



The CA IDMS REST API is Zowe Conformant and can be integrated with the Zowe/Brightside API Mediation Layer. Conformance with Zowe ensures that you can expect a high level of common functionality, interoperability, and user experience. Leveraging the CA IDMS REST API standalone or in conjunction with Zowe to integrate with open source tooling and dashboards are a powerful way to enhance and simplify the user experience for new DBAs and other users.

Supported Actions

The CA IDMS REST API lets you perform the following actions to manage and monitor your CA IDMS databases:

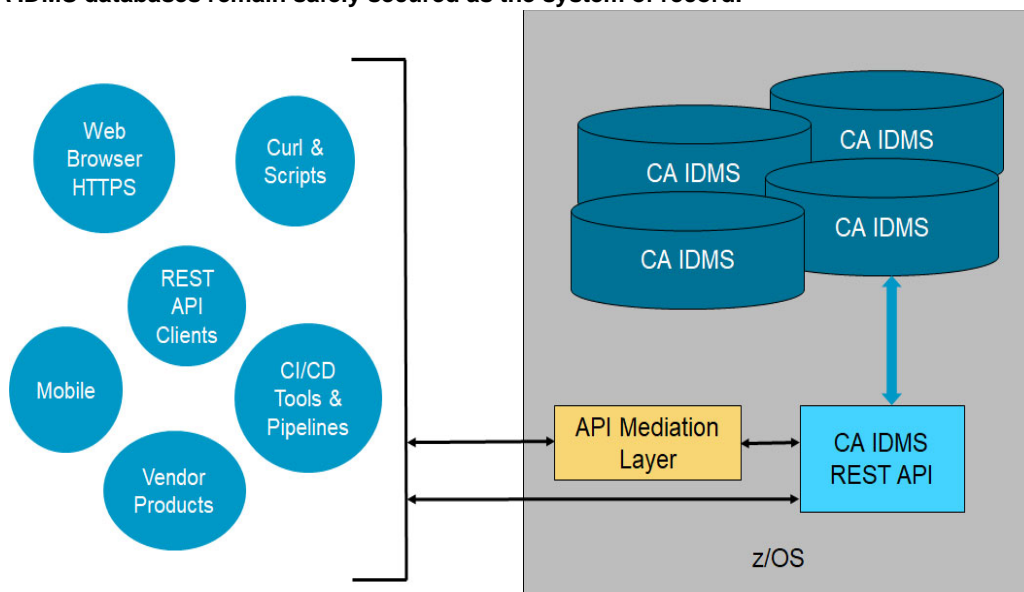
- View performance and monitor statistical data
- View DC log records
- Execute DCMT and DCUF commands

Example Use Cases

As a developer or database administrator, you can use the REST API in the following ways:

- Enable client dashboards or applications to view system and performance data.
- Enable automated warnings and recommendations to avoid critical system risks and outages.
- Obtain flexibility to leverage modern, user-friendly tooling to improve the user experience.

Figure 2: Your CA IDMS databases remain safely secured as the system of record.



The CA IDMS REST API, deployed on z/OS UNIX System Services (USS), utilizes Transport Layer Security (TLS) certificates, secured HTTP connection (HTTPS) protocol and Secure Sockets Layer (SSL). In addition, API functions can be secured with either DCMT security or External Security Managers (ESMs).

Simplifying Performance

Maintaining the high level of performance of your CA IDMS databases is essential. By lowering CPU usage and response times, you can reduce your total cost of ownership (TCO) and obtain the highest possible throughput, while enabling as much work to get done as possible. While the vast flexibility and options within CA IDMS enable superior reliability and continuity for your essential core business, they may be overwhelming for new DBAs who might not know where to start.

How can years of experienced DBA knowledge be retained and utilized to continuously tune and improve your databases? CA IDMS stores an abundant amount of performance related metrics that can be viewed within CA IDMS through the following ways:

- DCMT, DCUF, and OPER commands
- Culprit PMA and PMI reports
- SREPORTS reports
- Performance Monitor Product screens (PMRM, PMIM, and PMAM)

However, if you do not know what you are looking for, this data may be indistinguishable and confusing. Report outputs span several pages and contain rows and columns of numerical data that require detailed analysis and correlation to form meaningful conclusions.

Figure 3: Display command, DCMT DISPLAY ACTIVE TASKS, to view active tasks within the CA IDMS system. Command output typically spans multiple pages, showing both system and user tasks.

```

D AC TAS
      Current max tasks      133
      Times at max tasks    3504
      Allocated DCE/TCE     241
      Number of tasks abended 2
      Number of tasks processed 4176
      Number of tasks active 137

Taskid  Taskcd  Prog   LTERM  Pri Stat Stim  A(ECB)  ECB Type
000000000 *SYSTEM* *MASTER*      255 WAIT NOST 00383BF0 TCAECB
                                00052D4C PLESECB
                                363227A0 LTTMSECB
                                00383C0C Service Task ECB
000000001 *SYSTEM* *DBRC*      255 WAIT NOST 00086A08 DBRC WTOR ECB
                                3517F108 ESEECB
                                00027FA4 CCEECB
                                000280C4 CCEECB
                                00028188 CCEECB
                                00028214 CCEECB
                                000281E0 CCEECB
000000009 *DRIVER* UCFLINE      254 WAIT NOST 0005284C PLESECB
000000010 *DRIVER* UTAM        254 WAIT NOST 00052ACC PLESECB
                                006256D4 UTAM READ INIT ECB
                                00625854 UTAM RPL ECB
000000011 *DRIVER* SYSOUTL      254 WAIT NOST 00052E4C PLESECB
000000013 *DRIVER* UTAMLIN1     254 WAIT NOST 0005394C PLESECB
      PAGE 0001 - NEXT PAGE:

```

Would you like to simplify this user experience?

Scripting or coding languages can be used to parse and retrieve relevant data to compare values, determine performance issues, produce alerts, and therefore greatly reduce the length of time spent analyzing outputs. Through the use of the CA IDMS REST API calls, the values are returned in JSON format, which can be easily handled by many modern programming languages.

The following code example shows the JSON response from the CA IDMS REST call to return a list of active user tasks. The experienced DBA knows that seeing tasks waiting on the Program Definition Table (PDTECB) indicates a potential problem with available space in a storage pool, which can cause task delays while programs wait for pool availability.

```
{
  "taskNumber": 2581,
  "taskCode": "DCRTMAIN",
  "taskStatus": "WAIT",
  "taskPriority": 100,
  "currentProgram": "",
  "currentLinkLevel": 0,
  "lteName": "VL500125",
  "userId": "",
  "storageRceCount": 2,
  "programRceCount": 75,
  "runUnitRceCount": 0,
  "miscRceCount": 1,
  "privateNonXaStorage": 640,
  "privateXaStorage": 40320,
  "sharedNonXaStorage": 0,
  "sharedXaStorage": 3968,
  "programNonXaStorage": 0,
  "programXaStorage": 44576,
  "allocatedStorage": 40960,
  "systemModeTime": 0,
  "userModeTime": 0,
  "ecbAddress": "3B229858",
  "ecb1Type": "PDTECB",
  "ecb2Type": "",
  "ecb3Type": "",
  "dbkeyHolder": "0",
  "radixOfDbkeyHolder": "0",
  "dbkeyHolderTask": "",
  "defaultDictnode": "",
  "defaultDictname": "",
  "defaultDbnode": "",
  "defaultDbname": "",
  "defaultVersion": 0
}
```

Building the Future

Time-consuming and manual performance diagnostic activities performed by experienced DBAs can be turned into reusable scripts or programs, capturing the knowledge and expertise for the next generation of mainframe users. Problem detection and root cause analysis is simplified, saving valuable time to address issues before business impacts occur. By leveraging the CA IDMS REST API to invoke repeatable processes, you have increased flexibility to drill down into the data, to form insights, and to determine meaningfulness by understanding the relationships for corrective actions.

The following example shows how programming languages contain built-in methods (such as `JSON.parse`) to easily handle REST API response data. Key/Value pairs can be referenced by name and then used for subsequent analysis and steps.

```
// Produce an alert if active user tasks are waiting on the Program Definition Table
// (The JSON response is in variable "myJSON")
var myObj = JSON.parse(myJSON);
var string1 = 'PDTECB'
var string2 = 'WAIT'
if ((string1.localeCompare(myObj.ecb1Type) == 0) && (string2.localeCompare(myObj.taskStatus) == 0)
{
    performAlert();
}
```

If the user task is waiting for the Program Definition Table, then a warning is automatically generated to alert the DBA of a potential issue.

Executing REST API calls can also be performed easily within scripts and programs.

The following example shows an example of how a CA IDMS REST API call is used to display storage pools for a CA IDMS system. The following examples shows a Python code snippet for a GET call to retrieve a list of storage pools for a given CA IDMS system:

```
import requests

url = "https://myhost:myport/api/v1/storagePools/SYSDemo"
headers = {
    "cache-control": "no-cache",
    "accept": "application/json; charset=UTF-8",
    "cookie": "XSRF-TOKEN mytokenvalue",
    "Authorization": "Basic myauth"
}

response = requests.request("GET", url, headers=headers, verify=False)
```

DevOps Automation and Continuous Delivery

Using repeatable scripts or by capturing the logic of rules, performance impacts can be obtained and compared before and after CA IDMS system or application changes to ensure quality assurance and stability. Expected or target values for performance statistics become part of the DevOps process, where tests are run on an automation pipeline within the development cycle. The CA IDMS REST API enables you to retrieve data to help analyze accuracy and performance differences within your CI/CD pipelines for continuous deployment best practices. The open access to the various combinations of data provides you with countless opportunities, as well as more freedom and control.

CA IDMS system and database benchmarks can be automated with the CA IDMS REST API by utilizing scripting logic to validate performance metric ranges during the development cycle.

The example on the following page displays various statistics that without automation, would need to be manually analyzed and compared.

Figure 4: Display for the command, DCMT DISPLAY STATISTICS SYSTEM, to receive an overview of system statistics.

```

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Taskid Taskcd Prog LTERM Pri Stat Stim A(ECB) ECB Type
000000000 *SYSTEM* *MASTER* 255 WAIT NOST 00383BF0 TCAECB
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                                00383C0C Service Task ECB
000000001 *SYSTEM* *DBRC* 255 WAIT NOST 00086A08 DBRC WTOR ECB
                                3517F108 ESEECB
                                00027FA4 CCEECB
                                000280C4 CCEECB
                                00028188 CCEECB
                                00028214 CCEECB
                                000281E0 CCEECB
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000000010 *DRIVER* UTAM 254 WAIT NOST 00052ACC PLESECB
                                006256D4 UTAM READ INIT ECB
                                00625854 UTAM RPL ECB
000000011 *DRIVER* SYSOUTL 254 WAIT NOST 00052E4C PLESECB
000000013 *DRIVER* UTAMLIN1 254 WAIT NOST 0005394C PLESECB
PAGE 00001 - NEXT PAGE:

```

With end-to-end mainframe DevOps, customers can achieve greater business agility to deliver innovations and to keep pace with business-centric demands. Existing DevOps solutions and products that are popular today leverage REST APIs and can be used to accelerate and automate mainframe development across hybrid and cross-platform applications and ecosystems.

The following workflow is an example of a DevOps workflow for updating a CA IDMS application:

1. A change request is issued and an alert is sent to the DBA.
2. System analysis and performance baselines are established for the CA IDMS application.
3. Changes are now ready to be promoted from development to QA.
4. Performance metrics are captured and compared to baselines.
5. If performance metrics meet or exceed the expected results, changes are promoted to production.

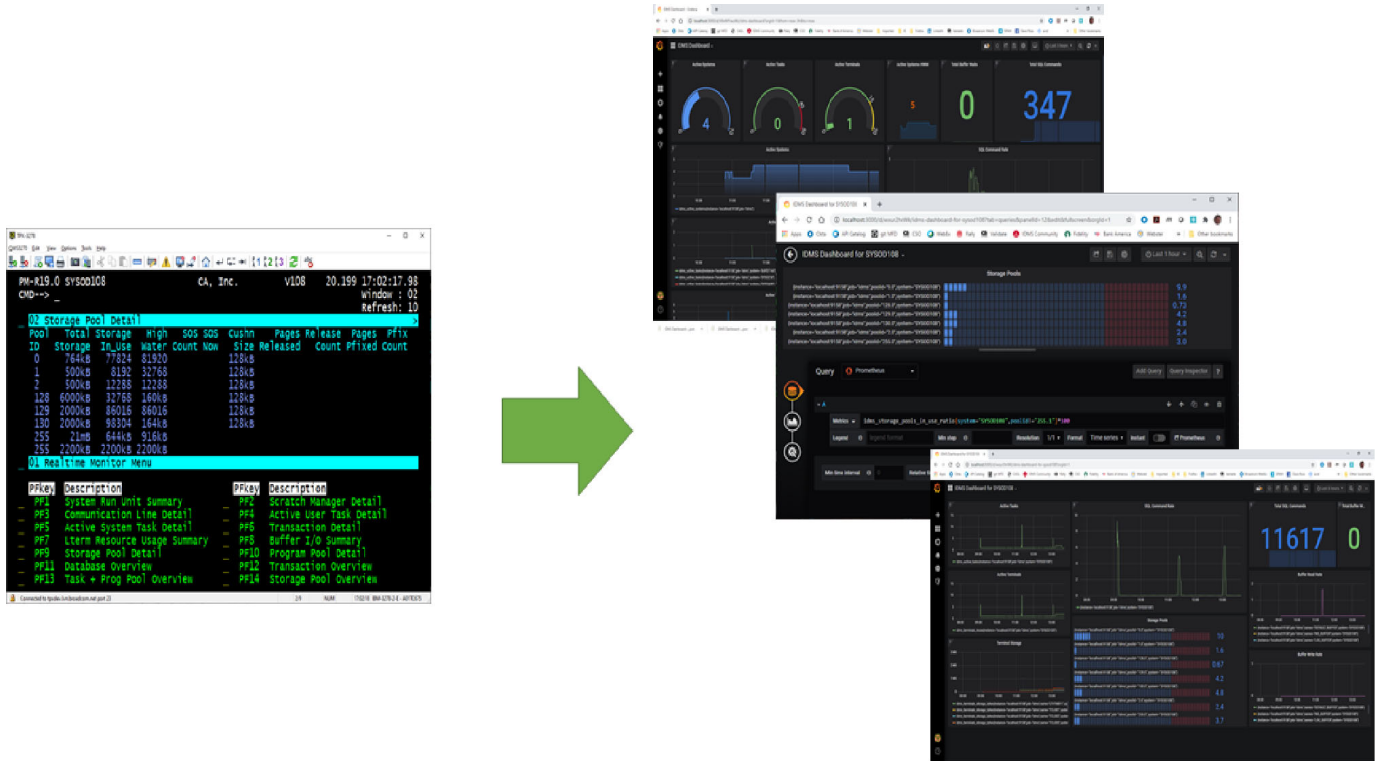
Modern and Graphical Real-Time Monitoring

Open source dashboard tools are familiar to the next-generation workforce and are generally more visually appealing and attractive, providing an alternative option for database monitoring without displacing existing tools and monitoring methods. Embracing open source solutions helps you to save costs and improves the overall return on investment (ROI) for integrating your mainframe and empowering enterprise innovation.

Would you like to deliver a better user experience, improve slow manual processes, and ease resource constraints?

The CA IDMS REST API enables you to move beyond traditional approaches, and to move from reactive mode to proactive techniques. Data is more sharable, easy to access, and supports self-service.

Figure 5: Sample use case: Transition from the mainframe terminal displays, such as PMRM screens with the CA IDMS Performance Monitor, to graphical dashboards with open source products.



In the above figure, a JSON exporter invokes the CA IDMS REST API every five minutes, populates a time series database called Prometheus, and is represented graphically by a web-enabled analytics product called Grafana. These tools not only aid displays, but are configurable for alerts and rules logic.

With enhanced visualization to various performance metrics, DBAs can more easily monitor operations to see trends and recognize unusual conditions that can indicate problems. Statistics exposed by the CA IDMS REST API can be collected at regular intervals for further analytical and historical diagnostics and queries. Conditions, such as Short on Storage (SOS), can be monitored by setting thresholds in the dashboard tool or generating alerts and notification emails. REST API calls and JSON data formats can even be consumed by familiar tools, such as Microsoft Excel, so that you can feed data into Excel reports or click a button that invokes and retrieves a metric value. Embracing open source and APIs can help you to deliver at the speed of business, securely and predictively, so that you can leverage systems data and services from mobile to mainframe.

Leveraging Your Investments for Future Growth

The CA IDMS REST API builds upon the existing value that customers have already invested in their CA IDMS mission-critical systems that have grown with and supported their businesses for decades. CA IDMS is a proven, reliable, scalable, and highly performant database management system. Our product strategy of “Embrace Open” positions us to be more agile in serving our customers’ modernization needs to optimize, simplify, and automate, and to help further exploit the benefits of the platform while helping address the skills challenge. The end goal is to enable our customers to leverage their existing investment and to transform user experiences by opening up CA IDMS through APIs.

How to Get Started?

- If you are a licensed CA IDMS/DB customer running the latest version (19.0), the CA IDMS REST API is available to you as part of the base license.
- You can download your copy of the CA IDMS Rest API online at [Support](#). To install your product, follow the installation procedures for your product on [Tech Docs](#). If you have any questions or require assistance, contact your [local technical support group](#) or visit the [Support Portal](#).
- Please visit the [CA IDMS IUA EIUA Community](#) site and participate in conversations regarding the CA IDMS REST API. Let us know what you think we should do next.
- Learn more by watching the webcast replay, [CA IDMS REST API: Overview and Demo](#).
- Learn more by watching the video, [APIs and Integration Using Open Source Monitoring Tools](#), delivered by David Ross, CA Database Architect (David.Ross@broadcom.com).
- For more information, contact Product Manager, Sheila Miller (Sheila.Miller2@broadcom.com) or Product Owner, Nakesha Newbury (Nakesha.Newbury@broadcom.com).

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