Changing how you interact with z/OS with IBM Z Open Automation Utilities

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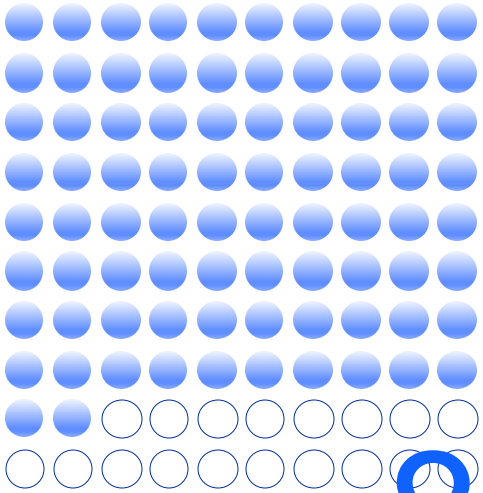
IBM Z Open Automation Utilities
overview

IBM Z Open Automation Utilities (ZOAU)

Enabling modern automation integration points for a diverse mainframe userbase

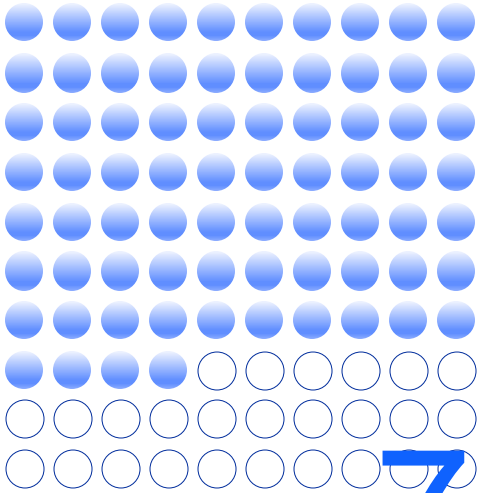
Mainframe-based applications play central role

*Executives that agree their **business case supports mainframe-based applications*** [1]



82%

*Mainframe-based applications are **central to technology strategy*** [1]

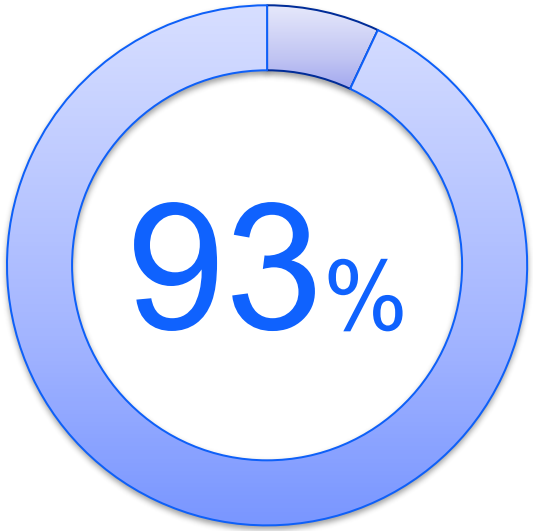


74%

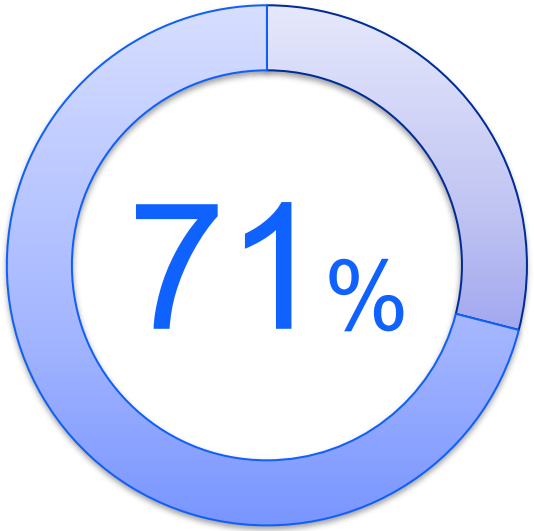
1 – IBM Institute for Business Value (2021) *Mainframe application modernization study*. IBM. Retrieved from https://www.ibm.com/downloads/cas/MOV58KNM

Ease-of-use for the UNIX community

*Acquiring the right **mainframe resources and skills** is “moderately” to “extremely” challenging* [1]



*Percentage of IT decision makers reporting that their **mainframe teams are understaffed*** [1]



1 – Ian Chappell et al (2020) *Mainframe modernization with APIs*. Deloitte. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/us/Documents/about-deloitte/us-ibm-zos-pov-digital.pdf

IBM Z Open Automation Utilities (ZOAU)

Easy. Familiar. Native

- Provides a command-line utilities with full capabilities to z/OS resources
- Enables z/OS developers to leverage common tooling to script automation
- Exposes z/OS services in an easy-to-consume manner
- Enhances other IBM offerings such as IBM Open Enterprise SDK for Python or IBM Open Enterprise SDK for Node.js and Red Hat Ansible Certified Content for IBM Z
- Continuously updated and enhanced

Key use cases

MVS dataset manipulation via USS

Job management

Consolidated Software Inventory queries
PTF level determination

Operator console queries
ISPF command execution via USS

Ansible automation via Red Hat
Ansible Certified Content for IBM Z
Prerequisite

MVS command execution

ZOAU is designed for programmers familiar with Linux and UNIX

Standardized Interfaces

- Runs in a UNIX environment that non-Z developers are used to

Native Automation

- Provides on-platform automation using popular open-source scripting languages such as Shell and Python

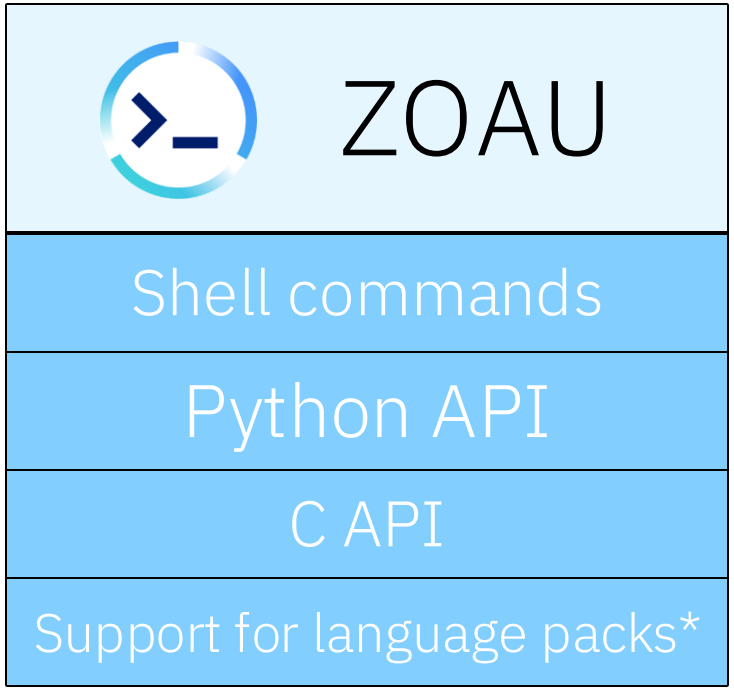
Foundational

- ZOAU provides a common abstraction layer that helps other offerings interface directly with z/OS

Free of charge

- Get started today for free
- Optional, free of charge software subscription & support recommended.

What is included in ZOAU

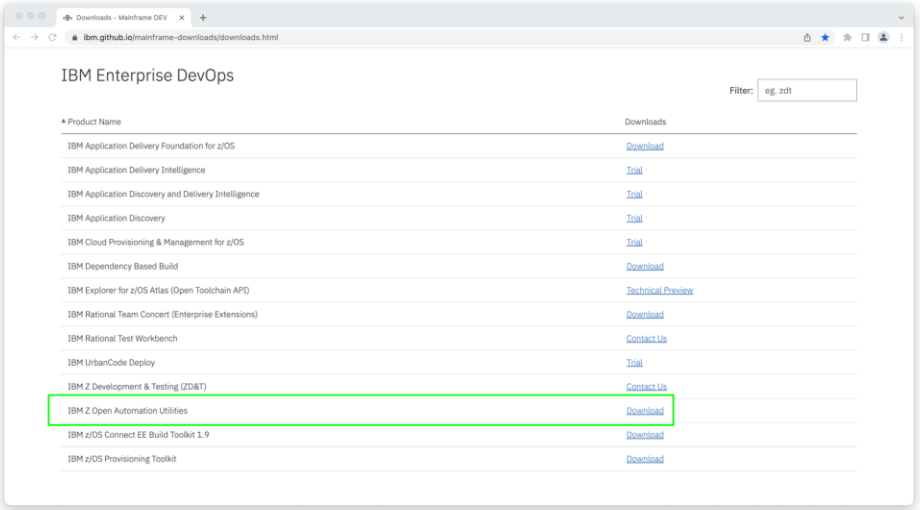


Capabilities

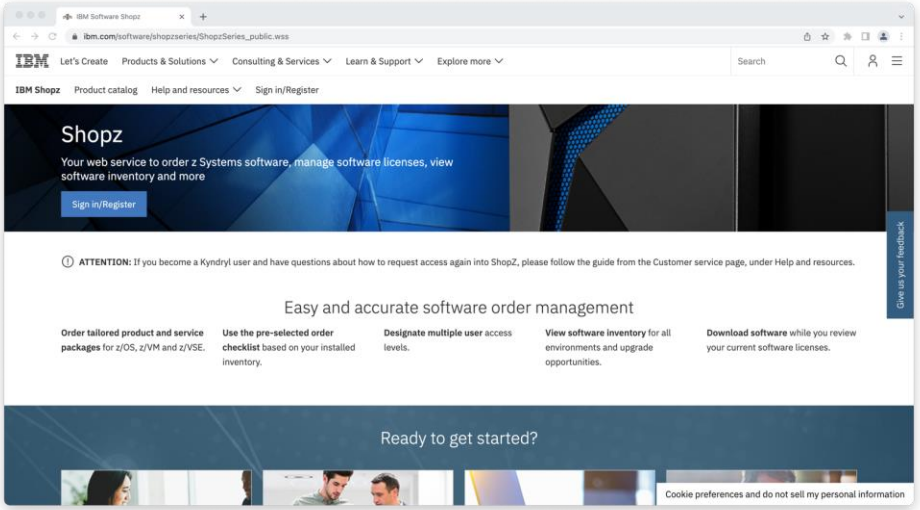
	Shell	Python	C API	3rd party open src: Node.js
Dataset manipulation	●	●	●	●
Job management	●	●	●	
MVS program execution	●	●	●	●
Operator command	●	●	●	

Ways to obtain ZOAU

- Mainframe Downloads Page as PAX



- IBM Shopz



ZOAU – Product Information

- ZOAU is available as a stand-alone product via SMP/E and PAX
  - PID: 5698-PA1
  - S&S PID: 5698-PAS

- ZOAU is also available as a bypassable requisite when ordering z/OS 3.2

- Product Information:
  - https://www.ibm.com/products/z-open-automation-utilities
  - https://www.ibm.com/support/knowledgecenter/SSKFYE

- It is also bundled with other products:
  - IBM Z Development and Test Environment (PID: 5900-AO8)
  - ADCD

IBM Z Open Automation Utilities
Simplification Ecosystem

- ZOAU is part of a larger community of products to simplify z/OS
- IBM Open Enterprise SDK for Python
  - Required to use ZOAU Python language bindings
- IBM Open Enterprise Foundations
  - Provides a set of standard open-source utilities typically available on Linux and other operating systems
    - git, curl, bash, vim, gpg, jq, and more
- All three are available as bypassable requisites with z/OS 3.1 or later
  - Very useful for application development in the z/OS UNIX shell

JSON output – Overview

- Open standard data exchange format
- Structured data
- Example

```
{
”identifier" : ”opercmd",
”rc" : “0”,
”reason" : “0”
”data" :
                {
                “command”: “R 24,CANCEL”,
                ”output": "IEE600I REPLY TO 24 IS;CANCEL\n”
                }
}
```

- Integration with z/OS client web enablement toolkit
- **JSON output directly via supported ZOAU APIs and shell commands**
- 13 utilities: apfadm, dcat, ddls, dhead, dinfo, dls, dtail, jls, opercmd, pjdd, dmod, dsed, and zinfo

Updates - ZOAU 1.4 – FMID HAL5140

- ZOAU 1.4.0: Announcement letter AD25-1204
- Migration guide (https://www.ibm.com/docs/en/zoau/1.4.x?topic= planning-migrating-zoau-v14-from-v13x)
- Release notes (https://www.ibm.com/docs/en/zoau/1.4.x?topic=whats-new-zoau)

Enhanced data set statistics

-Extended attribute support in dls/mls

-Add'l VSAM stats

-mls ISPF statistics

vf – *NEW* Volume statistics utility

-Access volume information via command line

-JSON output support

Python processing capabilities

-Read/write strings in other encodings

-Raised 1GB data ceiling

-Improved performance

IBM Open Enterprise SDK for Python 3.13 support

ZOAU - Updates

v1.4.0 release

-vf: (NEW) Lists active DASD volume status and space information
-dls/mls: Improved performance. Both have been rewritten in C
-dls: Extended attributes and statistics for VSAM data sets are now available
-mls: Better support for alias data set indication and grouping. Extended attribute support for data set members
-mls: Ability to print ISPF member statistics. JSON output support for mls
-Python datasets.read() and datasets.write() have improved performance due to leveraging zoau_io
-Python encoding conversion for strings read or written via other encodings. Raised processing limit to 1GB

Bug fixes / Minor enhancements
-dcat, dhead, and dtail: NULL bytes and unprintable characters in the input dataset are converted to spaces before printing.
Unprintable characters can be left unchanged if the -b argument is used.
-zoau(7): A new man page is added with descriptions of all the ZOAU commands. Use the command man zoau to view it.
-dls/dinfo: The -s option now also includes the number of extents, the size of the first extent, and the secondary space of a dataset.
-dls: Removed the deprecated dlshelper shell script from the bin directory, dls is now completely implemented in C.
-dls: Removed extraneous trailing periods from certain error messages.
-dls: New -tVSAM filter to display VSAM clusters including their components.
-pcon: New option -S allows reading the SYSLOG from different systems.
-pjdd: New option -i allows reading and filtering SYSIN datasets.
-The samples directory is reorganized, and new samples added.
-zoautil.so: Increased shared library version to 0x00020102.

ZOAU - Updates

v1.4.0 release

Python bug fixes / minor enhancements

-datasets.Dataset: Added three new fields for the space attributes, which are also fetched by datasets.list_datasets():
- allocated_extents displays the allocated extents for the dataset in the volume.
- first_extent_size estimated size of the first extent of the dataset.
- secondary_space estimated size of the secondary space for the dataset.

-datasets.list_members(): The returned list now separates member names and alias names into individual elements.

-New module members: New class Member to represent a partitioned dataset member metadata:
- Alias information.
- SMDE extended attributes.
- ISPF member statistics.

-New function fetch_members()

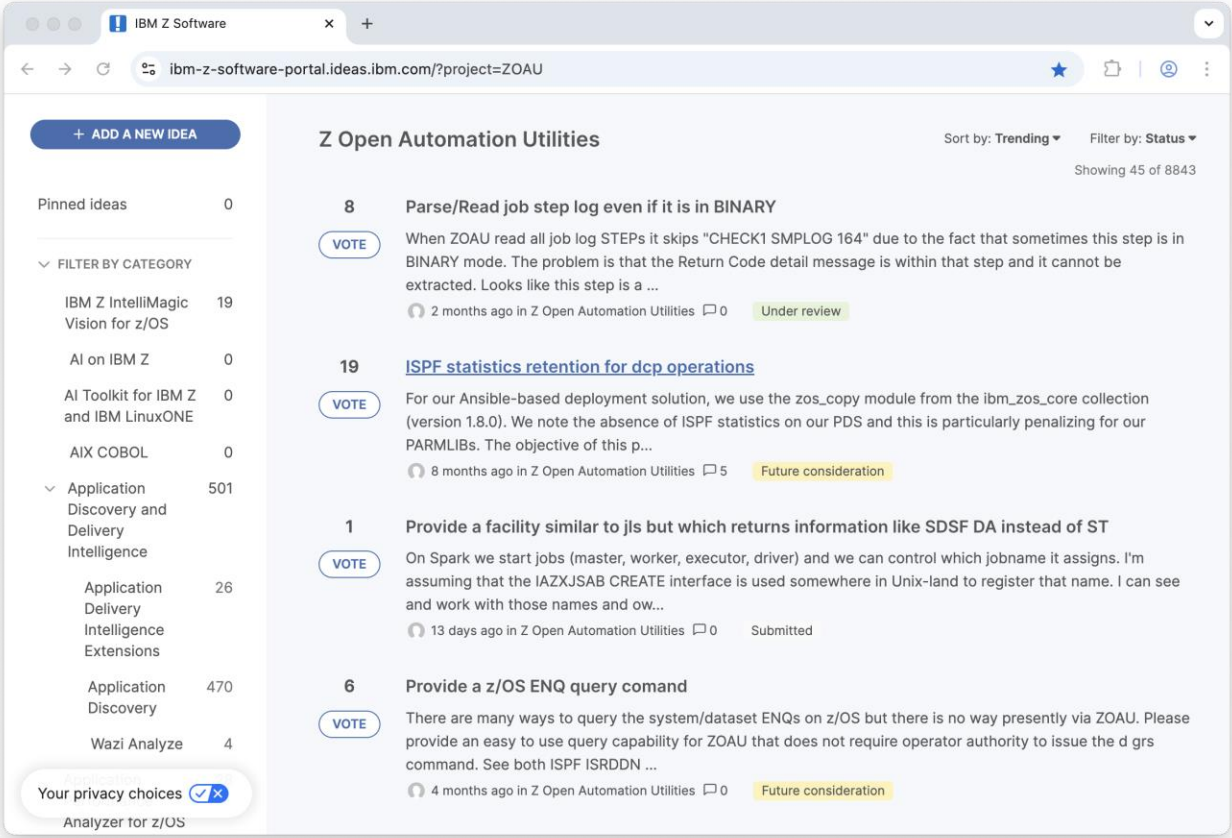
-New module volumes
- Class Volume
- New function list_volumes() to leverage the new vf utility.

New module vsam

New classes VsamCluster and VsamComponent to represent a VSAM cluster including the following metadata:
- VSAM cluster type
- VSAM component attributes
- VSAM component statistics

New function fetch_cluster()

ZOAU Ideas Portal



https://ibm-z-software-portal.ideas.ibm.com/?project=ZOAU

IBM Z Open Automation Utilities
Demo

Datasets

```
 ~/mvsutil> dtouch -t seq angio.hello
~/mvsutil> decho "Hello, world!" angio.hello
~/mvsutil> dls -lsHU angio.hello
dsname                                    dsorg recfm lrecl volume          used        alloc
ANGIO.HELLO                               PS    FB       80 9SX906           748         5.4M
~/mvsutil> drm angio.hello
~/mvsutil> dls -lsHU angio.hello
BGYSC1103E No datasets match pattern: ANGIO.HELLO.
```

Jobs

```
~> jsub -f mvsutil/tools/jcl/long_job.jcl
J0844625
~> jls J0844625
ANGIO    HLQ0     J0844625 AC           ?
~> jcan C HLQ0 J0844625
~> jls J0844625
ANGIO    HLQ0     J0844625 CANCELED     ?
~> jcan P HLQ0 J0844625
~> jls J0844625
BGYSC3503E Failed to retrieve job list.
```

Operator commands

```
~> opercmd "d t"
NP8         2025055  09:57:14.00           ISF031I CONSOLE ANGI0000 ACTIVATED
NP8         2025055  09:57:14.00          -D T
NP8         2025055  09:57:14.00           IEE136I LOCAL: TIME=09.57.13 DATE=2025.055  UTC: TIME=14.57.13 DATE=2025.055
~> opercmd "d m=stor"
NP8         2025055  09:57:18.00           ISF031I CONSOLE ANGI0000 ACTIVATED
NP8         2025055  09:57:18.00          -D M=STOR
NP8         2025055  09:57:18.00           IEE174I 09.57.18 DISPLAY M 561
                                          REAL STORAGE STATUS
                                          ONLINE-NOT RECONFIGURABLE
                                              0G-400G
                                              500G-1000G
                                          ONLINE-RECONFIGURABLE
                                              400G-500G
                                          PENDING OFFLINE
                                              NONE
                                           0M IN OFFLINE STORAGE ELEMENT(S)
                                           0M UNASSIGNED STORAGE
                                          STORAGE INCREMENT SIZE IS 2G
~> opercmd '$dspl'
NP8         2025055  09:57:24.00           ISF031I CONSOLE ANGI0000 ACTIVATED
NP8         2025055  09:57:24.00          -$DSPL
NP8         2025055  09:57:24.00           $HASP893 VOLUME(SPLX95)  STATUS=ACTIVE,PERCENT=4
```

Call to action

Learn

ZOAU Product page

ZOAU Documentation site

ZOAU Migration Guide (<=1.3.x)

IBM Open Enterprise SDK for Python

Try

IBM Github Downloads Page - ZOAU

ZOAU sample repository

Community

IBM Z Open Automation Utilities Community

IBM Z and LinuxOne - Ansible for IBM Z Community

Engage

IBM ideas portal

IBM Z Open Automation Utilities
Q&A

Thank you

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