Rock Your Ops

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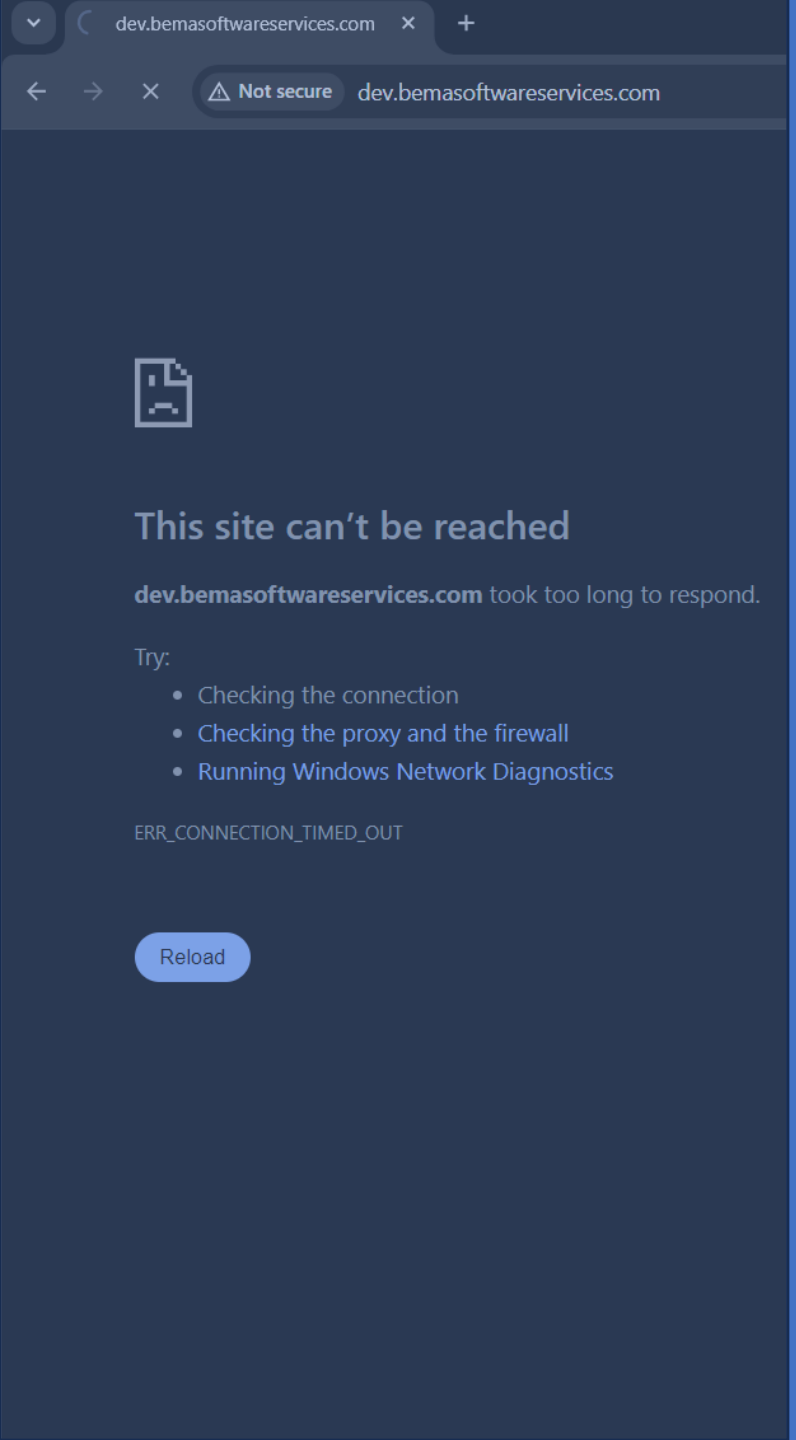
About Me

About You



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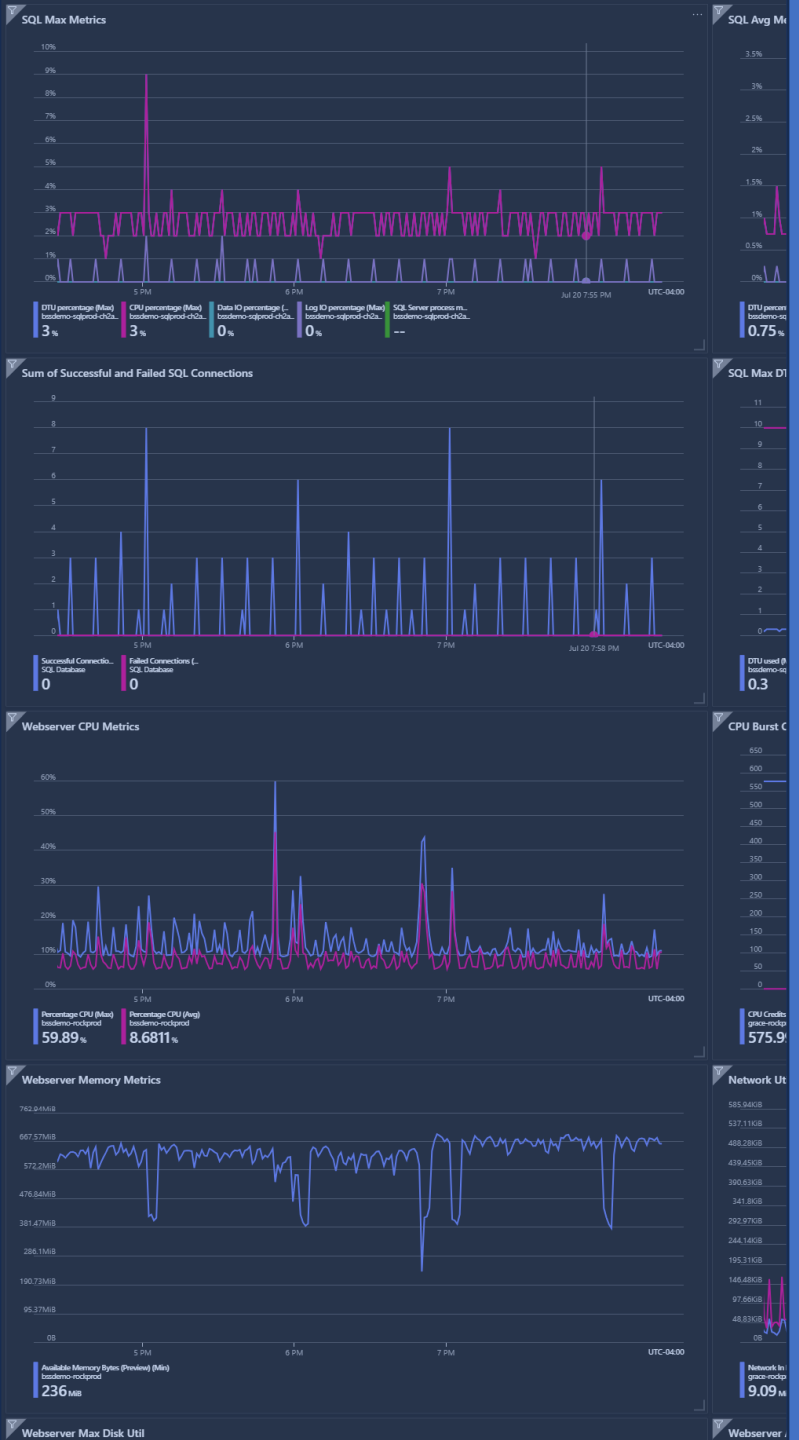
Rock is down… now what?



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Monitoring

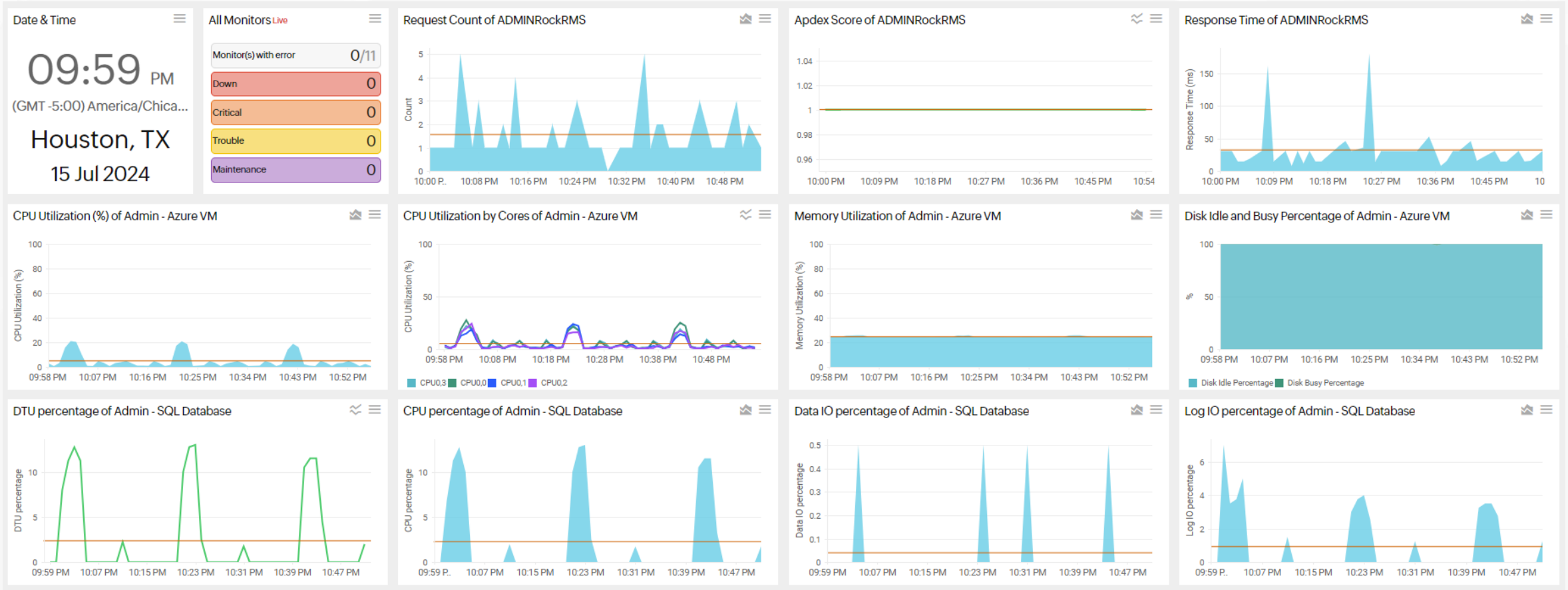
Monitoring Types: White Box

- AKA Observability
- Common Metrics and Components
  - Response Time
  - Request Throughput
  - Error Rate
  - Apdex
  - Transactions
  - Traces
- Agent-Based vs. Open Telemetry

Monitoring Types: Black Box

- External polling:
  - Response times
  - Internet infrastructure
  - TLS certificate monitoring
- Application server metrics:
  - CPU
  - Memory
  - Disk IO
  - Disk space
  - Network Throughput
  - Burst Credits
- SQL Database metrics
  - DTU Utilization
  - CPU Utilization
  - Data IO Percentage
  - Disk IO Percentage

Single Pane of Glass



Single Pane of Glass: Azure

Add BEMA's dashboard to your Azure environment!

- Displays data already collected by your Azure environment
- Dashboards are a no-cost Azure platform feature!

The Troubleshooting Process

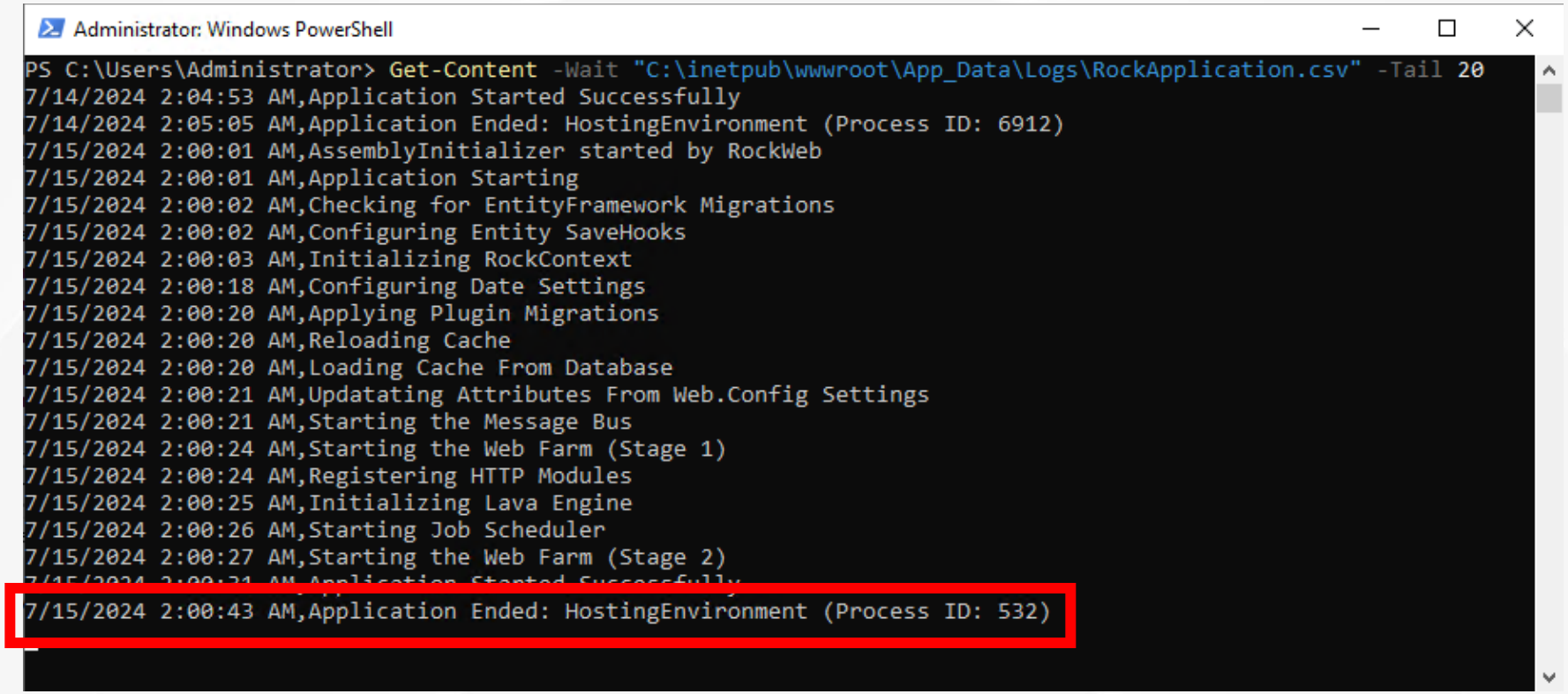
1. What am I seeing?
2. What can I learn from my monitoring tools?
3. What can I learn from my web server?
4. What can I learn from my database?

Digging Deeper: Web Server

- Rock Exceptions UI
- Rock Application Log File
  - `C:\inetpub\wwwroot\App_Data\Logs\RockApplication.csv`

Rock Application Log File

```
Get-Content –Wait “C:\inetpub\wwwroot\App_Data\Logs\RockApplication.csv” –Tail 100
```



Application Shutdown Reasons

BinDirChangeOrDirectoryRename	A change was made to the Bin folder or its contents. Typically a plugin install or update.
ConfigurationChange	Application configuration file was changed (web.config, web.ConnectionStrings.config)
InitializationError	The application was unable to initialize, likely due to an incorrect configuration (connection string, etc.).
UnloadAppDomainCalled	The “Restart Rock” button was clicked in the Rock UI.
HostingEnvironment	The hosting environment shut down the application domain (app pool recycle, other reasons).

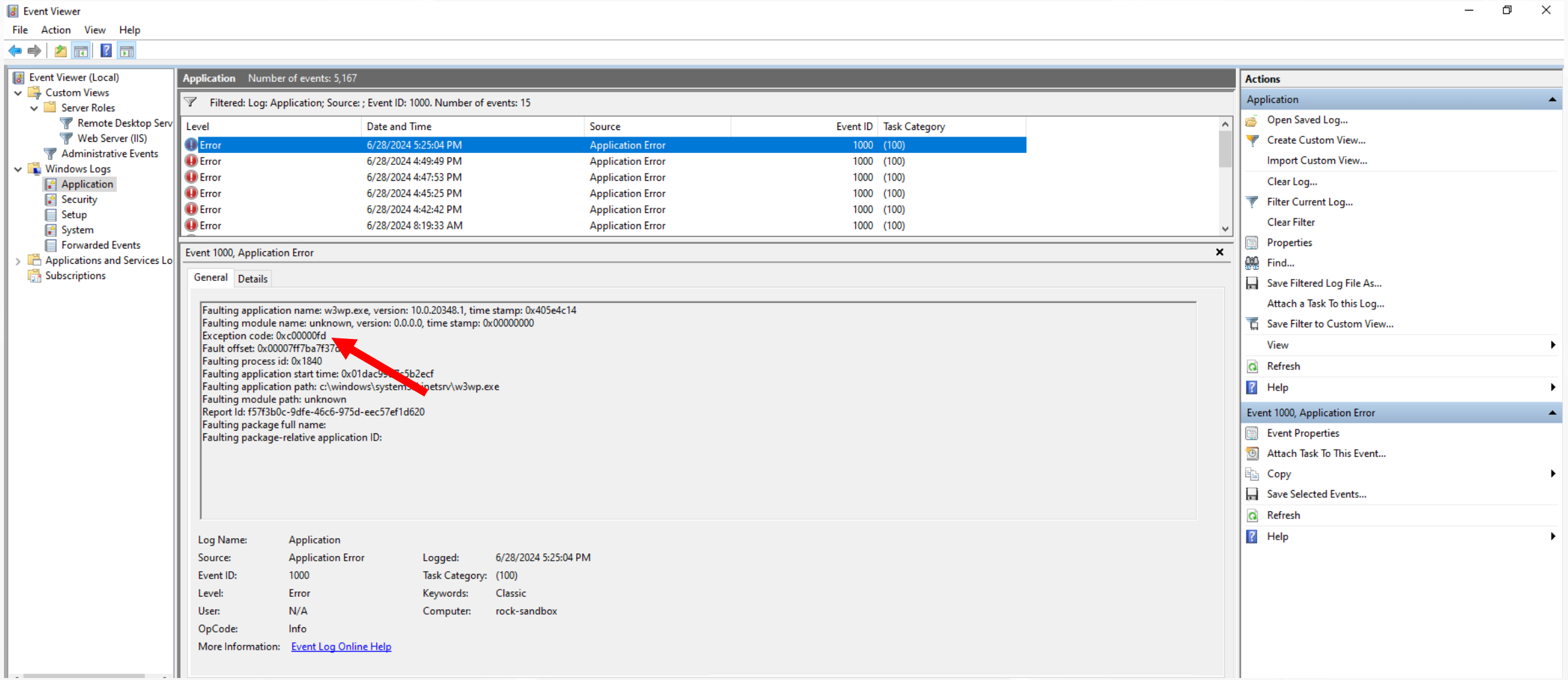
ASP.NET Shutdown Reasons Enum
Recommended AV Exclusions

What if no “Application Ended” entry is logged?
Application crash!

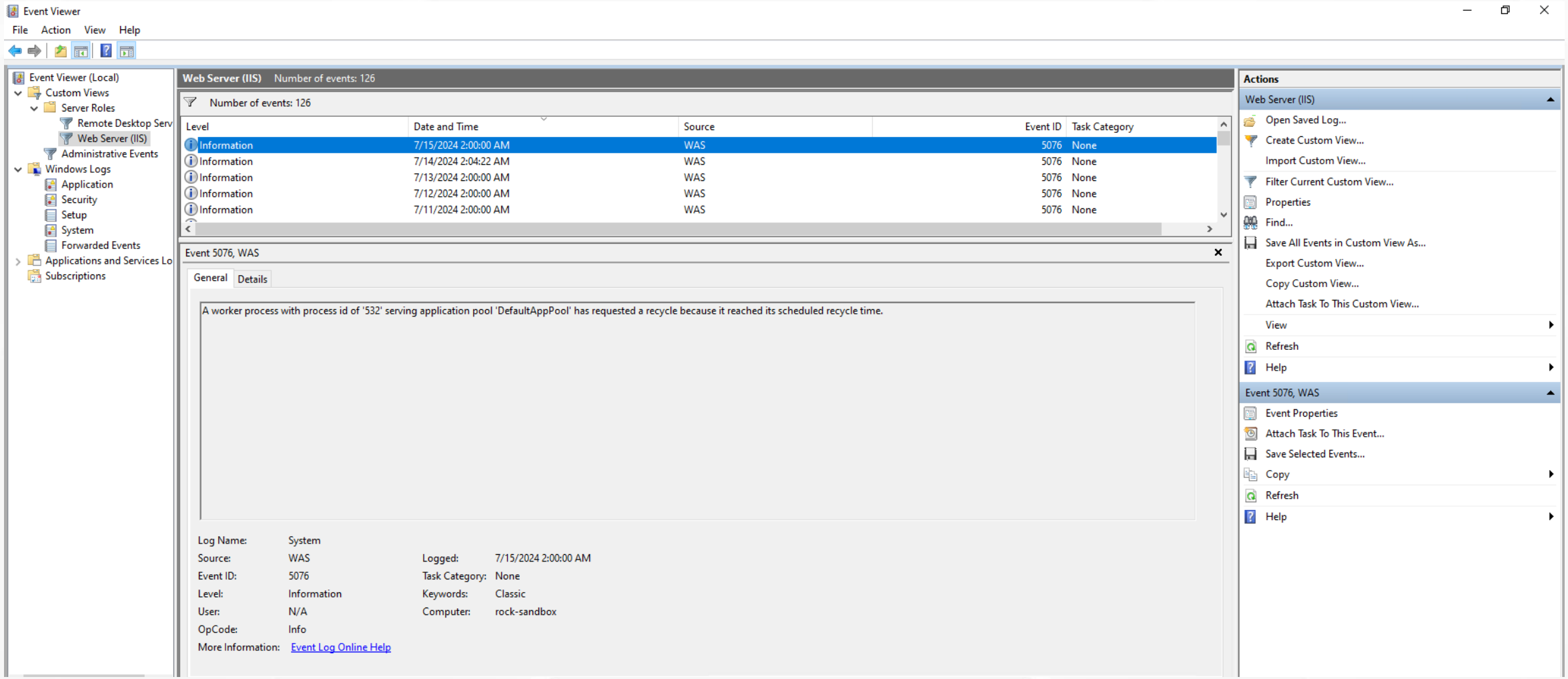
Digging Deeper: Web Server

- Rock Exceptions UI
- Rock Application Log File
  - `C:\inetpub\wwwroot\App_Data\Logs\RockApplication.csv`
- Windows Application Logs
  - `Application Log`
  - `Web Server (IIS)` custom view

Application Log



Web Server (IIS) Log

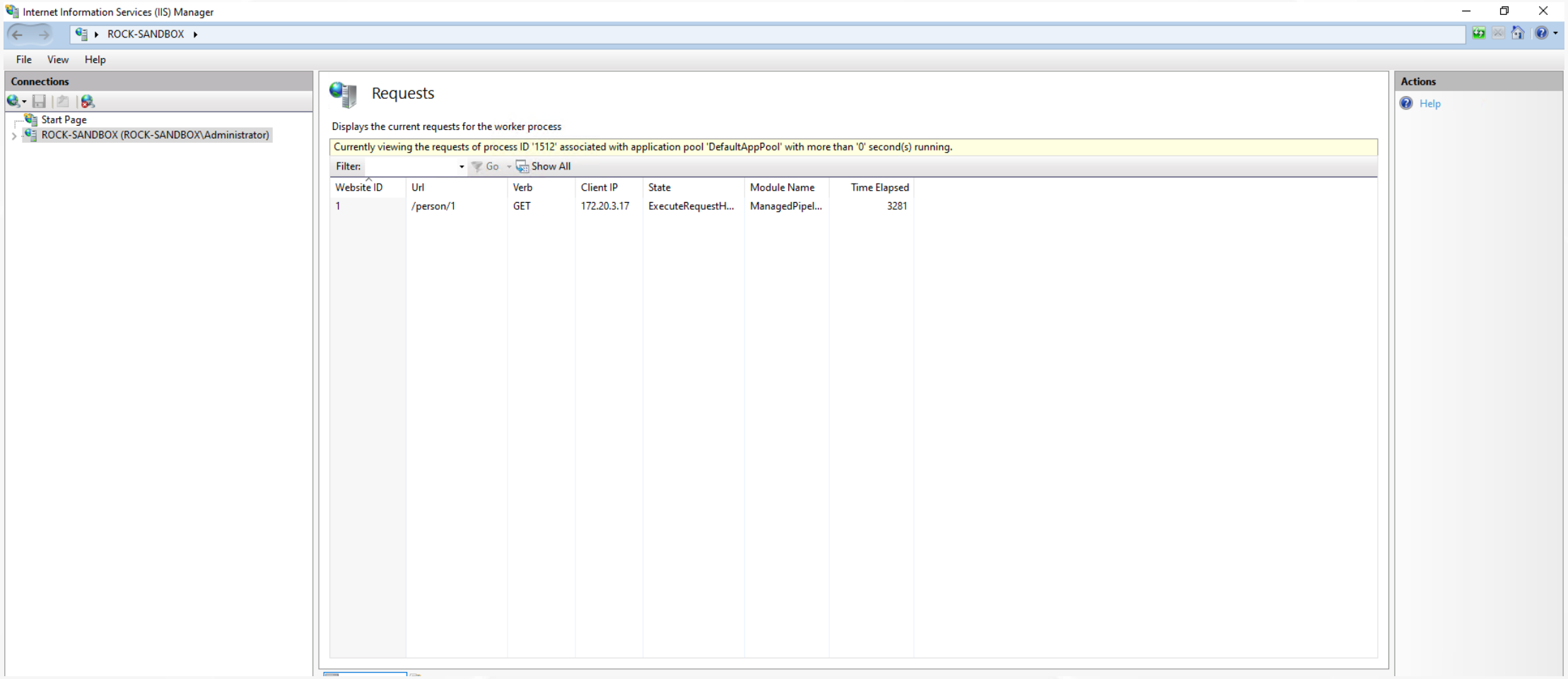


Digging Deeper: Web Server

- Rock Exceptions UI
- Rock Application Log File
  - `C:\inetpub\wwwroot\App_Data\Logs\RockApplication.csv`
- Windows Application Logs
  - `Application Log`
  - `Web Server (IIS)` custom view
- Rock Exception Log File
  - `C:\inetpub\wwwroot\App_Data\Logs\RockExceptions.csv`
- IIS Logs
  - `C:\inetpub\logs\LogFiles\W3SVC1`
- IIS Worker Process Requests

IIS Worker Process Requests

`IIS Manager > [Server Name] > Worker Processes > [App Pool Name]`

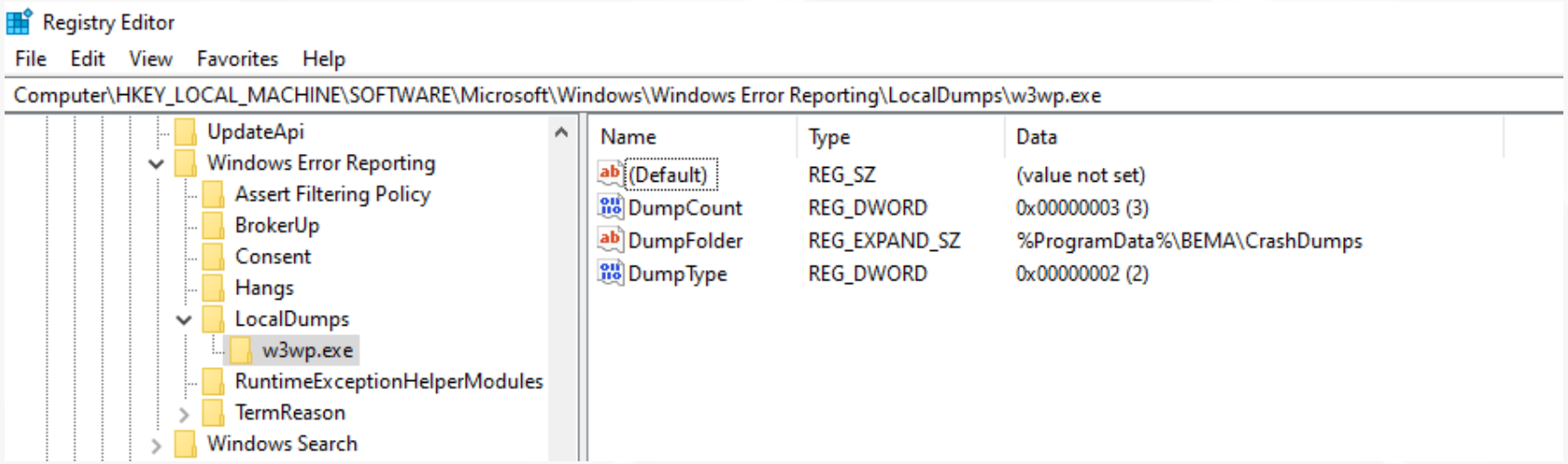


Crash Troubleshooting: Memory Dumps

- The best way to troubleshoot a crashing Rock instance
- Snapshot of the application state at a moment in time
- Capture with Windows Error Reporting

WER Configuration

- `HKLM\SOFTWARE\Microsoft\Windows\Windows Error Reporting\LocalDumps\w3wp.exe`
- `DumpCount` (DWORD): Limit number of store dump files (Recommend 3-5 on production system)
- `DumpFolder` (Expandable String): Dump file location
- `DumpType` (DWORD): 2 (Full Dump)

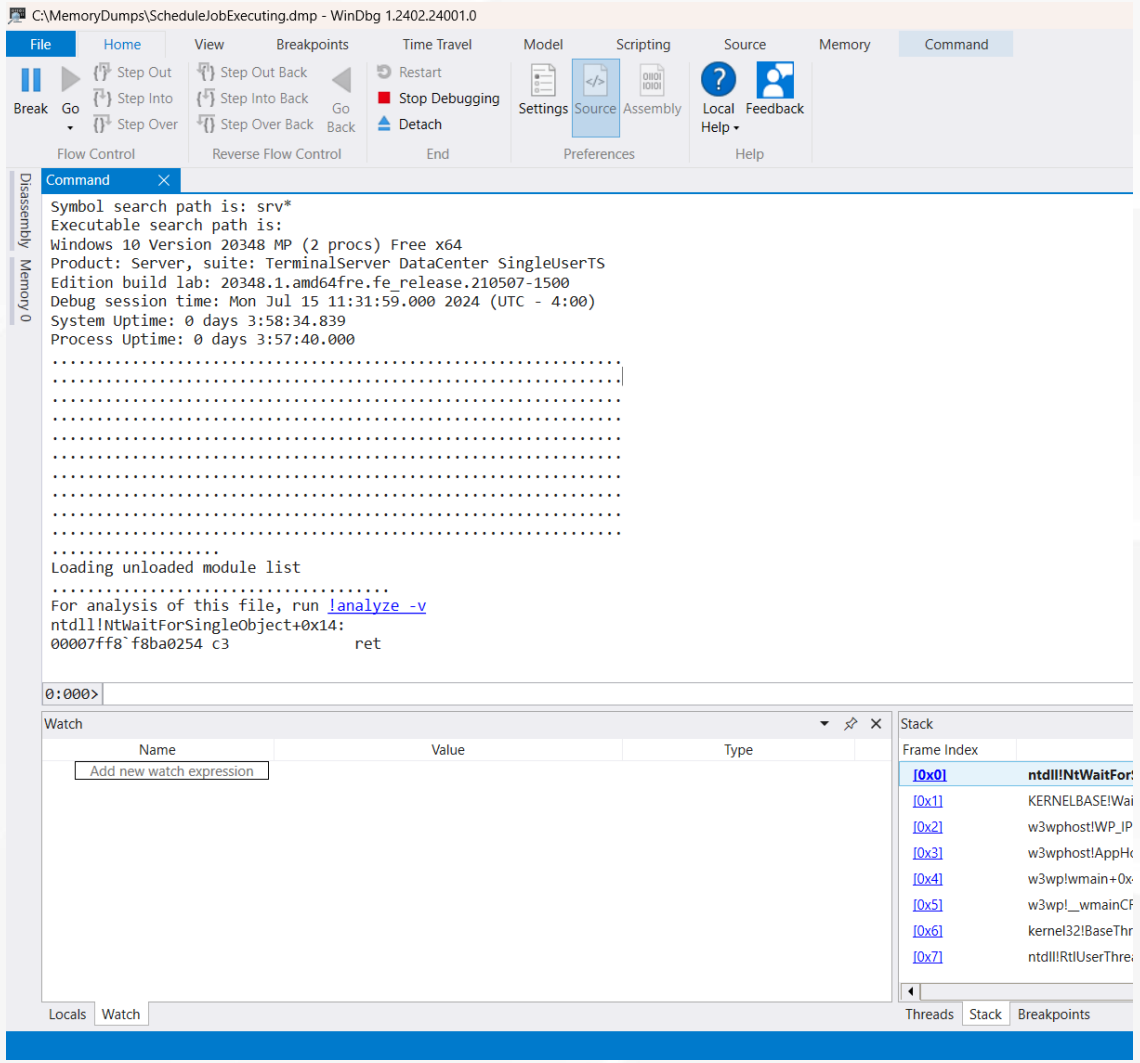


[WER Configuration Reference]

Memory Dump Analysis Tools

- Debug Diagnostic Tool v2
  - Easiest to get useful information without specialized knowledge. Pre-configured analyses that can be run on your memory dump file.
- Visual Studio Enterprise
  - The *Enterprise* edition of Visual Studio allows importing and analyzing memory dump files using the familiar debugging tools in Visual Studio.
- WinDbg
  - Low-level Windows debugging tool. Useful for finding answers you can’t find with the other two tools (or if you don’t have a Visual Studio Enterprise license).

Demo: Memory Dump Debugging

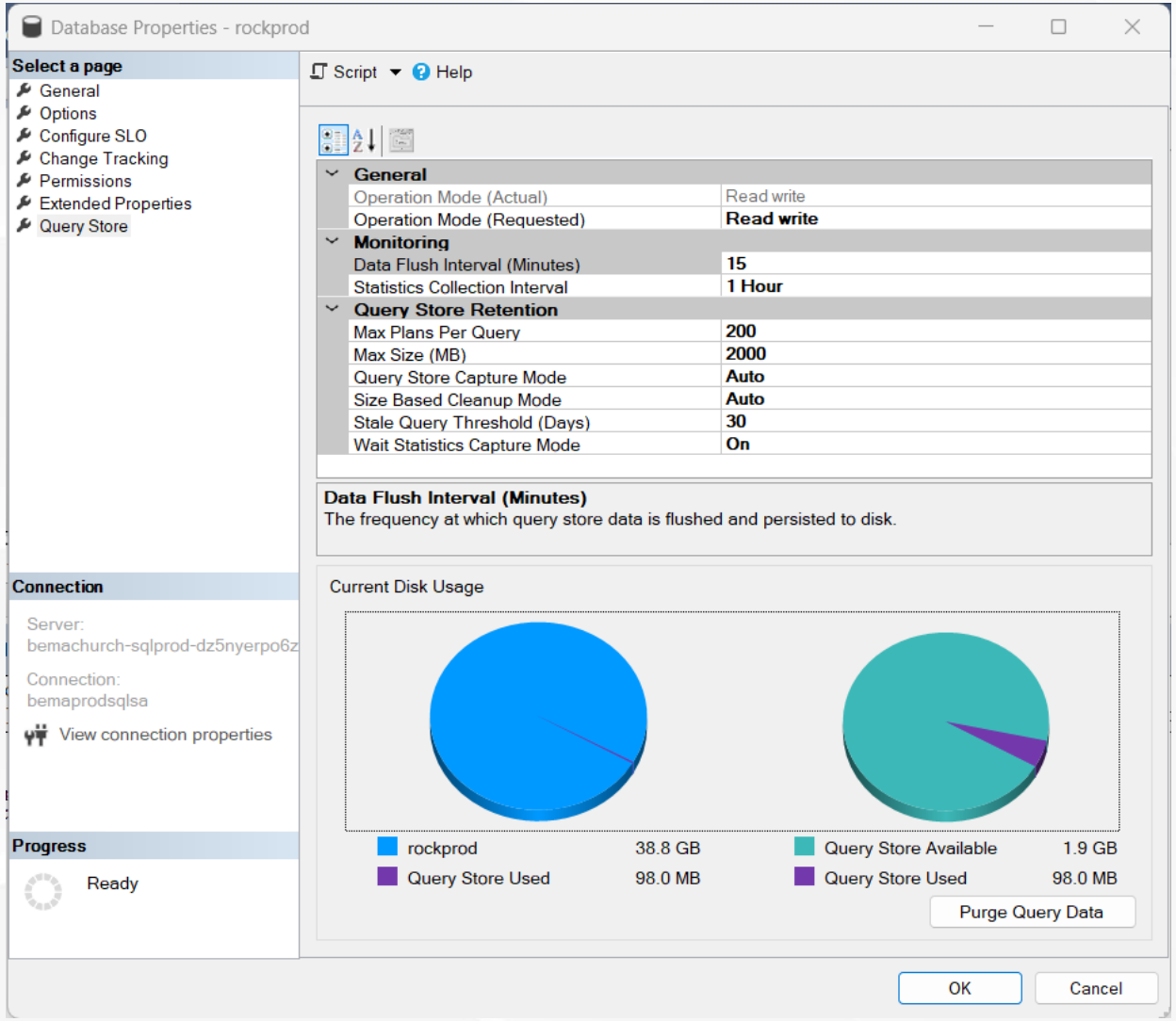


- Learn More:
  - Tess Ferrandez Blog
  - SOS Debugger Extension for WinDbg

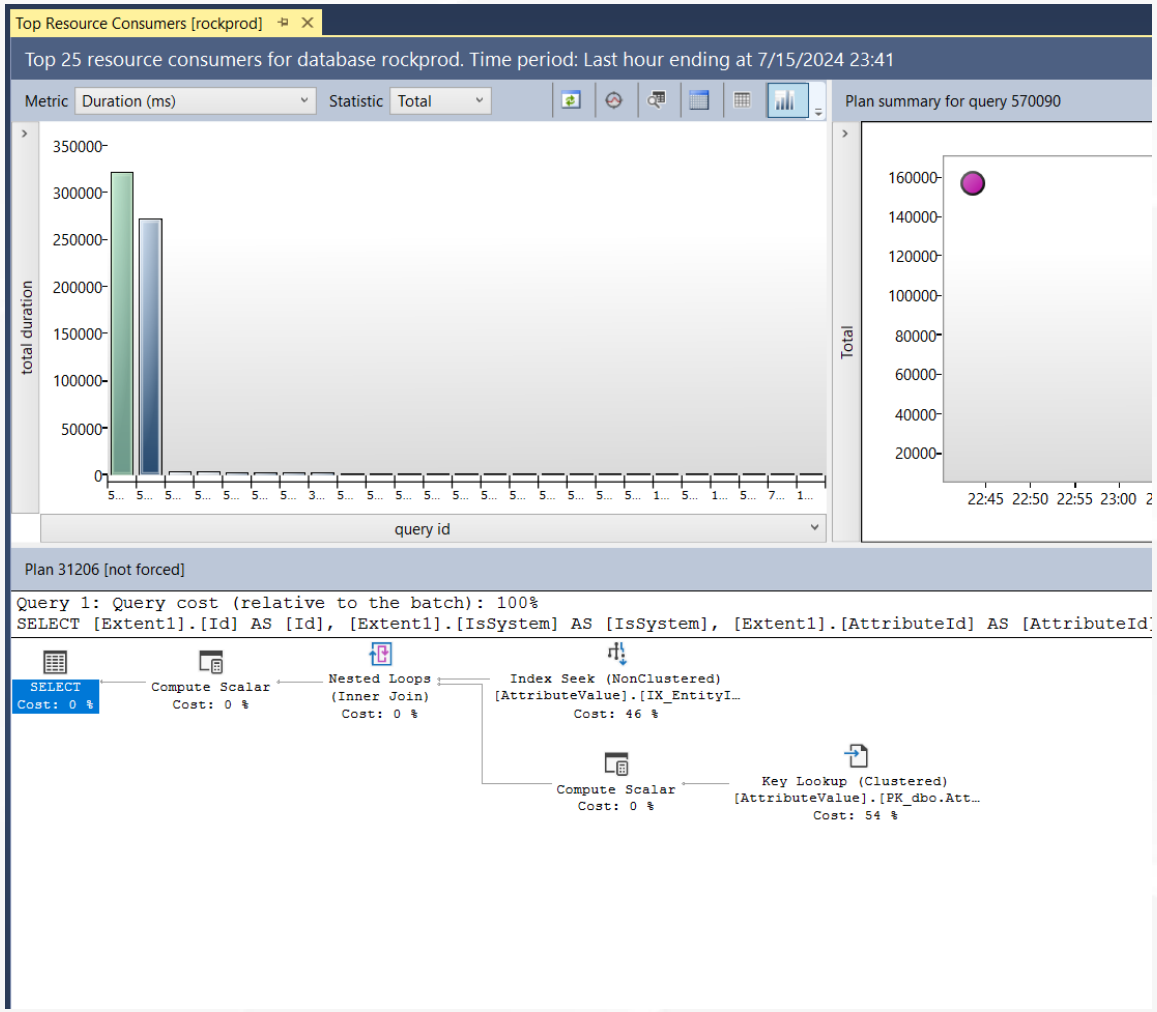
Digging Deeper: Database

- Query Store: database “black box”
- Key Settings
  - Max Size (MB) – consider 2 GB
  - Stale Query Threshold (Days)

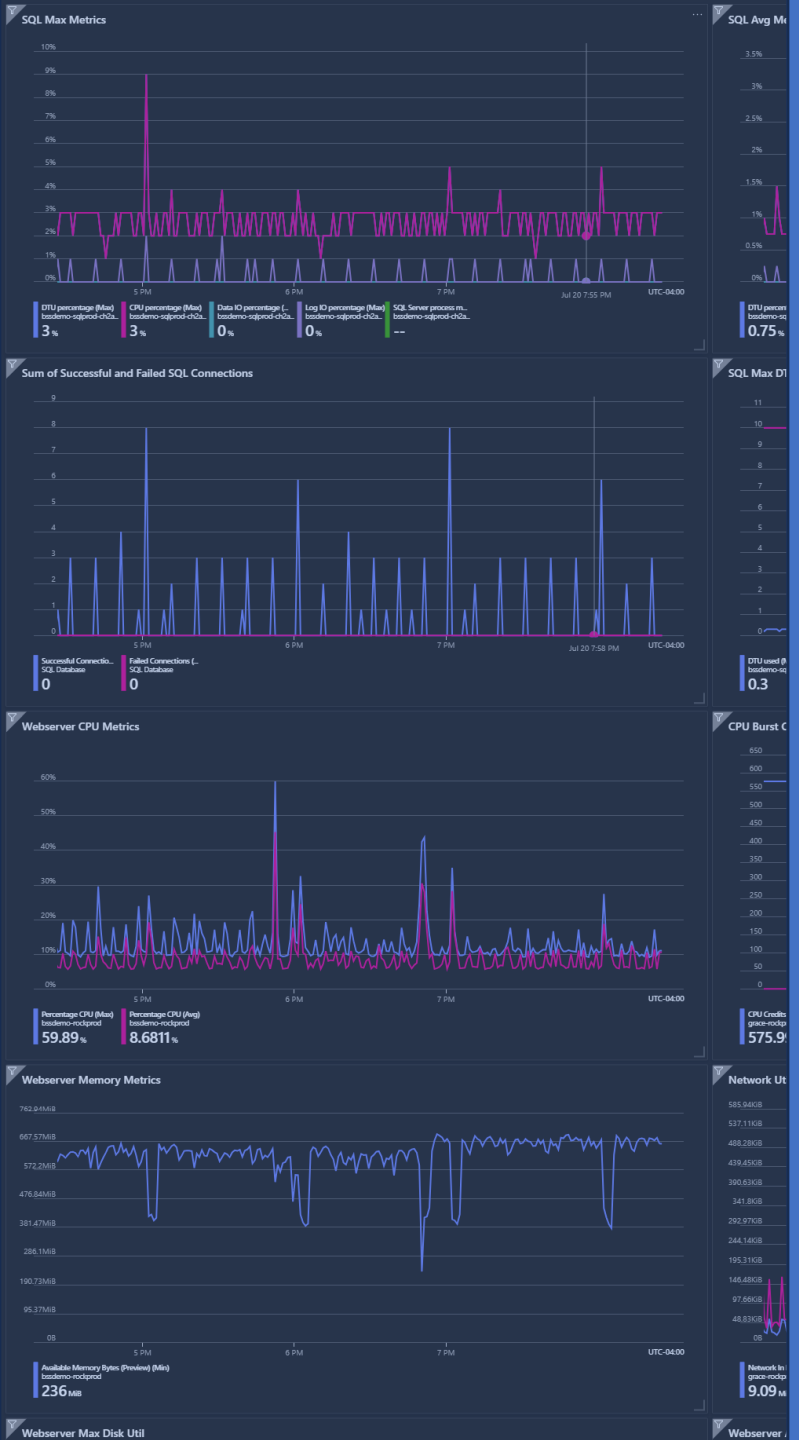
[Microsoft Learn: Monitoring Performance with Query Store]



Demo: Query Store



- Learn More:
  - [SQL Skills Query Store Blog]
  - [Erin Stellato: Why You Need Query Store]
  - [Erin Stellato: Query Store Best Practices]



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Resolving Performance Issues

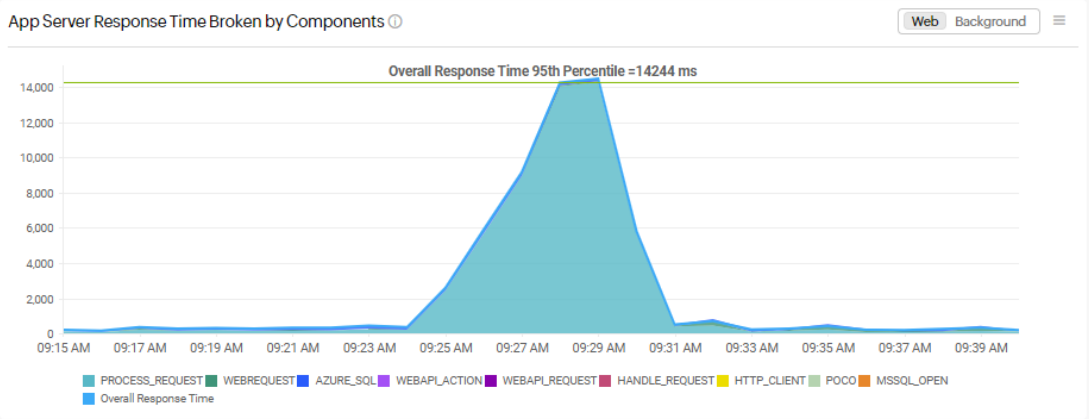
Performance is a Feature

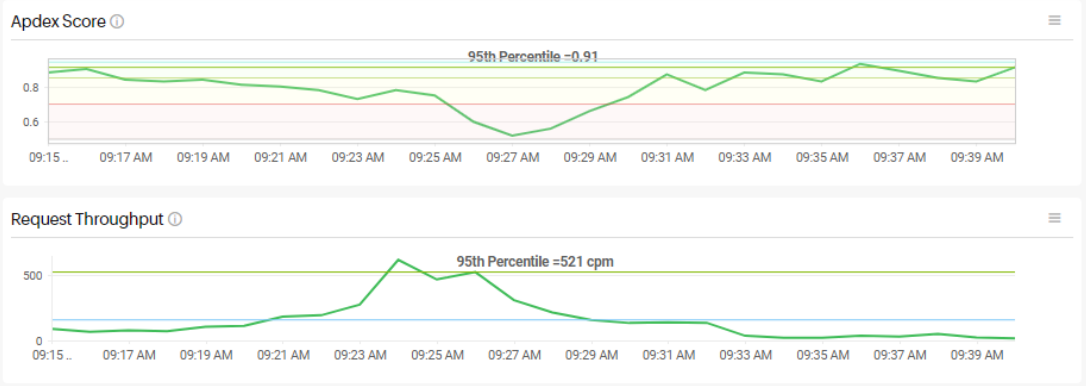
- Performance = Scalability
- Performance = Cost Savings
- Performance = Uptime
- Performance or provisioning problem?
  - Is it a broad/baseline issue or a specific feature/traffic problem?
  - Infrastructure design and code optimization work together

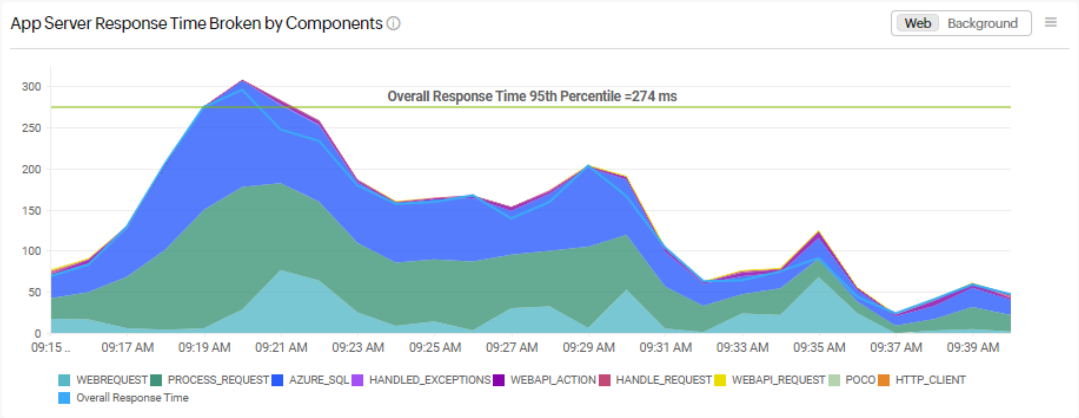
The Hot Path: Perf-Critical Code

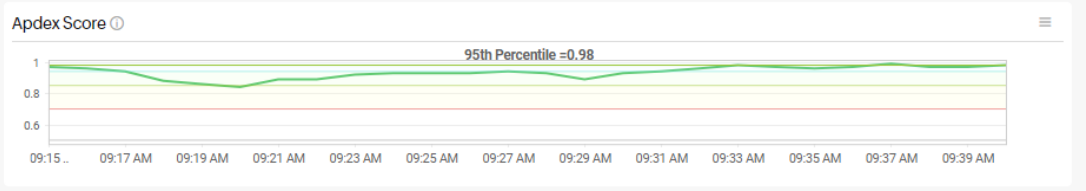
- Logic or code executed frequently or simultaneously by many sessions or users
- Optimization
  - Caching: Re-use work we've already done.
  - Persisted Datasets: Pre-computed data for data-heavy pages.
  - Lava / SQL Optimization
  - Traffic Offloading: Content Delivery Network (CDN)
    - Cloudflare
  - Load Testing
    - Locust

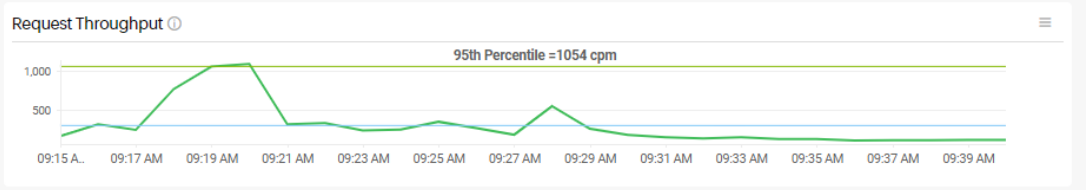
The Hot Path: Case Study











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