Amplify Db2 Developers Experience and Boost Efficiency with Broadcom's New VS Code Extension

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BROADCOM | MAINFRAME SOFTWARE

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Challenges and Solutions

Talent Acquisition attract next-gen to z	**Increase** the rate of change	**Open** integration opportunities

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Code4z

Code with Confidence

Market-leading **DevX** built on VS Code, the IDE developers know and love

Reduces friction and keeps developers in the flow state, driving velocity, quality and agility

Streamlines critical developer workflows:

- Extensive Z language support with integrations to Endevor and Git
- Improved quality with seamless debugging, unit testing, and abend analysis
- Rapid development of hybrid integrations to meet business demands

Fosters collaboration across mainframe and distributed teams

Breadth and depth of extensions spanning roles and functions

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"The adoption of Code4z is growing naturally. Developers are coding much faster with Code4z than with 3270 or plain CLI. They are not only developing in VS Code, but also building automation there."

~ Development Manager

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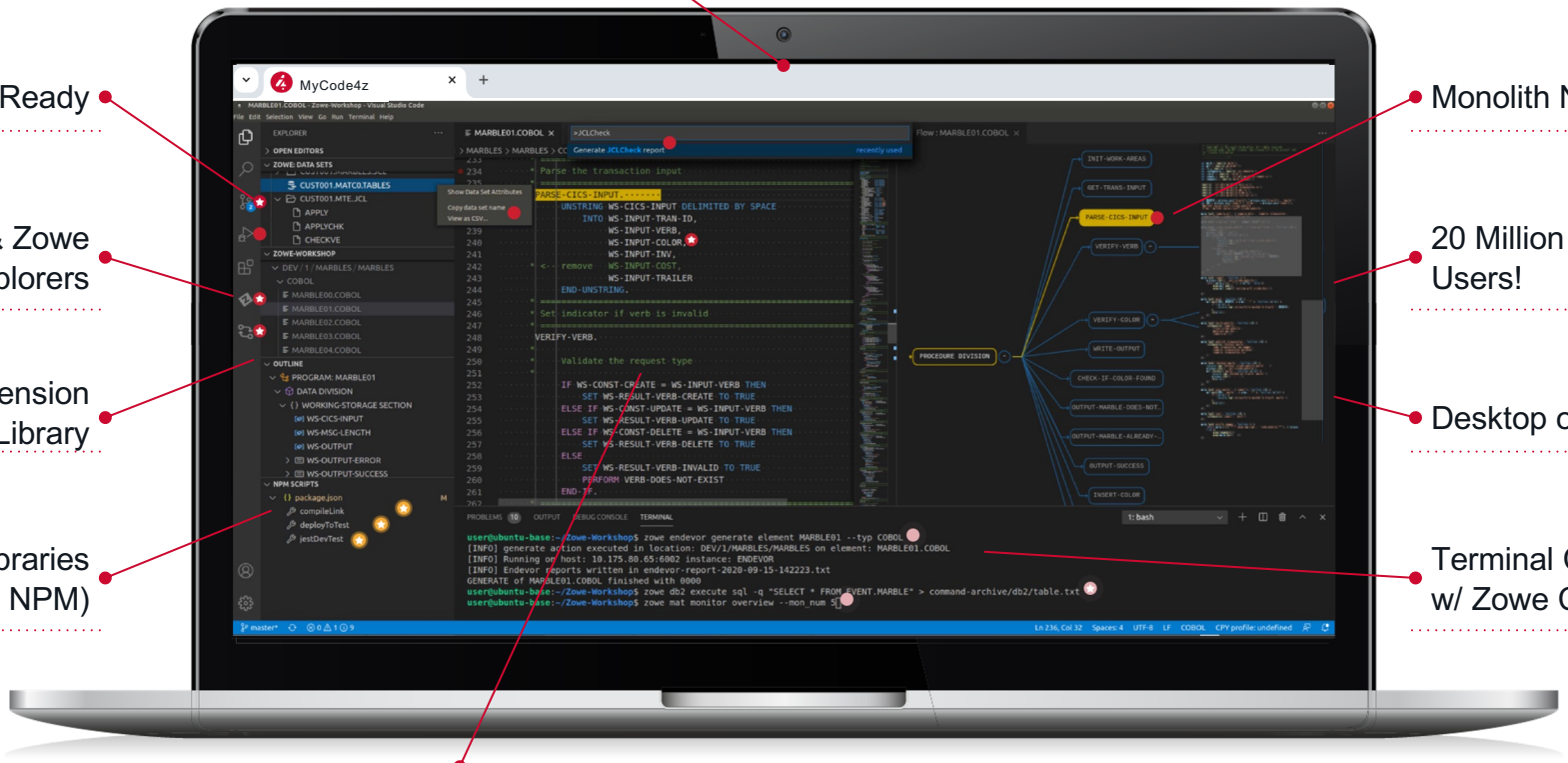
The Experience Developers LOVE: Code4z



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Code4z

DevX for Z

★ Future

Access and Learn

- Zowe Explorer
- Explorer for Endevor
- Data Editor
- Bridge for Git

Analyze

- App Discovery
- App Activity
- COBOL Control Flow
- Assist

Databases

- **DBM-Db2 Schema Mgmt**
- Database API Generator

Language Support

- PL/I
- COBOL
- HLASM
- JCL
- GEN
- Easytrieve
- Rexx
- OPS/REXX
- COBOL for IDMS

Testing and Diagnostics

- Unit Test
- Debugger
- Abend Analyzer
- JCL Check

Integrations

- Hostbridge

Note: Some extensions require Broadcom products running on the Z systems to fully function. Support for the extension is provided via the mainframe product entitlement.

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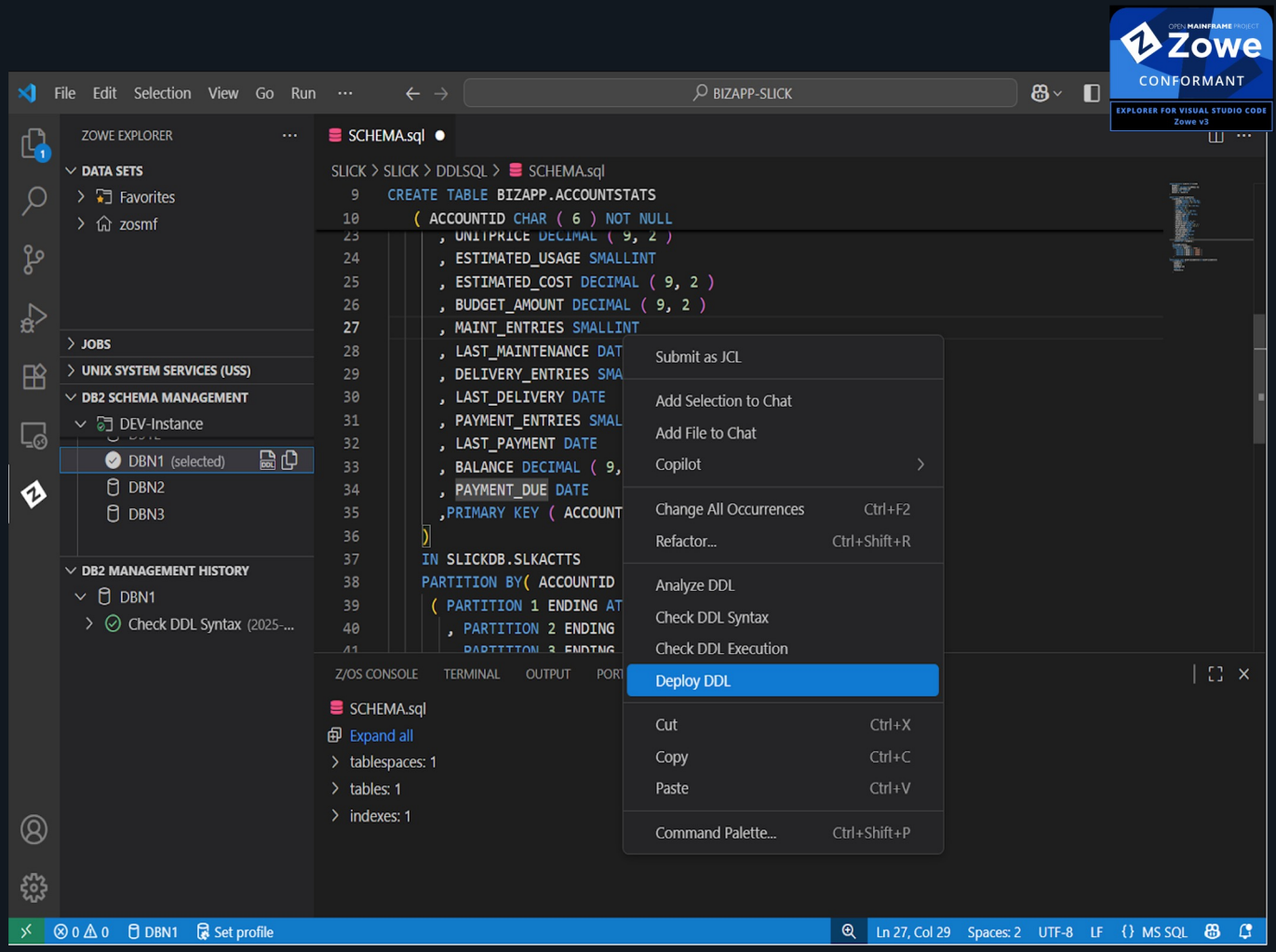
Code4z

*Database Management for Db2 z/OS (**DBM-Db2**) VS Code extension empowers developers and DBAs to **self-provision** Db2 objects, make and **deploy** schema changes **directly from VS Code**, driving the entire development process without switching tools*



Zowe CONFORMANT
EXPLORER FOR VISUAL STUDIO CODE Zowe v3

Db2

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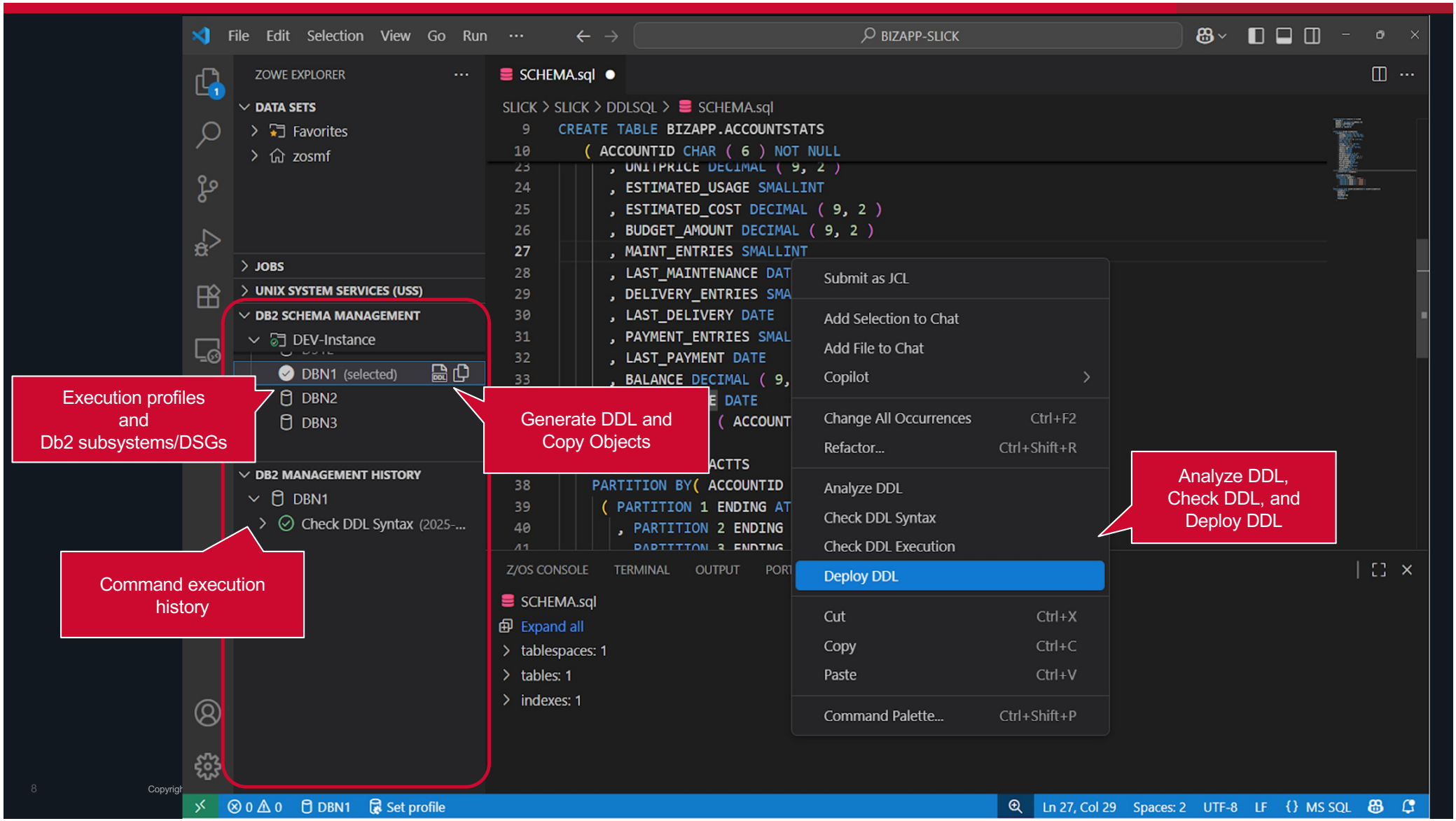
File Edit Selection View Go Run
BIZAPP-SLICK
ZOWE EXPLORER
DATA SETS
Favorites
zosmf
JOBS
UNIX SYSTEM SERVICES (USS)
DB2 SCHEMA MANAGEMENT
DEV-Instance
DBN1 (selected)
DBN2
DBN3
DB2 MANAGEMENT HISTORY
DBN1
Check DDL Syntax (2025-...
SCHEMA.sql
SLICK > SLICK > DDLSQL > SCHEMA.sql
CREATE TABLE BIZAPP.ACCOUNTSTATS
(ACCOUNTID CHAR (6) NOT NULL
, ESTIMATED_USAGE SMALLINT
, ESTIMATED_COST DECIMAL (9, 2)
, BUDGET_AMOUNT DECIMAL (9, 2)
, MAINT_ENTRIES SMALLINT
PARTITION BY(ACCOUNTID
(PARTITION 1 ENDING AT
, PARTITION 2 ENDING
Z/OS CONSOLE
TERMINAL
OUTPUT
SCHEMA.sql
Expand all
tablespaces: 1
tables: 1
indexes: 1
Submit as JCL
Add Selection to Chat
Add File to Chat
Copilot
Change All Occurrences Ctrl+F2
Refactor... Ctrl+Shift+R
Analyze DDL
Check DDL Syntax
Check DDL Execution
Deploy DDL
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Command Palette... Ctrl+Shift+P
Execution profiles and Db2 subsystems/DSGs
Generate DDL and Copy Objects
Analyze DDL, Check DDL, and Deploy DDL
Command execution history
DBN1
Set profile
Ln 27, Col 29
Spaces: 2
UTF-8
LF
MS SQL

Scenario 1: *View and Modify the definition of a Db2 object (like a Table) with its related Dependencies*

*Imagine you're working with a table called **EMP** that lives in a schema called **DEVUSER**. Now you need to get the table definition and save it in your testing code project.*

With Generate DDL command, you can:

- Get DDL statements that define **EMP** table along with related objects
- Automatically change the schema from **DEVUSER** to **TESTUSER** and other DDL attributes if needed
- Update and save generated SQL file on your machine

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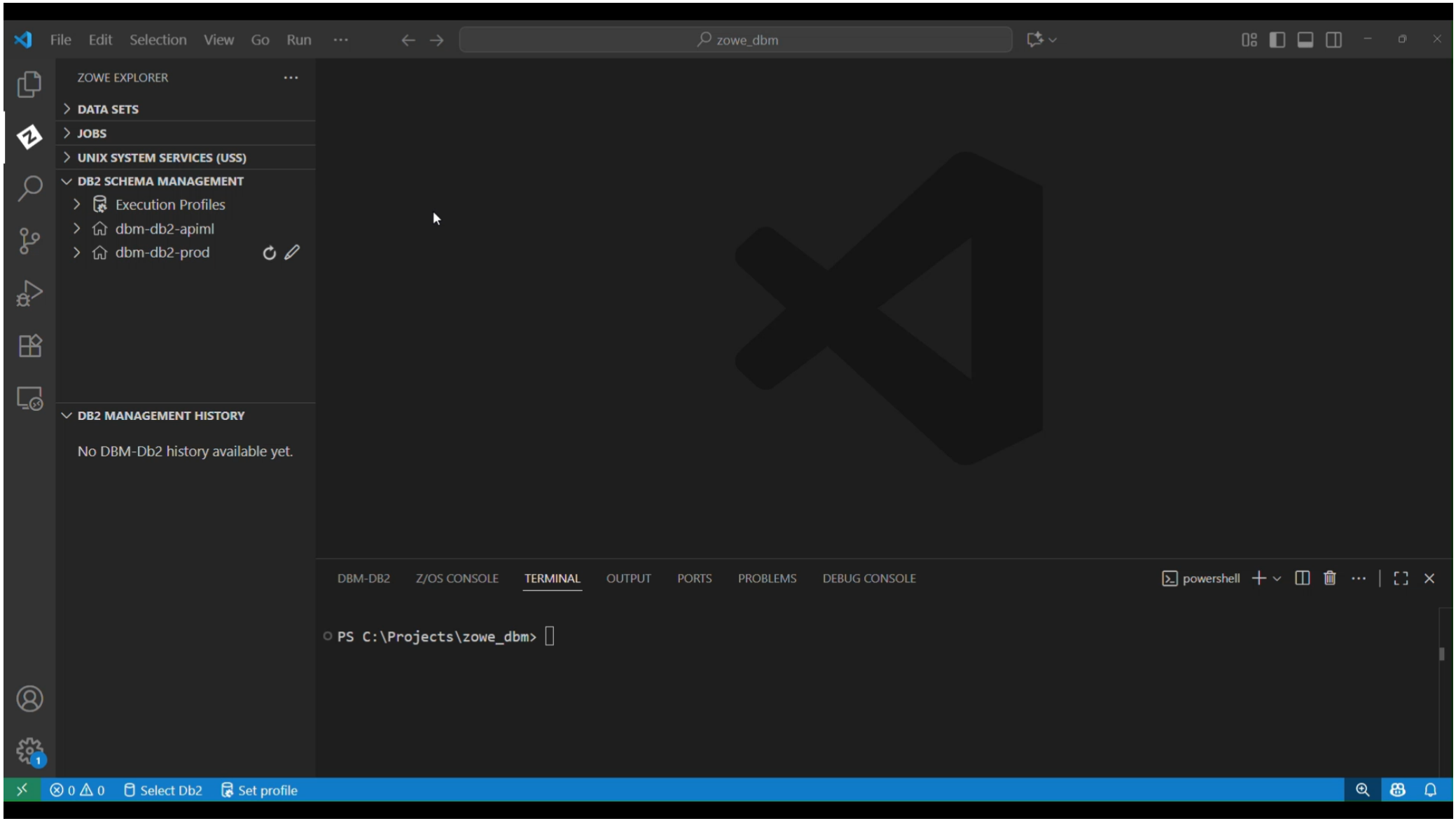
File Edit Selection View Go Run
zowe_dbm
ZOWE EXPLORER
DATA SETS
JOBS
UNIX SYSTEM SERVICES (USS)
DB2 SCHEMA MANAGEMENT
Execution Profiles
dbm-db2-apiml
dbm-db2-prod
DB2 MANAGEMENT HISTORY
No DBM-Db2 history available yet.
DBM-DB2
Z/OS CONSOLE
TERMINAL
OUTPUT
PORTS
PROBLEMS
DEBUG CONSOLE
powershell
PS C:\Projects\zowe_dbm>
0 0
Select Db2
Set profile

Scenario 2: *Check if DDL Syntax Is Correct and Executable*

1. You have a SQL DDL file.
2. Instead of directly running it and risking errors, you want to check the syntax and validate whether DDL can be successfully executed.

   *For example, to successfully create the table **TESTUSER.EMP**, you need to verify that the target tablespace exists and that the table does not already exist*
3. By running the **Check DDL Execution** command, you ensure that DDL execution would not fail

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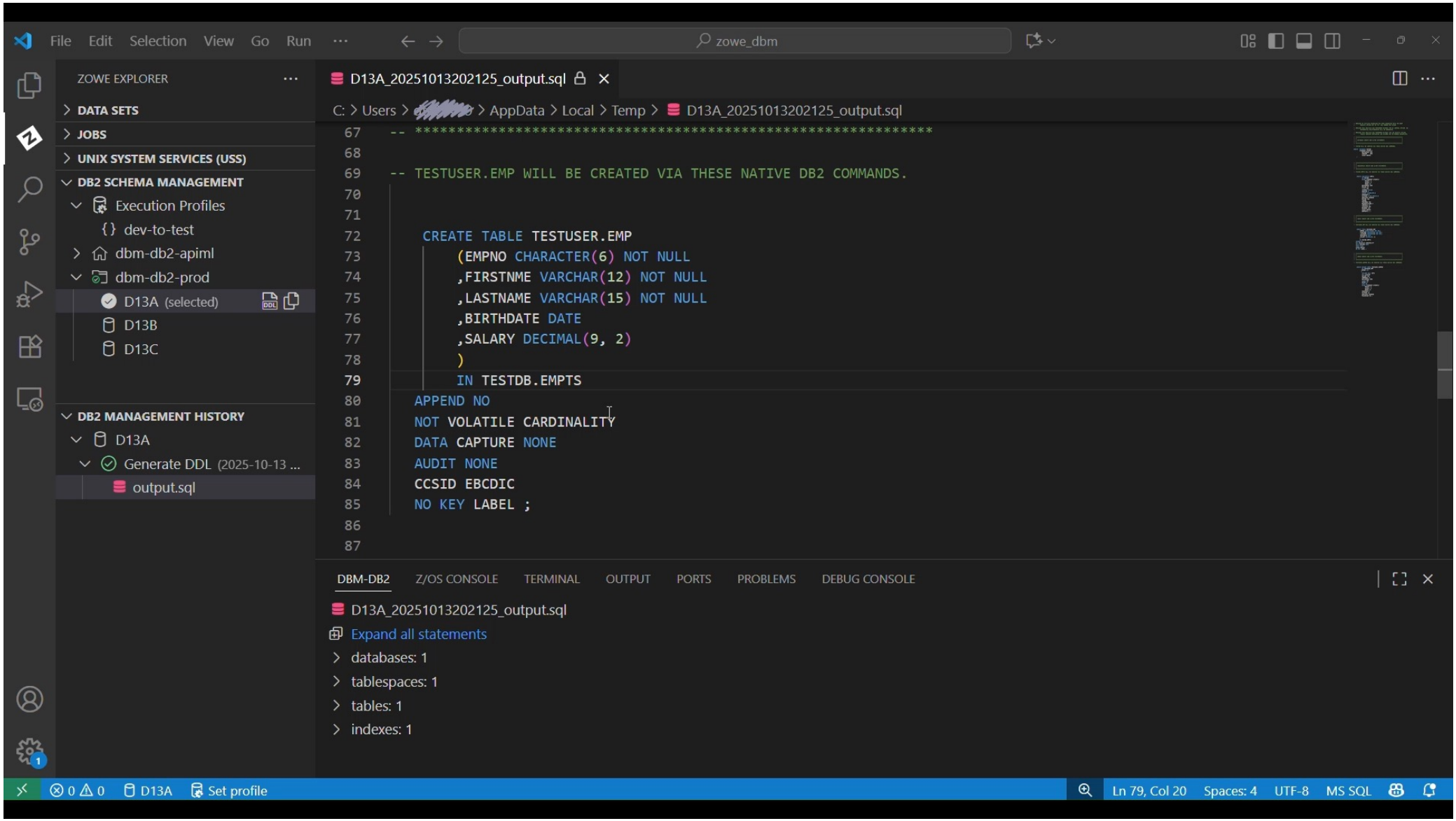
File Edit Selection View Go Run
zowe_dbm
ZOWE EXPLORER
DATA SETS
JOBS
UNIX SYSTEM SERVICES (USS)
DB2 SCHEMA MANAGEMENT
Execution Profiles
dev-to-test
dbm-db2-apiml
dbm-db2-prod
D13A (selected)
D13B
D13C
DB2 MANAGEMENT HISTORY
D13A
Generate DDL (2025-10-13 ...
output.sql
D13A_20251013202125_output.sql
C: > Users > [redacted] > AppData > Local > Temp > D13A_20251013202125_output.sql
67 -- **
68
69 -- TESTUSER.EMP WILL BE CREATED VIA THESE NATIVE DB2 COMMANDS.
70
71
72 CREATE TABLE TESTUSER.EMP
73 (EMPNO CHARACTER(6) NOT NULL
74 ,FIRSTNME VARCHAR(12) NOT NULL
75 ,LASTNAME VARCHAR(15) NOT NULL
76 ,BIRTHDATE DATE
77 ,SALARY DECIMAL(9, 2)
78)
79 IN TESTDB.EMPTS
80 APPEND NO
81 NOT VOLATILE CARDINALITY
82 DATA CAPTURE NONE
83 AUDIT NONE
84 CCSID EBCDIC
85 NO KEY LABEL ;
86
87
DBM-DB2
Z/OS CONSOLE
TERMINAL
OUTPUT
PORTS
PROBLEMS
DEBUG CONSOLE
D13A_20251013202125_output.sql
Expand all statements
databases: 1
tablespaces: 1
tables: 1
indexes: 1
0 0
D13A
Set profile
Ln 79, Col 20
Spaces: 4
UTF-8
MS SQL

Scenario 3: *Deploy Schema Changes to Db2*

*While working on a project, you modified the layout of the **EMP** table and now need to provision it to the **DEVUSER** environment. Your schema is different from what is in Db2 catalog, but you do not want to determine how to implement changes by yourself.*

With Deploy DDL command, you can:

- Automatically detect and apply schema changes for the **EMP** table without manually figuring out alters, drops, or recreates
- Review the full impact of changes on related objects before committing them
- Safely deploy schema changes

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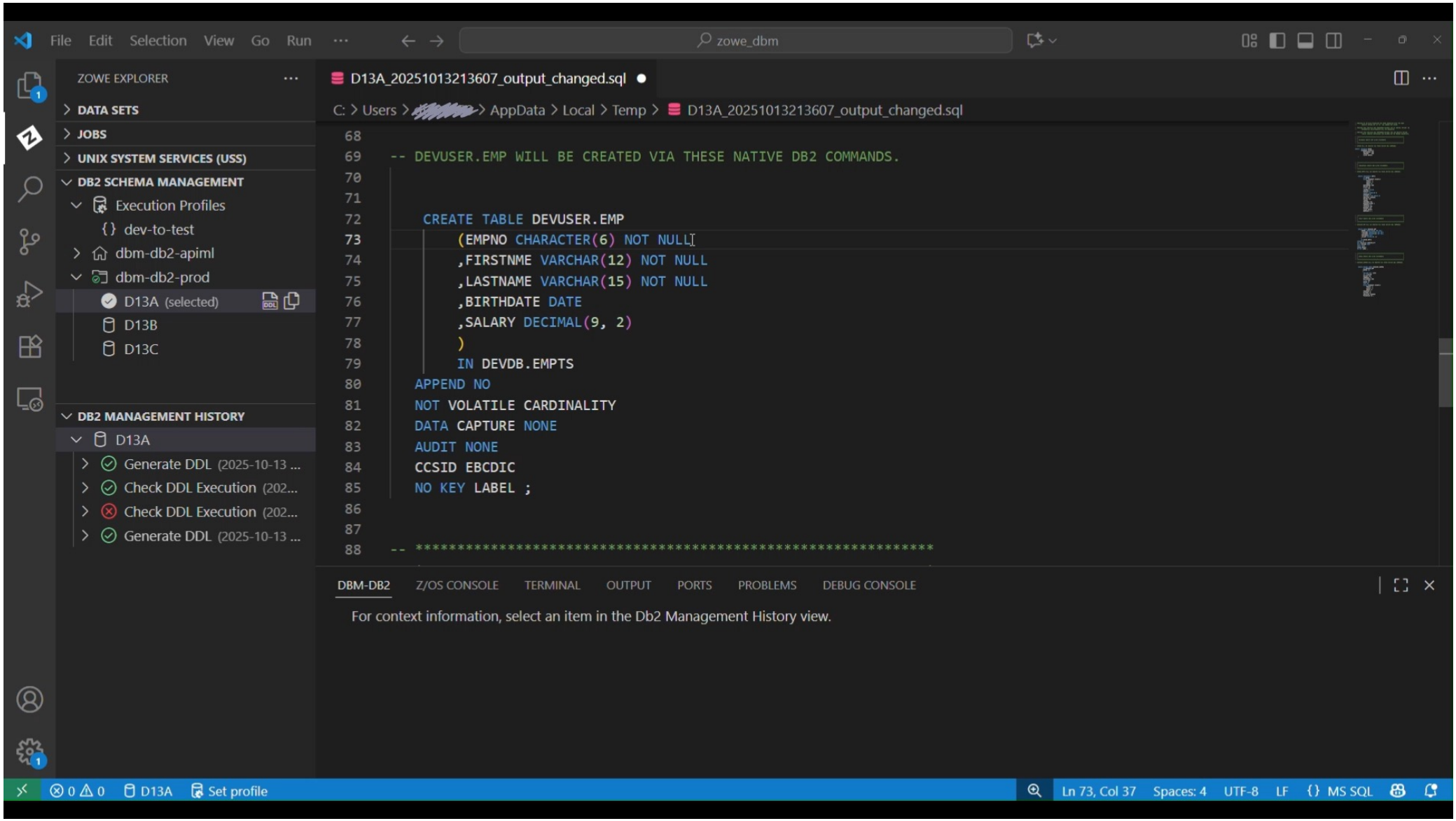
File Edit Selection View Go Run
zowe_dbm
ZOWE EXPLORER
DATA SETS
JOBS
UNIX SYSTEM SERVICES (USS)
DB2 SCHEMA MANAGEMENT
Execution Profiles
dev-to-test
dbm-db2-apiml
dbm-db2-prod
D13A (selected)
D13B
D13C
DB2 MANAGEMENT HISTORY
D13A
Generate DDL (2025-10-13 ...
Check DDL Execution (202...
Check DDL Execution (202...
Generate DDL (2025-10-13 ...
D13A_20251013213607_output_changed.sql
C: > Users > [redacted] > AppData > Local > Temp > D13A_20251013213607_output_changed.sql
68
69 -- DEVUSER.EMP WILL BE CREATED VIA THESE NATIVE DB2 COMMANDS.
70
71
72 CREATE TABLE DEVUSER.EMP
73 (EMPNO CHARACTER(6) NOT NULL
74 ,FIRSTNME VARCHAR(12) NOT NULL
75 ,LASTNAME VARCHAR(15) NOT NULL
76 ,BIRTHDATE DATE
77 ,SALARY DECIMAL(9, 2)
78)
79 IN DEVDB.EMPTS
80 APPEND NO
81 NOT VOLATILE CARDINALITY
82 DATA CAPTURE NONE
83 AUDIT NONE
84 CCSID EBCDIC
85 NO KEY LABEL ;
86
87
88 -- **
DBM-DB2
Z/OS CONSOLE
TERMINAL
OUTPUT
PORTS
PROBLEMS
DEBUG CONSOLE
For context information, select an item in the Db2 Management History view.
0 0
D13A
Set profile
Ln 73, Col 37
Spaces: 4
UTF-8
LF
MS SQL

Scenario 4: *Provision an object*

*You need to expand the project to leverage an existing **CARS** table. You copy the table to your testing environment under the new **TESTUSER** schema.*

With Copy Objects command, you can:

- Clone an object from one subsystem to another (or within the same subsystem), including both its definition and data inside
- You can include dependent objects (like indexes, views, etc.) as well
- If desired, the schema definition might be automatically updated in its certain parts (for example, change object qualifier). DDL statements are generated and made available as part of the copy process

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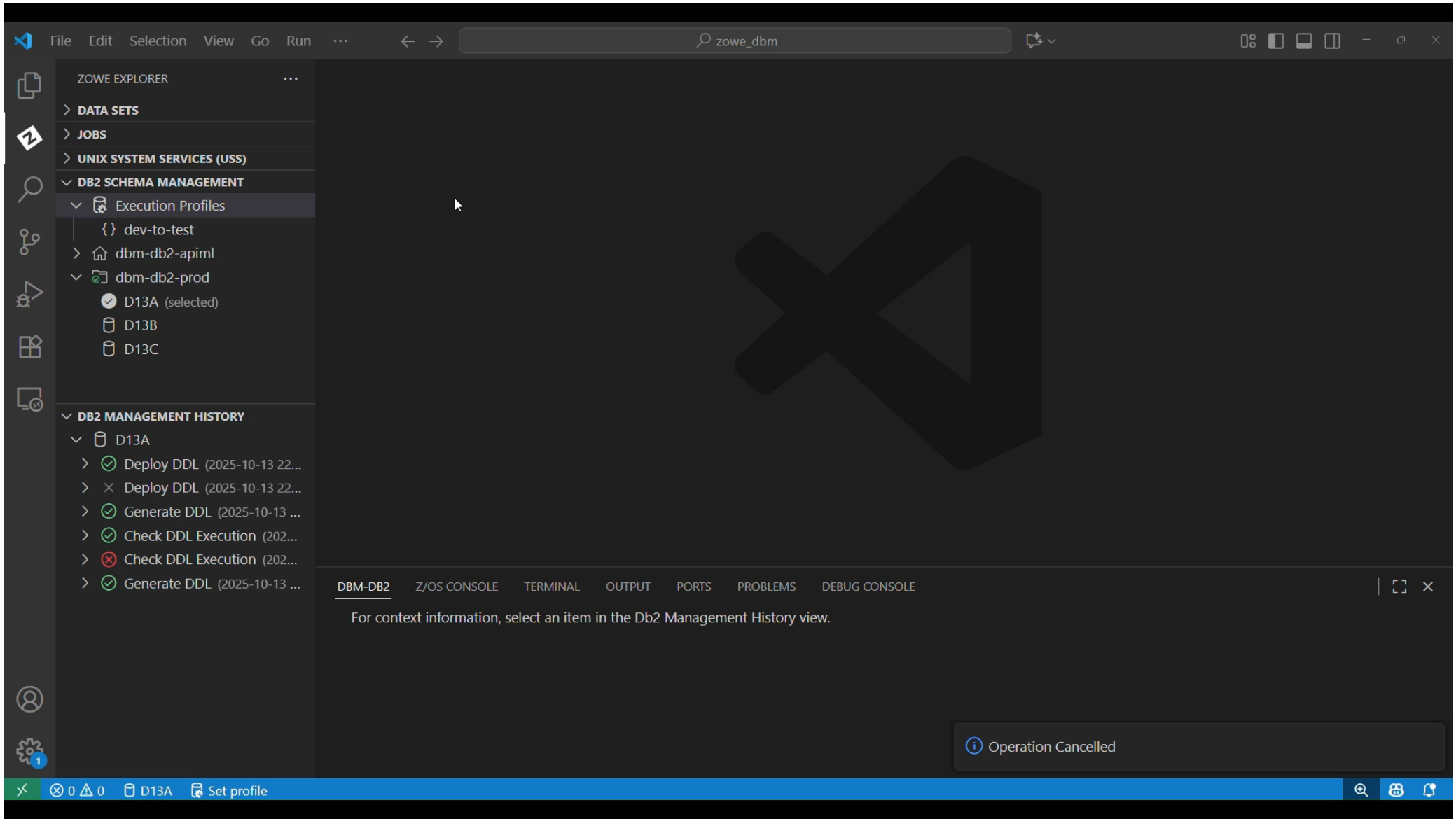
File Edit Selection View Go Run
zowe_dbm
ZOWE EXPLORER
DATA SETS
JOBS
UNIX SYSTEM SERVICES (USS)
DB2 SCHEMA MANAGEMENT
Execution Profiles
dev-to-test
dbm-db2-apiml
dbm-db2-prod
D13A (selected)
D13B
D13C
DB2 MANAGEMENT HISTORY
D13A
Deploy DDL (2025-10-13 22...
Deploy DDL (2025-10-13 22...
Generate DDL (2025-10-13 ...
Check DDL Execution (202...
Check DDL Execution (202...
Generate DDL (2025-10-13 ...
DBM-DB2
Z/OS CONSOLE
TERMINAL
OUTPUT
PORTS
PROBLEMS
DEBUG CONSOLE
For context information, select an item in the Db2 Management History view.
Operation Cancelled
0 0
D13A
Set profile

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Go hands-on with the market-leading DevX

- Target attendees: application developers (all levels), team leads, architects, tooling experts
- Expert facilitation by Broadcom staff
- On-site and/or virtual
- No installation required - *all you need is a browser!*
- Tailored to your operating environment (languages, subsystems, toolchains, etc.)
- Choose individual workshops or combine as needed
- Visit **code4z.broadcom.com**

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“Our HR loves it. We could hire from university people with **VS Code** knowledge.”

Dev Tools Modernization Leader
European Financial Services Institution

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Talent Acquisition attract developers to z	**Increase** the rate of change	**Open** integration opportunities

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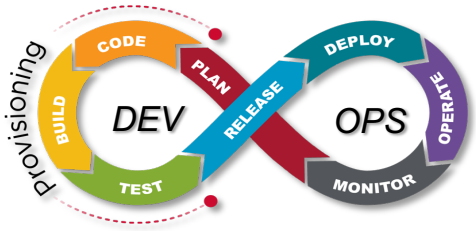
Hybrid CI/CD

Zowe as an automation enabler



non-Z

OPEN MAINFRAME PROJECT Zowe

PROVISION / SCAN / BUILD / DEPLOY / TEST / RELEASE

CLIs

APIs

z/OS

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Zowe DBM-Db2 CLI plugin

Orchestrate Db2 schema management from anywhere

```
Z/OS CONSOLE   DBM-DB2   TERMINAL   OUTPUT   PORTS   PROBLEMS   DEBUG CONSOLE
PS C:\Projects\zowe_dbm> zowe dbm-db2 --help

DESCRIPTION
-----------

  DBM-Db2 plug-in to interact with Db2 using the Broadcom Database Management
  Solutions for Db2 for z/OS.

  For details about command usage for automation, see DBM-Db2 samples at
  https://github.com/BroadcomMFD/dbm-db2

USAGE
-----

  zowe dbm-db2 <group>

  Where <group> is one of the following:

GROUPS
------

  check     Perform DDL syntax checking.
  compare   Compare DDL with a Db2 subsystem and produce an update script to
            implement changes.
  deploy    Deploy DDL statements to a Db2 subsystem.
  execute   Execute a script to implement Db2 object changes.
  generate  Generate DDL statements for Db2 objects.
  prepare   Prepare DDL statements and a script to migrate Db2 objects.
```

@broadcom/dbm-db2-for-zowe-cli

3.0.0 • Public • Published a month ago

Readme Code Beta

DBM for Db2 Plug-in for Zowe CLI

Jenkins

ANSIBLE

" An easy way to build Db2 for z/OS self-services for DBAs and developers at scale

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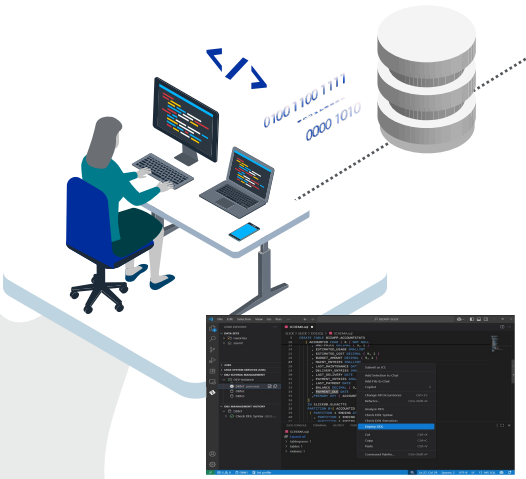
Enable Db2 for z/OS schema changes to be promoted with Zowe DBM for Db2 CLI Plug-in



`zowe dbm generate ddl` → *Managed through Git/GitLab for version control, change management, etc.*

`zowe dbm compare ddl` → *Change then goes through for automation*

The DBA gets to deny or approve the change.

`zowe dbm execute ddl` → *Change is executed and moved to the TEST environment*

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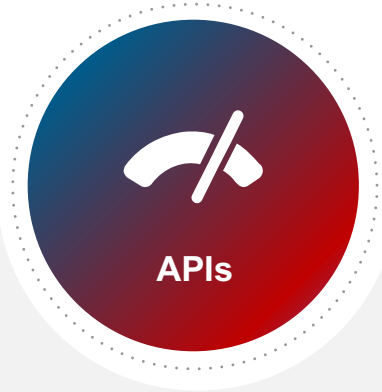

Talent Acquisition attract developers to z	**Increase** the rate of change	**Open** integration opportunities

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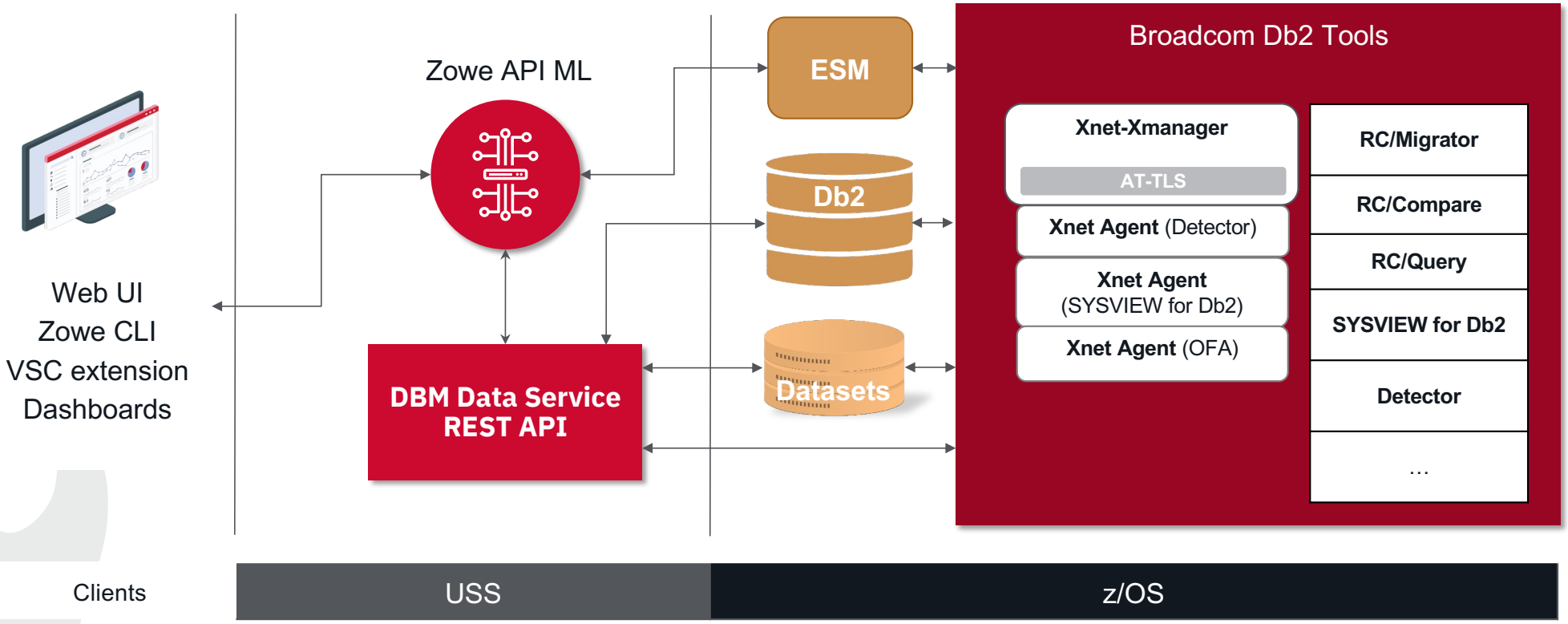
Db2 Tools REST API Infrastructure



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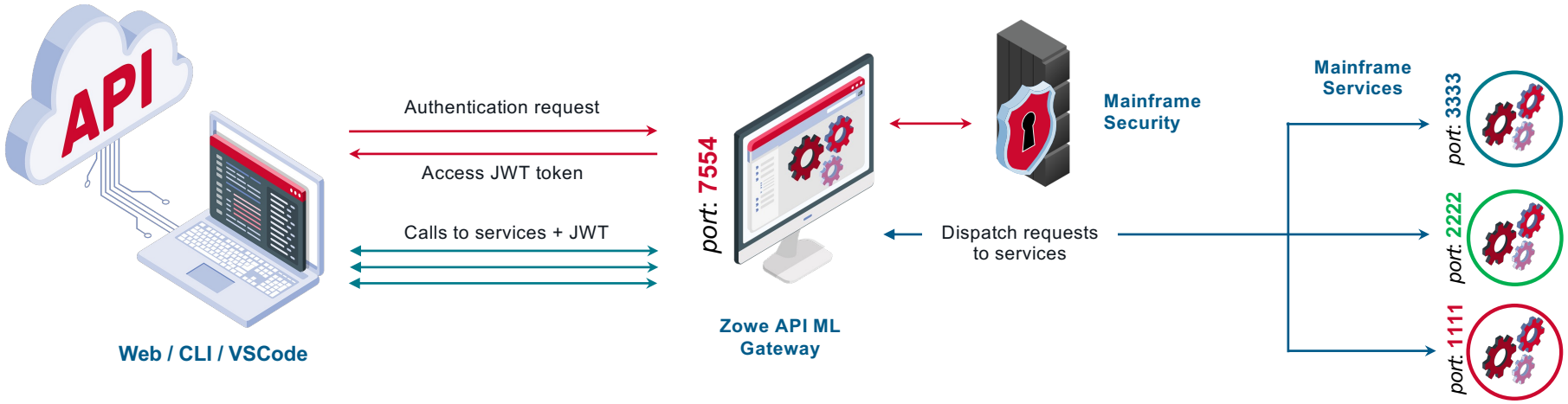
API Mediation Layer as a Foundational component



Improved **security, usability, resilience, availability, scalability**, and **manageability**

- Better experience for API consumers
- More robust Db2 integration
- Extensible to other services

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Zowe API Mediation Layer Installation News

- **PSWI-Based Installation Wizard** – install and configure API ML as a Portable Software Instance (PSWI) with a guided wizard
  - Documentation and z/OSMF workflows enable configuring both API ML ***standalone*** or Zowe as a whole thing
- **Single Service Deployment** – API ML can now run as a ***single*** service along with its components
  - Enhancing performance, startup times, CPU and memory consumption
  - Unified configuration options
  - Simplified troubleshooting
- **z/OSMF API Dependency Removal** – API ML operates independently of z/OSMF APIs, reducing prerequisites and simplifying setup (**in progress**)

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Monitor Db2 for z/OS Performance

- REST API exposes performance metrics
- Time series database collects data for analysis
  - Invokes the API at regular intervals
- Dashboard provides visualization of the performance metrics
  - Provides user customizable graphic displays
  - Generates alerts based on user defined thresholds
- DBA uses dashboard to monitor and analyze performance

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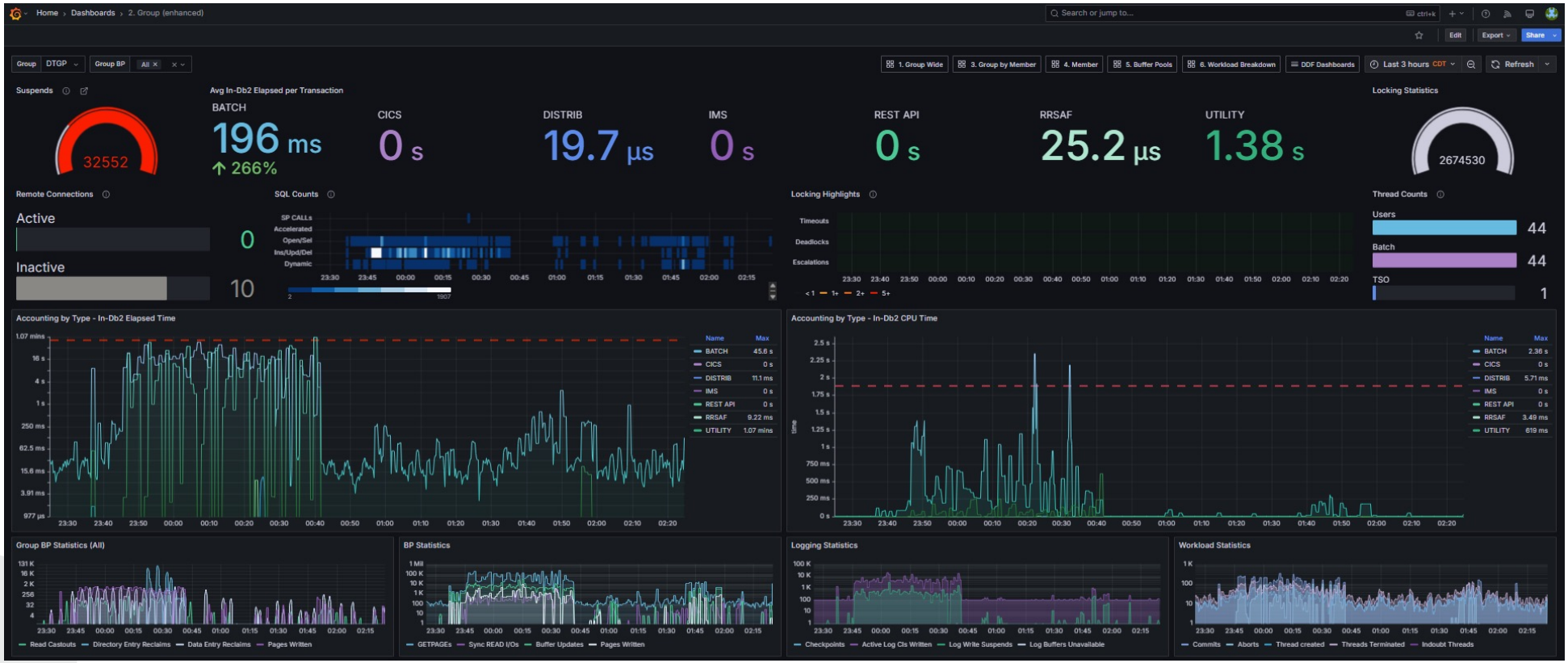
DBA needs to monitor trends and optimize database operations

Db2 Subsystem Performance (SYSVIEW for Db2)



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Db2 Workload Performance (Detector)

GET	/api/v1/pdt/prometheus/realtime	Retrieves real time statistics summarized by a function in a Prometheus acceptable key-value format
GET	/api/v1/pdt/realtime	Retrieves real time statistics summarized by a function in JSON format

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Thank you

Denis.Tronin@broadcom.com

Jim.Endler@broadcom.com

Engage with our experts!

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