TABLE	USERSPACE1	0	158,793	158,793	:
TPCDS	WEB_SALES	USER_TABLE	USERSPACE1	0	103,055	103,055	:
TPCDS	STORE_RETURNS	USER_TABLE	USERSPACE1	0	43,043	43,043	:
TPCDS	DATE_DIM	USER_TABLE	USERSPACE1	0	30,704	30,704	:
TPCDS	CUSTOMER_ADDRESS	USER_TABLE	USERSPACE1	0	17,252	17,252	:

Items per page: 10 1-10 of 30 items 1 1 of 3 pages

Table level I/O metrics




# Table storage






IBM Db2 Data Management Console

Database: TPCDS\_1G Local (UTC-8) 2:28 PM

Summary Database Statement Locking Applications Throughput I/O **Storage** Workload management

Table performance **Storage** Table space performance

Latest    Last collected: Nov 22, 2021 2:28:18 PM

Filter by: Tables  Search schema or table name    

Schema name	Table name	Logical size (kb) ↓	Physical size (kb)	Collect time	
TPCDS	STORE_SALES	654,592	654,592	Nov 22, 2021 2:28:18 PM	:
TPCDS	INVENTORY	612,864	612,864	Nov 22, 2021 2:28:18 PM	:
TPCDS	CATALOG_SALES	453,120	453,120	Nov 22, 2021 2:28:18 PM	:
TPCDS	WEB_SALES	227,328	227,328	Nov 22, 2021 2:28:18 PM	:
TPCDS	CUSTOMER_DEMOGRAPHICS	150,272	150,272	Nov 22, 2021 2:28:18 PM	:
TPCDS	STORE_RETURNS	37,888	37,888	Nov 22, 2021 2:28:18 PM	:
TPCDS	CATALOG_RETURNS	24,832	24,832	Nov 22, 2021 2:28:18 PM	:
TPCDS	CUSTOMER	23,808	23,808	Nov 22, 2021 2:28:18 PM	:
TPCDS	DATE_DIM	17,664	17,664	Nov 22, 2021 2:28:18 PM	:
TPCDS	TIME_DIM	11,776	11,776	Nov 22, 2021 2:28:18 PM	:

Items per page: 10 1-10 of 30 items 1 1 of 3 pages

## Table level storage metrics

# Table space performance

IBM Db2 Data Management Console

Database: TPCDS\_1G

Local (UTC-8) 2:29 PM

SummaryDatabaseStatementLockingApplicationsThroughputI/OStorageWorkload management

Table performanceStorageTable space performance

Latest ⓘ ↺ ↻

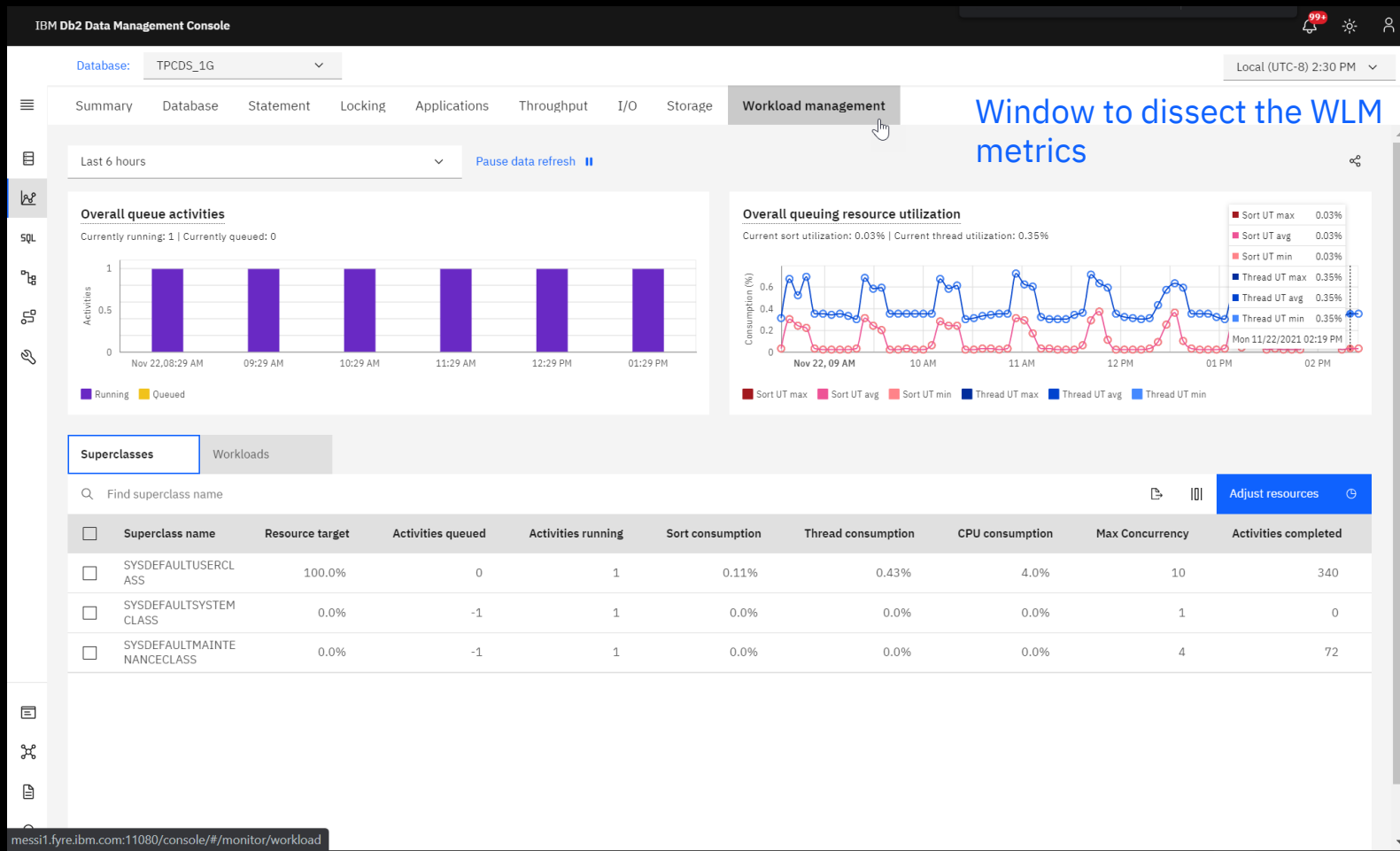
Last collected: Nov 22, 2021 2:28:58 PM

Search tablespace name

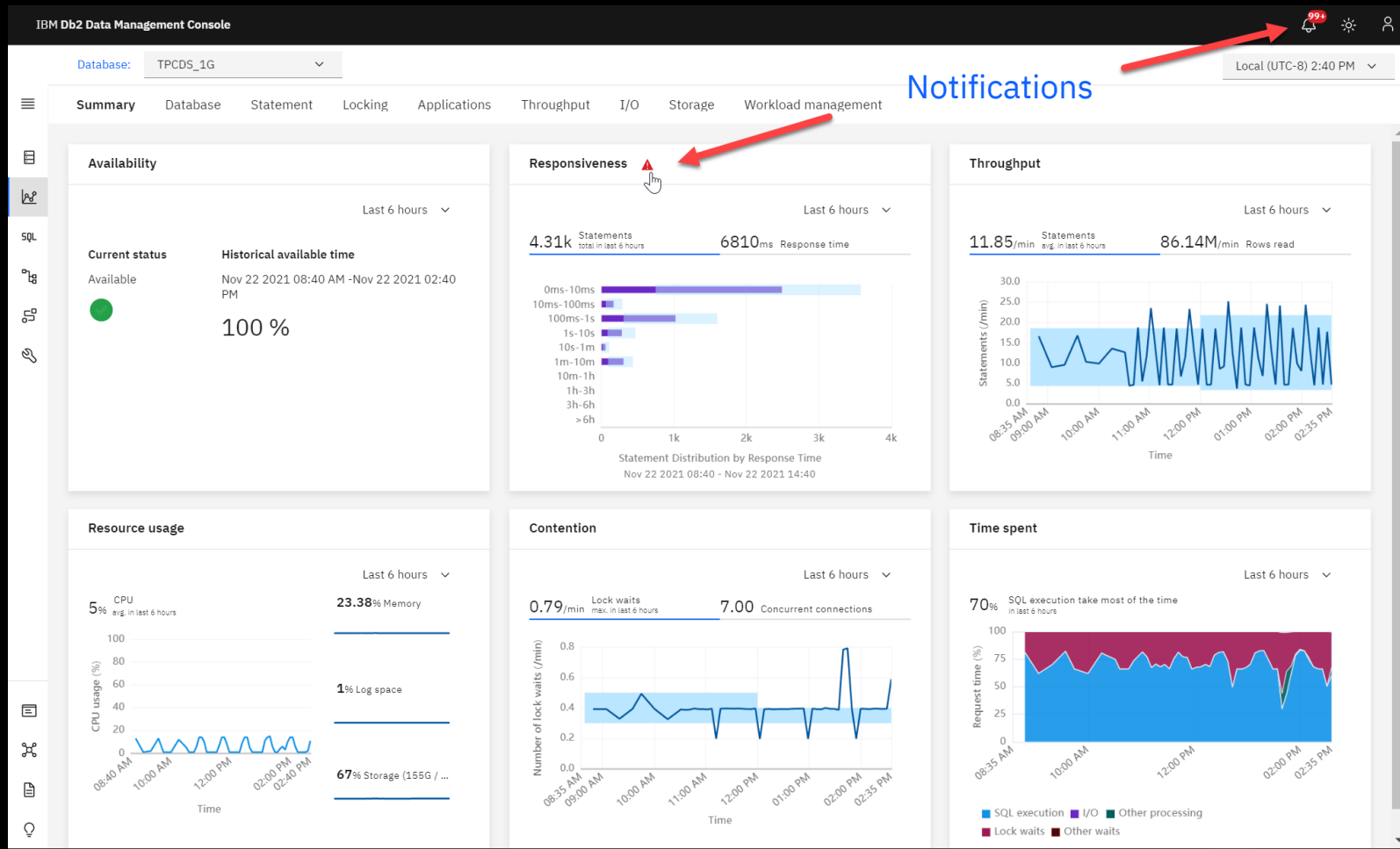
Table space name	Logical reads / min	Logical data reads / min	Logical index reads / min	Logical temporary page reads / min	Logical XDA reads / min	Hit ratio	Prefetch
SYSCATSPACE	26,085.00	8,989.00	17,083.00	0.00	13.00	100.00 %	0. ⋮
SYSTOOLSPACE	172.00	73.00	99.00	0.00	0.00	100.00 %	0. ⋮
TEMPSPACE1	1,069.00	1,069.00	0.00	1,069.00	0.00	99.91 %	0. ⋮
TEMPSPACE2	1,027.00	0.00	0.00	1,027.00	1,027.00	100.00 %	0. ⋮
TS4MONITOR	1,653.00	1,484.00	169.00	0.00	0.00	100.00 %	0. ⋮
USERSPACE1	21,452.00	1,781.00	19,671.00	0.00	0.00	100.00 %	0. ⋮

Table space level I/O metrics

# WLM Dashboard



# Notifications from alerts



# Alert details

IBM Db2 Data Management Console

---

## Notification center

Notification center

Updated 3:09:10 PM

Filter by:

All connections ▾

All severities ▾

Open ▾

All groups ▾

High to low ▾

New to old ▾

From YYYY-MM-DD

To YYYY-MM-DD

1 item selected
Delete 
Close 
Email 
Cancel

	Name	
<input checked="" type="checkbox"/>	<b>Statement performance</b> TPCDS_1G - Nov 22, 2021 1:54:34 PM <small>The metrics configured by the user to be monitored have deviated from ...</small>	PERFORMANCE   STATEMENTS
<input type="checkbox"/>	<b>Statement performance</b> TPCDS_1G - Nov 22, 2021 1:54:34 PM <small>The metrics configured by the user to be monitored have deviated from ...</small>	PERFORMANCE   STATEMENTS
<input type="checkbox"/>	<b>Statement performance</b> TPCDS_1G - Nov 22, 2021 1:54:34 PM <small>The metrics configured by the user to be monitored have deviated from ...</small>	PERFORMANCE   STATEMENTS
<input type="checkbox"/>	<b>Statement performance</b> TPCDS_1G - Nov 22, 2021 1:54:34 PM <small>The metrics configured by the user to be monitored have deviated from ...</small>	PERFORMANCE   STATEMENTS
<input type="checkbox"/>	<b>Database availability</b> wttest - Nov 16, 2021 3:29:42 PM <small>The database is not available.</small>	AVAILABILITY   STATUS
<input type="checkbox"/>	<b>Table space container utilization</b> TPCDS_1G_LOCAL - Sep 30, 2021 4:11:33 PM <small>Table space container utilization exceeded the set threshold.</small>	AVAILABILITY   STORAGE
<input type="checkbox"/>	<b>Table space container utilization</b> TPCDS_1G_LOCAL - Sep 30, 2021 4:11:33 PM <small>Table space container utilization exceeded the set threshold.</small>	AVAILABILITY   STORAGE

Items per page: 10 ▾
1-10 of 1000 items
1 ▾
1 of 100 pages
<
>

## Alert details in Notification center

● Critical - Statement performance

TPCDS\_1G - Nov 22, 2021 1:54:34 PM

**PERFORMANCE | STATEMENTS**

Alert #19165 - Open

**Analysis**

The metrics configured by the user to be monitored have deviated from the following alert thresholds:

- Critical** - Deviated 10 time(s) the historical average
- Warning** - Deviated 5 time(s) the historical average

To modify thresholds for a specific alert type, configure alert settings in the [Monitor Profile](#) page.

**Statement text**

```
SELECT I_ITEM_ID, I_ITEM_DESC, S_STATE, COUNT(SS_QUANTITY) AS STORE_SALES_QUANTITYCOUNT, AVG(SS_QUANTITY) AS STORE_SALES_QUANTITYAVE, STDEV(SQ_QUANTITY) AS STORE_SALES_QUANTITYSTDEV, STDEV(SS_QUANTITY)/AVG(SS_QUANTITY) AS STORE_SALES_QUANTITCOV, COUNT(SR_RETURN_QUANTITY) AS STORE_RETURNS_QUANTITYCOUNT, AVG(SR_RETURN_QUANTITY) AS STORE_RETURNS_QUANTITYAVE, STDEV(SR_RETURN_QUANTITY)/AVG(SR_RETURN_QUANTITY) AS STORE_RETURNS_QUANTITCOV, COUNT(CS_QUANTITY) AS CATALOG_SALES_QUANTITYCOUNT, AVG(CS_QUANTITY) AS CATALOG_SALES_QUANTITYAVE, STDEV(CS_QUANTITY)/AVG(CS_QUANTITY) AS CATALOG_SALES_QUANTITYSTDEV, STDEV(CS_QUANTITY)/AVG(CS_QUANTITY) AS CATALOG_SALES_QUANTITCOV FROM STORE_SALES, STORE_RETURNS, CATALOG_SALES, DATE_DIM D1, DATE_DIM D2, DATE_DIM D3, STORE, ITEM WHERE D1.D_QUARTER_NAME = ? AND D1.D_DATE_SK = SS.SOLD_DATE_SK AND I.ITEM_SK = SS.ITEM_SK AND S.STORE_SK = SS.STORE_SK AND SS.CUSTOMER_SK = SR.CUSTOMER_SK AND SS.ITEM_SK = SR.ITEM_SK AND SS.TICKET_NUMBER = SR.TICKET_NUMBER AND
```

Show more ▾

**Suggested resolution**



# Alert actions

[illegible]

# Tune for recommendations

The screenshot displays the IBM Db2 Data Management Console interface. In the background, a 'Notification center' shows a 'Critical - Statement performance' alert for 'TPCDS\_1G' dated Nov 22, 2021 1:54:34 PM. The alert details include 'PERFORMANCE | STATEMENTS', 'Alert #19165 - Open', and an 'Analysis' section stating that metrics deviated from historical averages. A 'Suggested resolution' section lists actions like 'View cost comparison report', 'View access plan', and 'Tune statement'. A modal dialog titled 'Select tuning activities to run' is overlaid on the console. The dialog shows the alert's name as 'Critical' and has a description field. Below this, there is a dropdown menu currently set to 'Explain options'. Under the 'Tuning options' section, four checkboxes are all checked: 'Format and annotate the statement', 'Generate access plan graph', 'Recommend RUNSTATS commands', and 'Recommend new indexes'. A large blue text overlay on the dialog reads 'e.g., tune SQL for recommendations'. The dialog has 'Close' and 'OK' buttons at the bottom. The console's sidebar on the left contains navigation icons for home, database, SQL, and other tools. The top right of the console shows a notification bell with '99+', a settings gear, and a user profile icon. The bottom status bar indicates the date and time: 'Nov 22, 2021 1:54:34 P'.

IBM Db2 Data Management Console

Notification center

**Critical - Statement performance**

TPCDS\_1G - Nov 22, 2021 1:54:34 PM

**PERFORMANCE | STATEMENTS**

Alert #19165 - Open

**Analysis**

The metrics configured by the user to be monitored

**Critical** - Deviated 10 time(s) the historical average  
**Warning** - Deviated 5 time(s) the historical average

To modify thresholds for a specific alert type, configure the alert

**Suggested resolution**

- [View cost comparison report](#): Compare the cost of the statement with the cost of the recommended statement.
- [View access plan](#): You can use access plan graph view explained SQL statements as a graph. You can use the information available from the graph to tune your statements for better performance.
- [Tune statement](#): Get advice and recommendations to help improve performance for a workload (group of statements).

**Alert trigger details**

Nov 22, 2021 1:54:34 P

Select tuning activities to run *preview*

\*Name: Critical

Description:

Explain options

Tuning options

- ☒ Format and annotate the statement
- ☒ Generate access plan graph
- ☒ Recommend RUNSTATS commands
- ☒ Recommend new indexes

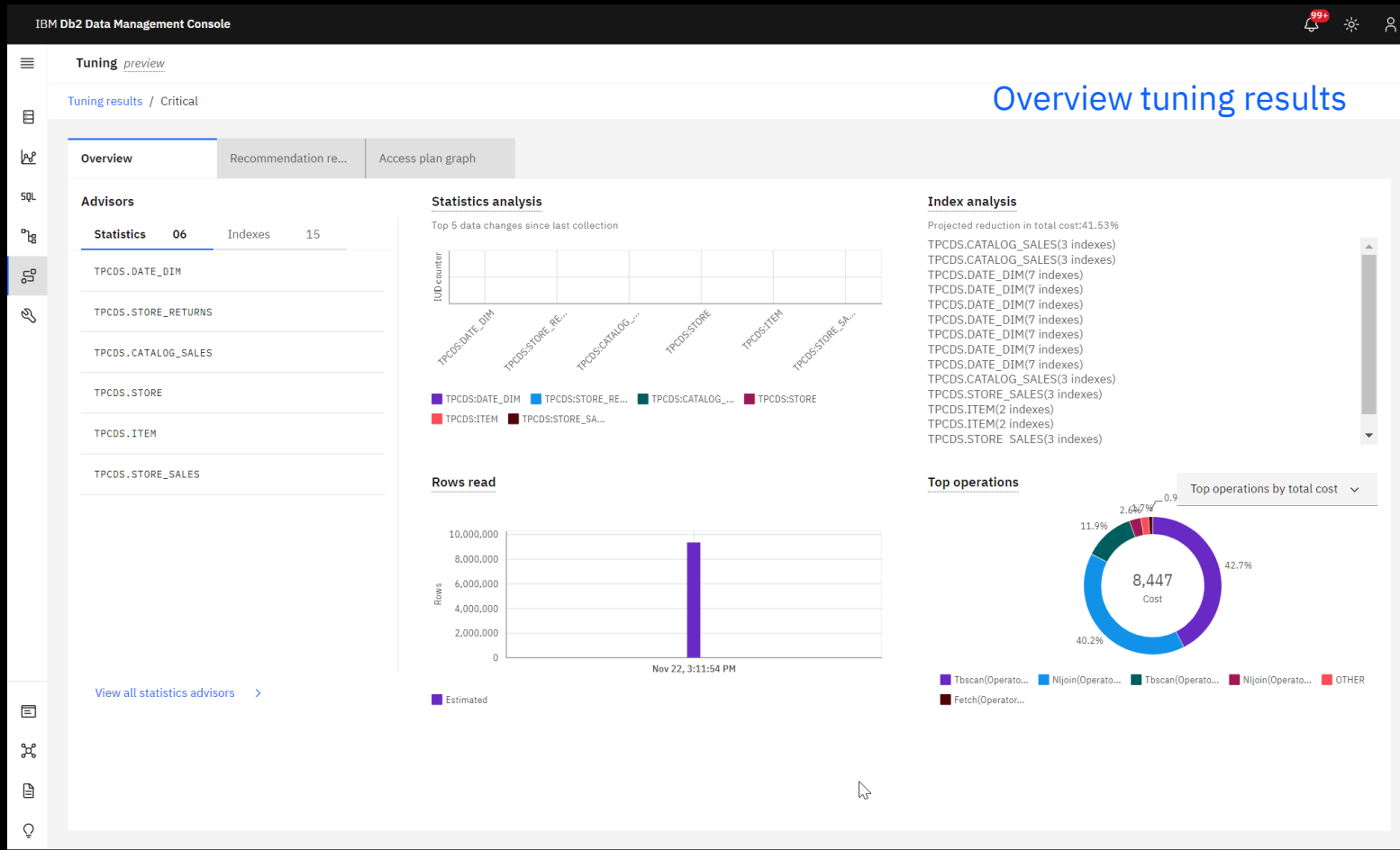
e.g., tune SQL for recommendations

Close OK

QUANTITY) AS  
RE\_SALES\_QUANTITYAVE,  
S\_QUANTITYCOV,  
YCOUNT,  
VE,  
TYSTDEV,  
YCOV,  
AVG(CS\_QUANTITY) AS  
(CS\_QUANTITY) AS  
VG(CS\_QUANTITY) AS  
DATE\_DIM D1, DATE\_DIM

Show more

# Tuning result



43

# Recommendations

IBM Db2 Data Management Console

Tuning *preview*

Tuning results / Critical

Overview

Recommendation re...

Access plan graph

Advisors

Statistics 06

Indexes 15

TPCDS.DATE\_DIM

TPCDS.STORE\_RETURNS

TPCDS.CATALOG\_SALES

TPCDS.STORE

TPCDS.ITEM

TPCDS.STORE\_SALES

Statistics analysis

Index analysis

Advisor scripts

```
RUNSTATS ON TABLE "TPCDS"."DATE_DIM"  
ON COLUMNS ( "D_DATE_SK", "D_QUARTER_NAME" )  
AND SAMPLED DETAILED INDEXES ALL  
ALLOW WRITE ACCESS  
UTIL_IMPACT_PRIORITY 50;  
  
RUNSTATS ON TABLE "TPCDS"."STORE_RETURNS"  
ON COLUMNS ( ("SR_CUSTOMER_SK","SR_ITEM_SK"),  
("SR_CUSTOMER_SK","SR_ITEM_SK","SR_TICKET_NUMBER") )  
WITH DISTRIBUTION ON COLUMNS ( "SR_ITEM_SK" NUM_FREQVALUES 15  
NUM_QUANTILES 25 , "SR_CUSTOMER_SK" NUM_FREQVALUES 15 NUM_QUANTILES 25 ,  
"SR_RETURNED_DATE_SK" NUM_FREQVALUES 15 NUM_QUANTILES 25 ,  
"SR_TICKET_NUMBER" NUM_FREQVALUES 15 NUM_QUANTILES 25 )  
AND SAMPLED DETAILED INDEXES ALL  
ALLOW WRITE ACCESS  
UTIL_IMPACT_PRIORITY 50;
```

Cancel

OK

Top operations by total cost

8,447

Cost

42.7%

40.2%

11.9%

2.64%

0.9%

Tbscan(Operato...

Nljoin(Operato...

Tbscan(Operato...

Nljoin(Operato...

OTHER

Fetch(Operator...

View all statistics advisors >

Tuning  
Recommendations

# Good old Access Plan drill down

IBM Db2 Data Management Console

Tuning *preview*
Tuning results / Critical

Overview

Recommendation re...

**Access plan graph**

Description

---

Name	Value
Operator identifier	1
Operator type	Return
Build level	DB2 v11.5.0.0 : s190610130 0
Statement heap size	8192
Maximum statement heap usage	1024 Pages
PLANID	4421f46cddc95689
STMTID	9a399ed1e2ecef6
SEMEVID	01fb02f973b47287
PREPTIME	380 milliseconds

**Cost Information**

Estimated output cardinality	0.00
Cumulative total cost	8,447.81
Cumulative CPU cost	824,876,352.00
Cumulative I/O cost	5,541.94
Cumulative first row total cost	8,447.81
Total cost	0.00
CPU cost	896.00
I/O cost	n/a

# Monitor Reports

IBM Db2 Data Management Console

99+

Reports

Blackouts

Jobs

Users and privileges

Connection profile

Monitoring profile

Event monitor profile

Settings

Edit report

Select type

Define

Schedule

Finish

Customize report

Select the metric(s) to be shown in report

Throughput

Resource usage

Sorts

Logs

Buffer pool and table space

Contention

Time spent

Top 10 statements

Interval

Select a time range. The report will be generated using the data collected during this interval.

12 hours

1 day

3 days

1 week

2 weeks

1 month

Cancel

Back

Next

Schedule historical monitor reports

# Individual Database Report

## scheduledDBPerformance

## Database level report

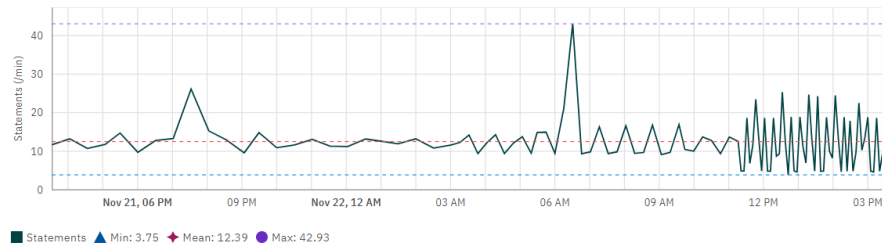
Download 

### Selected database report

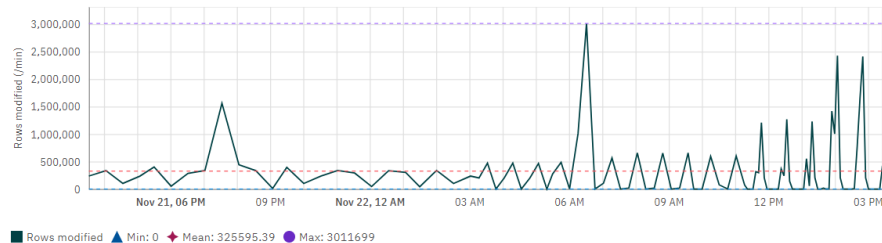
Database	TPCDS_1G	
Interval	1 day	
Scheduled	Every day	
Report start time	Sun 11/21/2021 03:30 PM	(Sun 11/21/2021 11:30 PM UTC)
Report stop time	Mon 11/22/2021 03:30 PM	(Mon 11/22/2021 11:30 PM UTC)
Collection time range	Sun 11/21-Mon 11/22	(Sun 11/21-Mon 11/22)
Report generated on	Mon 11/22/2021 03:30 PM	(Mon 11/22/2021 11:30 PM UTC)

### Throughput

Statements per minute



Rows modified per minute



# Enterprise Trend Report

## scheduledTrend

## Enterprise trend report

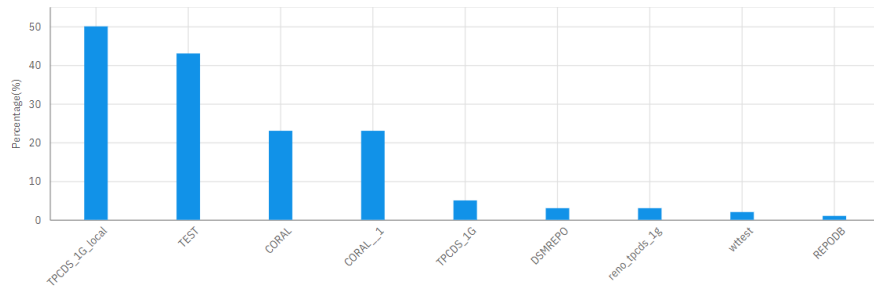
Download 

### Enterprise (All databases) report

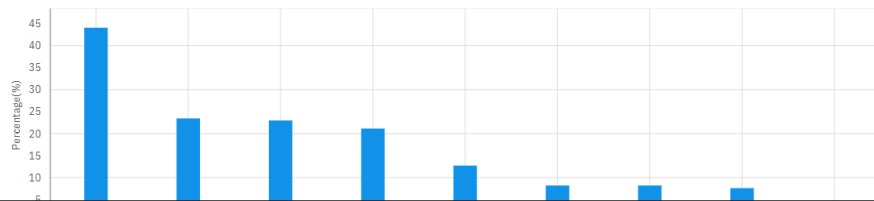
Database	All	
Interval	1 week	
Scheduled	Every Mon	
Report start time	Mon 11/15/2021 03:56 PM	(Mon 11/15/2021 11:56 PM UTC)
Report stop time	Mon 11/22/2021 03:56 PM	(Mon 11/22/2021 11:56 PM UTC)
Collection time range	Mon 11/15-Mon 11/22	(Mon 11/15-Mon 11/22)
Report generated on	Mon 11/22/2021 03:56 PM	(Mon 11/22/2021 11:56 PM UTC)

### Resource usage

10 most resource-intensive databases (CPU %)



10 most resource-intensive databases (Memory %)





# Thank you

Jason Sizto  
Senior Engineer

—

[jsizto@us.ibm.com](mailto:jsizto@us.ibm.com)

+1-408-463-2822

ibm.com

© Copyright IBM Corporation 2021. All rights reserved. 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. Any statement of direction represents IBM's current intent, is subject to change or withdrawal, and represent only goals and objectives. IBM, the IBM logo, and ibm.com are trademarks of IBM 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 at [Copyright and trademark information](#).

