

When You Think Db2 – Webinar Serie

Must have Zowe Apps
*The Future of Db2 for z/OS
administration with
IBM Db2 Admin Foundation*

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How the journey began...

Blog post by Mo Townsend, Director of Development, Db2 & Db2 Tools for z/OS in June 2021:

*“**Db2 Administration Foundation for z/OS** delivers key management capabilities to support different Db2 for z/OS users. This cornerstone of the transformation of Db2 Tools for z/OS will, over the next several releases, **replace many Data Studio features and administrative functions from Data Server Manager.**”*

Source:

<https://community.ibm.com/community/user/hybriddatamanagement/blogs/mo-townsend1/2021/06/07/announcing-db2-administration-foundation-for-zos>

...and where we are today – Data Studio EoS

- IBM Data Studio has been in maintenance mode for 8+ years
 - While Db2 12 for z/OS toleration was added at some point, it does not tolerate/support Db2 13 for z/OS
- On February 27, 2024, IBM announced the **End of Support (EOS)** date for Data Studio for Db2 for z/OS to be **March 31, 2025**: <https://ibm.biz/BdvTQa>
- This announcement only concerns Db2 for z/OS, not Db2 LUW
 - There will be a separate announcement for Db2 LUW later this year
- Data Server Manager support for Db2 for z/OS ended March 31, 2024

The new Db2 Administration landscape

IBM Db2 Administration Foundation

Provides basic DBA functions, e.g. catalog browser, SQL and command processors, SQL tuning integration

IBM Unified Management Server (UMS)

Provides APIs used by other IBM experiences

Zowe

IBM Db2 Analytics Accelerator Administration Services

Integrates IDAA administration functions into Db2 Admin Foundation

IBM Query Workload Tuner

IBM SQL Tuning Services

(Db2 Accessories Suite for z/OS V4.2.1 – Database Services Expansion Pack feature)

Provides SQL tuning APIs to be used directly or integrated into Db2 Admin Foundation or Db2 Developer Extension

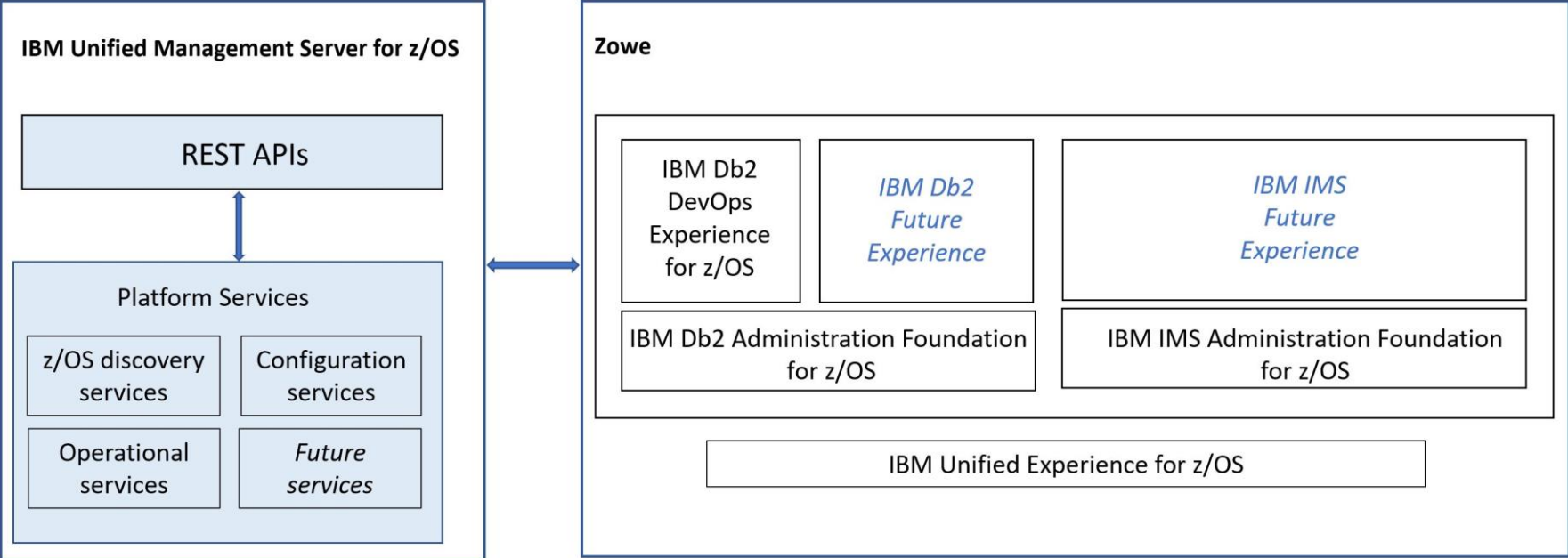
IBM Db2 Developer Extension for VS Code

Integrates developer-targeted Db2 interactions into VS Code, e.g. catalog browser, SQL execution, stored procedure development and SQL tuning

VS Code

All products are free of charge, except for IBM Query Workload Tuner. IDAA Admin Services are licensed and supported as part of IDAA.

UMS architecture



Source : <https://www.ibm.com/docs/en/umsfz/1.2.0?topic=overview-architectural>

Downloading and Installing UMS and Db2 Admin Foundation

- Both programs must be ordered via IBM ShopZ
 - IBM Unified Management Server for z/OS V1.2, PID 5698-UM1, FMID HIZP120
 - Db2 Administration Foundation for z/OS 1.2, PID 5698-ADF, FMID HAFX120
- **NEW:** Db2 Administration Foundation for z/OS 1.2.1 now includes IBM Unified Management Server for z/OS 1.2 (5698-UM1) (see Announcement at <https://www.ibm.com/docs/en/announcements/db2-administration-foundation-121-includes-unified-management-server-zos-12>)
- Effective March 1, 2023, Db2 Administration Foundation for z/OS Support and Subscription pricing was revised to **no charge** (see Announcement at <https://www.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&infotype=an&appname=iSource&supplier=897&letternum=ENUS223-008>)
- Always check compatibility matrix at <https://www.ibm.com/docs/en/umsfz/1.2.0?topic=functions-ums-ptf-compatibility>

IBM Db2 Administration Foundation Version 1.2

- Takes advantage of the Zowe V2.3 enhancements that are provided by Unified Management Server V1.2
- Includes integrated support for the extended SQL analysis and tuning features
- Expands the support for IDAA administration
- Includes several ease-of-use enhancements

<https://www.ibm.com/docs/en/umsfz/1.2.0?topic=functions-whats-new-in-db2-administration-foundation>

The screenshot displays the IBM Db2 Administration Foundation interface. At the top, the 'Explore objects' section shows search filters for Name, Schema, Type, and Subsystem. Below this, a table lists 4 objects found, including databases and table spaces. The 'Object hierarchy' section shows a tree view of the database structure, with 'DSN8S12E' selected. The 'SQL processor' section shows a query: `SELECT * FROM ARYTEST.A1640T00;` and the results of the execution, which were successful. The results table has columns for INDEX, KEY1, REA1, INT1, CHAR0, and CHAR1.

INDEX	KEY1	REA1	INT1	CHAR0	CHAR1
1	9	0.99999	11	_J_09	CHAR_100_COLUMN_RECORD_00009
2	10	1.0	12	_J_10	CHAR_100_COLUMN_RECORD_00010
3	27	2.77777	16	_J_27	CHAR_100_COLUMN_RECORD_00027
4	12	1.2222204	14	_J_12	CHAR_100_COLUMN_RECORD_00012
5	8	0.88888	15	_J_08	CHAR_100_COLUMN_RECORD_00008

Db2 for z/OS SQL Tuning Services

- Component of the IBM Database Services Expansion Pack feature, which ships with Db2 Accessories Suite for z/OS
- SQL Tuning Services consists of a set of RESTful APIs that you can use to analyze and tune SQL applications that work with Db2 for z/OS
- Runs in Websphere Liberty as separate STC
- Documentation available at <https://www.ibm.com/docs/en/db2-for-zos/13?topic=db2-sql-tuning-services>

The screenshot displays the Swagger UI for the IBM Db2 for z/OS SQL Tuning Services API. The top bar shows the Swagger logo and the endpoint `/tuningervice/v1/swagger.yaml`. The main header identifies the API as "IBM Db2 for z/OS SQL Tuning Services API" with an application version of 1.0 and OAS3 specification. Below this, a list of RESTful endpoints is shown, including:

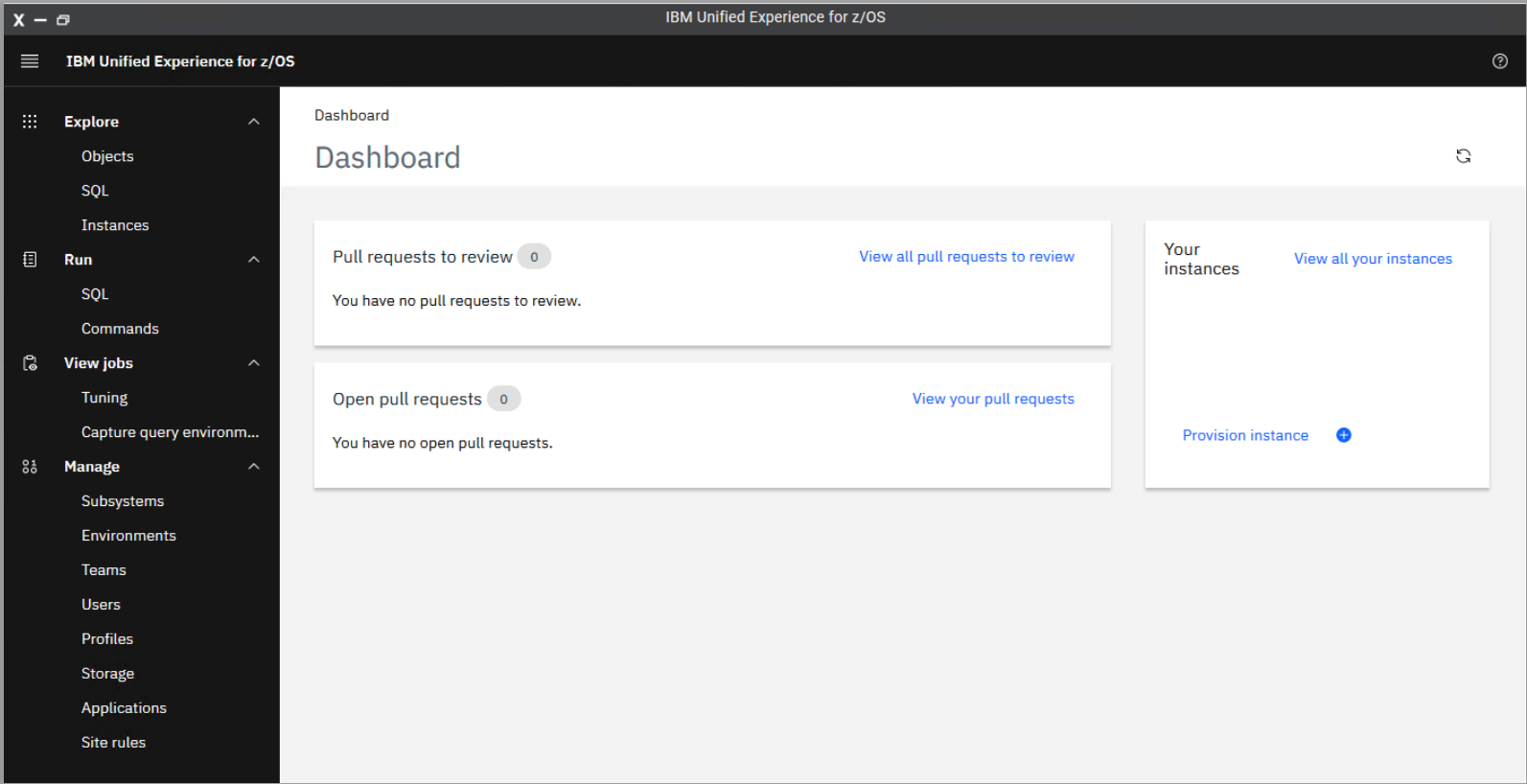
- EXPLAIN Tables Management**: `POST /tuningervice/v1/explaintb` Manage Explain tables
- SQL Capture**:
 - `POST /tuningervice/v1/sqlcapture/catalog` Retrieve all queries from Db2
 - `POST /tuningervice/v1/sqlcapture/file` Retrieve all queries from an upload
 - `POST /tuningervice/v1/sqlcapture/statcache` Retrieve all queries from the statistics cache
 - `POST /tuningervice/v1/sqlcapture/userdefinedrepo` Retrieve all queries from a user-defined repository
 - `POST /tuningervice/v1/sqlcapture/workload` Retrieve queries from a workload
- SQL Formatter**: `POST /tuningervice/v1/formatter` Submit a query format request
- SQL Annotator**: `POST /tuningervice/v1/annotator` Submit a query annotate request
- Visual Explainer**: `POST /tuningervice/v1/ve` Submit a Visual Explain request
- Access Path Advisor**: `POST /tuningervice/v1/apa` This is a fee based feature. Submit a Access Path Advisor request

Overlaid on the right side of the screenshot is a query execution plan diagram. The diagram shows a flow of operations:

- (1) QUERY (blue oval)
- (2) QB1 0 (purple oval)
- (3) FETCH 1 (yellow hexagon)
- (4) IXSCAN 1 (yellow hexagon)
- (5) XEMP2 8 (yellow hexagon)
- (6) EMP 42 (pink rectangle)

Arrows indicate the flow from (5) and (6) to (4), then from (4) to (3), then from (3) to (2), and finally from (2) to (1).

UMS main screen



Configure subsystems

The screenshot shows the 'Subsystems' management page in the IBM Unified Experience for z/OS. The page has a dark header with the title 'IBM Unified Experience for z/OS' and a breadcrumb 'Dashboard / Subsystems'. Below the header, there are tabs for 'Registered' (active) and 'Discovered'. A search bar is present with the placeholder text 'Search registered subsystems'. On the right side, there is a blue 'Register subsystem' button. The main content area displays a list of subsystems. The first entry is 'DBCG', which is expanded to show its details:

Subsystem	Db2
Location	DALLASC
Current function level	V12R1M504
Port	5040
Host	10.1.1.2
z/OS LPAR	S0W1
Last object discovery	Not discovered
Status	● Ready
Status messages	2 messages

Below the details, there is an 'Edit' link. To the right of the details, there is a large white box with a blue plus sign and the text 'Register subsystem'.

Catalog browser

The screenshot displays the IBM Unified Experience for z/OS Catalog browser interface. The page title is "Explore objects". The search criteria are: Name starts with "EMP", Schema starts with " ", Object type is "table", and Subsystem is "Filter subsystems". The applied filters are: Name: Starts with > EMP, Object type: Table, and Subsystem: DBCG. The search results show 3 objects found, listed in a table with columns: Name, Schema, Object type, Subsystem ID, Database, Type, Table space, and Implicit.

Name	Schema	Object type	Subsystem ID	Database	Type	Table space	Implicit
EMP	DSN81210	Table	DBCG	DSN8012A		DSN8S12E	N
EMPPROJECT	DSN81210	Table	DBCG	DSN8012A		DSN8S12P	N
EMP_PHOTO_RESUME	DSN81210	Table	DBCG	DSN8012A		DSN8S12B	N

Object details – Overview

IBM Unified Experience for z/OS

Dashboard / Explore objects / DSN81210.EMP

DSN81210.EMP details

Table Subsystem: DBCG

Overview | Structure | DDL | Relationship | Status | Data

Last refreshed 0 minutes ago

Key information

Database	DSN8D12A
Tablespace	DSN8S12E
Type	Table
Incomplete	Has parent index
Edit proc	DSN8EAE1
Drop restrict	No
Audit	None
Data capture	None

Object hierarchy

- DBCG Subsystem
 - DSN8D12A Database
 - DSN8S12E Table space
 - EMP Table

[Details](#)

Referential integrity

- 1 Parent
- 2 Siblings
- 3 Children

[Details](#)

Structure

0	Pending changes
42	Rows
14	Columns
0	Data version

[Details](#)

Creation details

Db2 version	V12
Created by	DSN81210
Created on	2016-12-19 14:25:19
Last altered on	2016-12-19 14:29:58

Object details – Structure

IBM Unified Experience for z/OS

Dashboard / Explore objects / DSN81210.EMP

DSN81210.EMP details Table Subsystem: DBCG

Overview **Structure** DDL Relationship Status Data

Columns Last refreshed 0 minutes ago

Name	Column number	Column type	Length	Scale	Nulls	Default	Field proc	Last modified by	Last modified on	Number of distinct values	Table name
EMPNO	1	CHAR	6	0	No	N	No	DSN81210	2016-12-19 14:25:19.107317	42	EMP
FIRSTNME	2	VARCHAR	12	0	No	N	No	DSN81210	2016-12-19 14:25:19.107317	39	EMP
MIDINIT	3	CHAR	1	0	No	N	No	DSN81210	2016-12-19 14:25:19.107317	20	EMP
LASTNAME	4	VARCHAR	15	0	No	N	No	DSN81210	2016-12-19 14:25:19.107317	41	EMP
WORKDEPT	5	CHAR	3	0	Yes	Y	No	DSN81210	2016-12-19 14:25:19.107317	8	EMP
PHONENO	6	CHAR	4	0	Yes	Y	No	DSN81210	2016-12-19 14:25:19.107317	32	EMP
HIREDATE	7	DATE	4	0	Yes	Y	No	DSN81210	2016-12-19 14:25:19.107317	32	EMP
JOB	8	CHAR	8	0	Yes	Y	No	DSN81210	2016-12-19 14:25:19.107317	8	EMP
EDLEVEL	9	SMALLINT	2	0	Yes	Y	No	DSN81210	2016-12-19 14:25:19.107317	8	EMP
SEX	10	CHAR	1	0	Yes	Y	No	DSN81210	2016-12-19 14:25:19.107317	2	EMP

Columns per page 10 of 1 - 10 of 14 columns 1 of 2 pages

Object details – DDL

The screenshot displays the IBM Unified Experience for z/OS interface. At the top, the breadcrumb navigation shows 'Dashboard / Explore objects / DSN81210.EMP'. The main heading is 'DSN81210.EMP details' with a subheading 'Table Subsystem: DBCG'. Below this, there are tabs for 'Overview', 'Structure', 'DDL', 'Relationship', 'Status', and 'Data', with 'DDL' being the active tab. The main content area shows the DDL for the table, including column definitions, constraints, and partitioning. A 'Run in SQL processor' button is visible on the right side of the DDL text. The interface also shows a 'Last refreshed 0 minutes ago' indicator in the top right corner of the main area.

```
1 SET CURRENT SQLID='DSN81210';
2 SET CURRENT APPLICATION COMPATIBILITY = 'V12R1M503';
3 CREATE TABLE DSN81210.EMP
4     (EMPNO          CHAR(6) FOR SBCS DATA NOT NULL,
5      FIRSTNM        VARCHAR(12) FOR SBCS DATA NOT NULL,
6      MIDINIT        CHAR(1) FOR SBCS DATA NOT NULL,
7      LASTNAME       VARCHAR(15) FOR SBCS DATA NOT NULL,
8      WORKDEPT       CHAR(3) FOR SBCS DATA WITH DEFAULT NULL,
9      PHONENO        CHAR(4) FOR SBCS DATA WITH DEFAULT NULL,
10     HIREDATE        DATE WITH DEFAULT NULL,
11     JOB             CHAR(8) FOR SBCS DATA WITH DEFAULT NULL,
12     EDLEVEL        SMALLINT WITH DEFAULT NULL,
13     SEX             CHAR(1) FOR SBCS DATA WITH DEFAULT NULL,
14     BIRTHDATE       DATE WITH DEFAULT NULL,
15     SALARY          DECIMAL(9, 2) WITH DEFAULT NULL,
16     BONUS          DECIMAL(9, 2) WITH DEFAULT NULL,
17     COMM           DECIMAL(9, 2) WITH DEFAULT NULL,
18     CONSTRAINT EMPNO
19     PRIMARY KEY (EMPNO),
20     CONSTRAINT NUMBER
21     CHECK (PHONENO >= '0000' AND PHONENO <= '9999'),
22     CONSTRAINT PERSON CHECK (SEX = 'M' OR SEX = 'F')),
23 IN DSN8012A.DSN8S12E
24 PARTITION BY (EMPNO ASC)
25 (PARTITION 1 ENDING AT ('099999'),
26  PARTITION 2 ENDING AT ('199999'),
27  PARTITION 3 ENDING AT ('299999'),
28  PARTITION 4 ENDING AT ('499999'),
29  PARTITION 5 ENDING AT ('999999'));
30 EDITPROC DSN8EAE1 WITH ROW ATTRIBUTES
31 AUDIT NONE
32 DATA CAPTURE NONE
33 CCSID          EBCDIC
34 NOT VOLATILE
35 APPEND NO ;
36 SET CURRENT APPLICATION COMPATIBILITY = 'V12R1M504';
37 COMMIT;
```


Object details – Status

The screenshot displays the IBM Unified Experience for z/OS interface. At the top, the breadcrumb navigation shows 'Dashboard / Explore objects / DSN81210.EMP'. The main heading is 'DSN81210.EMP details Table Subsystem: DBCG'. Below this, a horizontal menu contains tabs for 'Overview', 'Structure', 'DDL', 'Relationship', 'Status', and 'Data'. The 'Status' tab is currently selected. On the left side, a dropdown menu is open, showing 'Claims' (selected), 'Claims', and 'Locks'. In the top right corner of the main content area, it says 'Last refreshed 0 minutes ago' with a refresh icon. The central area features a large, light gray cube icon and the text: 'No claimers found' followed by 'This table does not have any claimers.'

Object details – Data

IBM Unified Experience for z/OS

Dashboard / Explore objects / DSN81210.EMP

DSN81210.EMP details Table Subsystem: DBCG

Overview Structure DDL Relationship Status **Data**

Refresh
Last refreshed 0 minutes ago

EMPNO	FIRSTNAME	MIDINIT	LASTNAME	WORKDEPT	PHONE0	HIREDATE	JOB	EDLEVEL	SEX	BIRTHDATE	SALARY	BONUS	COMM
000010	CHRISTINE	I	HAAS	A00	3978	1965-01-01	PRES	18	F	1933-08-14	52750.00	1000.00	4220.00
000020	MICHAEL	L	THOMPSON	B01	3476	1973-10-10	MANAGER	18	M	1948-02-02	41250.00	800.00	3300.00
000030	SALLY	A	KWAN	C01	4738	1975-04-05	MANAGER	20	F	1941-05-11	38250.00	800.00	3060.00
000050	JOHN	B	GEYER	E01	6789	1949-08-17	MANAGER	16	M	1925-09-15	40175.00	800.00	3214.00
000060	IRVING	F	STERN	D11	6423	1973-09-14	MANAGER	16	M	1945-07-07	32250.00	600.00	2580.00
000070	EVA	D	PULASKI	D21	7831	1980-09-30	MANAGER	16	F	1953-05-26	36170.00	700.00	2893.00
000090	EILEEN	W	HENDERSON	E11	5498	1970-08-15	MANAGER	16	F	1941-05-15	29750.00	600.00	2380.00
000100	THEODORE	Q	SPENSER	E21	0972	1980-06-19	MANAGER	14	M	1956-12-18	26150.00	500.00	2092.00
000110	VINCENZO	G	LUCCHESI	A00	3490	1958-05-16	SALESREP	19	M	1929-11-05	46500.00	900.00	3720.00
000120	SEAN		O'CONNELL	A00	2167	1963-12-05	CLERK	14	M	1942-10-18	29250.00	600.00	2340.00

Rows per page 10 1 - 10 of 42 rows

1 of 5 pages

Run SQL statements

The screenshot shows the IBM Unified Experience for z/OS interface. At the top, it says "IBM Unified Experience for z/OS". Below that, there's a navigation bar with "Dashboard / SQL" and a "SQL" title. On the right, there's a "Connection" dropdown menu set to "DBCG".

There are three tabs: "New SQL statements" (selected), "Recent statements", and "Analyzed statements". The main area contains a SQL query editor with the following code:

```
1 SELECT E.EMPNO, E.LASTNAME, E.FIRSTNME, D.DEPTNAME, D.LOCATION
2 FROM DSN81210.EMP E, DSN81210.DEPT D
3 WHERE E.WORKDEPT = D.DEPTNO AND D.DEPTNO='A00';
```

Below the editor are "Tune" and "Run" buttons. The "Run" button is highlighted in blue. Below the buttons, the query is repeated: "Query SELECT E.EMPNO, E.LASTNAME, E.FIRSTNME, D.DEPTNAME, D.LOCATION FROM DSN81210.EMP E, DSN81210.DEPT D WHERE E.WORKDEPT = D.DEPTNO AND D.DEPTNO='A00'".

The results section shows "Results SQL QUERY RAN SUCCESSFULLY, SQL CODE IS 0, SQL STATE IS 00000". Below this is a table with the following data:

	EMPNO	LASTNAME	FIRSTNME	DEPTNAME	LOCATION
1	000010	HAAS	CHRISTINE	SPIFFY COMPUTER SERVICE DIV.	
2	000110	LUCCHESI	VINCENZO	SPIFFY COMPUTER SERVICE DIV.	
3	000120	O'CONNELL	SEAN	SPIFFY COMPUTER SERVICE DIV.	
4	200010	HEMMINGER	DIAN	SPIFFY COMPUTER SERVICE DIV.	
5	200120	ORLANDO	GEORGE	SPIFFY COMPUTER SERVICE DIV.	

Query tuning

Query tuning

Select a tuning profile and configure parameters to tune your SQL query.
Selected profile : ZTrialProf

Select profile Select tuning actions Parameters Output

Select tuning actions

1 x Select tuning actions

- SQL Annotator
- Statistics Advisor
- Visual Explain

Cancel Previous

Query tuning

Select a tuning profile and configure parameters to tune your SQL query.
Selected profile : ZTrialProf

Select profile Select tuning actions Parameters Output

Job ID	Job name	Type	Profile	Status
1764313035198959616	Job1682579999476VE	Visual Explain	ZTrialProf	Ready to view!

Previous Close

Tuning jobs overview

IBM Unified Experience for z/OS

Dashboard / Tuning jobs

Tuning jobs

This page provides information about the tuning jobs that have been submitted. To compare access paths, select two jobs that completed successfully.

Search a job on this page

Last refreshed 0 minutes ago

<input type="checkbox"/> Job ID	Job name	User	Tuning profile	Job type	Status	Timestamp
<input type="checkbox"/> 1764313035198959616	Job1682579999476VE	IBMUSER	ZTrialProf	Visual Explain	✓ COMPLETED	2023-04-27 07:20:29.825
<input type="checkbox"/> 1764311896132947968	Job1682578912335VE	IBMUSER	ZTrialProf	Visual Explain	✓ COMPLETED	2023-04-27 07:02:24.694
<input type="checkbox"/> 1764149506195066880	Job1682424045356VE	IBMUSER	ZTrialProf	Visual Explain	✓ COMPLETED	2023-04-25 12:01:15.398
<input type="checkbox"/> 1764103664059813888	Job1682380326749VE	IBMUSER	ZTrialProf	Visual Explain	✓ COMPLETED	2023-04-24 23:52:37.944

Visual Explain result

SQL Statement | Warnings | Environment & Explain Options

Query

```
graph BT; Q1["(1) QUERY"] --> Q2["(2) QB1  
4"]; Q2 --> Q3["(3) NLJOIN 5"]; Q3 --> Q4["(4) FETCH 1"]; Q3 --> Q8["(8) FETCH 5"]; Q4 --> Q5["(5) IXSCAN 1"]; Q4 --> Q7["(7) DEPT  
14"]; Q5 --> Q6["(6) XDEPT1  
14"]; Q8 --> Q9["(9) IXSCAN 5"]; Q8 --> Q11["(11) EMP 42"]; Q9 --> Q10["(10) XEMP2 8"];
```

The diagram illustrates a query plan with the following nodes:

- (1) QUERY (Root)
- (2) QB1 4
- (3) NLJOIN 5
- (4) FETCH 1
- (5) IXSCAN 1
- (6) XDEPT1 14
- (7) DEPT 14
- (8) FETCH 5
- (9) IXSCAN 5 (Highlighted)
- (10) XEMP2 8
- (11) EMP 42

Description Search

Properties

NAME	VALUE
Index only	N
Type	I
Matching Columns	1
Cost Information	
Input RIDs	42
Index leaf pages	1
Scanned leaf pages	1
Scanned RIDs	5
Scanned rows	5
Output RIDs	5
Matching Filter Factor	0.11904758
Total Filter Factor	0.11904758

Predicates

Run Db2 commands

The screenshot shows the IBM Unified Experience for z/OS interface. At the top, the title bar reads "IBM Unified Experience for z/OS". Below it, the breadcrumb "Dashboard / Commands" is visible. The main heading is "Commands". On the right, there is a "Connection" dropdown menu set to "DBCG". Below the heading is a text input field containing "DIS GROUP" and a blue "Run" button. The output area displays the command's execution results, including a table of group members.

```
DIS GROUP
```

DIS GROUP

```
DSN7100I  -DBCG DSN7GCMD
*** BEGIN DISPLAY OF GROUP(.....) CATALOG LEVEL(V12R1M503)
CURRENT FUNCTION LEVEL(V12R1M504)
HIGHEST ACTIVATED FUNCTION LEVEL(V12R1M504)
HIGHEST POSSIBLE FUNCTION LEVEL(V12R1M504)
PROTOCOL LEVEL(2)
GROUP ATTACH NAME(....)
-----
DB2      SUB  DB2      SYSTEM  IRLM
MEMBER  ID  SYS  CMDPREF  STATUS  LVL   NAME    SUBSYS  IRLMPROC
-----
.....  0  DBCG -DBCG   ACTIVE  121504 SOW1    DJCG   DBCGIRLM
-----
SPT01  INLINE LENGTH:      32138
*** END DISPLAY OF GROUP(.....)
DSN9022I  -DBCG DSN7GCMD 'DISPLAY' GROUP ' NORMAL COMPLETION
```


IBM Z software trials

- IBM provides a free trial of Zowe and Db2 Admin Foundation at <https://early-access.ibm.com/software/support/trial/cst/welcomepage.wss?siteId=1135&tabId=2999&w=1>
- Trials are also available for other z/OS software

IBM Z software trials

Try IBM Z[®] software at no charge and with no installation. Your hands-on trial is available within 2 hours for 3 days (including weekends)

↓ Cloud, DevOps and APIs ↓ Database, application server

Database and application server software trials

IBM Db2 [®] Administration Foundation for z/OS [®]	IBM CICS [®] Transaction Server for z/OS [®]
Perform many of your Db2 for z/OS management tasks by using the new IBM Db2 Administration Foundation for z/OS. This streamlined, intuitive offering eliminates the extra time and knowledge that are required for navigating multiple ISPF-based products. Learn how to: <ul style="list-style-type: none">• Navigate the Db2 catalog to retrieve Db2 assets in an easy-to-read format.• View detailed dashboards that provide in-depth information about objects.• Take advantage of the intelligent SQL and Db2 command editors and data source name (DSN) command execution interface.• New: Analyze and tune SQL statements.• New: Capture SQL environment to diagnose SQL performance.	Use this mixed language application to create a Java™ or Node.js web app and deploy into IBM CICS Transaction Server. Learn how to: <ul style="list-style-type: none">• Create and deploy a Java application into CICS.• Create and deploy a Node.js application into CICS.
→ Register for the trial → Explore the product first	→ Register for the trial → Explore the product first

Zowe™

This open source framework hosted by the Open Mainframe Project™ includes members across the IBM Z community (ISV, SIs, z/OS practitioners).

Use interfaces as delivered or through plug-ins and extensions that are created by clients or third-party vendors.

[→ Register for the trial](#)
[↗ Explore the project first](#)

Resources

- Unified Management Server and Db2 Admin Foundation documentation
<https://www.ibm.com/docs/en/umsfz/1.2.0>
- Software requirements for UMS including supported Zowe versions
<https://www.ibm.com/docs/en/umsfz/1.2.0?topic=software-requirements-ums>
- IBM Z Distribution for Zowe documentation
<https://www.ibm.com/docs/en/zdfz/2.0.0>

Questions

