Db2 Data Management Console

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V3.1.10
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Db2 Data Management Console

Introduction

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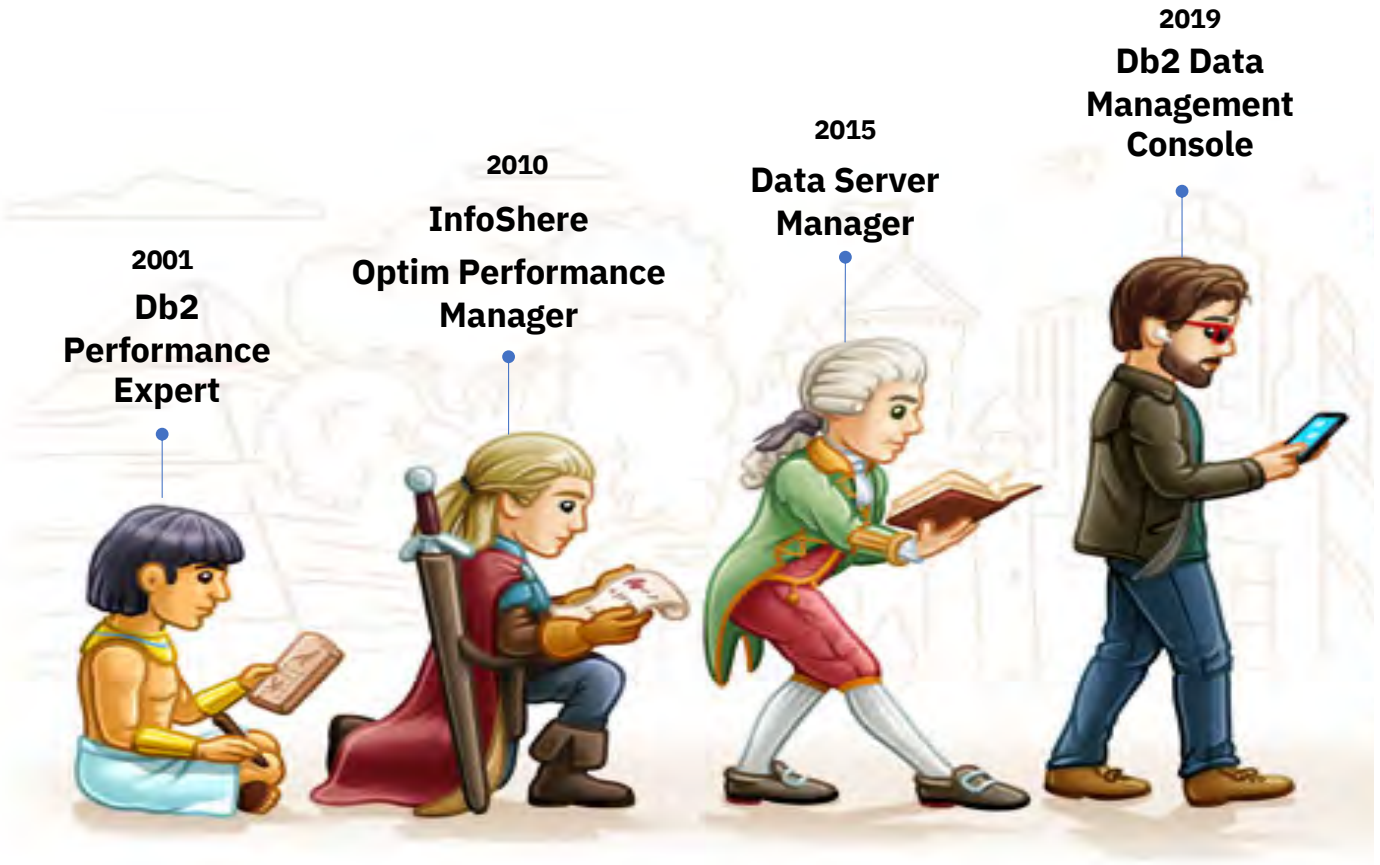
What is Data Management Console?

- Provides easy view of performance metrics of Db2 databases, focusing on problematic statements
- Keeps historical data for analysis
- Sends alerts when a threshold is reached
- Runs SQL
- Data Explorer
- Blackout events
- Execute and manage jobs
- Query tuning
- Replication
- Same look and feel for all Db2 databases, no matter where the database is located (cloud, Db2 Warehouse, PureScale, DPF, HADR, CP4D, etc)
- Free of charge, no license is required

Key features

- Real-time and historical monitoring
- Alerts, Custom Alerts and notifications
- Monitor Reports
- Fully integrated SQL editor
- Query Tuning
- Replication
- Database object exploration and management
- Jobs and Scheduler
- Blackout
- Auditing
- Team collaboration
- RESTful services APIs support

Evolution


2001
Db2 Performance Expert
2010
InfoShere Optim Performance Manager
2015
Data Server Manager
2019
Db2 Data Management Console

Db2 Data Management Console

Installation and Configuration

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Supported Db2 offerings and platforms

	On-premises			IBM Cloud		Cloud Pak for Data				Red Hat OpenShift	
	Db2 10.1.0.2 and up	***IIAS***	***Db2 Big SQL***	***Db2***	***Db2 Warehouse***	***Db2***	***Db2W***	***Data Virtualization***	***Db2 Big SQL***	***Db2***	***Db2W***
DMC standalone on premises	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
DMC service on Cloud Pak for Data	*No*			*No*		*Yes*				*No*	

System Requirements

https://www.ibm.com/support/pages/system-requirements-ibm-db2-data-management-console

- Select DMC version and Operating System
- Operating Systems tab
  - List of operating systems and levels supported for DMC server installation
- Prerequisites tab
  - Databases
    - List of Databases and levels supported for DMC repository database
  - JDBC Drivers
  - Web Browsers
- Supported Software
  - Managed Resources
    - List of databases and levels supported for monitored databases
- Hardware

Supported platforms

- AIX
- Linux
- Windows
- Mac OS
- zLinux

Capacity Planning

Table 1. Capacity recommendation

JVM Configuration

	Monitor DB#	CPU (Cores)	Memory (GB)	Disk for console (GB)	JVM (Max Heap size)	Network (GB)
Console	0-20	4	8	15	-Xmx 2048m	1 GB
	20-100	8	36	15	-Xmx 24576m	1 GB
	100-300	24	64	15	-Xmx 49152m	1 GB
	Monitor DB#	**CPU (Cores)**	**Memory (GB)**	**Disk for repository (GB) - 4 weeks**	**JVM (Max Heap size)**	**Network (GB)**
Repository database	0-20	4	4	95		
	20-100	8	16	950		
	100-300	16	32	2800		
Repository database (CFG)	logfilsiz = 8192, logprimary = 25, logsecond = 200					

UNIX and Linux

At least 64K or 65536 units for both the nproc value and the nofile value in the limits file

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=setup-capacity-planning

Capacity Planning – Repository database DSM vs. DMC

DSM	DMC	Example
Some metrics are available in realtime mode only	Some metrics are available in realtime and historical mode	Inflight Statements
Realtime data is not saved	Realtime data is saved	Each page refresh in Realtime mode
Delta data is saved	Raw and delta data is saved	Package cache metrics
Less metrics	More metrics	Index performance
Activity event monitor, only 5000 records are saved	All collected data from Activity event monitor is saved	

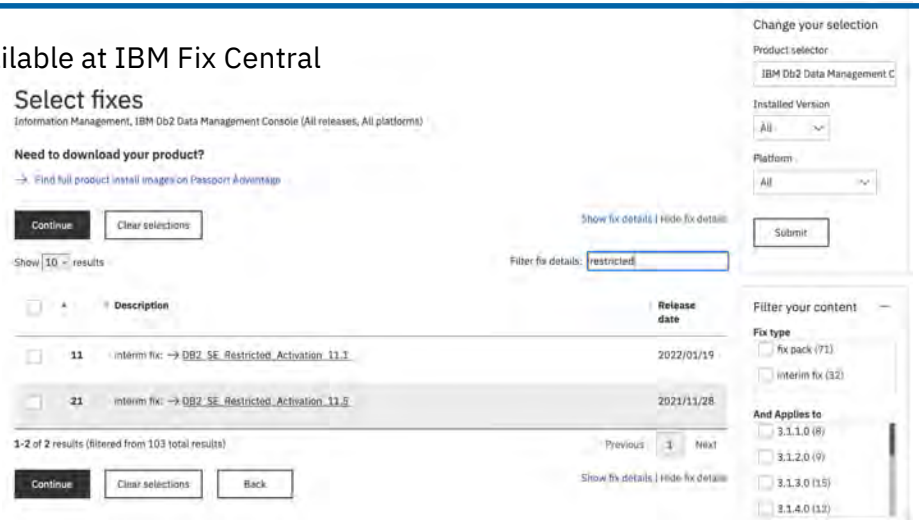
Repository Database Requirements

- Rules and restrictions
  - User must have the DBADM WITH DATAACCESS and SYSCTRL privileges
  - Dedicated database for DMC
  - Cannot be Db2 database partitioning feature (DPF) or pureScale®
  - Must have a temporary table space with a page size of at least 32 KB
    - TS4CONSOLE_TEMP will be created during repository database setup, if there is no existing temporary table space with at least 32 KB
  - Must be Unicode type to avoid SQL errors
  - Db2 version 11.1 or later
  - Oracle compatibility must be disabled
  - AUTOMATIC STORAGE option is set to YES
  - Minimum log settings: LOGPRIMARY 25 LOGSECOND 200 LOGFILSIZ 8192
  - Database configuration: EXTENDED_ROW_SZ enable
  - One repository database per DMC server
- Repository database needs to be at the same level of DMC code
  - Older DMC versions do not support repository databases already migrated to a newer version of DMC
    - If you have already upgraded your repository to a newer DMC release, there are several changes to tables that cannot be reverted. The rollback process will only work using a clean backup of your previous repository database, for example
      - Database backup taken when DMC version was V3.1.9
      - Migrate DMC to V3.1.10
      - To go back and use DMC V3.1.9 again, requires to restore the database backup taken at DMC V3.1.9 version
      - If an old database is restored, all information collected after that database backup will be lost

Additional Information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=tasks-creating-repository-database

Repository Database

- Db2 Restricted License for the Repository database only, available at IBM Fix Central
- DMC does not create the repository database
  - Repository database needs to exist before the configuration



- Create database example
  - db2 create database repodb pagesize 8 k
  - db2 UPDATE DATABASE CONFIGURATION FOR repodb USING LOGPRIMARY 25 LOGSECOND 200 LOGFILSIZ 8192
  - db2 UPDATE DATABASE CONFIGURATION FOR repodb USING EXTENDED_ROW_SZ enable
  - Additional Information

    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=database-creating-db2-repository
- Regularly scheduled maintenance is recommended
  - Backups
  - REORGs and RUNSTATs
    - ❖ reorg.sql file under <dmc_home>/ samples/DB2LUW
    - ❖ Additional information

      https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=database-maintaining-repository

Download and Installation

- **Download**
  - 4 ways to download Db2 Data Management Console
    - IBM Marketing Registration Services (MRS) Tool
    - Marketplace
    - IBM Fix Central
    - Passport Advantage
  - Additional information
    https://www.ibm.com/support/pages/node/885789
- **Installation**
  - Two different installation formats
    - Script
    - GUI
  - Backup repository database
  - Unzip image file
    - Existing directory is considered an upgrade
    - New directory is considered a new installation
  - Configure setup.conf file (ports, repository database)
  - Run setup script (DMC admin user)
  - Additional information
    - Setting up IBM Db2 Data Management Console
      https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=configuring-setting-up-db2-data-management-console
    - Upgrading
      https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=welcome-upgrading
    - Migrating from Data Server Manager (DSM)
      https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=upgrading-upgrade-data-server-manager-db2-data-management-console

Installation on AIX

- Bash is required
- Supported only on Power® 8 and later processors
- AIX® POWER7® compatible systems are not supported
  - **prtconf | grep -i proc**
    - Processor Type: PowerPC_POWER8
      Processor Implementation Mode: POWER 7
      Processor Version: PV_7_Compat**
- libc++.a (shr_64.o) could not be loaded error
  - Install XL C/C++ 16.1.0.10 by using the following steps:
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-cannot-install-db2-data-management-console-aix
- Additional configuration steps when Stack Execution Disable Protection (SED) is enabled
  - https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=ts-exempting-db2-data-management-console-by-using-sed-aix

Several Servers considerations

- Each DMC server can monitor up to 300 databases
- One repository database per DMC server
- One installation directory per DMC server
- If repository database and DMC server located in the same machine
  - The machine needs to have enough resources (memory, CPU, disk space)
    - ❖ If DMC server requires 64GB of memory according to the DMC capacity planning, the machine will need to have 96GB of memory available (DMC server plus the repository database)
- If more than one DMC server installed on the same machine
  - The machine needs to have enough resources (memory, CPU, disk space) available for each DMC installation
    - ❖ If DMC server requires 96GB of memory according to the DMC capacity planning, the machine will need to have 192GB of memory available
- Different port numbers for each DMC server
  - Including internal ports and job scheduler (bootstrap.properties file)
- Different DMC servers monitoring the same databases
  - Overhead on the monitored database by collecting duplicated information
  - Event monitor functions will have conflicts
    - ❖ Only enable event monitor on one DMC server, and keep disabled for the other DMC servers
      - ✓ HWCMON1007W error

Home Directory

Locating home installation or <dmc_home>

- **Script**
  - <dmc_home> is the location where the installation package was decompressed after download.
  - For example, on the Windows platform, if the installation package was decompressed to the below location: **C:\IBM\ibm-datamgmtconsole**, then the path of <dmc_home> is: **C:\IBM\ibm-datamgmtconsole**
- **GUI**
  - **Windows**
    - Right-click on the IBM Db2 Data Management Console icon on the desktop and select Open file location
    - Continue to the resources\bin folder to find the <dmc_home> directory
    - For example, if the IBM Db2 Data Management Console was installed using GUI installer in the following location**: C:\Program Files\IBM Db2 Data Management Console,** then the path of <dmc_home> is: **C:\Program Files\IBM Db2 Data Management Console\resources\bin**
  - **Linux**
    - Find the location where you extracted the installation package, and enter the resources/bin directory to find the <dmc_home> directory.
    - For example, if the installation package of the GUI installer was decompressed to the below location: **/opt/IBM/ibm-datamgmtconsole** then the path of <dmc_home> is: **/opt/IBM/ibm-datamgmtconsole/resources/bin**
  - **Mac**
    - In the Applications folder, right-click on IBM Db2 Data Management Console and select Show Package Contents.
    - Enter Contents/Resources/bin directory to find the <dmc_home> directory
    - For example, the default <dmc_home> path is: **/Applications/IBM Db2 Data Management Console.app/Contents/Resources/bin**

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-locating-db2-data-management-console-home-directory

Required privileges to Start Data Management Console

Operating System	Installed by	Started by	Supported (Y/N)	Limitation
Windows	Administrator	Administrator	Y	
Windows	Administrator	Non-administrator	N	
Windows	Non-administrator		N	
Linux/AIX	root	root	Y	
Linux/AIX	root	non-root	N	
Linux/AIX	non-root	root	Y	Once DMC is started by root user, a non-root user cannot start DMC, as they do not have the required write permission to work with DMC folders
Linux/AIX	non-root	non-root	Y	A non-root user can download, extract (unzip) the installation image, and run the setup utility
Linux/AIX	non-root user A	non-root user B	N	DMC cannot be installed by one non-root user and started by another non-root user

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-privileges-required-installing-starting-db2-data-management-console

Starting, Stopping, Checking Status

Option	Windows	Linux and UNIX
Start the server	start.bat	startup.sh
Stop the server	stop.bat	stop.sh
Restart the server	restart.bat	restart.sh
Check server status	status.bat	status.sh

- Scripts are located in <IBM Db2 Data Management Console install>/bin directory
- On Windows
  - Run the scripts as an administrator or from an Administrator CLP (Command Line Processor)
  - Start/Stop the server is also available using Windows Services
- Auto-start on Mac
  - https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=administering-autostarting-console
- Data Management Console URLs
  - http://*server_host_name_or_ip*:*http_port*/console
  - https://*server_host_name_or_ip*:*https_port*/console

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=administering-starting-stopping-restarting-server

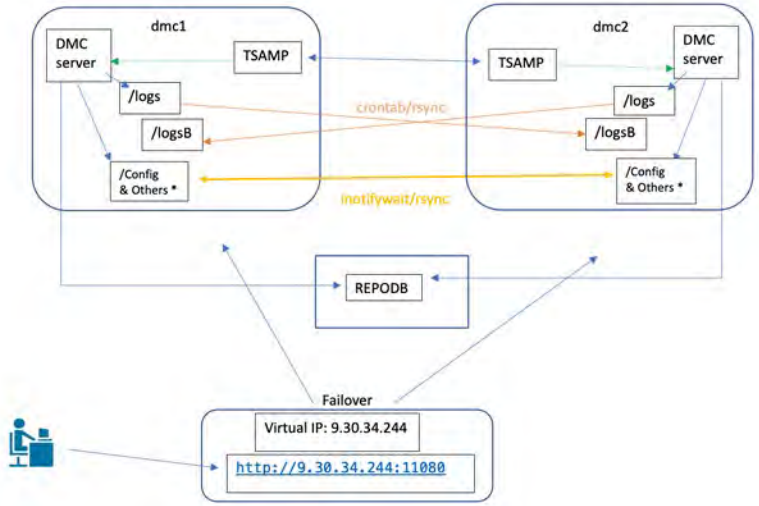
Uninstalling Data Management Console

- Stop Data Management Console server
- Verify that the server is stopped
- On Windows
  - Go to <dmc_home>/ bin directory
  - Run the script undo_setup.bat as an administrator or from an Administrator CLP (Command Line Processor)
  - Uninstall DMC
- Remove DMC directory
- Optional
  - Drop DMC repository database

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=administering-uninstalling-db2-data-management-console

Data Management Console – HADR Configuration

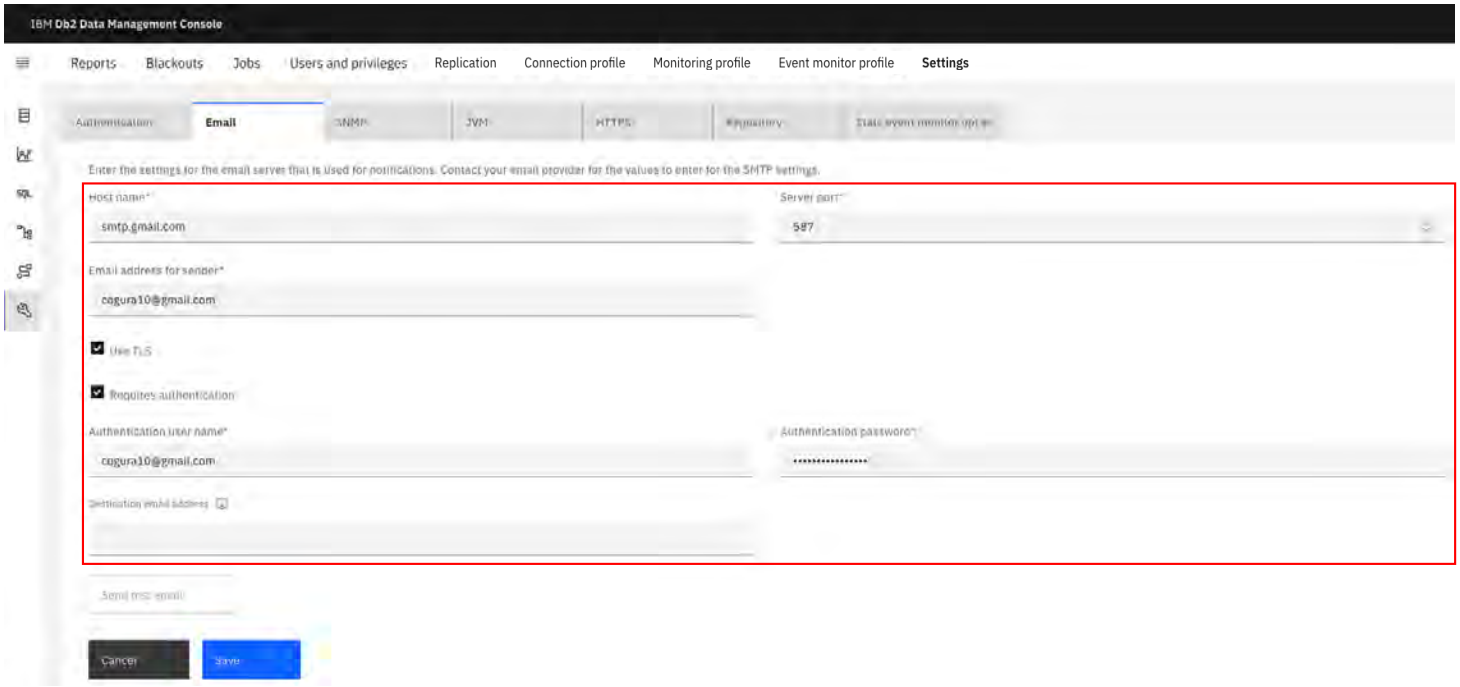
- Run in a highly available environment to minimize access downtime to the console



- Example above using IBM Tivoli® System Administration for Multiplatforms (Tivoli SA MP)
- DMC and Tivoli SA MP are installed on both the nodes
- Connect both the DMC servers to the same repository database REPODB that is hosted by a Db2 server
- The repository database can be hosted anywhere including on one of the two nodes, but it is recommended to host it on another independent node
- Only one of the DMC servers is up (online) at a time
- Tivoli SA MP monitors the status of the online DMC server and when it detects the DMC is down, it attempts to bring that DMC up
- If startup fails, Tivoli SA MP switches (fail over) to the other node and brings up DMC server on that node

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=administering-setting-up-high-availability

Email Configuration



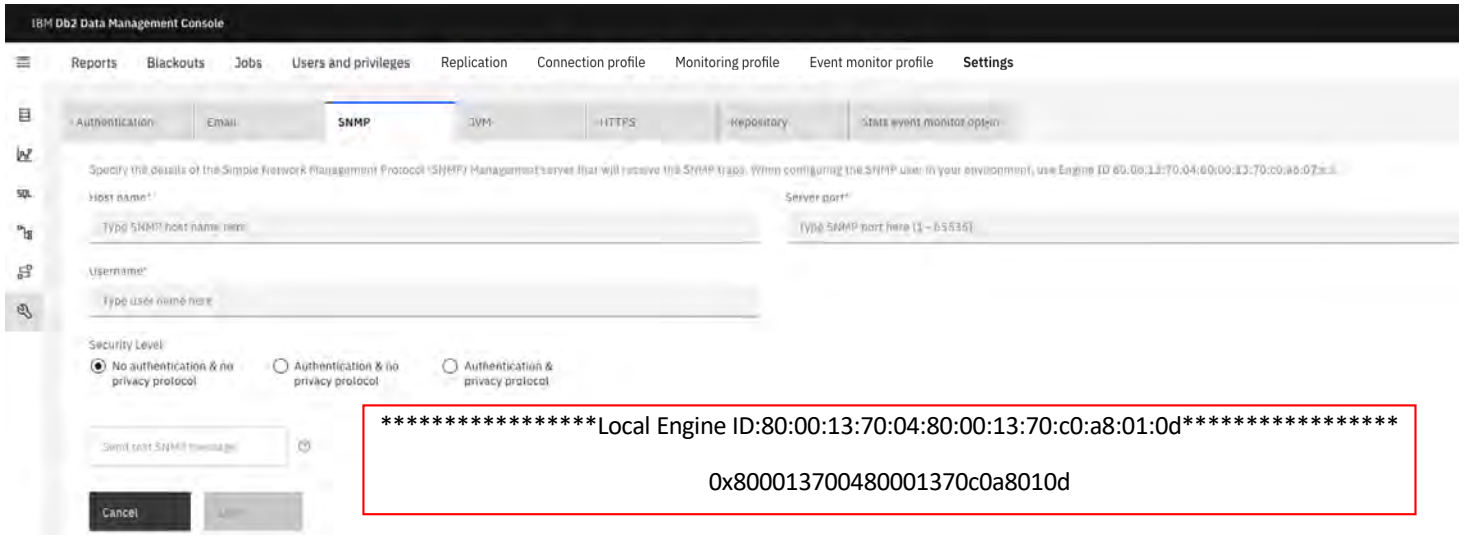
Settings

- Host name
- Server Port
- E-mail address for sender
- Use TSL
- Requires authentication
- Destination e-mail address

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-configuring-email-server

SNMP Configuration

- Supports SNMP V3
- Settings
  - Host name
  - Server Port
  - Username
  - Security Level



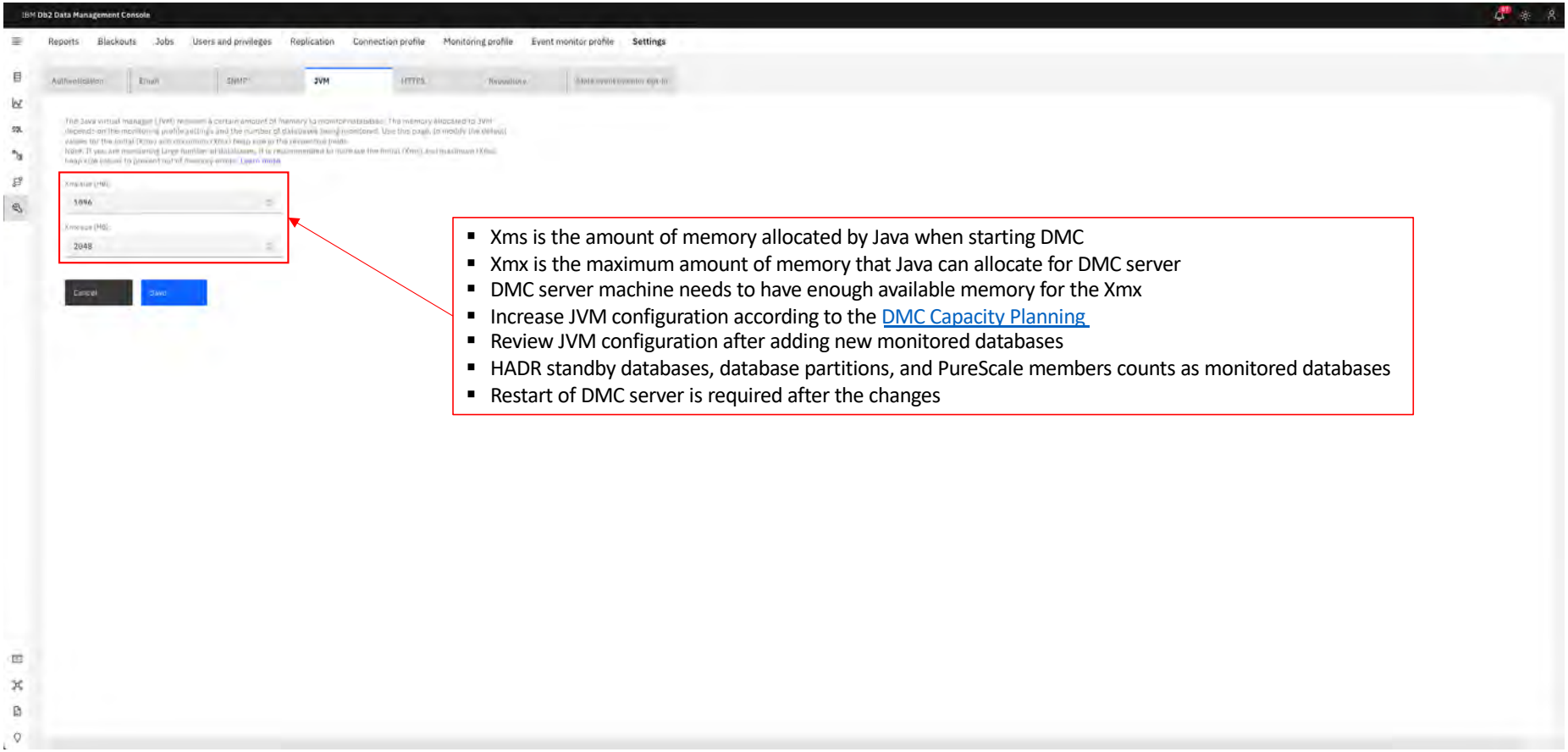
**********Local Engine ID:80:00:13:70:04:80:00:13:70:c0:a8:01:0d**********

0x800013700480001370c0a8010d

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-configuring-snmp-notifications

Integration with ServiceNow
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=notifications-integrating-db2-data-management-console-servicenow

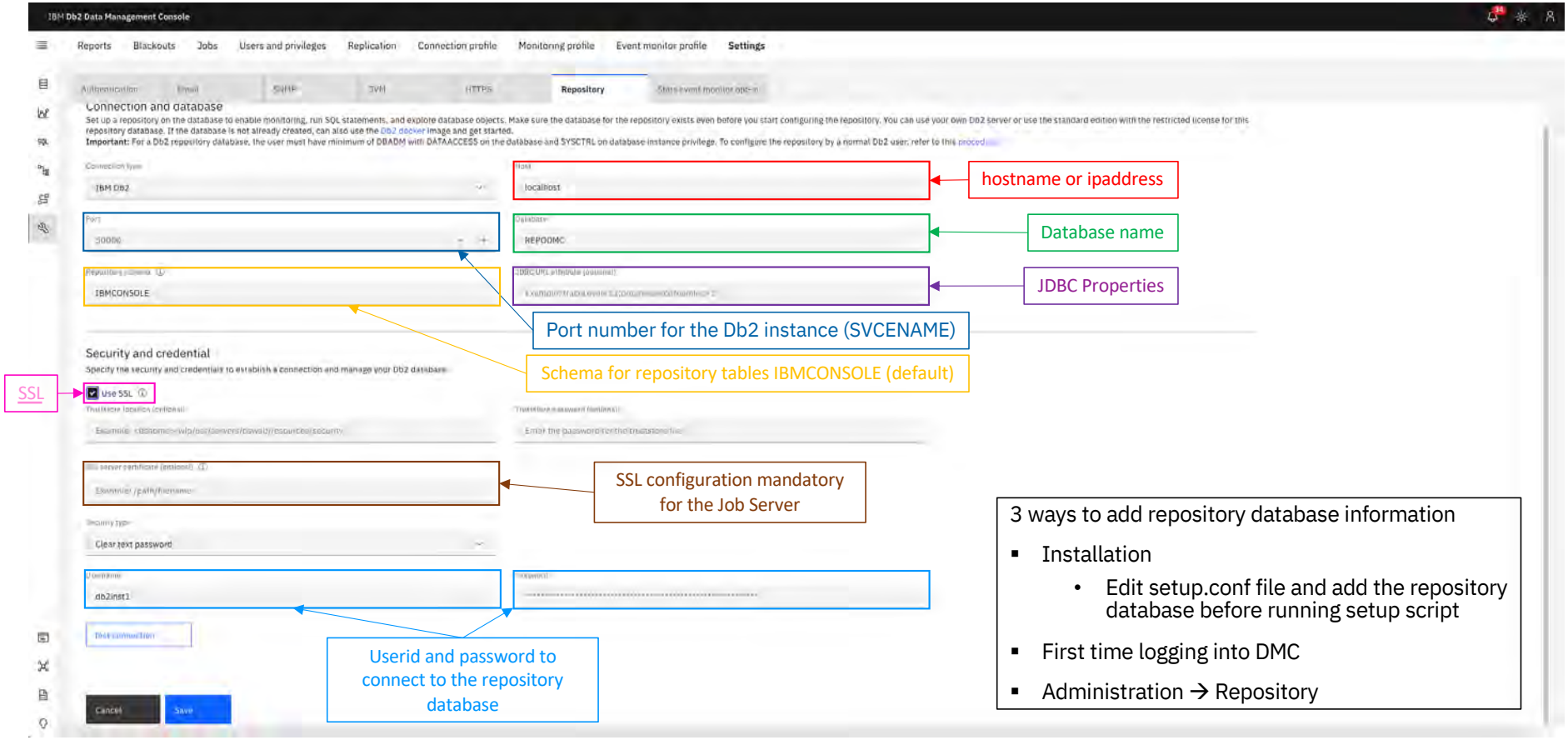
JVM Configuration



- Xms is the amount of memory allocated by Java when starting DMC
- Xmx is the maximum amount of memory that Java can allocate for DMC server
- DMC server machine needs to have enough available memory for the Xmx
- Increase JVM configuration according to the DMC Capacity Planning
- Review JVM configuration after adding new monitored databases
- HADR standby databases, database partitions, and PureScale members counts as monitored databases
- Restart of DMC server is required after the changes

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=events-configuring-java-heap-size

Repository Database Configuration



3 ways to add repository database information

- Installation
  - Edit setup.conf file and add the repository database before running setup script
- First time logging into DMC
- Administration → Repository

Db2 Data Management Console

Security

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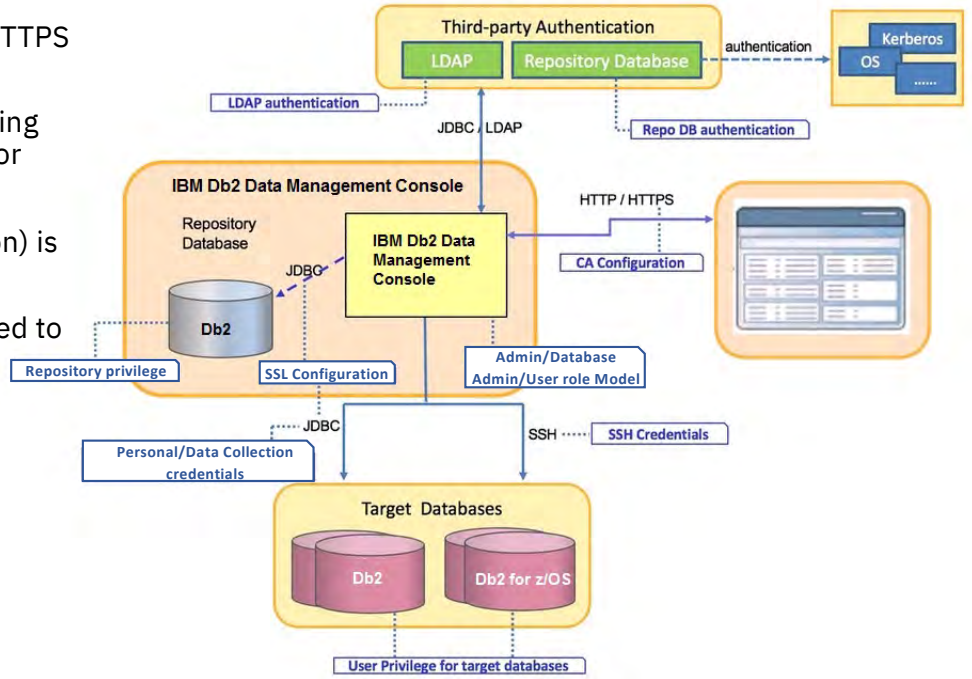
Security – Architecture

- Access to is controlled through authentication and authorization
- Can be accessed using both the secure HTTPS and unsecured HTTPS protocol
- Access is managed either by the console itself or by authenticating facilities that reside outside of the console, like an LDAP server or repository database
- Access within IBM Db2 Data Management Console (authorization) is managed by assigning user roles and privileges
- User privileges and operation/data collection credentials are used to ensure the security for target databases

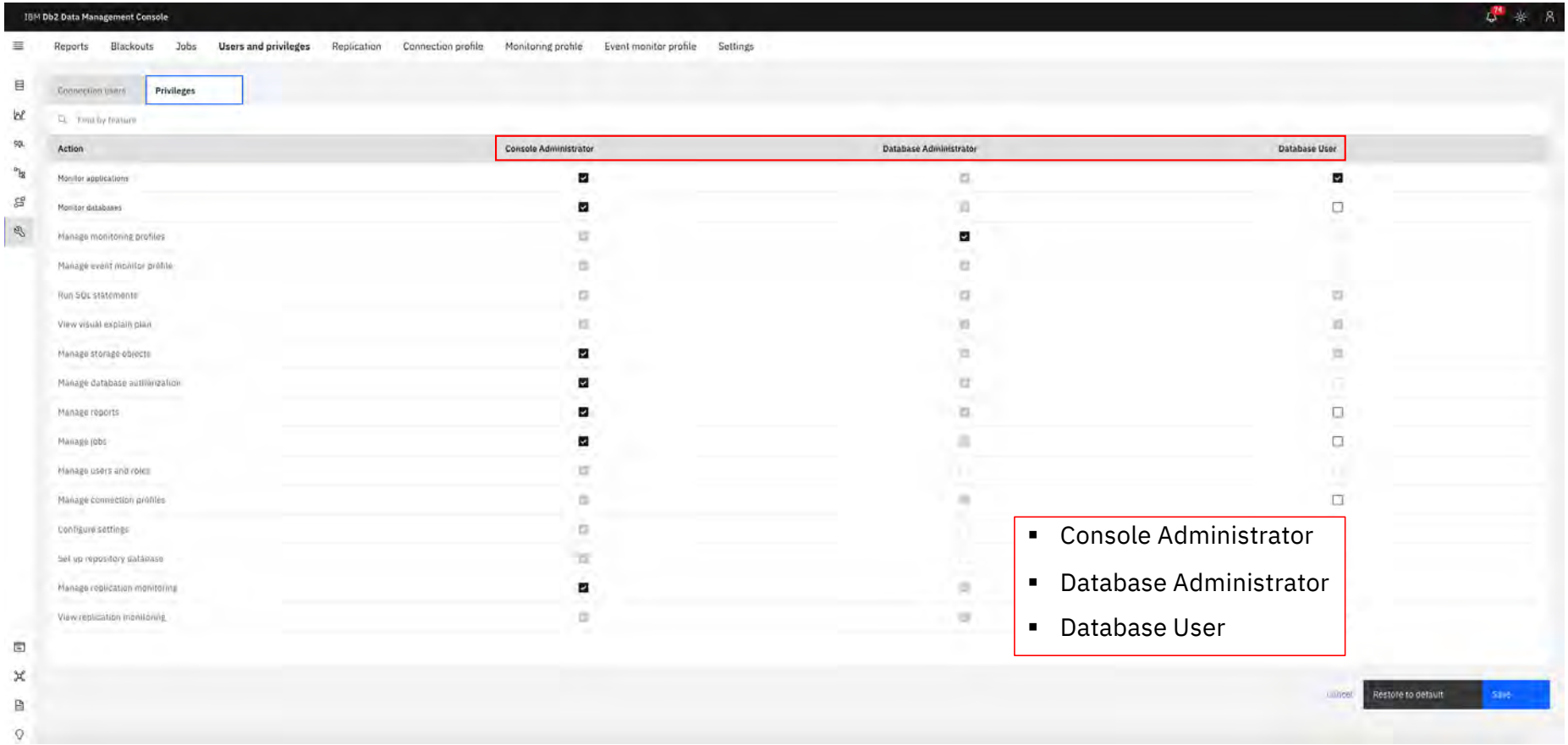


Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-security-architecture-db2-data-management-console

Security – SSL Certificates

- Additional configuration when using SSL Certificates
  - HTTPS URL using SSL Certificate
    https://www.ibm.com/support/knowledgecenter/SS5Q8A_3.1.x/com.ibm.datatools.dsweb.ots.security.doc/topics/https_cert.html
  - Repository database using SSL Certificate
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-enabling-ssl-connection-job-repository
  - Monitored databases using SSL Certificate
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-enabling-ssl-connectivity-managed-db2-databases

Security – Console Privileges

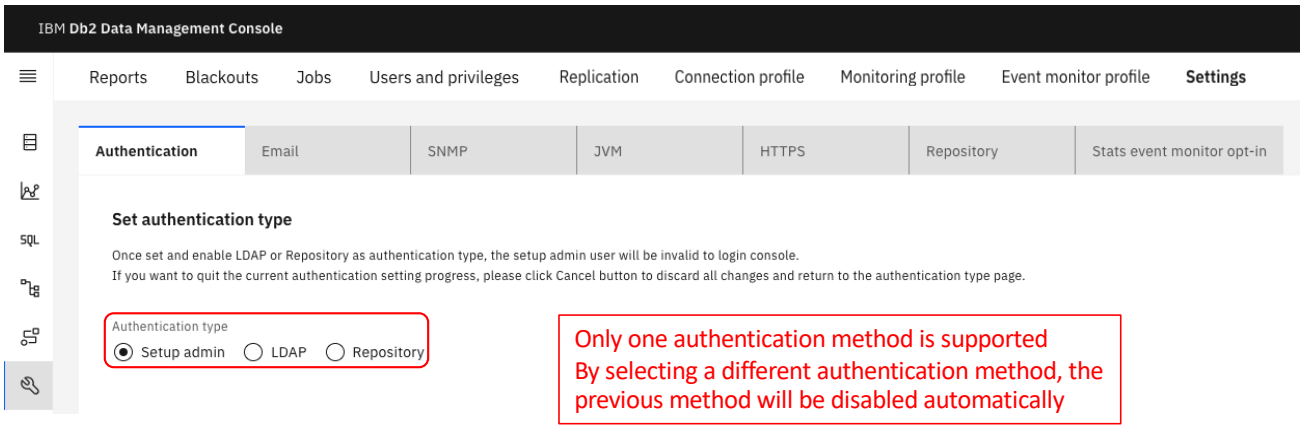


- Console Administrator
- Database Administrator
- Database User

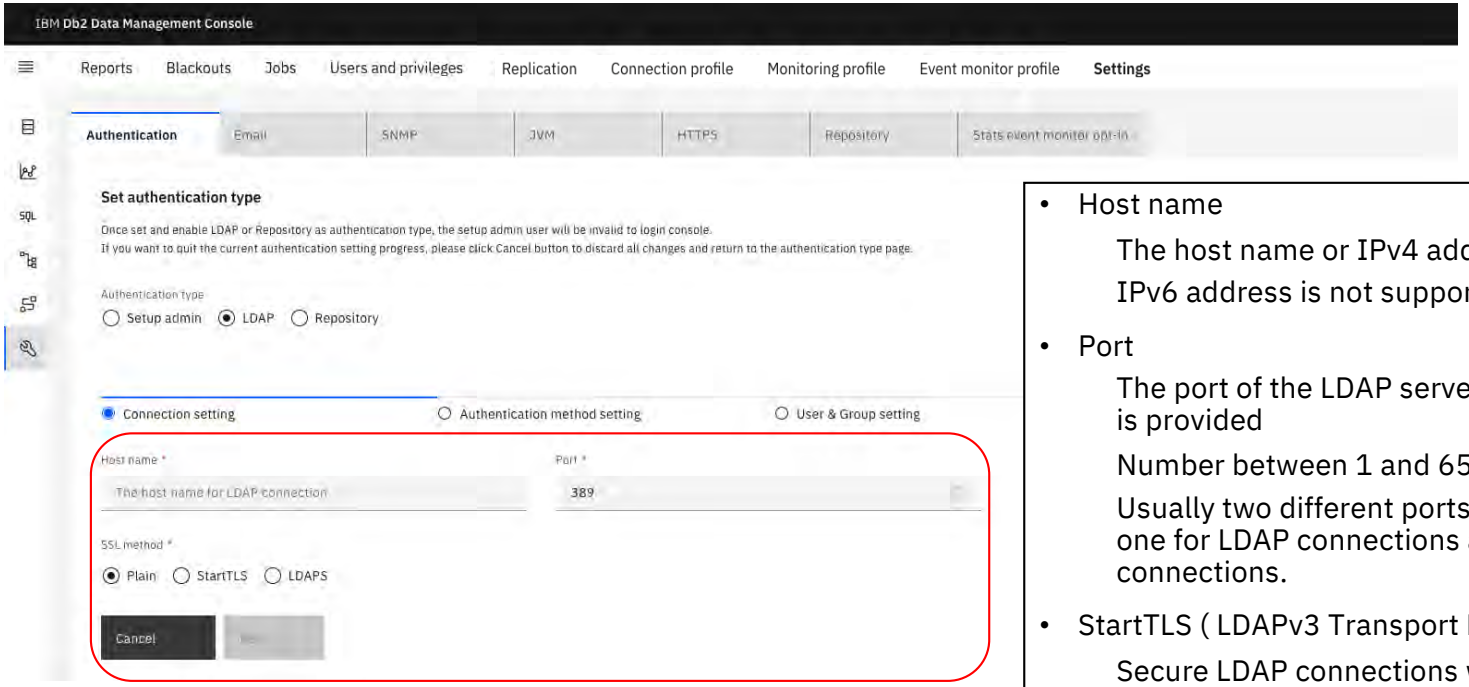
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-assigning-privileges

Security – Authentication Methods

- Setup admin
  - User created during installation
  - Console Administrator privileges
  - Resetting authentication back to Setup Admin (SuperAdmin)
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=configuration-resetting-authentication
- LDAP
  https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=configuration-delegating-authentication-authorization-ldap
- Repository
  https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=configuration-delegating-authentication-authorization-repository-database



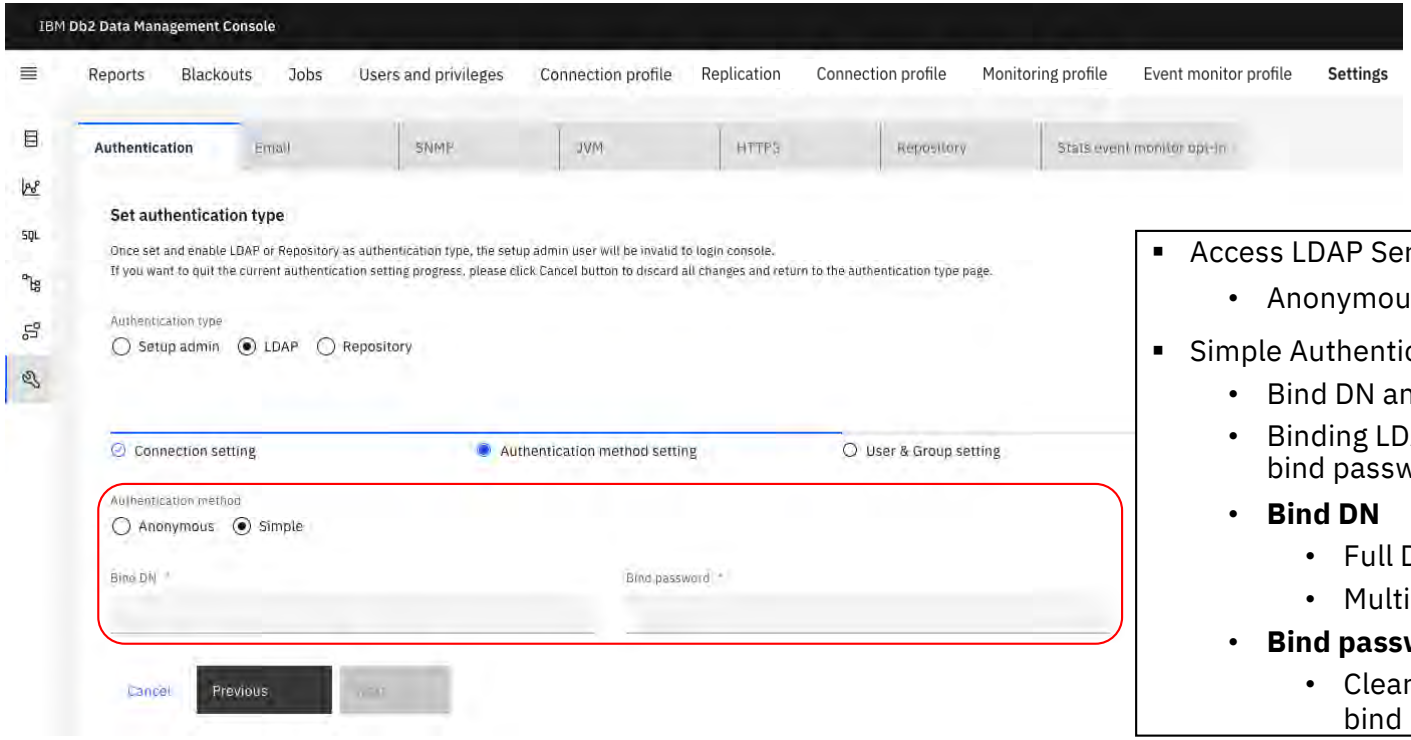
Security – Authentication Methods: LDAP



- Host name
  - The host name or IPv4 address of the target LDAP server
  - IPv6 address is not supported
- Port
  - The port of the LDAP server through which LDAP service is provided
  - Number between 1 and 65535
  - Usually two different ports will be used by LDAP service: one for LDAP connections and the other for LDAPS connections.
- StartTLS (LDAPv3 Transport Layer Security (TLS) extension)
  - Secure LDAP connections with StartTLS would be created
- LDAPS (LDAP over SSL)
  - Secure LDAPS connections would be created

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=ldap-configure-connection-settings

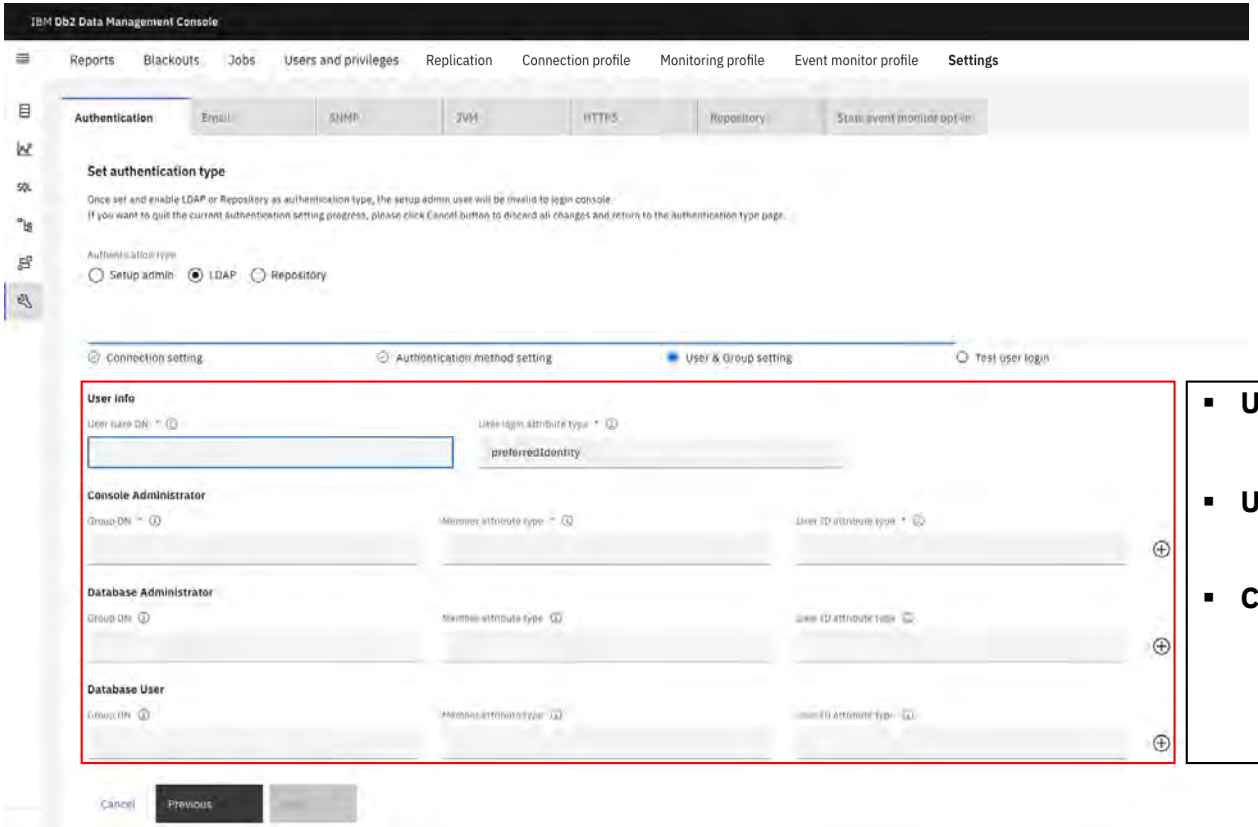
Security – Authentication Methods: LDAP Bind Account



- Access LDAP Server Anonymously
  - Anonymous bind operations
- Simple Authentication
  - Bind DN and bind password are required
  - Binding LDAP server with only bind DN or only bind password is not supported
  - **Bind DN**
    - Full DN value of bind account
    - Multiple bind accounts are not supported
  - **Bind password**
    - Clear text password associated with the bind DN

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=ldap-configure-bind-account

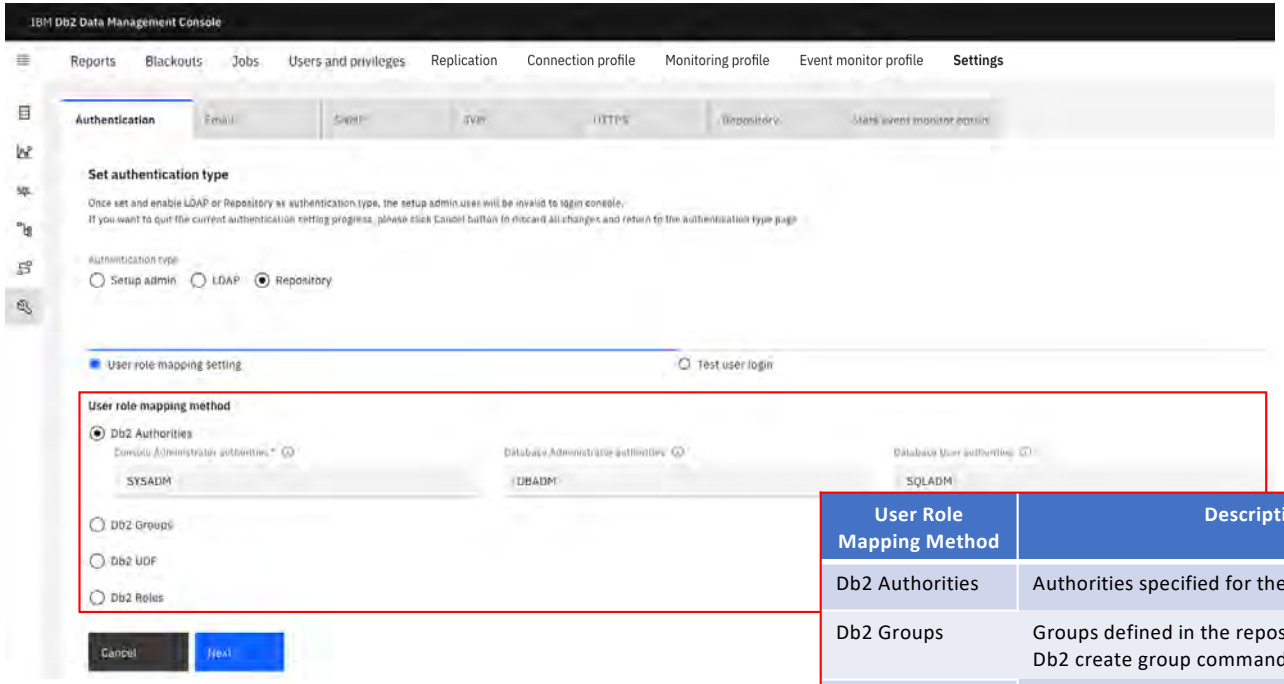
Security – Authentication Methods: LDAP User Groups



- **User base DN**
  - Full DN value of user base entry
- **User login attribute type**
  - User attribute type
- **Console Administrator Group is required**
  - Group DN
  - Member attribute type
  - User ID attribute type

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=ldap-configure-user-group-mapping

Security – Authentication Methods: Repository Database

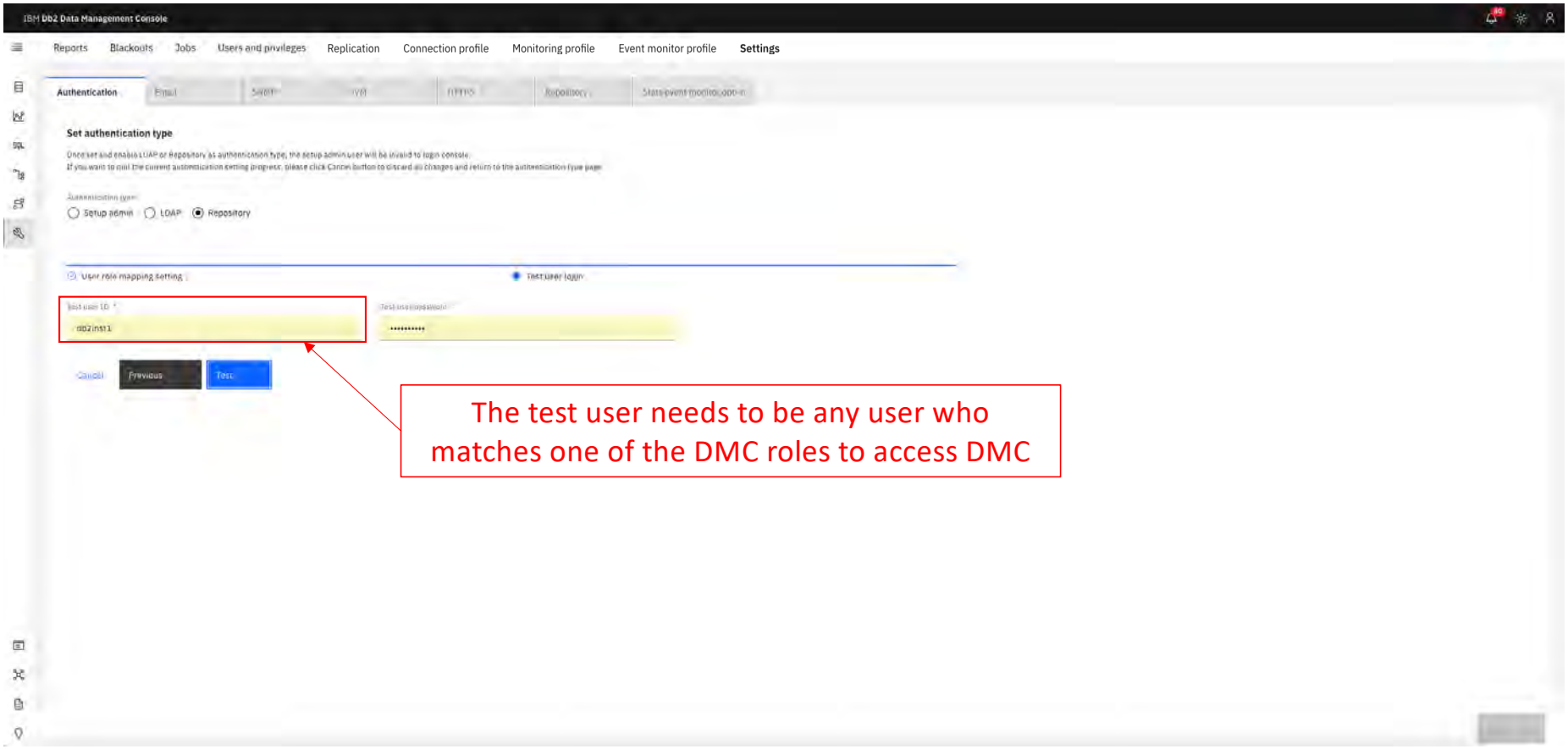


- **Console Administrator Group is required**

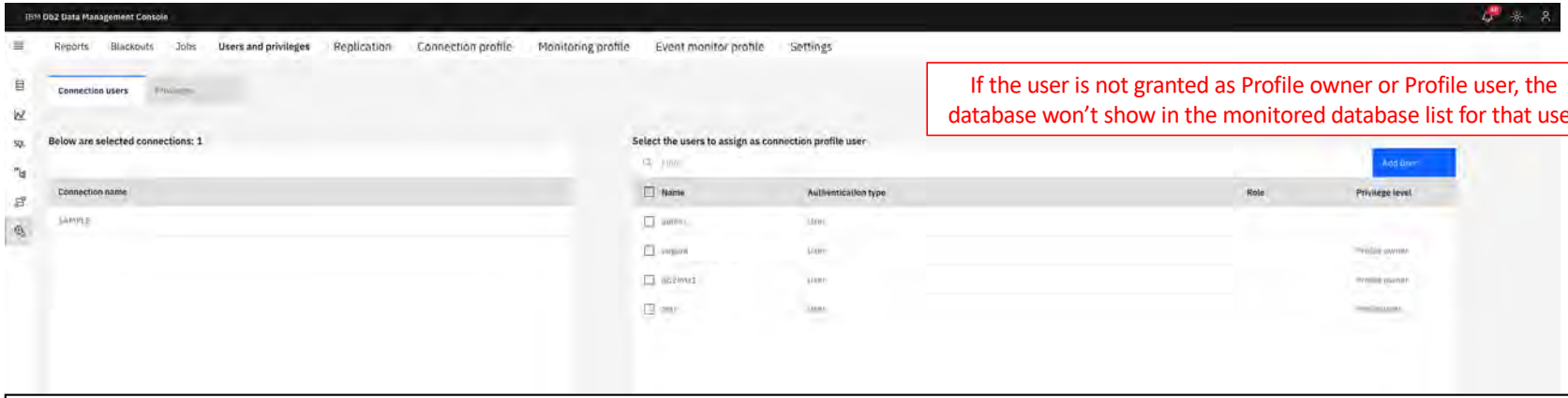
User Role Mapping Method	Description	Examples
Db2 Authorities	Authorities specified for the repository database	DBADM|DATAACCESS|SECADM|SQLADM
Db2 Groups	Groups defined in the repository database using Db2 create group command	ADMINGROUP|GROUP1|GROUP2
Db2 UDF	Execute privilege on specified UDFs created during the repository database setup: "<console_schema_name>.CANADMINISTER" "<console_schema_name>.CANDBA" "<console_schema_name>.CANVIEW"	IBMCONSOLE.CANADMINISTER
Db2 Roles	Roles defined in the repository database using Db2 create role command	ENTERPRISE_USER|SYSTS_USR

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=database-configure-user-role-mapping-settings

Security – Authentication Methods: Repository Database



Security – Connection Users



If the user is not granted as Profile owner or Profile user, the database won't show in the monitored database list for that user

- Grant access to users for monitored databases
  - **Profile owner**
    - ❖ The user who creates a connection profile is automatically granted the connection profile owner privilege
    - ❖ The user can use the connection profile, and can also edit or delete the connection profile for a database
    - ❖ The administrator or profile owners can assign connection profile owner or user privilege for the connection profile to other user IDs
  - **Connection profile user**
    - ❖ The user can use the connection profile (for example, run the SQL script on the target database) for which they have the connection profile user privilege

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-managing-user-roles-privileges

Security – Additional Security Parameters

- **Configure User ID rule**
  - Although IBM Db2 Data Management Console delegates authentication to external security systems, defining a restriction pattern for user ID is still a good security practice
  - Default rules for user ID
    - ❖ Total length from 1 to 128 characters
    - ❖ Allowed characters are lower-case letters(a-z), numbers(0-9), underscore(_), hyphen(-), dot(.), at(@) and comma(,);
    - ❖ Begin with a lower-case letter or number
- **Append customized HTTP response headers to web resources**
  - Set a rule to restrict the loading of web resource to preventing attacks like Clickjacking or XSS, you can append your own headers to HTTP responses
- **Verify server host name or IP address**
  - Prevent 'Host Header Injection' attack that someone intercept your HTTP requests and replace the value of host header, you can configure a list of host names and IP address of your server where IBM Db2 Data Management Console is installed to enable verification of the host header
- **Customize several JSSE security properties**
  - To meet the latest security requirement, IBM Db2 Data Management Console has overwritten some of the default JSSE security properties of IBM SDK, Java Technology Edition, Version 8.
- **Customize idle timeout value**
  - Customized idle timeout value that will automatically log off the console after 'x' minutes of user inactivity

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-customize-security-parameters

SSH Configuration

Secure shell (SSH) services protocol to establish an encrypted communication channel with remote database servers
Allows users to issue commands and complete transactions with databases on connected servers and accommodate the encryption requirements
While the console primarily uses JDBC to communicate with remote database servers, it needs SSH to perform the following:

Execute the scripts/utilities in the remote machine

- Db2 commands, such as *db2look* for generating DDLs
- Administration commands, such as *db2start* and *db2stop*
- Operating system commands, such as *ls* on linux machines, to browse the folders of a remote machine
- CLP from the SQL editor

A number of functions available which require that connected servers be configured to support SSH. The following table identifies these functions:

Category	Tasks that require an SSH service
Generation of SQL queries	Run SQL statements (SQL Editor) where the *Run method* option is set to **CLP WITH SSH**
Database Monitoring	Collect CPU information from an AIX server
Job	Run Job with type Db2 CLP Script Executable/Shell Script
General	Search for databases or objects using the *Browse* feature

PasswordAuthentication property must be set to **yes** in sshd configuration file

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-communicating-securely-remote-servers

Console Port Numbers

Required to be open in the Firewall configuration

Property	Default	File location	Description
port	11080	<dmc_home>/wlp/usr/servers/dsweb/bootstrap.properties	The HTTP port that is used to access the IBM Db2 Console web console from a web browser. If http access is not allowed, set the value to -1
https.port	11081	<dmc_home>/wlp/usr/servers/dsweb/bootstrap.properties	The HTTPS secure port that is used to access the IBM Db2 Console web console from a web browser
internal.port	11082	<dmc_home>/wlp/usr/servers/dsweb/bootstrap.properties	Internal port for the IBM Db2 Console server
job.http.port	11088	<dmc_home>/wlp/usr/servers/dsweb/bootstrap.properties	Job-scheduler service port
drs.port	11098	<dmc_home>/Config/dswebserver_override.properties	Dr.s service port

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=administering-modifying-db2-data-management-console-ports

Db2 Data Management Console

Monitored Databases

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Monitored Databases – Pre-Setup

Database Parameter	Description	Recommended value
MON_REQ_METRICS	For basic data collection of statements, activities, workloads, etc.	BASE
MON_ACT_METRICS	For basic data collection of statements, activities, workloads, etc.	BASE
MON_OBJ_METRICS	For data collection of database objects, such as TABLE, TABLESPACE, etc.	BASE
MON_RTN_DATA	For data collection of stored procedure	BASE
MON_LW_THRESH	For data collection of blocking and waiting connections	30,000,000 (microseconds)
MON_DEADLOCK	For data collection of blocking and waiting connections	history
MON_LOCKTIMEOUT	For data collection of blocking and waiting connections	history
MON_LOCKWAIT	For data collection of blocking and waiting connections	without_hist

Note: Enabling **Locking event monitor** option in **Administration > Event monitor profile** page, updates the MON_LW_THRESH, MON_DEADLOCK, MON_LOCKTIMEOUT, and MON_LOCKWAIT parameters of the target database to the recommended value

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=tasks-setting-database-parameter-values

Monitored Databases – HADR Configuration Requirement

- Required Configuration for historical monitoring data
  - DB2_HADR_ROS is ON
  - DB2_STANDBY_ISO is UR
- Event monitoring of an HADR standby connection is not supported

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=monitoring-hadr-historical

Monitored Databases – Required Privileges

Data collection credential ID must meet the following requirements

- SQLADM on the database
  - This privilege provides access to most of the required functions.
- WLMADM on the database
  - This privilege is required to create console workload(s)
- SYSMAINT_GROUP
  - A few monitoring calls use admin functions that use the snapshot monitor to capture information about the database and any connected applications
  - For example: SNAP_GET_UTIL_PROGRESS table function

    https://www.ibm.com/docs/en/db2/11.5?topic=views-snap-get-util-progress-progress-snapshot

    Authorization

    ❖ One of the following authorizations is required:
      - ➢ EXECUTE privilege on the SNAP_GET_UTIL_PROGRESS table function
      - ➢ DATAACCESS authority

    ❖ In addition, to access snapshot monitor data, one of the following authorities is also required:
      - ➢ SYSMON
      - ➢ SYSCTRL
      - ➢ SYSMAINT
      - ➢ SYSADM

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=console-min-db-privileges-required-db2

Adding Monitored Databases

Db2 version 10.1.0.2 or later after DMC V3.1.6 or later

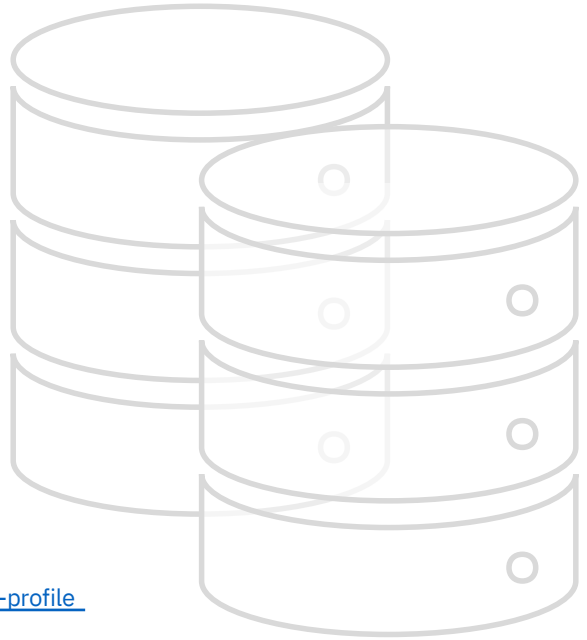
- List of supported monitored databases in System Requirements
- Db2 10.1 databases are not enabled by default
  https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=new-version-316

Up to 300 monitored databases per DMC server

- To avoid performance issues in the DMC server

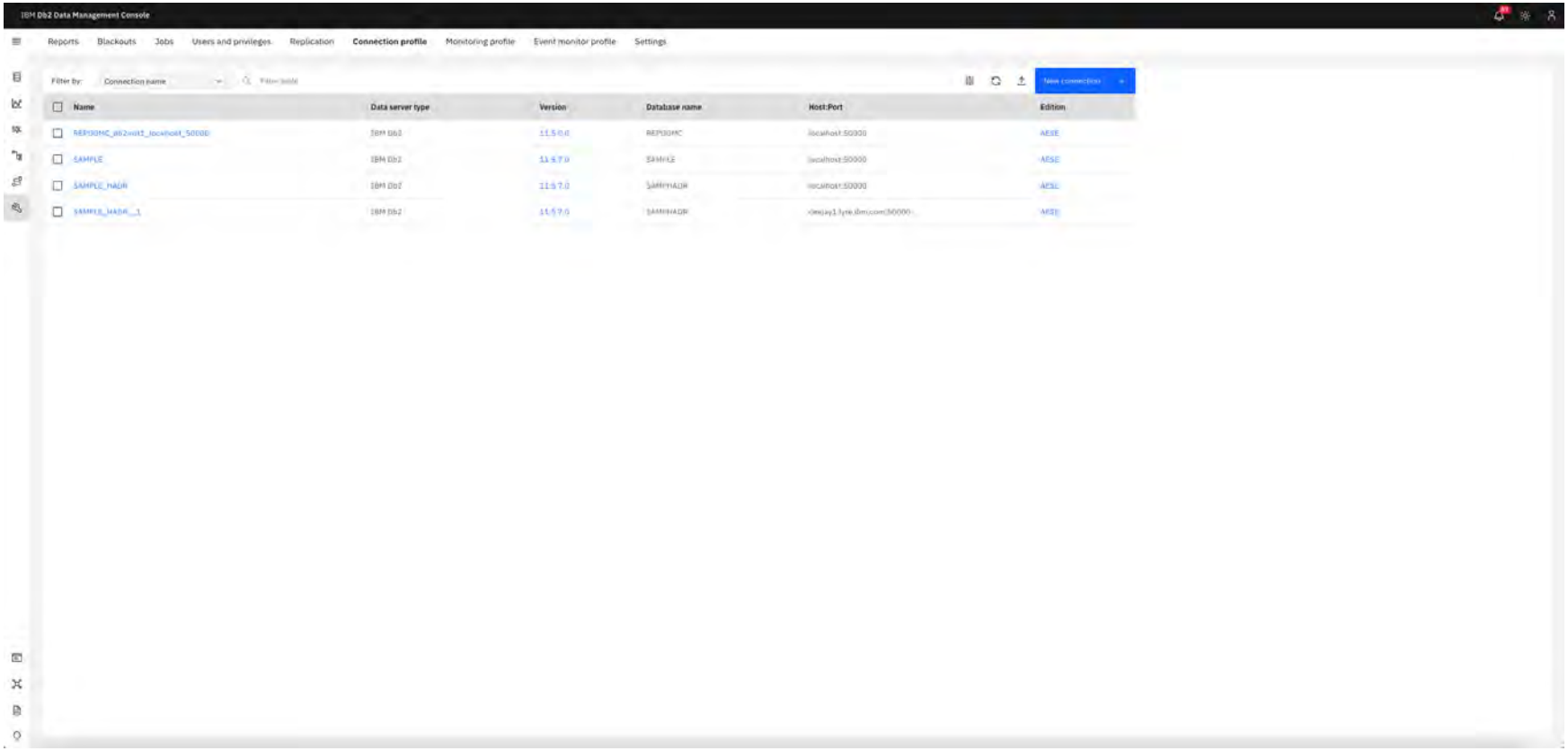
3 ways to add a connection profile

- Add a connection profile via Web UI
- Import connections from file
- REST API
- Additional information
  https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-adding-connection-profile



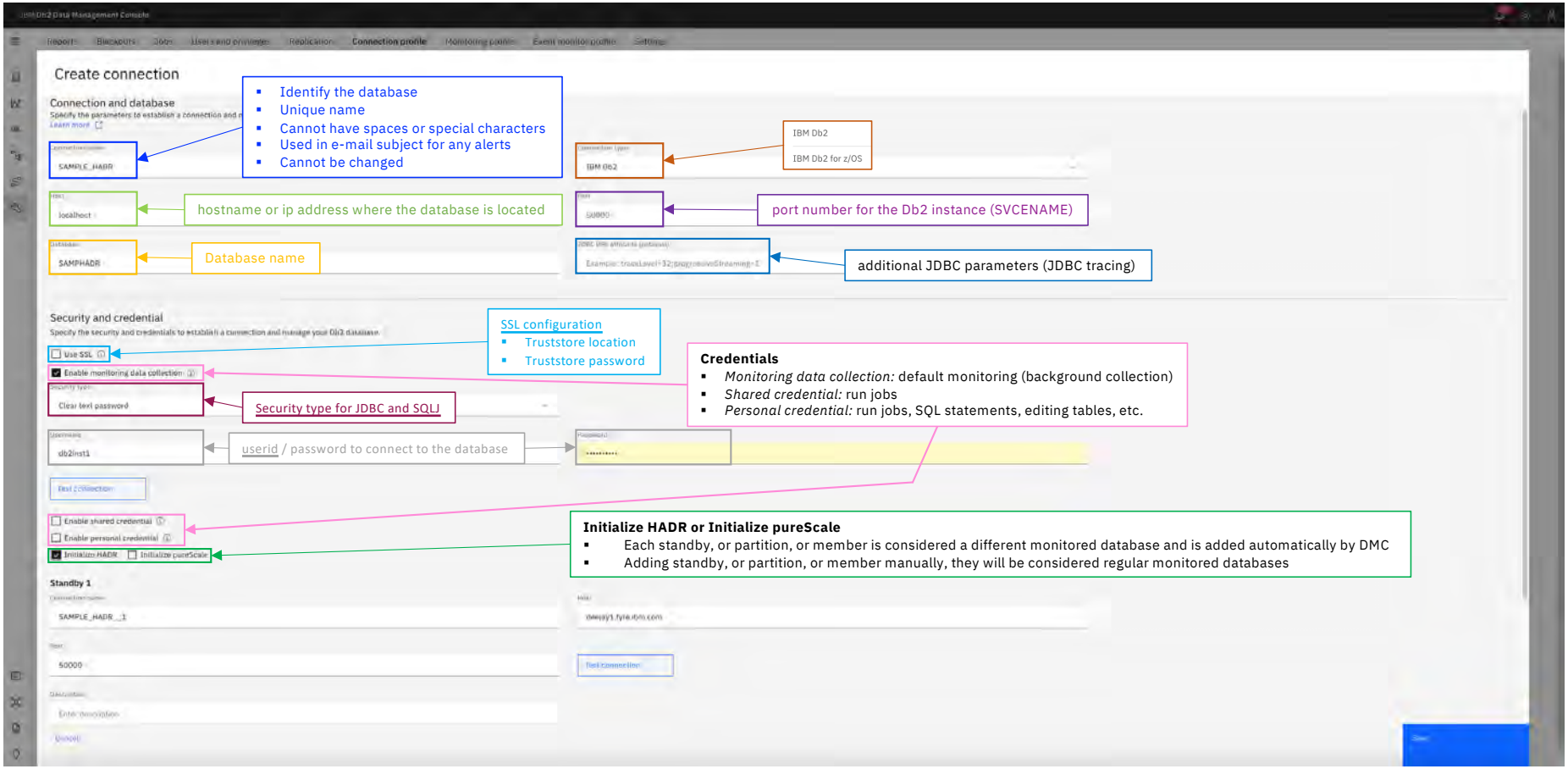
Monitored Databases – Adding Connection Profile

- Administration → Connection profile → New connection



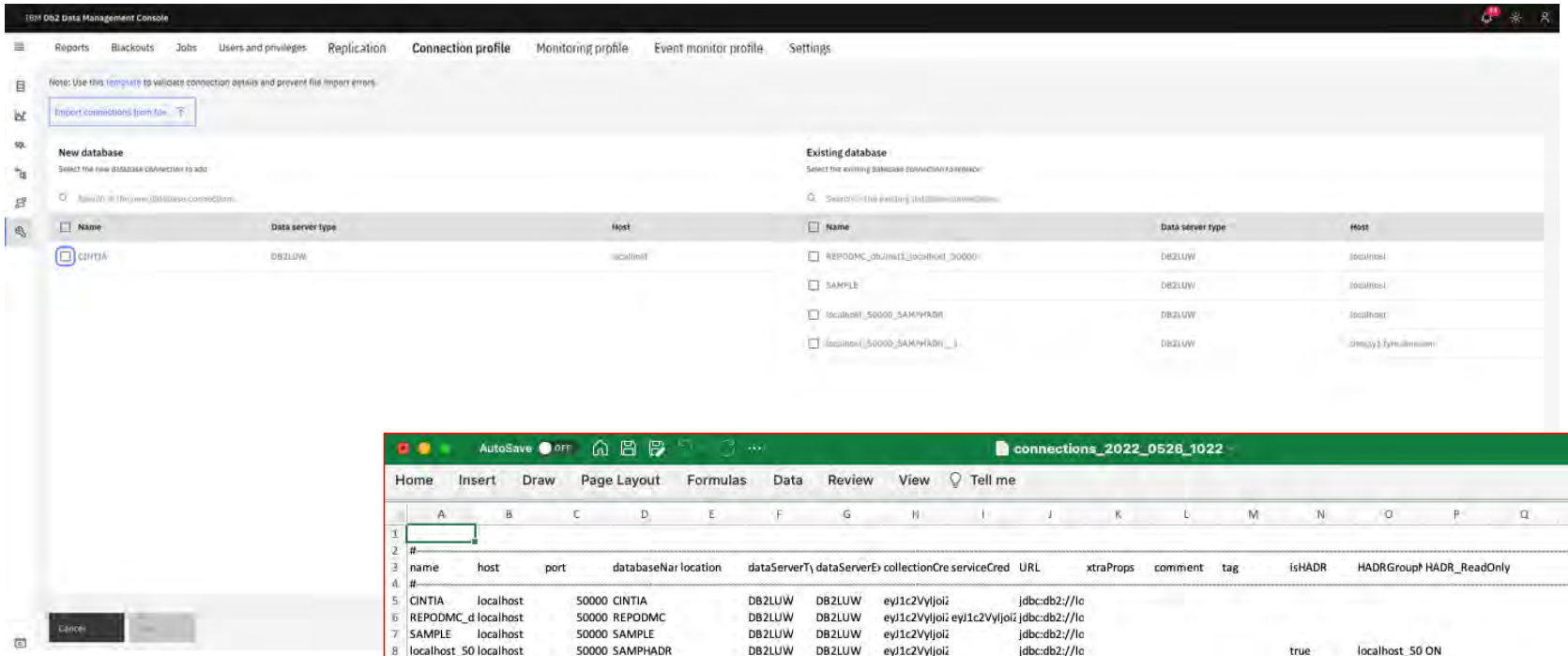
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-adding-connection-profile

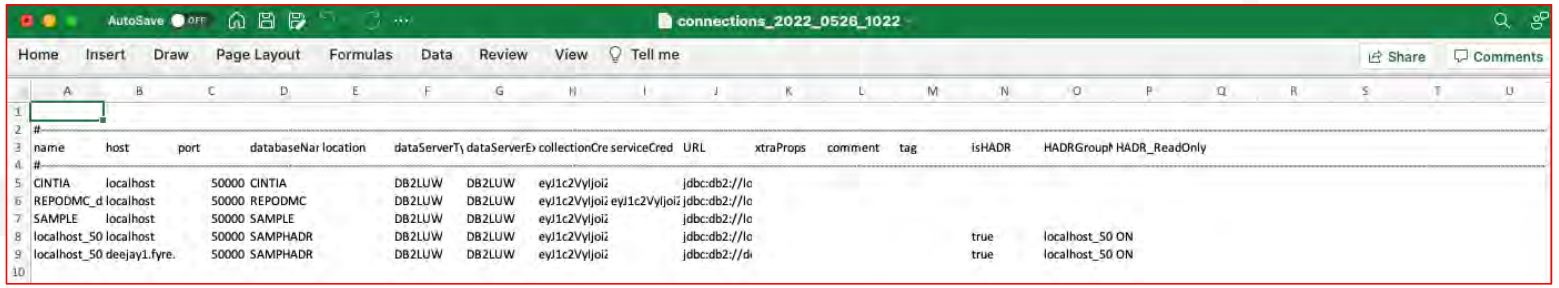
Monitored Databases – Adding Connection Profile



Monitored Databases – Importing connections from a file

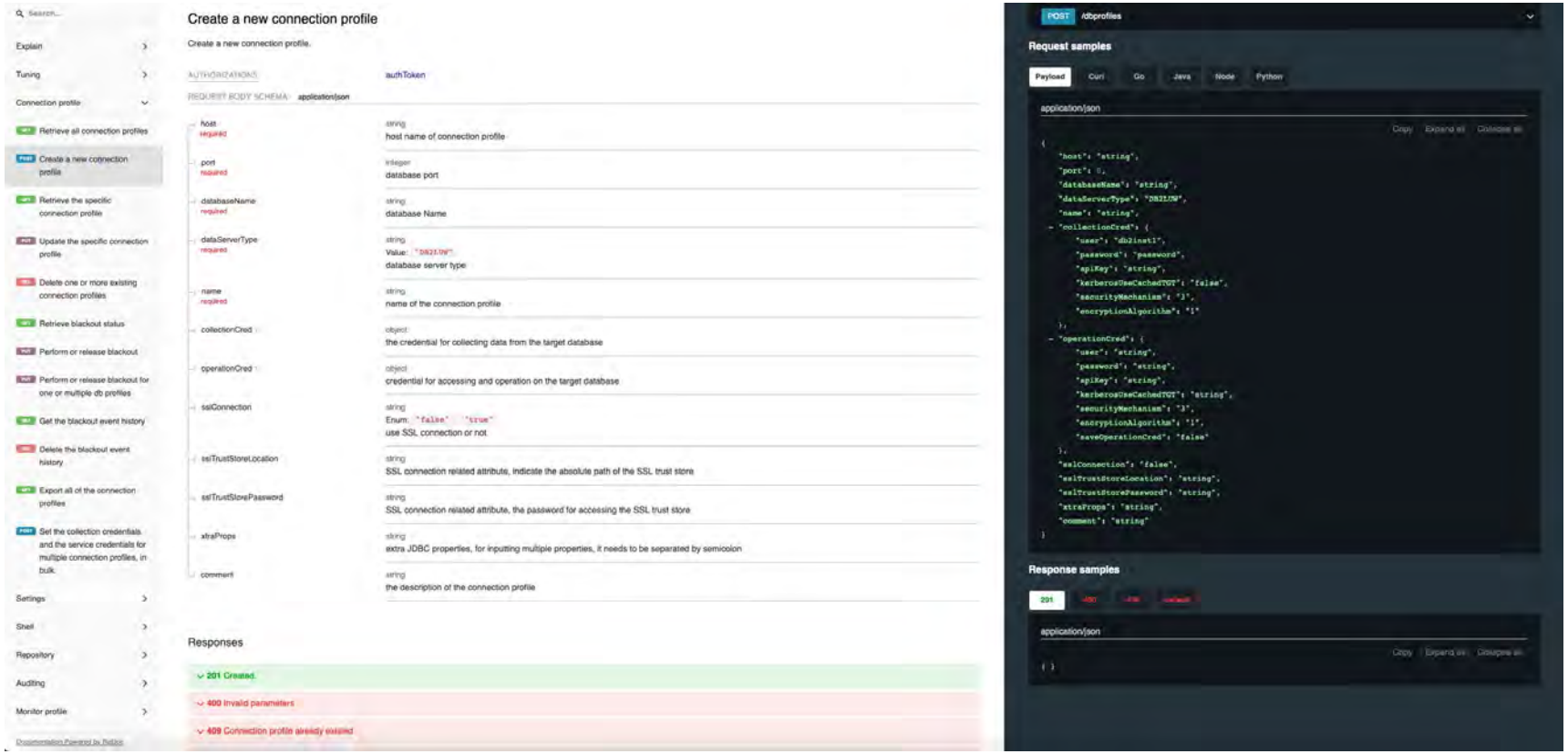
- Import is asynchronous operation, profiles will be imported in turn
- Database connection information must be in CSV (comma-separated value) text format





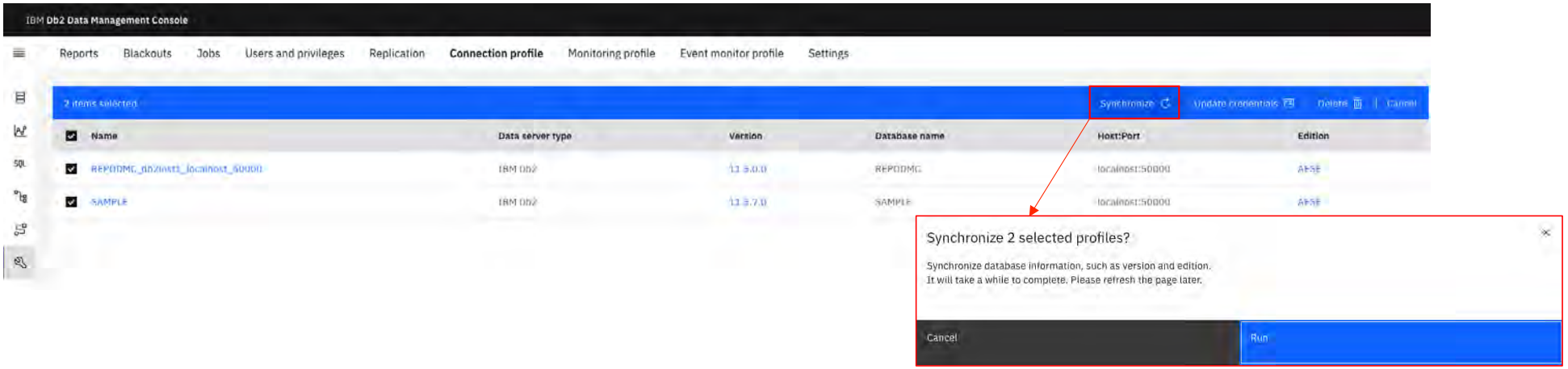
Monitored Databases – Adding connection via REST API

- Create new connection profile REST API

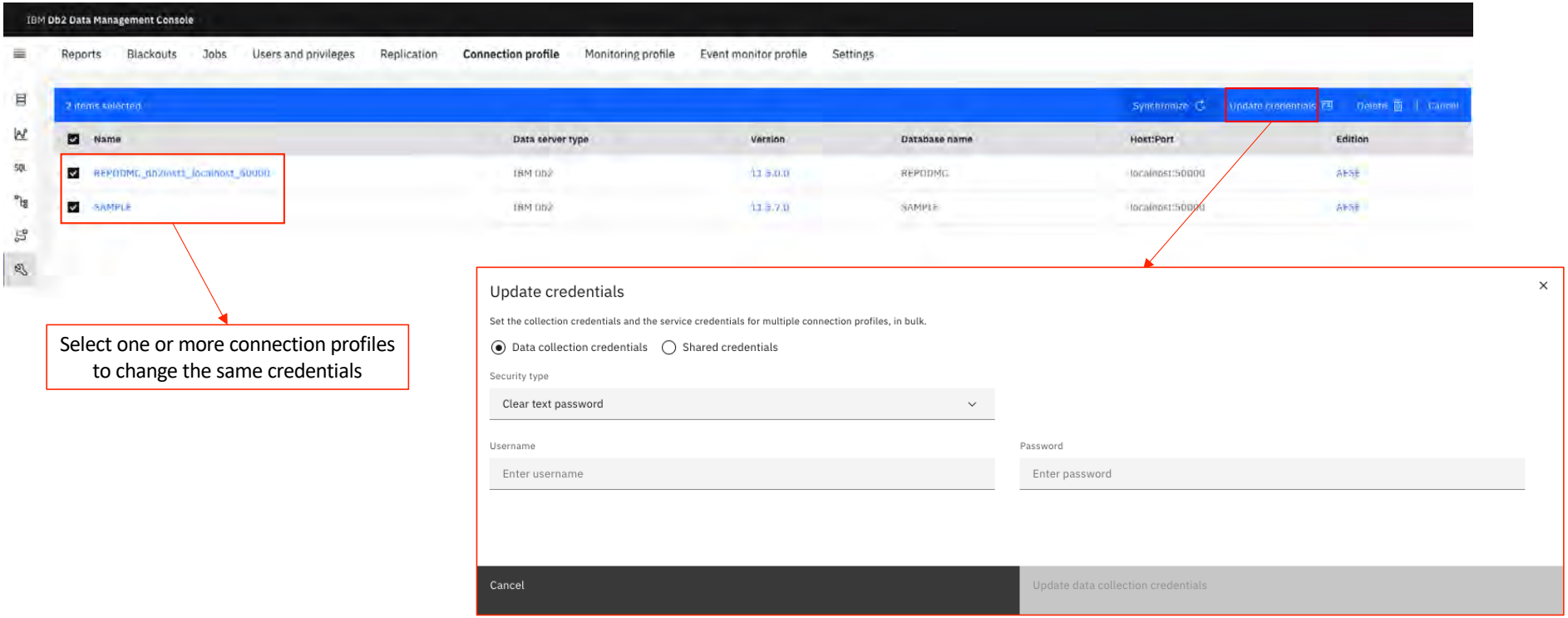


Monitored Databases – Db2 upgrade

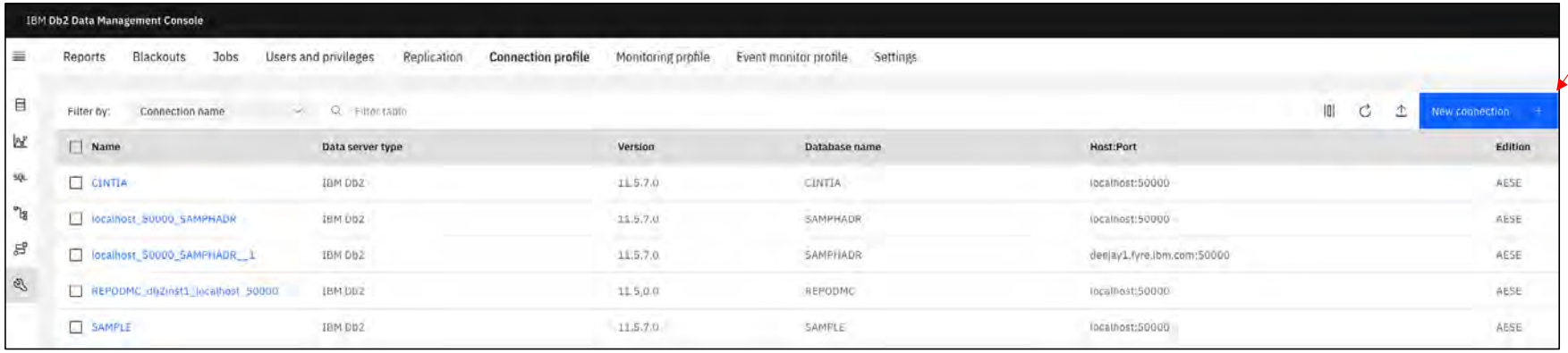
- db2updv*nn* command on the monitored database is required to update Db2 APIs and table functions used by DMC
- Run the following query on the monitored database to check the Db2 API level
  - db2 "select versionnumber from sysibm.sysversions order by 1 desc”
- Make sure that the query results matches db2level to avoid errors in DMC
  - https://www.ibm.com/support/pages/ibm-db2-data-management-console-dmc-showing-sqlcode-206-not-valid-context-where-it-used-error
- Update Connection Profile
  - Administration → Connection profile
  - Select connection profiles
  - Click on Synchronize, and Run button



Monitored Databases – Update credentials

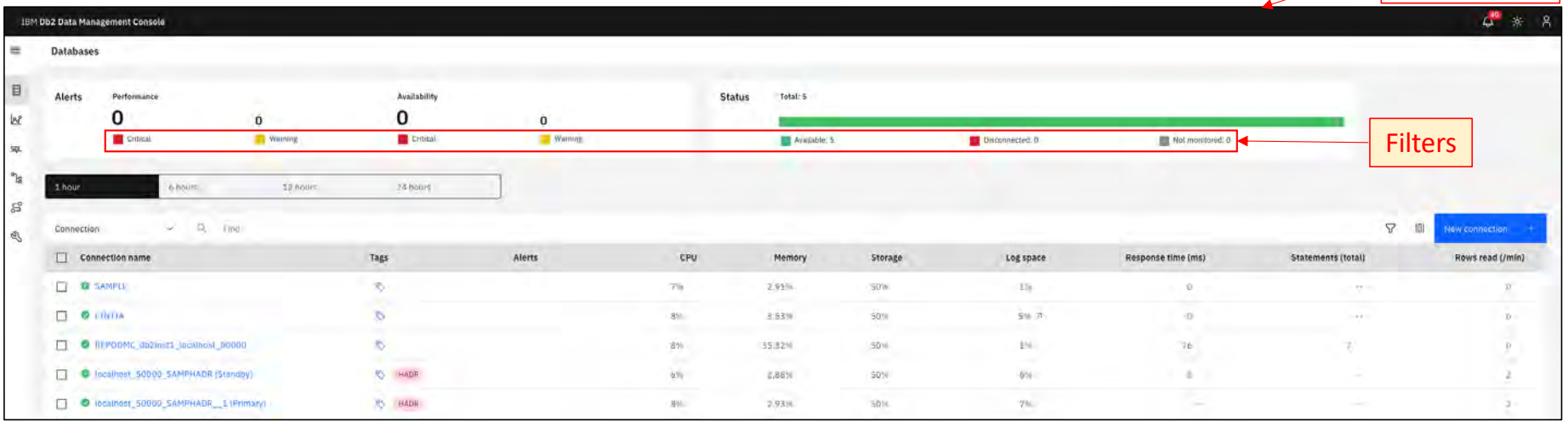


Monitored Databases – Connection Profile List



Connection Profile Page (all added databases)

Home Page (monitoring enabled databases)



Db2 Data Management Console

Monitoring Profile

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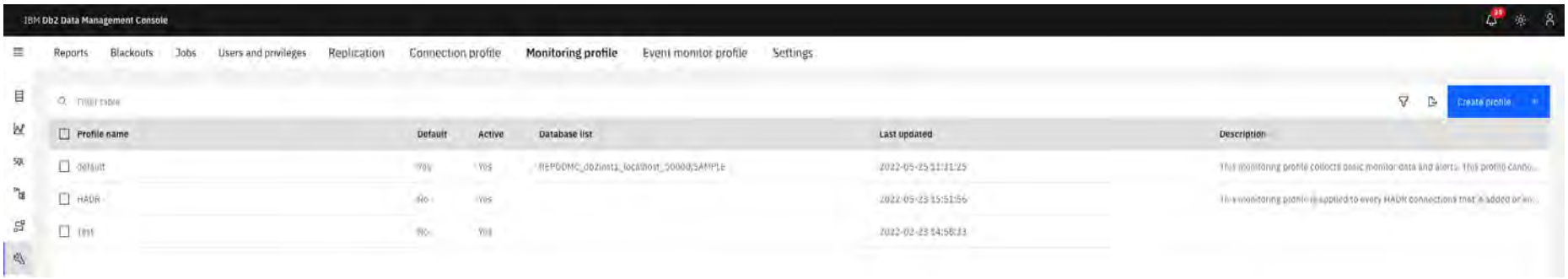
Monitoring Profile – Configuration

- **Administration → Monitoring profile**
  - **Status**
    - Default: Yes/No (only one default Monitoring profile)
      - New connection profiles will be assigned to the **default** monitoring profile automatically
    - Active: Yes/No
  - **Profile name:** unique name
  - **Database list** (assigned databases)
  - **Description**
- **HADR monitoring profile**
  - Predefined for standby databases



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=monitoring-setting-up-profile

Monitoring Profile – Monitor Settings

Collection

- Collect data every (minutes)

Package cache

- SQL statements captured
- Table data read for a collection

Package cache only displays top n queries order by 16 KPIs

1. num_exec_with_metrics
2. stmt_exec_time
3. total_cpu_time
4. rows_read
5. rows_returned
6. total_act_wait_time
7. lock_wait_time
8. sort_overflows
9. logical_reads
10. physical_reads
11. temp_reads
12. pool_data_l_reads
13. pool_index_l_reads
14. lock_escals
15. lock_waits
16. wlm_queue_time_total

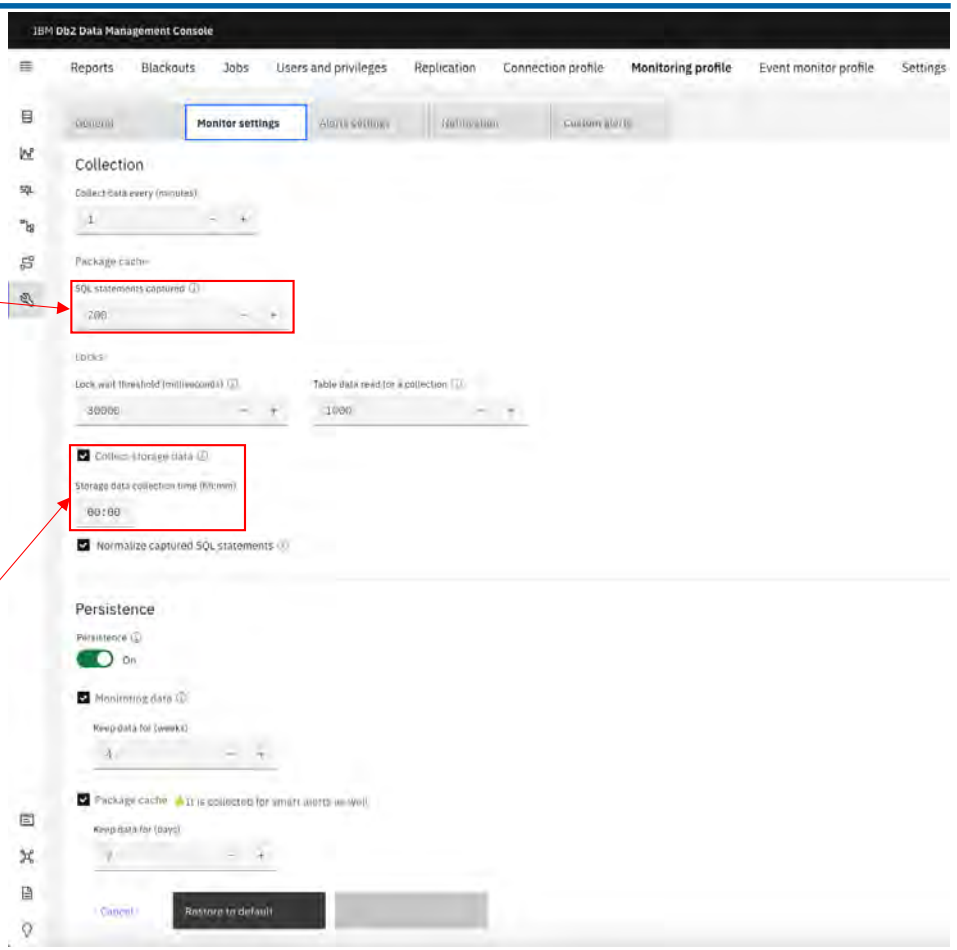
In this example:
Every 1 minute, read maximum of 1000 records from the package cache, and keep the top 200 only

Locks

- Lock wait threshold (miliseconds)
- Table data read for a collection

Collect storage data

- Heavy query used to capture storage data
- It can impact the monitored database
- Disable the query or schedule the query to run when the monitored database is not busy
- Reorg/runstas on the monitored database catalog tables might help the query performance



Monitoring Profile – Monitor Settings

Normalize captured SQL statements

SELECT * FROM TABLEA WHERE NAME = 'IBM'
SELECT * FROM TABLEA WHERE NAME = 'DATA'
SELECT * FROM TABLEA WHERE NAME = 'MANAGEMENT'
SELECT * FROM TABLEA WHERE NAME = 'CONSOLE'
SELECT * FROM TABLEA WHERE NAME = 'SKILL'
SELECT * FROM TABLEA WHERE NAME = 'TRANSFER'

➔ *6 records*

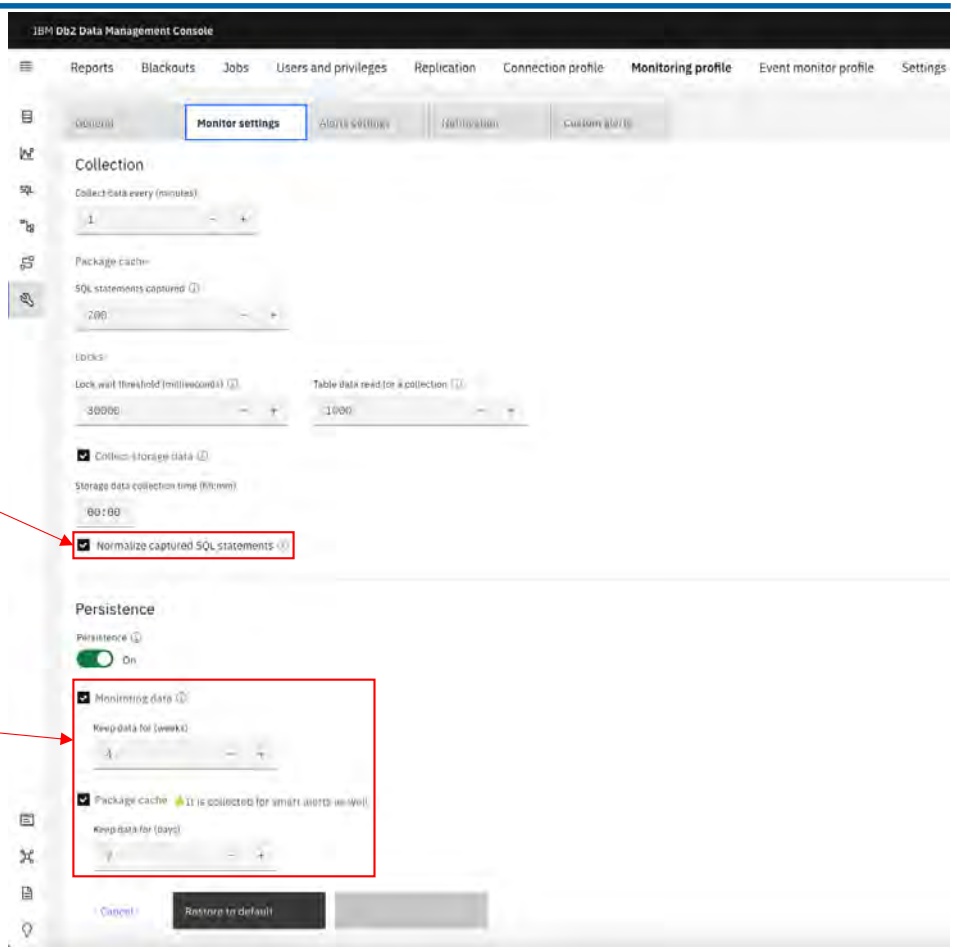
Affects disk space in repository database

SELECT * FROM TABLEA WHERE NAME = ?

➔ *1 records*

Persistence

- Historical data
  - Monitoring data
    - ❖ Keep data for (weeks)
  - Package cache
    - ❖ Keep data for (days)

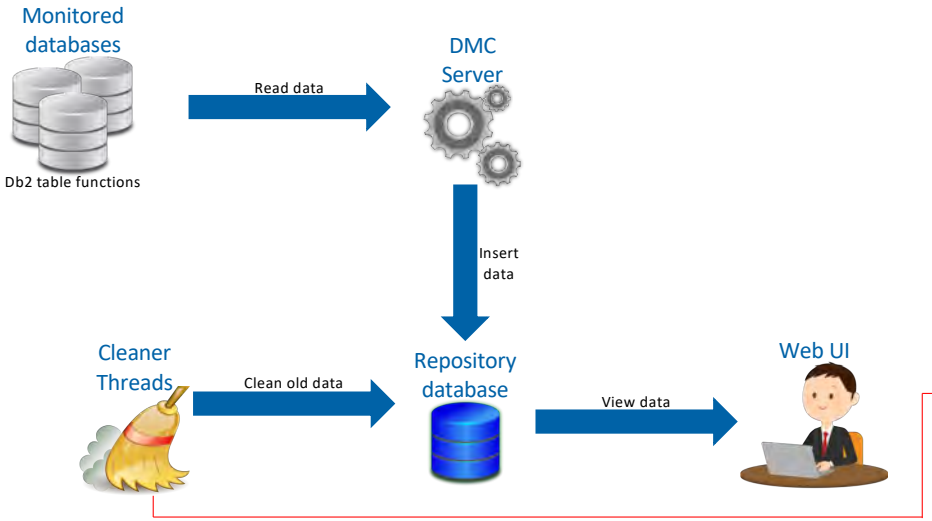


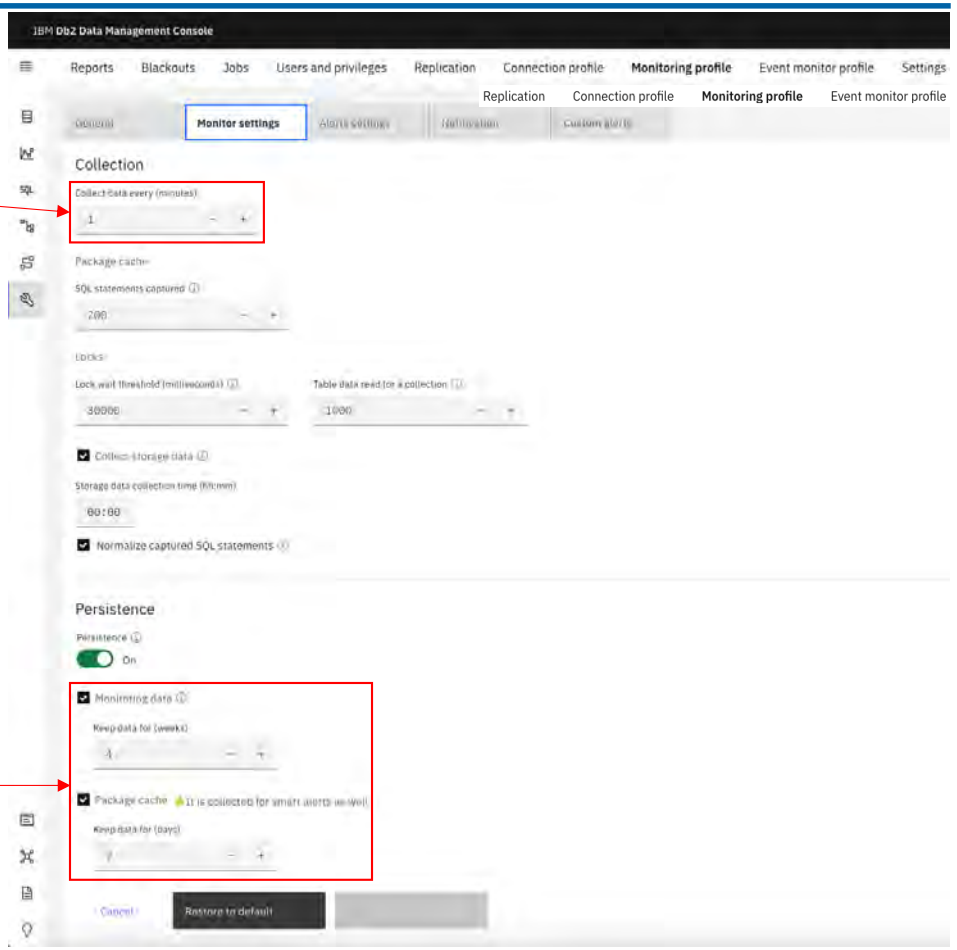
In case old data is not being deleted in repository database, use the deleteRepoData_expired script:
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-deleting-expired-monitor-data

Deleting data for a deleted connection profile use the deleteRepoData4DeletedConnection script:
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-cleaning-up-monitor-data-deleted-connections

Monitoring Profile – Data Collection Cycle

- Collect data every (minutes)
  - Data might not be available if not captured during the cycle (snapshot)
- The lower the number the more data will be collected
  - Example of 1 hour monitoring with a database running 100 applications
    - ❖ Capturing information every 1 minute: 100 x (60 / 1) = 6000 records
    - ❖ Capturing information every 5 minutes: 100 x (60 / 5) = 1200 records
    - ❖ Capturing information every 15 minutes: 100 x (60 / 15) = 400 records
    - ❖ Multiplied by the number of tables collecting data
    - ❖ Multiplied by the number of databases assigned to the monitoring profile





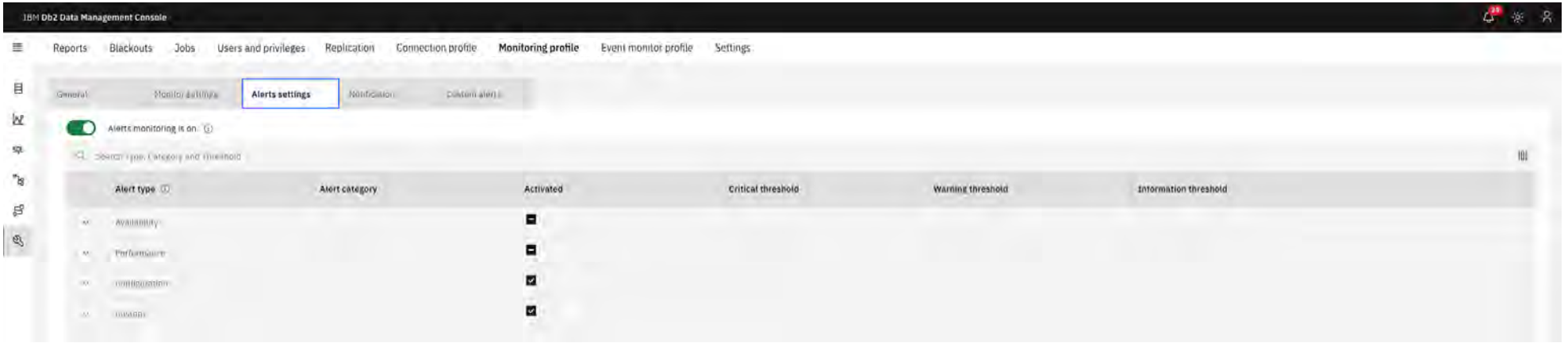
Monitoring Profile – Alert Settings

4 Categories

- Availability
- Performance
- Configuration
- Custom

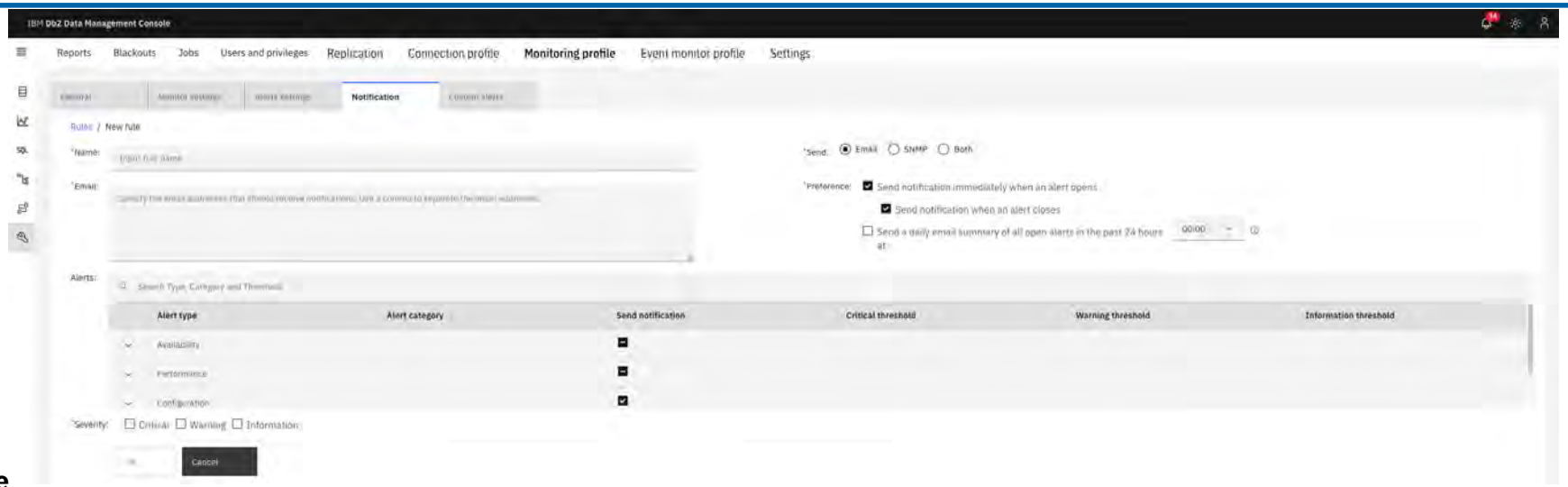
Thresholds

- Critical
- Warning
- Information



Additional information (including list of alerts available)
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=alerts-grouping-by-type

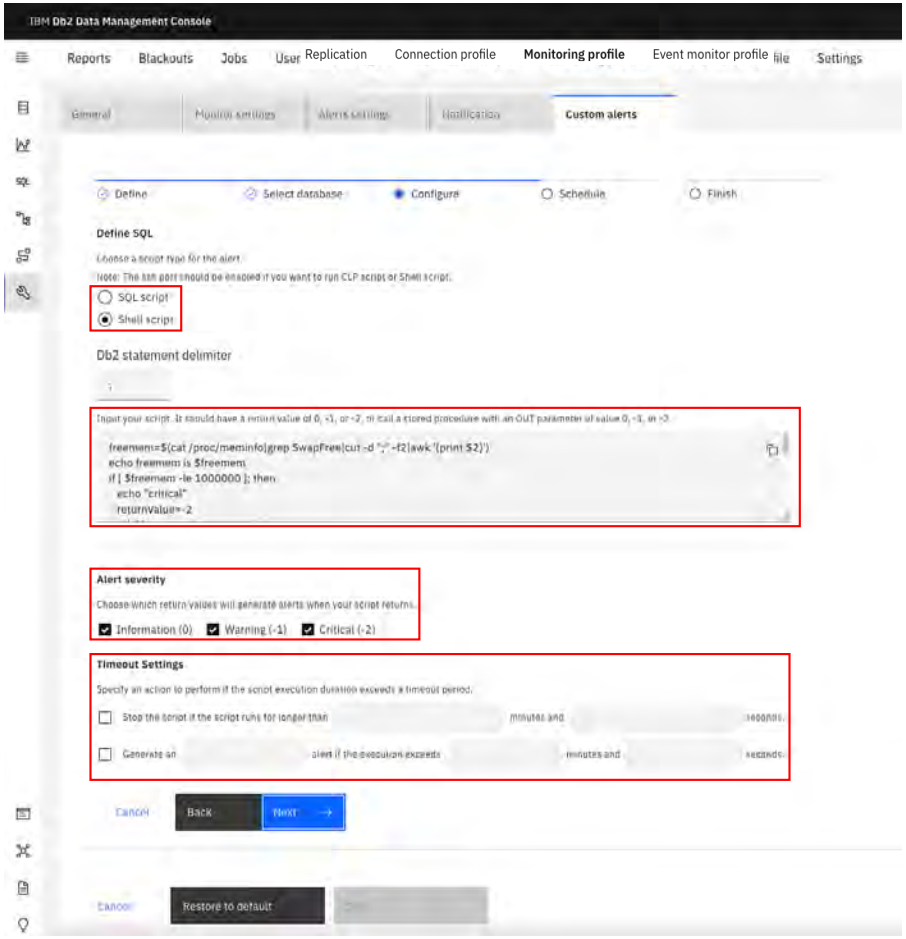
Monitoring Profile – Notification (Rules)



- **Name**
- **3 types of notification**
  - e-mail (list of e-mails for the alert)
  - SNMP
  - Both
- **Preference**
  - Send notification immediately when an alert opens
  - Send notification when an alert closes
  - Send a daily email summary of all open alerts in the past 24 hours
- **Alert type**
- **Severity**
  - Critical
  - Warning
  - Information
- Click on ***"OK"*** button to apply the notification changes
- Click on ***"Save"*** button to save the monitoring profile

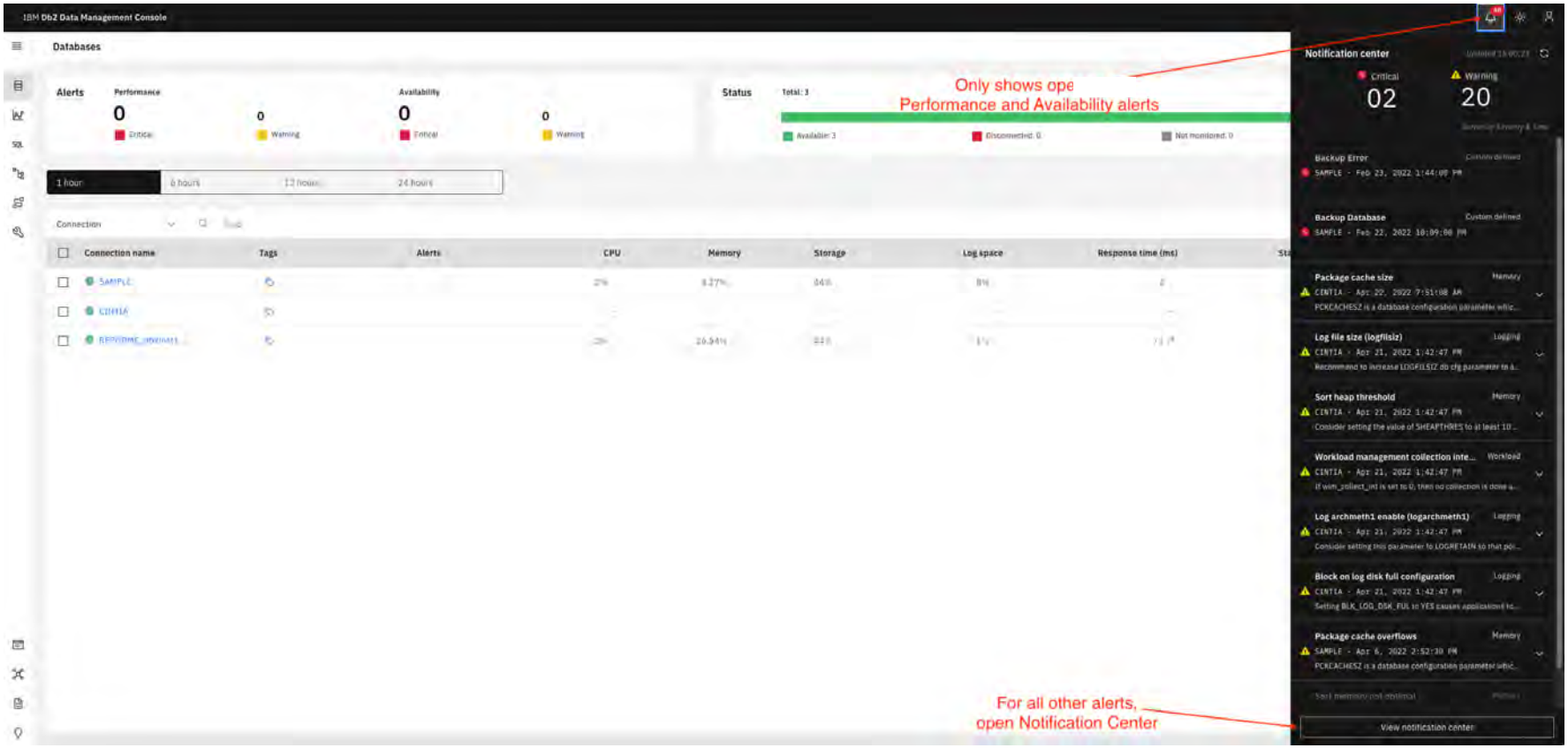
Monitoring Profile – Custom Alerts

- **Script type**
  - SQL script
  - Shell Script
- **Script text**
  - Scripts must return severity column (returnValue) to trigger the alert
    - ❖ Information: 0
    - ❖ Warning: -1
    - ❖ Critical: -2
  - Stored procedures
    - ❖ OUT parameter must be included to return an exit code (-2,-1, or 0)
  - Second column to return auxiliary information as output (optional)
- **Timeout Settings**

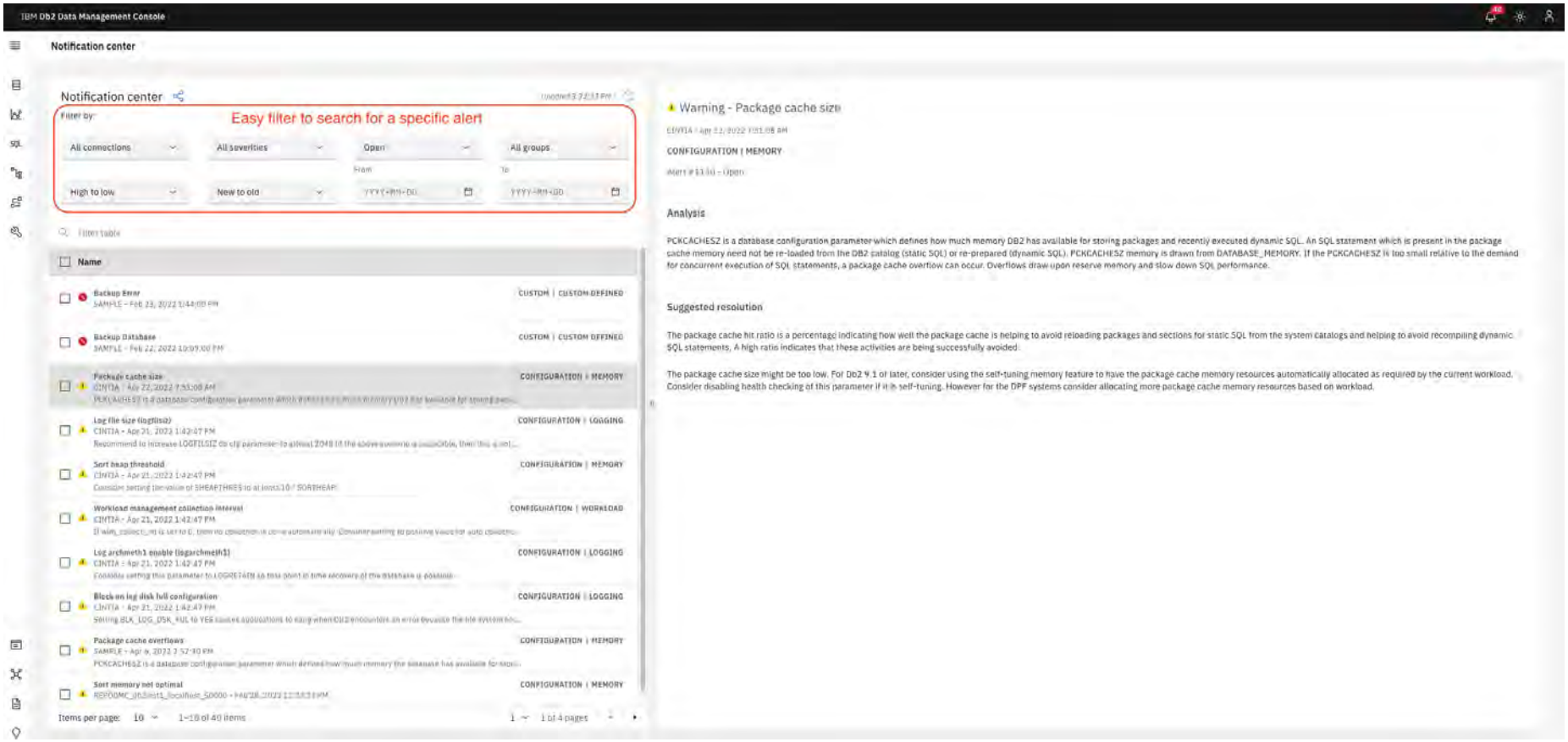


Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=profile-creating-custom-alerts
Custom alerts samples
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=alerts-custom-code-snippets

Notification Center

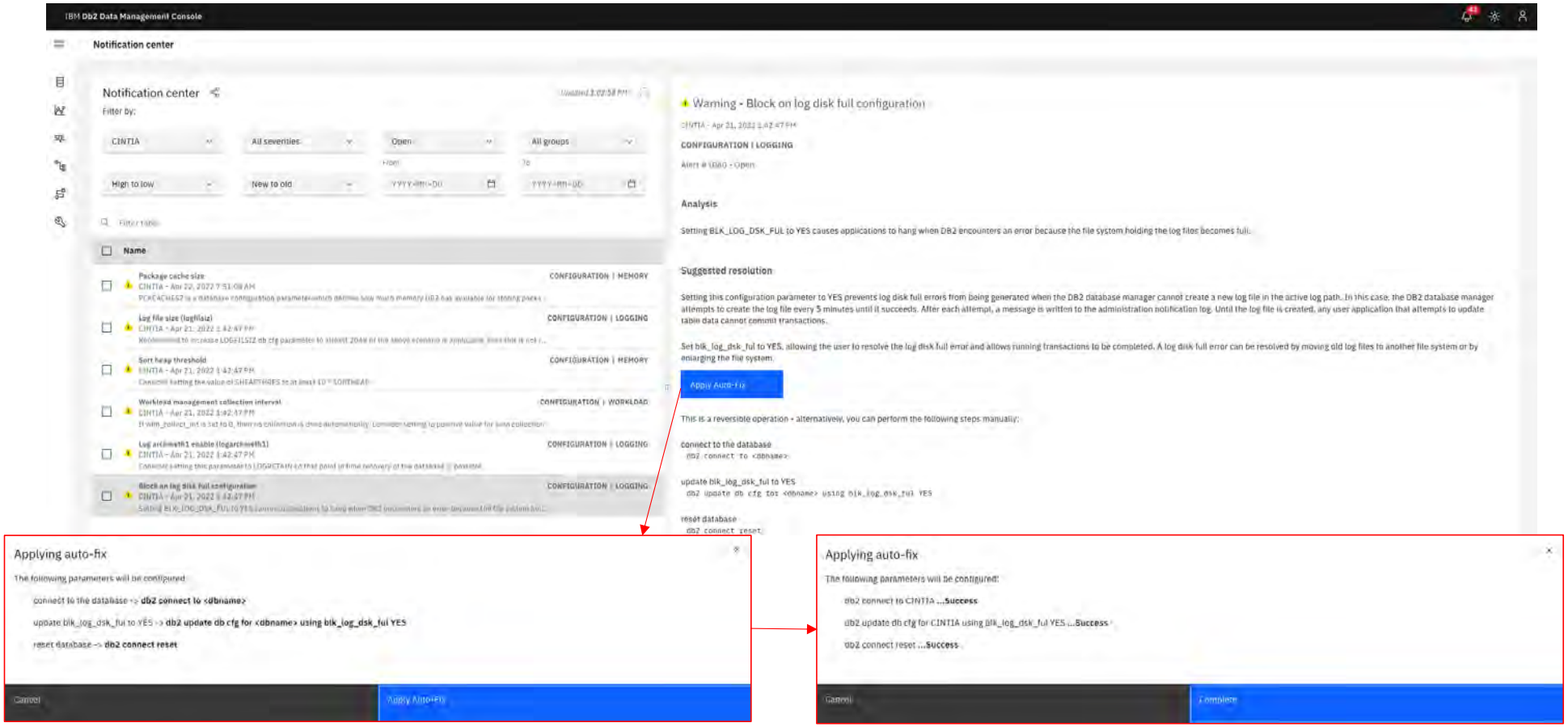


Notification Center



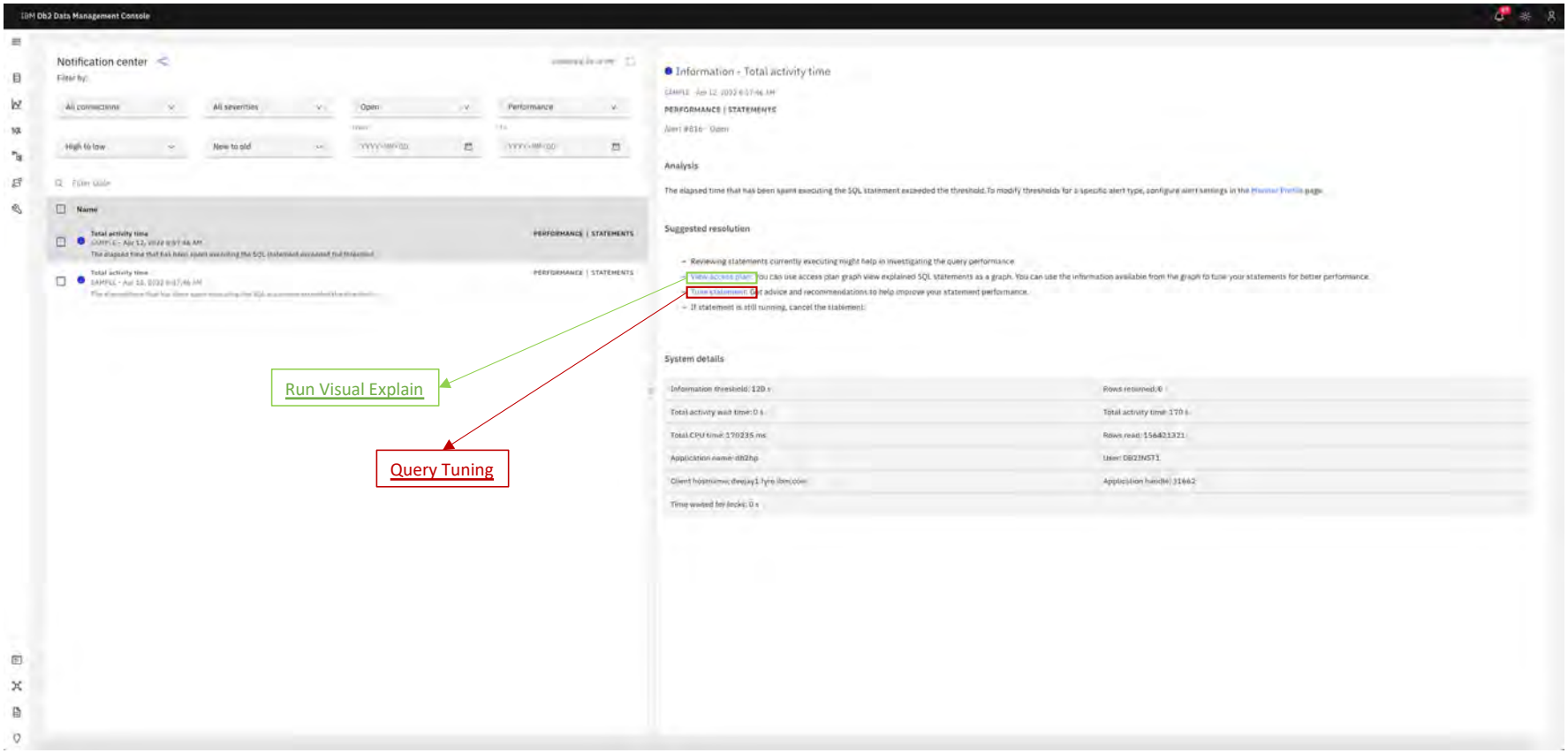
Notification Center – Suggested Resolution

- Apply Auto-Fix

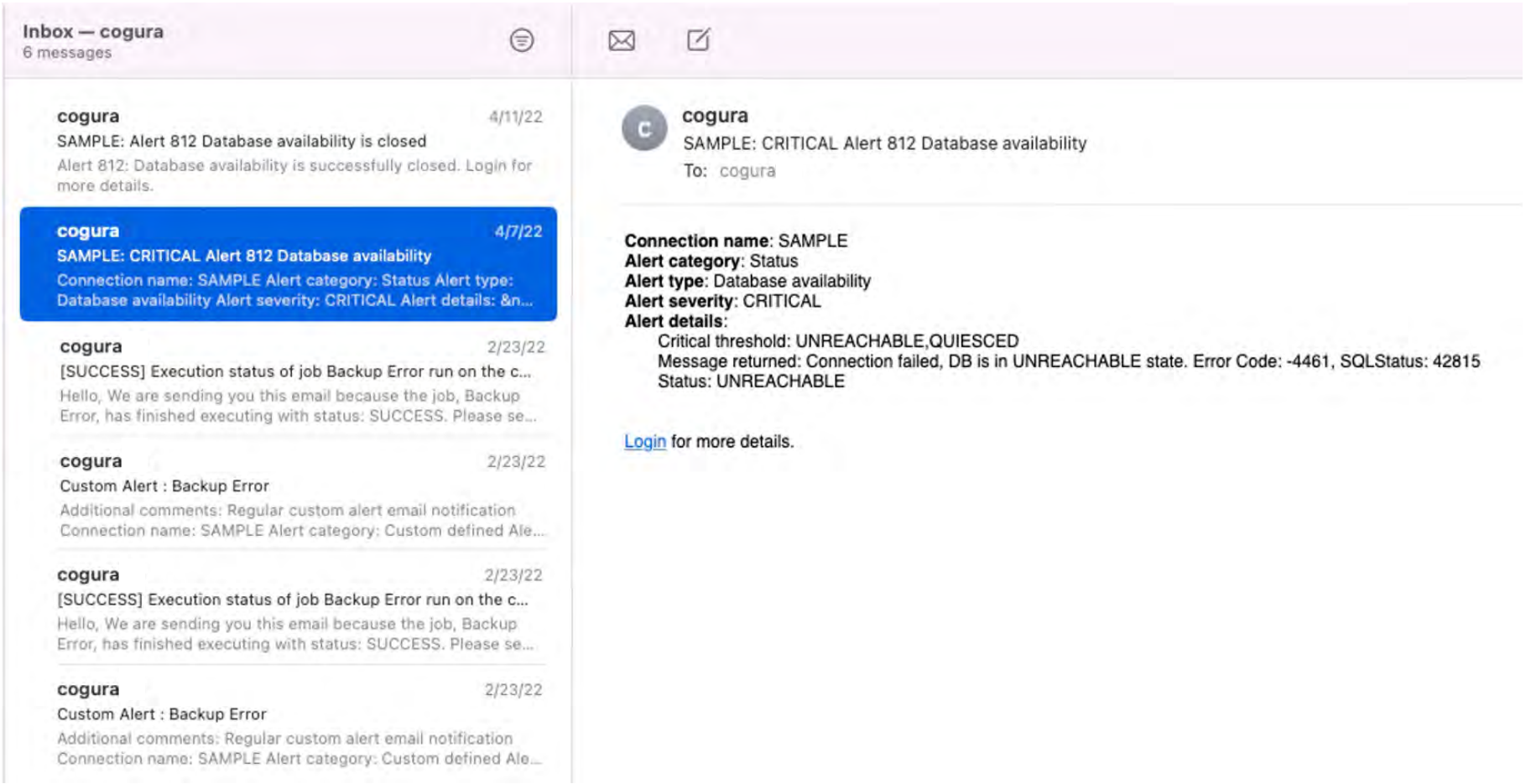


Notification Center – Suggested Resolution

- View access plan
- Tune statement



Alerts – e-mail



Db2 Data Management Console

Event Monitor

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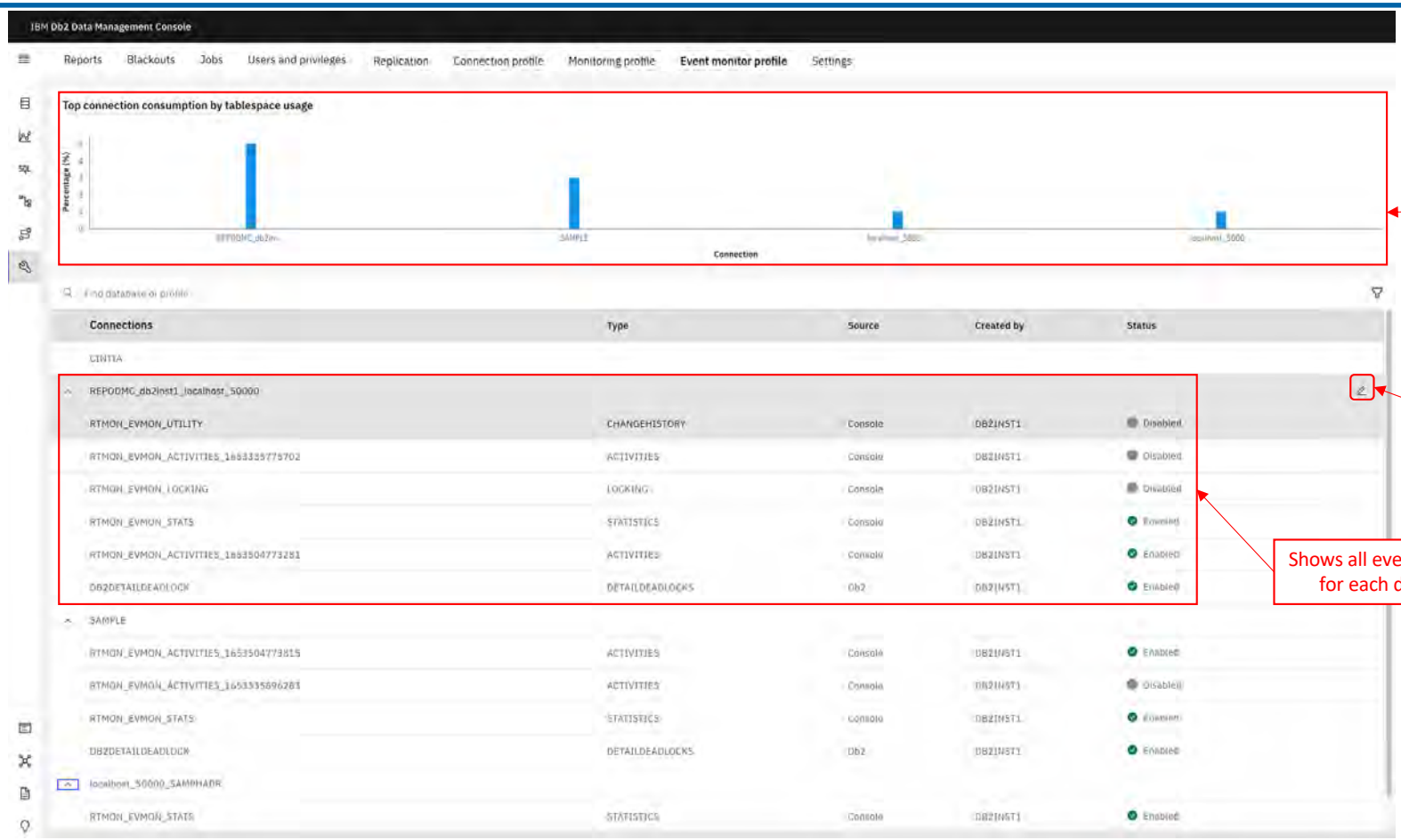
Event Monitor – Prerequisites

Prerequisites settings for the monitored database

- Privileges to create event monitoring-related objects: SYSCTRL or SYSADM privilege is required to create BUFFERPOOL and TABLESPACE
- WLMADM or DBADM privilege is required to CREATE / ALTER WORKLOAD
- ACCESSCTRL or SECADM privilege is required to GRANT EXECUTE on PROCEDURE
- SYSADM privilege is required to run db2set (ATS)
- Tablespace for event monitor tables

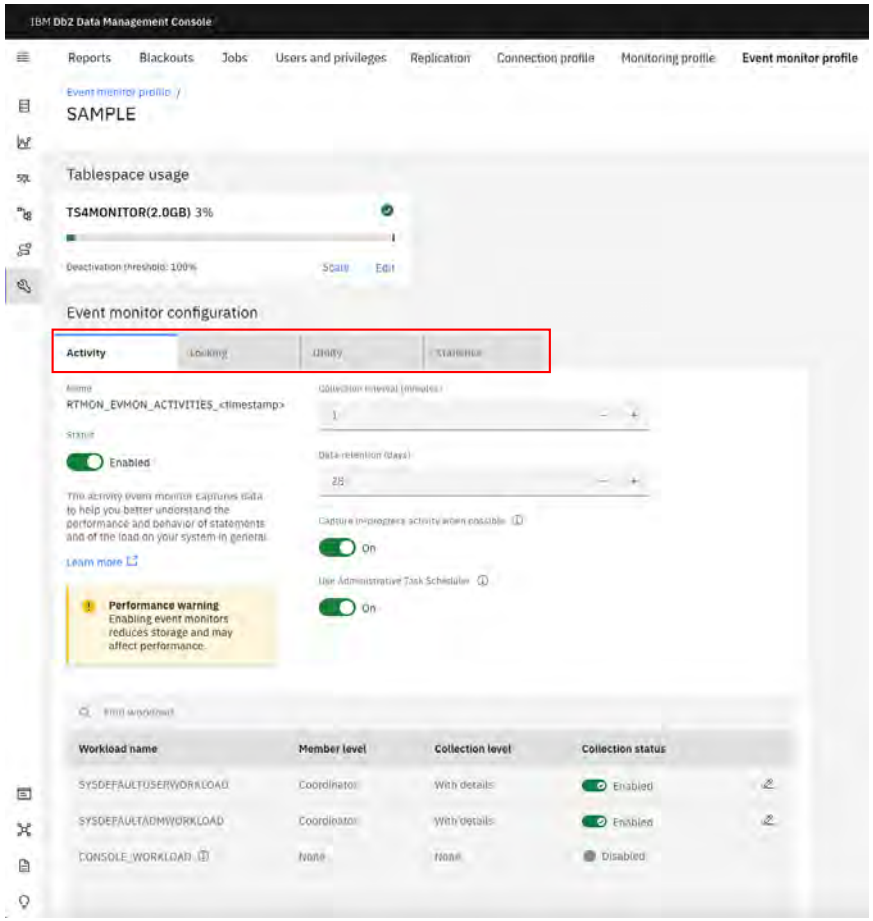
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=events-table-space-other-prerequisites-event-monitoring

Event Monitor Profile



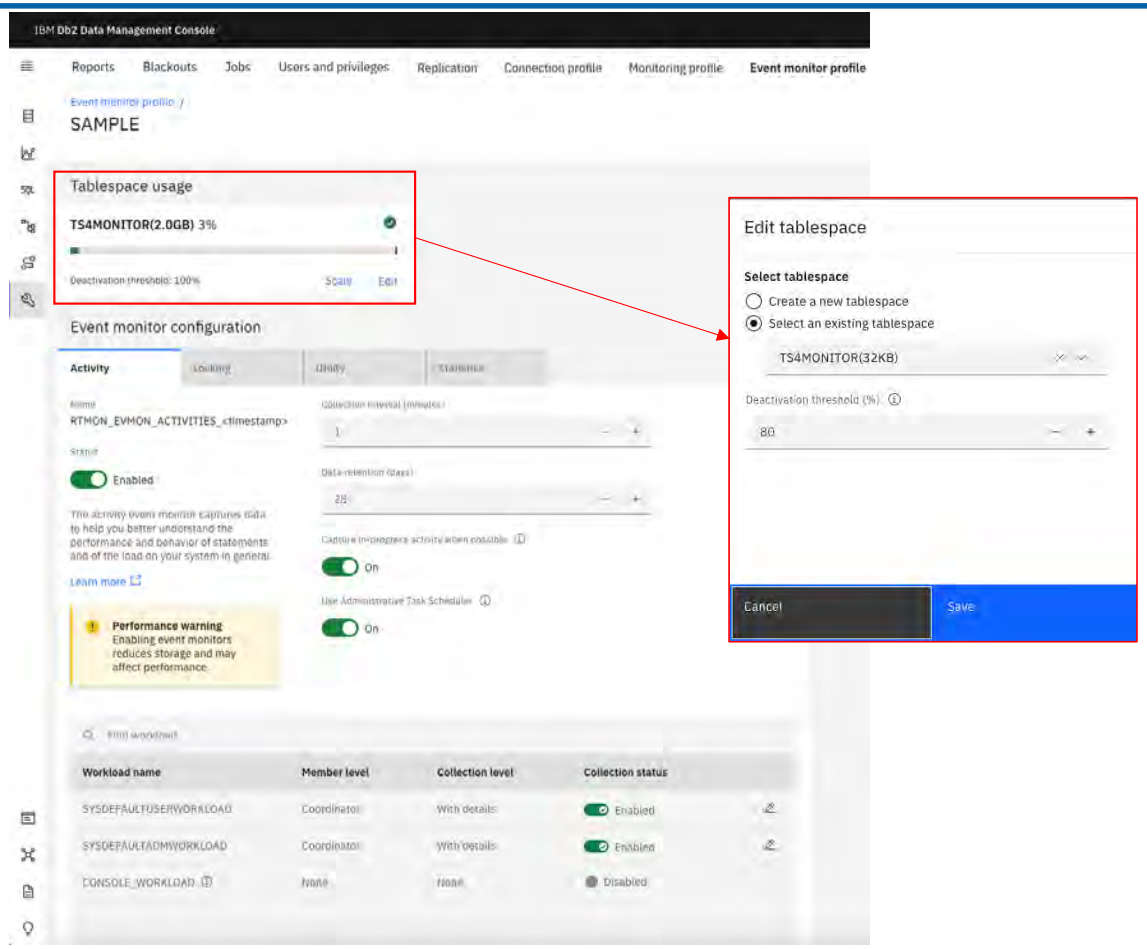
Event Monitor – Settings

- When enabled, DMC issues Db2 CREATE EVENT MONITOR … WRITE TO TABLES command on the monitored database
- Tablespace is required to store the event monitor tables
- Db2 creates the event monitor and event monitor tables, and insert data into those tables
- 4 event monitors
  - Activity
    - ❖ Activity event monitor
    - ❖ Monitor → Statement → Individual executions
  - Locking
    - ❖ Locking event monitor
    - ❖ Monitor → Locking → Locking event monitor
  - Utility
    - ❖ Change history event monitor
    - ❖ Monitor → Applications → Utilities event monitor
  - Statistics
    - ❖ Statistics event monitor
    - ❖ Monitor → Summary → Responsiveness widget



Event Monitor – Tablespace

- Created on monitored database
- Not required for HADR standby databases
- New table space (created by DMC)
  - TS4MONITOR default name
- Existing table space requirements
  - 32K page
  - Across all database partitions or members
  - AUTOMATIC STORAGE AUTORESIZE YES
  - MAXSIZE 2G
- To increase the table space usage size, click ‘Scale’ to set new table space size



Event Monitor – Tablespace Requirements

Without ATS

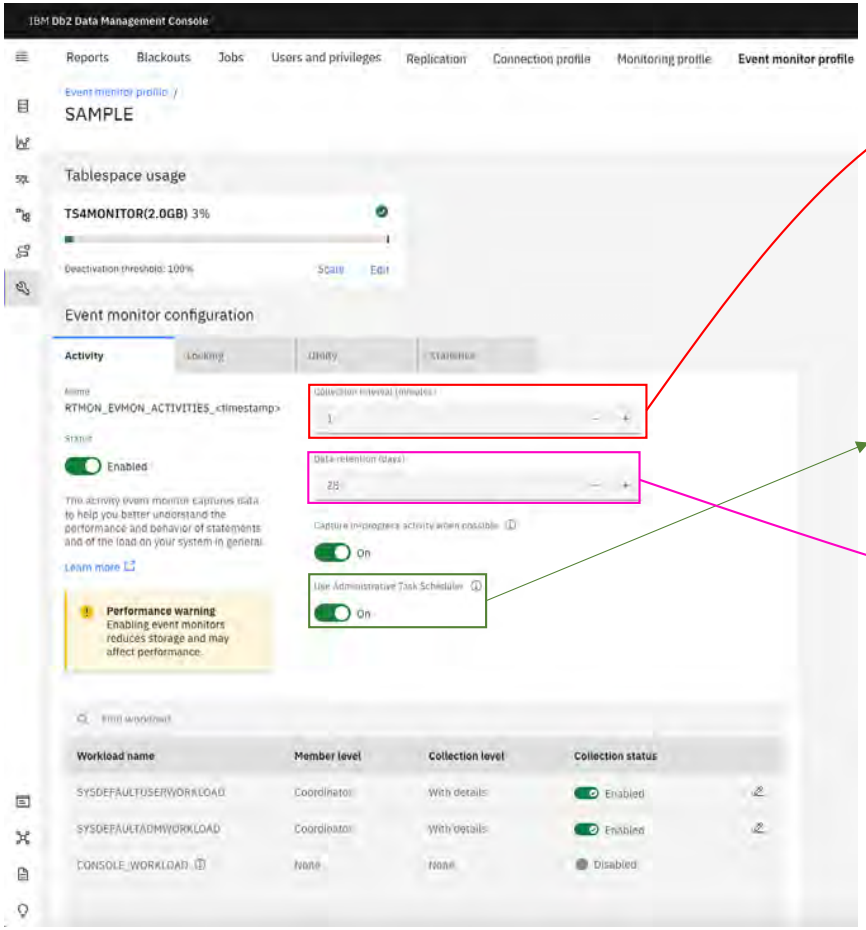
```
--Create a bufferpool with page size 32kb
CREATE BUFFERPOOL CONSOLEPOOL ALL DBPARTITIONNUMS SIZE 1000 AUTOMATIC PAGESIZE 32768
--Create a partition spanning all partitions
CREATE DATABASE PARTITION GROUP CONSOLEGROUP ON ALL DBPARTITIONNUMS
--Create the 32kb tablespace with max size 2G specified
CREATE TABLESPACE TS4MONITOR IN CONSOLEGROUP PAGESIZE 32768 MANAGED BY AUTOMATIC STORAGE AUTORESIZE YES INITIALSIZE 100M MAXSIZE 2G BUFFERPOOL CONSOLEPOOL
--Create a 32kb pagesize temporary tablespace if there is not an existing one
CREATE TEMPORARY TABLESPACE TEMPSPACE2 PAGESIZE 32K MANAGED BY AUTOMATIC STORAGE EXTENTSIZE 4 BUFFERPOOL CONSOLEPOOL
--Disable the legacy console workload DSM_WORKLOAD if it exists
ALTER WORKLOAD DSM_WORKLOAD DISABLE
--Define a workload to filter the monitored console executed statements. Because the COLLECT ACTIVITY DATA option is not specified, the statement history will not collect the statements of the workload.
CREATE WORKLOAD CONSOLE_WORKLOAD APPLNAME (''DSMAu*'',''DSMRt*'',''DS_ConnMgt*'',''DSSNAP*'',''DSMOQT'',''UC_*'')
--Capture the statements for the default two workloads on the coordinator node. If you want to collect the activity data for all nodes of a multi-partition database, change the COORDINATOR option to ALL.
ALTER WORKLOAD SYSDEFAULTUSERWORKLOAD COLLECT ACTIVITY DATA ON COORDINATOR WITH DETAILS;
ALTER WORKLOAD SYSDEFAULTADMWORKLOAD COLLECT ACTIVITY DATA ON COORDINATOR WITH DETAILS;
--Capture the aggregate responsiveness workload information
ALTER WORKLOAD SYSDEFAULTUSERWORKLOAD COLLECT AGGREGATE ACTIVITY DATA BASE;
ALTER WORKLOAD SYSDEFAULTADMWORKLOAD COLLECT AGGREGATE ACTIVITY DATA BASE;
```

With ATS

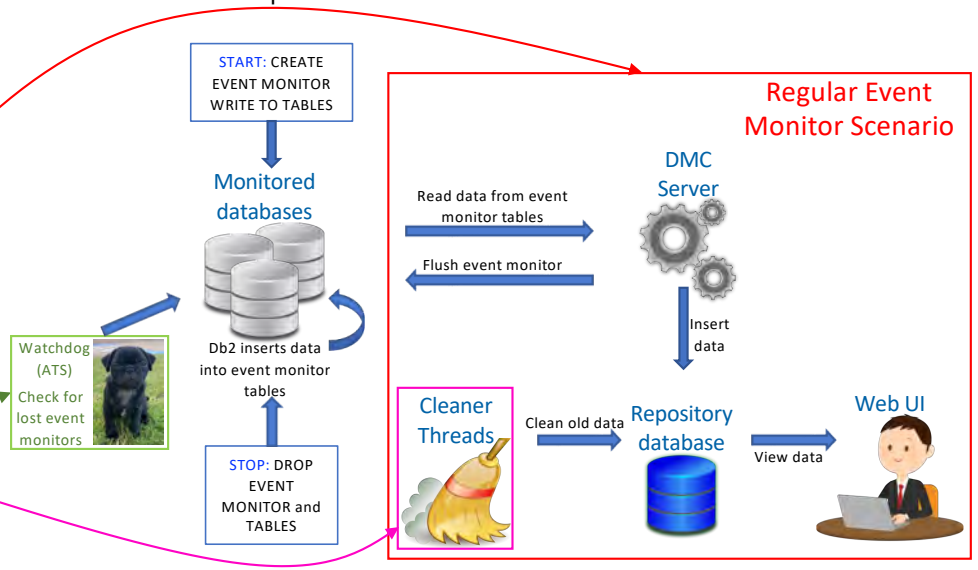
```
--Create a bufferpool with page size 32kb
CREATE BUFFERPOOL CONSOLEPOOL ALL DBPARTITIONNUMS SIZE 1000 AUTOMATIC PAGESIZE 32768
--Create a partition spanning all partitions
CREATE DATABASE PARTITION GROUP CONSOLEGROUP ON ALL DBPARTITIONNUMS
--Create the 32kb tablespace with max size 2G specified
CREATE TABLESPACE TS4MONITOR IN CONSOLEGROUP PAGESIZE 32768 MANAGED BY AUTOMATIC STORAGE AUTORESIZE YES INITIALSIZE 100M MAXSIZE 2G BUFFERPOOL CONSOLEPOOL
--Create a 32kb pagesize temporary tablespace if there is not an existing one
CREATE TEMPORARY TABLESPACE TEMPSPACE2 PAGESIZE 32K MANAGED BY AUTOMATIC STORAGE EXTENTSIZE 4 BUFFERPOOL CONSOLEPOOL
--Disable the legacy console workload DSM_WORKLOAD if it exists
ALTER WORKLOAD DSM_WORKLOAD DISABLE
--Define a workload to filter the monitored console executed statements. Because the COLLECT ACTIVITY DATA option is not specified, the statement history will not collect the statements of the workload.
CREATE WORKLOAD CONSOLE_WORKLOAD APPLNAME (''DSMAu*'',''DSMRt*'',''DS_ConnMgt*'',''DSSNAP*'',''DSMOQT'',''UC_*'')
--Capture the statements for the default two workloads on the coordinator node. If you want to collect the activity data for all nodes of a multi-partition database, change the COORDINATOR option to ALL.
ALTER WORKLOAD SYSDEFAULTUSERWORKLOAD COLLECT ACTIVITY DATA ON COORDINATOR WITH DETAILS;
ALTER WORKLOAD SYSDEFAULTADMWORKLOAD COLLECT ACTIVITY DATA ON COORDINATOR WITH DETAILS;
--Capture the aggregate responsiveness workload information
ALTER WORKLOAD SYSDEFAULTUSERWORKLOAD COLLECT AGGREGATE ACTIVITY DATA BASE;
ALTER WORKLOAD SYSDEFAULTADMWORKLOAD COLLECT AGGREGATE ACTIVITY DATA BASE;
--Create SYSTOOLSPACE for Administrative Task Schedule(ATS)
CREATE TABLESPACE SYSTOOLSPACE IN IBMCATGROUP MANAGED BY AUTOMATIC STORAGE USING STOGROUP IBMSTOGROUP EXTENTSIZE 4
--Ensure you have ADMIN_TASK_ADD and ADMIN_TASK_UPDATE privileges to execute stored procedures(ATS)
GRANT EXECUTE ON PROCEDURE SYSPROC.ADMIN_TASK_ADD TO USER ${userName};
GRANT EXECUTE ON PROCEDURE SYSPROC.ADMIN_TASK_UPDATE TO USER ${userName};
--Enable on the database the setting related to ATS, please choose the "CLP with SSH" Run method in Options
!db2set DB2_ATS_ENABLE=YES;
```

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=events-table-space-other-prerequisites-event-monitoring

Event Monitor – Data Collection Cycle



- Regular event monitor scenario happens according to the Collection interval configured in the Event monitor profile



- **ATS (Administrative Task Scheduler) watchdogs**
  - Helpful when DMC loses the connection to the monitored database
  - On
    - ❖ Automatically drop existing event monitors and event monitor tables
    - ❖ ATS needs to be configured and running on the monitored database
  - Off
    - ❖ Possibility to reach tablespace full error
    - ❖ Need to drop existing event monitors and event monitor tables manually

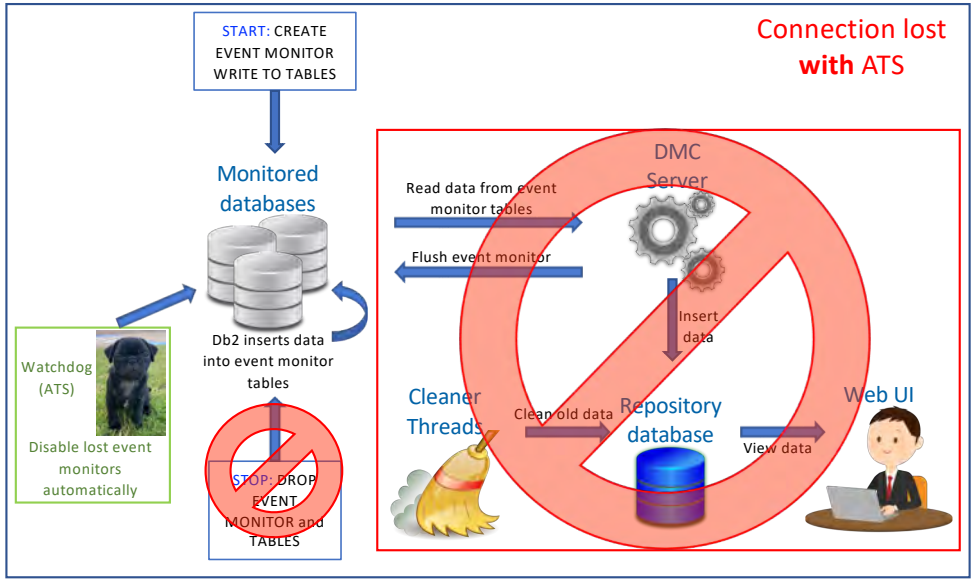
Event Monitor – Administrative Task Scheduler (ATS)

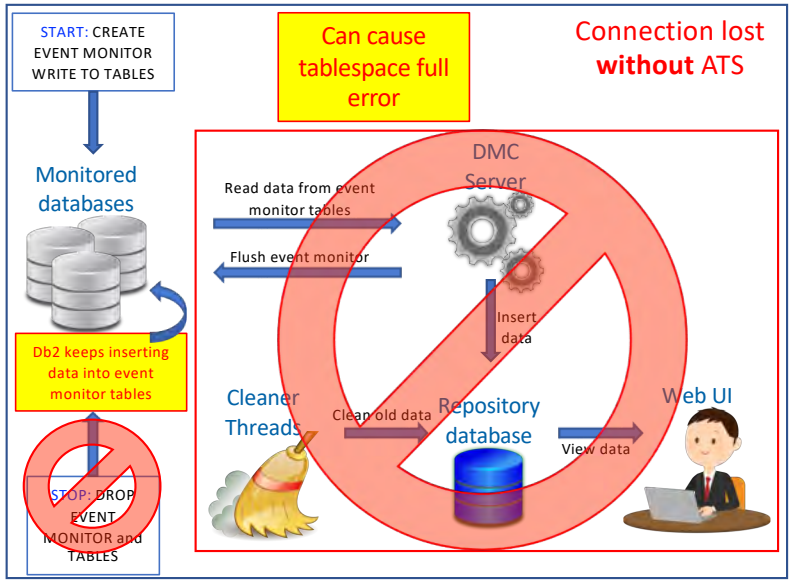
Common scenarios when DMC loses the connection to the monitored database

- Connection from DMC to the monitored database was forced (force applications command)
- DMC crashes

Why use Administrative Task Scheduler (ATS)?

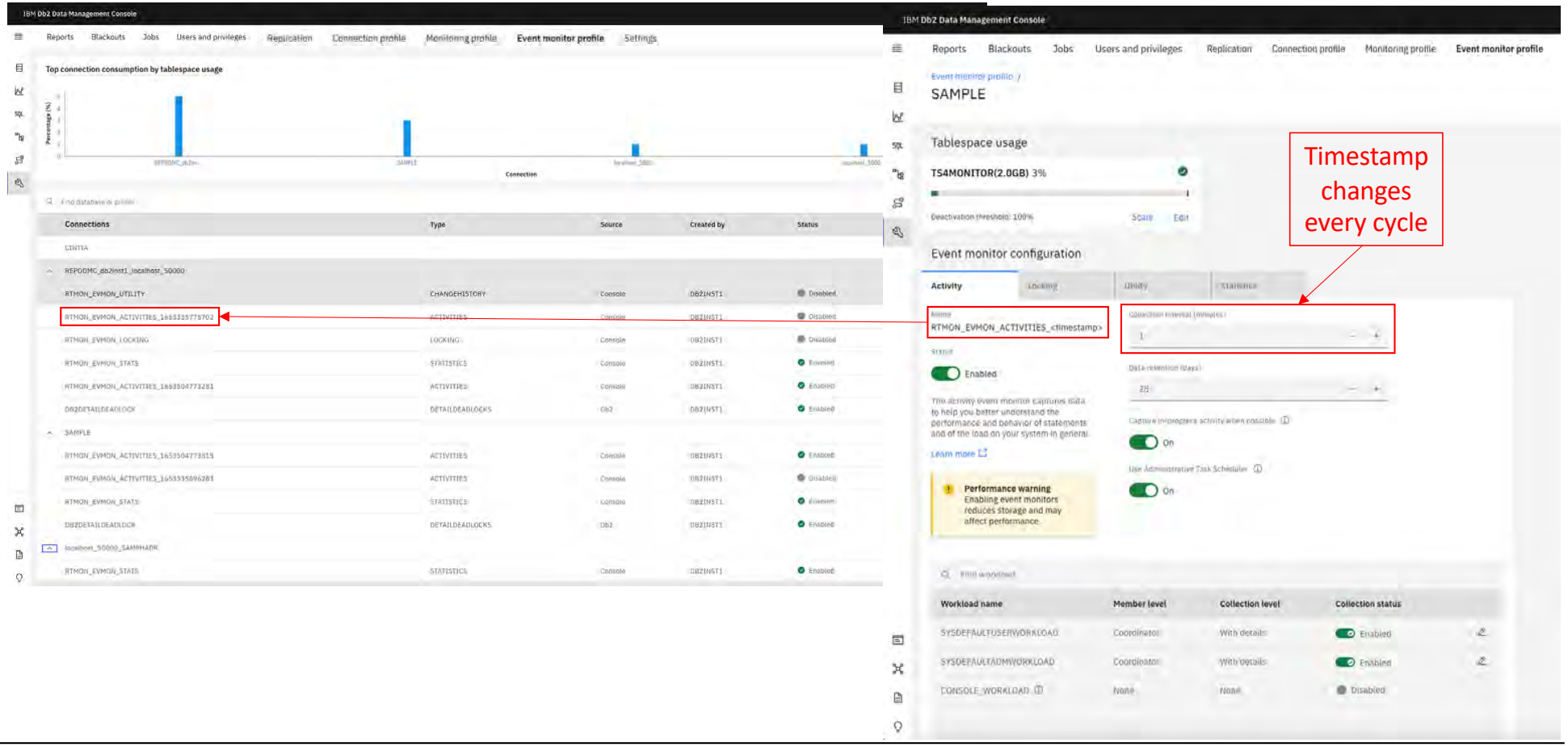
- Watchdogs drop the event monitors and event monitor tables automatically



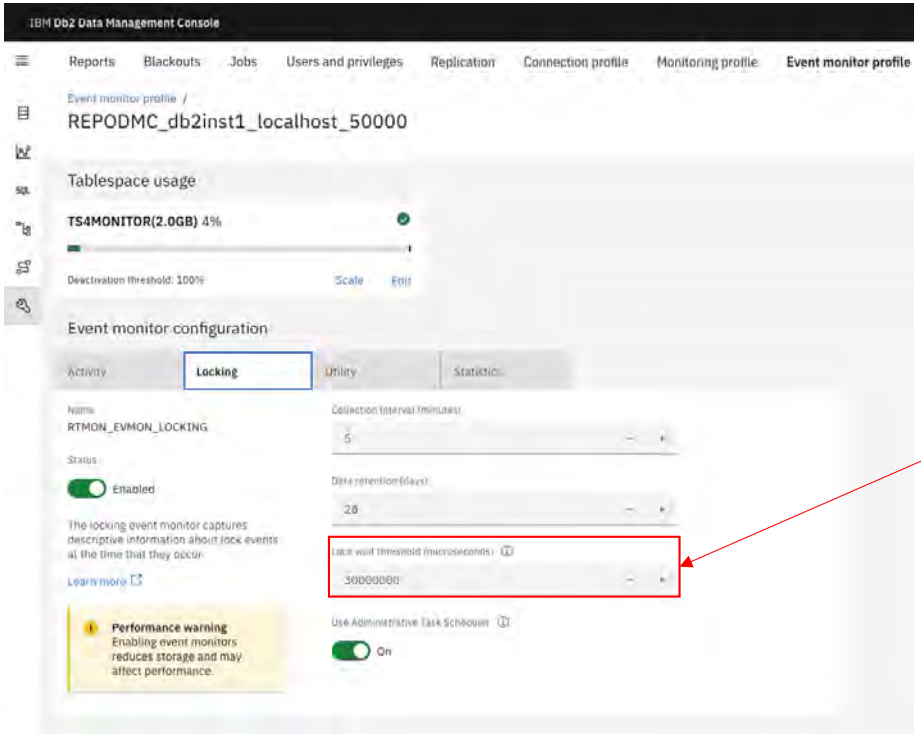


Additional information about ATS:
https://www.ibm.com/docs/en/db2/11.5?topic=scheduler-administrative-task

Event Monitor – Activity

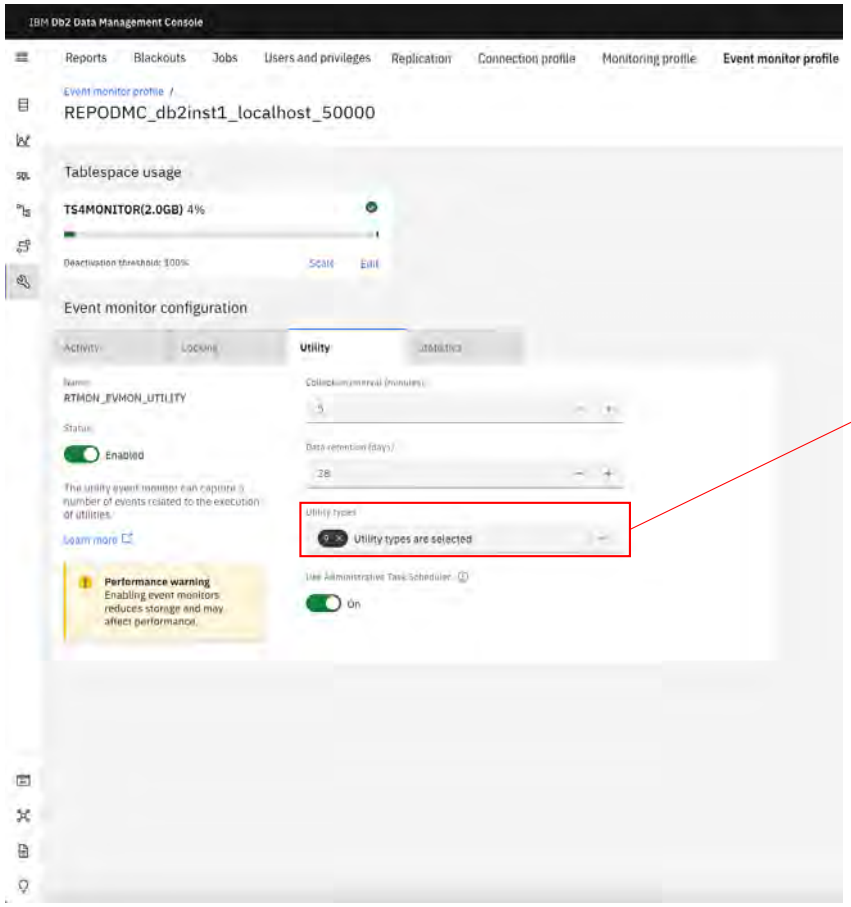


Event Monitor – Locking



Only locks time up to threshold will be collected

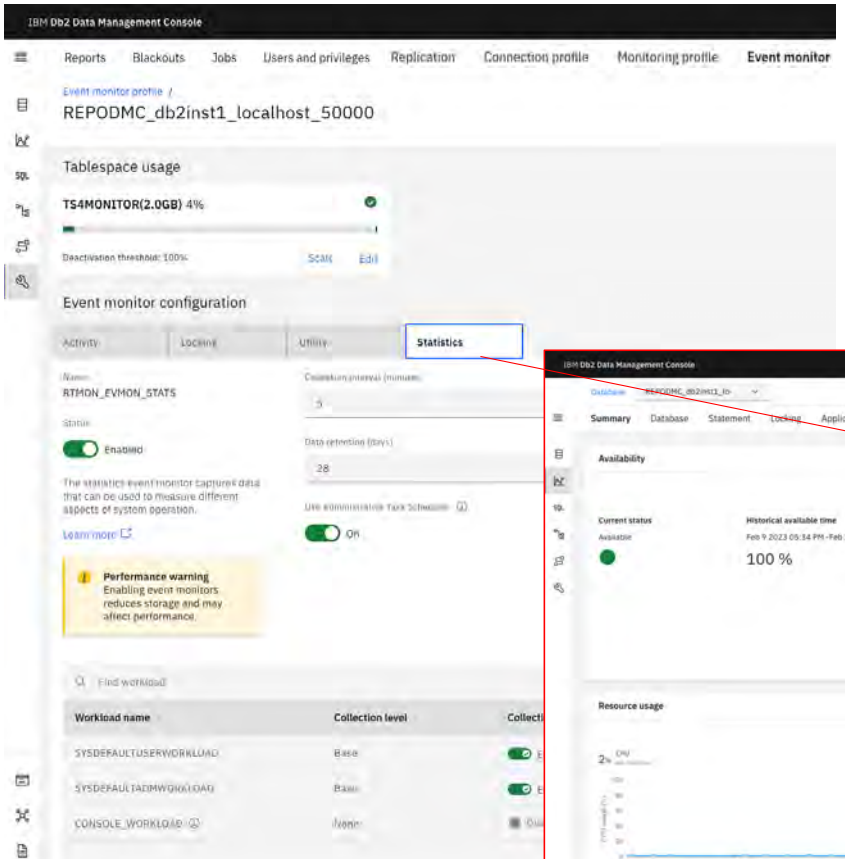
Event Monitor – Utility

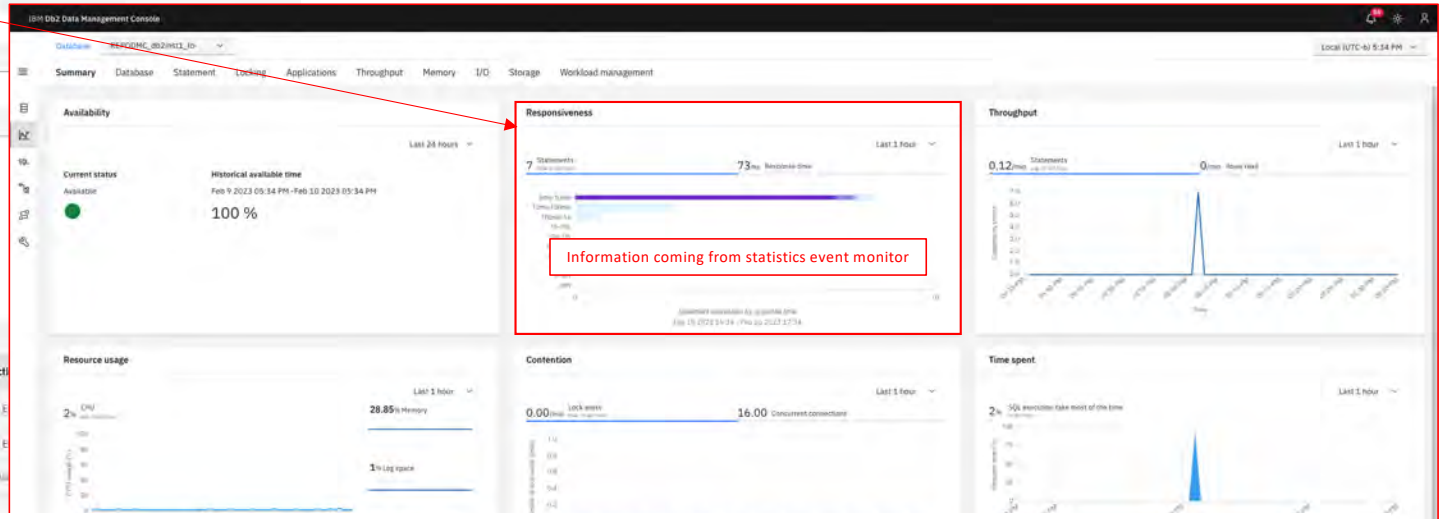


Only captures information from the **selected** Utility Types

Utility Types
BACKUP
LOAD
MOVETABLE
ONLINERECOVERY
REDISTRIBUTE
REORG
RESTORE
ROLLFORWARD
RUNSTATS

Event Monitor – Statistics





Why should you opt-in?

Statistics event monitor must be enabled on a connected database for the 'Responsiveness' widget in the ***Monitor > Summary page*** to display data in the widget.

Note: The **"Responsiveness" widget** is disabled (default) when the Statistics event monitor opt-in feature is disabled (default)

What is the benefit?

The **"Responsiveness" widget** is a tool that gives you an insight on changes of query response time characteristics over time. This widget uses the aggregated activity data collected by the statistics event monitor and helps you understand how quickly the system is processing the statements. You can also view your workload composition and capture activities for diagnostic reasons.

In most cases, statistic event monitor will only add a minor overhead to monitored databases, which should be safe to enable it

Additional information

https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=events-setting-up-statistics-event-monitoring-opt-in

Db2 Data Management Console

Monitoring Databases

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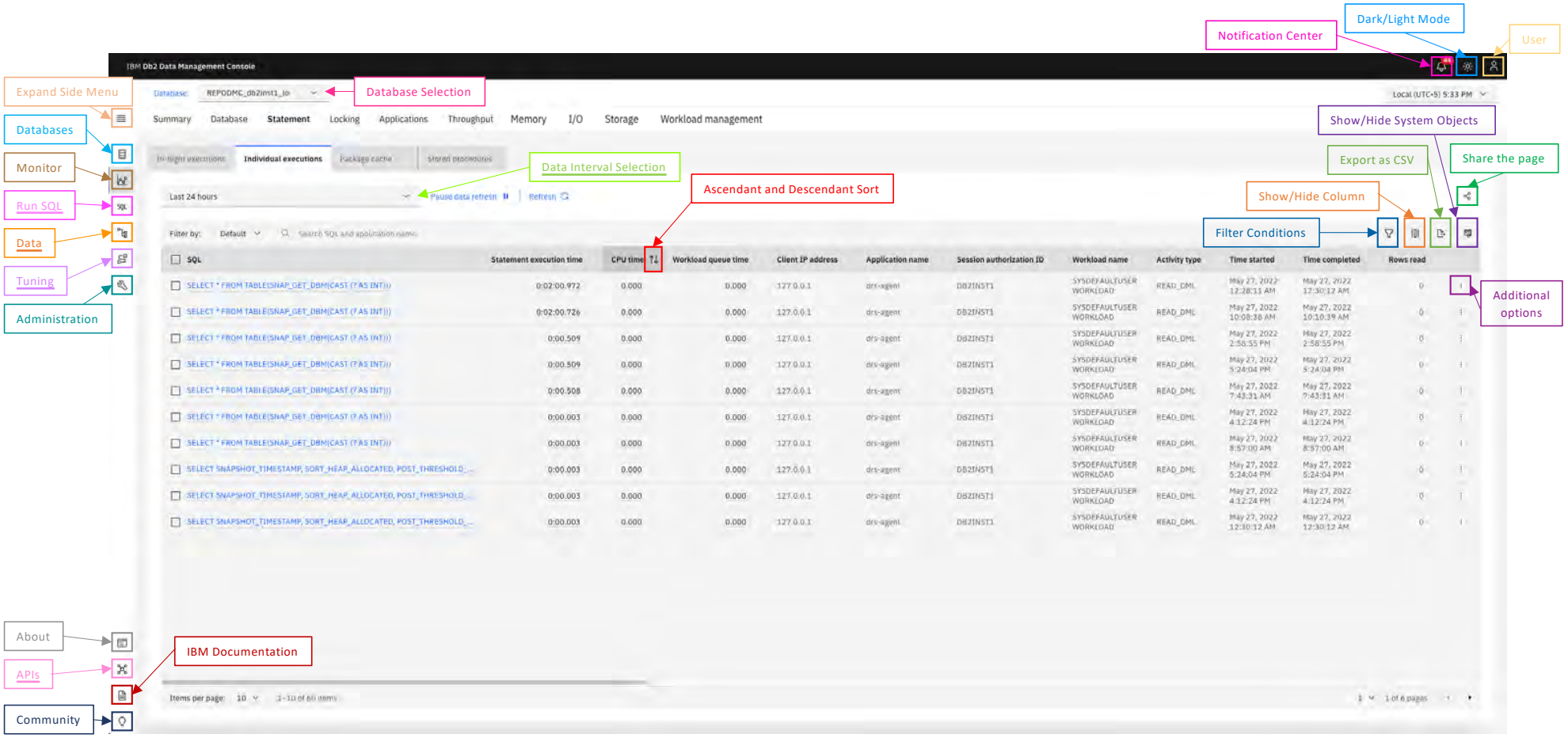
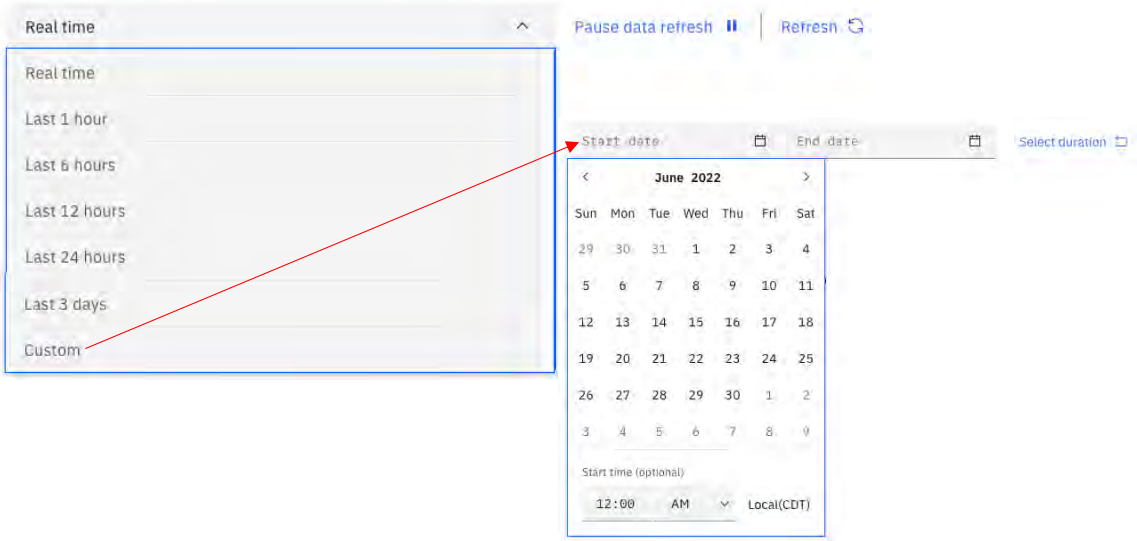
Monitor Database – Understanding Icons

IBM Db2 - Data Management Console



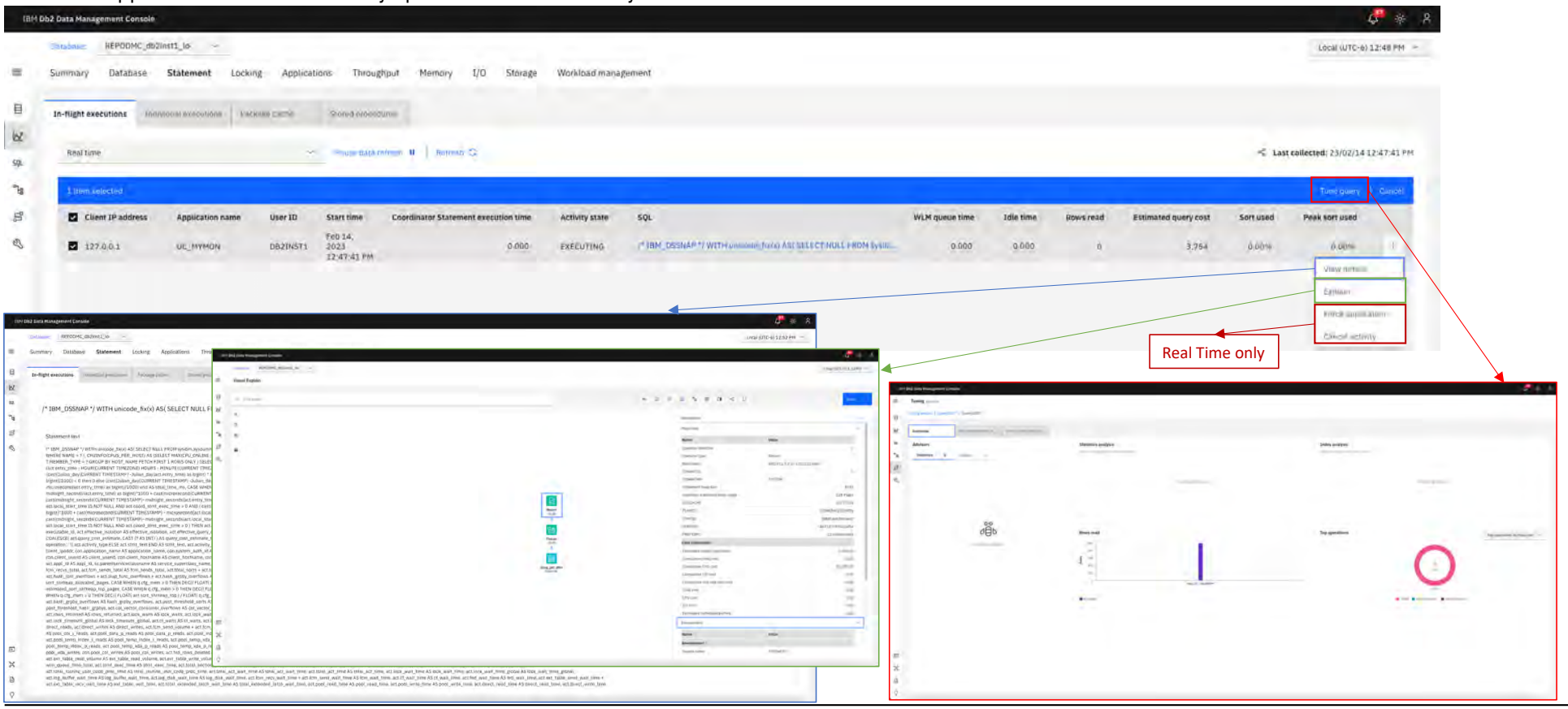
Monitor Database – Show Data Interval

- Sampling data only
- To see all records, use Custom option and specify a date interval



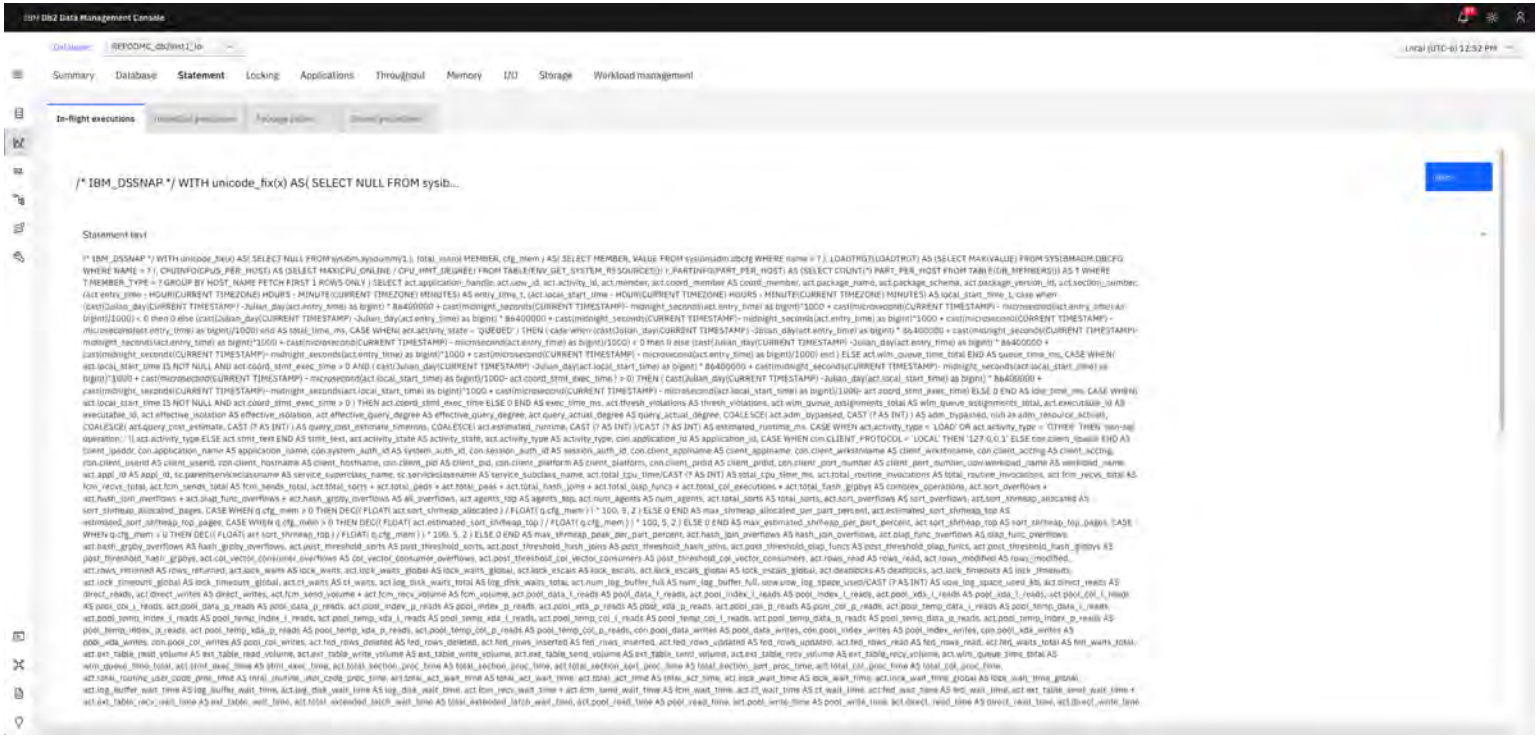
Monitor Statement – Statements

- All captured statements have an option to View details, Visual Explain, and Tune query
- Force application and cancel activity options for Real Time only

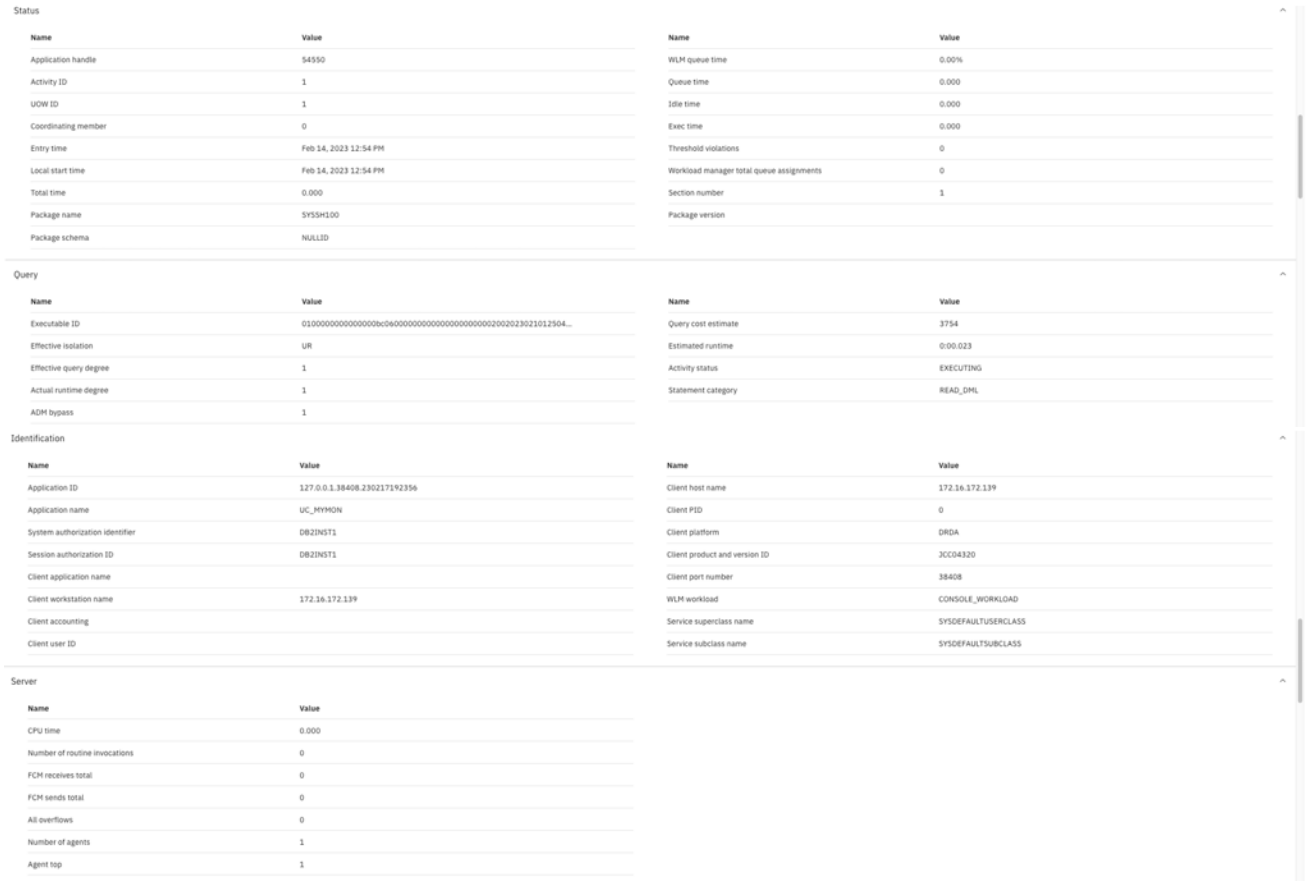


Monitor Statement – Statements – View Details 1/4

- Using the View details option from a statement, drill down for details



Monitor Statement – Statements – View Details 2/4



Status

Name	Value	Name	Value
Application handle	54550	WLM queue time	0.00%
Activity ID	1	Queue time	0.000
UOW ID	1	Idle time	0.000
Coordinating member	0	Exec time	0.000
Entry time	Feb 14, 2023 12:54 PM	Threshold violations	0
Local start time	Feb 14, 2023 12:54 PM	Workload manager total queue assignments	0
Total time	0.000	Section number	1
Package name	SYSSH100	Package version	
Package schema	NULLID		

Query

Name	Value	Name	Value
Executable ID	0100000000000000bc060000000000000000000200202302101250 4...	Query cost estimate	3754
Effective isolation	UR	Estimated runtime	0:00.023
Effective query degree	1	Activity status	EXECUTING
Actual runtime degree	1	Statement category	READ_DML
ADM bypass	1		

Identification

Name	Value	Name	Value
Application ID	127.0.0.1.38408.23021719235 6	Client host name	172.16.172.139
Application name	UC_MYMON	Client PID	0
System authorization identifier	DB2INST1	Client platform	DRDA
Session authorization ID	DB2INST1	Client product and version ID	JCC04320
Client application name		Client port number	38408
Client workstation name	172.16.172.139	WLM workload	CONSOLE_WORKLOAD
Client accounting		Service superclass name	SYSDEFAULTUSERCLASS
Client user ID		Service subclass name	SYSDEFAULTSUBCLASS

Server

Name	Value
CPU time	0.000
Number of routine invocations	0
FCM receives total	0
FCM sends total	0
All overflows	0
Number of agents	1
Agent top	1

Monitor Statement – Statements – View Details 3/4

Sort

Name	Value	Name	Value
Total sorts	0	OLAP function overflows	0
Sort overflows	0	Hash group by overflows	0
Sort share heap currently allocated	41	Post threshold sorts	0
Max share heap allocated per part percent	0.00%	Hash join threshold	0
Estimated sort share heap top pages	61	OLAP function threshold	0
Max estimated share heap per part percent	0.00%	Hash group by threshold	0
Sort share heap high watermark	61	Columnar vector consumer overflows	0
Max share heap peak per part percent	0.00%	Post threshold columnar_vector consumers	0
Hash join overflows	0		

Rows properties

Name	Value
Rows read	0
Rows returned	0
Rows modified	0

Locking

Name	Value
Total lock waits	0
Global lock waits	0
Total lock escalations	0
Lock escalations in CF	0
Total deadlocks	0
Total lock timeouts	0
Global lock timeouts	0
Number of cluster caching facility waits	0

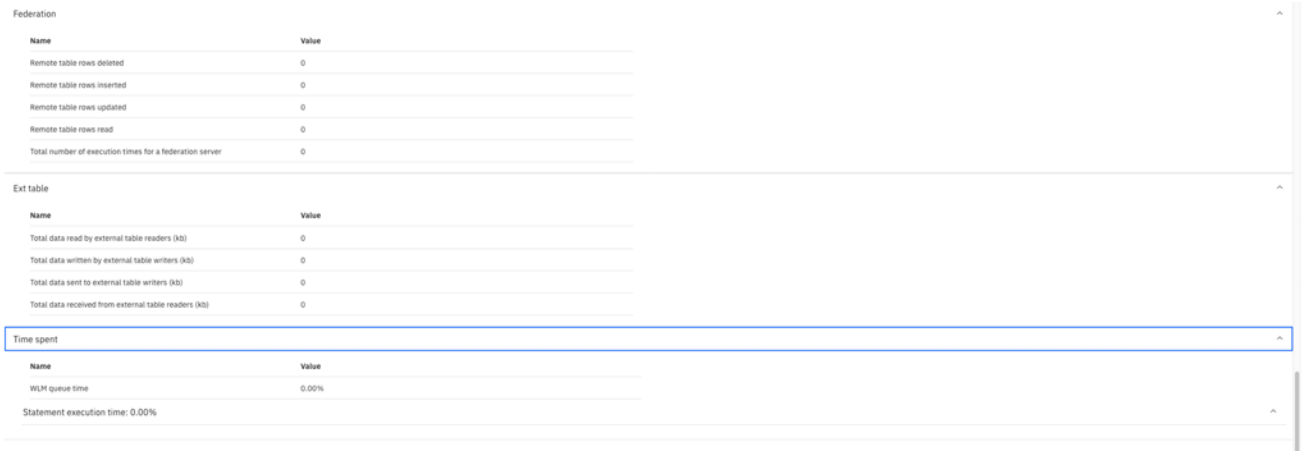
I/O

Name	Value	Name	Value
Direct reads	0	Buffer pool temp physical reads	0
Direct writes	0	Buffer pool logical reads	0
FCM send+receive volume (kb)	0	Buffer pool physical reads	0
Buffer pool temp logical reads	0	Buffer pool writes	0

Log

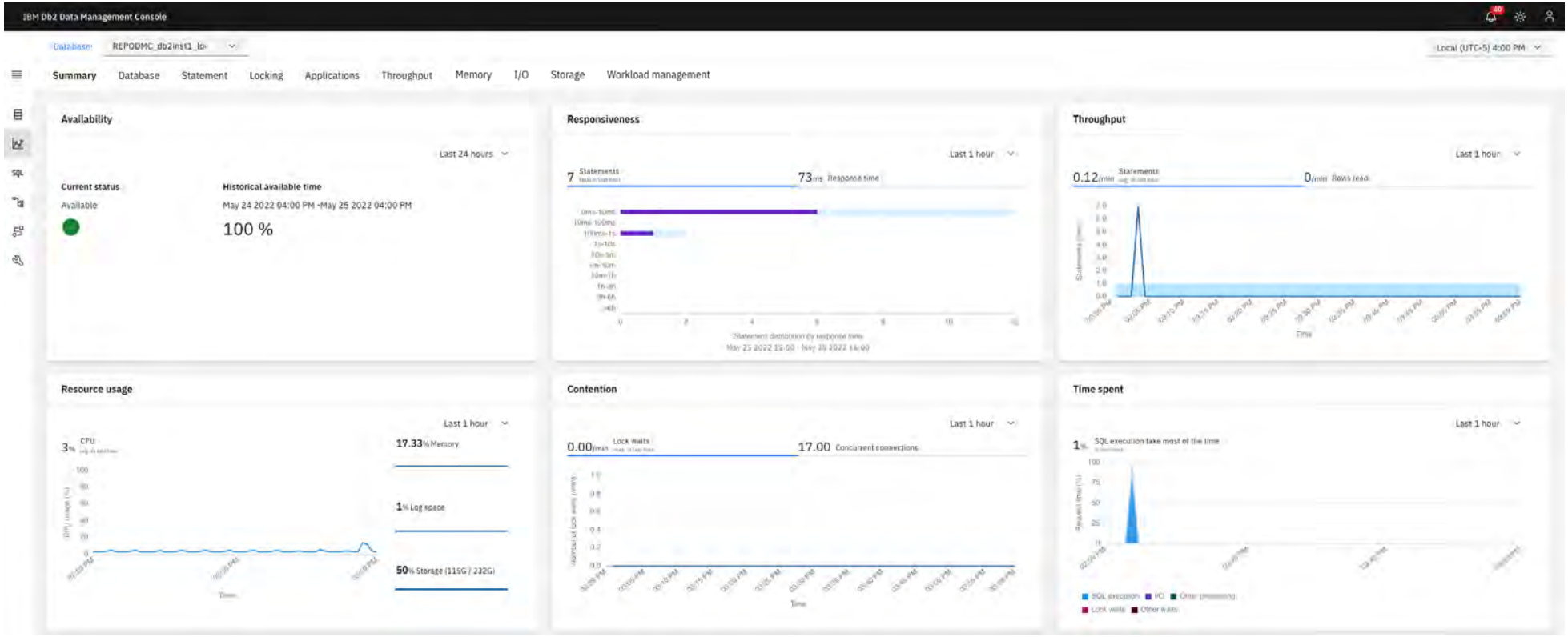
Name	Value
Log disk waits	0
Number of times full log buffer caused agents to wait	0
Unit of work log space used (kb)	0

Monitor Statement – Statements – View Details 4/4



Monitor – Summary

Overview showing main metrics for the monitored database



Additional information

https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=metrics-summary

https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=SS5Q8A_3.1.x/com.ibm.datatools.dsweb.ots.installconfig.doc/topics/consolehome.html#baselinedesc

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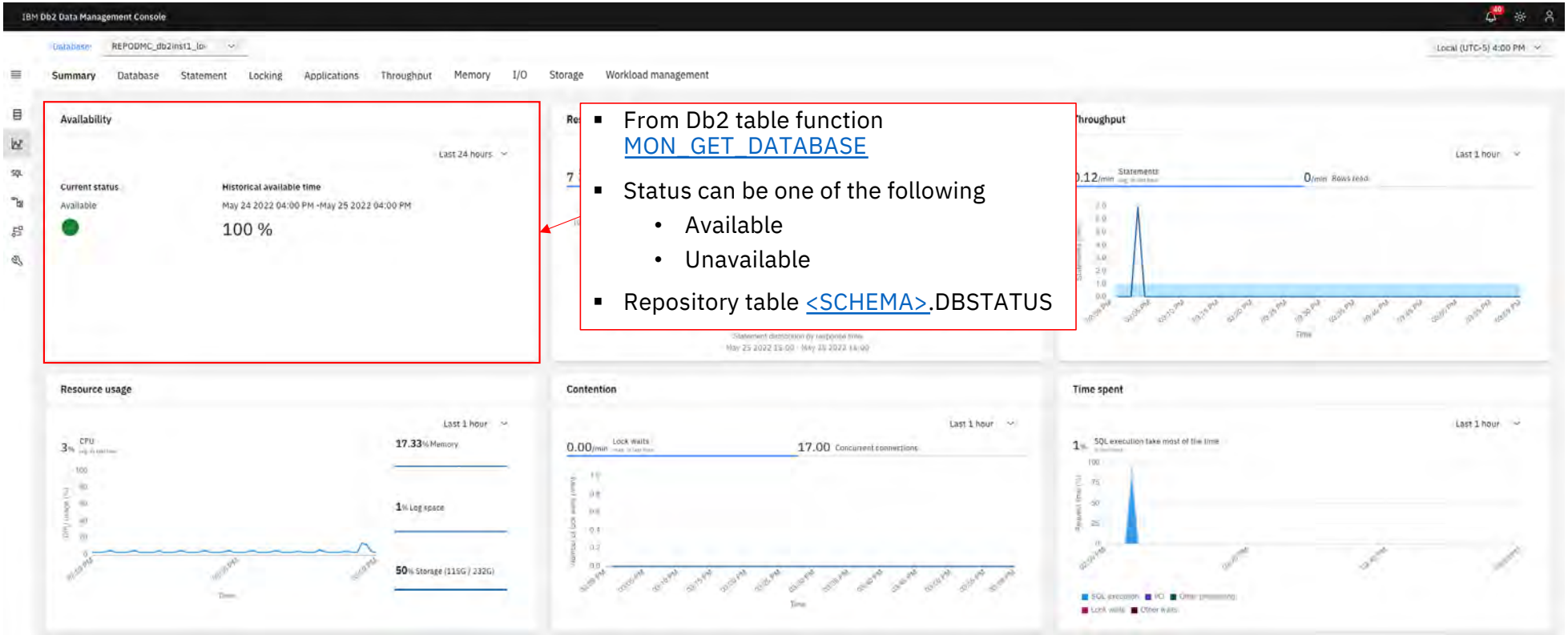
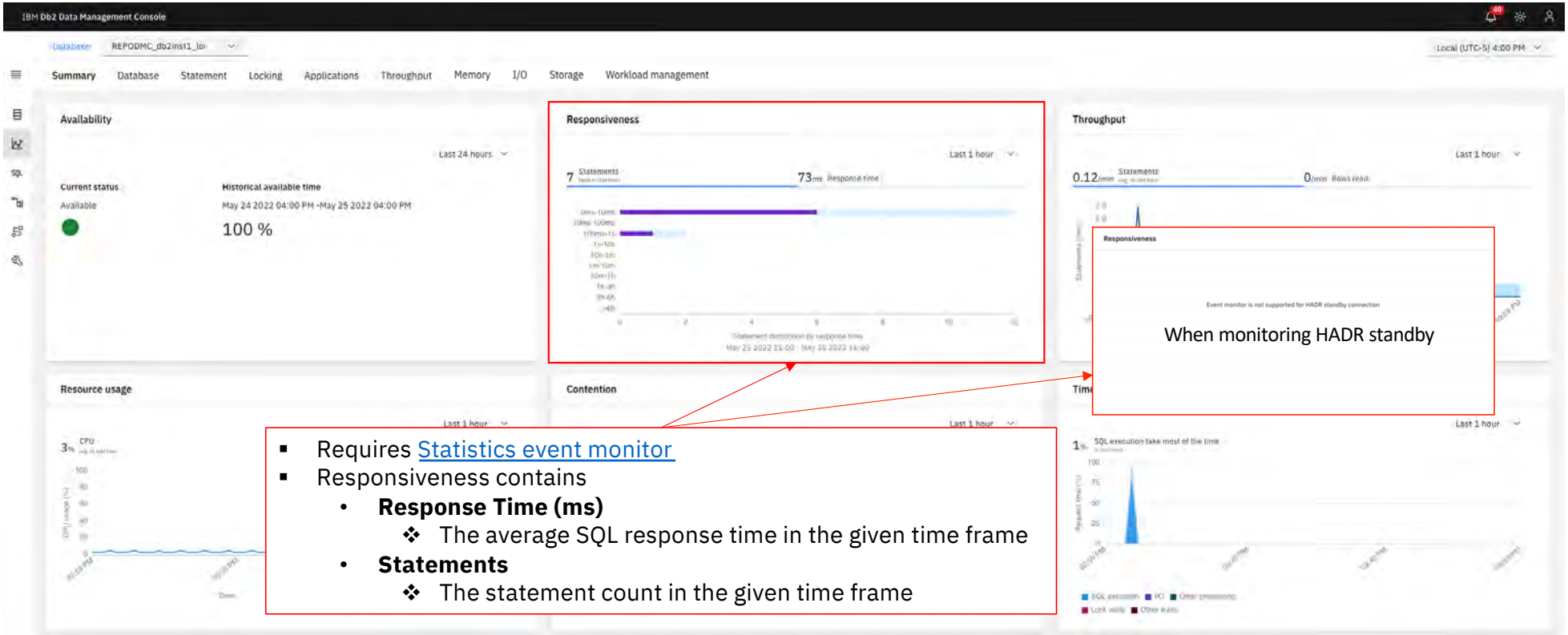
Monitor – Summary – Availability



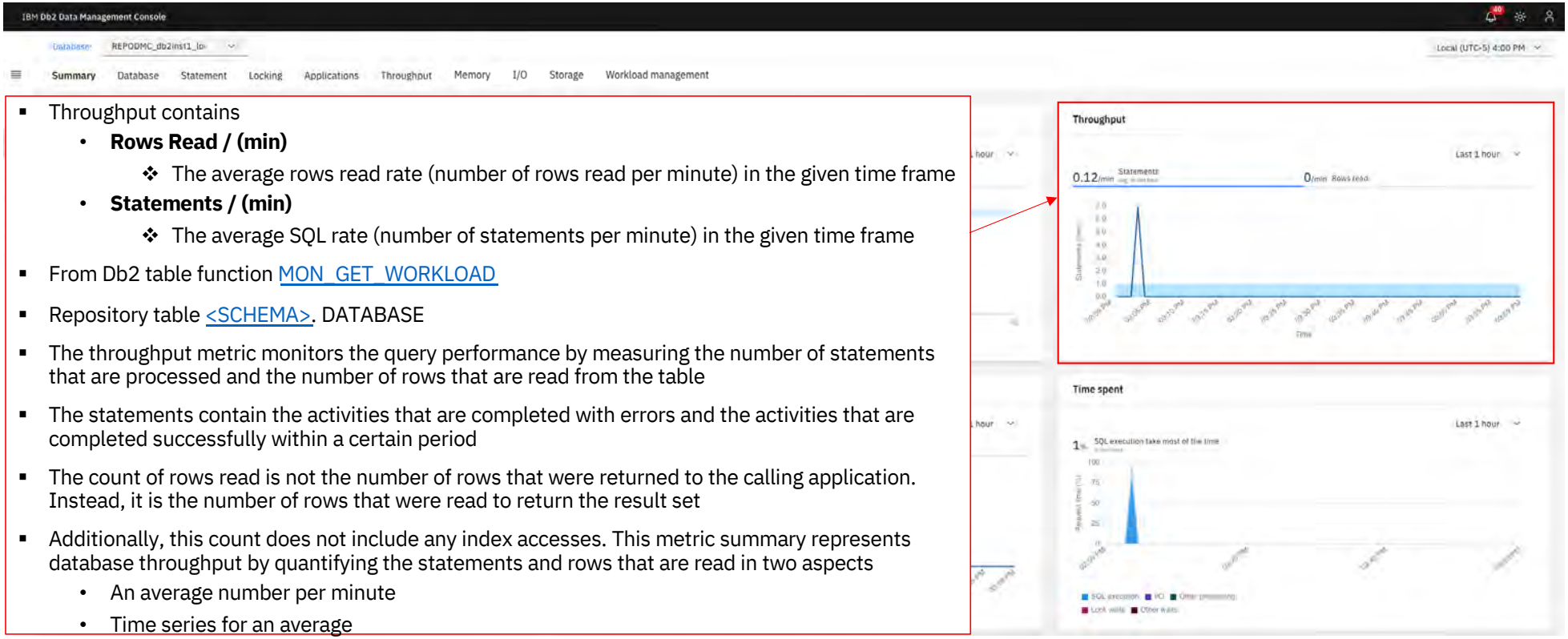
- From Db2 table function MON_GET_DATABASE
- Status can be one of the following
  - Available
  - Unavailable
- Repository table <SCHEMA>.DBSTATUS

Additional information including table description
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=summary-availability

Monitor – Summary – Responsiveness



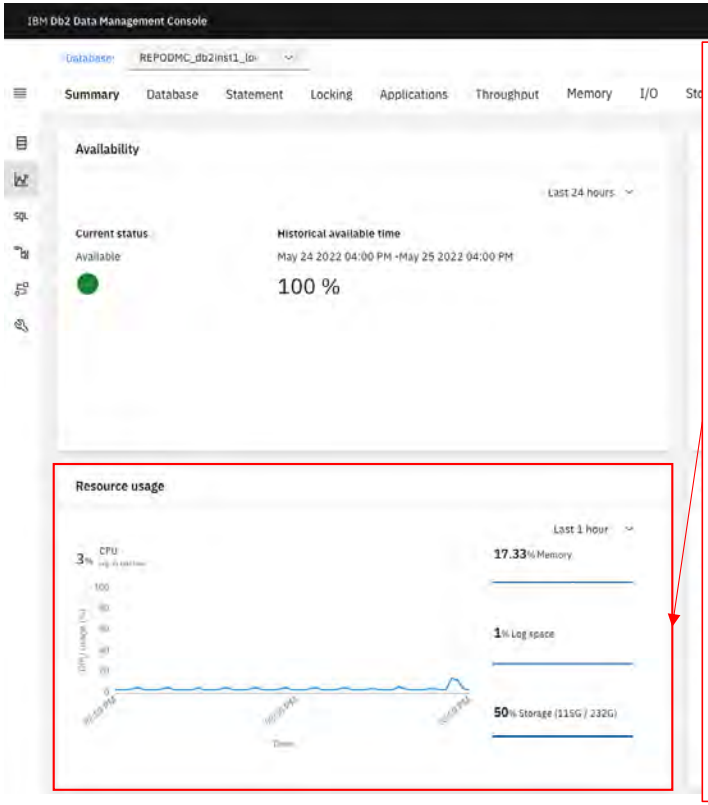
Monitor – Summary – Throughput



- Throughput contains
  - **Rows Read / (min)**
    - ❖ The average rows read rate (number of rows read per minute) in the given time frame
  - **Statements / (min)**
    - ❖ The average SQL rate (number of statements per minute) in the given time frame
- From Db2 table function MON_GET_WORKLOAD
- Repository table <SCHEMA>. DATABASE
- The throughput metric monitors the query performance by measuring the number of statements that are processed and the number of rows that are read from the table
- The statements contain the activities that are completed with errors and the activities that are completed successfully within a certain period
- The count of rows read is not the number of rows that were returned to the calling application. Instead, it is the number of rows that were read to return the result set
- Additionally, this count does not include any index accesses. This metric summary represents database throughput by quantifying the statements and rows that are read in two aspects
  - An average number per minute
  - Time series for an average

Additional information including table description
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=summary-throughput

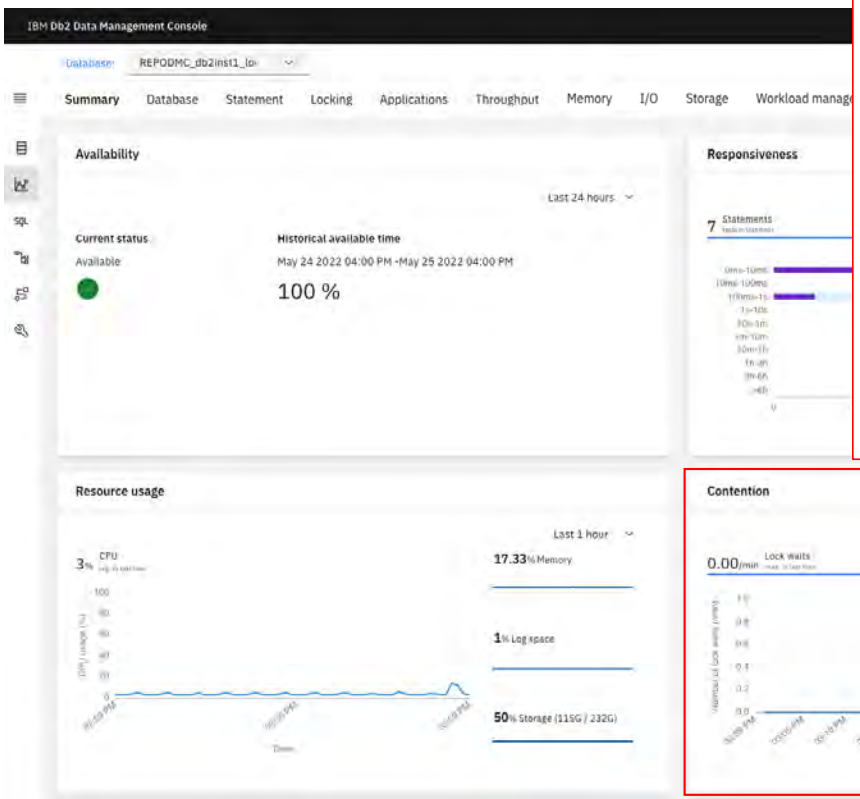
Monitor – Summary – Resource Usage



- Resource usage contains
  - **CPU (%)**
    - The average Db2 CPU usage percentage in the given time frame
    - If the database has multiple nodes, only the master node (member = 0) is considered
  - **Memory (%)**
    - The average memory usage percentage in the given time frame
  - **Storage (%)**
    - The latest storage usage percentage in the given time frame
  - **Log Space (%)**
    - The max log space usage percentage in the given time frame
- From Db2 table function ENV_GET_DB2_SYSTEM_RESOURCES and ENV_GET_SYSTEM_RESOURCES
- SUM(CPU_USER) and SUM(CPU_SYSTEM) from the ENV_GET_DB2_SYSTEM_RESOURCES grouped by database members and joined with the columns from ENV_GET_SYSTEM_RESOURCES for those database members
- Repository tables
  - CPU (%)
    - <SCHEMA>.RESOURCE_CPU
    - Db2WoC - <SCHEMA>.WOLVERINE_API_CPU
  - Memory (%)
    - <SCHEMA>.RESOURCE_MEMORY
    - Db2WoC - <SCHEMA>.WOLVERINE_API_MEMORY
  - Storage (%)
    - <SCHEMA>. RESOURCE_STORAGEGROUP
    - Db2WoC - <SCHEMA>.WOLVERINE_API_STORAGE
  - Log Space (%)
    - <SCHEMA>. RESOURCE_LOGSPACE

Additional information including table description
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=summary-resource-usage

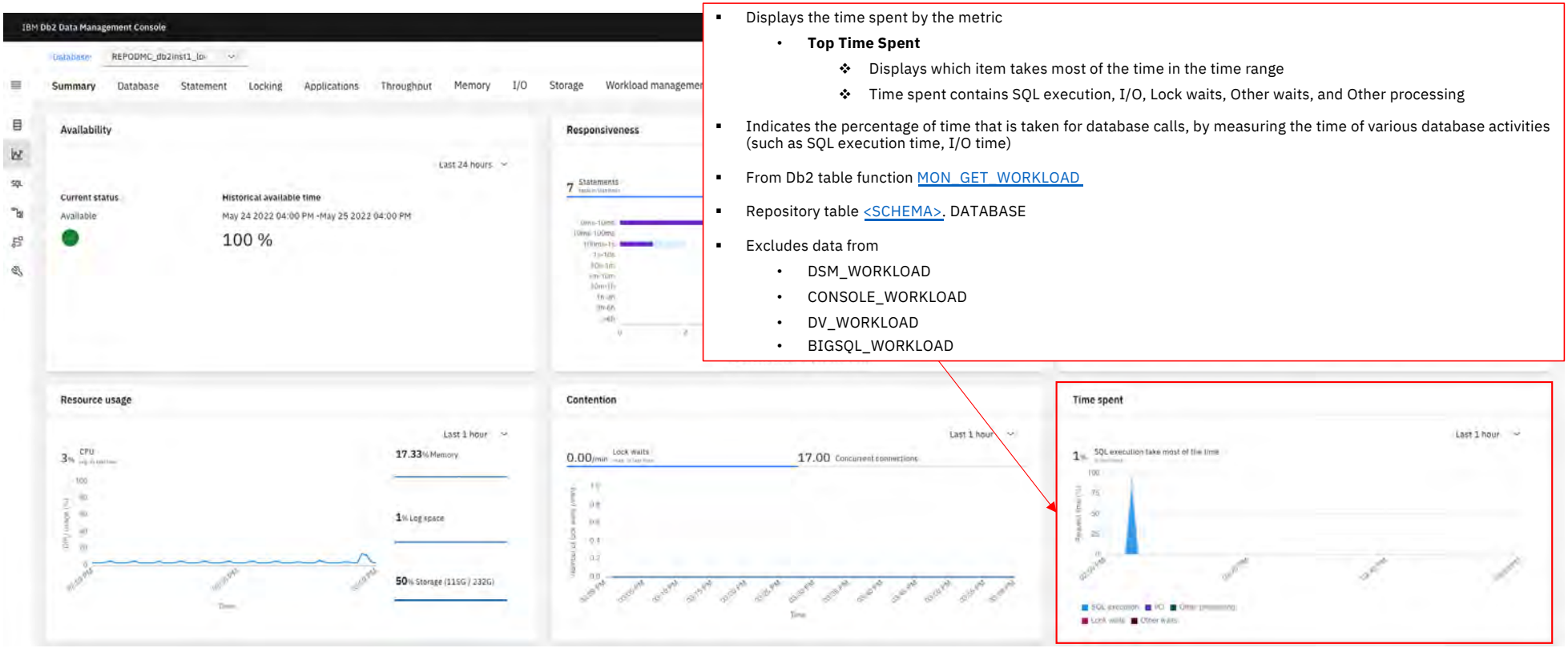
Monitor – Summary – Contention



- Contention contains
  - **Lock Waits(/m)**
    - The max lock waits number per minute in the given time frame
  - **Connections**
    - The max concurrent connections value in the given time frame
- Database contention situation by measuring lock-waits and concurrent database connections
- From Db2 table functions MON_GET_ACTIVITY and MON_GET_CONNECTION
- The data for lock-waits is collected from repository table <SCHEMA>.DATABASE
- The data for concurrent database connections is collected from
  - <SCHEMA>. CONTENTION_CONNECTION
  - <SCHEMA>.ONLINE_CONNECTION
- Repository tables
  - Information in <SCHEMA>. CONTENTION_CONNECTION table is from MON_GET_CONNECTION
  - Information in <SCHEMA>.ONLINE_CONNECTION is from MON_GET_ACTIVITY and MON_GET_CONNECTION

Additional information including table description
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=summary-contention

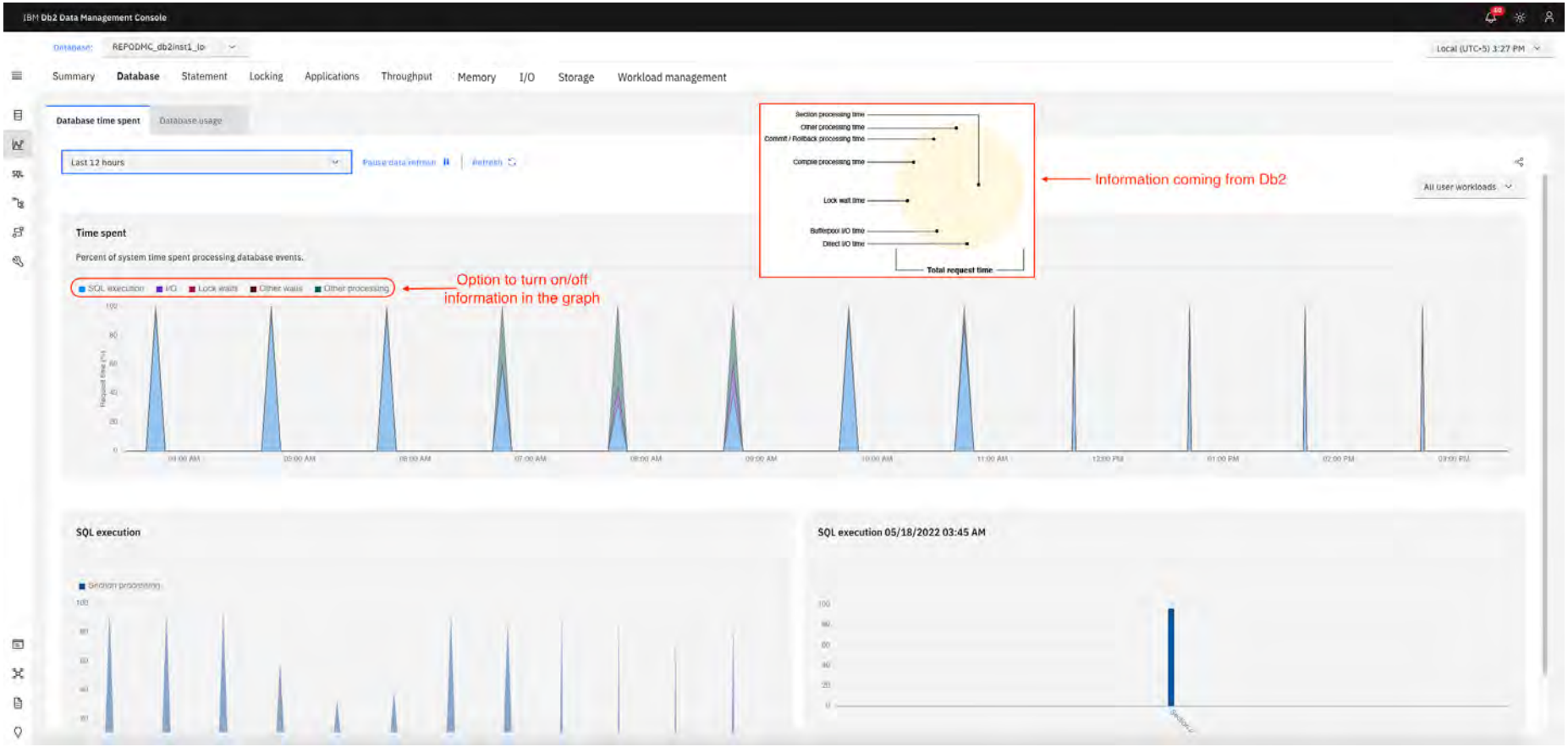
Monitor – Summary – Time Spent



- Displays the time spent by the metric
  - **Top Time Spent**
    - ❖ Displays which item takes most of the time in the time range
    - ❖ Time spent contains SQL execution, I/O, Lock waits, Other waits, and Other processing
- Indicates the percentage of time that is taken for database calls, by measuring the time of various database activities (such as SQL execution time, I/O time)
- From Db2 table function MON_GET_WORKLOAD
- Repository table <SCHEMA>. DATABASE
- Excludes data from
  - DSM_WORKLOAD
  - CONSOLE_WORKLOAD
  - DV_WORKLOAD
  - BIGSQL_WORKLOAD

Additional information including table description
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=summary-time-spent

Monitor Database – Database time spent



Monitor Database – Database time spent details

Metrics from MON_GET_WORKLOAD function:

Category: SQL execution
- TOTAL_SECTION_PROC_TIME
- TOTAL_COL_PROC_TIME
- TOTAL_ROUTINE_USER_CODE_PROC_TIME

Category: I/O
- POOL_READ_TIME
- POOL_WRITE_TIME
- DIRECT_READ_TIME
- DIRECT_WRITE_TIME

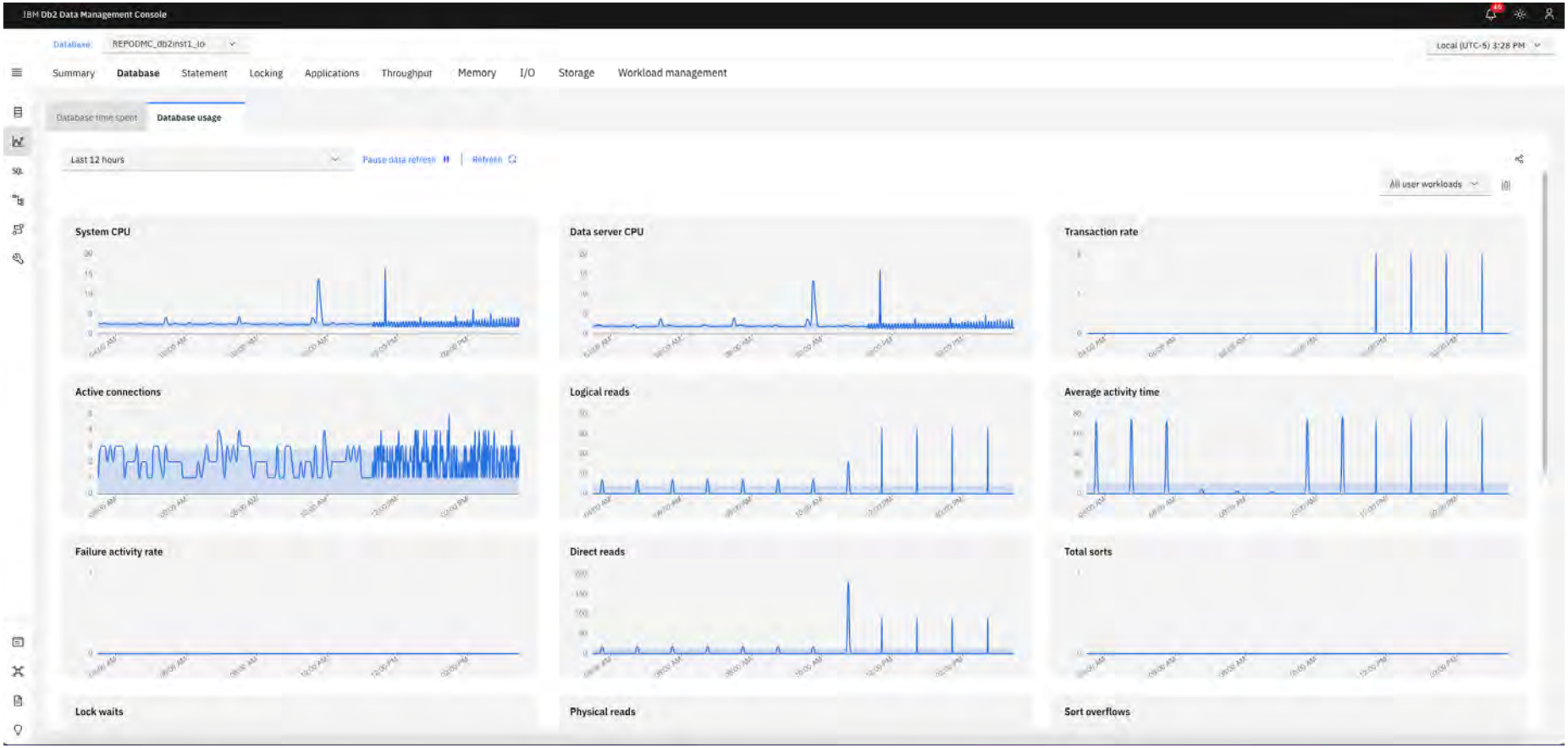
Category: Lock waits
- LOCK_WAIT_TIME
- LOCK_WAIT_TIME_GLOBAL

Category: Other waits
- AGENT_WAIT_TIME
- WLM_QUEUE_TIME_TOTAL
- LOG_BUFFER_WAIT_TIME
- LOG_DISK_WAIT_TIME
- TCPIP_RECV_WAIT_TIME
- TCPIP_SEND_WAIT_TIME
- IPC_SEND_WAIT_TIME
- IPC_RECV_WAIT_TIME
- AUDIT_SUBSYSTEM_WAIT_TIME
- AUDIT_FILE_WRITE_WAIT_TIME
- DIAGLOG_WRITE_WAIT_TIME
- EVMON_WAIT_TIME
- TOTAL_EXTENDED_LATCH_WAIT_TIME
- PREFETCH_WAIT_TIME
- COMM_EXIT_WAIT_TIME
- IDA_SEND_WAIT_TIME
- IDA_RECV_WAIT_TIME
- RECLAIM_WAIT_TIME
- SPACEMAPPAGE_RECLAIM_WAIT_TIME
- FED_WAIT_TIME

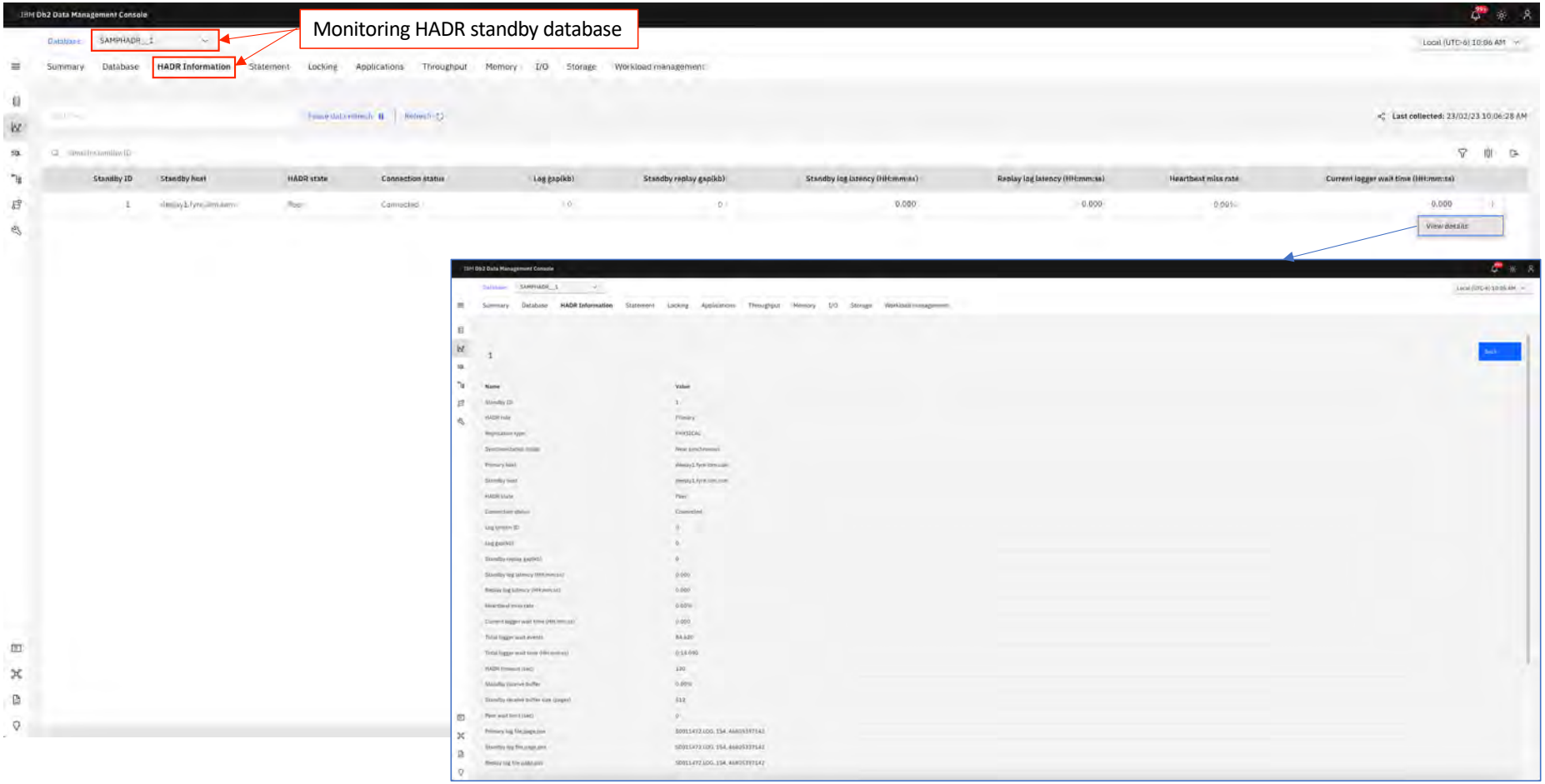
Category: Other processing
- TOTAL_COMPILE_PROC_TIME
- TOTAL_IMPLICIT_COMPILE_PROC_TIME
- TOTAL_LOAD_PROC_TIME
- TOTAL_REORG_PROC_TIME
- TOTAL_RUNSTATS_PROC_TIME
- TOTAL_CONNECT_REQUEST_PROC_TIME
- TOTAL_CONNECT_AUTHENTICATION_PROC_TIME
- TOTAL_COMMIT_PROC_TIME
- TOTAL_ROLLBACK_PROC_TIME
- TOTAL_BACKUP_PROC_TIME
- TOTAL_INDEX_BUILD_PROC_TIME

Additional information
- Metrics from MON_GET_WORKLOAD function
  https://www.ibm.com/docs/en/db2/11.5?topic=functions-mon-get-workload-get-workload-metrics
- Additional Db2 information
  https://www.ibm.com/docs/en/db2/11.5?topic=elements-time-spent-monitor

Monitor Database – Database usage

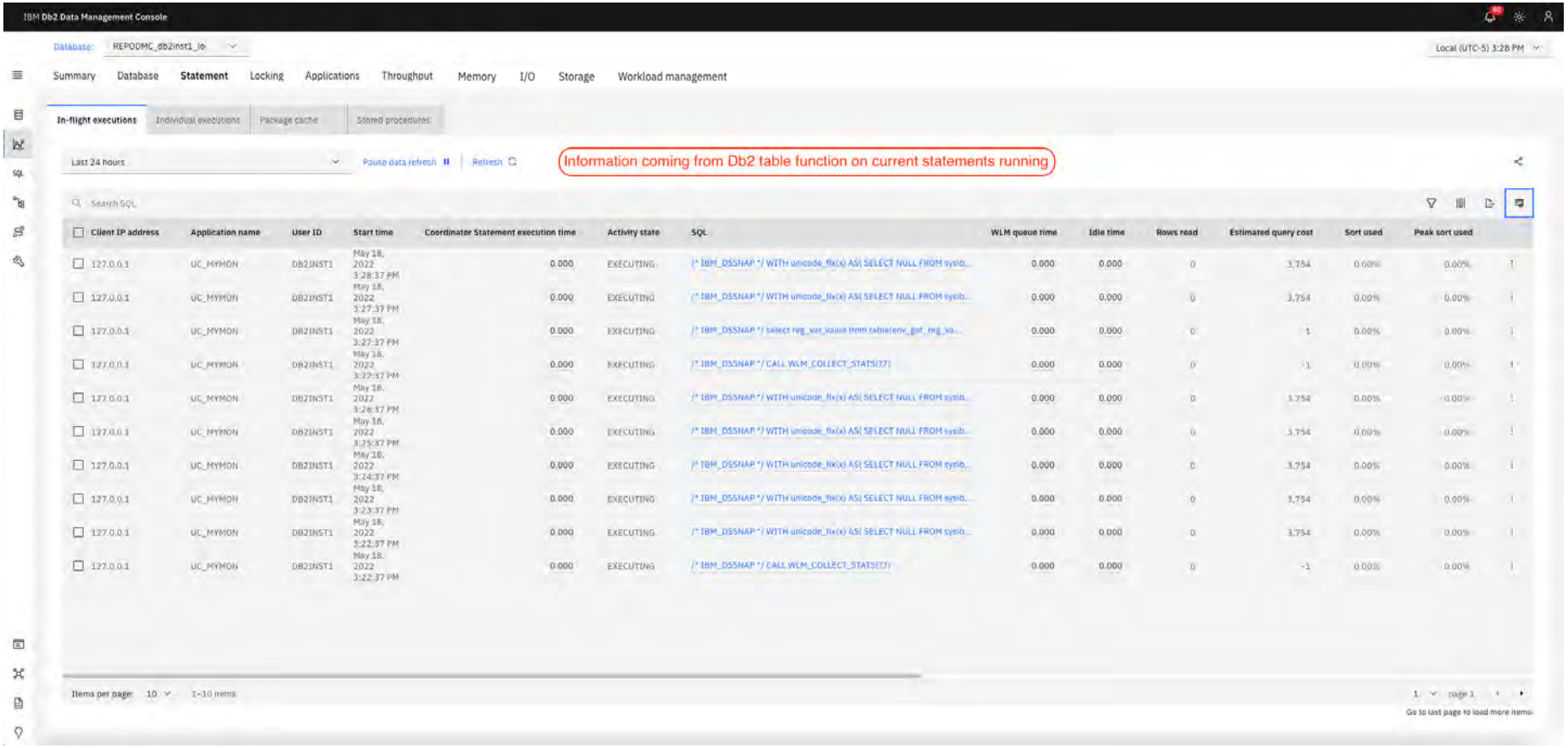


Monitor – HADR Information



Monitor Statement – In-flight executions

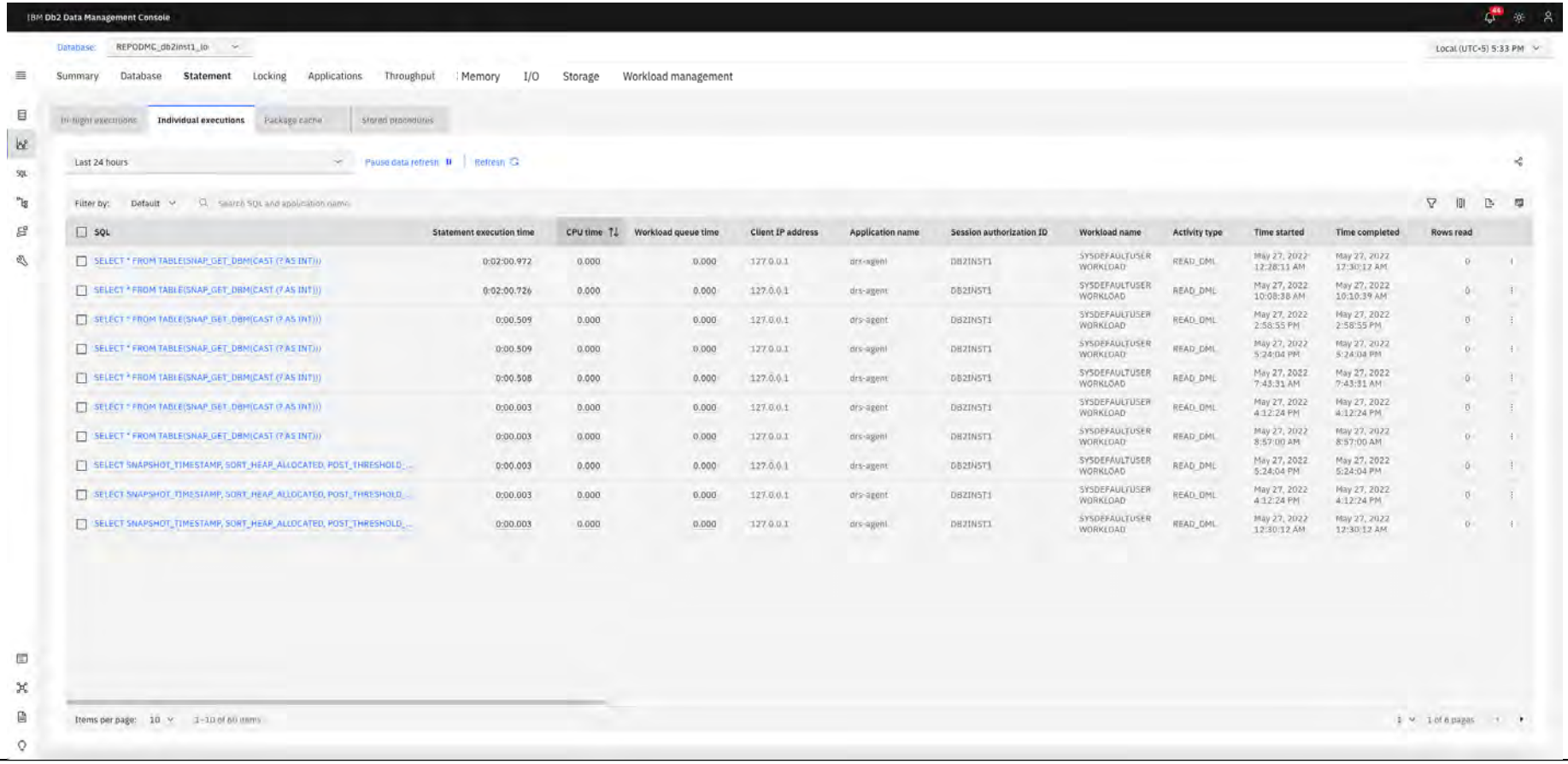
Current statements running at the moment of the collection interval configured in the monitoring profile



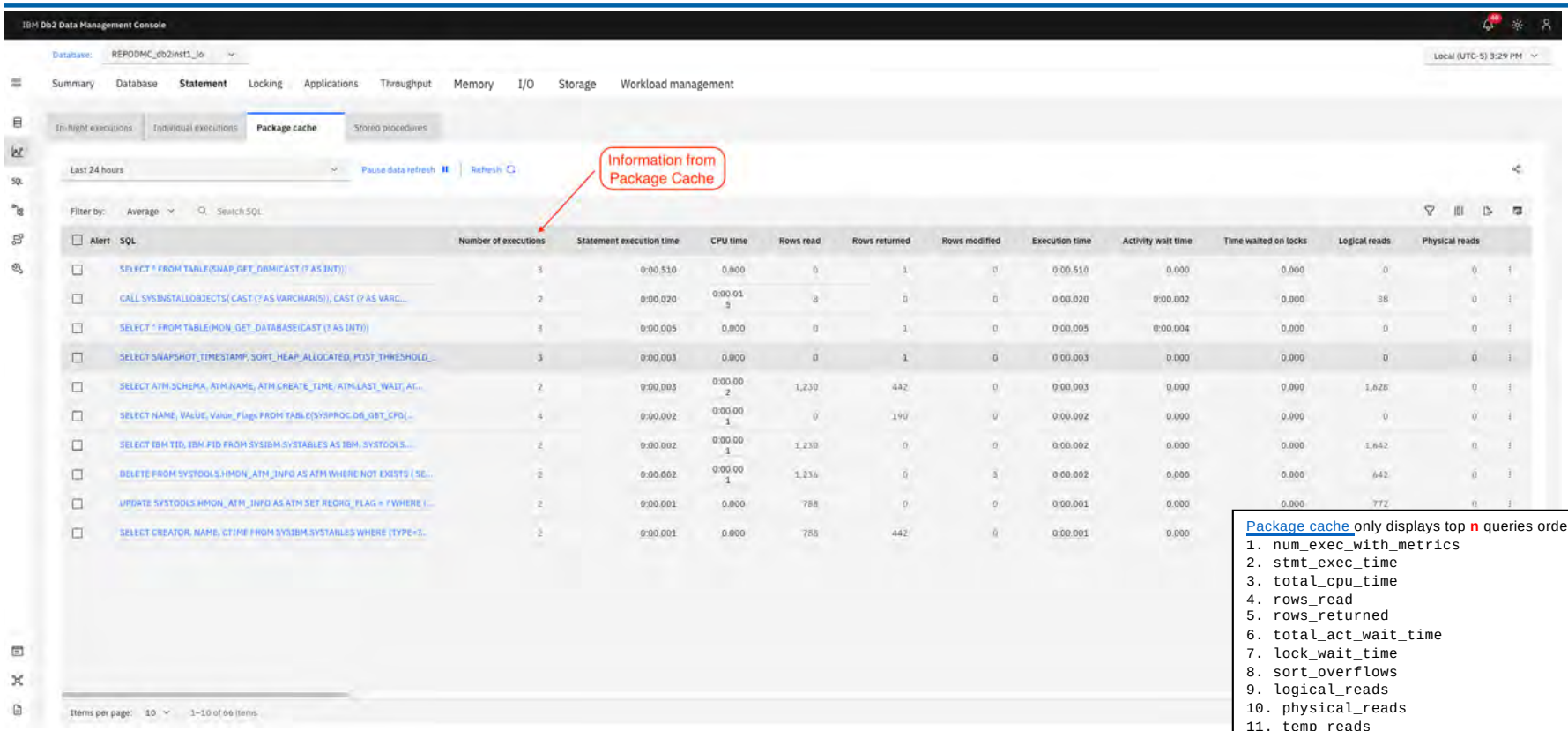
Monitor Statement – Individual executions

IBM Db2 - Data Management Console

Requires Activity Event Monitor



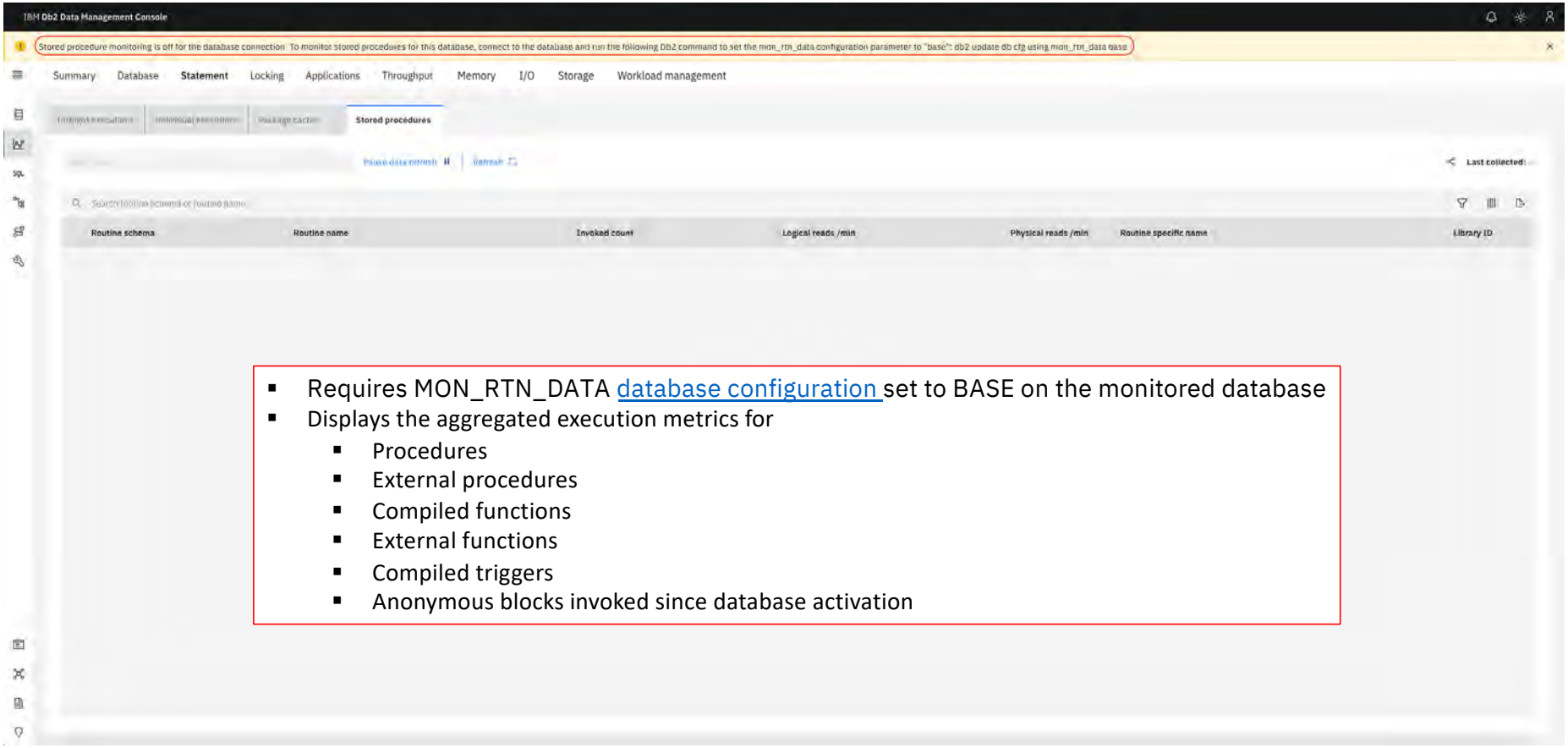
Monitor Statement – Package cache



Package cache only displays top **n** queries order by 16 KPIs

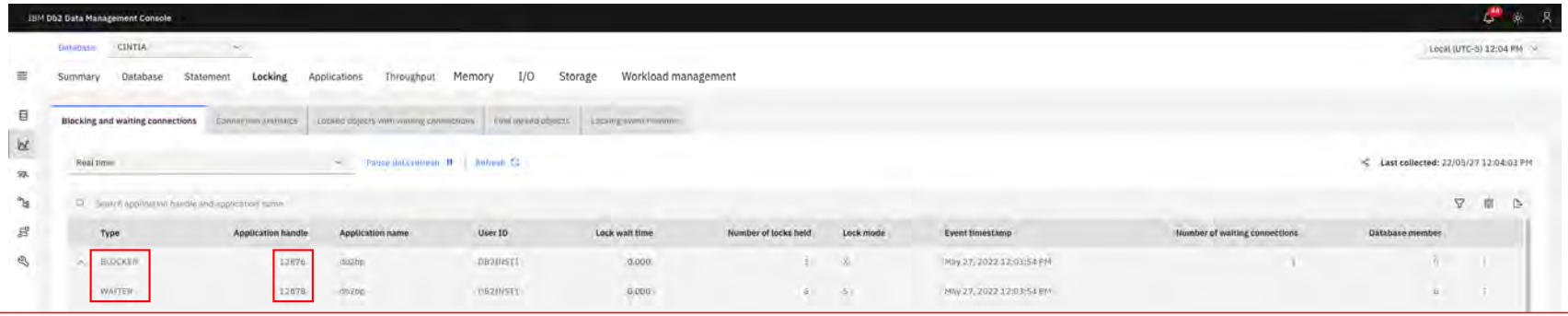
1. num_exec_with_metrics
2. stmt_exec_time
3. total_cpu_time
4. rows_read
5. rows_returned
6. total_act_wait_time
7. lock_wait_time
8. sort_overflows
9. logical_reads
10. physical_reads
11. temp_reads
12. pool_data_l_reads
13. pool_index_l_reads
14. lock_escals
15. lock_waits
16. wlm_queue_time_total

Monitor Statement – Stored procedures



- Requires MON_RTN_DATA database configuration set to BASE on the monitored database
- Displays the aggregated execution metrics for
  - Procedures
  - External procedures
  - Compiled functions
  - External functions
  - Compiled triggers
  - Anonymous blocks invoked since database activation

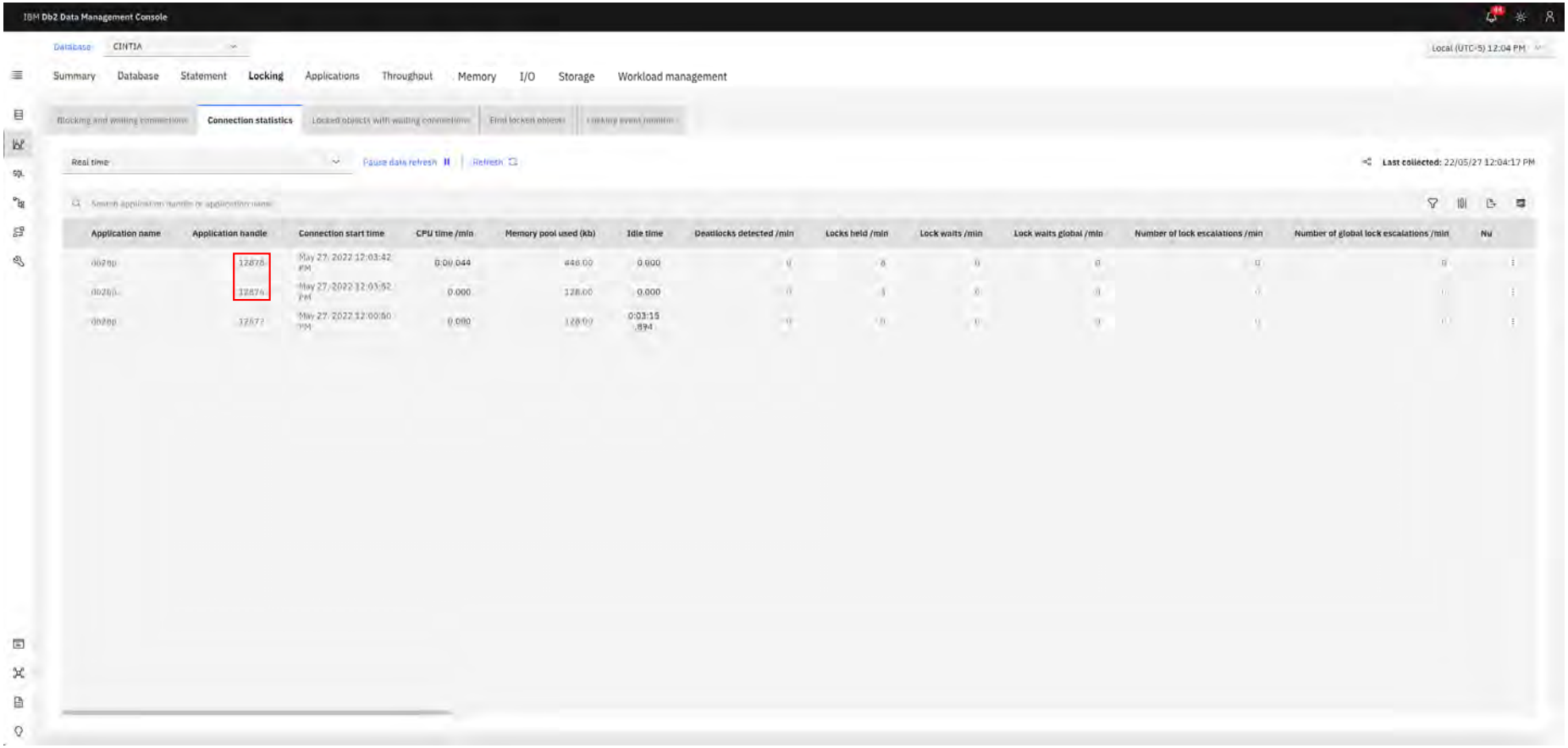
Monitor Locking – Blocking and waiting connections



- Information about the blocker and waiter pair
- Table functions
  - MON_GET_APPL_LOCKWAIT
  - MON_GET_CONNECTION
  - MON_GET_ACTIVITY
  - MON_GET_PKG_CACHE_STMT
- To retrieve connection information for BLOCKER connections, information is gathered using the table function MON_GET_CONNECTION with parameters (HLD_APPLICATION_HANDLE, and HLD_MEMBER) which is collected from MON_GET_APPL_LOCKWAIT
- To retrieve connection information for WAITER connections, information is gathered using the table function MON_GET_CONNECTION with parameters (REQ_APPLICATION_HANDLE, and REQ_MEMBER) which is collected from MON_GET_APPL_LOCKWAIT
- To get the SQL statement of the application holding the lock, MON_GET_PKG_CACHE_STMT with parameters (NULL, LAST_EXECUTABLE_ID, NULL, and HLD_MEMBER) is used, where LAST_EXECUTABLE_ID is collected from MON_GET_CONNECTION and HLD_MEMBER is collected from MON_GET_APPL_LOCKWAIT
- To get the SQL statement for the waiting application, MON_GET_ACTIVITY with parameters (REQ_APPLICATION_HANDLE, and REQ_MEMBER) is used, which is collected from MON_GET_APPL_LOCKWAIT
- Repository table <SCHEMA>. LOCKPAIR

Additional information including table description
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=metrics-blocking-waiting-connections

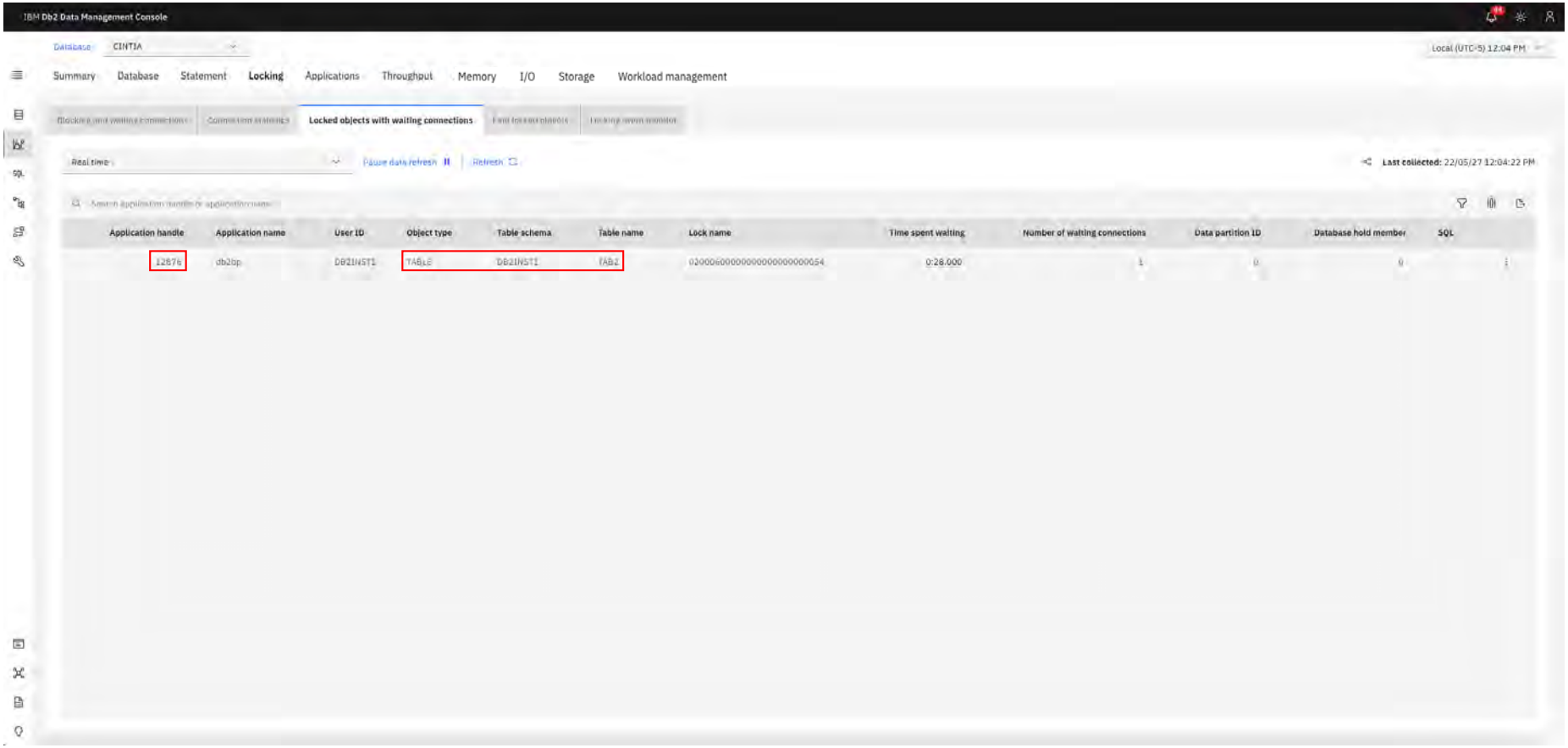
Monitor Locking – Connection statistics



Monitor Locking – Locked objects with waiting connections

IBM Db2 - Data Management Console

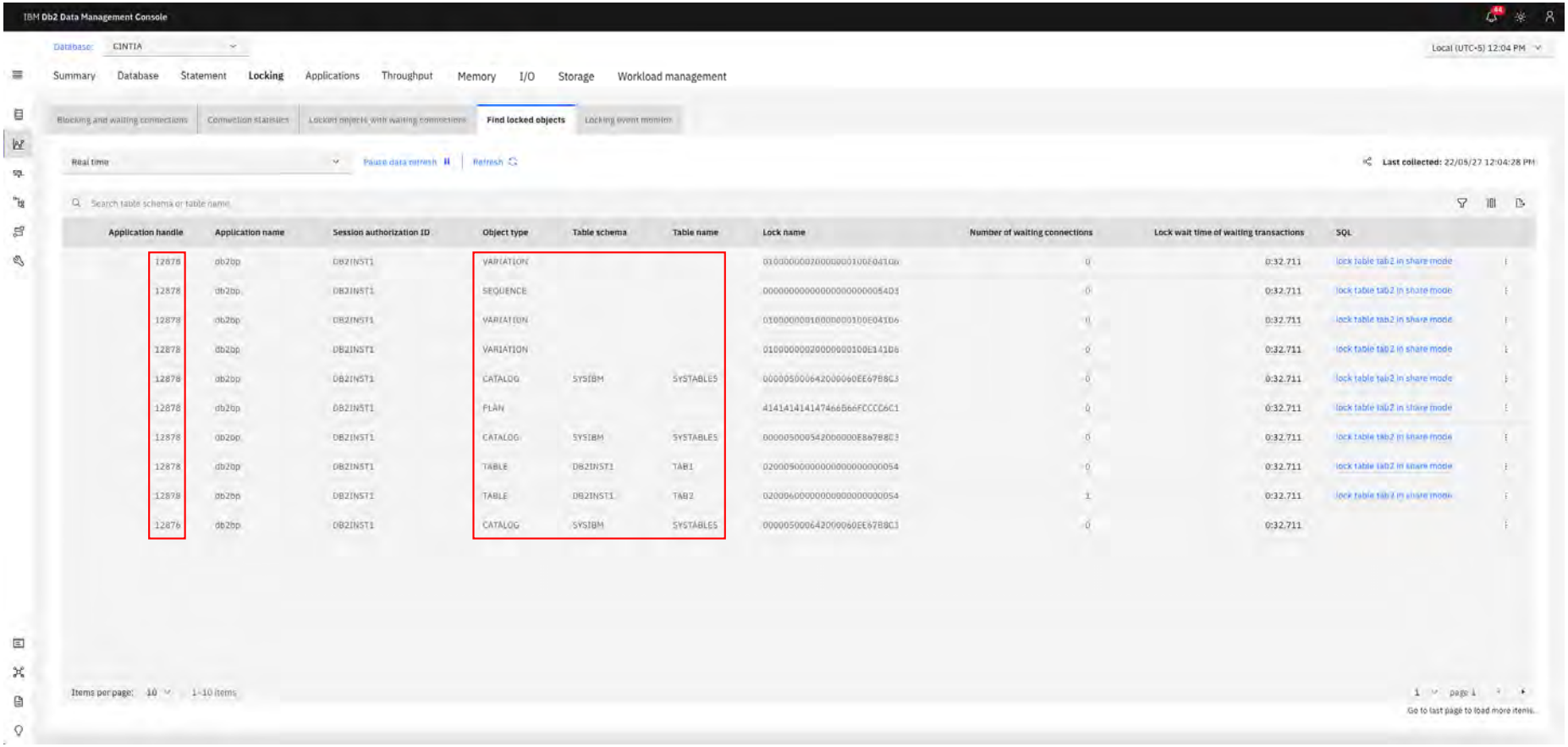
Displays the detailed data of the locked process and information of the process that blocked it



Monitor Locking – Find locked objects

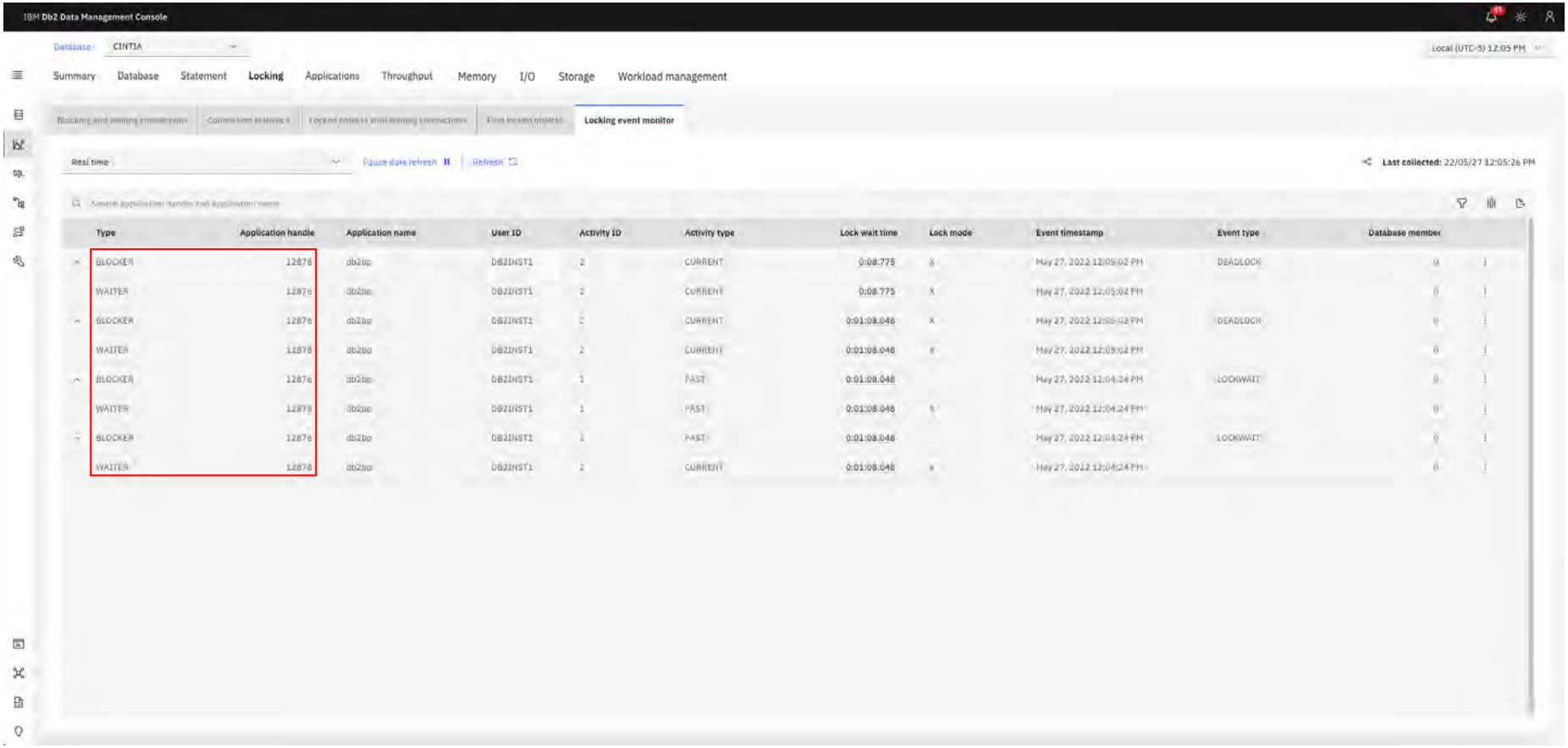
IBM Db2 - Data Management Console

Displays the detailed information of locked operations



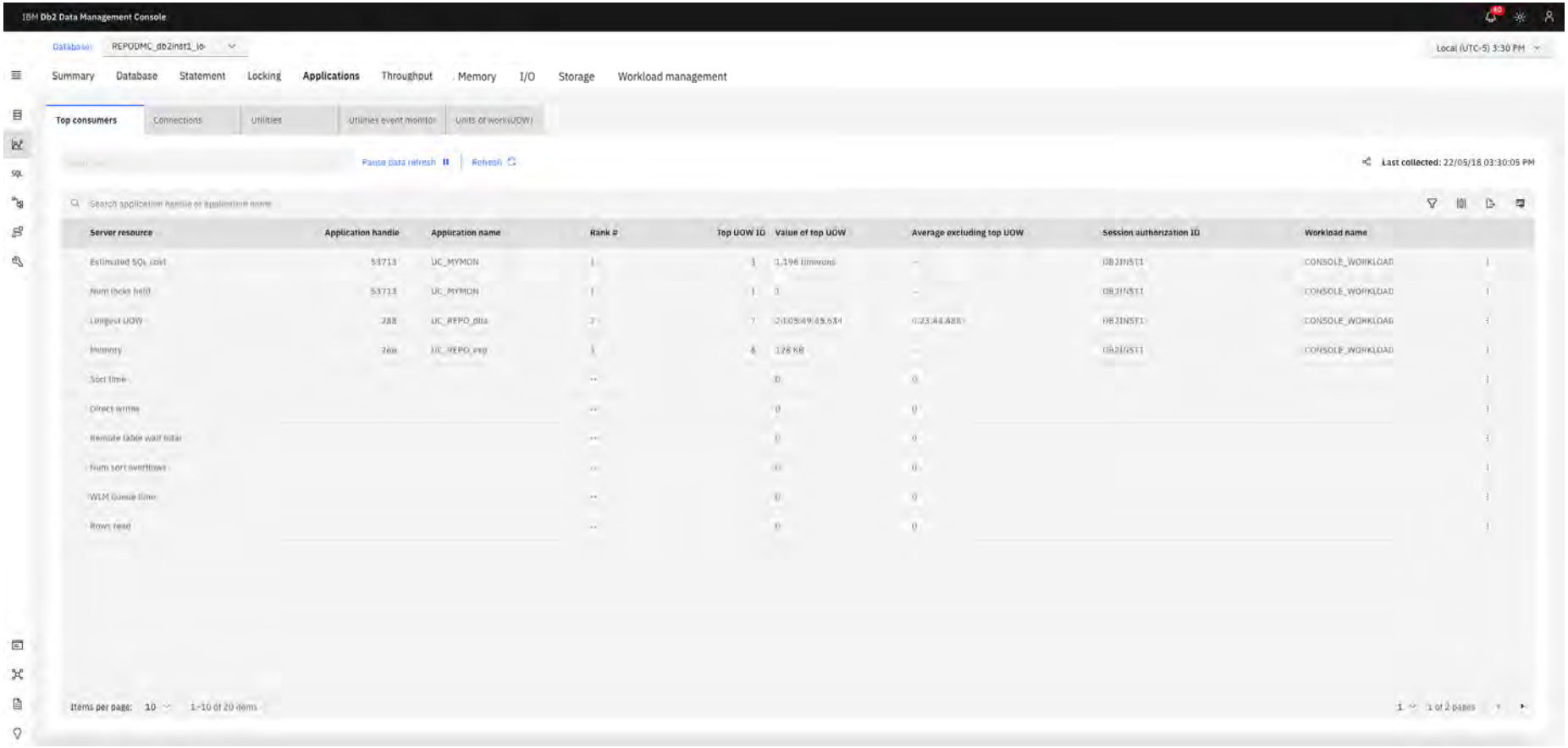
Monitor Locking – Locking event monitor

Requires locking event monitor

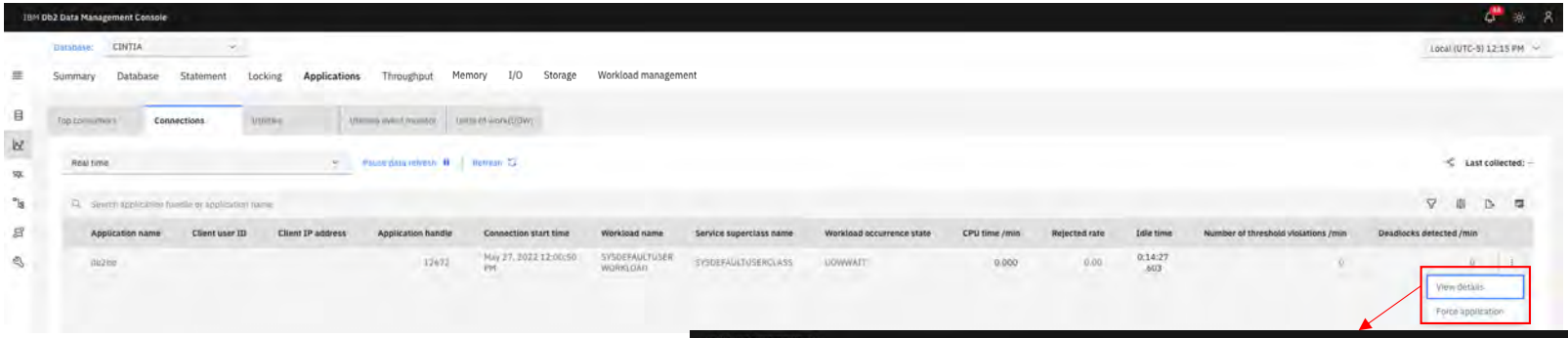


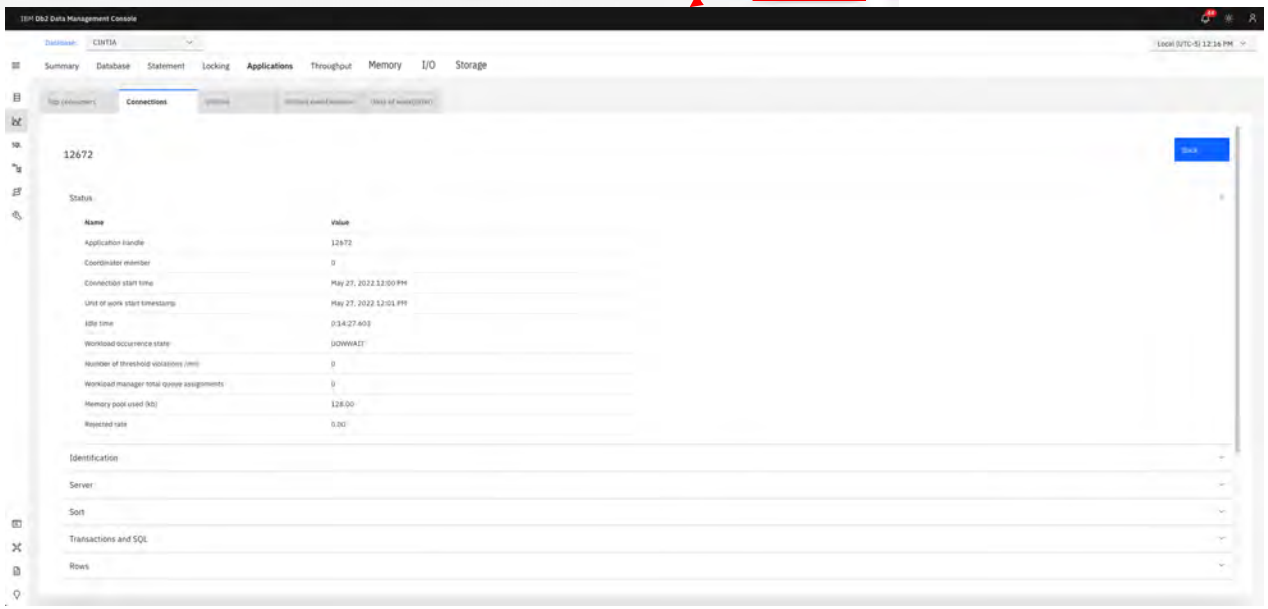
Monitor Applications – Top consumers

Displays the top consumers of the system resources



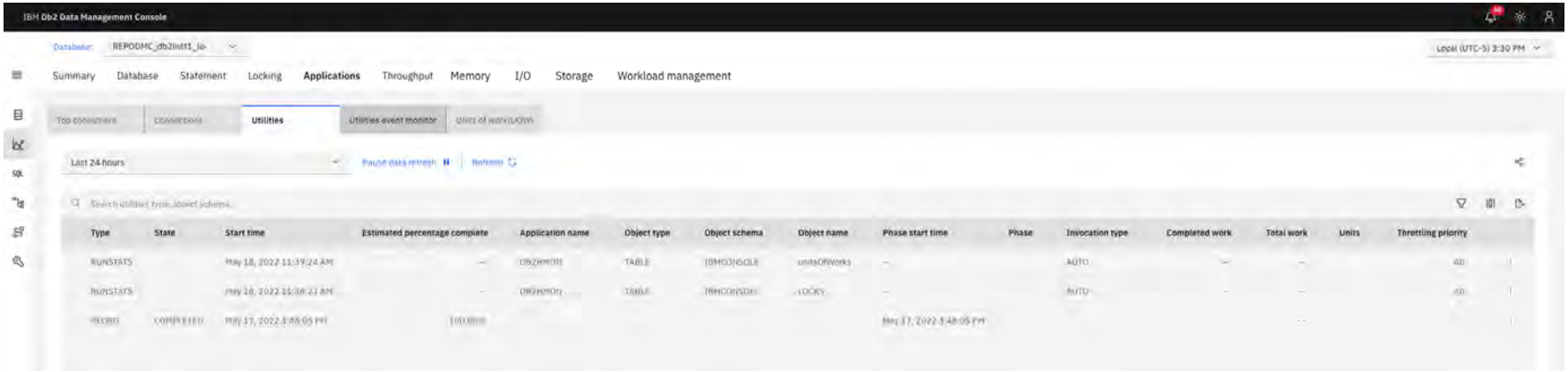
Monitor Applications – Connections





- Application details
- Force application using Personal Credentials
- Force application option only available for Real time view

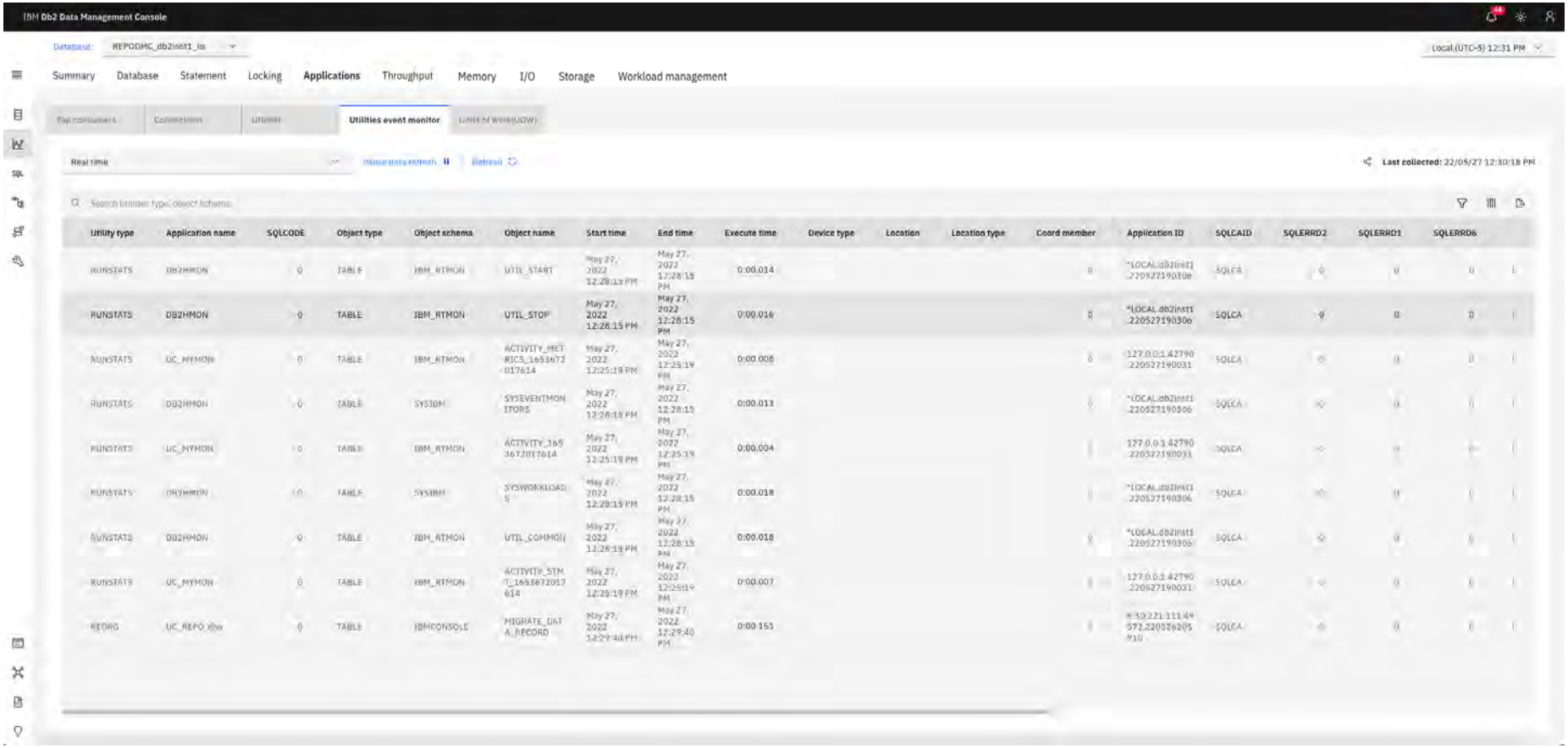
Monitor Applications – Utilities



Monitor Applications – Utilities event monitor

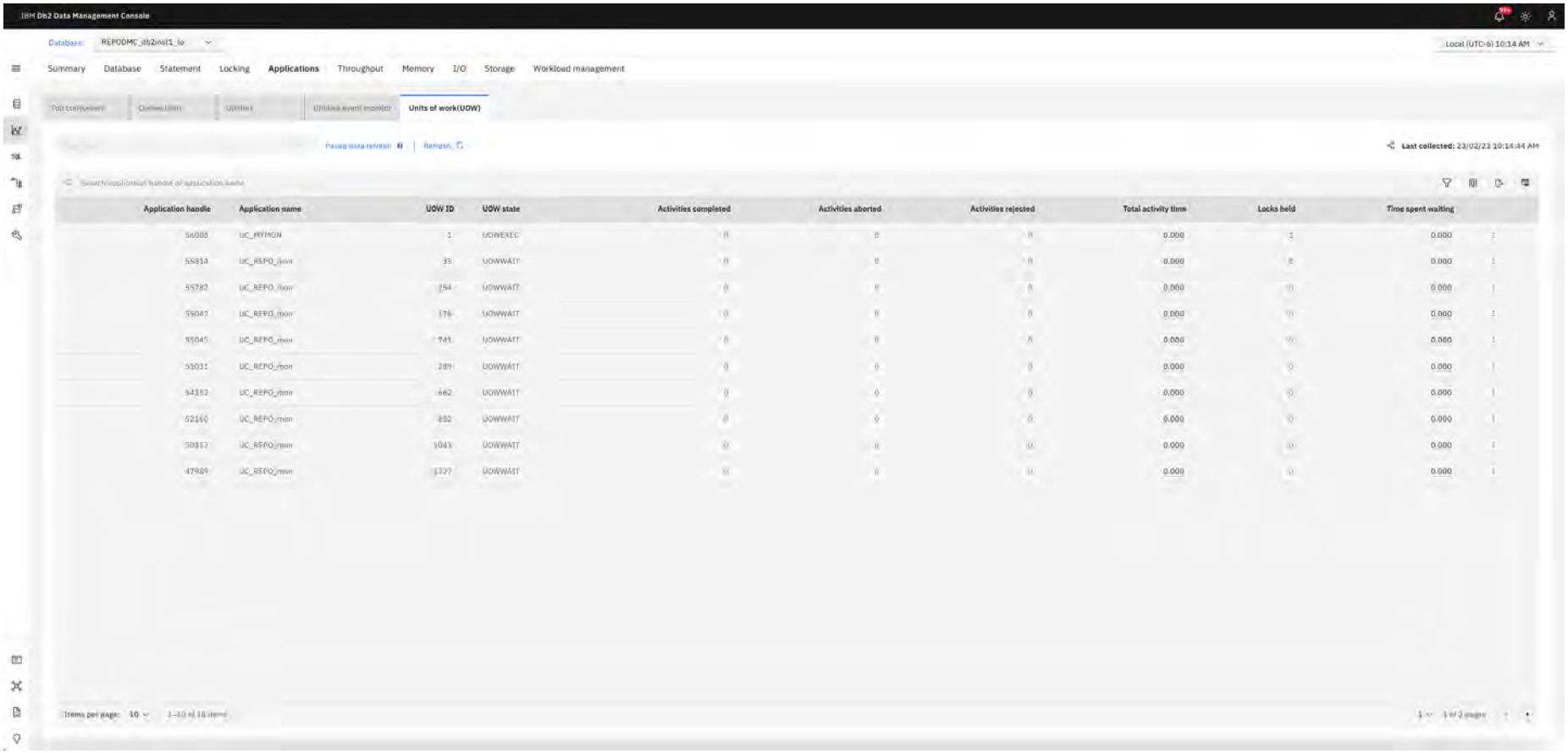
IBM Db2 - Data Management Console

Requires Utility Event Monitor



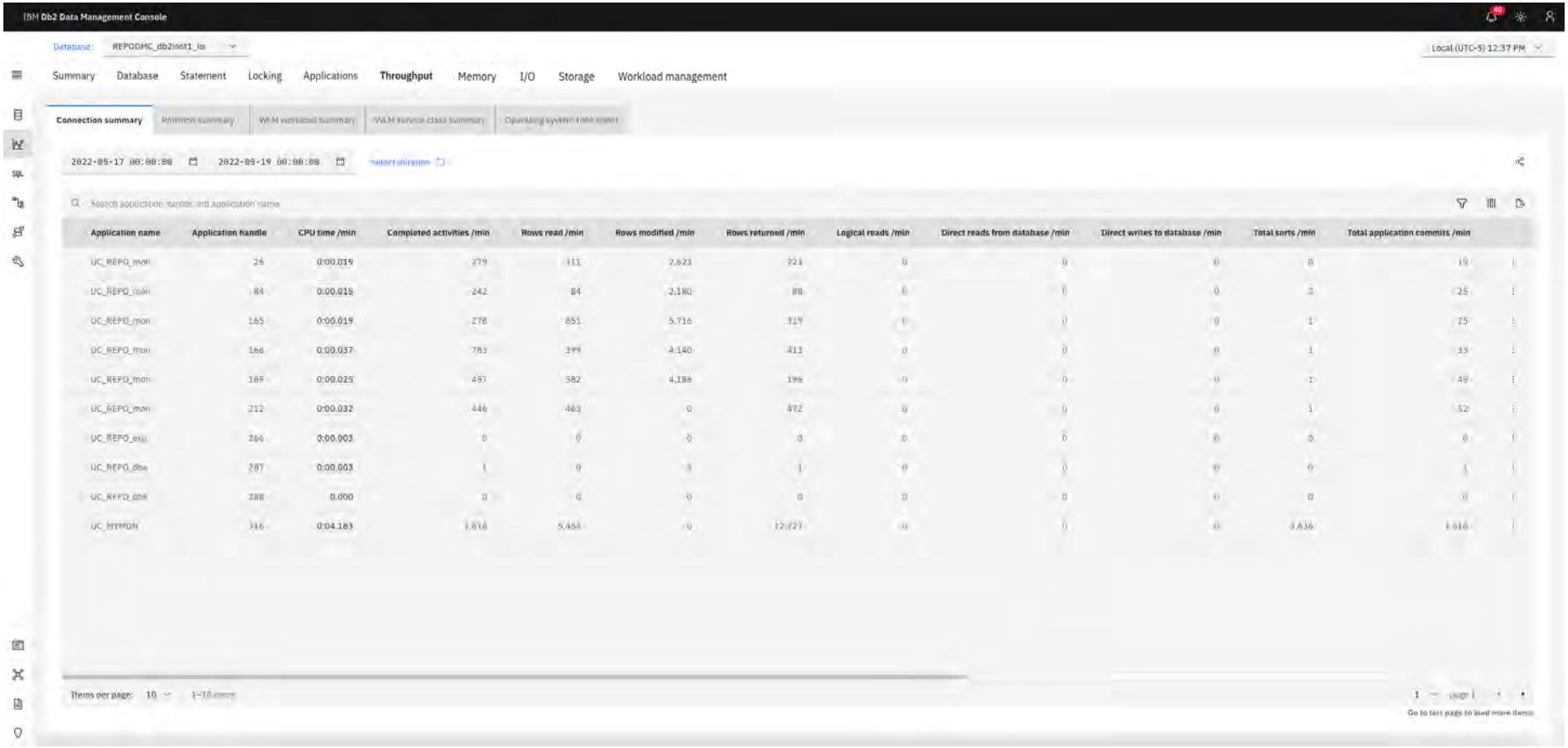
Monitor Applications – Units of work (UOW)

Indicates what transactions (units of work) are consuming the most resources in the data server



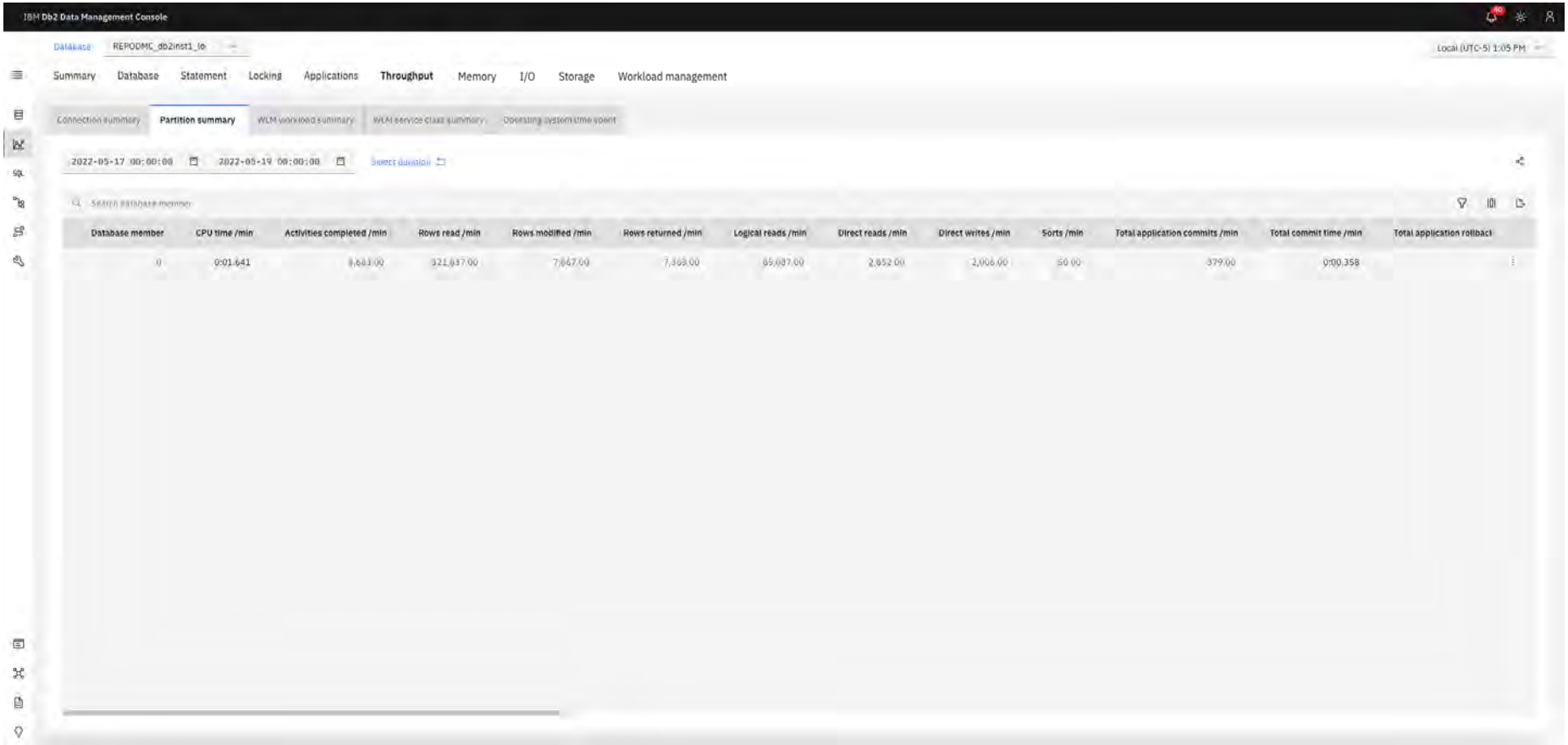
Monitor Throughput – Connection summary

Displays a summary of all connections established to the console



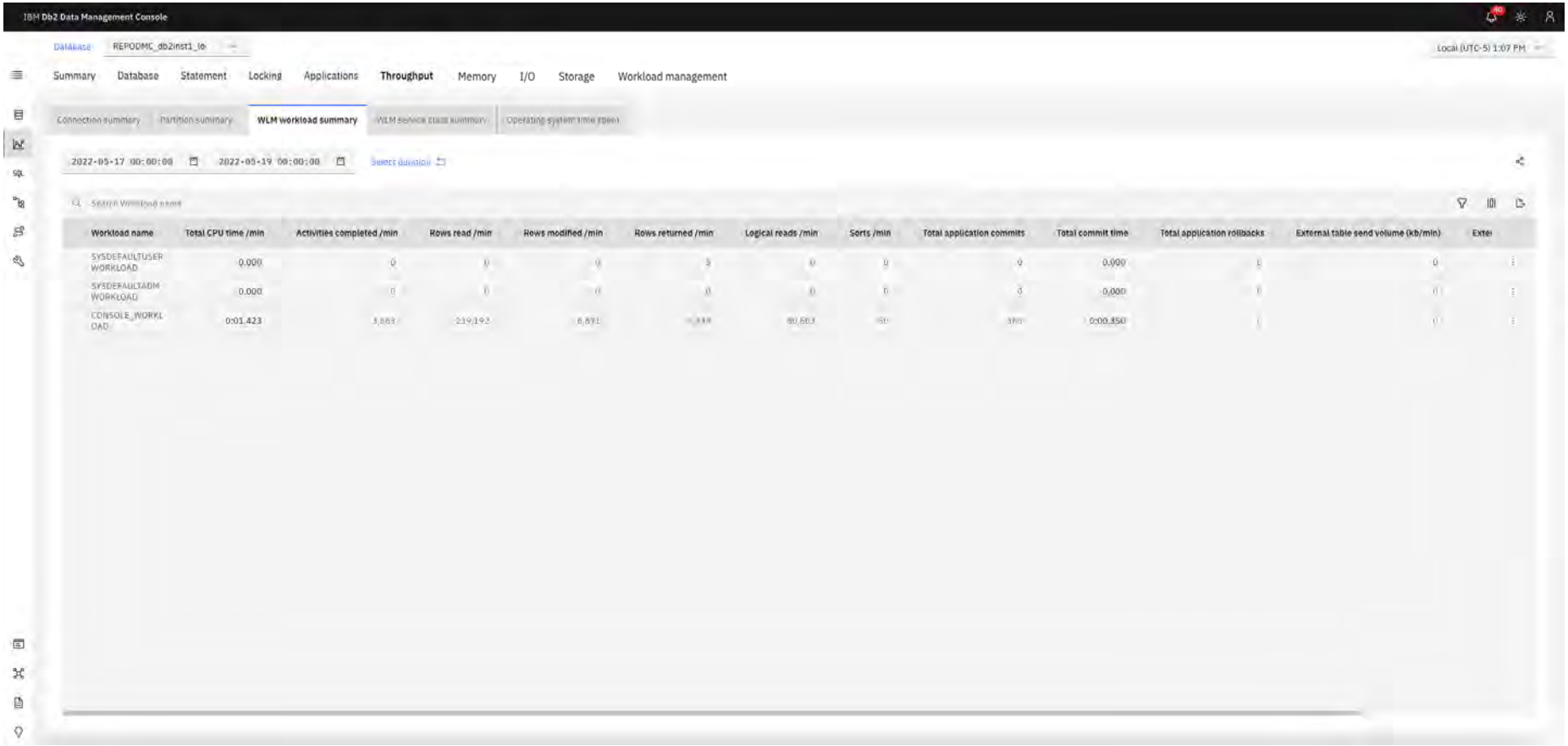
Monitor Throughput – Partition summary

Displays the information for each data partition used by a database



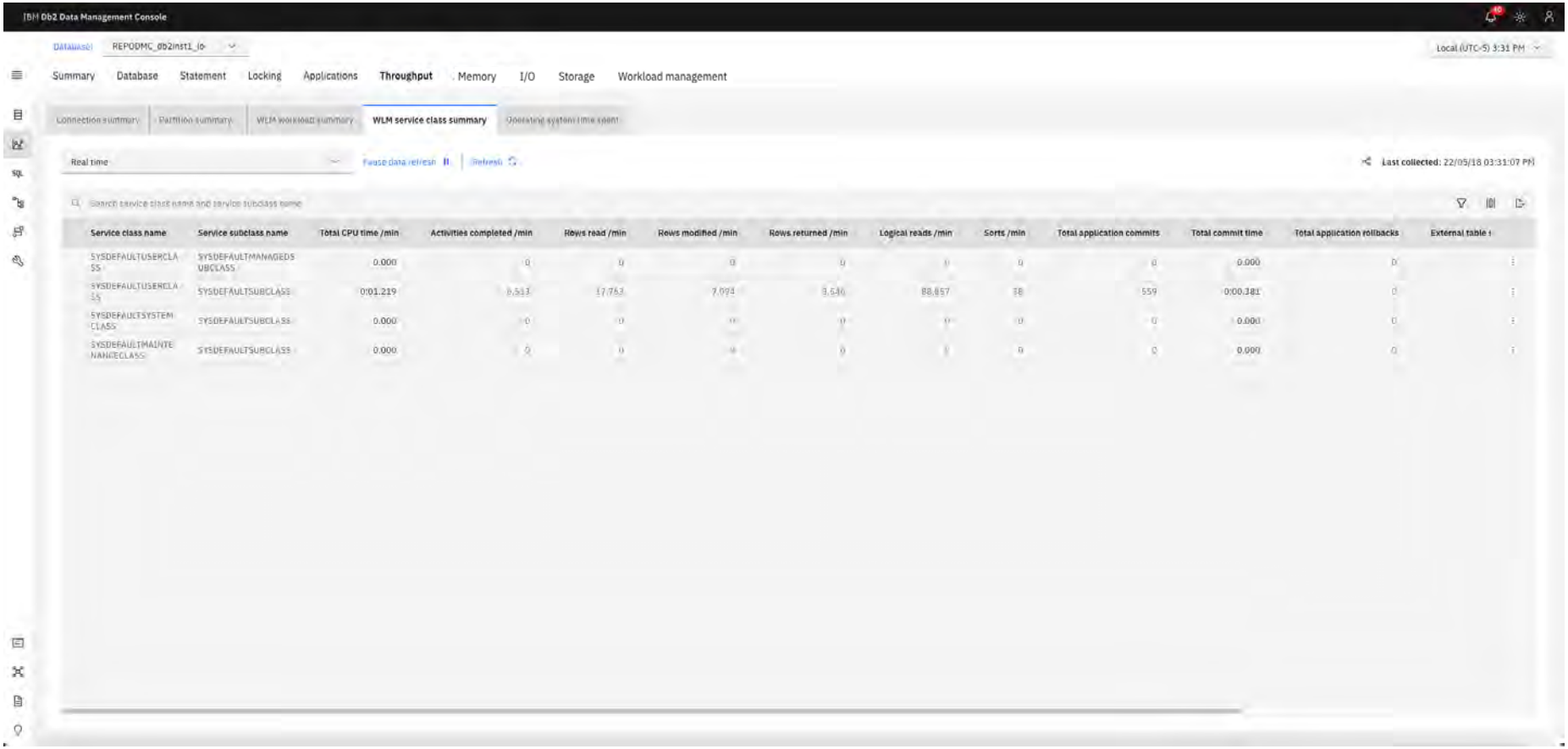
Monitor Throughput – WLM workload summary

Represents the accumulation of all metrics for requests that were submitted by connections mapped to the identified workload objects

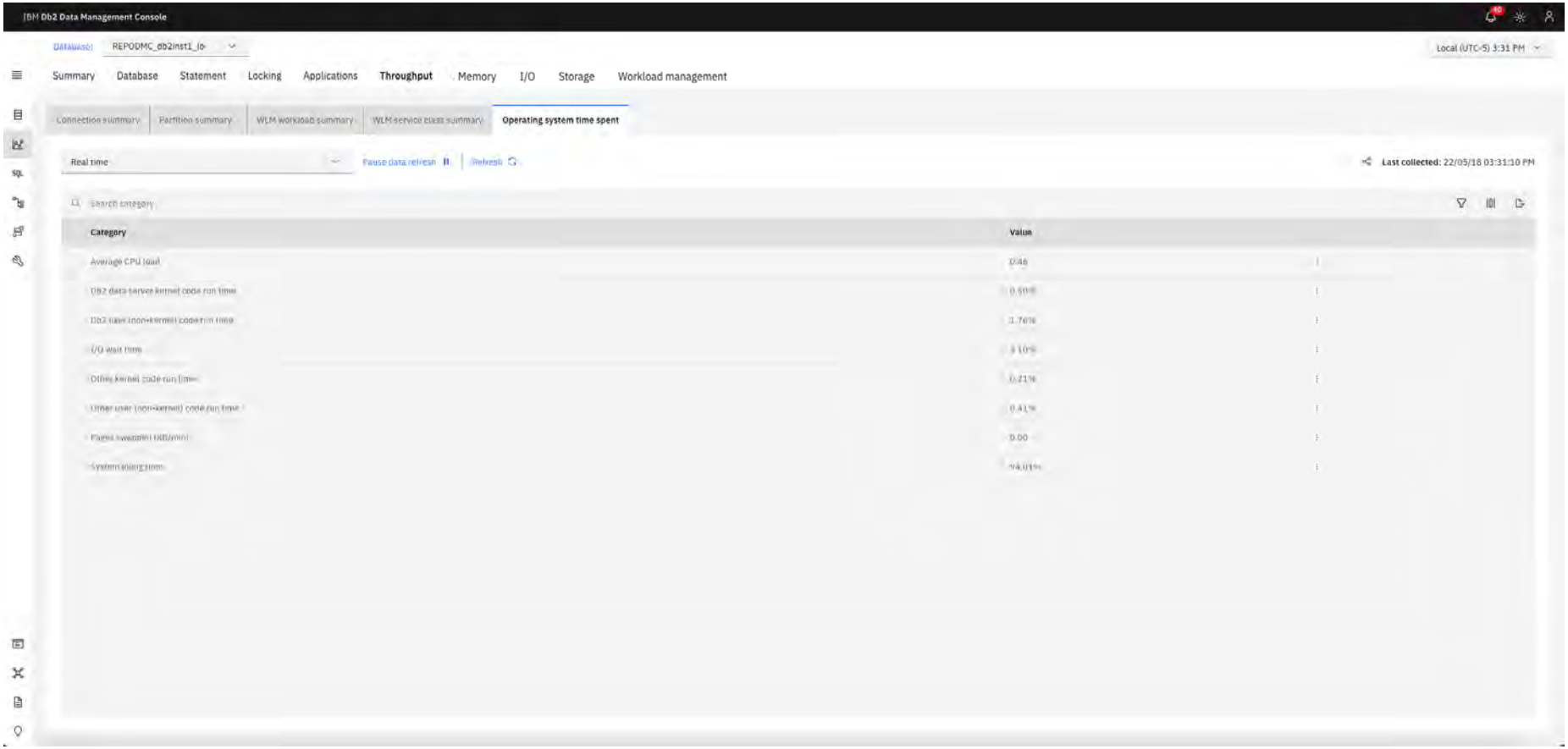


Monitor Throughput – WLM service class summary

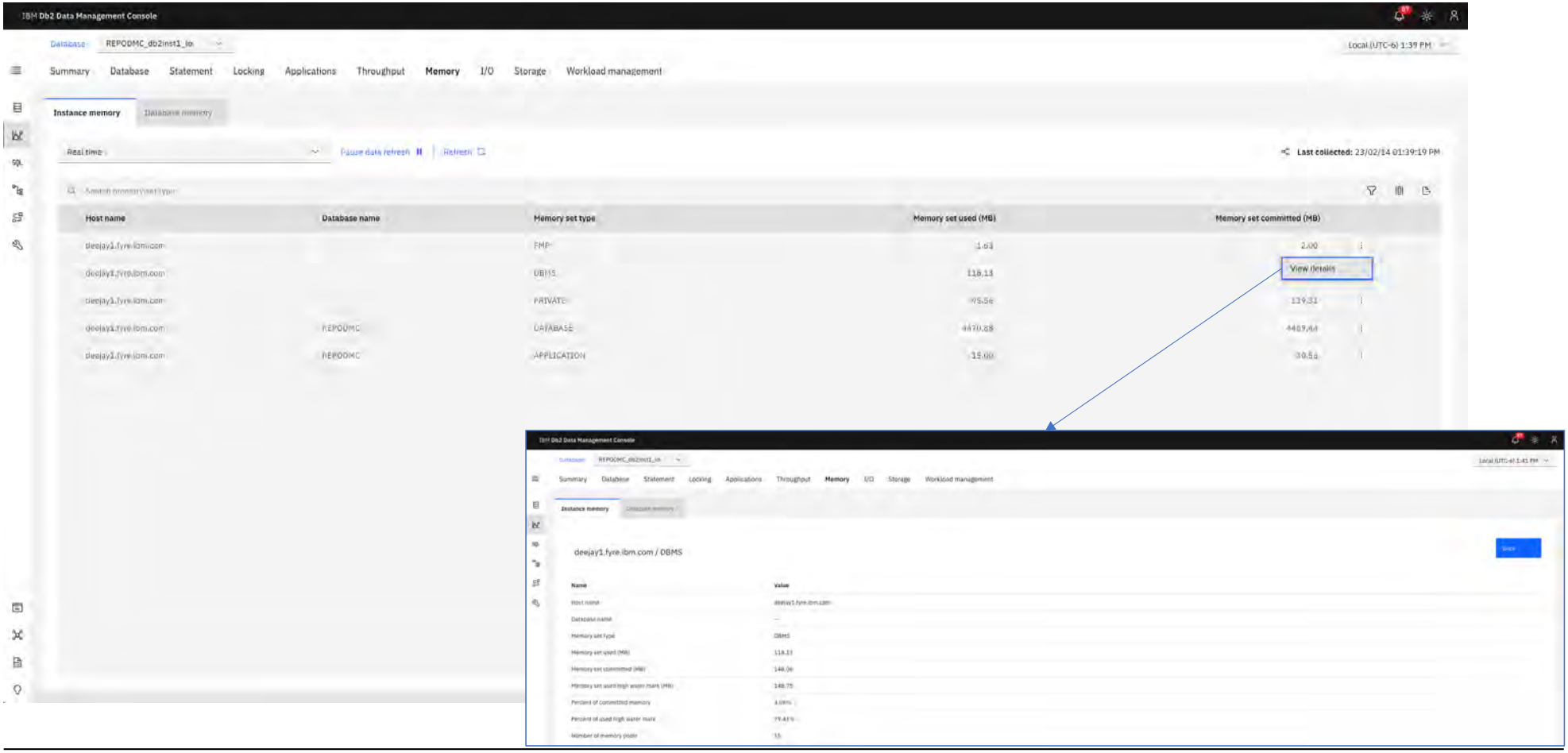
Represents the accumulation of all metrics for requests that have executed under the indicated service subclass



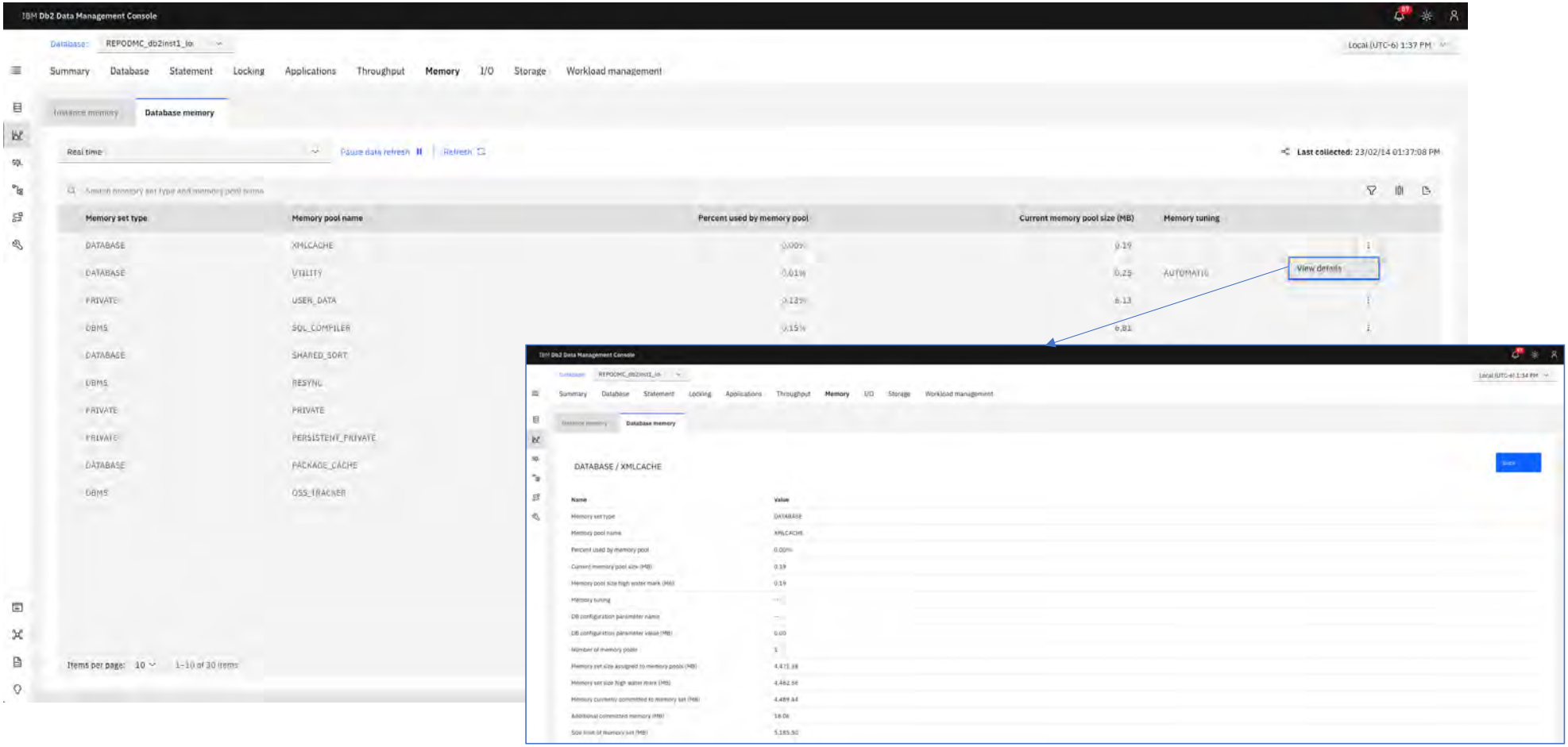
Monitor Throughput – Operating system time spent



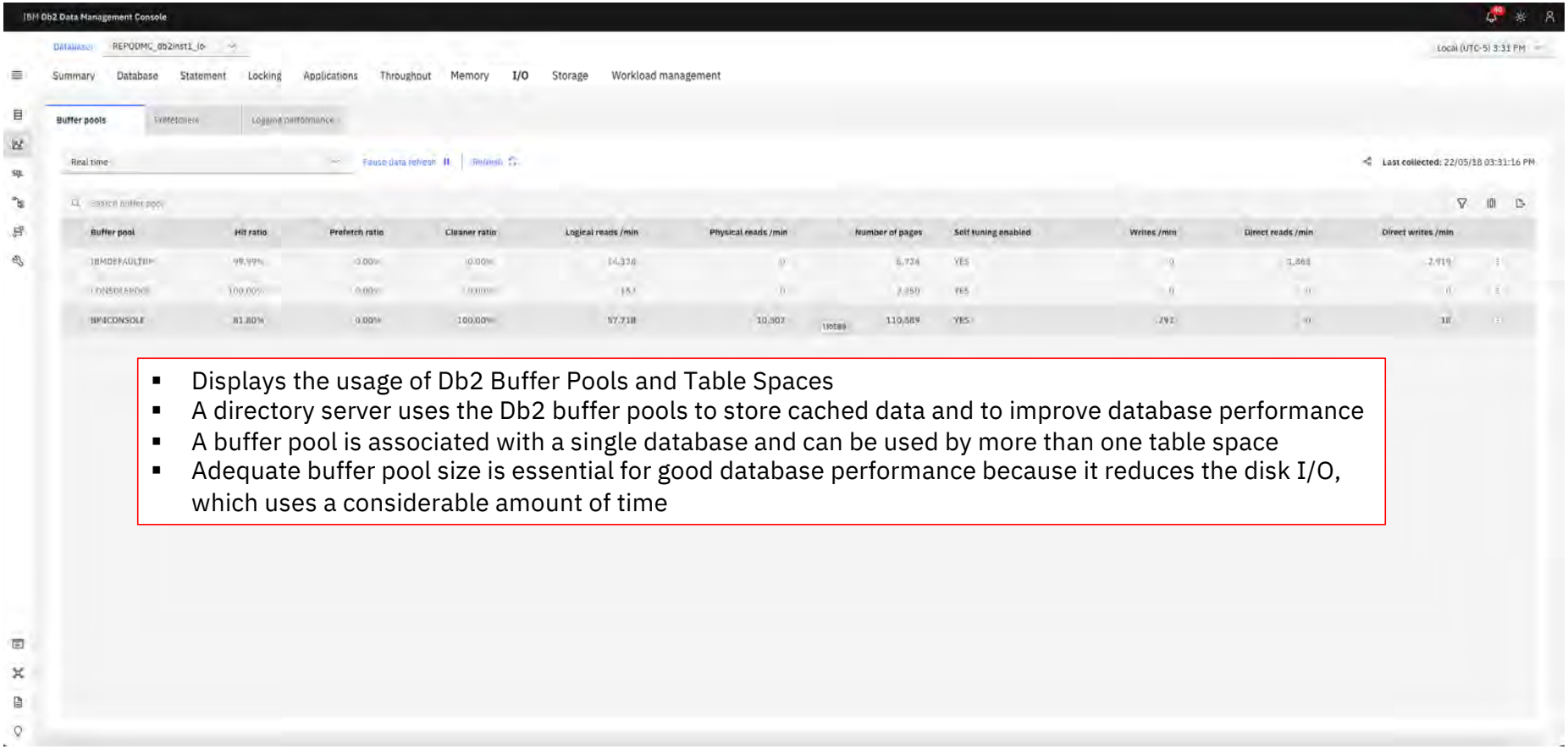
Monitor Memory – Instance memory



Monitor Memory – Database memory

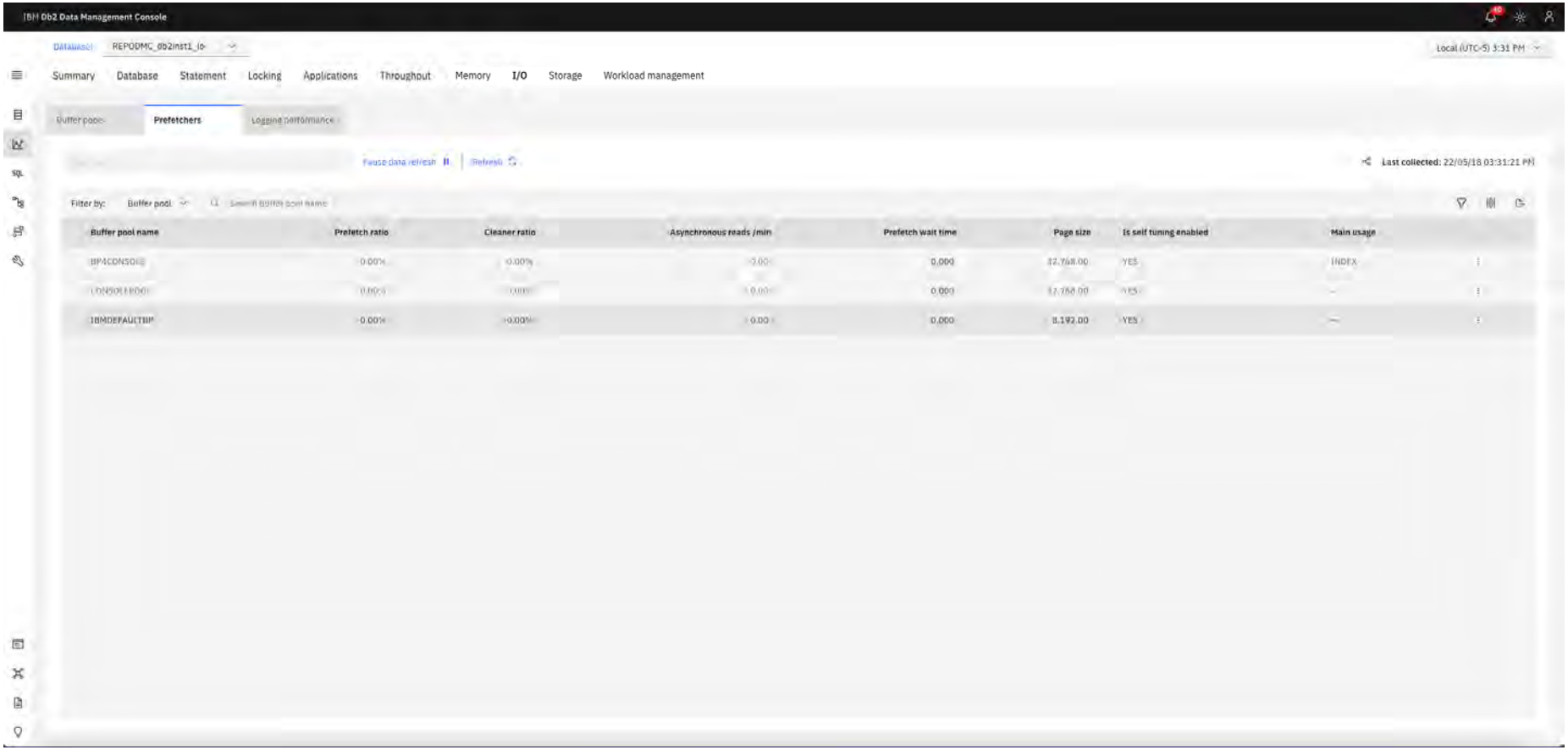


Monitor I/O – Buffer pools

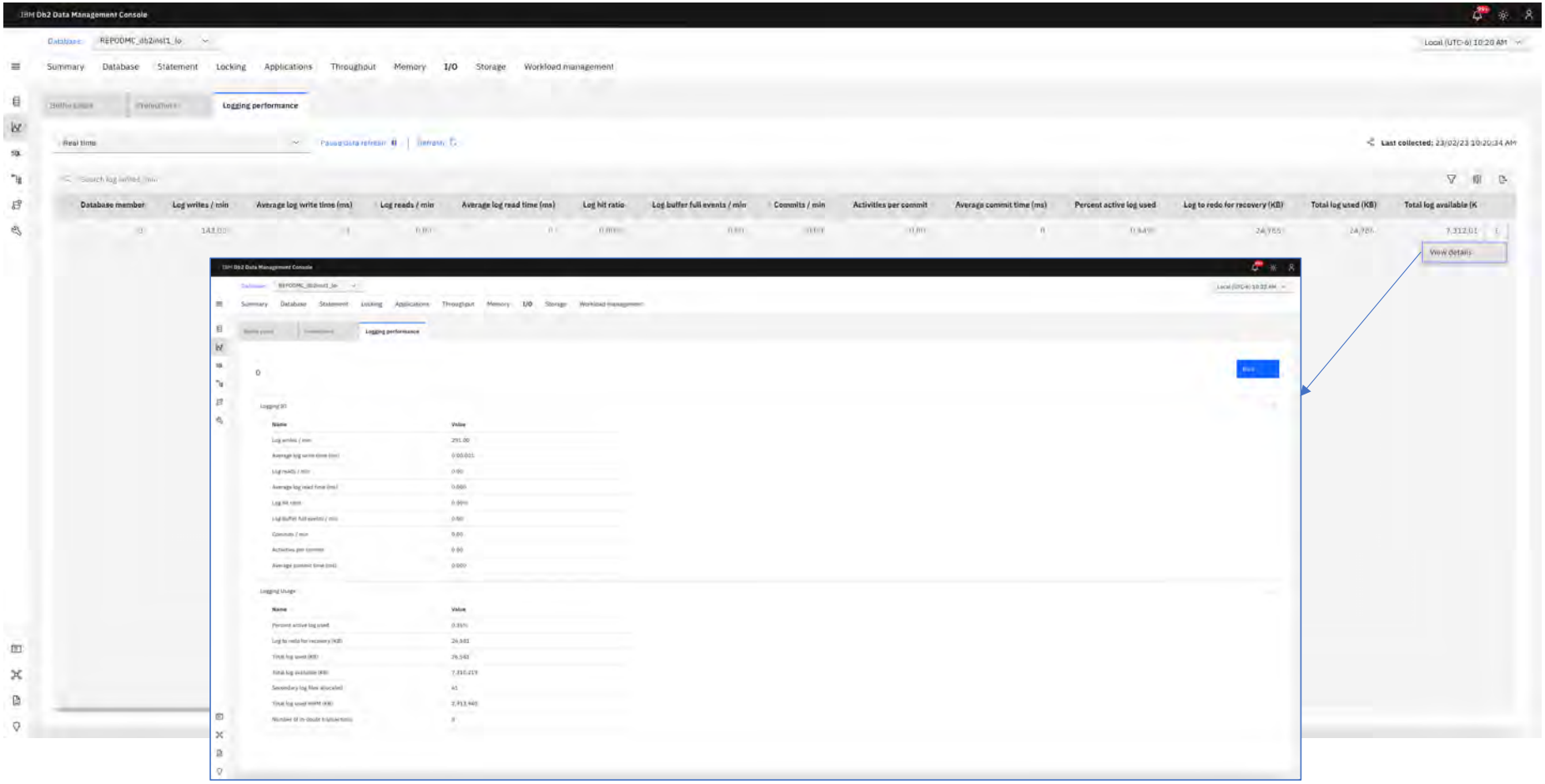


- Displays the usage of Db2 Buffer Pools and Table Spaces
- A directory server uses the Db2 buffer pools to store cached data and to improve database performance
- A buffer pool is associated with a single database and can be used by more than one table space
- Adequate buffer pool size is essential for good database performance because it reduces the disk I/O, which uses a considerable amount of time

Monitor I/O – Prefetchers

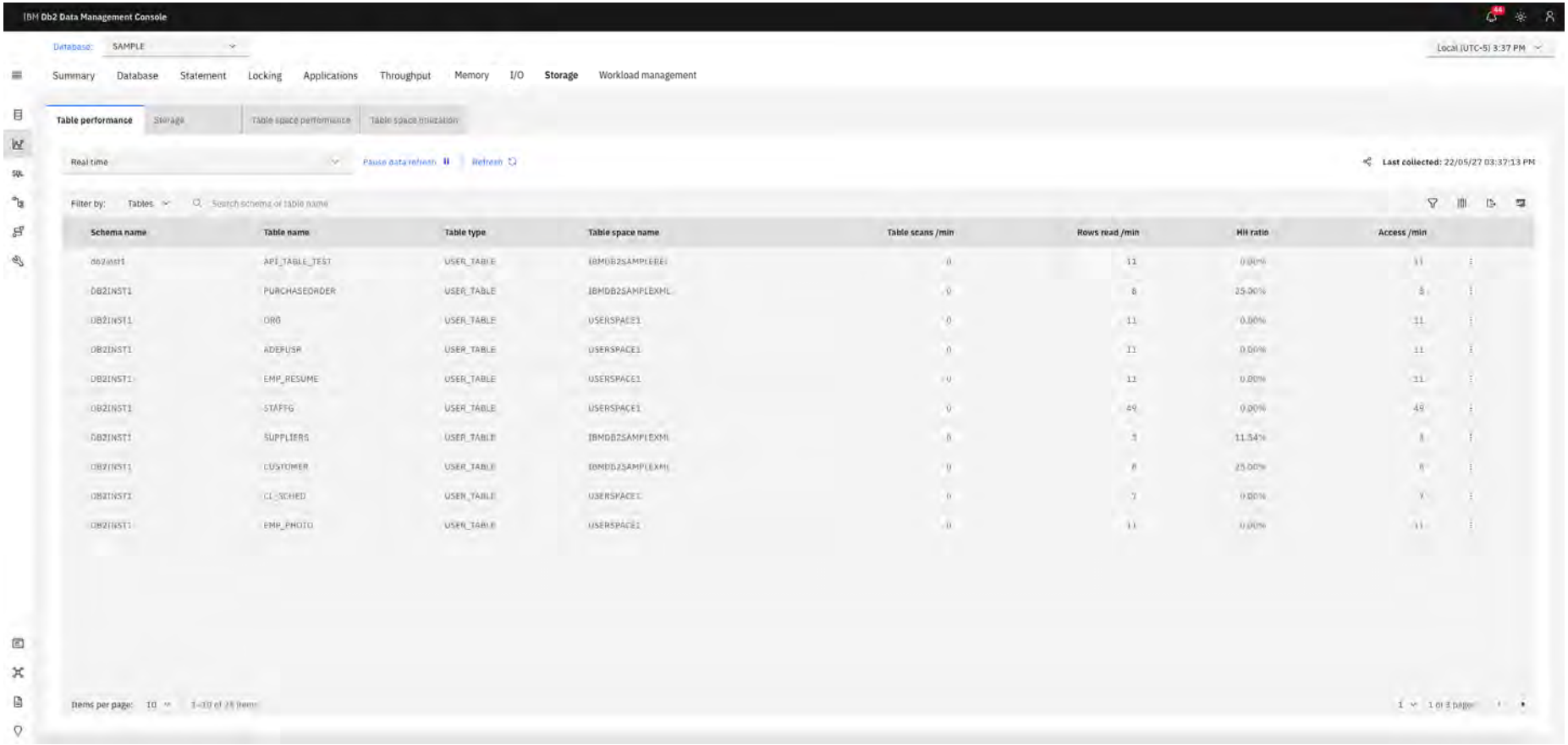


Monitor I/O – Logging performance



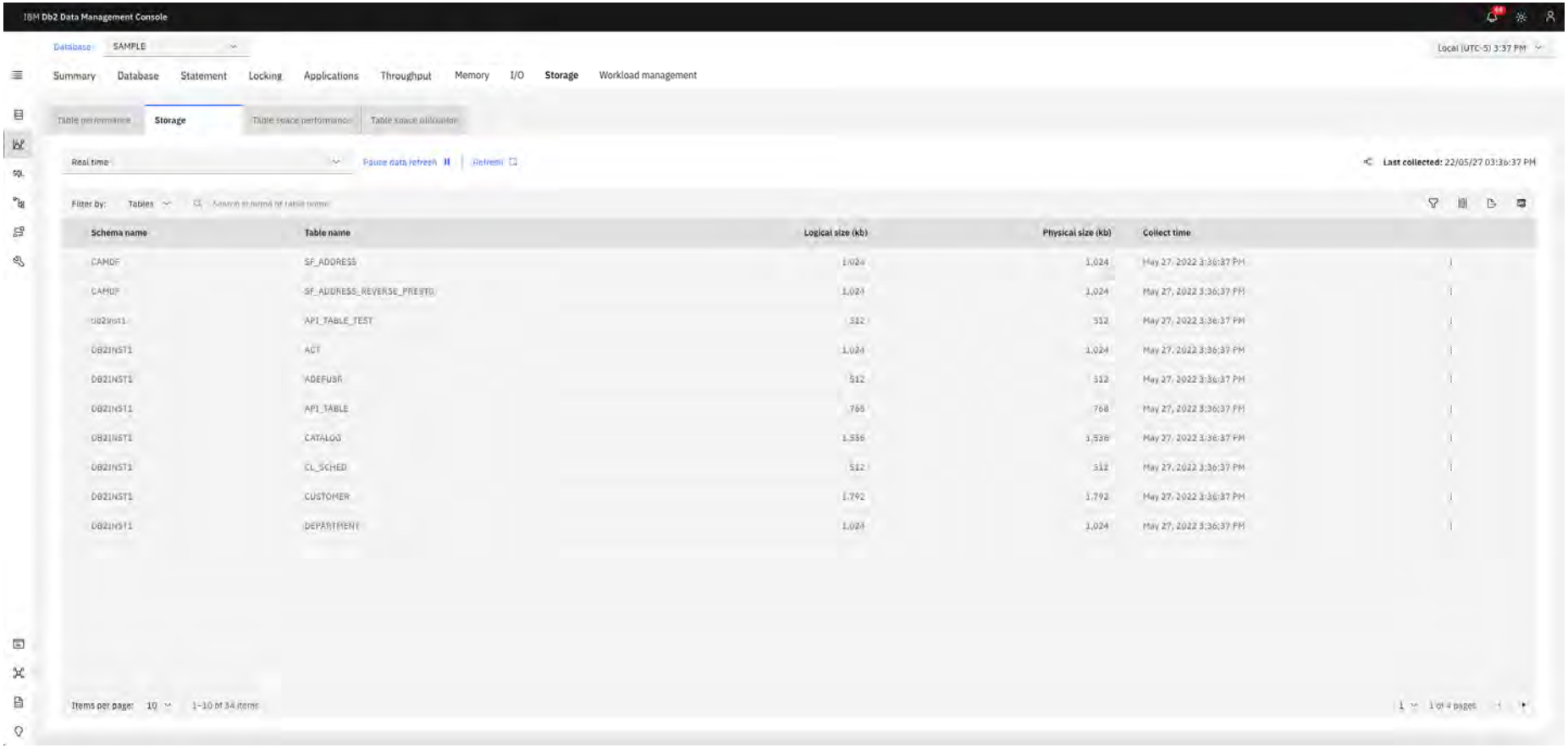
Monitor Storage – Table performance

Displays the performance data of each table or each schema

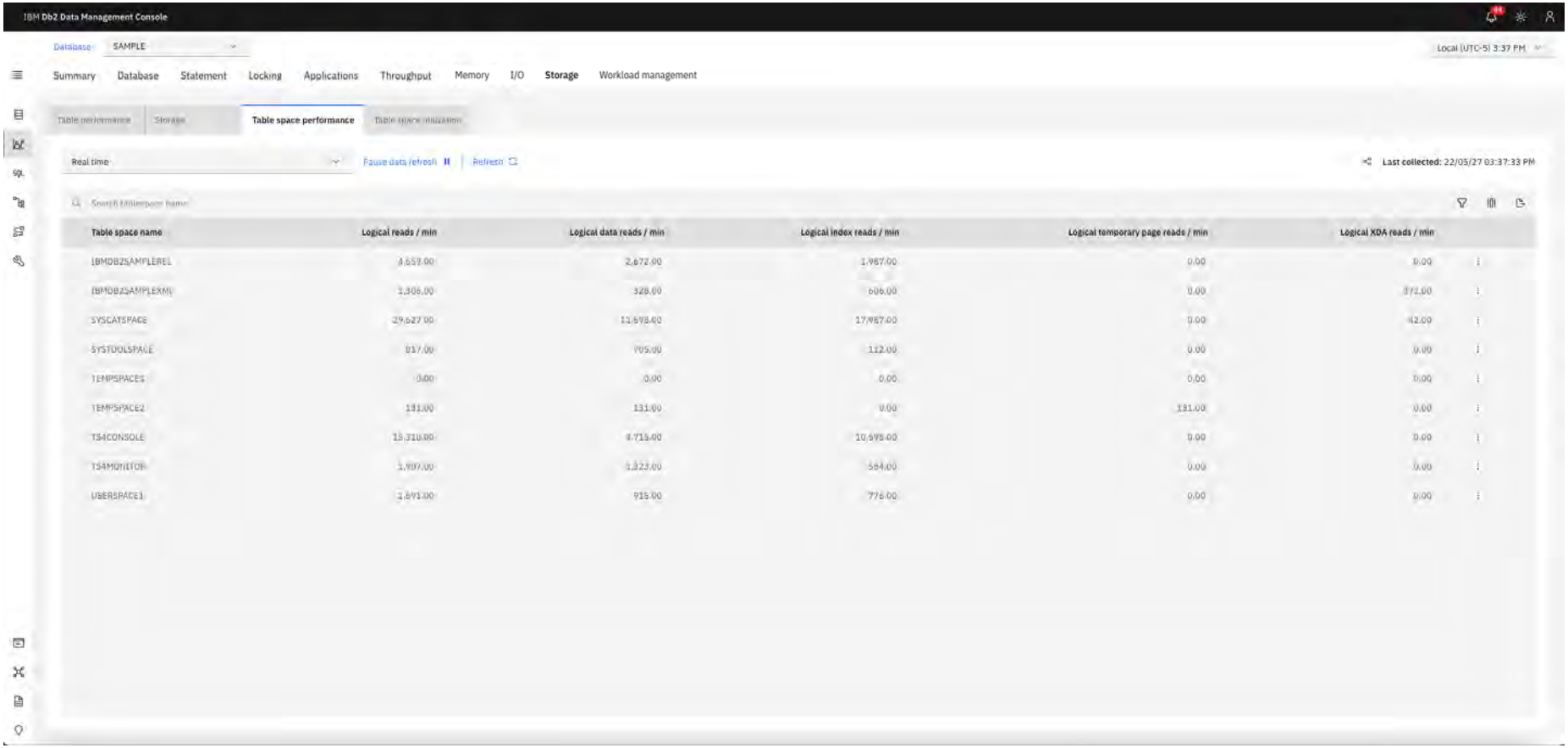


Monitor Storage – Storage

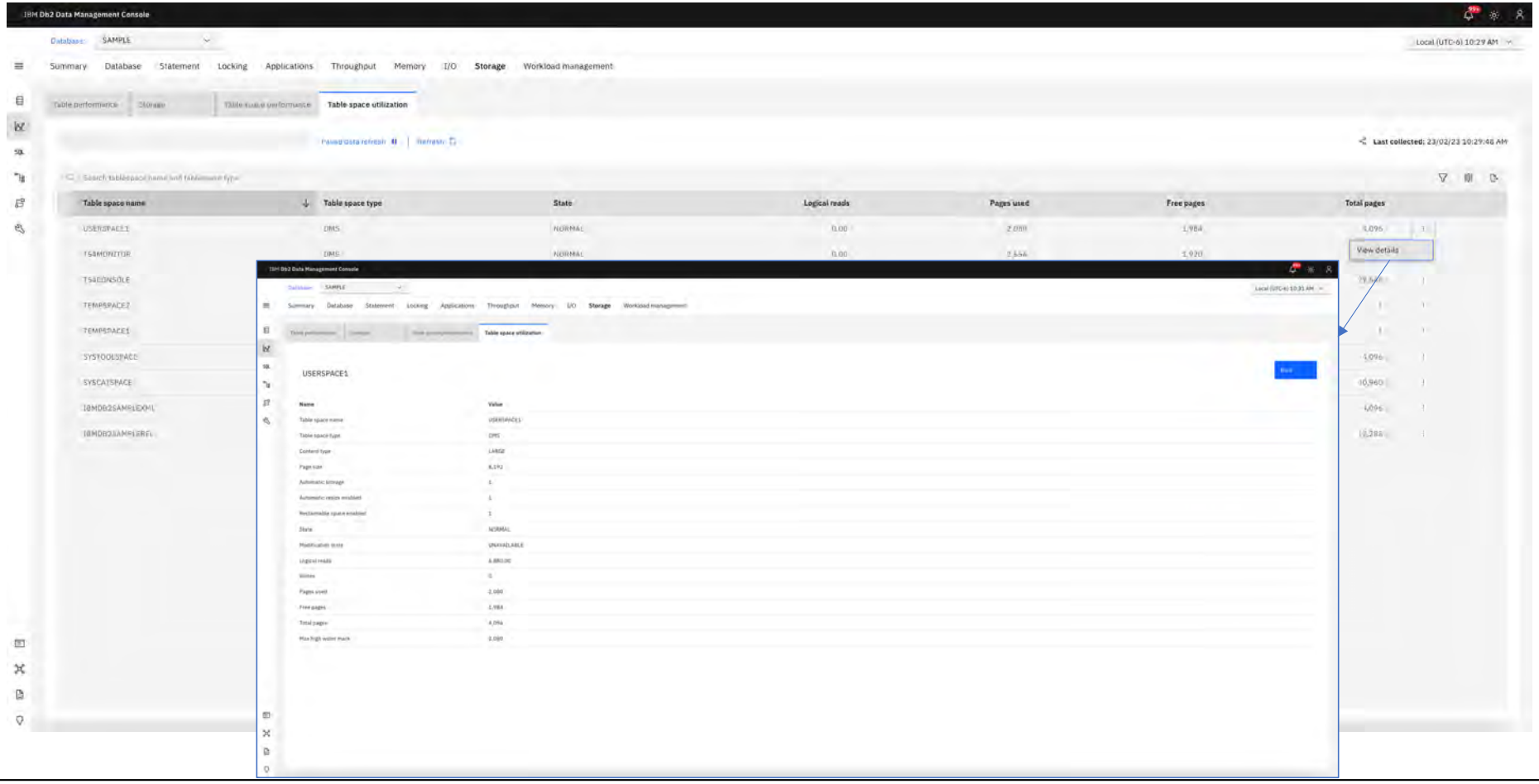
Displays the storage usage data of each table or each schema



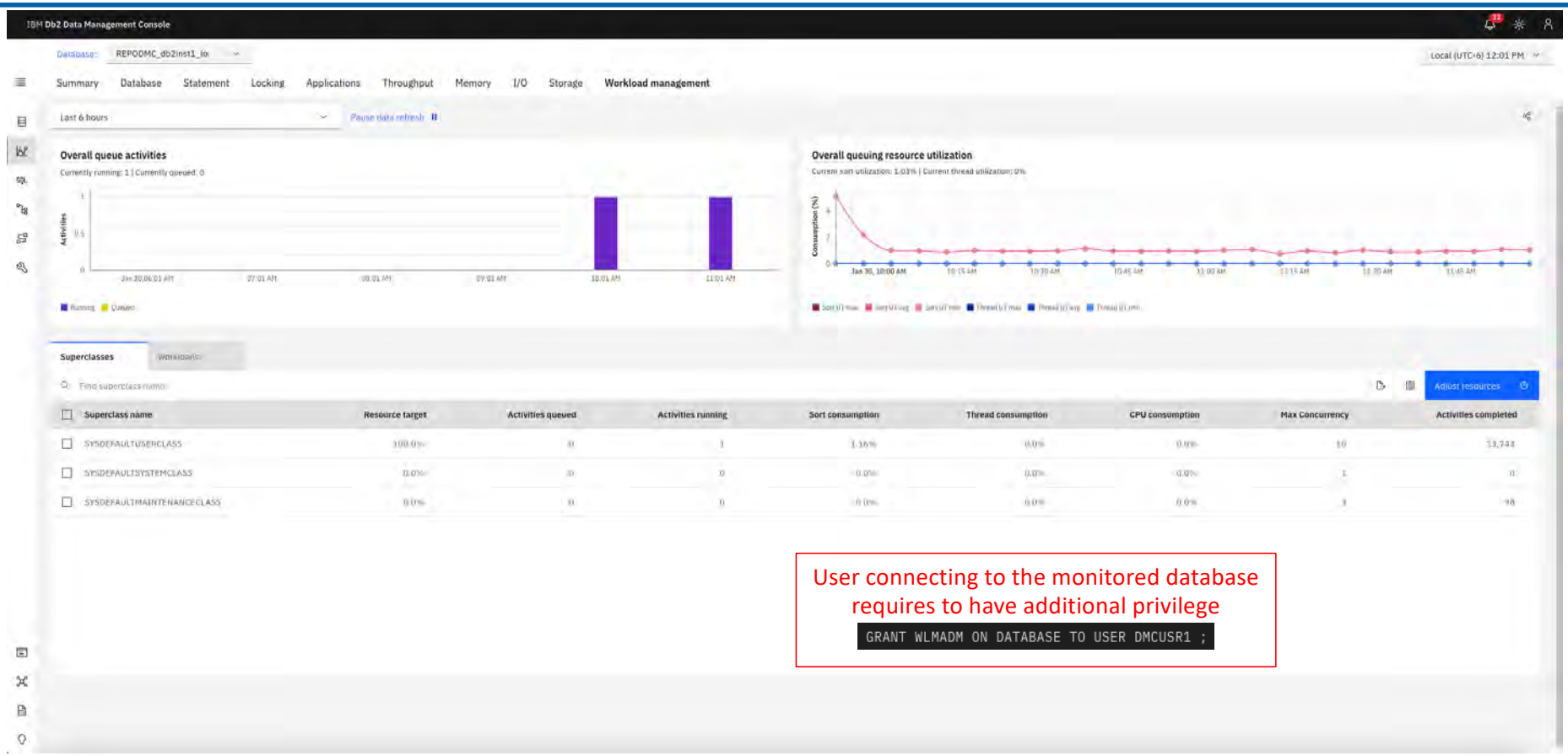
Monitor Storage – Table space performance



Monitor Storage – Table space utilization



Monitor Workload Management



User connecting to the monitored database requires to have additional privilege

```
GRANT WLMADM ON DATABASE TO USER DMCUSR1 ;
```

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=console-min-db-privileges-required-db2

Db2 Data Management Console

Data

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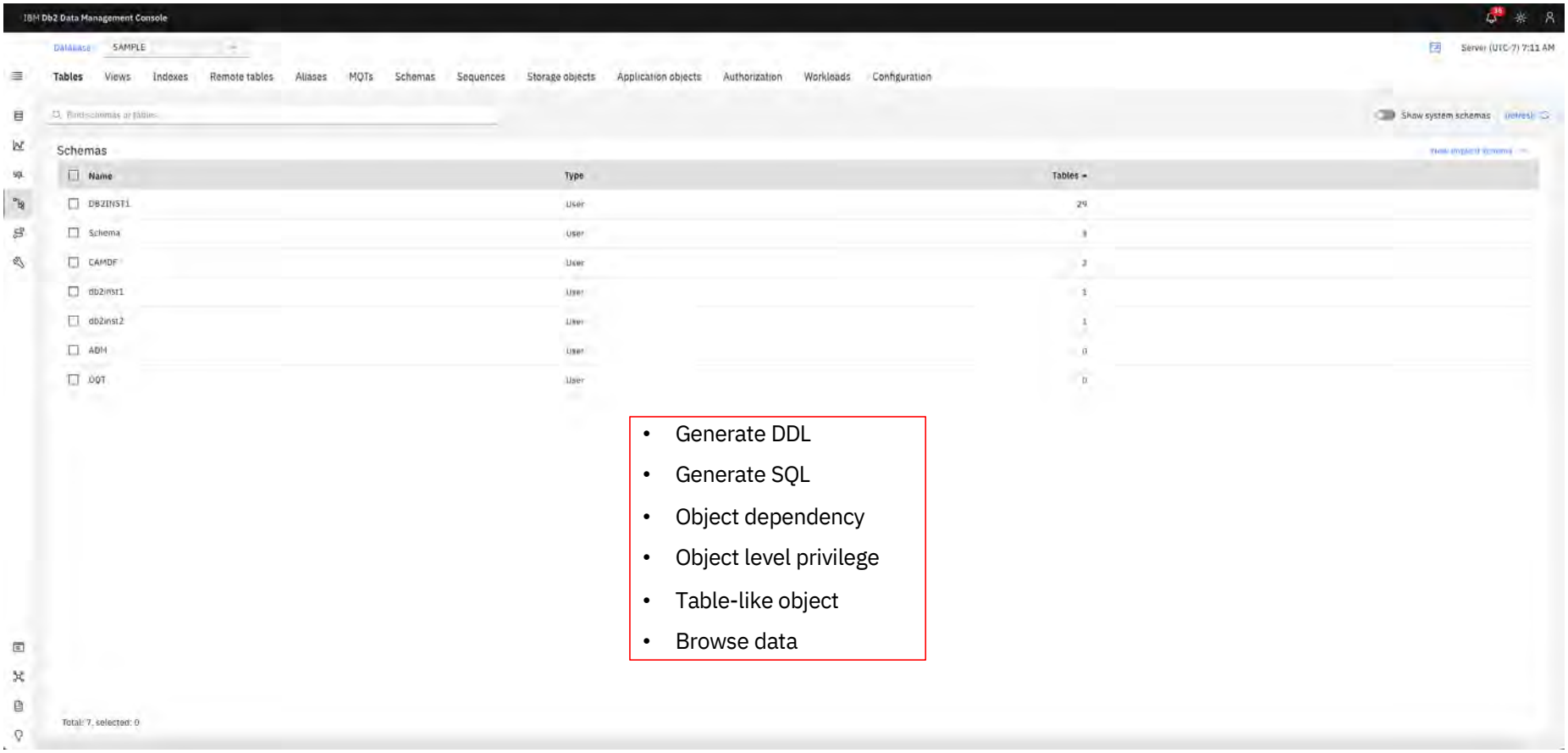
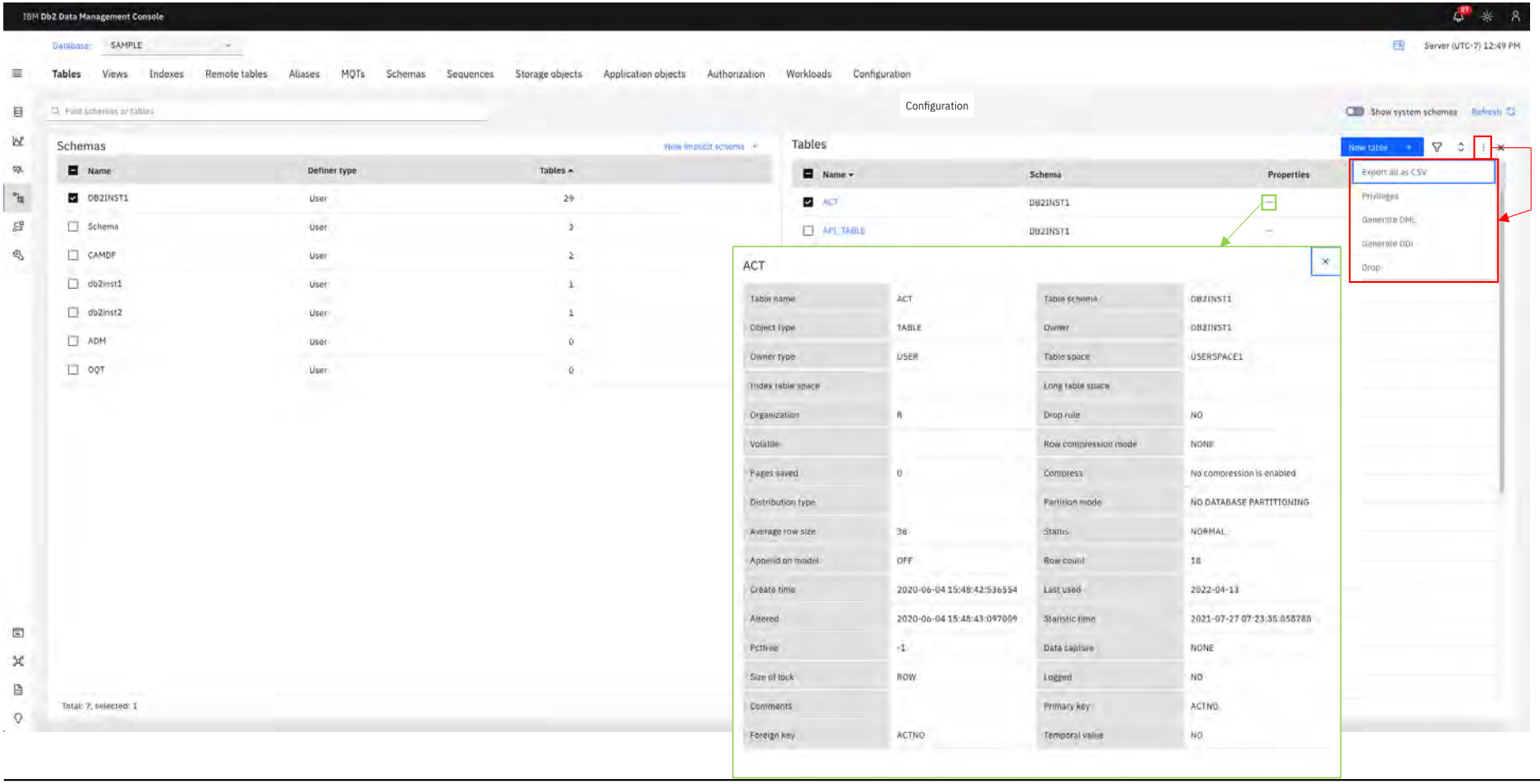
Data

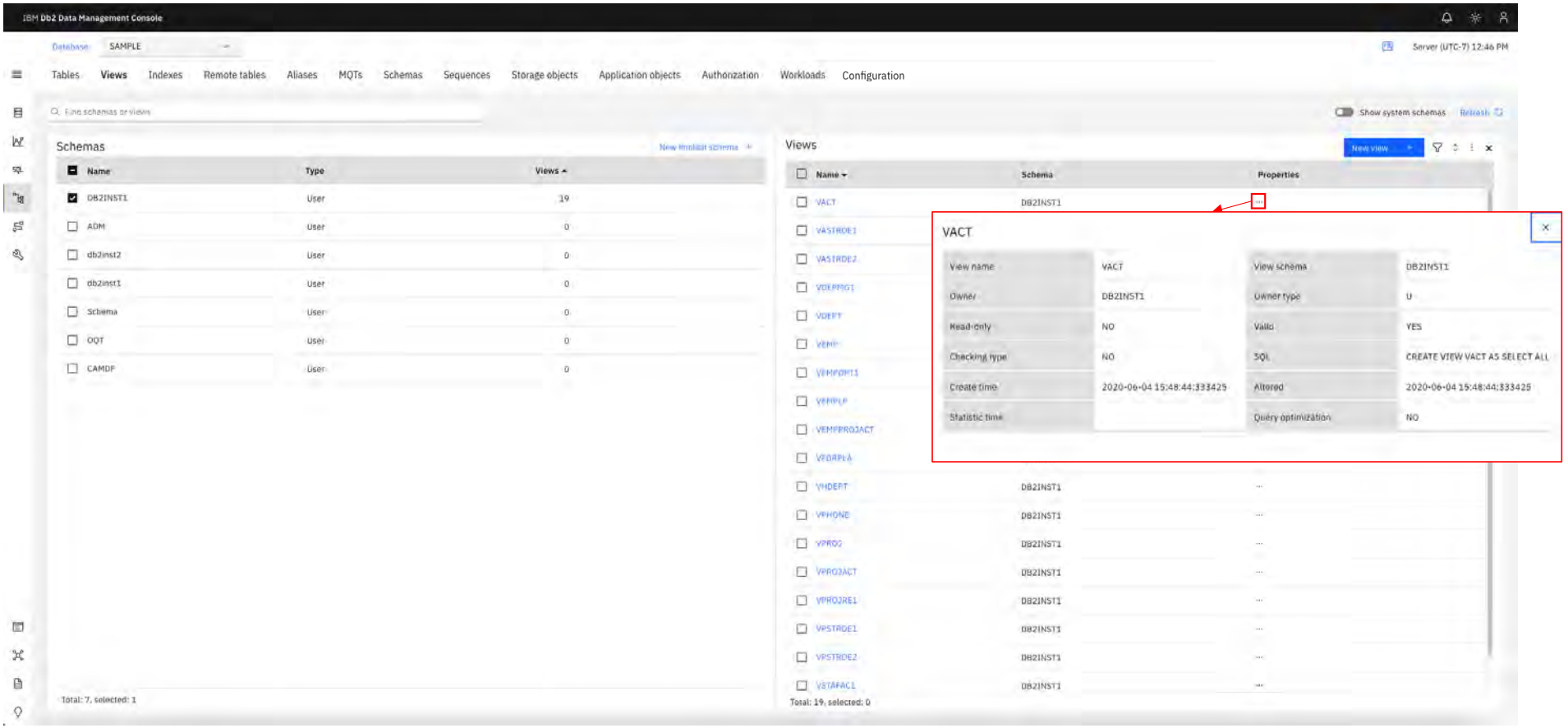


- Generate DDL
- Generate SQL
- Object dependency
- Object level privilege
- Table-like object
- Browse data

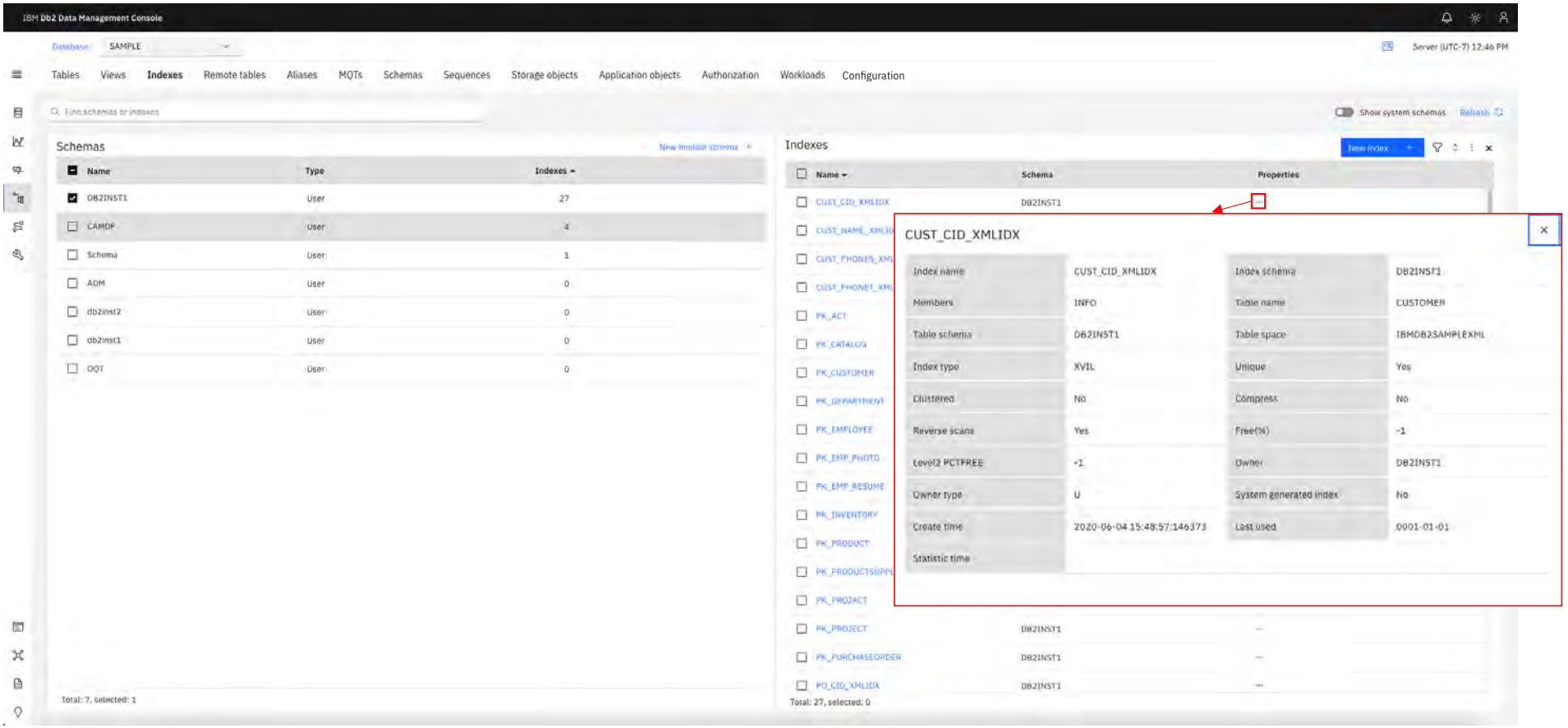
Data – Tables


IBM Db2 Data Management Console
Database: SAMPLE
Server (UTC+7) 12:49 PM
Tables Views Indexes Remote tables Aliases MQTs Schemas Sequences Storage objects Application objects Authorization Workloads Configuration
Configuration
Show system schemas
Schemas
Name Definer type Tables
DB2INST1 User 29
Schema User 3
CAMDF User 2
db2inst1 User 1
db2inst2 User 1
ADM User 0
OQT User 0
Total: 7, selected: 1
Tables
Name Schema Properties
ACT DB2INST1
API_TABLE DB2INST1
New table
Export all as CSV
Privileges
Generate DML
Generate DDL
Drop
ACT
Table name ACT
Table schema DB2INST1
Object type TABLE
Owner DB2INST1
Owner type USER
Table space USERSPACE1
Index table space
Long table space
Organization R
Drop rule NO
Volatile
Row compression mode NONE
Pages saved 0
Compress No compression is enabled
Distribution type
Partition mode NO DATABASE PARTITIONING
Average row size 36
Status NORMAL
Append on model OFF
Row count 18
Create time 2020-06-04 15:48:42.536554
Last used 2022-04-13
Altered 2020-06-04 15:48:43.097009
Statistic time 2021-07-27 07:23:35.058788
Pctfree 10
Data capture NONE
Size of lock ROW
Logged NO
Comments
Primary key ACTNO
Foreign key ACTNO
Temporal value NO

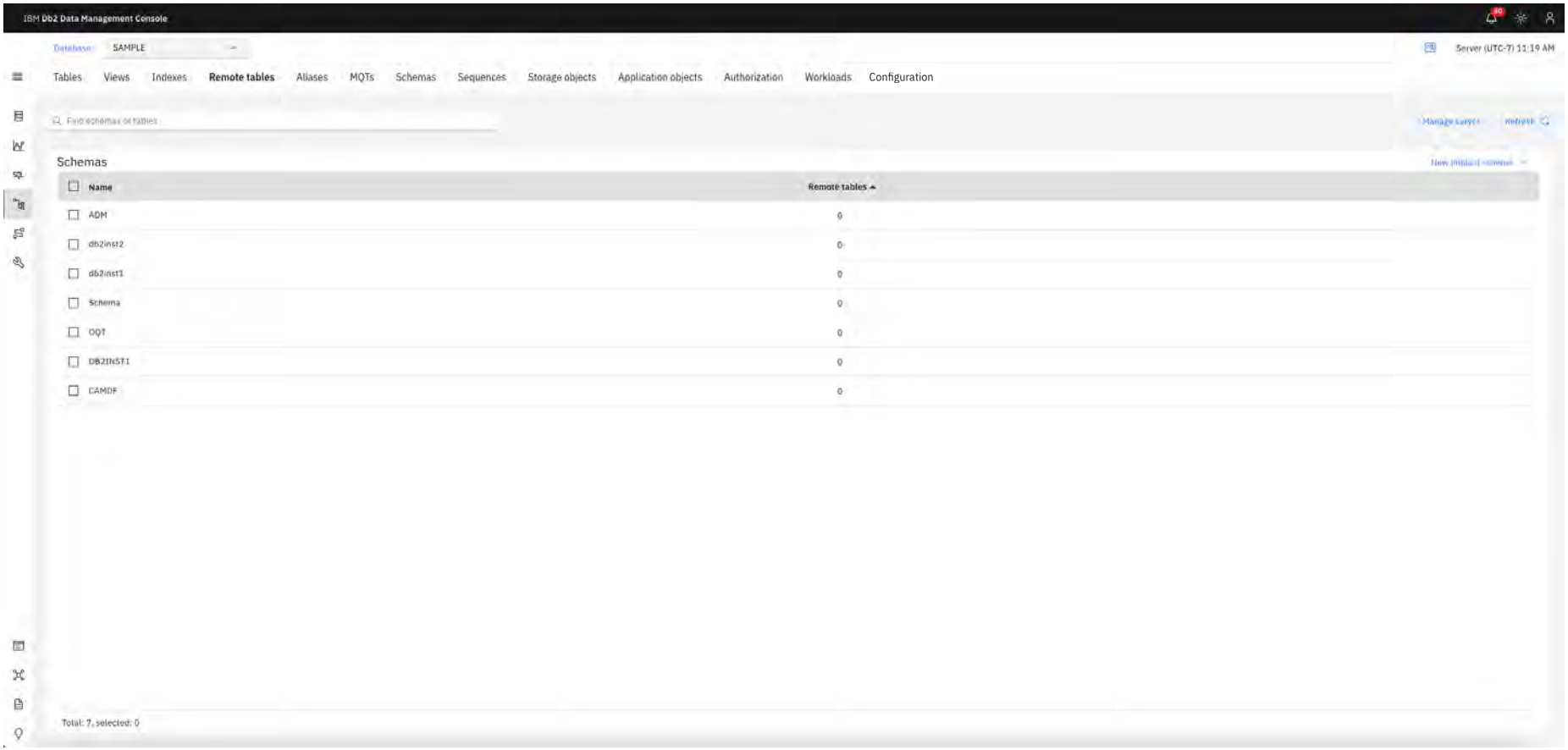
Data – Views


IBM Db2 Data Management Console
Database: SAMPLE
Server (UTC-7) 12:46 PM
Tables Views Indexes Remote tables Aliases MQTs Schemas Sequences Storage objects Application objects Authorization Workloads Configuration
Show system schemas
Schemas
Name Type Views
DB2INST1 User 19
ADM User 0
db2inst2 User 0
db2inst1 User 0
Schema User 0
OQT User 0
CAMDF User 0
Total: 7, selected: 1
Views
New view
Name Schema Properties
VACT DB2INST1
VDEPT DB2INST1
VEMP DB2INST1
VEMPPROJACT DB2INST1
VHDEPT DB2INST1
VPHONE DB2INST1
VPROJ DB2INST1
VPROJACT DB2INST1
VPSTRDE1 DB2INST1
VPSTRDE2 DB2INST1
VSTAFAC1 DB2INST1
Total: 19, selected: 0
VACT
View name VACT
View schema DB2INST1
Owner DB2INST1
Owner type U
Read-only NO
Valid YES
Checking type NO
SQL CREATE VIEW VACT AS SELECT ALL
Create time 2020-06-04 15:48:44.333425
Altered 2020-06-04 15:48:44.333425
Statistic time
Query optimization NO

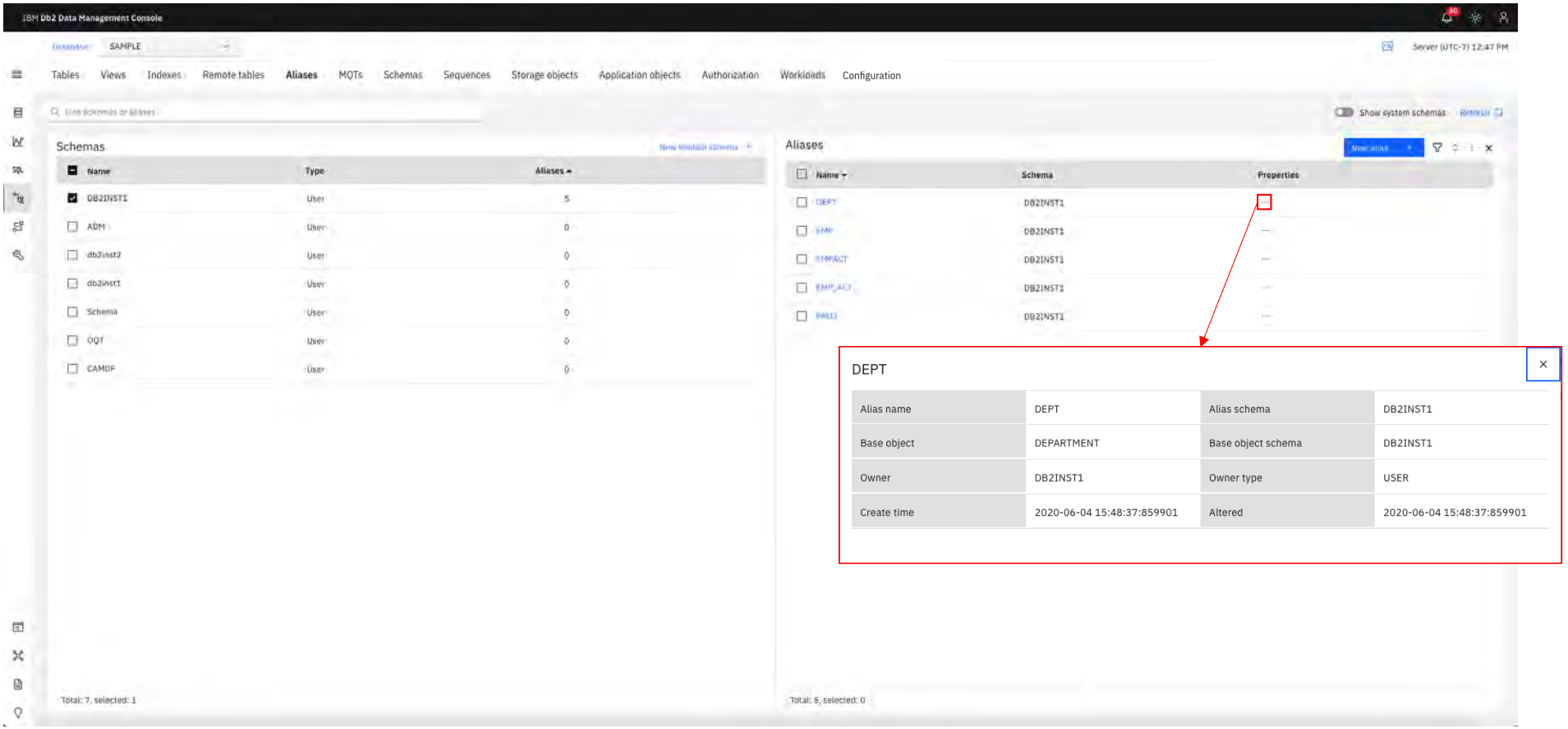
Data – Indexes



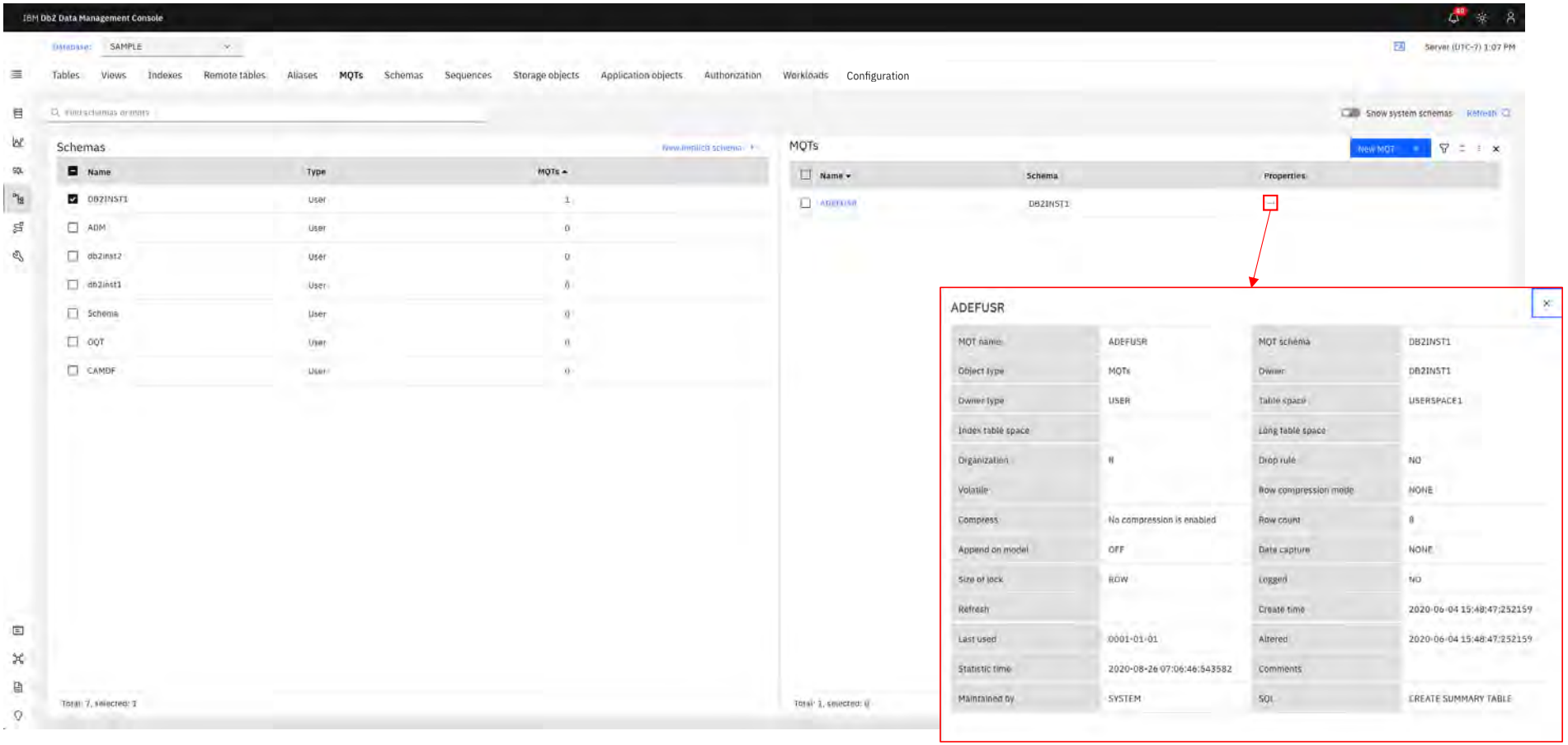
Data – Remote tables



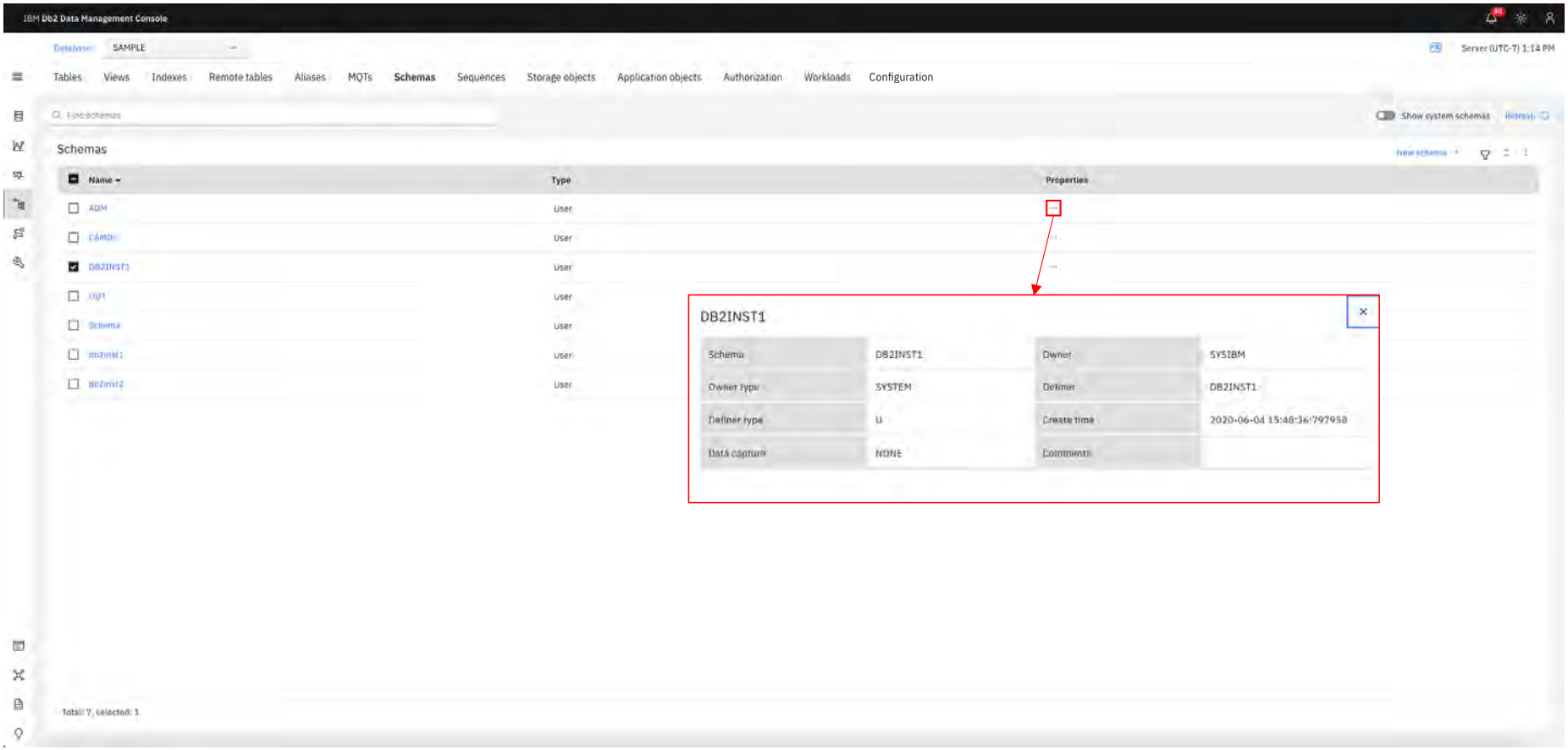
Data – Aliases



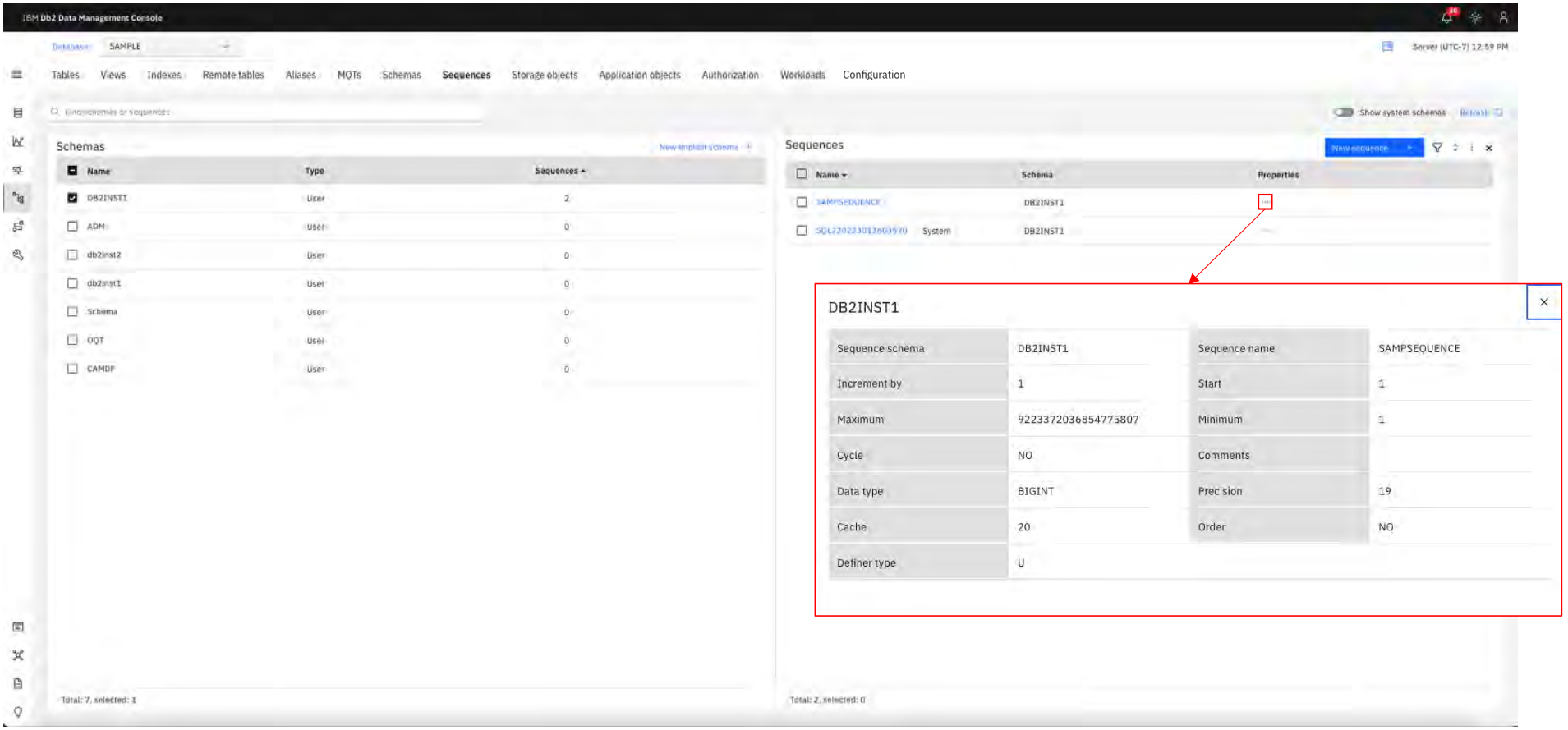
Data – MQTs


IBM Db2 Data Management Console
SAMPLE
Tables
Views
Indexes
Remote tables
Aliases
MQTs
Schemas
Sequences
Storage objects
Application objects
Authorization
Workloads
Configuration
Schemas
Name
Type
MQTs
DB2INST1
User
1
ADM
User
0
db2inst2
User
0
db2inst1
User
0
Schema
User
0
OQT
User
0
CAMDF
User
0
MQTs
Name
Schema
Properties
DB2INST1
ADEFUSR
MQT name
ADEFUSR
MQT schema
DB2INST1
Object type
MQTs
Owner
DB2INST1
Owner type
USER
Table space
USERSPACE1
Index table space
Long table space
Organization
R
Drop rule
NO
Volatile
Row compression mode
NONE
Compress
No compression is enabled
Row count
0
Append on model
OFF
Data capture
NONE
Size of lock
ROW
Logged
NO
Refresh
Create time
2020-06-04 15:48:47.252159
Last used
0001-01-01
Altered
2020-06-04 15:48:47.252159
Statistic time
2020-08-26 07:06:46.543582
Comments
Maintained by
SYSTEM
SQL
CREATE SUMMARY TABLE

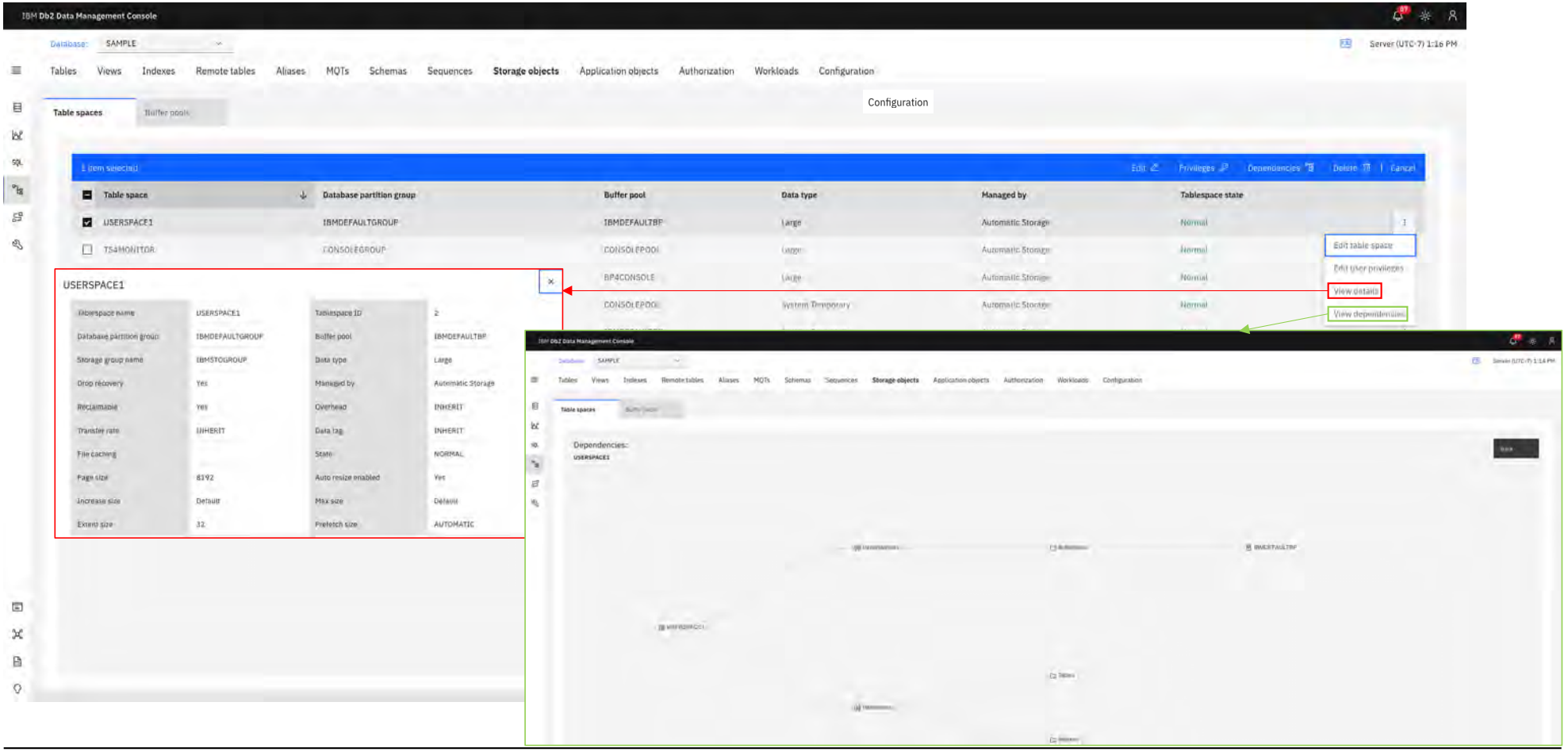
Data – Schemas



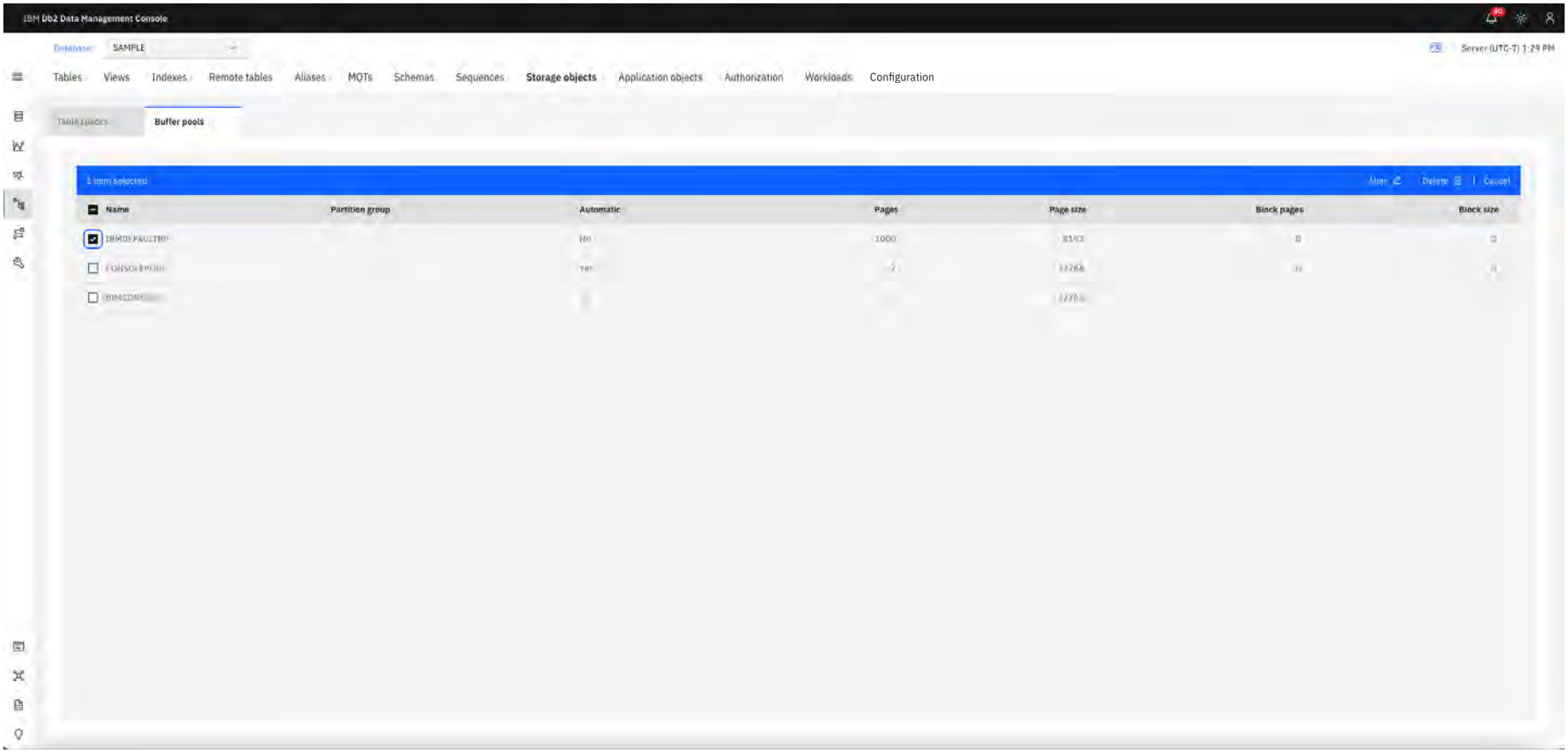
Data – Sequences



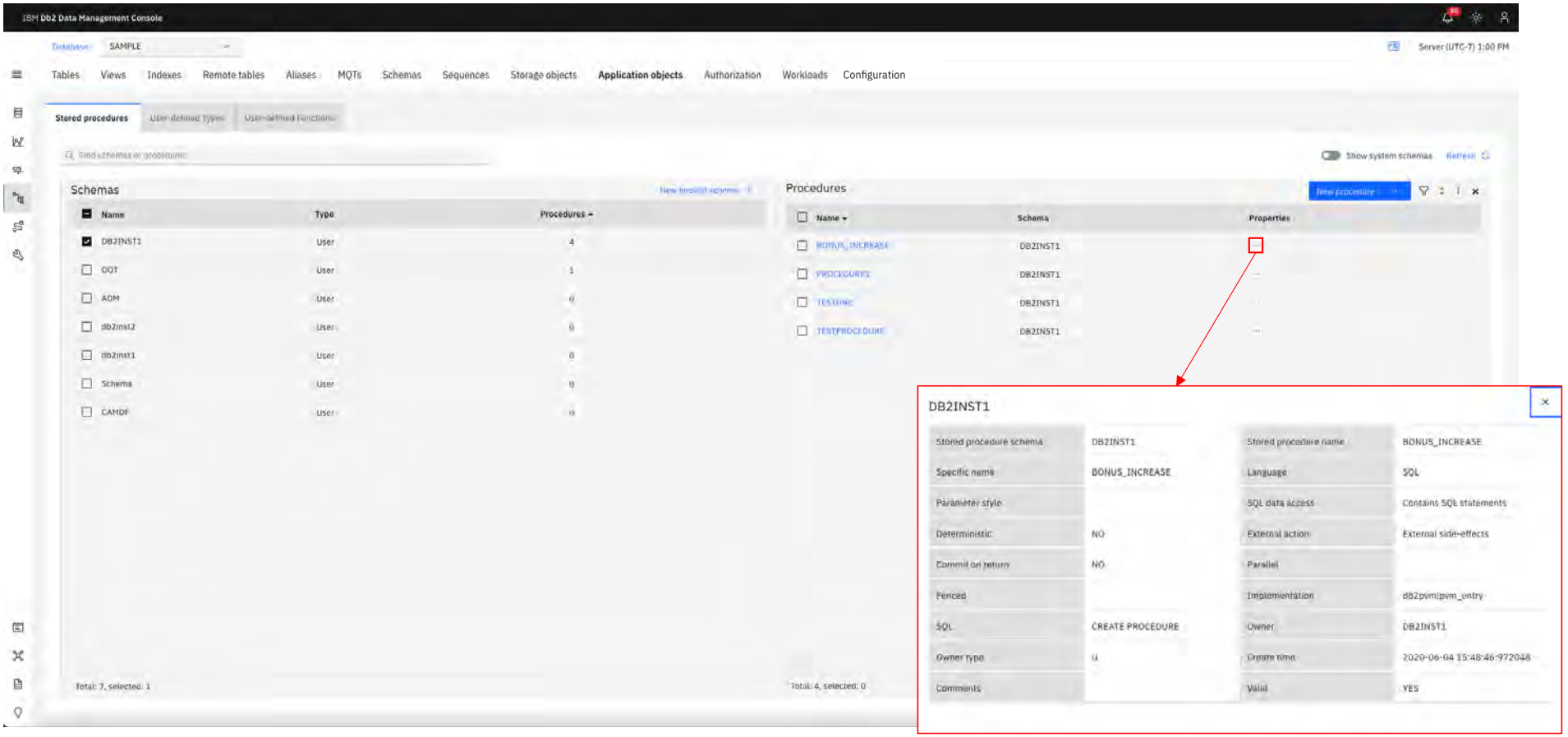
Data – Storage Objects – Table spaces



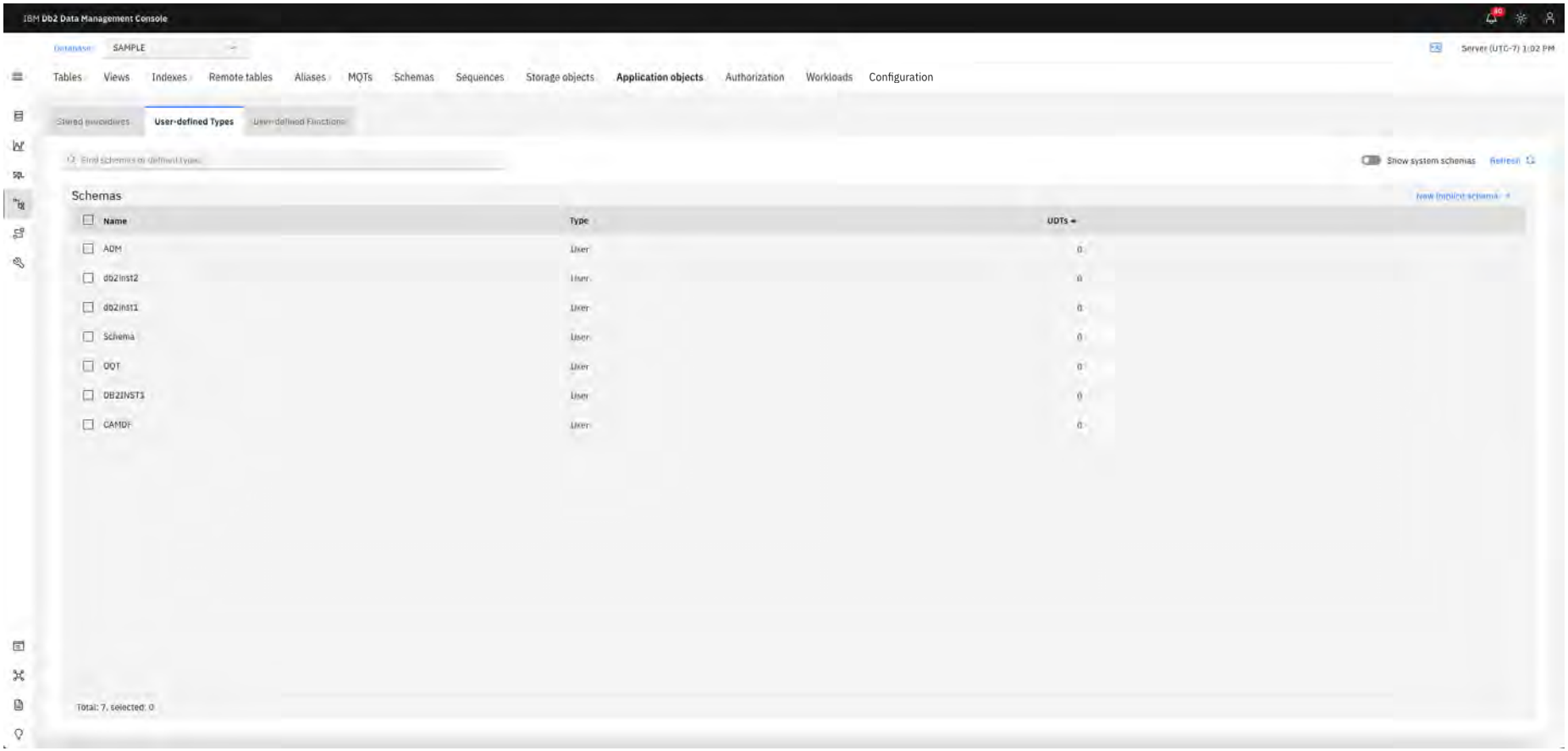
Data – Storage Objects – Buffer pools



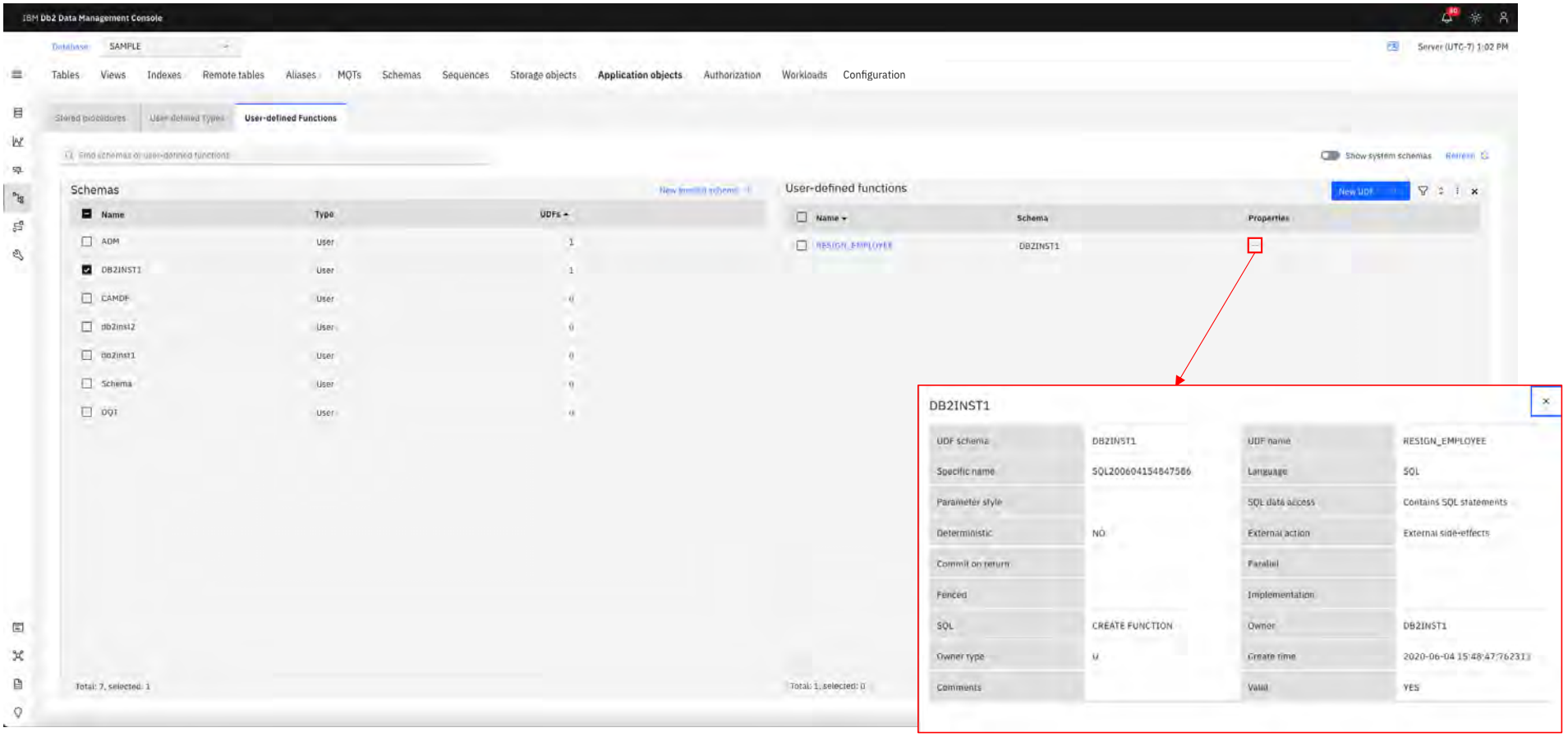
Data – Application Objects – Stored procedures



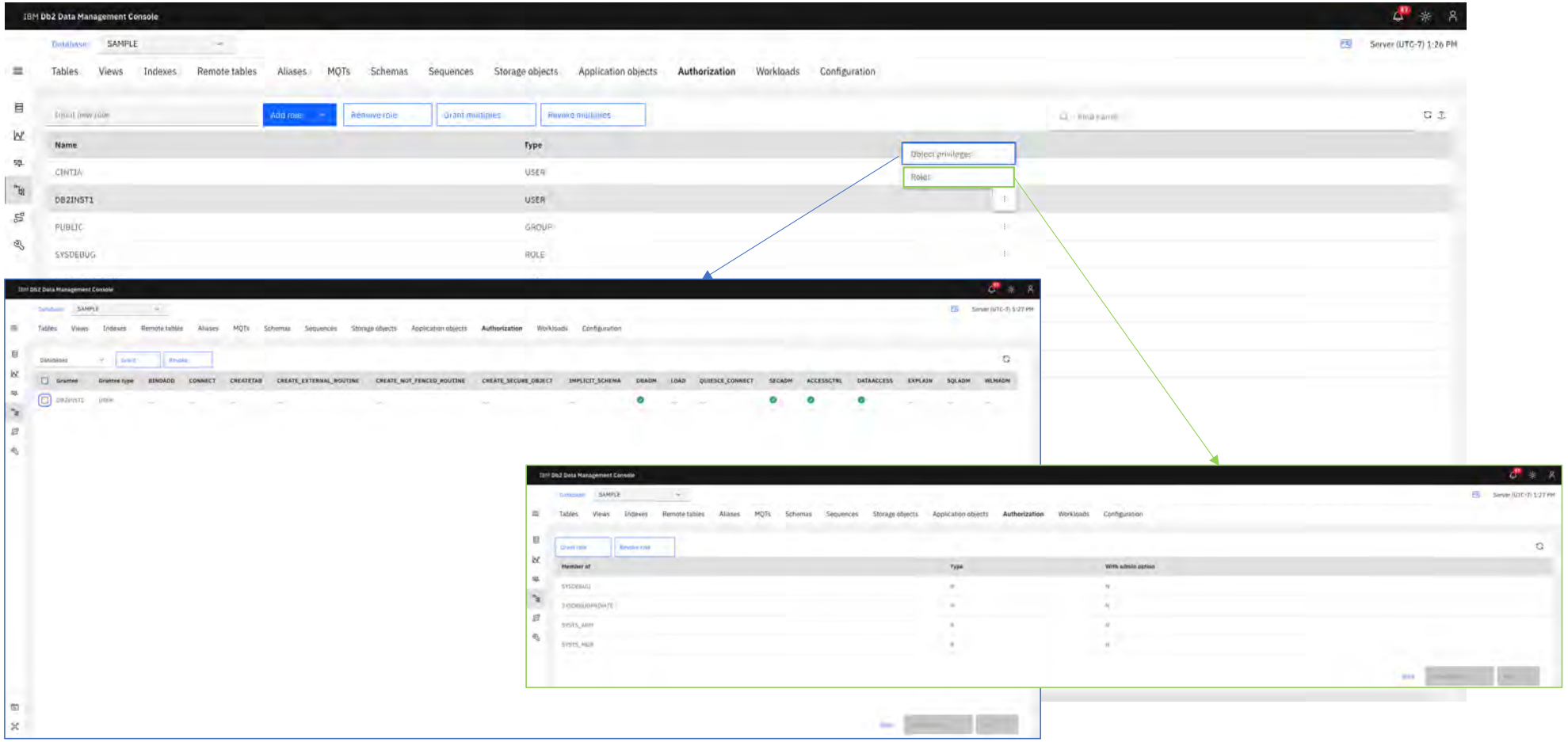
Data – Application Objects – User-defined Types



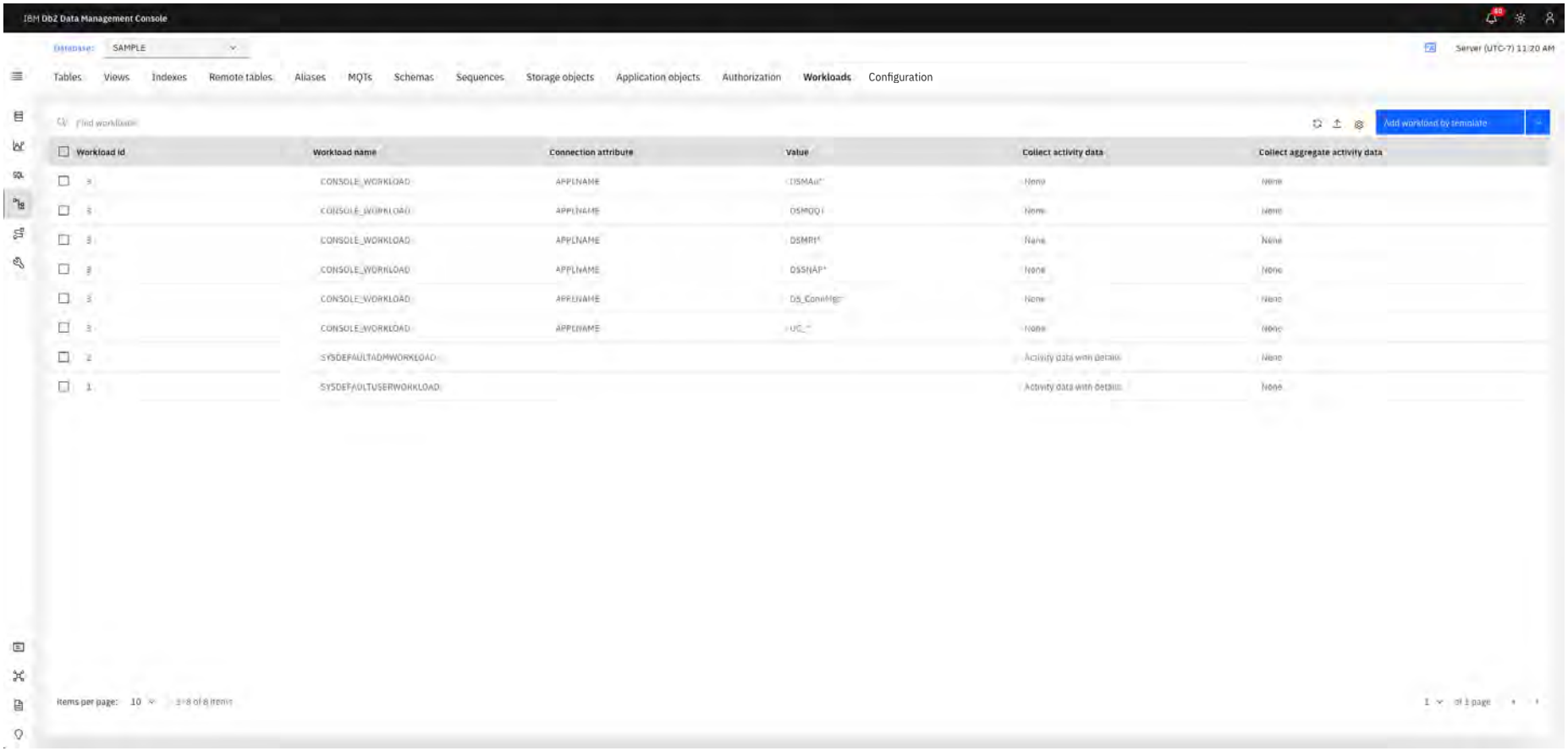
Data – Application Objects – User-defined Functions



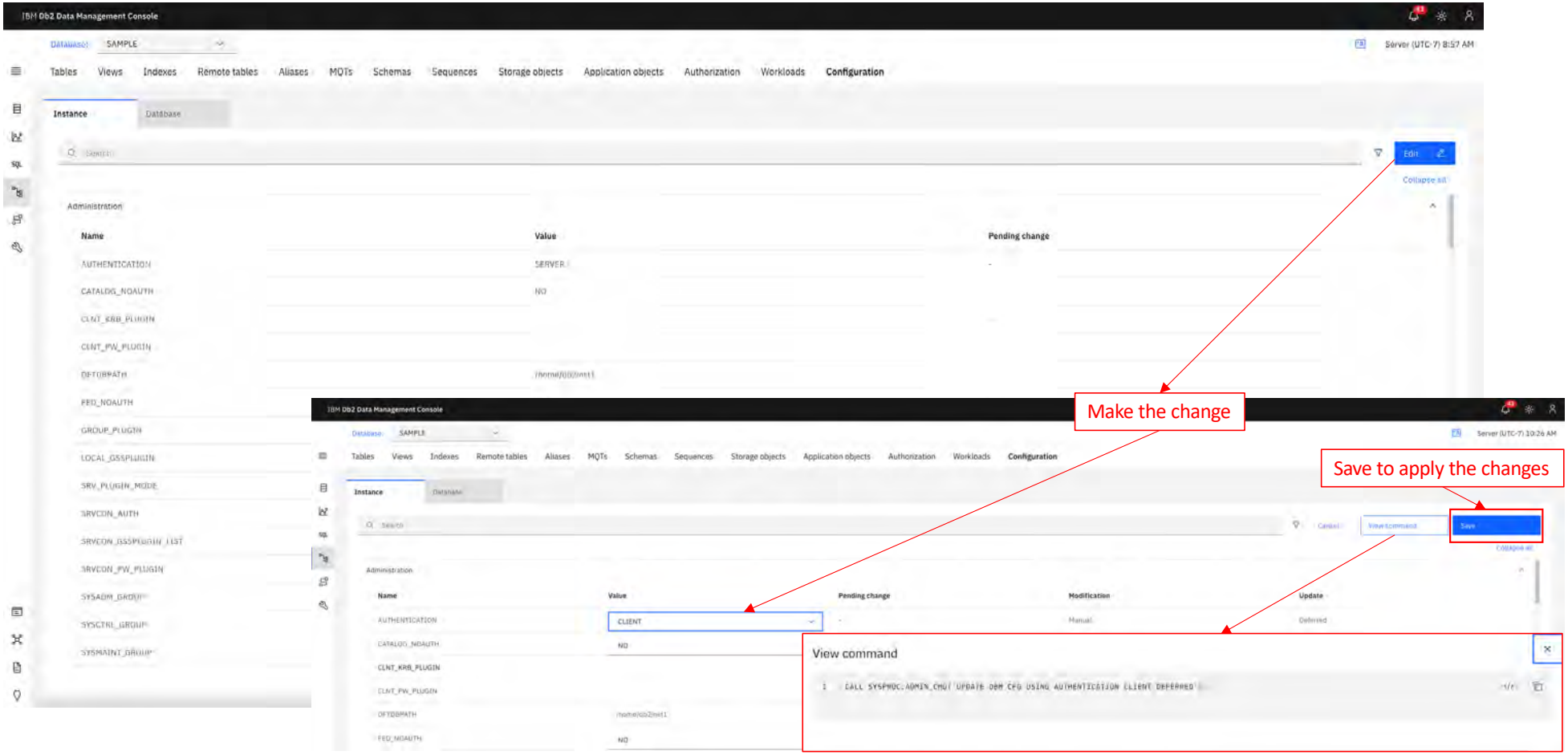
Data – Authorization



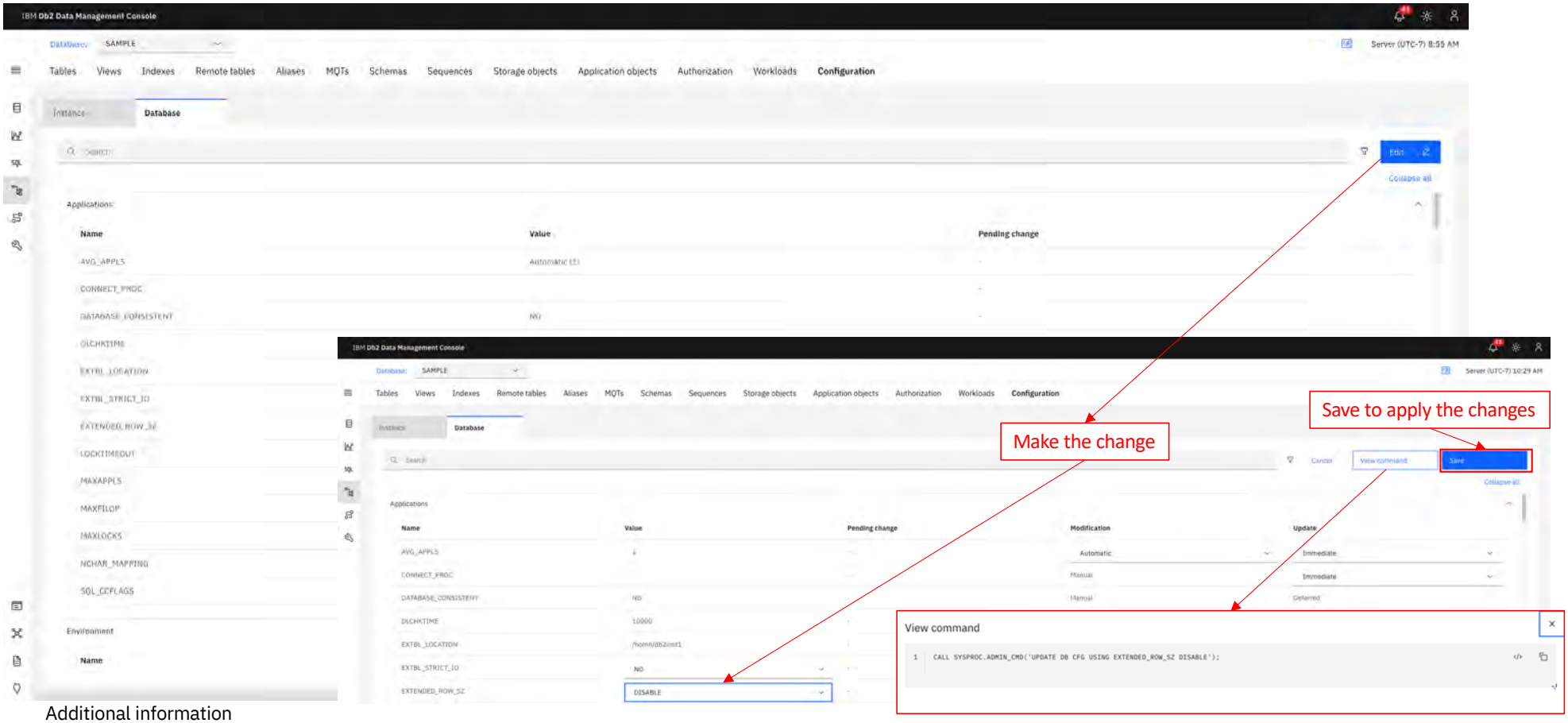
Data – Workloads



Data – Configuration – Instance



Data – Configuration – Database



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=administering-updating-configuration-parameters

Db2 Data Management Console

SQL Editor

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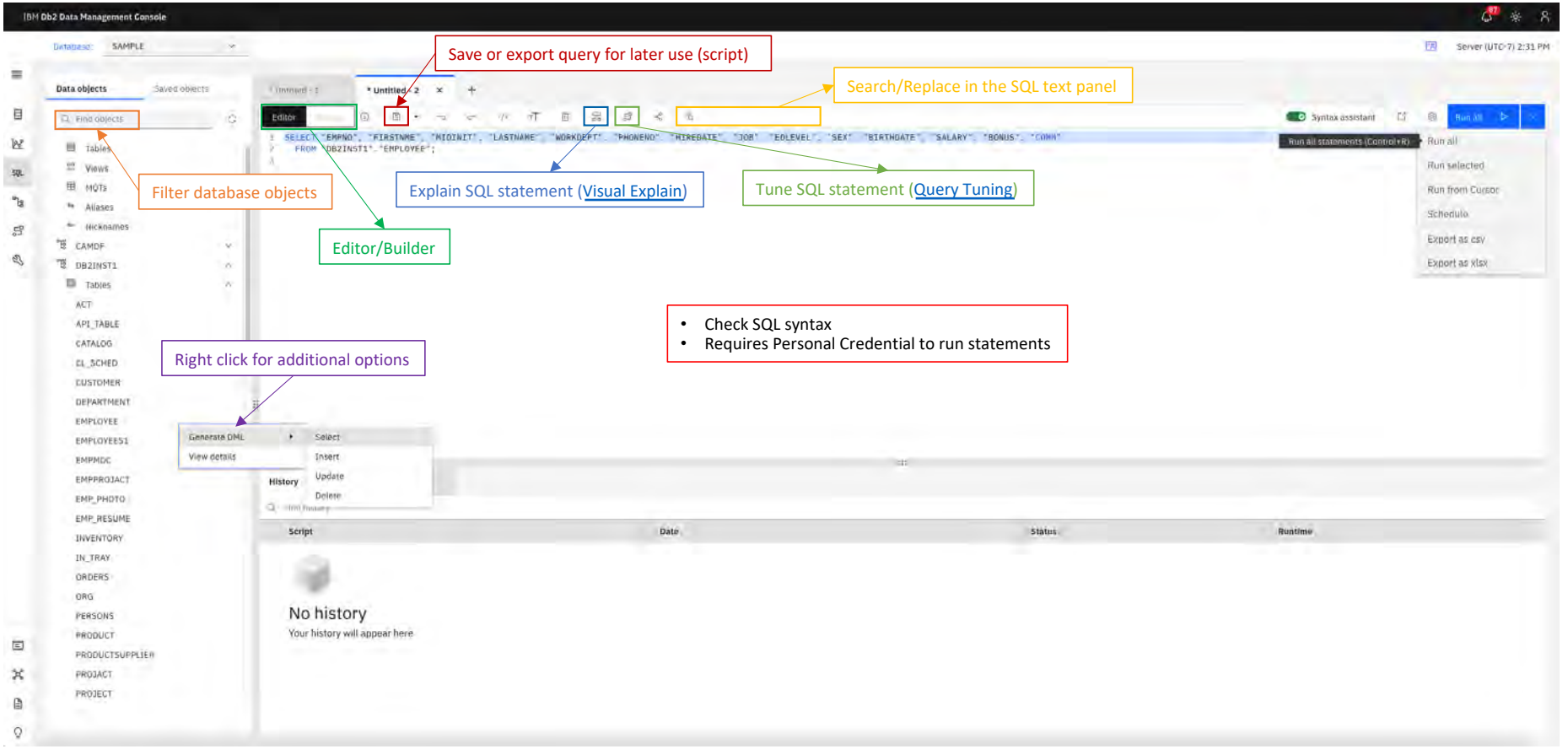
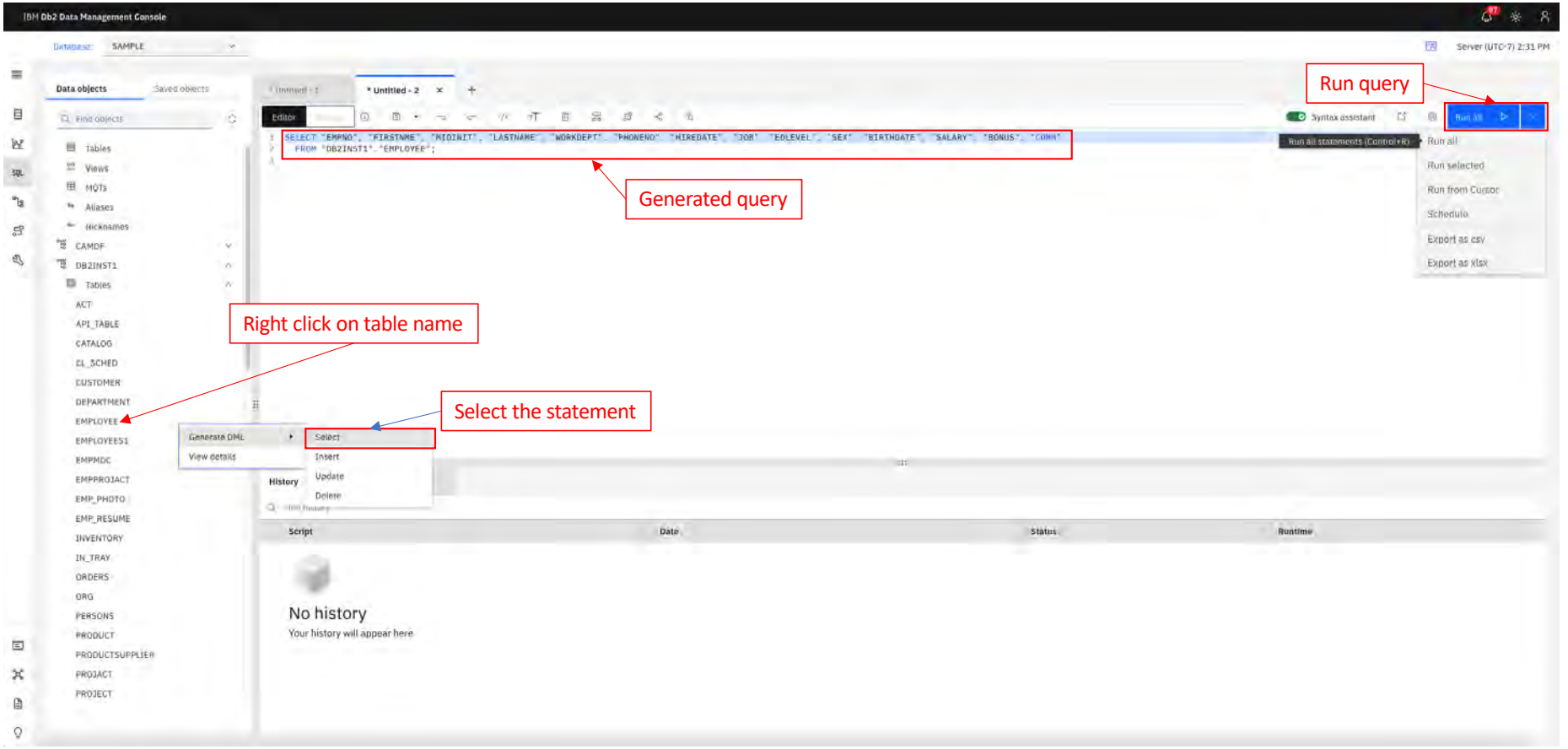
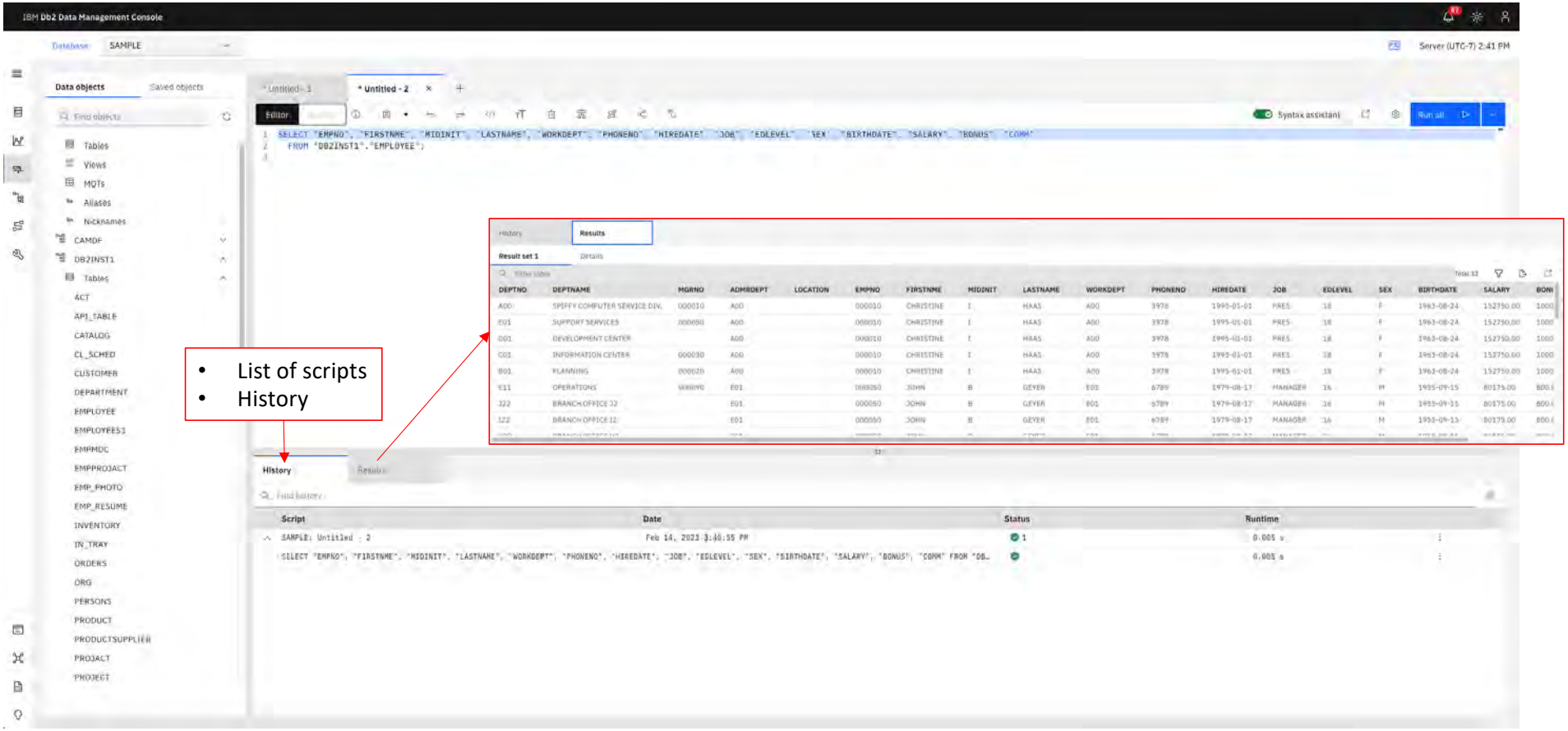
Integrated SQL Editor



Run SQL – Editor

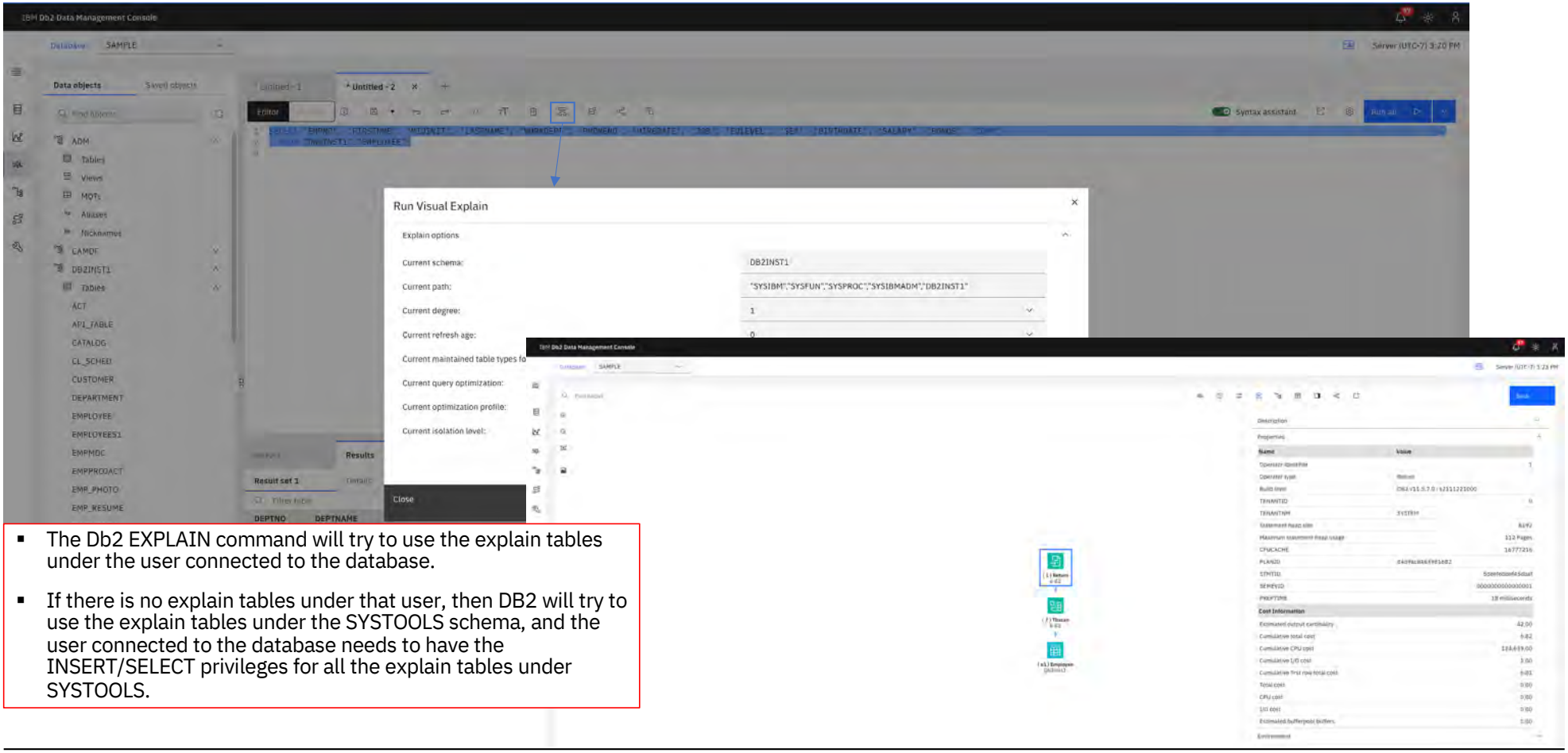


Run SQL – Editor



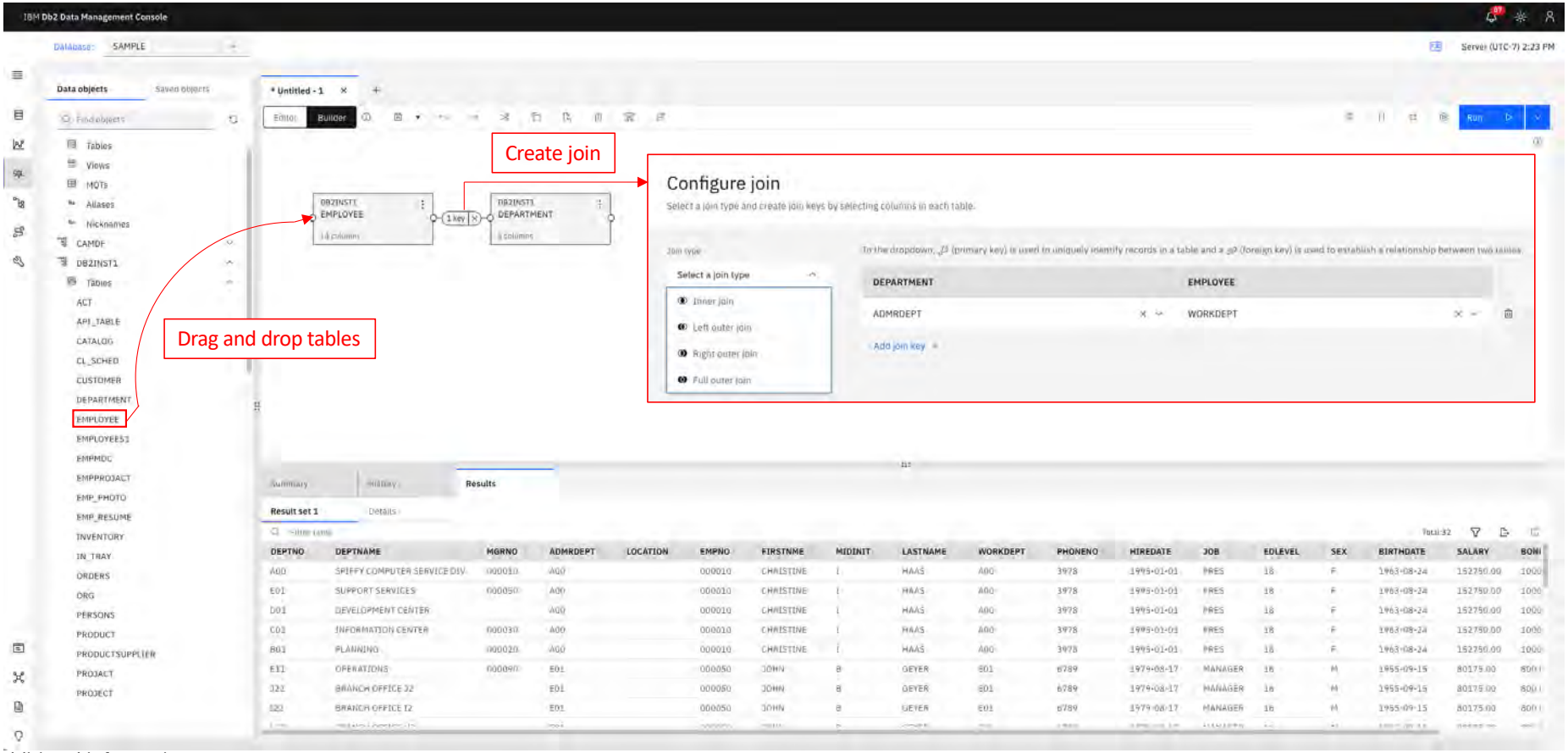
- List of scripts
- History

Run SQL – Visual Explain



- The Db2 EXPLAIN command will try to use the explain tables under the user connected to the database.
- If there is no explain tables under that user, then DB2 will try to use the explain tables under the SYSTOOLS schema, and the user connected to the database needs to have the INSERT/SELECT privileges for all the explain tables under SYSTOOLS.

Run SQL – Builder



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=sql-using-builder

Db2 Data Management Console

Query Tuning

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Query Tuning

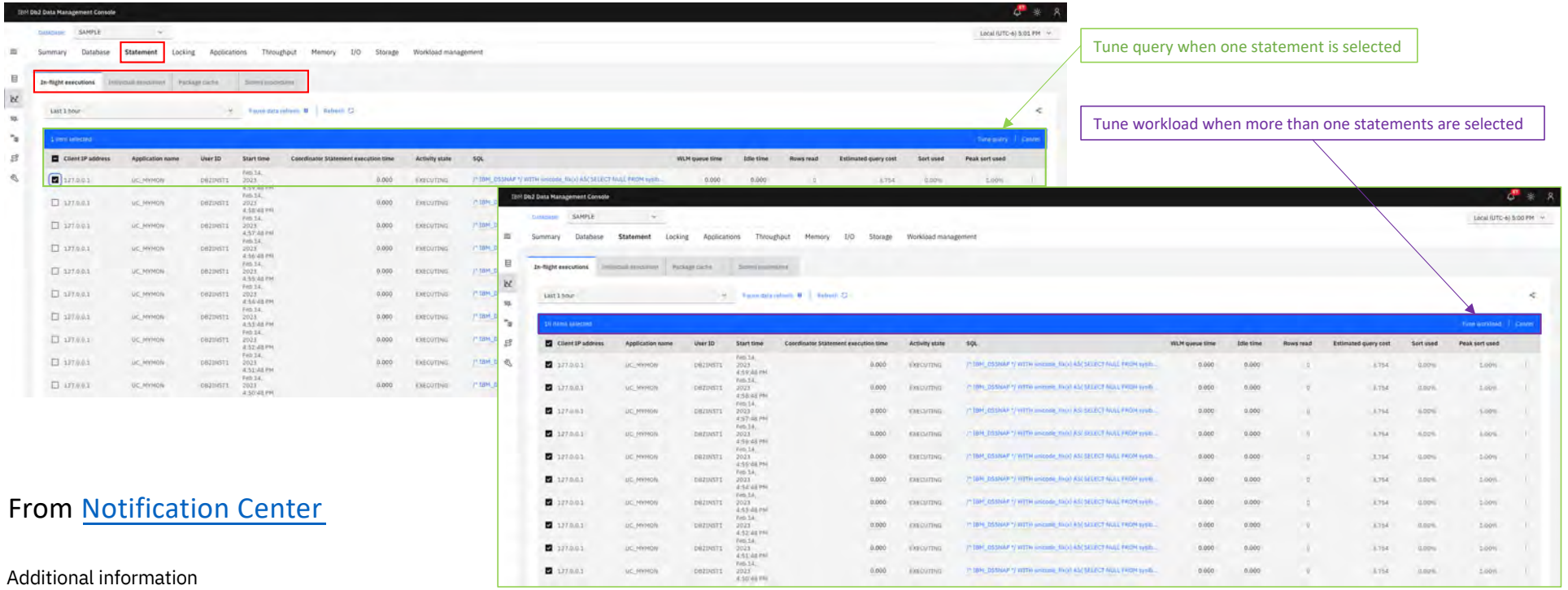
- Format and annotate the statement
- Generate access plan graph
  - Access plan graph describes both the operational details of query execution and how the data flows
  - A leaf node of an access plan graph is either a table node or an index node that represents a data source in the query execution plan
  - Typically a table node is at the bottom of the graph, and the access plan proceeds upward from there
- Recommend RUNSTATS commands
  - Generated by the Statistics Analyzer
  - Lists all the tables that are accessed by the queries in the single-query or workload that are tuned and recommended actions for updating their associated catalog statistics
- Recommend new indexes
  - The **Storage comparison** chart, **Performance comparison** chart, and **Index recommendations** table are displayed
  - The **Storage comparison** chart and **Performance comparison** chart provide a comparison between the original cost and the after-change cost if index recommendations are applied

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=welcome-tuning

Query Tuning – Creating a Tuning Task

3 ways to create a tuning task

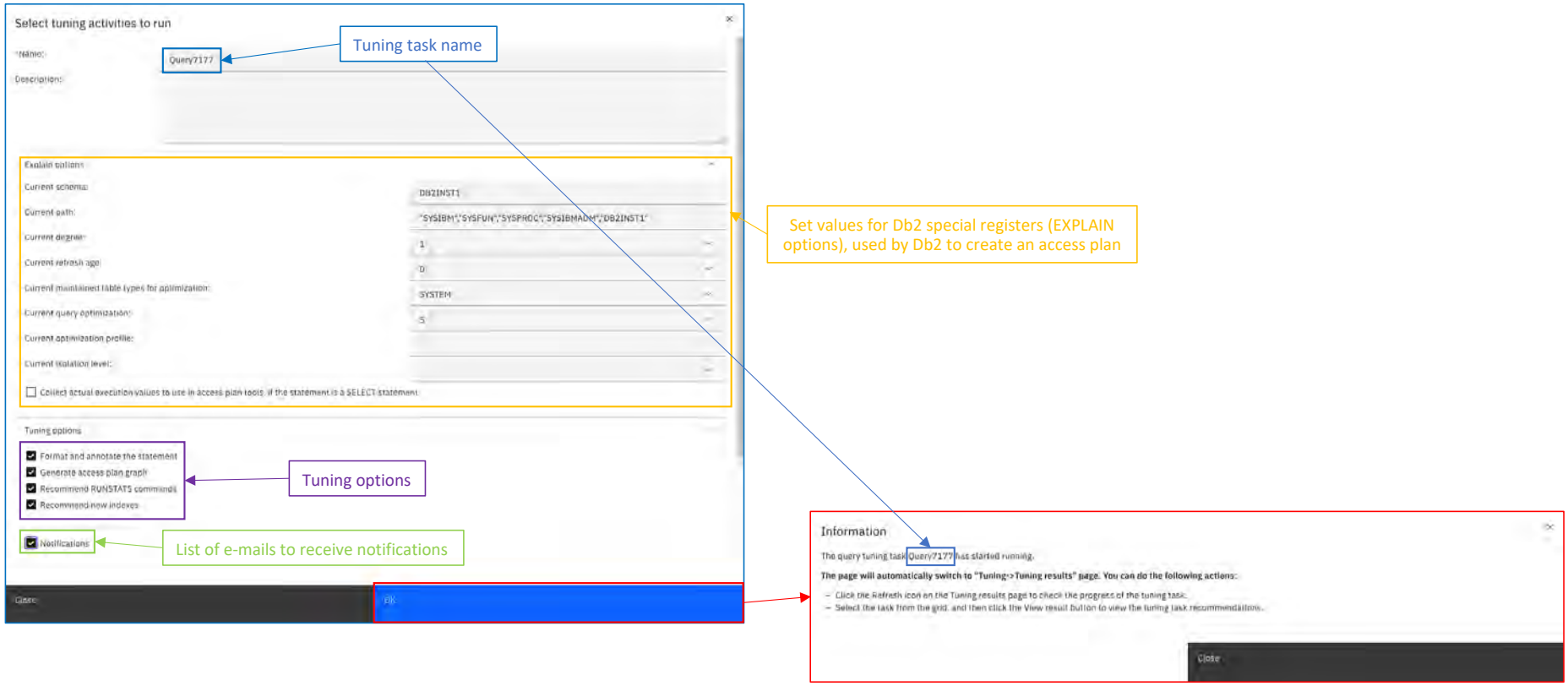
- From Run SQL Editor
- From any of Statement tabs



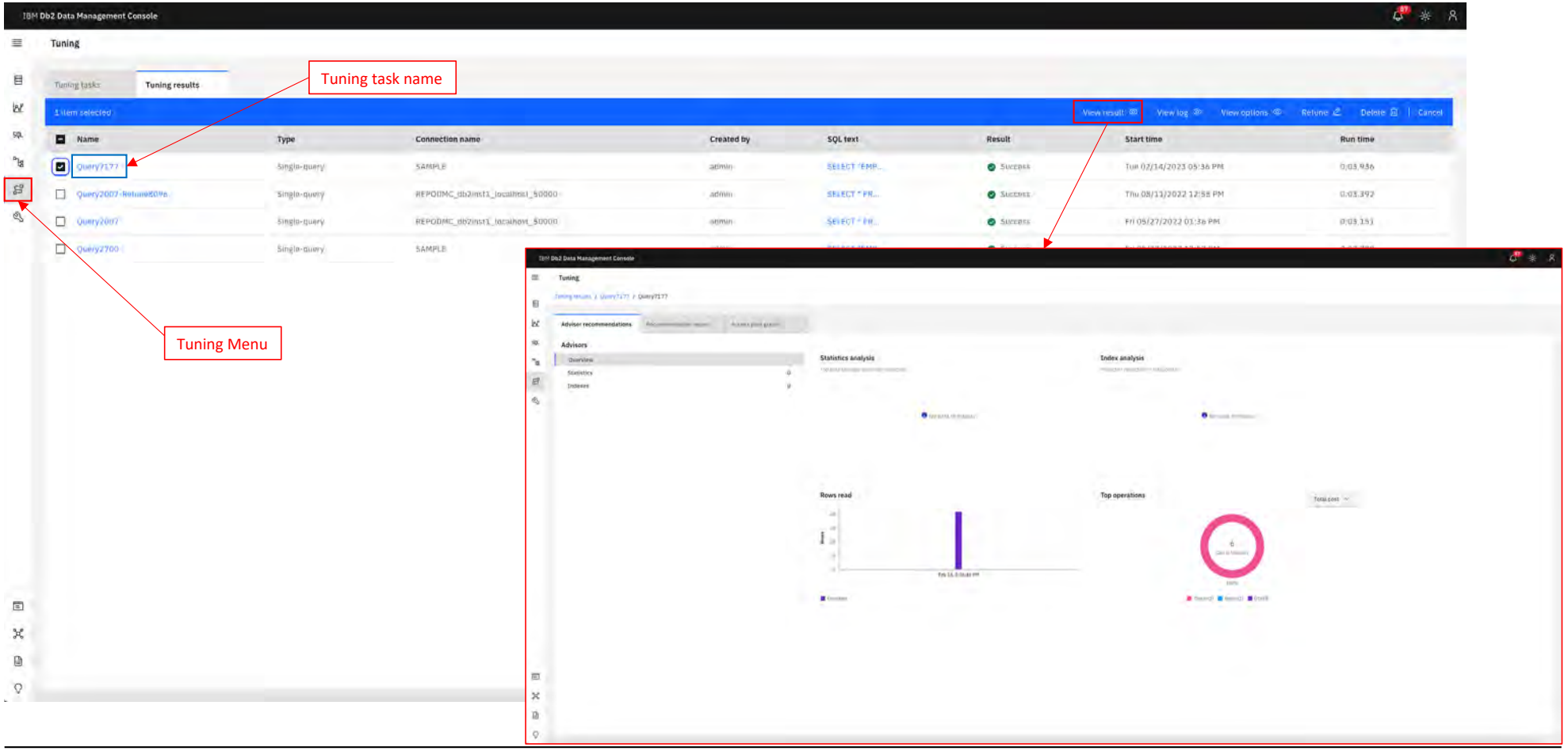
- From Notification Center

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=tuning-creating-task

Query Tuning – Tuning Task definition



Query Tuning – View Results



Db2 Data Management Console

Replication

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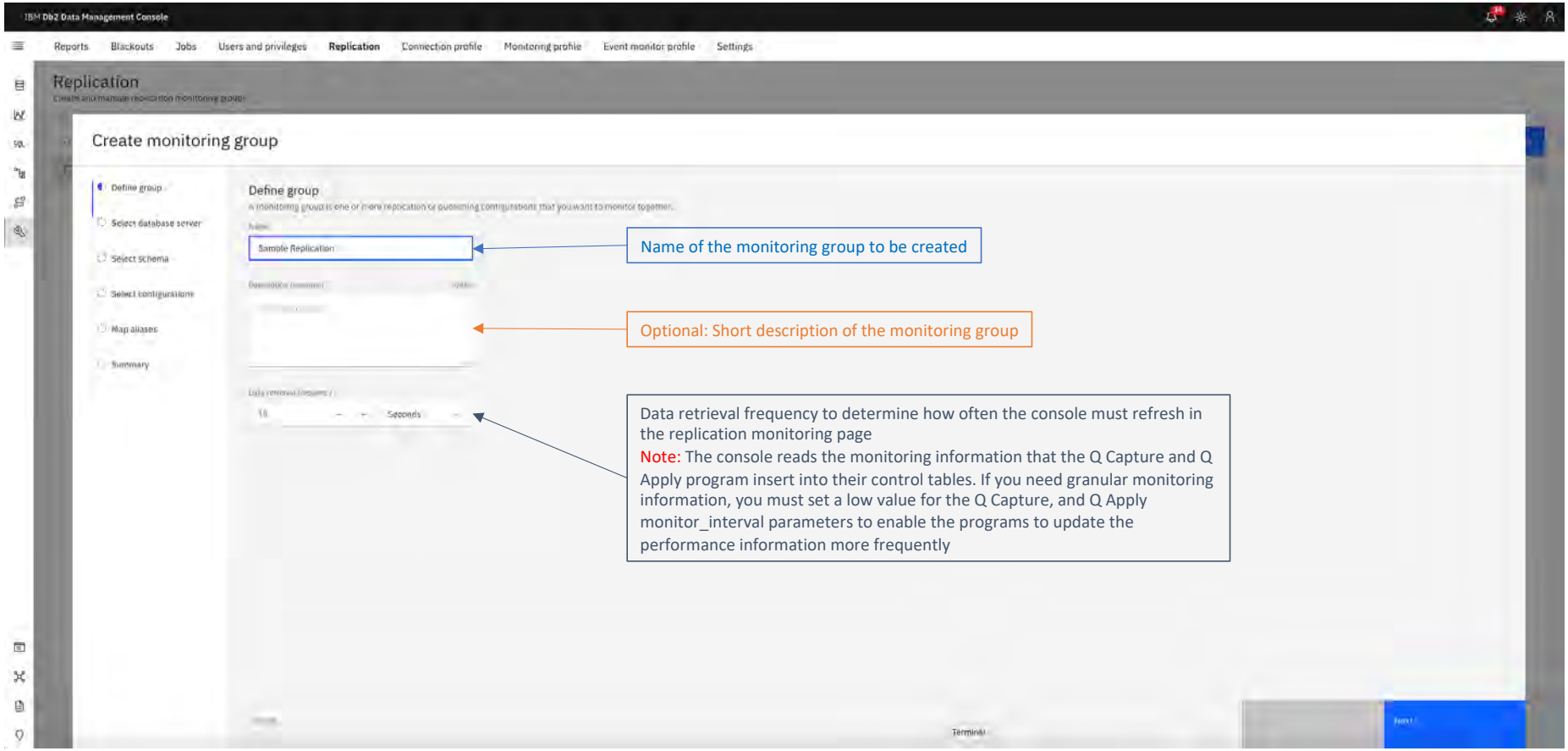
Replication

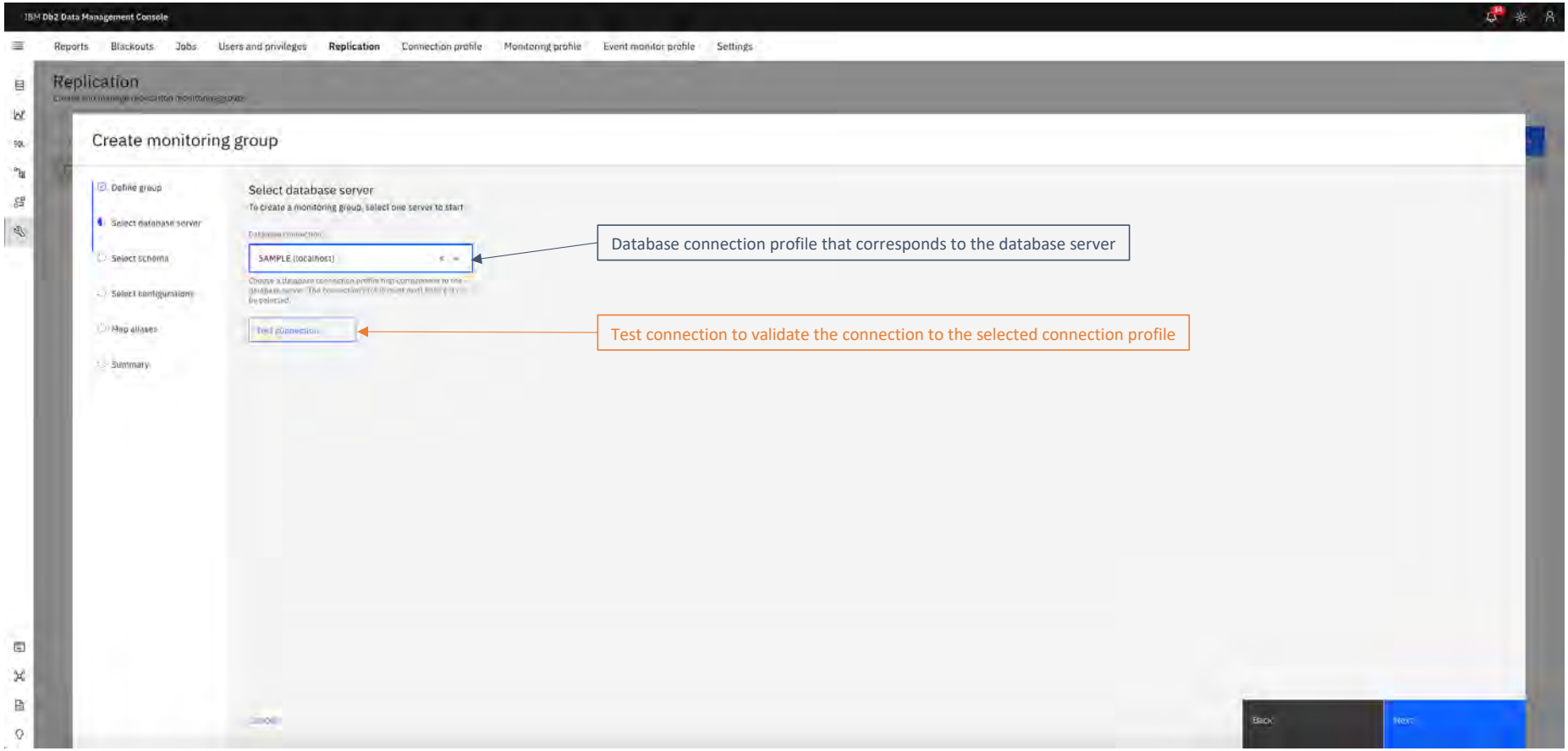
- Available in V3.1.9 or later
- Enhancements in V3.1.10
  - Enhanced throughput chart to use bar chart format
  - Introduced the following tabs in throughput chart for displaying the Q capture and Q depth details
    - Capture throughput Capture throughput
      - Number of rows that are sent from the source table
    - Capture Q depth
      - Number of messages on the transmission queue that are associated with the send queue
    - Apply throughput Apply throughput
      - Number of rows that are applied to the target table
    - Apply Q depth
      - Number of messages on the receive queue.
- Enhanced latency chart with an interactive legend
- Improved performance on latency and throughput charts by reducing the data points and fetch time
- Improved Replication home page load speed and performance
- Added 15-minutes time interval in the monitoring group details page
- Introduced bidirectional configuration type option for creating a monitoring group

Replication – Monitoring Group

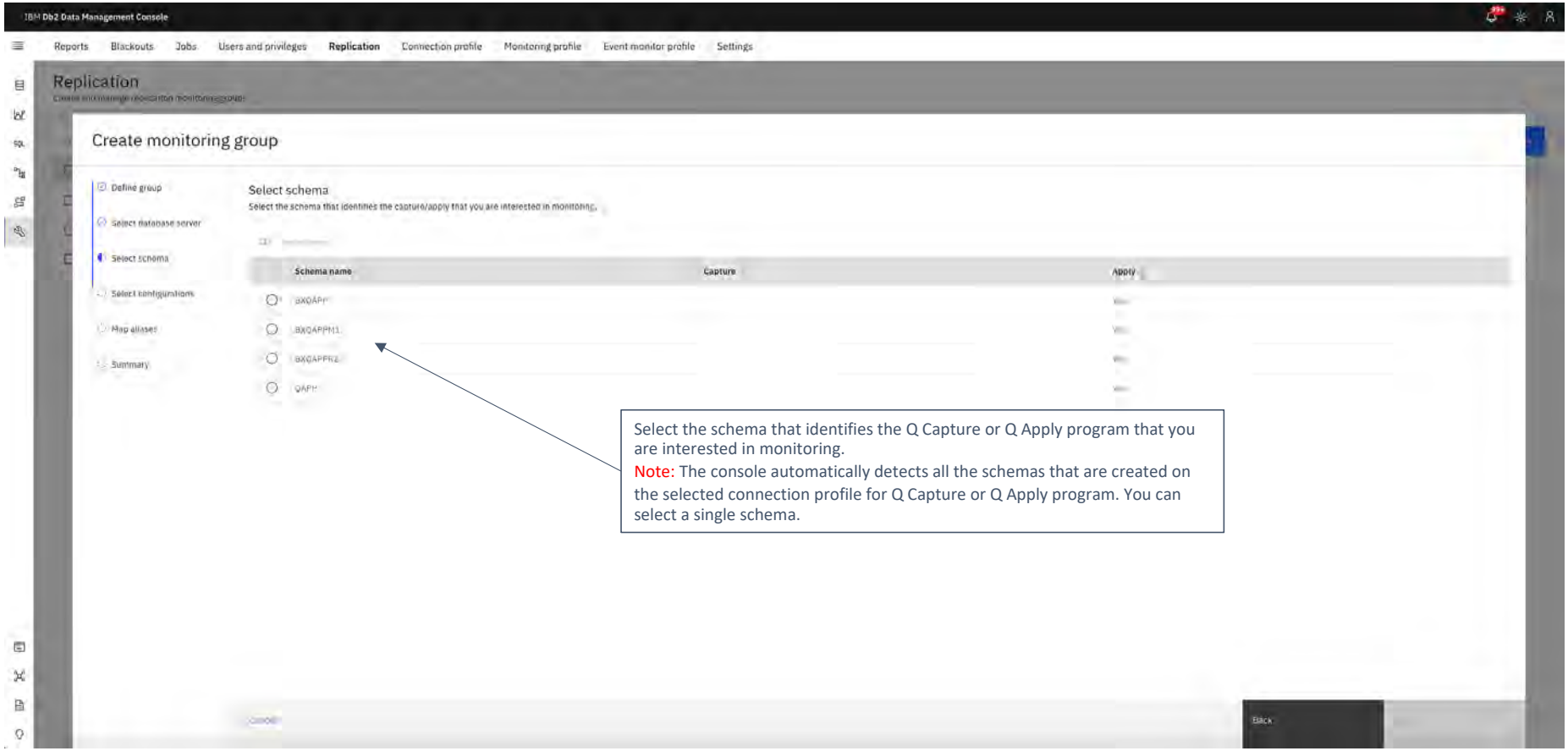


Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=replication-creating-monitoring-group

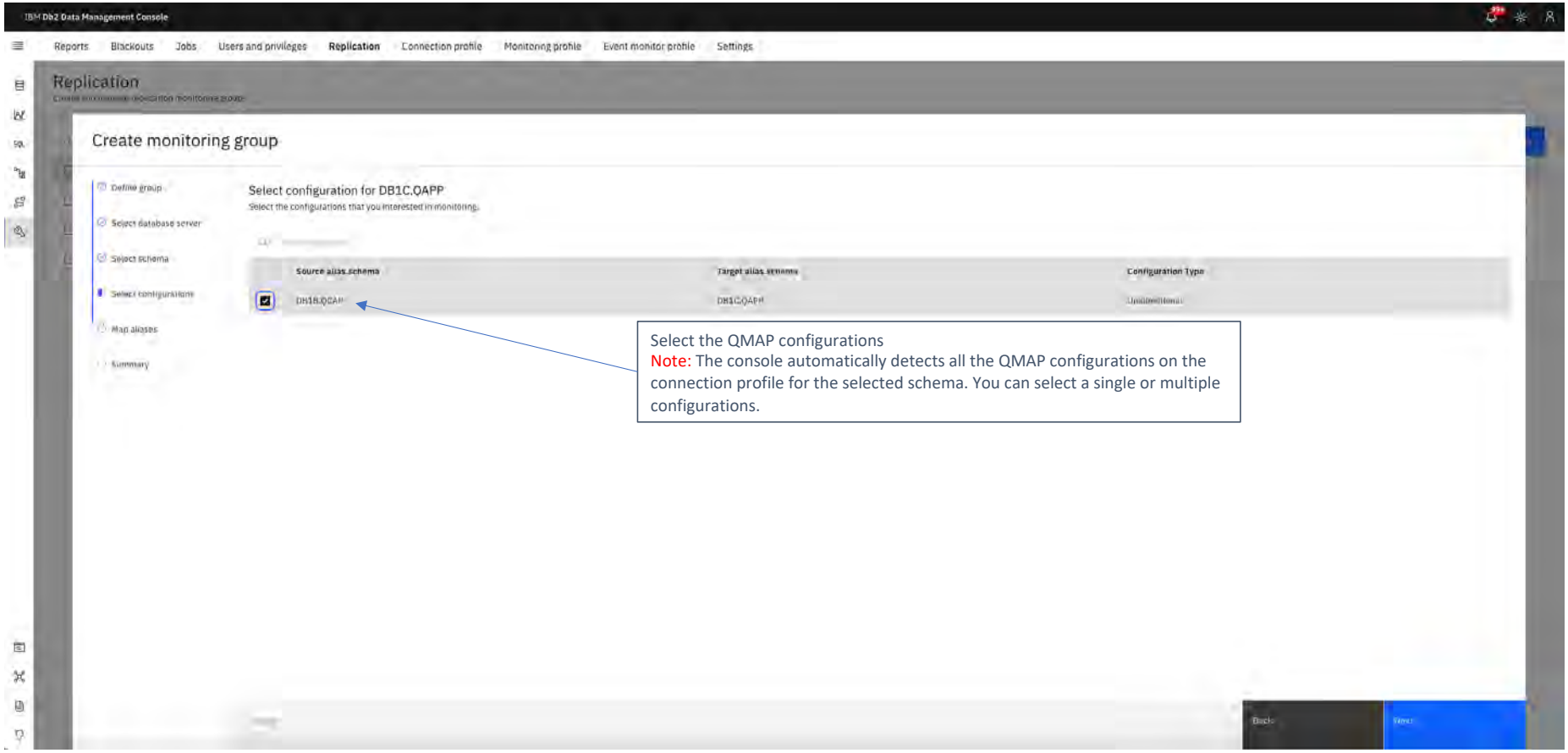
Replication – Database Server



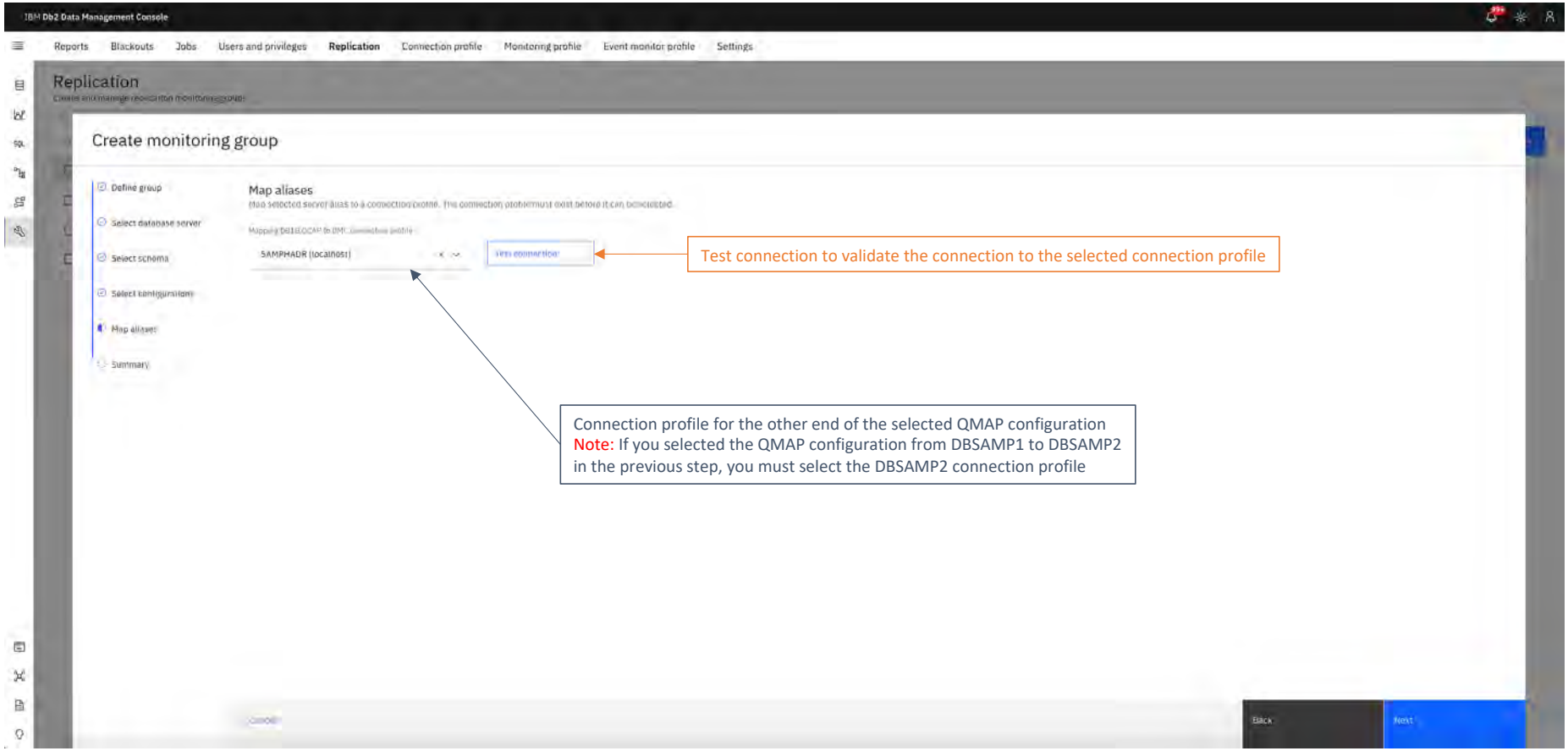
Replication – Schema



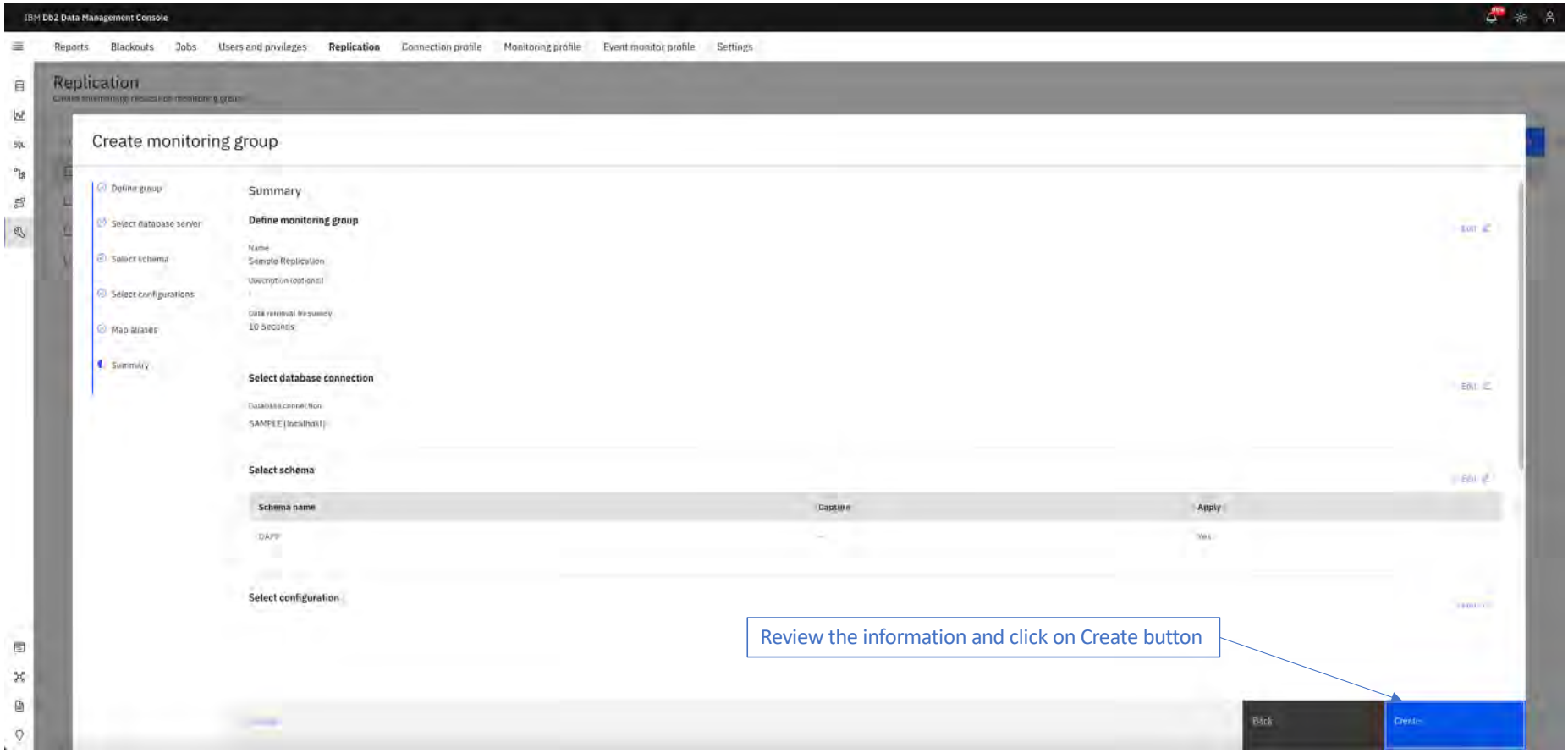
Replication – Configurations



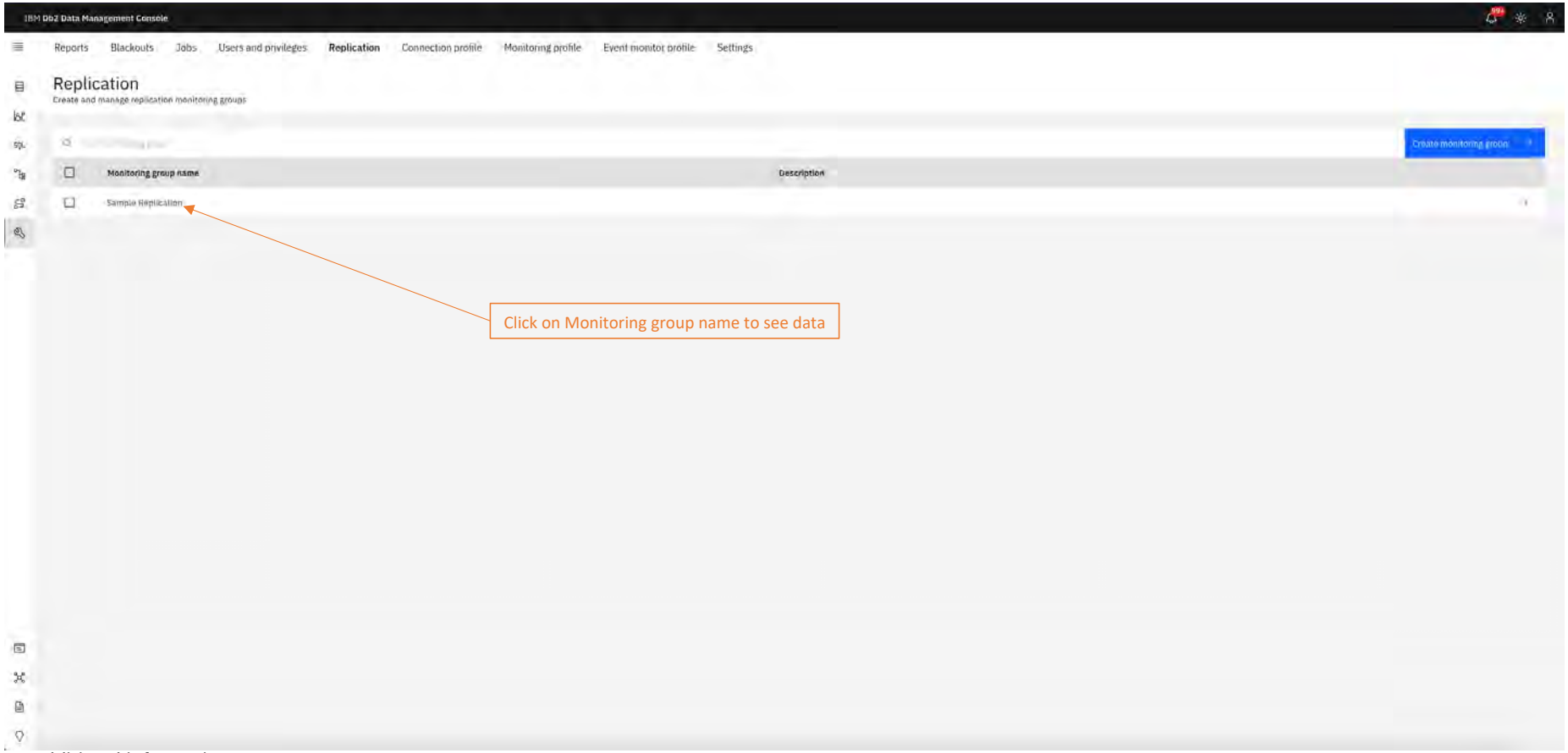
Replication – Map Aliases



Replication – Summary

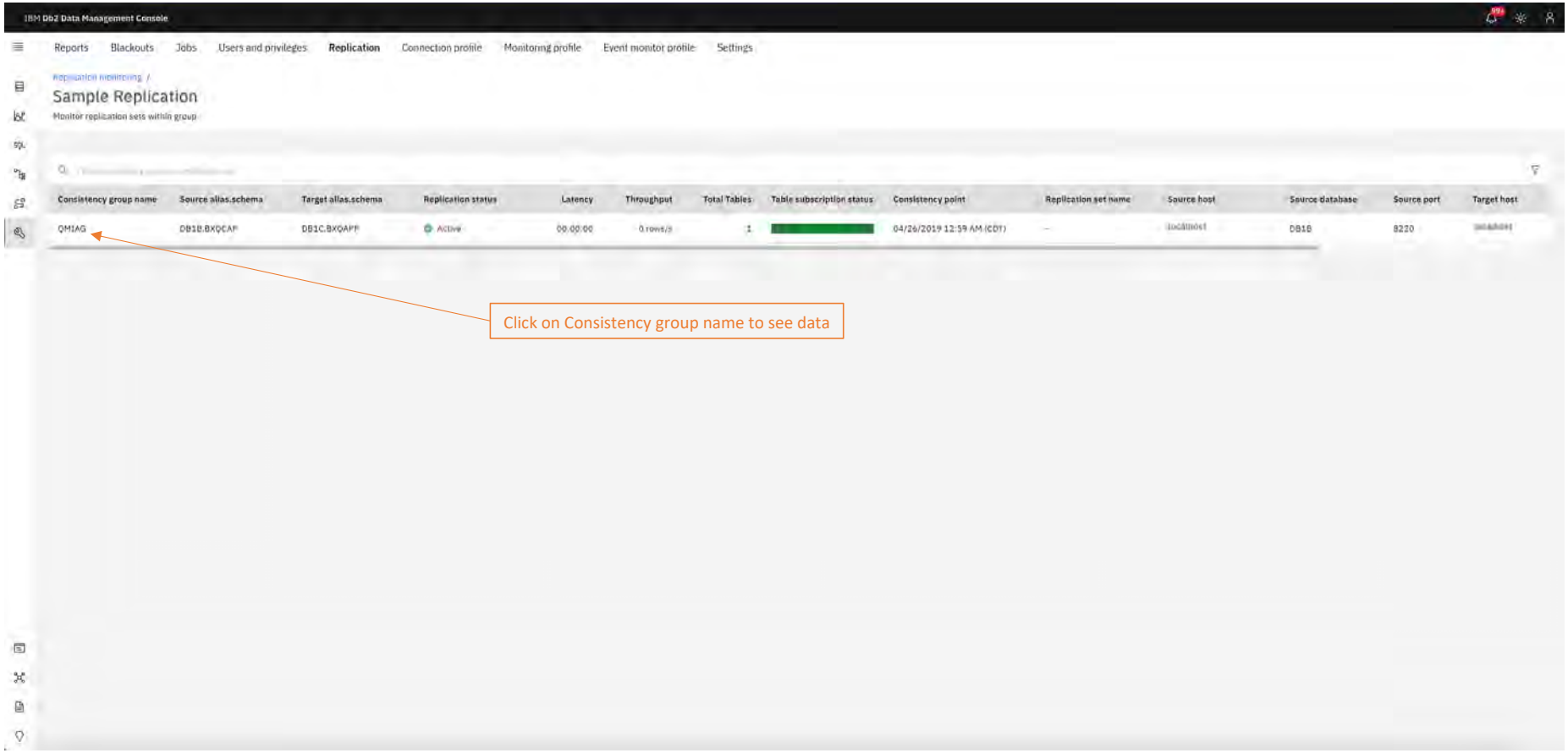


Replication – Monitoring



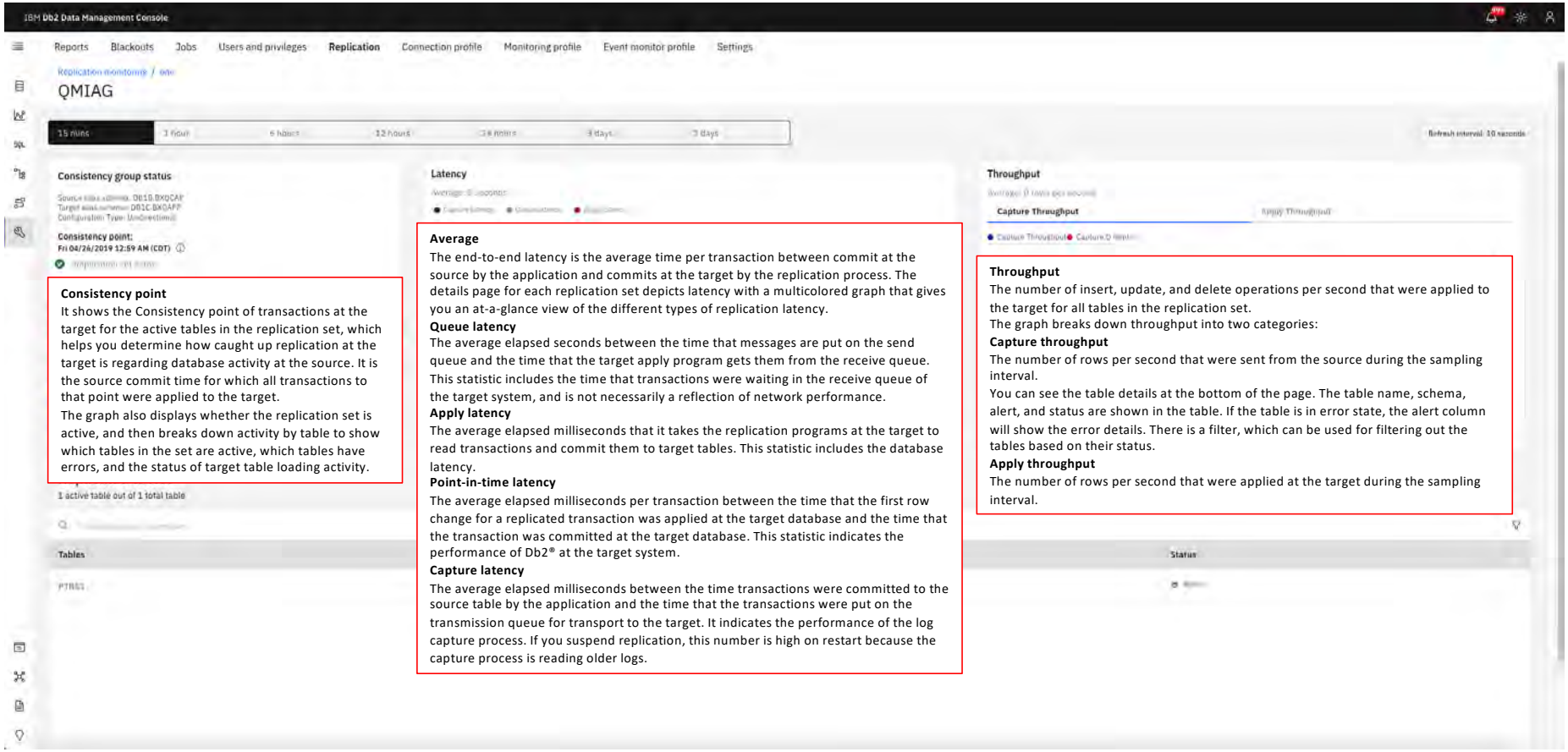
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=replication-monitoring

Replication – Monitoring



Replication – Monitoring

IBM Db2 - Data Management Console



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=replication-monitoring

Db2 Data Management Console

Additional Features

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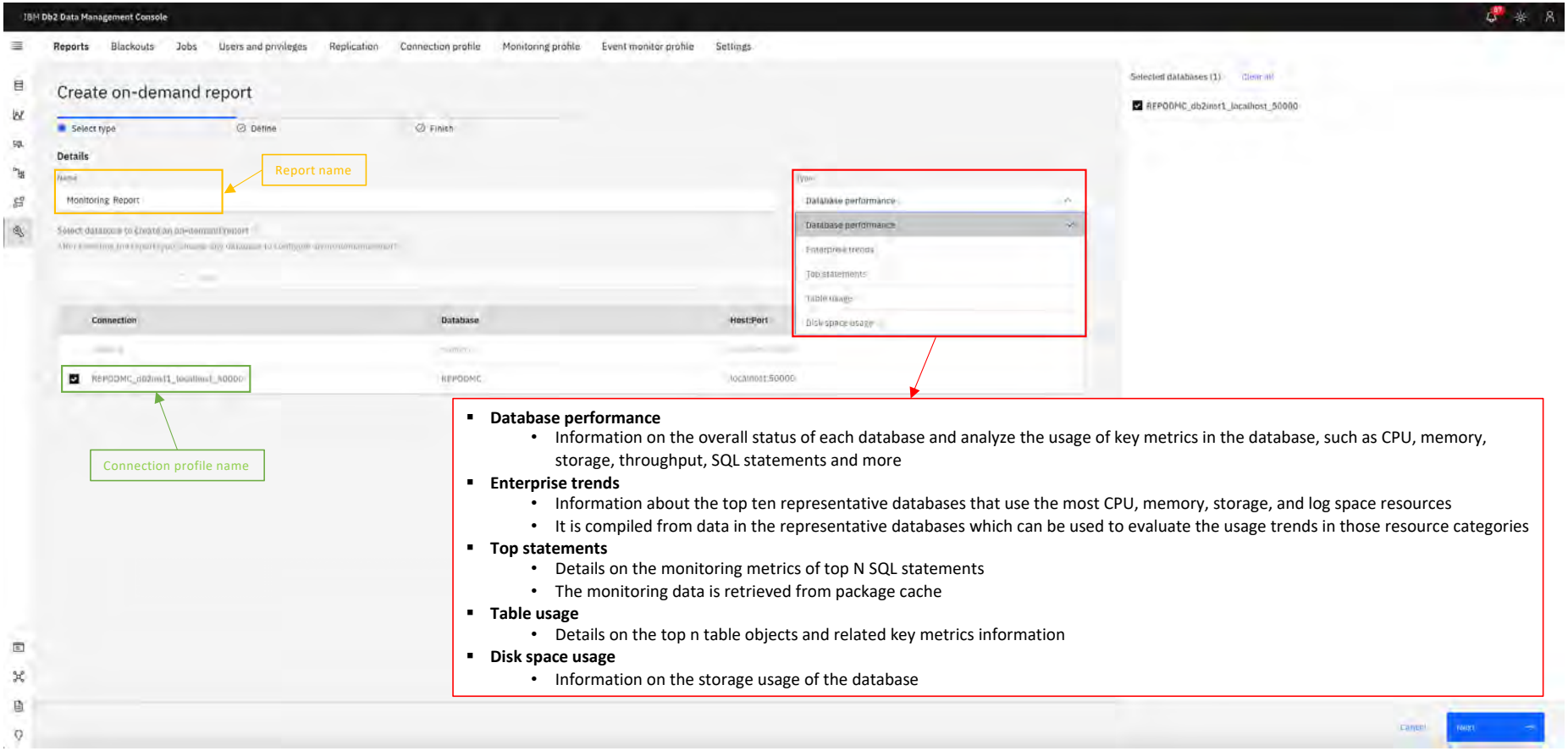
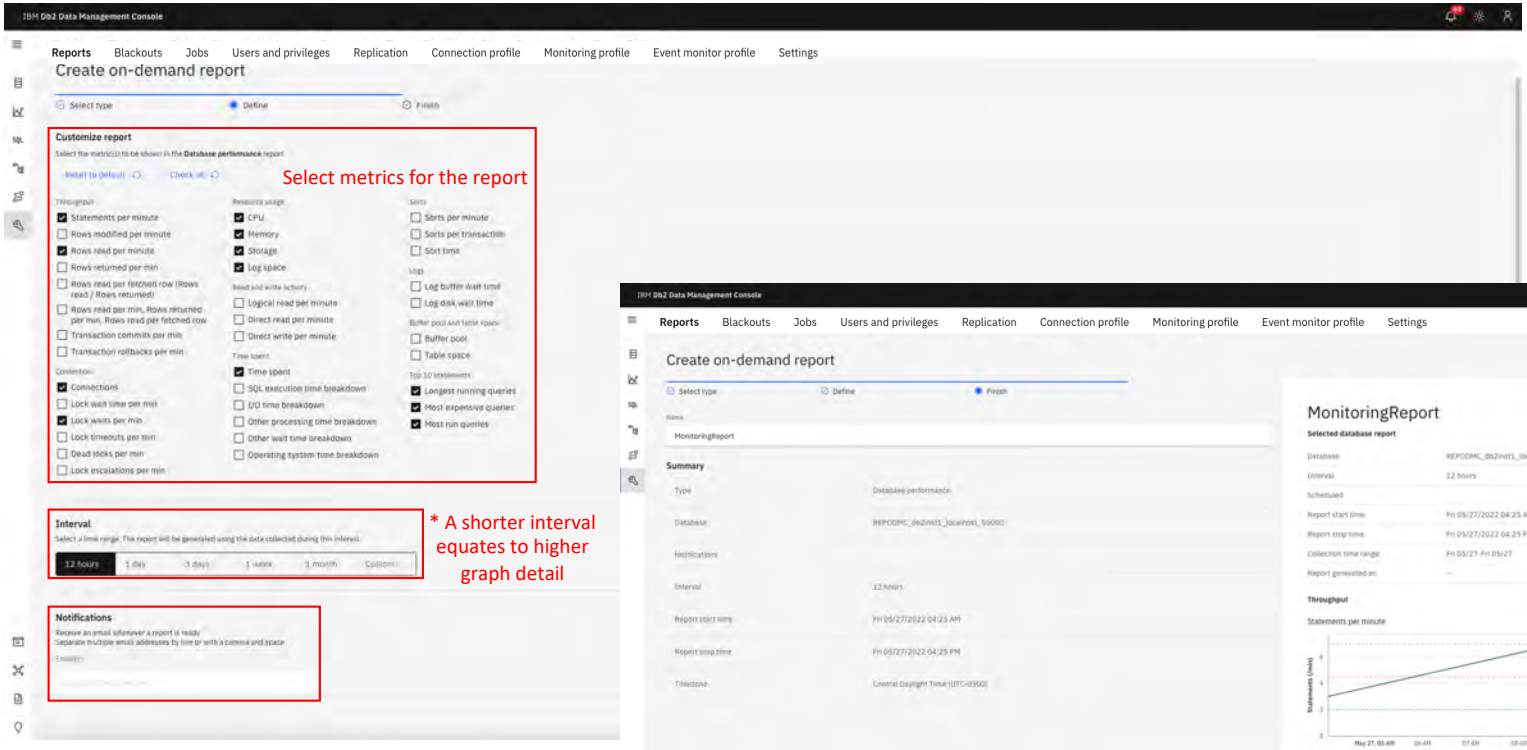
Reporting

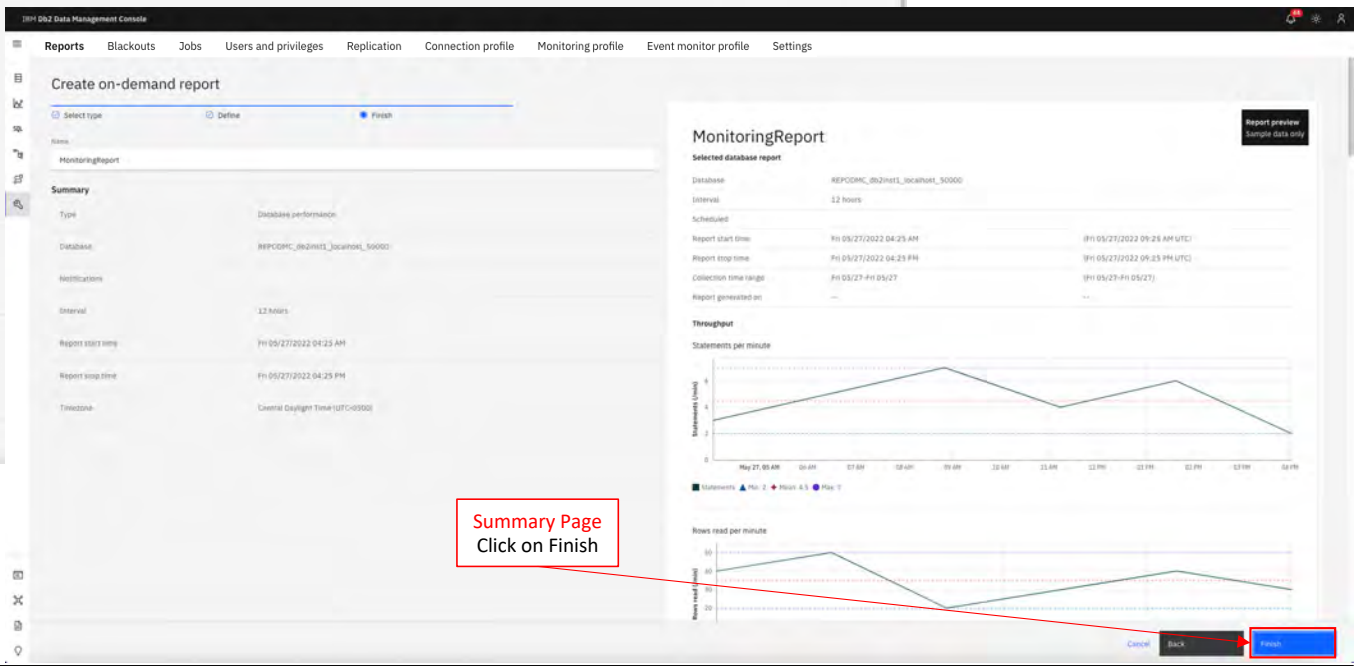


- **Database performance**
  - Information on the overall status of each database and analyze the usage of key metrics in the database, such as CPU, memory, storage, throughput, SQL statements and more
- **Enterprise trends**
  - Information about the top ten representative databases that use the most CPU, memory, storage, and log space resources
  - It is compiled from data in the representative databases which can be used to evaluate the usage trends in those resource categories
- **Top statements**
  - Details on the monitoring metrics of top N SQL statements
  - The monitoring data is retrieved from package cache
- **Table usage**
  - Details on the top n table objects and related key metrics information
- **Disk space usage**
  - Information on the storage usage of the database

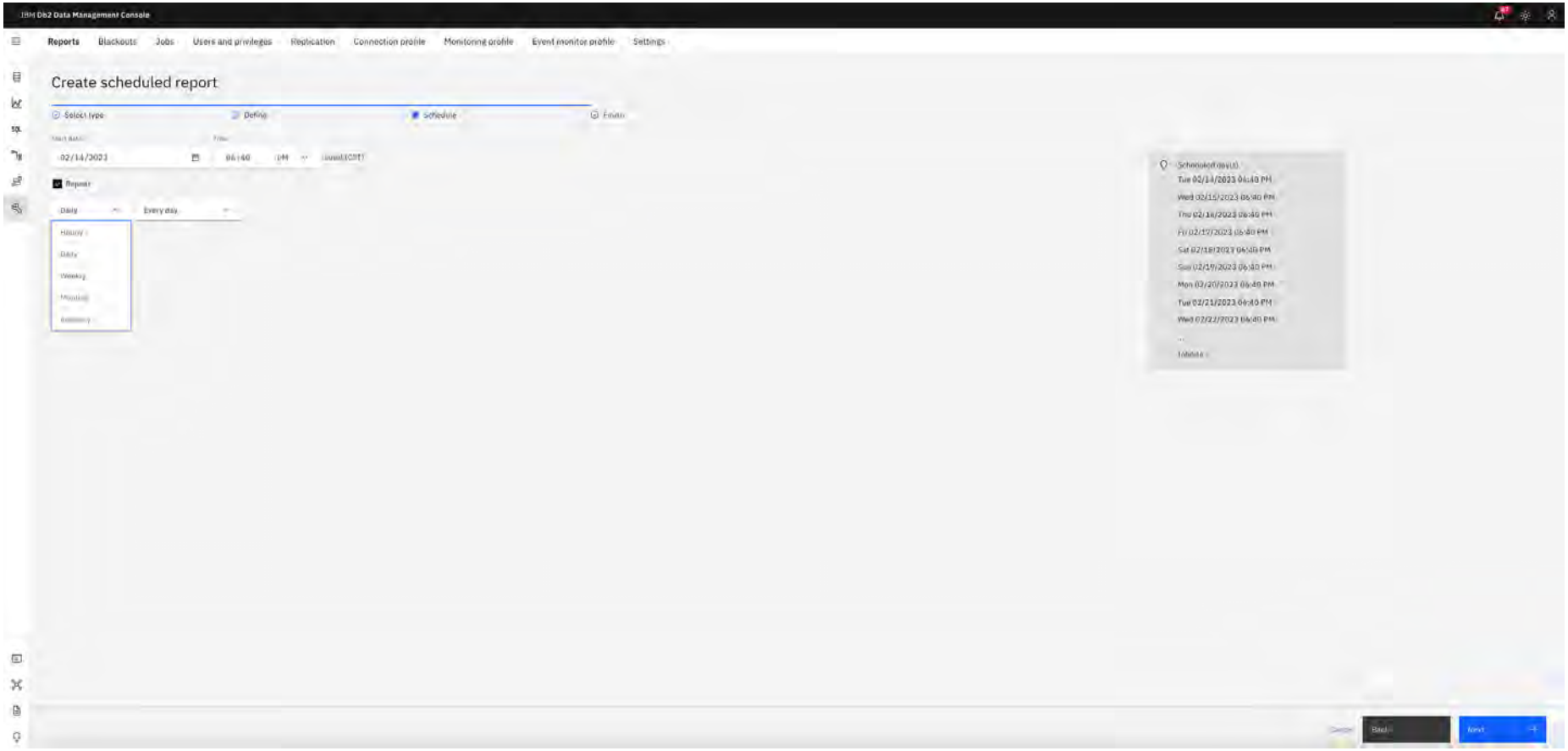
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=monitoring-creating-monitor-reports

Reporting

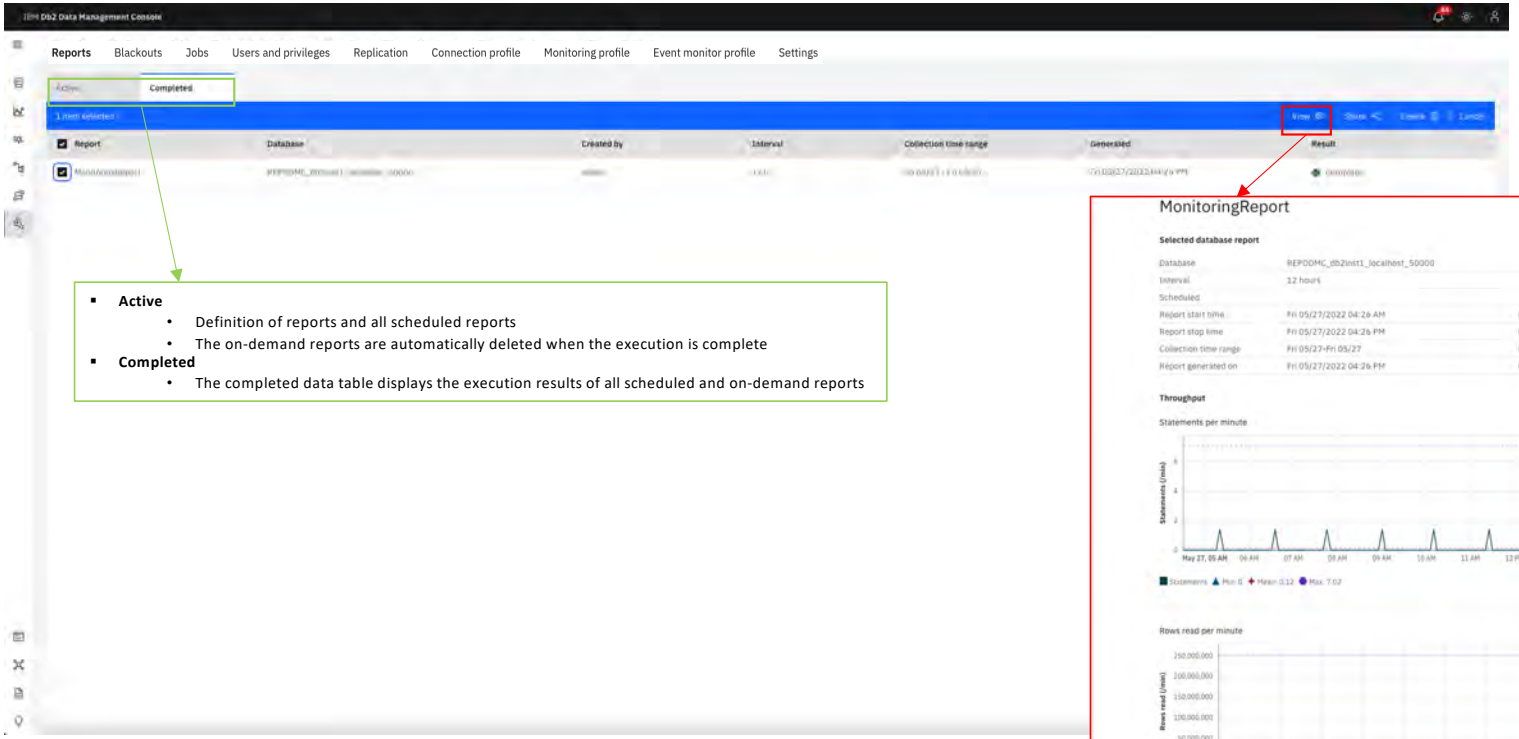

IBM Db2 Data Management Console
Reports
Blackouts
Jobs
Users and privileges
Replication
Connection profile
Monitoring profile
Event monitor profile
Settings
Create on-demand report
Select type
Define
Finish
Customize report
Select metrics for the report
Interval
12 hours
* A shorter interval equates to higher graph detail
Notifications


IBM Db2 Data Management Console
Reports
Blackouts
Jobs
Users and privileges
Replication
Connection profile
Monitoring profile
Event monitor profile
Settings
Create on-demand report
Select type
Define
Finish
MonitoringReport
Summary
Report preview
Sample data only
Selected database report
Throughput
Statements per minute
Rows read per minute
Summary Page
Click on Finish
Cancel
Back
Finish

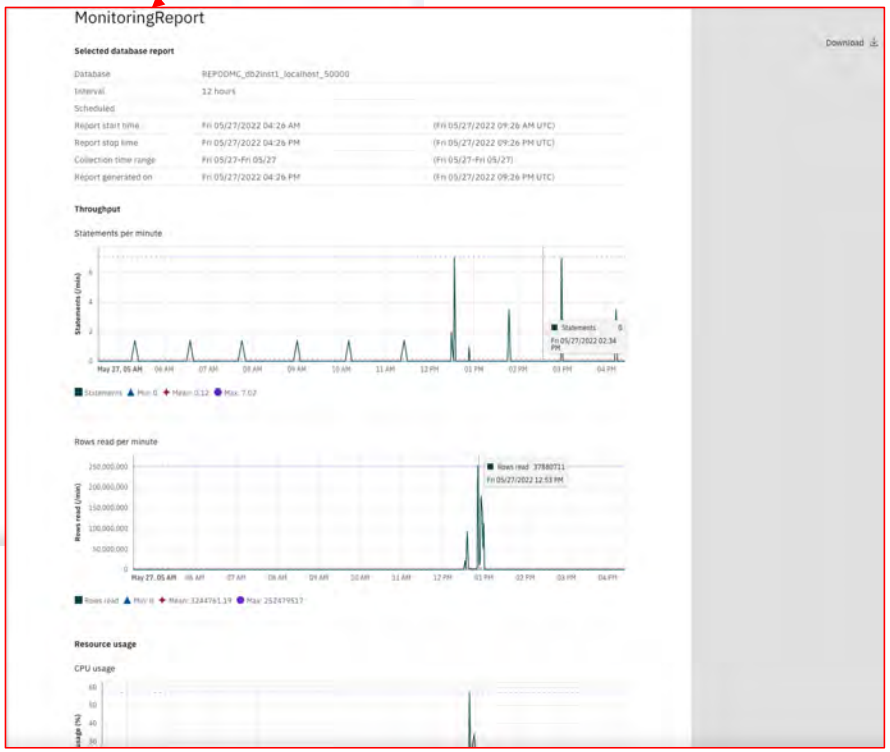
Reporting – Scheduling



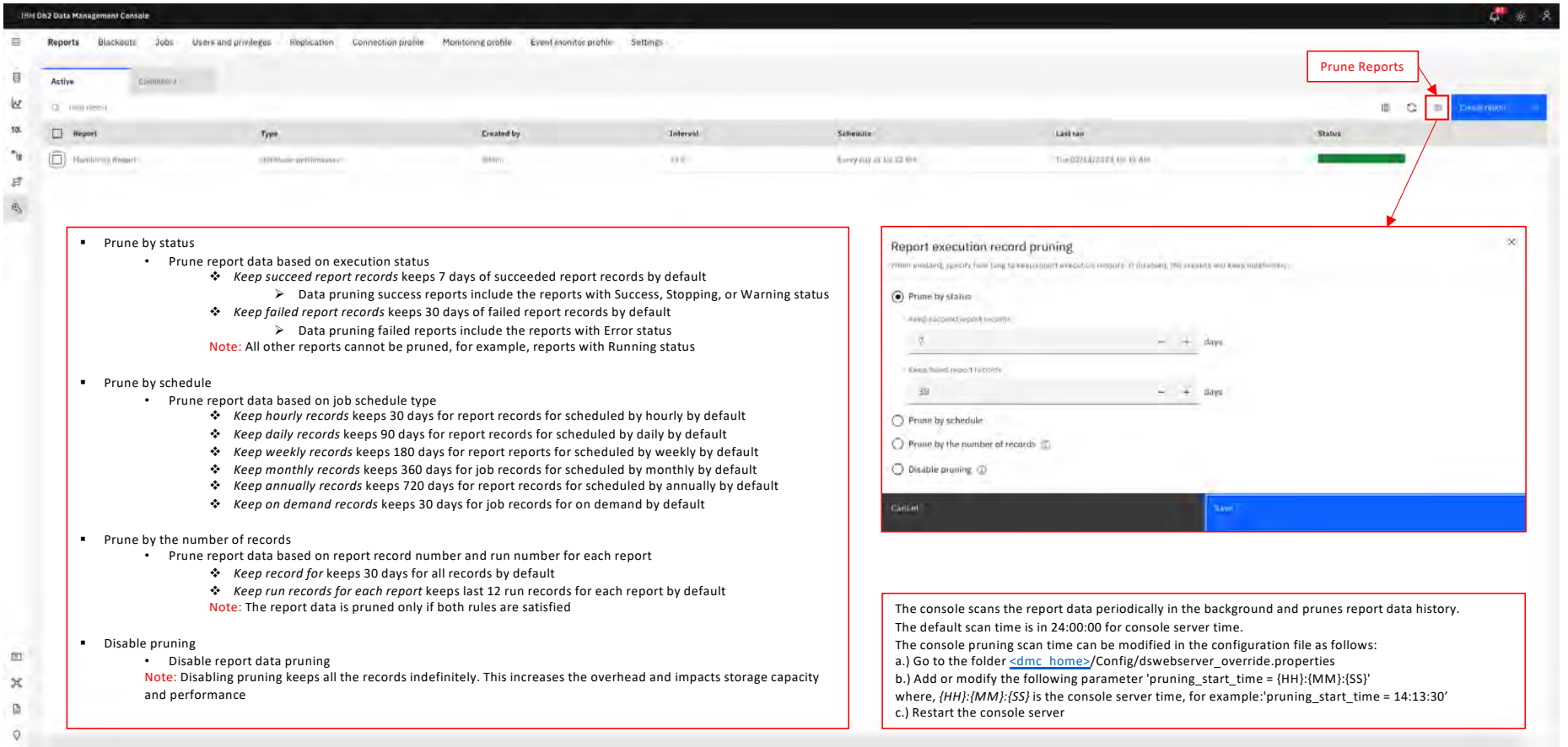
Reporting – View Results



- **Active**
  - Definition of reports and all scheduled reports
  - The on-demand reports are automatically deleted when the execution is complete
- **Completed**
  - The completed data table displays the execution results of all scheduled and on-demand reports



Reporting – Pruning



- Prune by status
  - Prune report data based on execution status
    - *Keep succeed report records* keeps 7 days of succeeded report records by default
      - Data pruning success reports include the reports with Success, Stopping, or Warning status
    - *Keep failed report records* keeps 30 days of failed report records by default
      - Data pruning failed reports include the reports with Error status

    Note: All other reports cannot be pruned, for example, reports with Running status

- Prune by schedule
  - Prune report data based on job schedule type
    - *Keep hourly records* keeps 30 days for report records for scheduled by hourly by default
    - *Keep daily records* keeps 90 days for report records for scheduled by daily by default
    - *Keep weekly records* keeps 180 days for report reports for scheduled by weekly by default
    - *Keep monthly records* keeps 360 days for job records for scheduled by monthly by default
    - *Keep annually records* keeps 720 days for report records for scheduled by annually by default
    - *Keep on demand records* keeps 30 days for job records for on demand by default

- Prune by the number of records
  - Prune report data based on report record number and run number for each report
    - *Keep record for* keeps 30 days for all records by default
    - *Keep run records for each report* keeps last 12 run records for each report by default

    Note: The report data is pruned only if both rules are satisfied

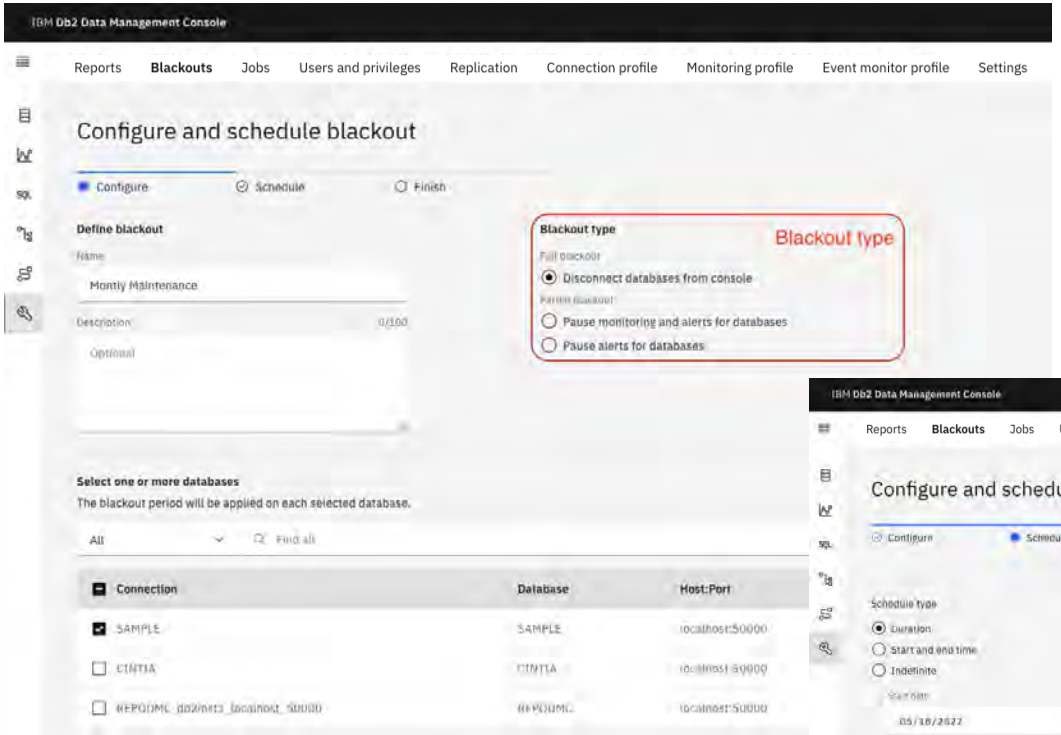
- Disable pruning
  - Disable report data pruning

  Note: Disabling pruning keeps all the records indefinitely. This increases the overhead and impacts storage capacity and performance

The console scans the report data periodically in the background and prunes report data history.
The default scan time is in 24:00:00 for console server time.
The console pruning scan time can be modified in the configuration file as follows:
a.) Go to the folder <dmc_home>/Config/dswebserver_override.properties
b.) Add or modify the following parameter 'pruning_start_time = {HH}:{MM}:{SS}'
where, *{HH}:{MM}:{SS}* is the console server time, for example:'pruning_start_time = 14:13:30'
c.) Restart the console server

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=reports-pruning-report

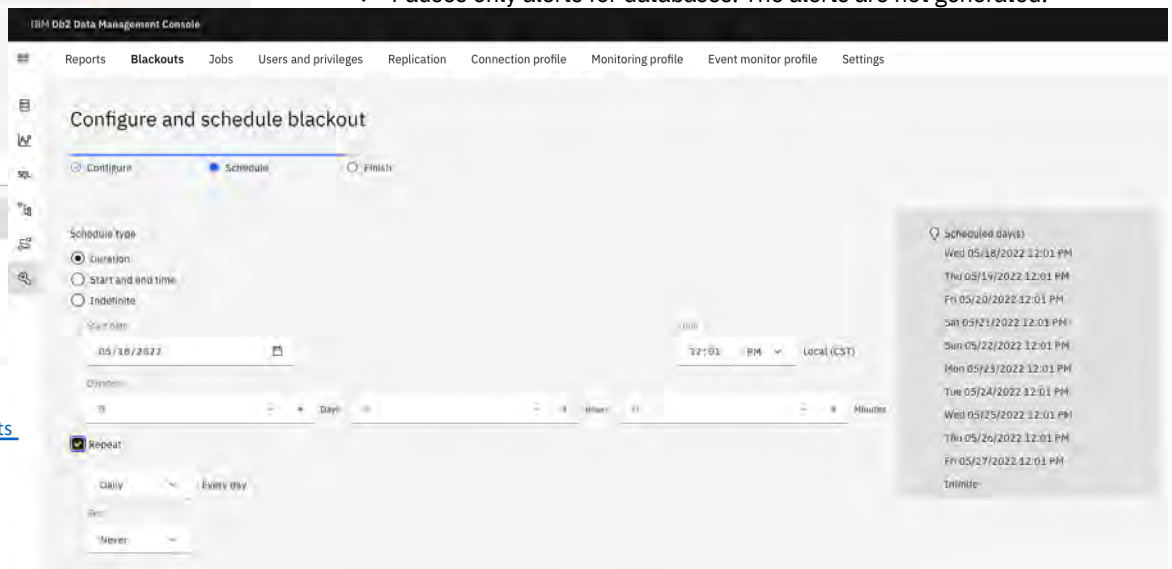
Blackout – Web UI



Used to avoid a database connection from DMC to the monitored database, or disabling some of the functions such as monitoring and alerting during database maintenance window

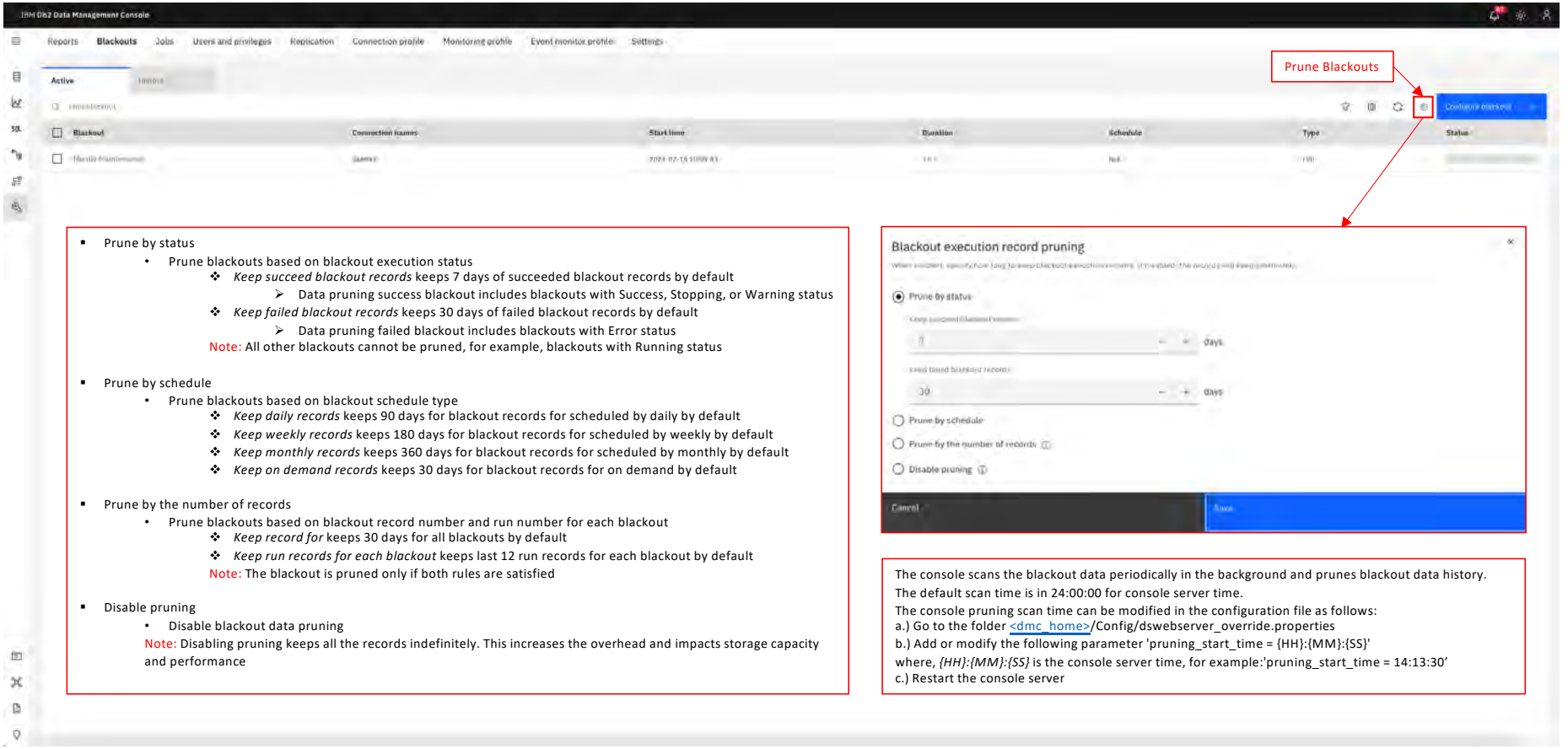
3 Types of Blackout

- Full blackout
  - ❖ Disconnects databases from console
- Monitor and alert blackout
  - ❖ Pauses monitoring and alerts for databases. The monitor does not collect metric data and the alert are not generated.
- Alert blackout
  - ❖ Pauses only alerts for databases. The alerts are not generated.



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-creating-blackouts

Blackout – Pruning



- Prune by status
  - Prune blackouts based on blackout execution status
    - *Keep succeed blackout records* keeps 7 days of succeeded blackout records by default
      - Data pruning success blackout includes blackouts with Success, Stopping, or Warning status
    - *Keep failed blackout records* keeps 30 days of failed blackout records by default
      - Data pruning failed blackout includes blackouts with Error status

    Note: All other blackouts cannot be pruned, for example, blackouts with Running status

- Prune by schedule
  - Prune blackouts based on blackout schedule type
    - *Keep daily records* keeps 90 days for blackout records for scheduled by daily by default
    - *Keep weekly records* keeps 180 days for blackout records for scheduled by weekly by default
    - *Keep monthly records* keeps 360 days for blackout records for scheduled by monthly by default
    - *Keep on demand records* keeps 30 days for blackout records for on demand by default

- Prune by the number of records
  - Prune blackouts based on blackout record number and run number for each blackout
    - *Keep record for* keeps 30 days for all blackouts by default
    - *Keep run records for each blackout* keeps last 12 run records for each blackout by default

    Note: The blackout is pruned only if both rules are satisfied

- Disable pruning
  - Disable blackout data pruning

  Note: Disabling pruning keeps all the records indefinitely. This increases the overhead and impacts storage capacity and performance

The console scans the blackout data periodically in the background and prunes blackout data history.
The default scan time is in 24:00:00 for console server time.
The console pruning scan time can be modified in the configuration file as follows:
a.) Go to the folder <dmc_home>/Config/dswebserver_override.properties
b.) Add or modify the following parameter 'pruning_start_time = {HH}:{MM}:{SS}'
where, *{HH}:{MM}:{SS}* is the console server time, for example:'pruning_start_time = 14:13:30'
c.) Restart the console server

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=blackouts-pruning

Blackout – REST API

Perform or release blackout

Blackout a connection profile, only the profile owner can blackout the profile, administrators automatically get the owner privilege of all profiles.

AUTHORIZATIONS: authToken

PATH PARAMETERS

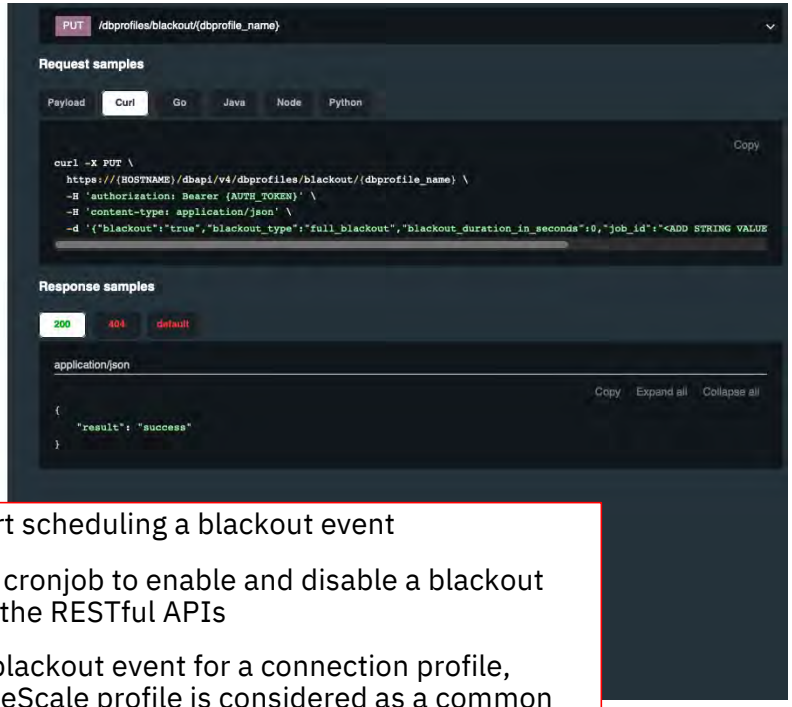
- dbprofile_name (required) — string — The specific name of the connection profile on which the session user wants to perform blackout or release blackout.

REQUEST BODY SCHEMA: application/json

- blackout (required) — string — Enum: "true" "false" — perform or release blackout
- blackout_type — string — Enum: "full_blackout" "monitor_and_alert_blackout" "alert_only_blackout" — blackout type. The default type is full_blackout.
- blackout_duration_in_seconds — integer — blackout duration. The detault duration is indefinite.
- job_id — string — id of the job which trigger the blackout event.
- job_name — string — name of the job which trigger the blackout event. The detault job name is Ad-hoc API.

Responses

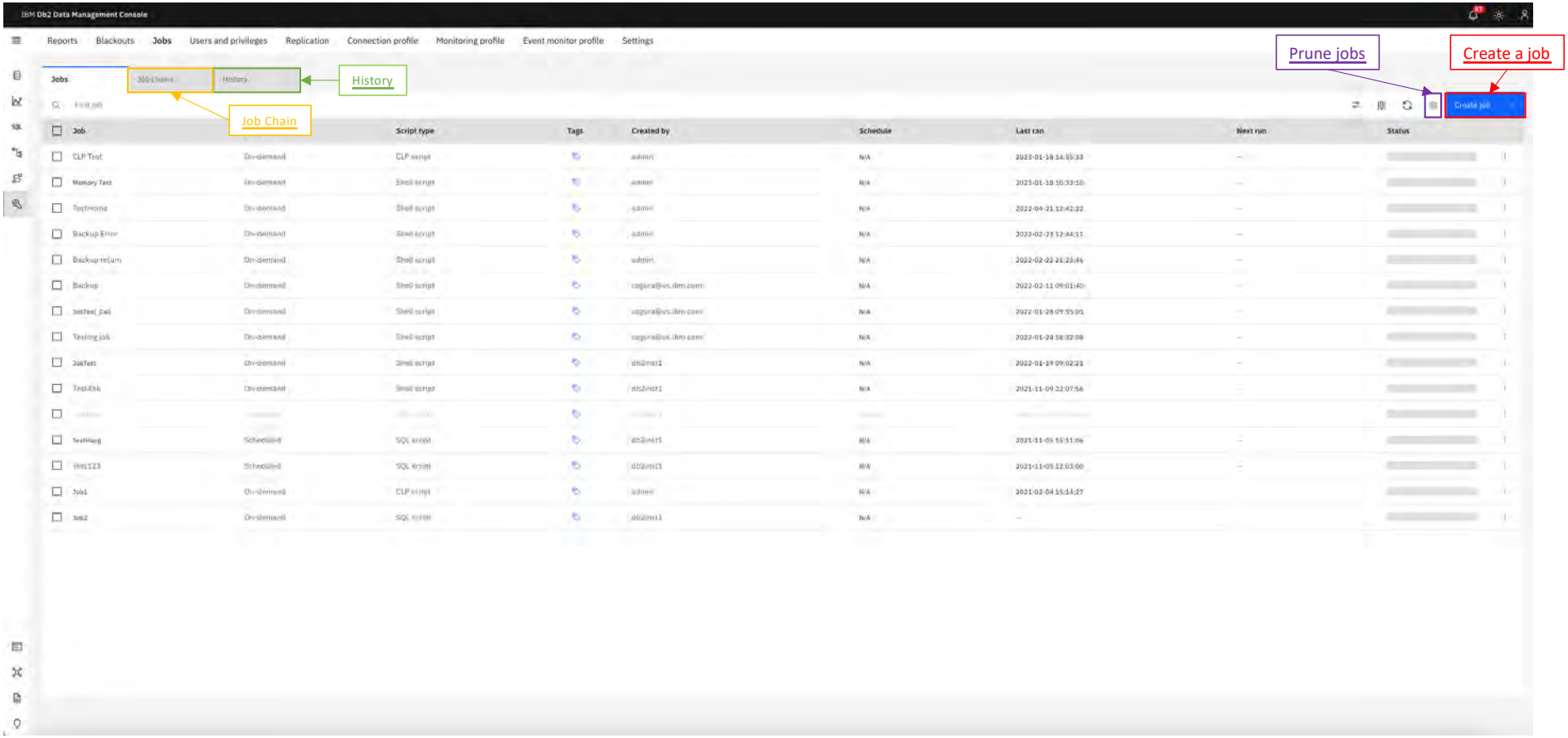
- 200 Perform or release blackout on a connection profile.
- 404 The connection profile does not exist
- default Error payload



- Does not support scheduling a blackout event
- You can setup a cronjob to enable and disable a blackout event by calling the RESTful APIs
- While setting a blackout event for a connection profile, every HADR/pureScale profile is considered as a common profile and the blackout event is set one at a time

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=apis-configuring-blackout-event-rest-api

Jobs


IBM Db2 Data Management Console
Reports
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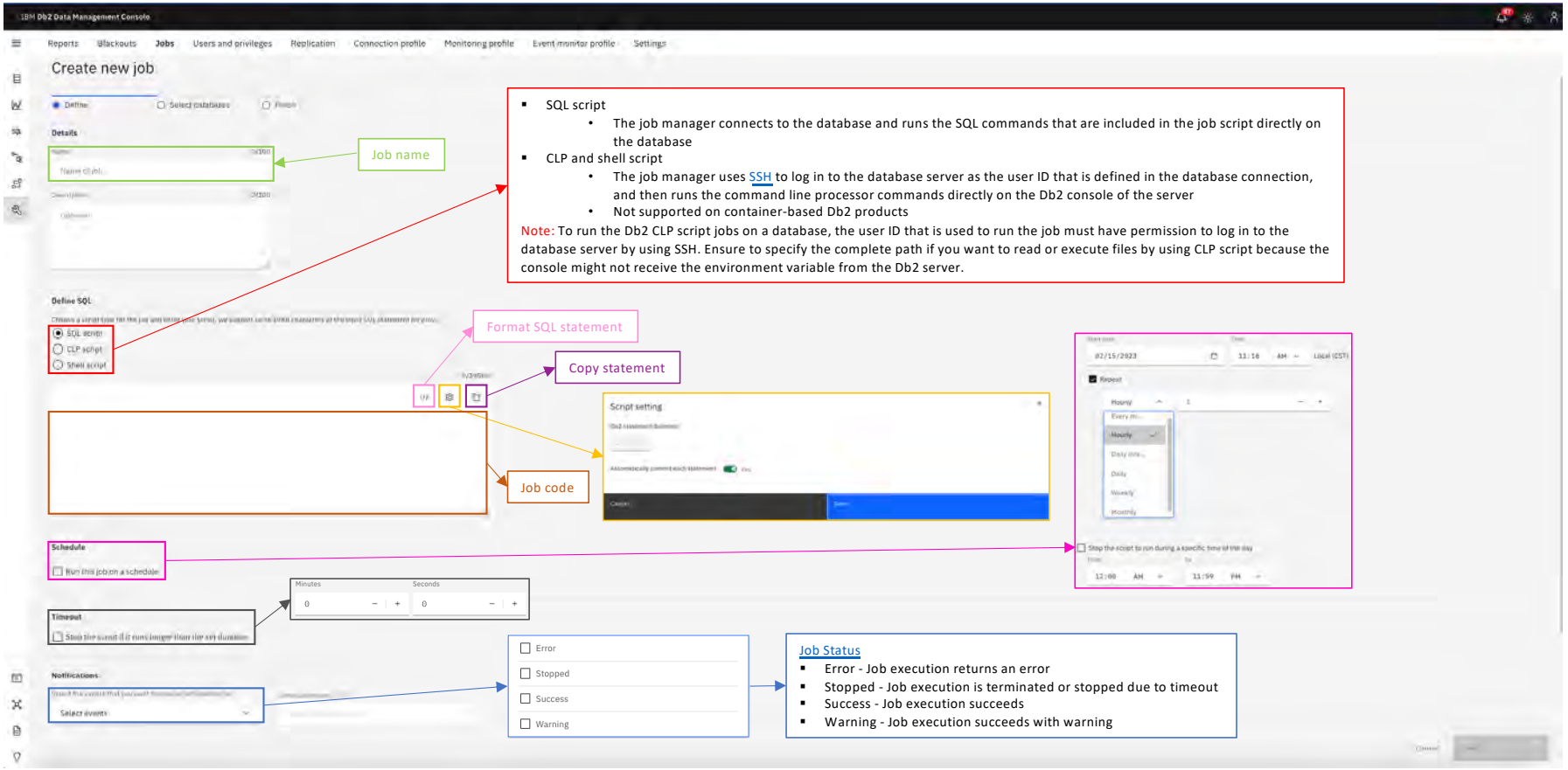
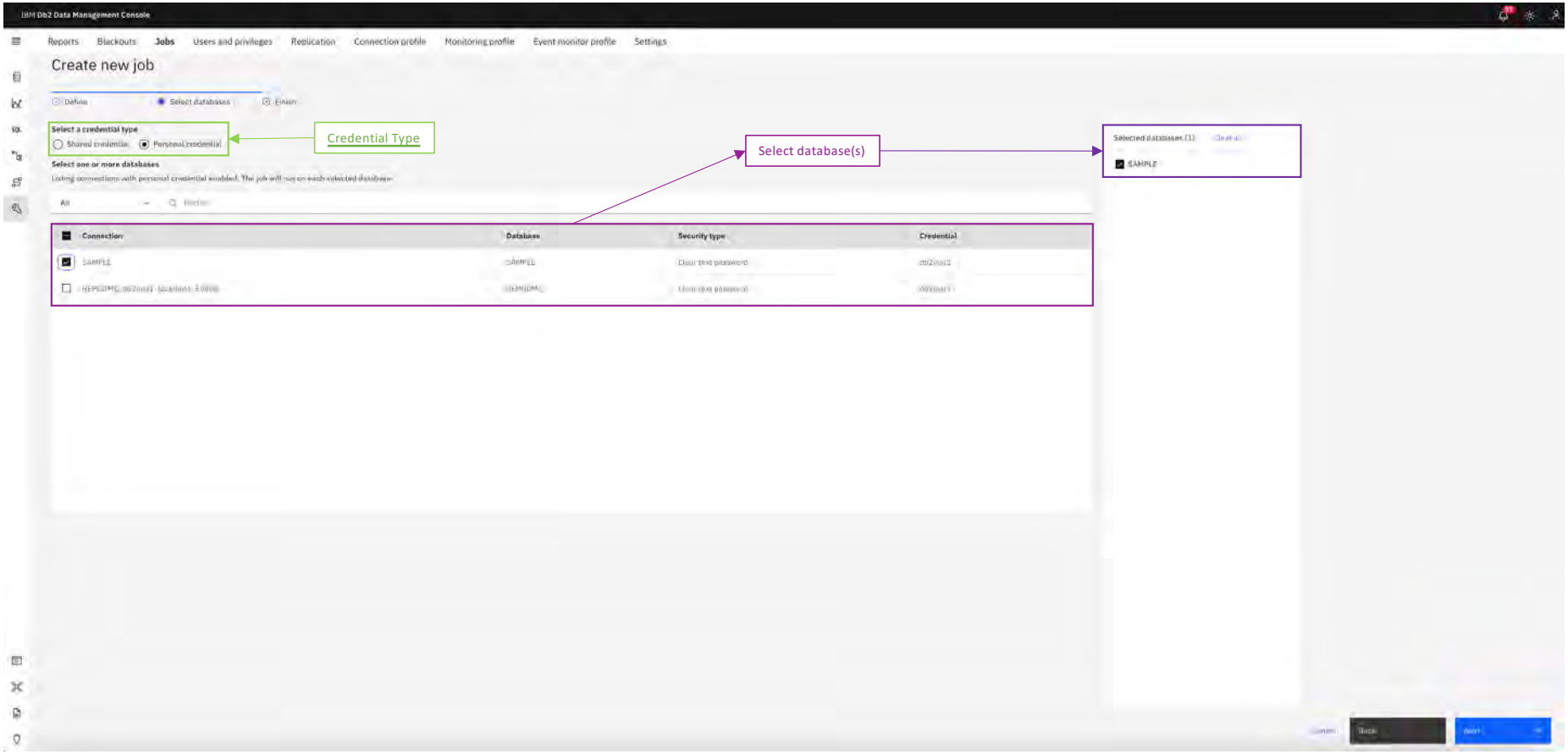
History
Job Chain
Prune jobs
Create a job
Create job
Job
Script type
Tags
Created by
Schedule
Last run
Next run
Status

Jobs – Creating a Job 1/3



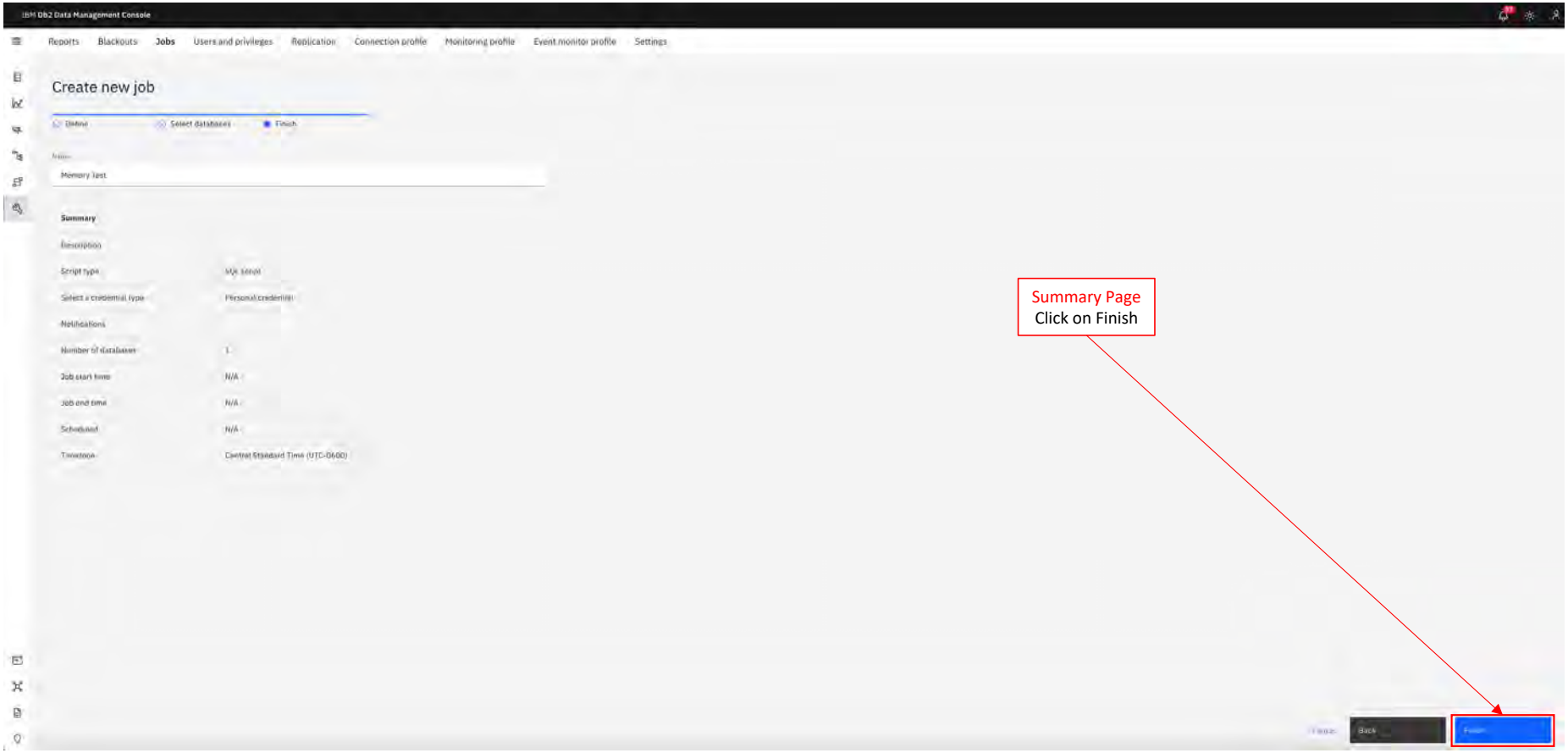
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-creating-scheduling-jobs

Jobs – Creating a Job 2/3



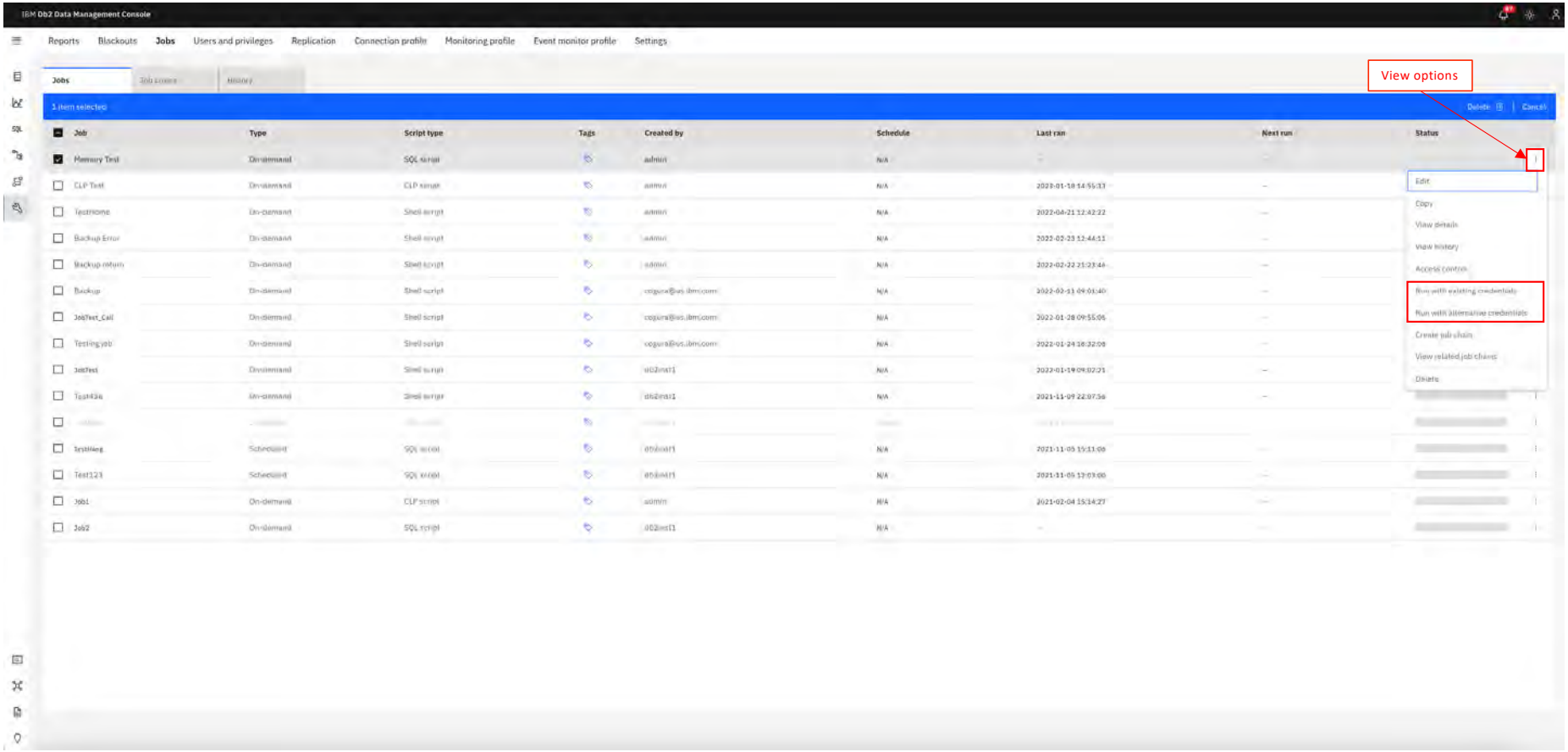
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-creating-scheduling-jobs

Jobs – Creating a Job 3/3



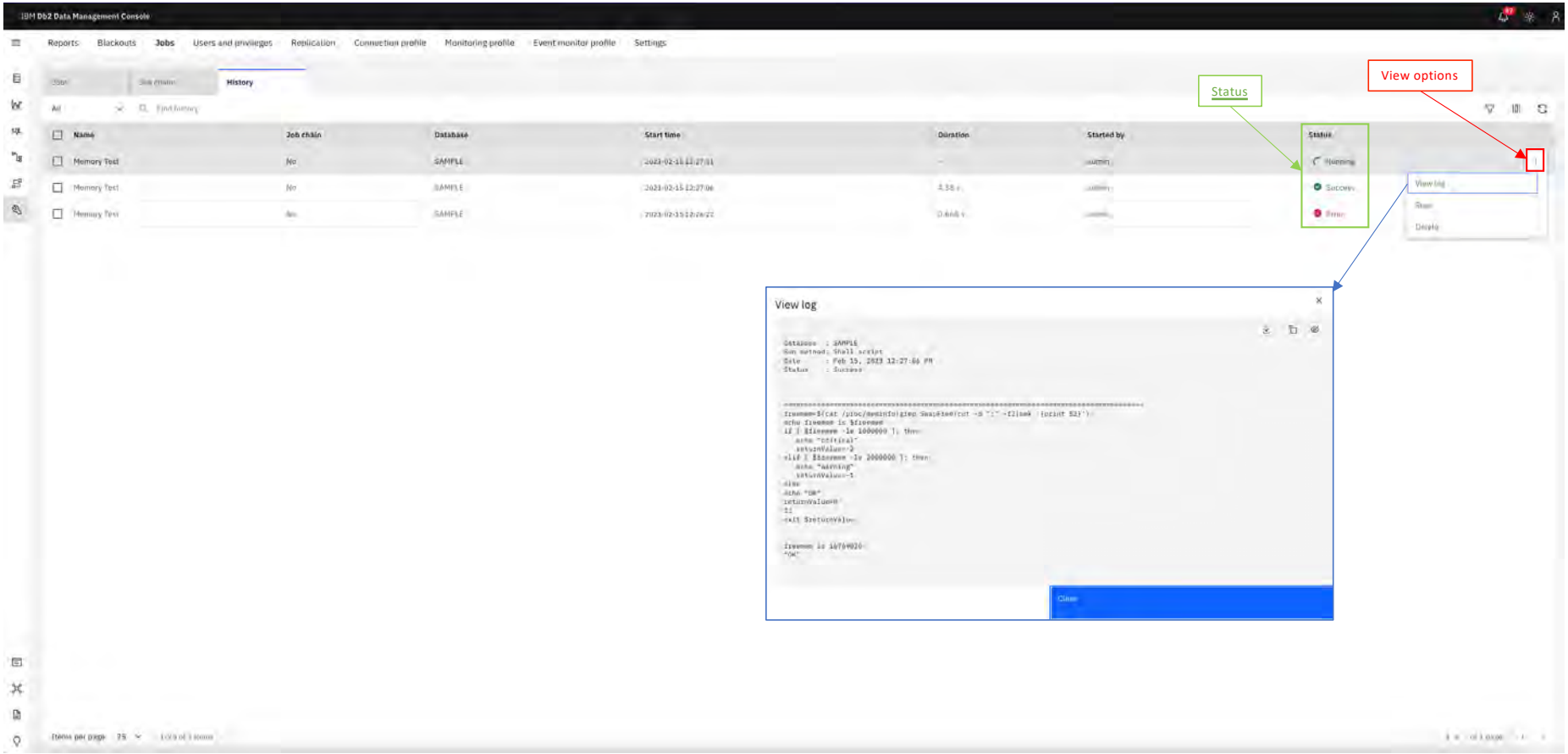
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-creating-scheduling-jobs

Jobs – Running On-demand Jobs



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-creating-scheduling-jobs

Jobs – History



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=environment-creating-scheduling-jobs

Jobs – Status

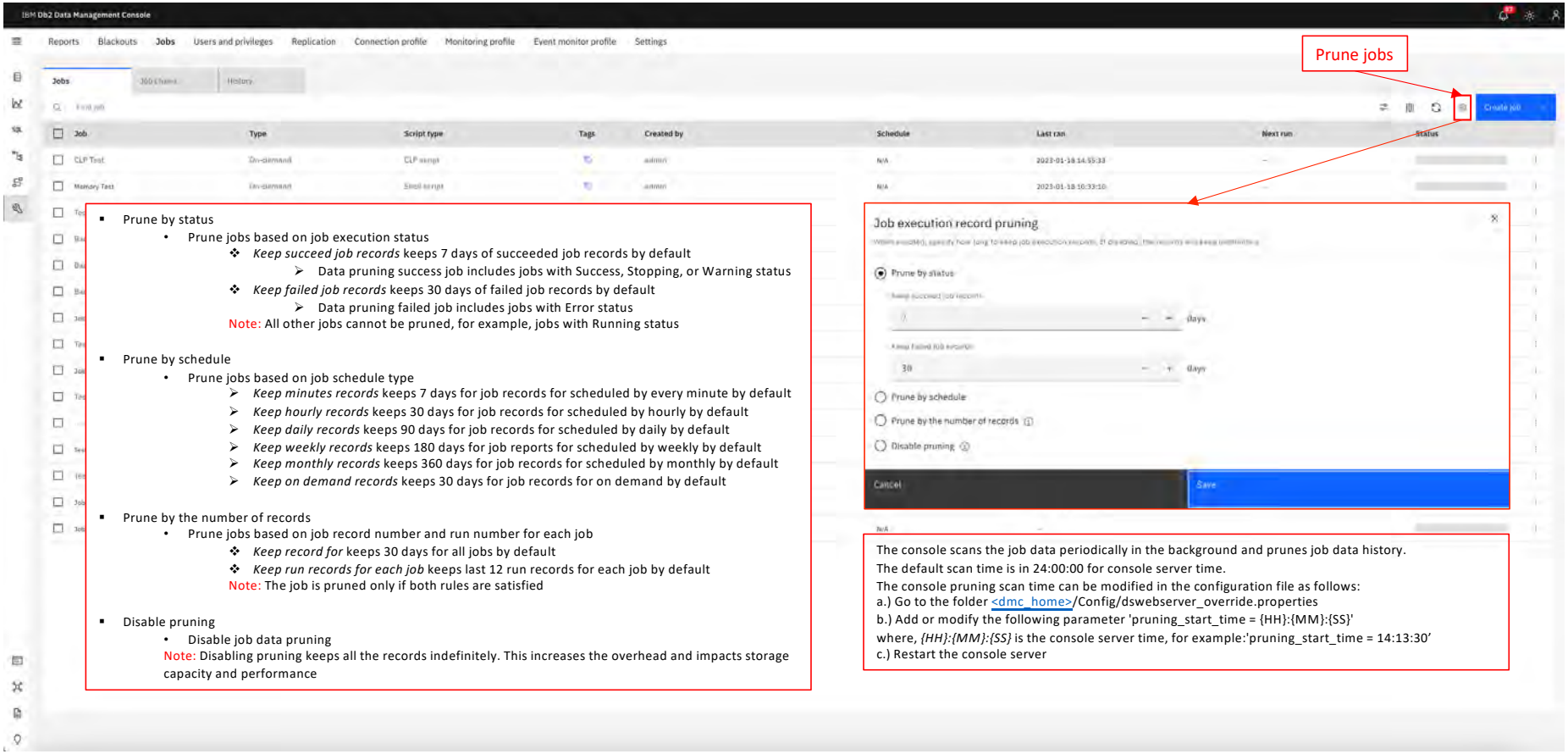
Notifications help you monitor the execution results for your jobs across multiple databases and schedules.

The following table provides the job status for execution of different type of scripts:

Script	Success	Error	Warning	Stopped
JDBC - only one statement	The statement is executed successfully.	SQL error is returned during execution or credential error and other backend error.	SQL warning is returned during execution.	The job is stopped by the user or due to timeout.
JDBC - multiple statements	All the statements are executed successfully, without any error or warning.	At lease one statement has error. If there is both error and warning, the job will show error status as priority. The job will stop at the current statement when an error is received.	There is no error, but at lease one statement has SQL warning.	The job is stopped by the user or due to timeout.
CLP - only one statement	The statement is executed successfully, without any Db2 error.	SQL error is returned during execution or SSH error and other backend error.	SQL warning is returned during execution.	The job is stopped by the user or due to timeout.
CLP - multiple statements	All the statements are executed successfully, without any error or warning.	At lease one statement has error. The job will stop at the current statement when an error is received.		The job is stopped by the user or due to timeout.
Shell - only one command	The command is executed successfully	SSH error and shell error and other backend error.		The job is stopped due to timeout.
Shell - multiple commands	All the commands are executed successfully. Unrecognized commands are ignored.	SSH error and shell error and other backend error.		The job is stopped due to timeout.

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-job-status

Jobs – Pruning Jobs



- Prune by status
  - Prune jobs based on job execution status
    - *Keep succeed job records* keeps 7 days of succeeded job records by default
      - Data pruning success job includes jobs with Success, Stopping, or Warning status
    - *Keep failed job records* keeps 30 days of failed job records by default
      - Data pruning failed job includes jobs with Error status

    Note: All other jobs cannot be pruned, for example, jobs with Running status

- Prune by schedule
  - Prune jobs based on job schedule type
    - *Keep minutes records* keeps 7 days for job records for scheduled by every minute by default
    - *Keep hourly records* keeps 30 days for job records for scheduled by hourly by default
    - *Keep daily records* keeps 90 days for job records for scheduled by daily by default
    - *Keep weekly records* keeps 180 days for job reports for scheduled by weekly by default
    - *Keep monthly records* keeps 360 days for job records for scheduled by monthly by default
    - *Keep on demand records* keeps 30 days for job records for on demand by default

- Prune by the number of records
  - Prune jobs based on job record number and run number for each job
    - *Keep record for* keeps 30 days for all jobs by default
    - *Keep run records for each job* keeps last 12 run records for each job by default

    Note: The job is pruned only if both rules are satisfied

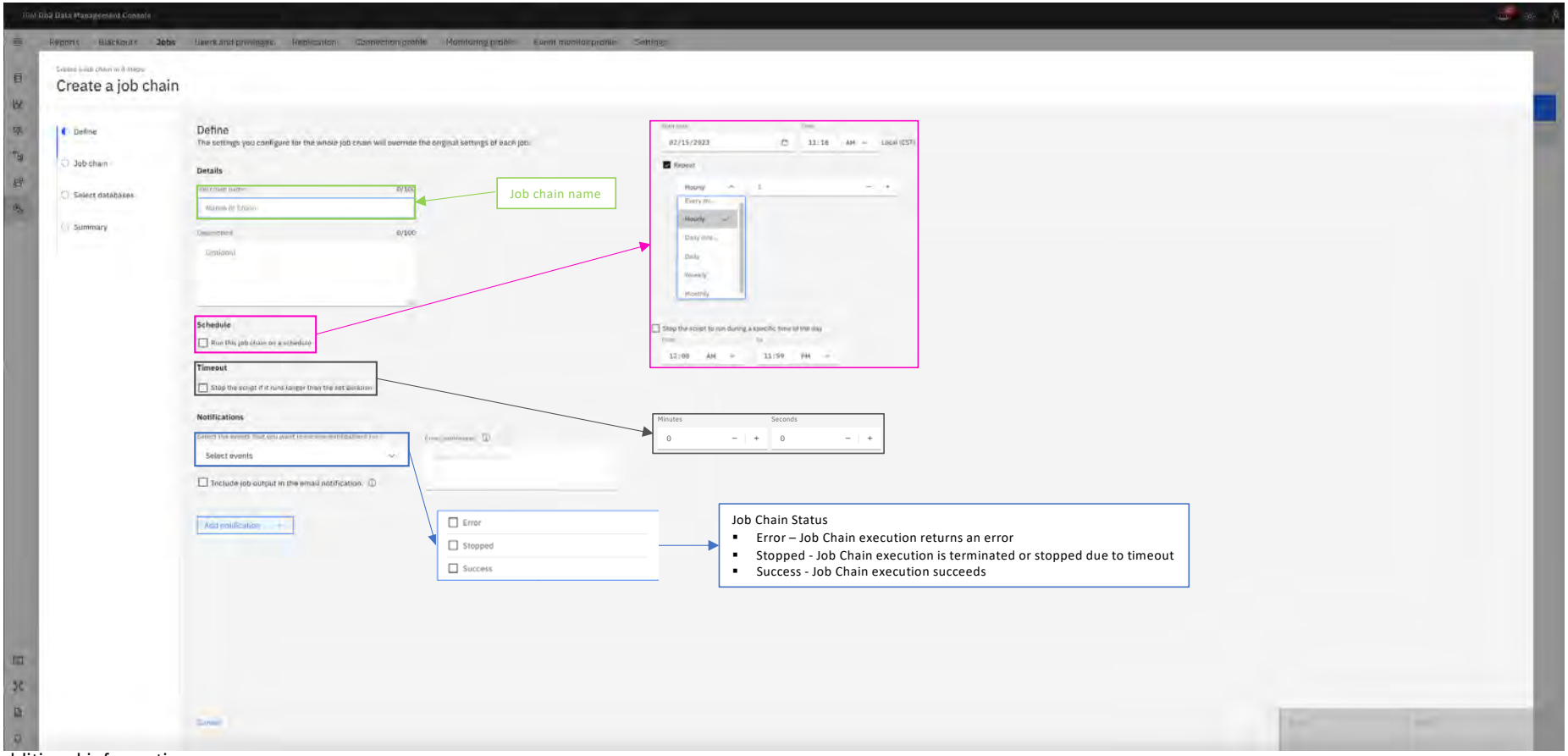
- Disable pruning
  - Disable job data pruning

  Note: Disabling pruning keeps all the records indefinitely. This increases the overhead and impacts storage capacity and performance

The console scans the job data periodically in the background and prunes job data history.
The default scan time is in 24:00:00 for console server time.
The console pruning scan time can be modified in the configuration file as follows:
a.) Go to the folder <dmc_home>/Config/dswebserver_override.properties
b.) Add or modify the following parameter 'pruning_start_time = {HH}:{MM}:{SS}'
where, *{HH}:{MM}:{SS}* is the console server time, for example:'pruning_start_time = 14:13:30'
c.) Restart the console server

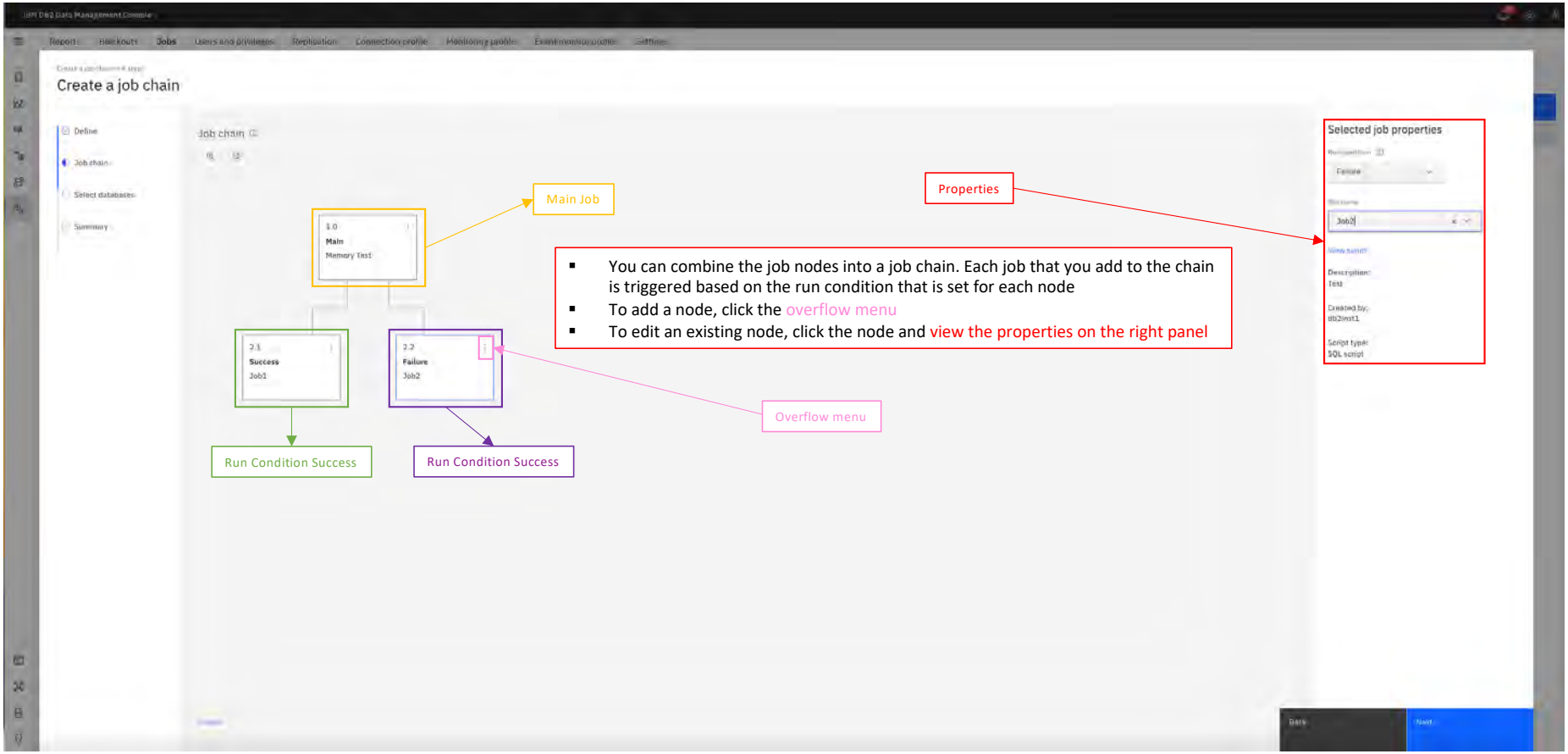
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-pruning-job

Job Chain – Creating a Job Chain 1/4



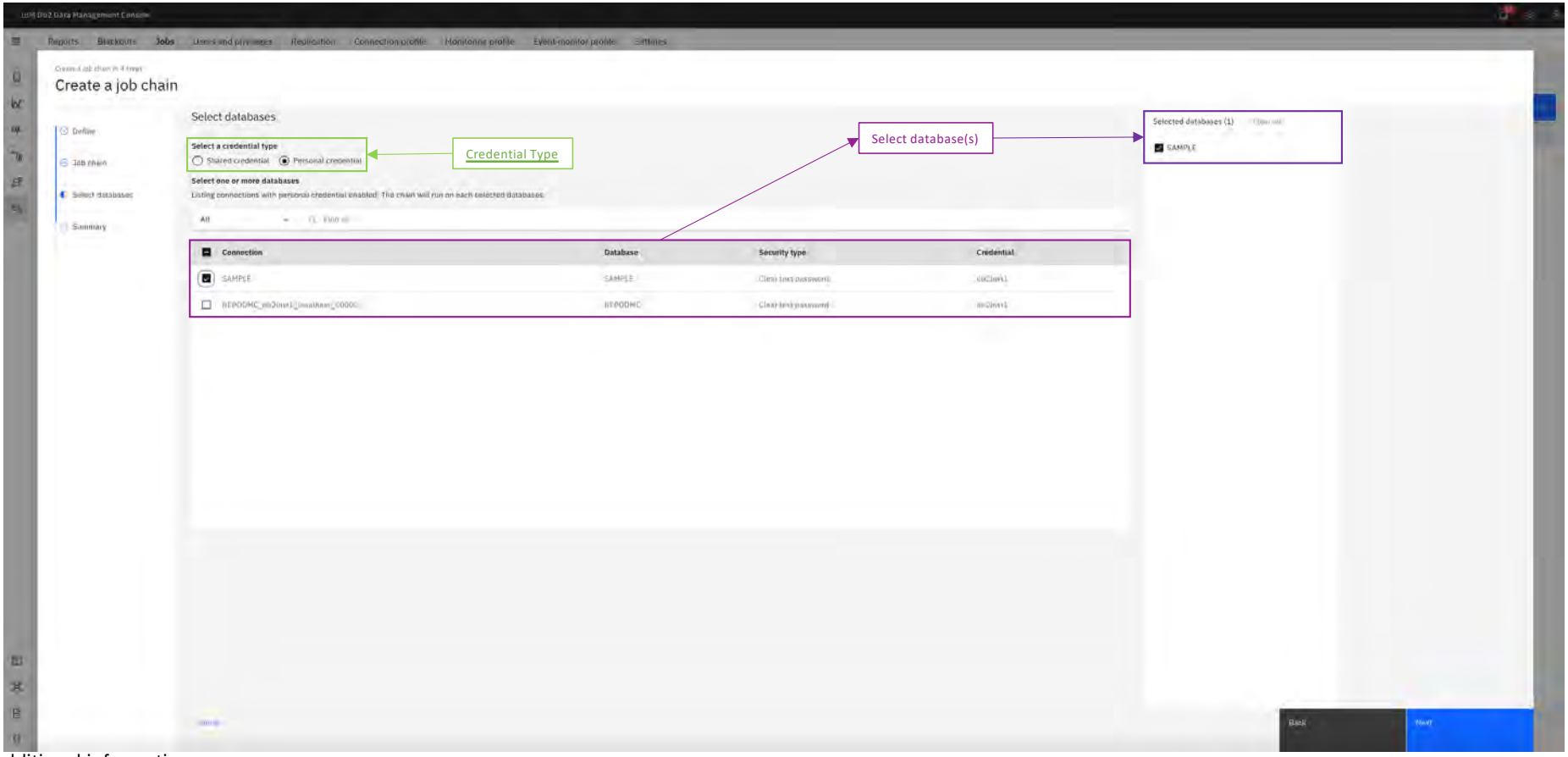
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-creating-updating-job-chain

Job Chain – Creating a Job Chain 2/4



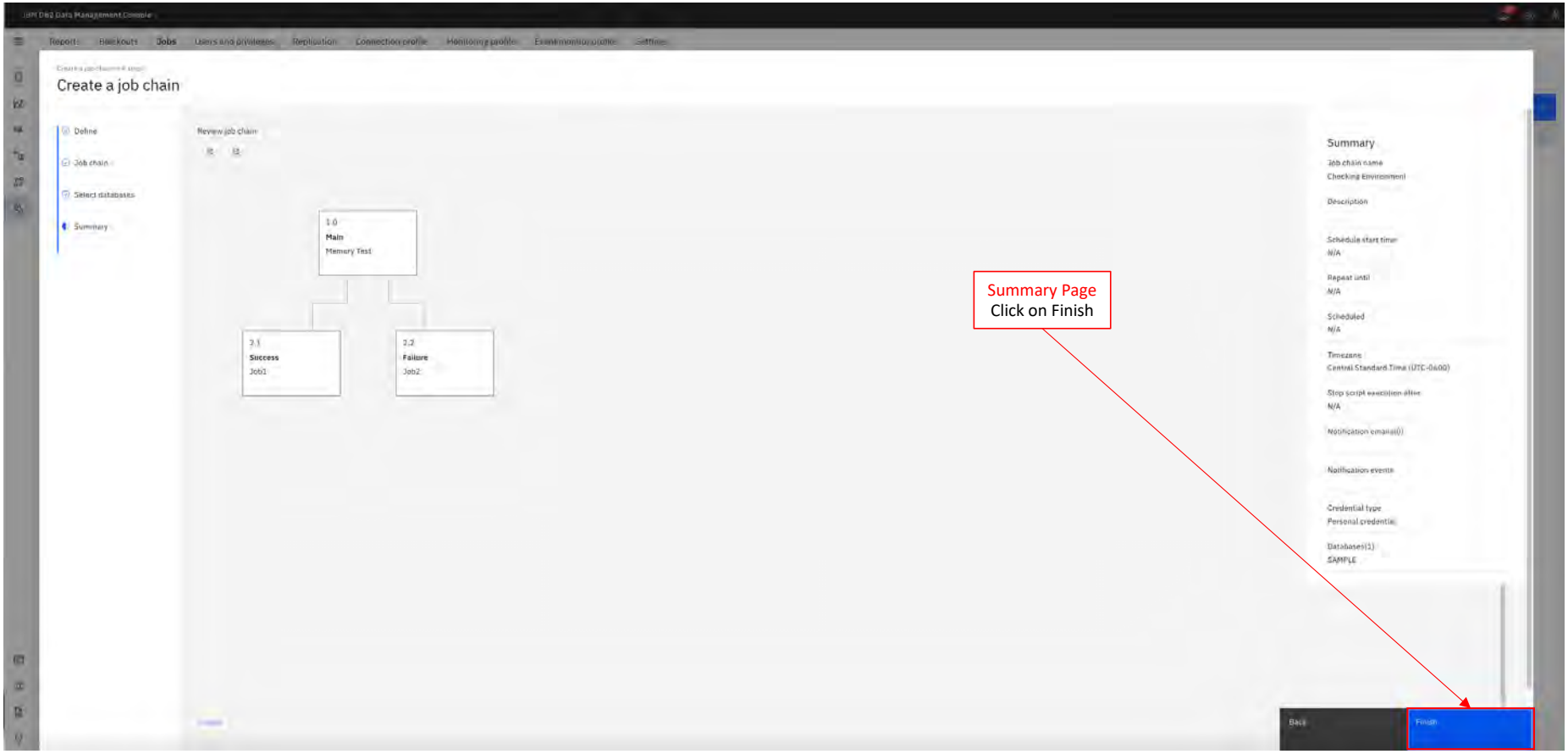
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-creating-updating-job-chain

Job Chain – Creating a Job Chain 3/4



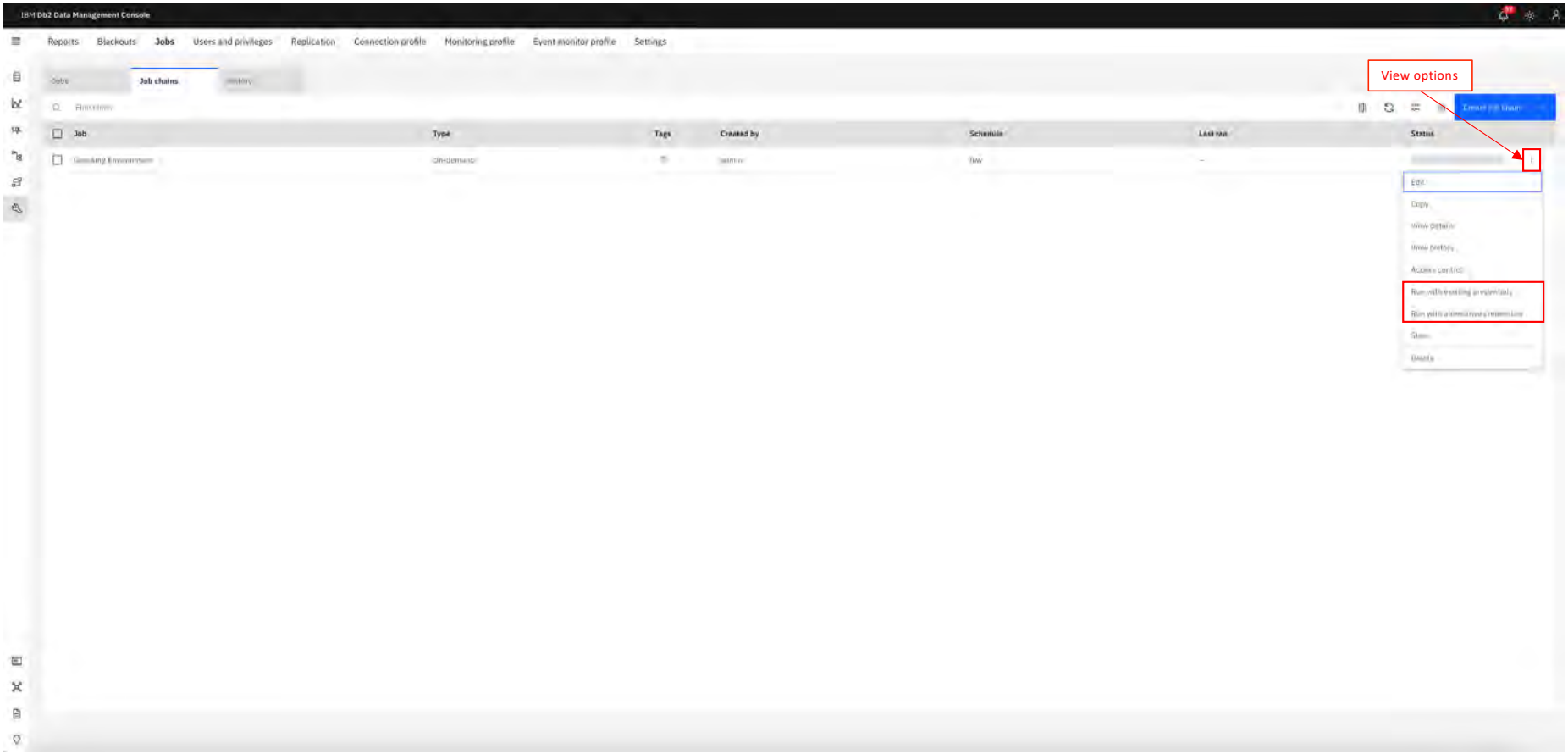
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-creating-updating-job-chain

Job Chain – Creating a Job Chain 4/4



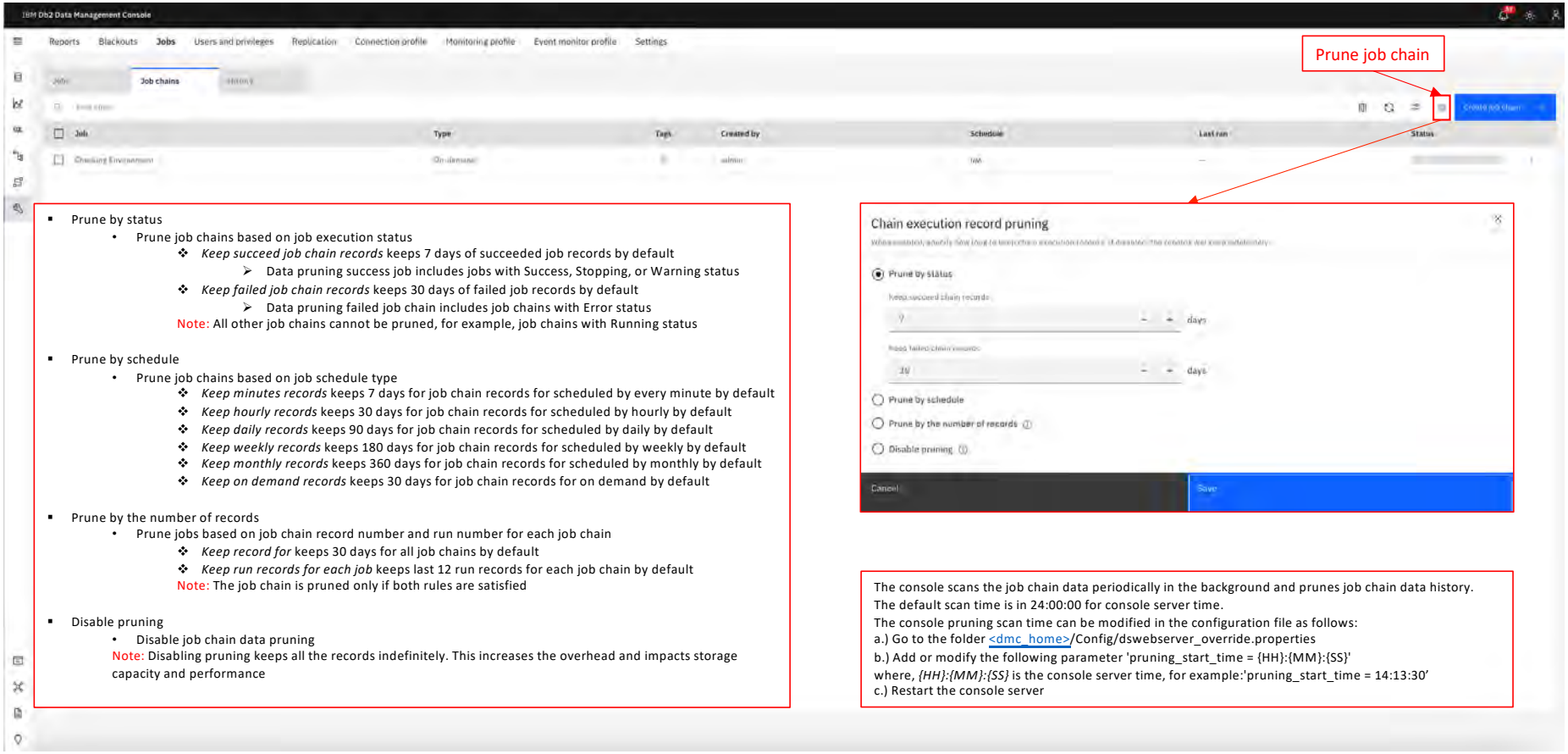
Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-creating-updating-job-chain

Job Chain – Running On-demand Job Chain



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=jobs-creating-updating-job-chain

Job Chain – Pruning Job Chain



- Prune by status
  - Prune job chains based on job execution status
    - *Keep succeed job chain records* keeps 7 days of succeeded job records by default
      - Data pruning success job includes jobs with Success, Stopping, or Warning status
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  - Prune job chains based on job schedule type
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    - *Keep monthly records* keeps 360 days for job chain records for scheduled by monthly by default
    - *Keep on demand records* keeps 30 days for job chain records for on demand by default

- Prune by the number of records
  - Prune jobs based on job chain record number and run number for each job chain
    - *Keep record for* keeps 30 days for all job chains by default
    - *Keep run records for each job* keeps last 12 run records for each job chain by default

    Note: The job chain is pruned only if both rules are satisfied

- Disable pruning
  - Disable job chain data pruning

  Note: Disabling pruning keeps all the records indefinitely. This increases the overhead and impacts storage capacity and performance

The console scans the job chain data periodically in the background and prunes job chain data history.
The default scan time is in 24:00:00 for console server time.
The console pruning scan time can be modified in the configuration file as follows:
a.) Go to the folder <dmc_home>/Config/dswebserver_override.properties
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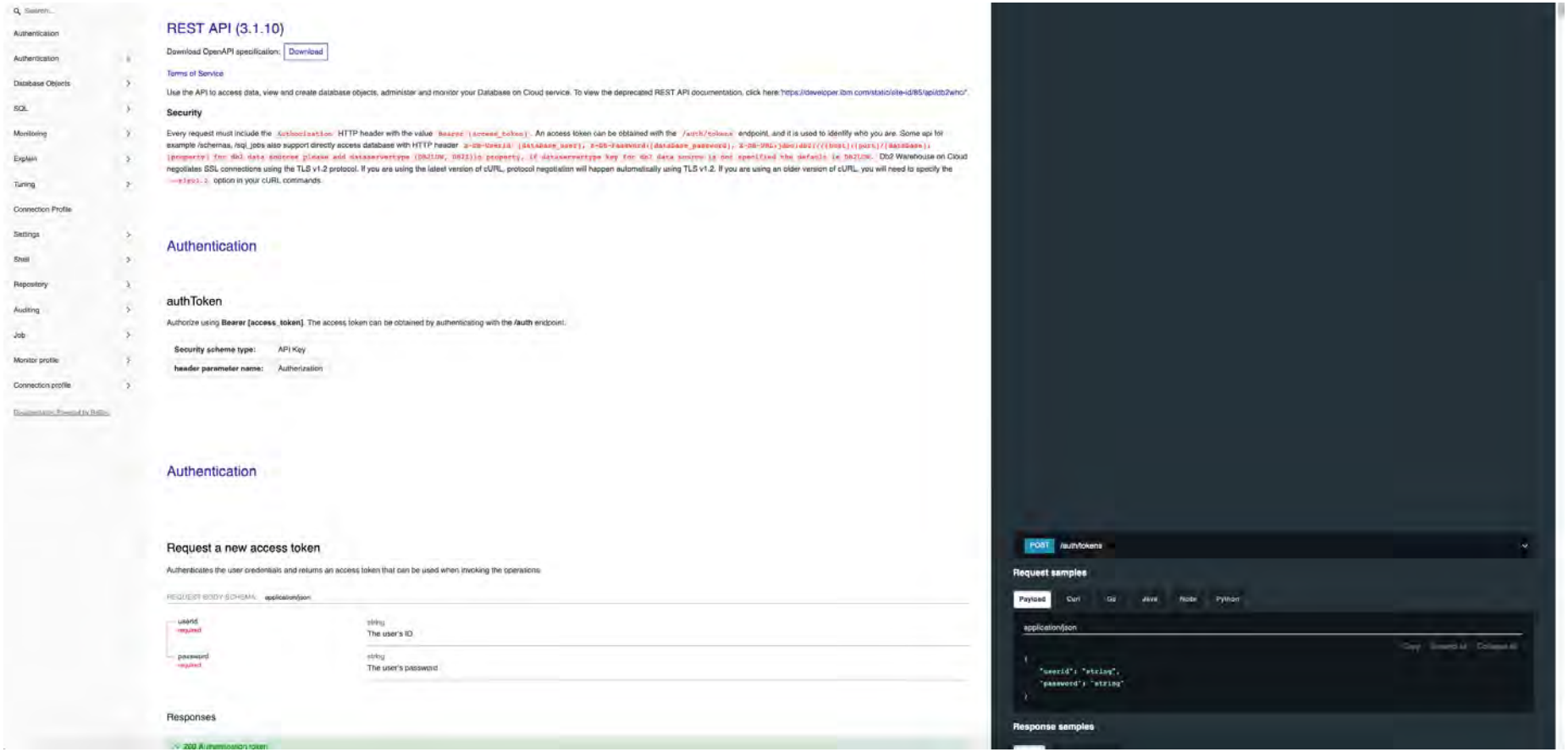
where, *{HH}:{MM}:{SS}* is the console server time, for example:'pruning_start_time = 14:13:30'
c.) Restart the console server

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=chain-pruning-job

RESTful Services APIs Support



Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=welcome-working-apis

REST API – Examples

Getting a token

```
TOKEN=$(curl -X POST \
 http://localhost:11080/dbapi/v4/auth/tokens \
 -H 'content-type: application/json' \
 -d '{"userid":"admin","password":"admin"}' \
 | jq -r '.token'
)
echo $TOKEN
```

Requires jq command installed on the machine

Setting up blackout

```
TOKEN=$(curl --silent --insecure -X POST \
 http://localhost:11080/dbapi/v4/auth/tokens \
 -H 'content-type: application/json' \
 -d '{"userid":"'admin'","password":"'admin'"}' \
 | jq -r '.token'
)
BLACKOUTSTATUS=$(curl --silent --insecure -X PUT \
    http://localhost:11080/dbapi/v4/dbprofiles/blackout/SAMPLE \
     -H 'authorization: Bearer '$TOKEN \
     -H 'content-type: application/json' \
     -d '{"blackout":"'$BLACKOUT'"}'
     )
```

Disabling Storage Query

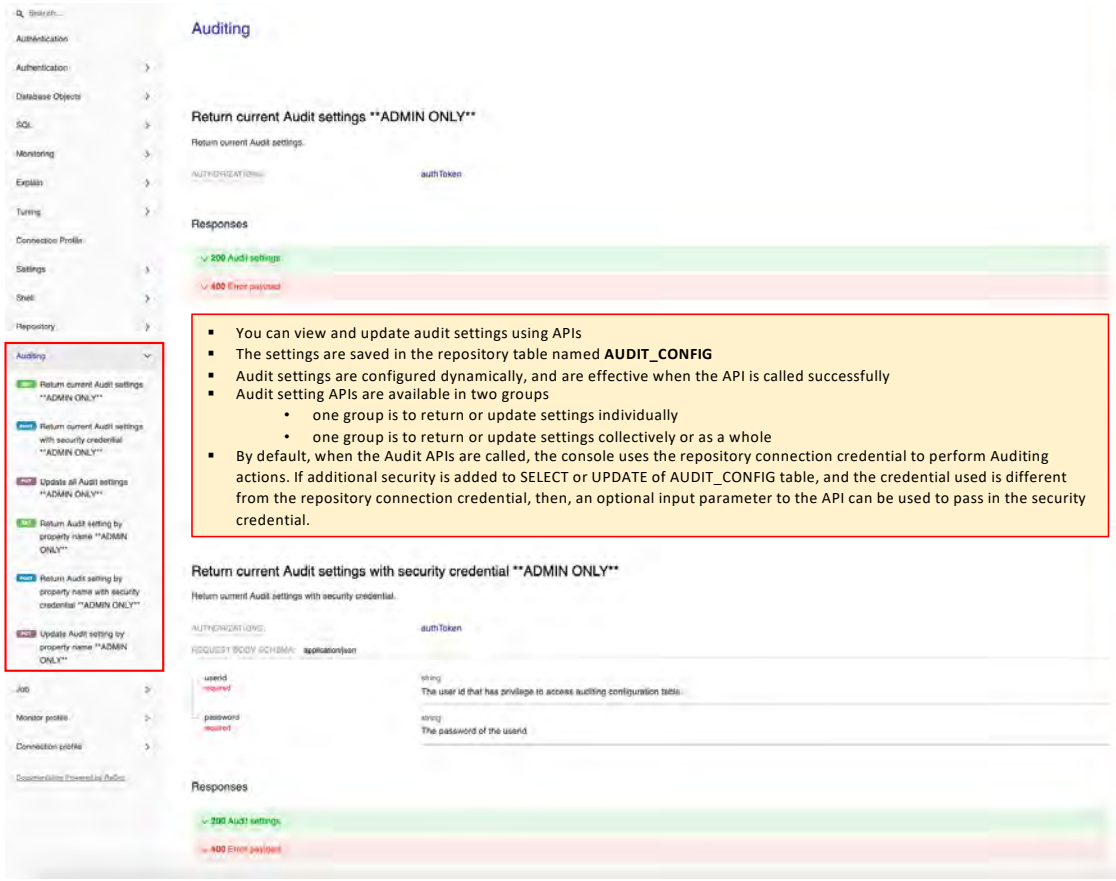
```
TOKEN=$(curl --silent --insecure -X POST \
 http://localhost:11080/dbapi/v4/auth/tokens \
 -H 'content-type: application/json' \
 -d '{"userid":"'admin'","password":"'admin'"}' \
 | jq -r '.token'
)
STORAGESTATUS=$(curl --silent --insecure -X $PARAMETER \
   http://localhost:11080/dbapi/v4/monitorprofile/front/config/tablestorage \
 -H 'accept: application/json' \
 -H 'authorization: Bearer '$TOKEN \
 -H 'content-type: application/json;charset=utf-8' \
 -d '{"enabled":"'POST'","include_sys":"false","max_rows_read":5000,"schedule_rule":"0 0 12 * * ?"}'
)
```

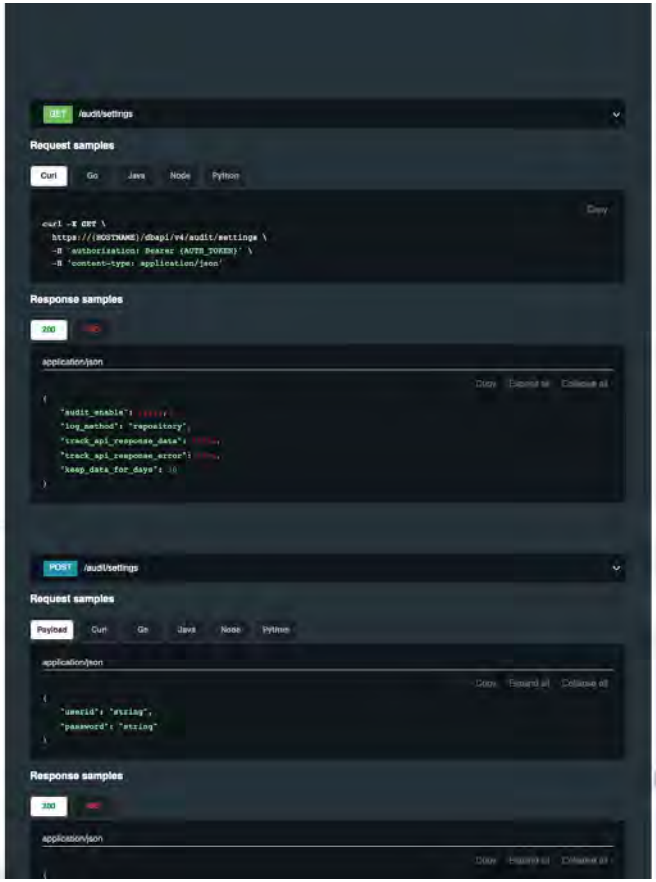
Audit Logging

- **Audit event types**
  - All successful and unsuccessful login attempts
  - All logoff attempts
  - Attempts to perform unauthorized functions
  - Activities performed by admin accounts
  - Attempts to update console settings
  - Connection profile privilege management audit
- **Audit storage methods**
  - Db2 Data Management Console's repository
    - ❖ AUDIT_LOG table (Default)
      - ➢ Two columns
        - ❑ **TIMESTAMP** which is the timestamp in milliseconds since Jan 1 00:00, 1970
        - ❑ **LOG** which is the audit record
  - Server's file system
    - ❖ audit.* under <dmc installation dir>/logs directory

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=apis-audit-logs

Audit REST API





Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=logs-configuring-audit

Db2 Data Management Console

dmctop

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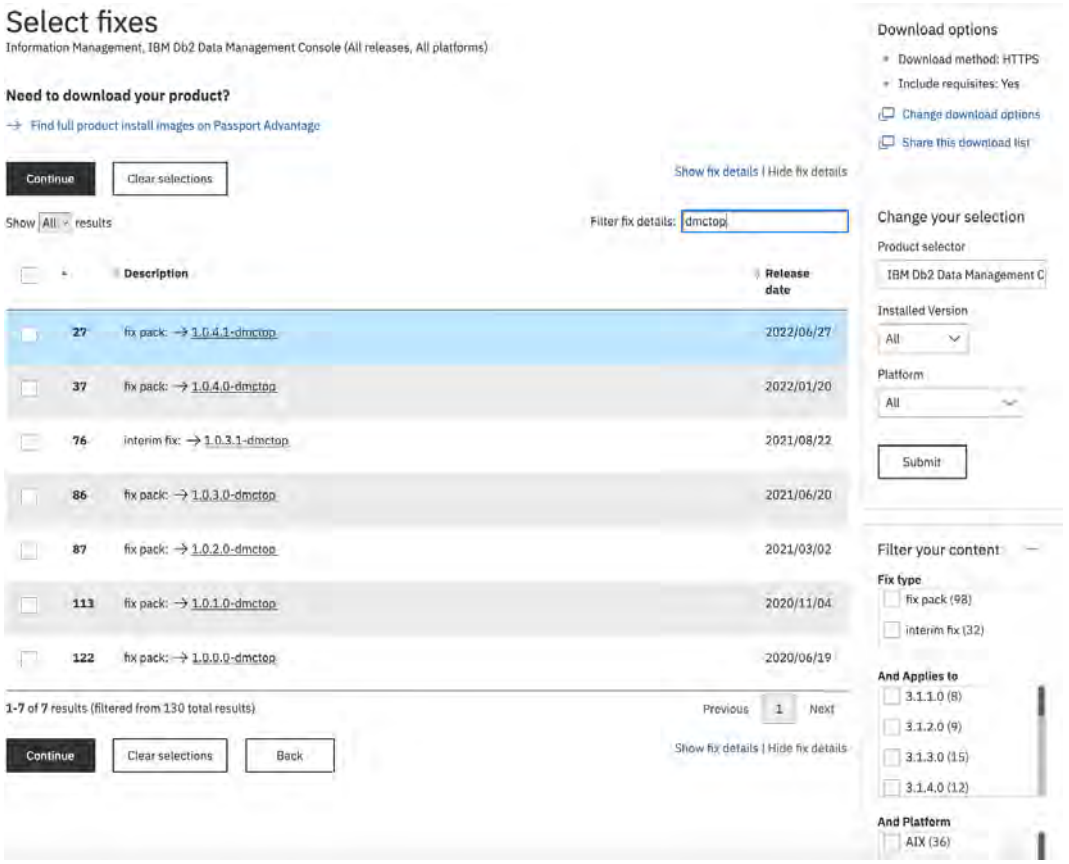
dmctop – Key Features

- Sessions
  - See at a glance which connections are active, blocked, or idle
  - Drill down on a connection to see details of the current state of execution of SQL that is in question
- Running SQL
  - See a list of recently run statements
  - Drill down is provided to see the full SQL text or run explain on a statement
- Top Consumers
  - Find which connections or activities are consuming the most CPU, IO or other resource
- Time spent
  - Shows a breakdown of where the monitored database is spending time broken down to the full granularity provided by Db2
- pureScale performance
  - See Db2 pureScale performance metrics and cache facility state
- HADR status
  - See primary and standby database HADR configuration state
- Federation
  - View federated activity for the federated database

dmctop – Download and Installation

- Simple text-based tool for monitoring, similar to the dsmtop and db2top
- Can monitor Db2 V11.1 and above
- Beginning with IBM Db2 Data Management Console v3.1.5, dmctop v1.0.2 is bundled with Db2 v11.5.6
- Download the latest dmctop at IBM Fix Central
- Supported only on Power® 8 and later processors
- Setting up dmctop
  - https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=dmctop-setting-up
- dmctop manual
  - https://ibm.github.io/dmctop-wiki/



dmctop – Comparing dmctop and db2top

Improvements and new features

- Default secured connection (SSL) support
- Support for Db2 features including pureScale, BLU (column store tables) and workload management
- Monitor remote database
- Monitor federated database
- Easier navigation with menus, view specific help available in the footer section
- Reset baseline, hide idle connections, visual alerts, spanning view across multiple monitors

Running dmctop

- **Running dmctop from Db2 server**
  - When running on database server, dmctop connects to local database without requiring credentials
  - Uses existing ODBC driver on the server hence installation of separate ODBC driver is not required
    - **Note:** Db2 v11.5.5. databases only contain dmctop v1.0.0.0 on Linux and Windows operating systems

  1) Copy dmctop on server under the desired location
     - **Note:** If you want to use dmctop v1.0.0.0 for Db2 v11.5.5. databases, skip step1 and go directly to step 2
  2) Run the dmctop
     - For Linux/AIX/MacOS

       dmctop -d SAMPLE
     - For Windows

       dmctop.exe -d SAMPLE

- **Running dmctop remotely**
  - The easiest way to run dmctop is to fully specify the database and user credentials
  - dmctop utility will use the CLI driver
  - For Linux/AIX/MacOS
    - dmctop -d <database_name> -n <host_name> -r <port_number> -u <user_id> [-cert-path Root-CA certificate absolute path]
  - For Windows
    - dmctop.exe -d <database_name> -n <host_name> -r <port_number> -u <user_id> [-cert-path Root-CA certificate absolute path]
  - For example
    - For Linux/AIX/MacOS

      dmctop -d SAMPLE -n localhost -r 50000 -u db2inst1
    - For Windows

      dmctop.exe -d SAMPLE -n localhost -r 50000 -u db2inst1

Running dmctop

- **Run dmctop in background mode**
  - When using the -b parameter, saves information to file in CSV format
  - Issuing multiple sub-options for background mode (-b) is not supported
  - The -b parameter takes one of the following single character sub-option values
    - d - overview
    - l - connections
    - a - top consumer activities
    - J - Skew monitor
    - s - in-flight statements
    - D - Package cache
    - L - Lock statistics
    - m - DB memory
    - I - Instance memory
    - F - Federation
    - A - HADR
  - For example
    - **Using default file name**
      - For Linux/AIX/MacOS

        dmctop -d SAMPLE -n localhost -r 50000 -u db2inst1 -insecure -b d
      - For Windows

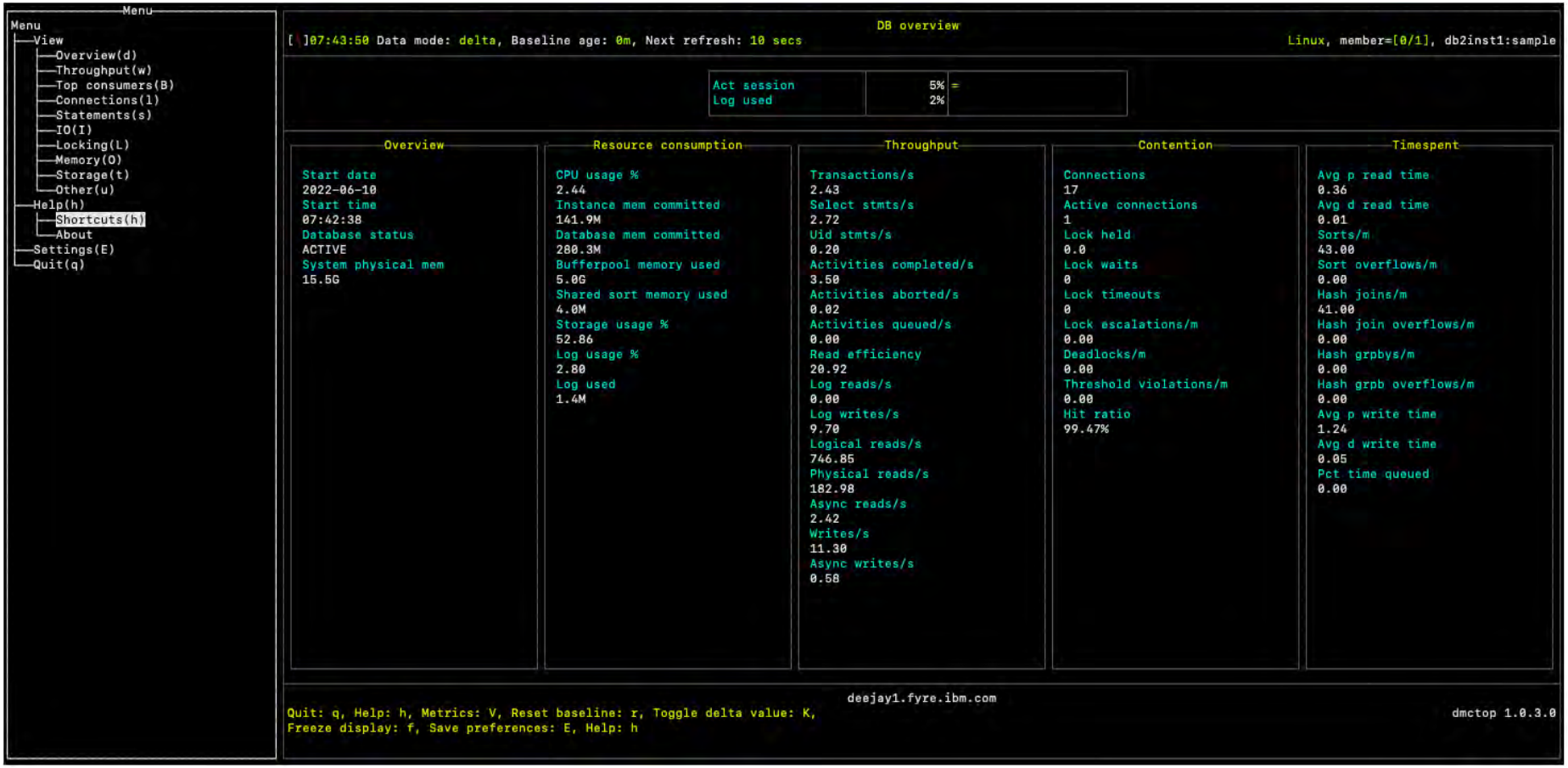
        dmctop.exe -d SAMPLE -n localhost -r 50000 -u db2inst1 -insecure -b d
    - **Specifying output file name**
      - For Linux/AIX/MacOS

        dmctop -d SAMPLE -n localhost -r 50000 -u db2inst1 -insecure -b d -f <outputFile>.csv
      - For Windows

        dmctop.exe -d SAMPLE -n localhost -r 50000 -u db2inst1 -insecure -b d -f <outputFile>.csv

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=dmctop-setting-up

dmctop


Menu
Menu
View
Overview(d)
Throughput(w)
Top consumers(B)
Connections(l)
Statements(s)
IO(I)
Locking(L)
Memory(O)
Storage(t)
Other(u)
Help(h)
Shortcuts(h)
About
Settings(E)
Quit(q)
DB overview
[ ]07:43:50 Data mode: delta, Baseline age: 0m, Next refresh: 10 secs
Linux, member=[0/1], db2inst1:sample
Act session 5% =
Log used 2%
Overview
Start date
2022-06-10
Start time
07:42:38
Database status
ACTIVE
System physical mem
15.5G
Resource consumption
CPU usage %
2.44
Instance mem committed
141.9M
Database mem committed
280.3M
Bufferpool memory used
5.0G
Shared sort memory used
4.0M
Storage usage %
52.86
Log usage %
2.80
Log used
1.4M
Throughput
Transactions/s
2.43
Select stmts/s
2.72
Uid stmts/s
0.20
Activities completed/s
3.50
Activities aborted/s
0.02
Activities queued/s
0.00
Read efficiency
20.92
Log reads/s
0.00
Log writes/s
9.70
Logical reads/s
746.85
Physical reads/s
182.98
Async reads/s
2.42
Writes/s
11.30
Async writes/s
0.58
Contention
Connections
17
Active connections
1
Lock held
0.0
Lock waits
0
Lock timeouts
0
Lock escalations/m
0.00
Deadlocks/m
0.00
Threshold violations/m
0.00
Hit ratio
99.47%
Timespent
Avg p read time
0.36
Avg d read time
0.01
Sorts/m
43.00
Sort overflows/m
0.00
Hash joins/m
41.00
Hash join overflows/m
0.00
Hash grpbys/m
0.00
Hash grpb overflows/m
0.00
Avg p write time
1.24
Avg d write time
0.05
Pct time queued
0.00
deejay1.fyre.ibm.com
Quit: q, Help: h, Metrics: V, Reset baseline: r, Toggle delta value: K,
Freeze display: f, Save preferences: E, Help: h
dmctop 1.0.3.0

dmctop – Shortcuts

Use shortcuts to drill down information

Description	Shortcut
** View **	
1)Overview	d
2)Throughput	
- Workloads	w
- Workload Assignment	W
- Service Classes	C
- Members	p
- Skew monitor	J
- Time spent (system)	Q
3)Top Consumer	
- Units of Work	B
- Connections	c
- Activities	v
4)Connections	l
5)Statements	
- In-flight statement	s
- Executed SQL (pkg cache)	D
6)IO	
- Bufferpools	I
- Prefetchers	P
- Table Spaces	y
- Table	Y
- Logging Performance	N
- CF Status	x
- pureScale Performance	X
7)Locking	
- Lock Statistics	L
- Blockers, waiters	b
- Locks	U
- Locked Objects	o
8)Memory	
- Database memory pools	O
- Instance memory sets	n
9)Storage	
- Table Space Utilization	t
- Table Utilization	T
10)Other	
- Utilities	u
- REORG	R
- HADR	A
- Federation	F
11)Help	
- Shortcuts	h
12)Settings	
- Save Preferences	E
13)Quit	q
14)Set refresh interval	CTRL+t

Db2 Data Management Console

Configuration Files

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Configuration Files – Config directory

Configuration files are located under <dmc_home>/Config directory

- dswebserver_override.properties
  - Overrides the configuration in dswebserver.properties file
  - Not changed during DMC upgrade
  - Console hostname, ipaddress, URL
  - Authentication Configuration (SuperAdmin, LDAP, Repository Database)
  - e-mail configuration (e-mail host, port number, e-mail address)
- dswebserver.properties
  - Overwritten during DMC upgrade
  - Contains the current DMC version (build and release)
  - 10.01 support enabled/disabled
- ext_ldap_config_v2.json
  - LDAP configuration information when LDAP authentication is used
- metadb_override.properties
  - Overrides the configuration in metadb.properties file
  - Not changed during DMC upgrade
  - Repository database information (host, port number, database name)
- metadb.properties
  - Overwritten during DMC upgrade
  - Repository database internal information
- monitorProfile directory
  - Default configuration when creating new monitoring profiles
- product directory
  - about.properties file
  - License files
- server.crt and server.key
  - Original certificate to be used for SSL configuration
  - Recommended to be changed by using the steps from https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-enabling-https-db2-data-management-console
- SSLConfig.xml
  - SSL configuration
- TLSOnlyConfig.xml
  - TLS configuration sslProtocol="TLSv1.2"

Relevant information only, do not to change the contents, unless requested by development or DMC manual

- Configuration files for logging
  - admin_log.properties
  - alert_log.properties
  - deletedDBData_log.properties
  - diagnosis_log.properties
  - DS_System_log.properties
  - explain_log.properties
  - fixnow_log.properties
  - home_log.properties
  - LOAD_log.properties
  - monitor_log.properties
  - repoUtil_log.properties
  - runsql_log.properties
  - sample_log.properties
  - setup_log.properties
  - tuning_log.properties
  - UserUtils_log.properties

Additional Configuration Files

Under <dmc_home>/wlp/usr/servers/dsweb

- bootstrap.properties
  - Port numbers
    - port=11080
    - https.port=11081
    - job.http.port=11088
    - internal.port=11082
  - SSL configuration
    - https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-enabling-https-db2-data-management-console
  - Ciphers
- jvm.options
  - Contains the JVM configuration, memory allocation for the DMC java process
    - -Xms (start)
    - -Xmx (maximum)
  - Additional information

    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-resolving-out-memory-errors
- server.env
  - WLP_OUTPUT_DIR dump files directory configuration

Relevant information only, do not to change the contents, unless requested by development or DMC manual

Db2 Data Management Console

Log Files

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Log Files

- Configuration files for logging located under <dmc_home>/Config directory
- Log files are located under <dmc_home>/logs directory
- DMC start is required after changing the logging property files
- Circular logging
- Parameters
  - MaxEdition
    - Default 4
    - Starts from 0, where 0 is the most recent data
  - MaxFileSizeInM
    - Default 10
    - Size in megabites
  - LogInitialLevel
    - Default 6
    - Frequently used
      - LOG_ERROR = 2
      - LOG_WARNING = 4
      - LOG_INFO = 6
      - LOG_DEBUG = 9
      - LOG_TRACE = 13

Component	Property File	Log File
Admin	admin_log.properties	admin.0
Alert	alert_log.properties	alert.0
	deletedDBData_log.properties	deletedDBData.0
	diagnosis_log.properties	diagnosis.0
General	DS_System_log.properties	DS_System.0
Explain	explain_log.properties	explain.0
	fixnow_log.properties	fixnow.0
	home_log.properties	home.0
	LOAD_log.properties	LOAD.0
	monconn_log.properties	monconn.0
Monitor	monitor_log.properties	monitor.0
Repository	repoUtil_log.properties	repoUtil.0
Run SQL	runsql_log.properties	runsql.0
	sample_log.properties	sample.0
Setup	setup_log.properties	setup.0
Query Tuning	tuning_log.properties	tuning.0
	UserUtils_log.properties	UserUtils.0

Additional Ways to Change Log Level

Logs level can also be changed by

- logUtils.sh script

```
<dmc_home>/dsutils/bin/logUtils.sh
```

`Usage: "logUtils.sh <admin|dbapi|monitor|explain|runsql|all> <trace|info>"`
By default, the log level is `info`. To collect more debug information, set the value to `trace`.

Additional info
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-customizing-trace-log-settings

- Logger REST API

curl –X PUT 'SCHEME://HOST:PORT/<component>/logger' \
-H 'Authorization: Bearer {getting a token}' \
-H 'cache-control: no-cache'-H 'content-type: application/jason' \
-d '{"loggerName":"<component>","logLevel":"13","maxFileSize":"10","editions":"4", "enableRolling":"true"}' –k
Where

- component: dbapi/v3, admin, monitor, run_sql
- Parameters
  - loggerName is a must, accepted values are DS_System, admin, monitor, runsql
  - logLevel: logger level, accepted values are 2, 4, 6, 9, and 13
    - LOG_ERROR = 2
    - LOG_WARNING = 4
    - LOG_INFO = 6
    - LOG_DEBUG = 9
    - LOG_TRACE = 13
  - enableRolling: Whether to enable the rolling log – true or false
  - maxFileSize: Maximum size of rolling log files (MB)
  - editions: Maximum number of rolling log files

Additional Log Files

- messages.log file
  - Under <dmc_home>/logs directory
  - Show status of DMC server
  - Last date and time that the server was started
- ffdc directory
  - The FFDC (First Failure Data Capture) directory preserves the information that is generated from a processing failure used by IBM Support
  - You can remove the FFDC information after investigation
  - The dump file is created in the <dmc_home>/work/dsweb directory. If you modify the WLP_OUTPUT_DIR attribute in server.env, the dump file will be stored in <WLP_OUTPUT_DIR>/dsweb directory. You can remove the dump files (javadump, core, heapdump etc.) after investigation
- Job Scheduler Server log files
  - Under <dmc_home>/addons/job-scheduler/logs
- Dr S log files
  - Under <dmc_home>/addons/drs/drs-agent/logs

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dsutil Files

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dsutil/bin Files – Utilities directory

Script files under <dmc_home>/dsutil/bin directory

- crypt.sh
  - Encrypt password
  - Additional information
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=installation-customized-product-setup
- deleteRepoData4DeletedConnection.sh
  - Clean up monitor data for deleted database connections
  - Additional information
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-cleaning-up-monitor-data-deleted-connections
- deleteRepoData_expired.sh
  - Clean up monitor data for deleted database connections
  - Additional information
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-deleting-expired-monitor-data
- enable_setup_admin.sh
  - Reset the authentication configuration settings back to the SuperAdmin user during the installation
  - Additional information
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=configuration-resetting-authentication
- libertyCertsCrypt.sh
  - Encrypt SSL certificate password
  - Additional information
    - https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=securing-enabling-https-db2-data-management-console
- logUtils.sh
  - Change log level script
- repoUtil.sh
  - Resolving transaction log for the database is full error
  - Additional information
    - https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-resolving-transaction-log-database-is-full-error
- retrieveAdminCred.sh
  - Retrieve SuperAdmin credentials
- setupRepo.sh
  - Avoid LOB errors when setting up DMC repository database
  - Additional information
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-resolving-transaction-log-database-is-full-error
- changeRepoDbUserPWD.sh
  - Change password for the userid connecting to the repository database
  - Additional information
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=administering-resetting-repository-user-password

Relevant information only, do not to change the contents, unless requested by development or DMC manual

dsutil/bin/pre_req_script Files – Utilities directory

Script files under <dmc_home>/dsutil/bin/pre_req_script directory

- dmc sub-directory
  - aix_bash_check.sh
    - Check if bash is enabled on AIX only
  - check_dmc_server.sh
    - Check if the server has enough resources according to the DMC capacity planning
  - check_dmc_capacity.sh
    - Called by check_dmc_server.sh script
- monitor_db sub directory
  - aix_bash_check.sh
    - Check if bash is enabled on AIX only
  - check_mon_db.sh
    - Check required AIX bash if applicable
    - Check DB configuration for minimum requirements to collect monitor statistics
    - Check userid for minimum required object privileges
  - check_monitor_dbcfg_with_auth.sh
    - Check target database to ensure database configuration parameters meet the minimum requirements to collect monitor statistics
  - grant_mondb_min.sh
    - Grant the user minimum object privileges on a restrictive monitoring database
    - Exceptions
      1) user issuing job cancellation may require higher privileges.
      2) user running REORG or RUNSTAT in tuning may require higher privileges
  - verify_mondb_min.sh
    - Verify if the user meets minimum required privileges on the monitored database

Relevant information only, do not to change the contents, unless requested by development or DMC manual

- repository sub-directory
  - aix_bash_check.sh
    - Check if bash is enabled on AIX only
  - check_repo_capacity.sh
    - Check CPU, memory, and disk space for the repository database
  - check_repo_config.sh
    - Check required repository database configuration
  - check_repo_server.sh
    - Check if the user has required privileges for the repository database
  - create_repodb.sh
    - Create the repository database
  - create_repo_objects.sh
  - create_repo.sh
    - Check requirements and create repository database
      - check_repo_config.sh
      - create_repo_objects.sh
      - create_repodb.sh
      - create_repo_objects.sh
      - create_repodb.sh
  - grant_repodb_min.sh
    - Grant the user minimum object privileges on the repository database
  - verify_repodb_min.sh
    - Script to verify if a user on repodb database meets minimum required object prilvileges

Db2 Data Management Console

Common issues

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Out of Memory Errors

- **Symptoms**
  - DMC server runs for a while and it gets unresponsive or has unpredictable behavior
- **Causes**
  - By default, the Java virtual manager that is installed with IBM Db2 Data Management Console uses up to a certain amount of memory. The memory that is needed to monitor databases depends on the monitoring profile settings and the number of databases being monitored. If the memory that is needed to monitor databases is significant, you will see out-of-memory errors.
- **Diagnosing the problem**
  - Investigate the resources available to the server according to the Capacity Planning
  - Make sure that you have enough resources available for DMC server, increasing the configuration but not having enough memory available, DMC server will crash again
- **Resolving the problem**
  - 2 ways to change JVM configuration
    - ❖ Web UI Administration → Settings → JVM, if the DMC server is not down
    - ❖ Edit the <dmc_home>/ wlp/usr/servers/dsweb/jvm.options file
  - Default JVM configuration
    - ❖ -Xms512m
    - ❖ -Xmx2048m
  - Modify the default JVM options for the initial (Xms) and maximum (Xmx) heap size values for memory allocation
  - Restart DMC server

Additional information
https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-resolving-out-memory-errors
https://www.ibm.com/support/pages/data-management-console-dmc-server-reports-out-memory-errors

Timestamp conversion

- Export data into a flat file (CSV), the timestamp value format in the exported file is unsupported
  - Changing the date format
    https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-changing-date-format-in-excel-reports
- Timestamp Converter
  - https://timestamp.online/

Questions?

We are here to help!

- Data Management Console Community page
  - https://community.ibm.com/community/user/hybriddatamanagement/blogs/maryia-rakina1/2021/04/21/db2-data-management-console-product-hub?CommunityKey=ea909850-39ea-4ac4-9512-8e2eb37ea09a&Tab=groupdetails

- Help us improve our product using IBM Aha!
  - https://ibm-data-and-ai.ideas.ibm.com/?category=7093947472735440072

- Create a case with IBM Data Management Console Support team
  - https://www.ibm.com/mysupport/s/?language=en_US
    - Attach screen shots showing the problem
    - Provide monitored database name having the issue
    - dmccollector
      https://www.ibm.com/docs/en/db2-data-mgr-console/3.1.x?topic=support-exchanging-information