ArcGIS Monitor: Introduction

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Motivation
ArcGIS Monitor: Why?

Availability to tools

- Standard monitoring tools:
  - Focus on infrastructure only
  - IT controlled
  - No ArcGIS components
  - Low success of ArcGIS troubleshooting
ArcGIS Monitor: Why?

Needs of the customer

- Customers need help with:
  - resolution time
  - performance
  - administration
  - end-user satisfaction
ArcGIS Monitor: Why?
Growing complexity of ArcGIS Enterprise and underlying infrastructure

Certificates
Load balancer
Firewall
ArcGIS Web Adaptor
Portal for ArcGIS
Storage with immediate consistency
ArcGIS Monitor: How?

- **End to End monitoring:**
  - ArcGIS platform
  - Underlying infrastructure
- **Quickly diagnose:**
  - Unstable infrastructure
  - Overloaded system
  - Bottlenecks
- **Scalable and non-intrusive**

*Used by Esri Managed Cloud Services to Monitor 500+ GIS Servers*
ArcGIS Monitor: What?
A monitoring product that provides:

- Actionable information
  - Health
  - Usage
  - SLA reporting
Value to Customers
Maximize GIS Investments

Administrators:
• Detect, diagnose, and resolve issues with availability, configuration, performance and usage
• Gather actionable, quantifiable operational metrics and usage trends over time

Managers:
• Increase communication among GIS and IT staff and senior management
• Reduce administration costs

Users:
• Improve end-user satisfaction
Primary audience is enterprise GIS / IT admins

- Users (“patients”)
- GIS / IT admins (“doctors”)
- Esri PS and Tech Support (“specialists”)

Although a novice user can install and configure, this tool is intended to empower experienced GIS / IT Administrators
Features
Availability
ArcGIS Monitor uses Critical alerts to measure Downtime

- Availability is usually expressed as a percentage of uptime in a given time span, e.g. month, year:
- \[ \text{Availability (\%)} = \frac{\text{Total time} - \text{Downtime}}{\text{Total Time}} \times 100\% \]

<table>
<thead>
<tr>
<th>Availability %</th>
<th>Downtime per year</th>
<th>Downtime per month</th>
<th>Downtime per week</th>
<th>Downtime per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% (&quot;one nine&quot;)</td>
<td>36.5 days</td>
<td>72 hours</td>
<td>16.8 hours</td>
<td>2.4 hours</td>
</tr>
<tr>
<td>95% (&quot;one and a half nines&quot;)</td>
<td>18.25 days</td>
<td>36 hours</td>
<td>8.4 hours</td>
<td>1.2 hours</td>
</tr>
<tr>
<td>99% (&quot;two nines&quot;)</td>
<td>3.65 days</td>
<td>7.20 hours</td>
<td>1.68 hours</td>
<td>14.4 minutes</td>
</tr>
<tr>
<td>99.5% (&quot;two and a half nines&quot;)</td>
<td>1.83 days</td>
<td>3.60 hours</td>
<td>50.4 minutes</td>
<td>7.2 minutes</td>
</tr>
<tr>
<td>99.9% (&quot;three nines&quot;)</td>
<td>8.76 hours</td>
<td>43.8 minutes</td>
<td>10.1 minutes</td>
<td>1.44 minutes</td>
</tr>
<tr>
<td>99.95% (&quot;three and a half nines&quot;)</td>
<td>4.38 hours</td>
<td>21.56 minutes</td>
<td>5.04 minutes</td>
<td>43.2 seconds</td>
</tr>
<tr>
<td>99.99% (&quot;four nines&quot;)</td>
<td>52.56 minutes</td>
<td>4.38 minutes</td>
<td>1.01 minutes</td>
<td>8.64 seconds</td>
</tr>
</tbody>
</table>
Availability

- Health status over time period
Root Cause Analysis (RCA)

“Culprit” - the most downstream failing component
“Victims” – all upstream failing components
### Root Cause Analysis Reports 10/17/2018 7:56 AM

<table>
<thead>
<tr>
<th>Group</th>
<th>Type</th>
<th>Category</th>
<th>Start Time</th>
<th>End Time</th>
<th>Min</th>
<th>Level</th>
<th>Counter Name</th>
<th>Rule</th>
<th>Instance</th>
<th>Name</th>
<th>Counter Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim</td>
<td>ArcGIS</td>
<td></td>
<td>10/17/2019 5:20 AM</td>
<td>10/17/2019 5:20 AM</td>
<td>19</td>
<td>Warning</td>
<td>Log-ERROR &gt; 0</td>
<td>Validation</td>
<td>ArcGIS GisEvent Server</td>
<td>ArcGIS GisEvent Server</td>
<td>Critical</td>
<td>ArcGIS GisEvent Server errors</td>
</tr>
</tbody>
</table>
## RCA Culprits list

### Root Cause Analysis Reports 10/17/2018 7:56 AM

<table>
<thead>
<tr>
<th>Type</th>
<th>Category</th>
<th>Last Alert</th>
<th>Level</th>
<th>Status</th>
<th>Counter Name</th>
<th>Rule</th>
<th>Counter Instance</th>
<th>Name</th>
<th>Counter Type</th>
</tr>
</thead>
</table>
| Culprit    | Database  | 10/17/2019 1:26 AM  | Critical| Closed | Code => 0      | Validation   | 10.0.2.104      | eGDB Activity| Failed Exit code or program
| Culprit    | Database  | 10/17/2019 1:26 AM  | Warning | Closed | Code => 0      | Validation   | 10.0.3.184      | eGDB Performance| Failed Exit code or program
| Culprit    | ArcGIS    | 10/17/2019 4:40 AM  | Critical| Closed | Log-ERROR > 0  | Validation   | 10.0.3.27       | ArcGIS GeoEvent Server| GeodEvent errors
| Culprit    | ArcGIS    | 10/17/2019 5:29 AM  | Critical| Closed | Portal for ArcGIS = 0 | WinService Portal | 10.0.3.282       | ArcGIS | Service not running
| Culprit    | ArcGIS    | 10/17/2019 5:30 AM  | Warning | Closed | Error > 0      | Validation   | 10.0.3.184      | WinService AGS | Service not running
| Culprit    | ArcGIS    | 10/17/2019 6:26 AM  | Critical| Closed | ArcGIS Server = 0 | WinEvent: Portal | 10.0.3.282       | WinService AGS | -
| Culprit    | ArcGIS    | 10/17/2019 6:30 AM  | Warning | Closed | Error > 0      | Validation   | 10.0.3.184      | WinEvent: AGS | -
| Culprit    | ArcGIS    | 10/17/2019 7:26 AM  | Critical| Closed | ArcGIS Data Store = 0 | WinService DataStore | 10.0.3.282       | WinEvent | Service not running
| Culprit    | ArcGIS    | 10/17/2019 7:30 AM  | Warning | Closed | Error > 0      | Validation   | 10.0.3.282      | WinEvent: DataStore | -
| Culprit    | ArcGIS    | 10/17/2019 7:30 AM  | Warning | Open   | Log-ERROR > 0  | Summary      | Hosting Server | ArcGIS | ArcGIS Errors
| Culprit    | ArcGIS    | 10/17/2019 7:56 AM  | Warning | Open   | Log-ERROR > 0  | Summary      | Hosting Server | ArcGIS | ArcGIS Errors
| Culprit    | Portal    | 10/17/2019 7:56 AM  | Critical| Open   | Status Federation > 0 | Summary | Portal | Status Machine

- Use the root cause analysis report to list culprits.
### RCA Victim list

#### Root Cause Analysis Reports 10/17/2018 7:56 AM

- **Set Time:** Today
- **Time Range:** 10/17/2018 12:00 AM to 10/17/2018 7:56 AM

<table>
<thead>
<tr>
<th>Type</th>
<th>Category</th>
<th>Last Alert</th>
<th>Level</th>
<th>Status</th>
<th>Counter Name</th>
<th>Rule</th>
<th>Counter Instance</th>
<th>Name</th>
<th>Counter Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 1:20 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Response Time (sec)</td>
<td>&gt; 3</td>
<td>Countries_Sel_Epgdb_Draw</td>
<td>Countries_Sel_Epgdb_Draw</td>
<td>gHttp</td>
<td>Show HTTP performance</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 1:20 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Response Time (sec)</td>
<td>&gt; 3</td>
<td>Countries_Sel_Epgdb_Test</td>
<td>Countries_Sel_Epgdb_Test</td>
<td>gHttp</td>
<td>Show HTTP performance</td>
</tr>
<tr>
<td>Victim</td>
<td>ArcGIS</td>
<td>10/17/2018 1:20 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Log-SEVERE</td>
<td>&gt; 9</td>
<td>Summary</td>
<td>ArcGIS Server</td>
<td>gArcGIS</td>
<td>ArcGIS Errors</td>
</tr>
<tr>
<td>Victim</td>
<td>ArcGIS</td>
<td>10/17/2018 1:20 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Log-CRITICAL</td>
<td>&gt; 9</td>
<td>Summary</td>
<td>ArcGIS Server</td>
<td>gArcGIS</td>
<td>ArcGIS Errors</td>
</tr>
<tr>
<td>Victim</td>
<td>Software</td>
<td>10/17/2018 1:20 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Error</td>
<td>&gt; 9</td>
<td>10.0.3.154</td>
<td>Wabavt AGS</td>
<td>gHTTP</td>
<td>-</td>
</tr>
<tr>
<td>Victim</td>
<td>Database</td>
<td>10/17/2018 1:40 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Code</td>
<td>&lt;= 0</td>
<td>Validation</td>
<td>eSRS Status</td>
<td>gHTTP</td>
<td>-</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 3:10 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Find String NOT</td>
<td>- 1</td>
<td>SampleWorldCities</td>
<td>SampleWorldCities</td>
<td>gHttp</td>
<td>Found negative search string</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 3:10 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Find String</td>
<td>= 8</td>
<td>SampleWorldCities</td>
<td>SampleWorldCities</td>
<td>gHttp</td>
<td>Cannot find search string</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 5:20 AM</td>
<td>Critical</td>
<td>Closed</td>
<td>Find String</td>
<td>= 1</td>
<td>Portal for ArcGIS Health</td>
<td>Portal for ArcGIS Health</td>
<td>gHttp</td>
<td>Found negative search string</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 5:20 AM</td>
<td>Critical</td>
<td>Closed</td>
<td>Find String</td>
<td>= 1</td>
<td>Portal for ArcGIS Health</td>
<td>Portal for ArcGIS Health</td>
<td>gHttp</td>
<td>Found negative search string</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 5:20 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>Content Length</td>
<td>&lt; 10069</td>
<td>Countries_Sel_Epgdb_Draw</td>
<td>Countries_Sel_Epgdb_Draw</td>
<td>gHttp</td>
<td>Invalid map</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 5:20 AM</td>
<td>Warning</td>
<td>Closed</td>
<td>JSON Error Code</td>
<td>&gt; 9</td>
<td>Countries_Sel_Epgdb_Test</td>
<td>Countries_Sel_Epgdb_Test</td>
<td>gHttp</td>
<td>JSON Error in response body</td>
</tr>
<tr>
<td>Victim</td>
<td>Web</td>
<td>10/17/2018 5:20 AM</td>
<td>Critical</td>
<td>Closed</td>
<td>Find String NOT</td>
<td>= 1</td>
<td>Countries_Sel_Epgdb_Test</td>
<td>Countries_Sel_Epgdb_Test</td>
<td>gHttp</td>
<td>Found negative search string</td>
</tr>
</tbody>
</table>
Categories

Group of counters
Site
ArcGIS Monitor site properties
API

API to access Alerts and Availability

ArcGIS Monitor API

The ArcGIS Monitor API is intended for advanced, programmatic access to data, likely through the use of scripts. For support please contact Esri.

Supported Operations:
- Generate Token
- Collections
- Alerts
- Availability

Example URL:
https://arcgismonitor.esri.com/rest/api/auth/token

POST Body Example:
```
{ "username": "Site", "password": "ArcGISMonitor" }
```

Notes:
- HTTP POST
- User Token may impact visibility. Check user security access to collections prior to using the generated token.

POST Body:
```
{"username":"Site","password":"ArcGISMonitor"}
```
Use case
Problems: Golf Courses points “disappeared” from a map
First noticed around 7 am
<table>
<thead>
<tr>
<th>ID</th>
<th>QTime</th>
<th>Time</th>
<th>Code</th>
<th>Type</th>
<th>Count/Interval</th>
<th>User</th>
<th>Machine</th>
<th>Method Name</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10/17/2018 7:20 AM</td>
<td>10/17/2018 7:15 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>2</td>
<td>10/17/2018 7:29 AM</td>
<td>10/17/2018 7:15 AM</td>
<td>SEVERE</td>
<td>-1</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>3</td>
<td>10/17/2018 7:15 AM</td>
<td>10/17/2018 7:14 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>4</td>
<td>10/17/2018 7:15 AM</td>
<td>10/17/2018 7:13 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>5</td>
<td>10/17/2018 7:15 AM</td>
<td>10/17/2018 7:12 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>6</td>
<td>10/17/2018 7:15 AM</td>
<td>10/17/2018 7:11 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>7</td>
<td>10/17/2018 7:15 AM</td>
<td>10/17/2018 7:10 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>8</td>
<td>10/17/2018 7:15 AM</td>
<td>10/17/2018 7:10 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>9</td>
<td>10/17/2018 7:15 AM</td>
<td>10/17/2018 7:09 AM</td>
<td>SEVERE</td>
<td>-1</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
<tr>
<td>10</td>
<td>10/17/2018 7:16 AM</td>
<td>10/17/2018 7:10 AM</td>
<td>SEVERE</td>
<td>9069</td>
<td>1</td>
<td></td>
<td>10.0.3.27</td>
<td>ValidateServerDataStore_Execute</td>
<td>Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connections. The connection property set was missing a required property or the property value was unrecognized. Instance not available on server.</td>
</tr>
</tbody>
</table>
Investigate “culprit” machine

Problem: ArcGIS Data Store service not running. Restarting service throws logging error.
Resolve: correct password and start ArcGIS Data Store service
What is ArcGIS Monitor?

ArcGIS Monitor is a tool specifically designed to help you analyze and optimize the health of your ArcGIS implementation throughout the lifecycle of your Enterprise GIS. ArcGIS Monitor maximizes your GIS investment by providing you with timely and insightful system metrics on the status, availability, usage, system performance, and resource usage of your Enterprise GIS. Alerts provide system administrators with real-time notifications to facilitate rapid resolution when measurements are outside of defined system thresholds. Reports with statistics can be used to visualize historical data and enhance communications among GIS, IT, business owners, and senior management.

Key components of ArcGIS Monitor
Gallery: https://arcgismonitor.maps.arcgis.com

- Tutorials
- Video
- Extensions / Tasks

https://www.arcgis.com/home/group.html?id=58d996e9b40d45439d298d14fa309534&start=1&view=list&sortOrder=asc&sortField=owner#content
ArcSOC Optimizer

- Decrease or increase instances, based on:
  - 1. historical usage
  - 2. available memory and process count
ArcSOC Optimizer

Setting min / max instances across 100 to 1000s of services in dynamic environments is challenging.
How To: Upgrade from System Monitor to ArcGIS Monitor

**Summary**

What versions of System Monitor can be upgraded?

Upgrading from System Monitor 3.x or 10.5.x can be completed by following the instructions below in the section “Upgrade from System Monitor 3.x or 10.5.x to ArcGIS Monitor”.

Upgrading from System Monitor 2.x or 1.x is not supported due to significant design changes. To move to ArcGIS Monitor 10.6, follow the instructions in the section titled “Migrate from System Monitor 2.x or 1.x to ArcGIS Monitor.”

**Procedure**

Upgrade from System Monitor 3.x or 10.5.x to ArcGIS Monitor

The monitoring service (.SM file) can be imported from 3.x in the ArcGIS Monitor 10.6 administrator. This creates a new Windows service, from which the same credentials working in 3.x can be set, and each counter type that was imported can be tested. After the test is successful, new data for those counters can be collected, if there are any extensions or tasks present, the
Installation

ArcGIS Monitor Demo Site

https://arcgismonitor.esri.com/