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Monitoring Progress® Application Server (PAS) for the OpenEdge® Platform



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Agenda

- Classic AppServer Monitoring
- JMX
- OEJMX
- REST API
- HealthScanner
- New 12.8 ”OEManager" Script
- Recommendations



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Classic AppServer Monitoring

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asbman -query

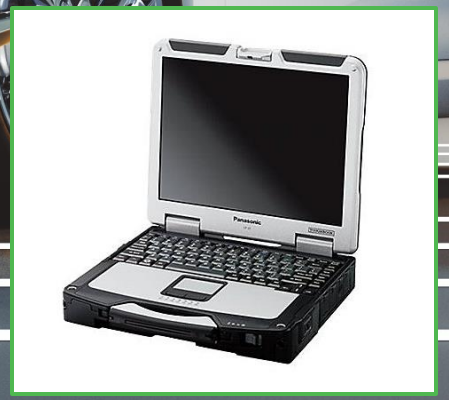


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JMX supports:

- OEJMX
- REST API
- HealthScanner







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Classic AppServer Monitoring

The classic monitoring asbman –i(-name) asbroker1 –q(-query)

```
Broker Name                : asbroker1
Operating Mode             : State-reset
Broker Status              :  ACTIVE
Broker Port                : 3090
Broker PID                 : 28482
Active Servers             : 7
Busy Servers               : 1
Locked Servers              : 0
Available Servers           : 6
Active Clients (now, peak)     : (1, 21)
Client Queue Depth (cur, max)  : (1, 21)
Total Requests             : 1449080
Rq Wait (max, avg)          : (100 ms, 2 ms)
Rq Duration (max, avg)       : (1200 ms, 30 ms)
```


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Classic AppServer Monitoring

Agent information

PID	State	Port	nRq	nRcvd	nSent	Started	Last Change
09170	AVAILABLE	19101	144908	144908	144908	09-Apr-2022 06:18	12-Apr-2022 14:27
02158	AVAILABLE	19102	046299	046299	046299	11-Apr-2022 11:59	12-Apr-2022 14:27
02161	AVAILABLE	19103	046274	046274	046274	11-Apr-2022 11:59	12-Apr-2022 14:27
28412	AVAILABLE	19104	018443	018443	018443	12-Apr-2022 06:58	12-Apr-2022 14:27
28415	AVAILABLE	19105	018507	018507	018507	12-Apr-2022 06:58	12-Apr-2022 14:27
28418	AVAILABLE	19106	018434	018434	018434	12-Apr-2022 06:58	12-Apr-2022 14:27
28421	BUSY	19107	018330	018330	018330	12-Apr-2022 06:58	12-Apr-2022 14:27

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Java Management eXtensions (JMX)

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JMX

- JMX is a Java technology that supplies tools for managing and monitoring applications, system objects, devices (such as printers) and service-oriented networks
- Those resources are represented by objects called MBeans (for Managed Bean)
- In the API, classes can be dynamically loaded and instantiated
- Tomcat supports JMX
- PAS for OpenEdge supports JMX
- ***Always on***

(Source for the first 3 bullets – Wikipedia.com)

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OpenEdge Java Management eXtensions (OEJMX)

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OEJMX Script

- OEJMX.sh(.bat) resides in the PAS for OpenEdge instance directory in “bin”
- It reads a file (default extension .qry) that directs the specific JMX APIs to execute
- The OEJMX script launches a JVM which connects to Tomcat/PAS for OpenEdge JVM running for that instance
- Queries the JVM and writes an output file (by default in the instance-dir/temp directory)

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OEJMX Script

Pros

- Secure, can only be run on machine where PAS for OpenEdge is running
- Scriptable
- Many different metrics gathered in a single query

Cons

- Slow (must launch JVM and connect to PAS for OpenEdge JVM)
  - Should not be run in quick succession
- Several calls to gather data needed sometimes
- .qry script creation takes some getting used to

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OEJMX Script – *Manager Sessions*

```
# getSessions.qry
{"O":"PASOE:type=oemanager,name=SessionManager","M":["getMetrics","oepas1"]}
```


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```

oejmx.bat -Q jmxqueries\getSessions.qry

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oejmx.bat -Q jmxqueries\getSessions.qry

Query: Line 1. PASOE:type= oemanager,name=SessionManager, getMetrics(oepas1)

Result:
{"getMetrics":{"maxConcurrentClients":"1","concurrentConnectedClients":"0","numReserveABLSessionTimeouts":"0","writeErrors":"0","reads":"30","numReserveABLSessionWaits":"0","startTime":"2023-07-21T06:28:29.358-04:00","requests":"10","type":"OE_BROKER","writes":"20","readErrors":"0","accessTime":"2023-11-09T13:19:08.089-05:00"}}

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JavaScript Object Notation (JSON) Formatter


```
{
        "operation": "GET SESSION-MGR METRICS",
        "outcome": "SUCCESS",
        "result": {
                "requests": 500,
                "writeErrors": 0,
                "reads": 2000,
                "concurrentConnectedClients": 0,
                "writes": 2000,
                "maxConcurrentClients": 4,
                "readErrors": 0,
                "numReserveABLSessionTimeouts": 0,
                "numReserveABLSessionWaits": 0,
                "type": "OE_BROKER",
                "startTime": "2022-08-17T17:04:39.969-04:00",
                "accessTime": "2022-08-17T17:09:15.648-04:00"
},
        "errmsg": "",
        "versionStr": "v11.7.16 ( 2022-08-12 )",
        "versionNo": 1
}
```


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OEJMX Script – *Get Agents*

getAgents.qry

{"O":"PASOE:type= oemanager,name=AgentManager","M":["getAgents",”oepas1"]}

oejmx.bat -Q jmxqueries\getAgents.qry

Query: Line 1. PASOE:type= oemanager,name=AgentManager, getAgents(oepas1)

Result:
{"getAgents":{"agents":[{"agentId":"u9oyMfogQ1SnTC_XaqwyUA","pid":"1692","state":"AVAILABLE"}]}}

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OEJMX Script – *Get Agent Metrics*

getAgentMetrics.qry

{"O":"PASOE:type= oemanager,name=AgentManager","M":["getSessionMetrics",”1692"]}

oejmx.bat -Q jmxqueries\getAgentMetrics.qry

Query: Line 1. PASOE:type= oemanager,name=AgentManager, getSessionMetrics(1692)

Result: {"getSessionMetrics":{"AgentSession":[

{"SessionState":"IDLE","ConnectionId":"org.codehaus.jettison.json.JSONObject$Null","SessionMemory":869908,"EndTime":"org.codehaus.jettison.json.JSONObject$Null","ThreadId":-1,"SessionExternalState":0,"StartTime":"2019-12-15T16:16:00.268","SessionId":4},

{"SessionState":"ACTIVE","ConnectionId":"org.codehaus.jettison.json.JSONObject$Null","SessionMemory":3613499,"EndTime":"org.codehaus.jettison.json.JSONObject$Null","ThreadId":4,"SessionExternalState":0,"StartTime":"2019-12-15T16:16:00.268","SessionId":7}]}}

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OEJMX Script – *Get Agent Requests*

getRequests.qry

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oejmx.bat -Q jmxqueries\getAgentMetrics.qry

Query: Line 1. PASOE:type= oemanager,name=AgentManager, getRequestMetrics(17642)

Result:

{"getRequestMetrics":{"AgentRequest":[{"RequestNum":11,"RequestProcName":"Progress.Web.InternalWebHandler:HandleRequest","RequestLen":8,"ConnectionId":23,"EndTime":"2023-11-09T13:53:05.237+05:00","requestID":"ROOT:w:00000091","BrokerSessionId":"gysK3F9lRlqzWPVr4vUoSw","StartTime":"2023-11-09T13:53:05.229+05:00","SessionId":4,"RequestStatus":0},

{"RequestNum":12,"RequestProcName":"Progress.Web.InternalWebHandler:HandleRequest","RequestLen":4,"ConnectionId":23,"EndTime":"2023-11-09T13:53:08.795+05:00","requestID":"ROOT:w:00000096","BrokerSessionId":"gysK3F9lRlqzWPVr4vUoSw","StartTime":"2023-11-09T13:53:08.791+05:00","SessionId":4,"RequestStatus":0},

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REST API

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REST API Calls

- REST-based API calls to the JMX

Pros

- Accessible remotely, but can be limited to localhost (or specific hosts)
- Very fast
- Easy to use
- System-agnostic
- Swagger documents

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REST API Calls

Cons

- Can be accessed remotely—so considered a security risk
- Can only gather a single metric per call
- Must install the REST API manager application (OEManager.war)
- Cannot get Tomcat information through this REST API

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REST API Calls – *Manager Sessions*

http://oelxc76dev07:8080/oemanager/applications/oepas1/metrics

{"operation": "GET SESSION-MGR METRICS","outcome": "SUCCESS","result": {"requests": 500,"writeErrors": 0,"reads": 2000,"concurrentConnectedClients": 0,"writes": 2000,"maxConcurrentClients": 4,"readErrors": 0,"numReserveABLSessionTimeouts": 0,"numReserveABLSessionWaits": 0,"type": "OE_BROKER","startTime": "2022-08-17T17:04:39.969-04:00","accessTime": "2022-08-17T17:09:15.648-04:00"},"errmsg": "","versionStr": "v11.7.16 (2022-08-12)","versionNo": 1}

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REST API Calls – *Get Agents*

http://oelxc76dev07:8080/oemanager/applications/oepas1/agents

{"operation": "GET
AGENTS","outcome": "SUCCESS","result": {"agents": [{"agentId": "xPG7sVBM
RO-
GLLVsdiG2HA","pid": "29402","state": "AVAILABLE"}]},"errmsg": "","versionStr":
"v11.7.16 (2022-08-12)","versionNo": 1}

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REST API Calls – *Get Agent Metrics*

http://oelxc76dev07:8080/oemanager/applications/oepas1/agents/29402/sessions

{"operation": "","outcome": "SUCCESS","result": {"AgentSession": [{"SessionId": 4,"SessionState": "IDLE","StartTime": "2022-08-17T17:06:33.512","EndTime": null,"ThreadId": -1,"ConnectionId": null,"SessionExternalState": 0,"SessionMemory": 805071},{"SessionId": 7,"SessionState": "IDLE","StartTime": "2022-08-17T17:06:33.512","EndTime": null,"ThreadId": -1,"ConnectionId": null,"SessionExternalState": 0,"SessionMemory": 804959},{"SessionId": 8,"SessionState": "IDLE","StartTime": "2022-08-17T17:06:33.512","EndTime": null,"ThreadId": -1,"ConnectionId": -1,"SessionExternalState": 0,"SessionMemory": 805123},

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REST API Calls – *Get Agent Requests*

http://oelxc76dev07:8080/oemanager/applications/oepas1/agents/29402/requests

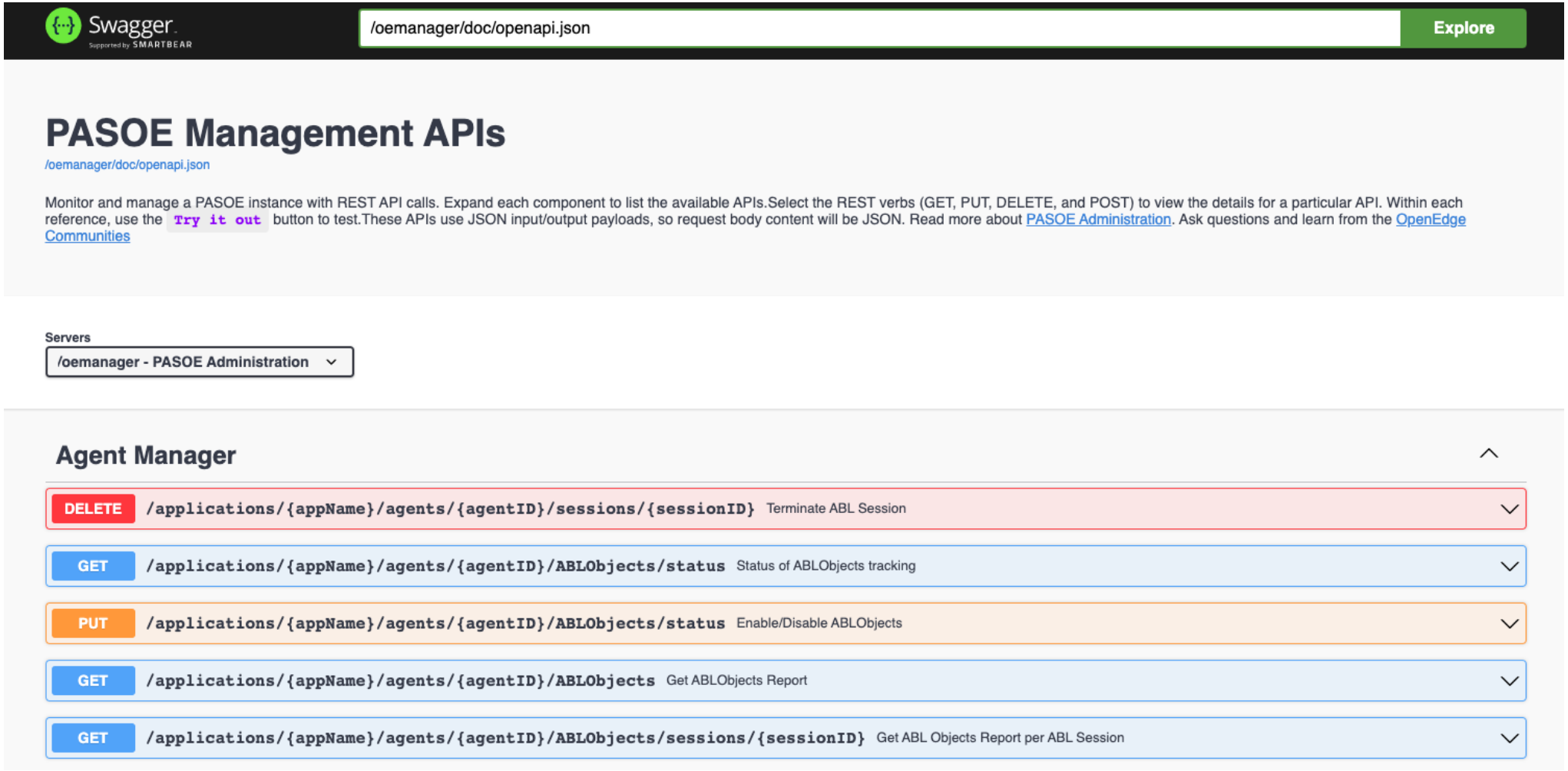
{"RequestProcName":"sports2kserver.p","SessionId":9,"ConnectionId":47,"StartTime":"2022-08-17T17:06:53.377","EndTime":"2022-08-17T17:06:53.380","RequestNum":92},

{"RequestProcName":"sports2kserver.p","SessionId":9,"ConnectionId":47,"StartTime":"2022-08-17T17:06:53.390","EndTime":"2022-08-17T17:06:53.392","RequestNum":93},

{"RequestProcName":"sports2kserver.p","SessionId":9,"ConnectionId":47,"StartTime":"2022-08-17T17:06:53.402","EndTime":"2022-08-17T17:06:53.404","RequestNum":94

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REST API Calls



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REST API Add-Ons

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Progress Iceberg

https://github.com/progress/iceberg/tree/main

A collection of code, utilities and guides from real-world customer engagements.

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Purpose: To provide expanded tooling which has been successfully utilized in PAS for OpenEdge operation.

Audience: Developers and DevOps/ITOps members who administer PAS for OpenEdge server instances.



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OEManager Script

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OEManager Script

- New in 12.8
- Meant to be like "asbman –query” but BETTER
- oemanager.sh/bat

- How to run it
- cd <path-to-instance>/<instance-name>/bin
- ./oemanager
  - If run in another directory, it will fail and warn “can’t find oemanager.xml”
  - ./oemanager –help

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oemanager.sh/.bat

```
[PCTRun] Utility Runtime: 12.8.0.0.1184.ALPHA
[PCTRun] Report Executed: 2023-11-09T14:27:54.421-05:00
[PCTRun]  PAS for OpenEdge Instance: http://localhost:8080
[PCTRun]
[PCTRun] ABL Application Information [oepas1 - v12.8.0 ( 2023-11-08 )]
[PCTRun]     WebApp: ROOT
[PCTRun]       APSV: ENABLED
[PCTRun]       SOAP: ENABLED
[PCTRun]       REST: ENABLED
[PCTRun]        WEB: ENABLED
```


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OEManager.sh/.bat

```
[PCTRun] Manager Properties
[PCTRun]          Maximum Agents:          2
[PCTRun]          Minimum Agents:          1
[PCTRun]          Initial Agents:          1
[PCTRun]    Max. Connections/Agent:        200
[PCTRun]    Max. ABLSessions/Agent:        200
[PCTRun]       Idle Conn. Timeout:     300,000 ms (00:00:05:00.000)
[PCTRun]     Idle Session Timeout:   1,800,000 ms (00:00:30:00.000)
[PCTRun]       Idle Agent Timeout:   1,800,000 ms (00:00:30:00.000)
[PCTRun]    Idle Resource Timeout:           0 ms (00:00:00:00.000)
[PCTRun]       Conn. Wait Timeout:       3,000 ms (00:00:00:03.000)
[PCTRun]     Request Wait Timeout:      15,000 ms (00:00:00:15.000)
[PCTRun]    Initial Sessions/Agent:          2
[PCTRun]    Min. Avail. Sess/Agent:          1
```


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oemanager.sh/.bat

```
[PCTRun] > Agent PID 747126: AVAILABLE
 [PCTRun]    Est. Agent Lifetime: 00:00:04:46.145
 [PCTRun]    DynMax ABL Sessions:        200
 [PCTRun]     Total ABL Sessions:          2
 [PCTRun]     Avail ABL Sessions:          2
 [PCTRun]       Open Connections:          1
 [PCTRun]        Overhead Memory: 13,982 KB
 [PCTRun]
 [PCTRun]    SESSION ID     STATE         STARTED                    LIFETIME        SESS. MEMORY
ACTIVE MEM.   REQUESTS      BOUND/ACTIVE CLIENT SESSION
 [PCTRun]             4    IDLE          11/09/2023 14:27:54.883+05:00   00:00:04:46.145      12,924 KB
13,088 KB         22        -
 [PCTRun]             7    IDLE          11/09/2023 14:27:54.883+05:00   00:00:04:46.145         630 KB
630 KB          0        -
```


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OEManager.sh/.bat

```
[PCTRun]       Active Agent-Sessions: 0 of 2 (0% Busy)
[PCTRun]     Utilized Agent-Sessions: 1 of 2 (>801 KB)
[PCTRun]       Approx. Agent Memory: 27,700 KB
[PCTRun]
[PCTRun] Session Manager Metrics (Count+Time)
[PCTRun]           # Requests to Session:          22
[PCTRun]          # Agent Responses Read:          66 (0 Errors)
[PCTRun]     Agent Read Time (Mn, Mx, Av): 00:00:00:00.000 / 00:00:00:00.000 / 00:00:00:00.000
[PCTRun]        # Agent Requests Written:          44 (0 Errors)
[PCTRun]     Concurrent Connected Clients:          0 (Max: 1)
[PCTRun]     Tot. Reserve ABLSession Wait: 00:00:00:00.001
[PCTRun]      # Reserve ABLSession Waits:          0
[PCTRun]     Avg. Reserve ABLSession Wait: 00:00:00:00.000
[PCTRun]     Max. Reserve ABLSession Wait: 00:00:00:00.001
[PCTRun]     # Reserve ABLSession Timeout:          0
```


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oemanager.sh/.bat

[PCTRun]

[PCTRun] Client HTTP Sessions: 1

[PCTRun] STATE SESS STATE BOUND LAST ACCESS / STARTED ELAPSED TIME SESSION MODEL ADAPTER SESSION ID REQUEST ID

[PCTRun]

[PCTRun] READY RESERVED NO 2023-11-09T14:32:35.691-0500 00:00:00:05.371 SESSION_FREE pF8m-HB_RVCTec5XJ6K_4Q

[PCTRun]

BUILD SUCCESSFUL

Total time: 0 seconds

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OpenEdge HealthScanner

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HealthScanner

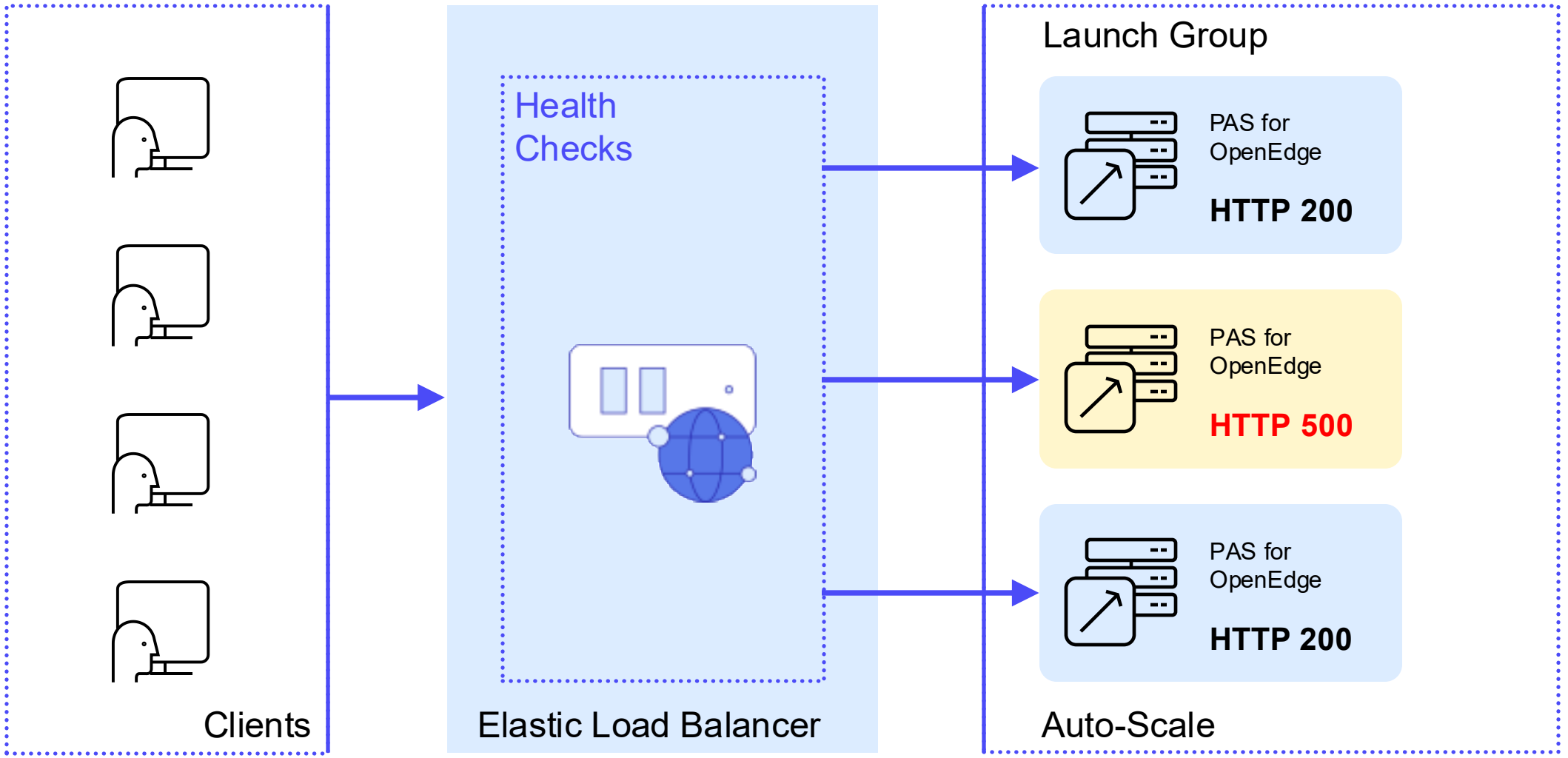
- Designed for load balancing infrastructures
- Allows you to remove an ailing VM from a load balanced array before it is unresponsive
- Reports system information, not just the health of PAS for OpenEdge & VM

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HealthScanner

- http://oelxc76dev07:8899/health
- Returns 200 or 500
- http://oelxc76dev07:8899/health?view=summary
- **{**"health": 6**0**,"timestamp": "2022-08-19T14:06:12.233681Z","interval": **60}**

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HealthScanner

Pros

- Great for overall health of your PAS for OpenEdge machine
- Great for automatic load balancing integration
- Gathers system information, as well as PAS for OpenEdge health
- Can be accessed remotely or by script (can disable remote access)

Cons

- Does not give the same detailed information as OEJMX or REST API
- Must be enabled—both to gather information and to allow remote access
- Is available only in 12.0+

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HealthScanner

http://oelxc76dev07:8899/health?view=details

{"name": "PASOE HealthScanner","color": "#F63538","timestamp": "2022-08-19T14:07:12.237416Z","result": {"health": 0,"value": 0,"marginal": true,"critical": true,"ignore": false,"failOnCritical": true,"failedBy": "OS Health"},"config": {"calculation": "sum of probes(health * weight) / sum of probes(weight)","critical": 0.6,"probeID": 1,"name": "PASOE HealthScanner","marginal": 0.7,"description": "Composite weighted health of PAS for OpenEdge server metrics","weight": 1,"className": "com.progress.appserv.services.health.probe.CompositeHealthProbe","enabled": true,"failOnCritical": false},+

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HealthScanner

http://oelxc76dev07:8899/health?view=dataset

{"HealthData": [{"probeid": 1,"health": 0,"marginal": true,"critical": true,"ignore": false,"failOnCritical": true,"failedBy": "OS Health","value": "0.0","lastpoll": "2022-08-19T14:10:12.252503Z"},{"probeid": 2,"health": 0,"marginal": true,"critical": true, "ignore": false,"failOnCritical": false,"failedBy": null,"value": "0.0","lastpoll": "2022-08-19T14:10:12.252503Z"},+

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HealthScanner

linuxx86_64:122$ bin/oehealth.sh

{"Health":0.0}

linuxx86_64:122$ bin/oehealth.sh -D

{"getView":{"name":"PASOE HealthScanner","color":"#F63538","timestamp":"2022-08-19T14:14:12.266009Z","result":{"health":0.0,"value":0.0,"marginal":true,"critical":true,"ignore":false,"failOnCritical":true,"failedBy":"OS Health"},"config":{"calculation":"sum of probes(health ablapps bin common conf hcapps instances.unix instances.windows logs openedge temp webapps work weight) / sum of probes(weight)","critical":0.6,"probeID":1,"name":"PASOE HealthScanner","marginal":0.7,"description":"Composite weighted health of PAS for OpenEdge server metrics","weight":1.0,”+

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Recommendations

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Recommendations

- Use REST API when you:
  - Want fast requests
  - Are making many requests in a short period of time
  - Are looking to alert on issues

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Recommendations

- Use OEJMX when you:
  - Want to gather many metrics at once
  - Are querying less frequently
  - Don’t want to install the manager or OEManager applications

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Recommendations

- Use HealthScanner when you:
  - Are load balancing (or not)
  - Want to know system information, not just PAS for OpenEdge
  - Want to trend data (view=dataset)

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Recommendations

- New oemanager.sh/bat script
  - Runs on Rest API calls (but be sure to secure remote access) when you:
    - Want fast requests
    - Are making many requests in a short period of time
    - Are looking to alert on issues
    - Are looking for "asbman –query" convenience

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Recommendations

- What should I monitor?
  - PAS for OpenEdge accepting requests
    - http(s)://host:port/rest/_oepingService/_oeping *

      https://docs.progress.com/bundle/pas-for-openedge-management/page/ABL-application-PING-service.html
  - Tomcat incoming thread pool
    - http(s)://host:port/manager/status
  - Current and max sessions in Session Manager
    - http(s)://host:port/oemanager/applications/metrics
  - Current agent sessions
    - http(s)://host:port/oemanager/applications/agents/<agent-id>/sessions

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Recommendations

- What should I monitor?
  - Current agent sessions memory
    - http(s)://host:port/oemanager/applications/agents/<agent-id>/sessions
  - System health
    - System tools
      - Top, vmstat, iostat, task manager
    - HealthScanner (12.0+)

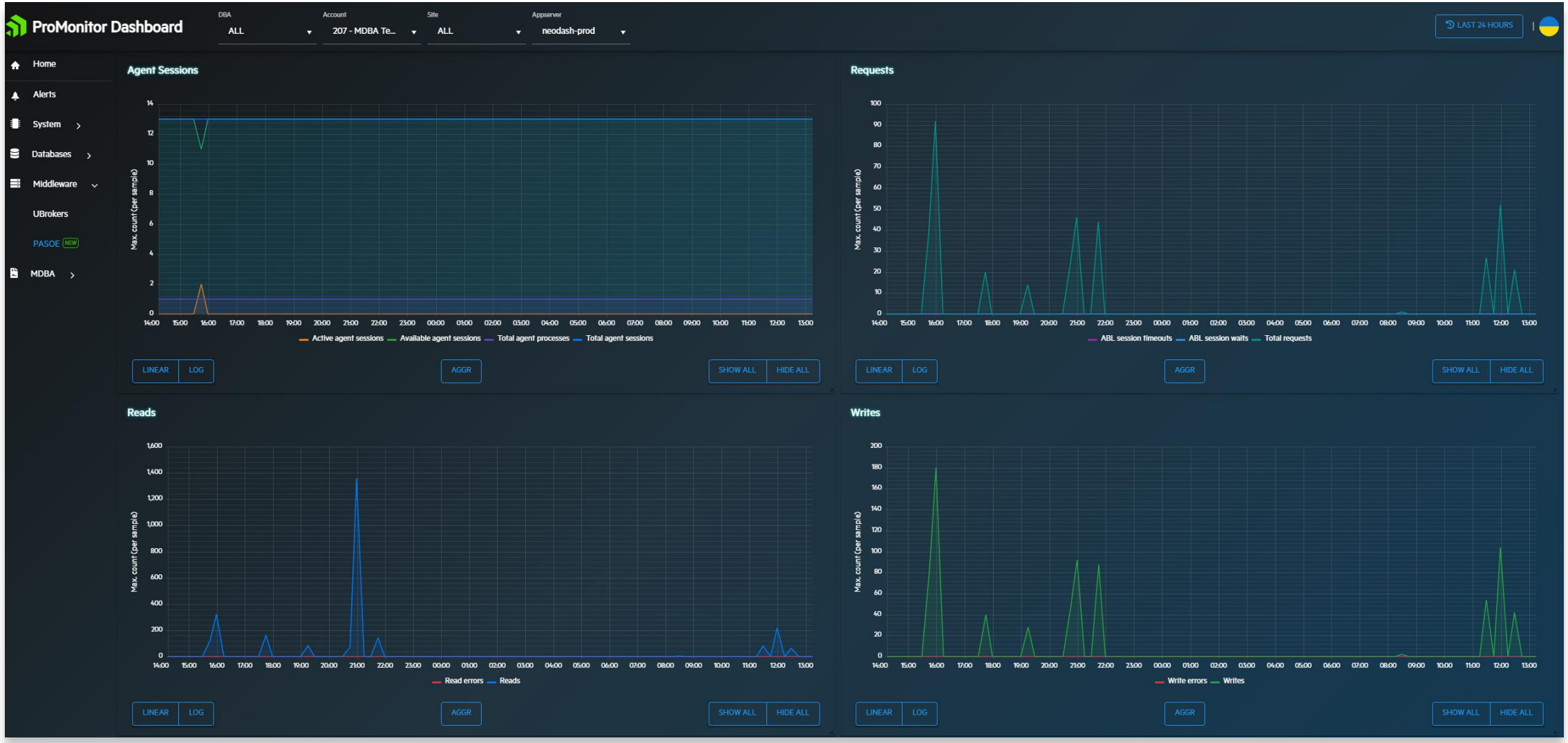
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Eating Our Own Dog Food

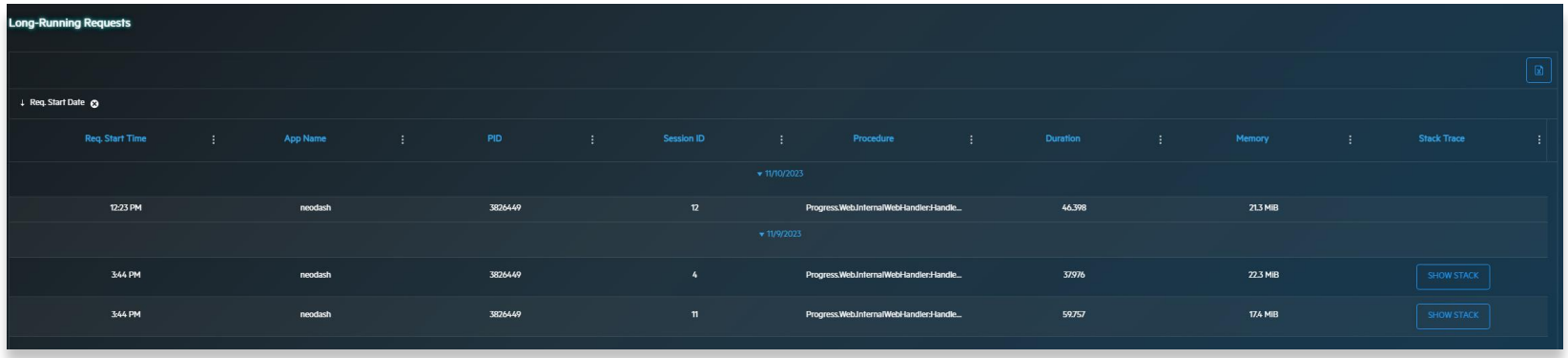
- Managed Database Administration (MDBA) Service
  - ProMonitor for gathering alerts and data
  - Web-based dashboard for viewing alerts and data
  - PAS for OpenEdge monitoring included

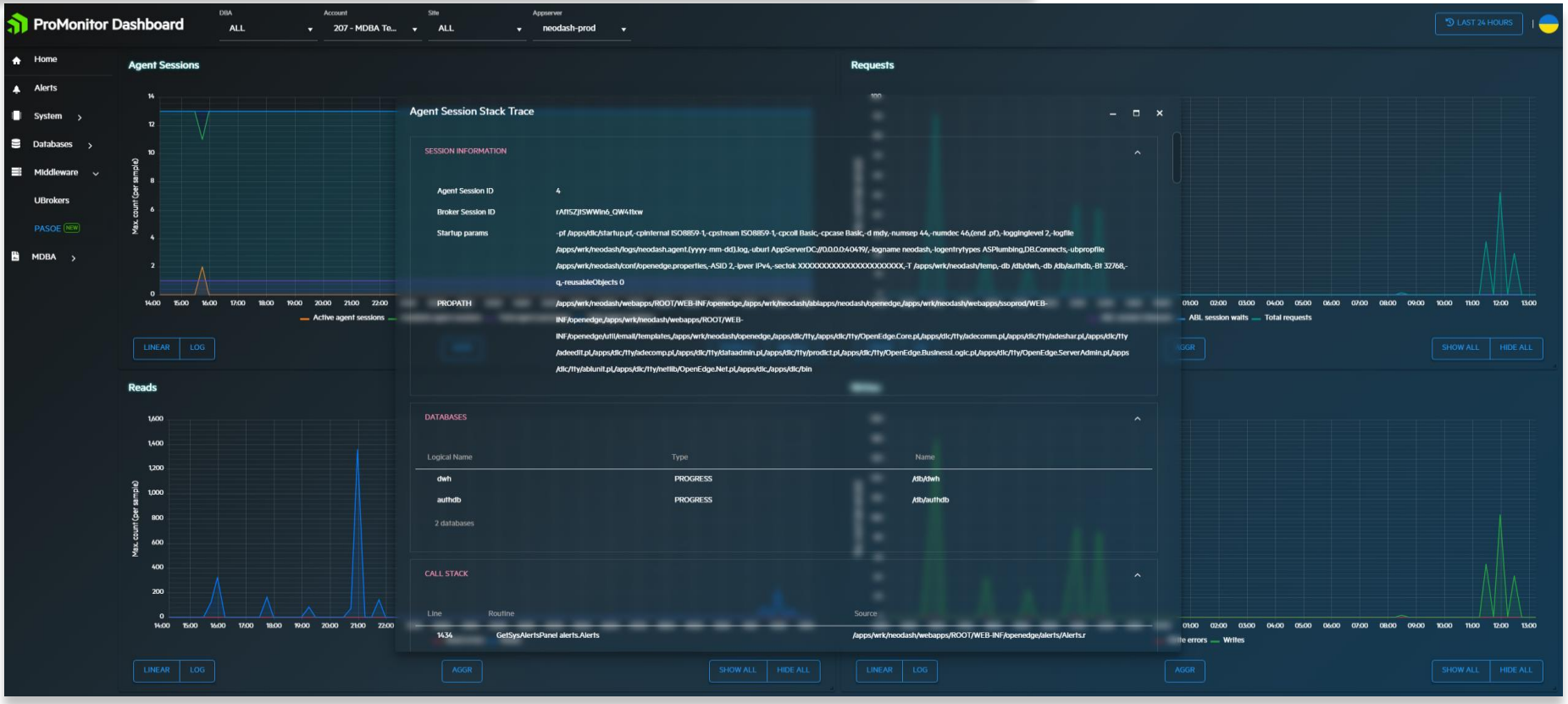
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References

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  - https://docs.progress.com/bundle/openedge-new-info-1174/page/Use-OEJMX-to-manage-and-monitor-an-instance.html
- REST API Reference for oemanager.war
  - https://docs.progress.com/bundle/pas-for-openedge-administration-117/page/REST-API-Reference-for-oemanager.war.html
- HealthScanner
  - https://docs.progress.com/bundle/openedge-whats-new/page/HealthScanner.html

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References

- 12.8 OEManager script
  - Tasks: https://docs.progress.com/bundle/pas-for-openedge-management/page/oemanager-tasks.html
  - Use Cases: https://docs.progress.com/bundle/pas-for-openedge-management/page/oemanager-use-cases.html

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Summary

- Is better than Classic
- Has many monitoring tools
- May want to use a combination
- Start monitoring!

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Questions?

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