Motivation
ArcGIS Monitor: Why?
Optimize Your Enterprise GIS Deployments

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

- 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 Server
ArcGIS Data Store
Database
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
Overload System:

- Users
- Services

Identify typical cases
Unstable Infrastructure:
   - Network
   - NAS
   - VMWare

Identify typical cases
Identify typical cases

Bottlenecks:
- configuration
- maintenance
- workflows
Monitoring Enterprise GIS

Challenges

- Multiple administrators
- Multiple disparate monitoring/diagnostic tools
- Data collected in a **reactive** fashion: on demand and for limited time
- Correlation of data with **different timestamp** is difficult
- ArcGIS administrators do not have **access** to all tools, data and reports
- Challenging to quickly identify the **root cause** and take appropriate measures
When problems arise, what is the root cause?
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
Planning for ArcGIS Monitor deployment

- Approve MongoDB and other software prerequisites
- Identify environments and solutions to be monitored
- Select deployment option: centralized or distributed
- Prepare credentials and connectivity
- Assign ArcGIS Monitor administrator
Installation

Centralized deployment
On-premises option

ArcGIS Monitor
Minimum Sizing:
4 CPU cores, 16 GB
Additional 2 CPU, 4 GB
per Monitoring Service

Web Users
https://<AMI hostname>:443
or configurable
Token Authentication
(valid 24 hr)

ArcGIS Monitor Administrator
(must log into machine)

Encrypted passwords
27017 (configurable)

Target Environment
Windows Server
Linux Server
Web Server
ArcGIS Server
Geodatabase
Oracle
SQL Server
Amazon

Access/Secret key

HTTP or HTTPS

WMI (IWA)
SSH (Named user)
Http (token)
Odbc (Named user)

Centralized deployment
On-premises option
Use “local” monitoring services for each “environment”

Do not use one Monitoring Service for all environments

- **Pros:**
  - One server
  - Central admin

- **Cons:**
  - Longer collection times
  - CPU spikes when “concurrent” collection on one machine
Distributed deployment
Full stack monitoring
Use “remote” monitoring services for each “environment”

Multiple data centers over high latency, but managed from central location.

Users in remote datacenters should remote desktop to central data center to access System Monitor.
Register collection
Add monitoring services
Add counters

Demo:
Administrator

1. Register Collection
2. Add monitoring service
3. Add Counters
Resources
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
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 “Upgrading 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 below 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 (.mp) 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...
Categories
Web

- Response Time
- HTTP code
ArcGIS

- Server
- Portal
- GeoEvent
- GeoAnalytics
- ArcSOC Optimizer
GeoAnalytics
Database

- ArcGIS Datastore
- Oracle
- SQL Server

AWS RDS and SQL Azure coming soon
Usage

User stats

- Transactions
- Response Time
- HTTP Codes
GeoInfo
Requests per user IP
Extensions
Gallery: https://arcgismonitor.maps.arcgis.com

- Tutorials
- Video
- Extensions / Tasks
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
Alerts
Alerts: actionable information
Starting point for troubleshooting

Alerts 3/6/2018, 9:45:19 AM

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<th>ID</th>
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<th>Collection</th>
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Charts and Stats
Analyze alert groups
Details
Source
Available in 10.6.1
Alert View 3/6/2018, 10:06:42 AM

Response Time (sec)

Chart Resolution: real-time value at collection interval when query less than 12 hrs

Statistics: both chart and table reflect true statistics like min, max, percentile

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Availability
Availability is usually expressed as a percentage of uptime in a given time span, e.g. month, year:

\[ \text{Availability } (\%) = \left( \text{Total time} - \text{Downtime} \right) / \text{Total Time} \times 100\% \]

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<th>Availability %</th>
<th>Downtime per year</th>
<th>Downtime per month</th>
<th>Downtime per week</th>
<th>Downtime per day</th>
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<tbody>
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<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>
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<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>
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<tr>
<td>99% (&quot;two nines&quot;)</td>
<td>3.65 days</td>
<td>7.20 hours</td>
<td>1.68 hours</td>
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<td>99.5% (&quot;two and a half nines&quot;)</td>
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<td>3.60 hours</td>
<td>50.4 minutes</td>
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<td>99.9% (&quot;three nines&quot;)</td>
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<td>43.8 minutes</td>
<td>10.1 minutes</td>
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<td>5.04 minutes</td>
<td>43.2 seconds</td>
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<tr>
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<td>52.56 minutes</td>
<td>4.38 minutes</td>
<td>1.01 minutes</td>
<td>8.64 seconds</td>
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Availability
Aggregated view based on Critical alerts

- Downtime defined only by Critical alerts
Use case
Problems: Golf Courses points “disappeared” from a map
1. Identify “suspect” component
2. Get details
### Log View

**End:** 05/24/2018 3:46 PM  
**Start:** 05/24/2018 11:39 AM  
**Number of Records:** 229

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Investigate “culprit” machine

Problem: ArcGIS Data Store service not running. Restarting service throws logging error.
Resolve: correct password and start ArcGIS Data Store service
Verify resolution
Best practices
arcgismonitor.esri.com demo site as use case
Understand architecture and typical root causes
Understand Root Cause and Impact analysis: “culprits and victims”

“Culprit” - the most downstream failing component
“Victims” – all upstream failing components

Example 1

Example 2
Map counters to architecture components

**Web**

- Web Adaptor
- Portal for ArcGIS
- Hosting Server
- GeoEvent Server
- ArcGIS Server
- ArcGIS Data Store (relational + tile cache)

## ArcGIS Monitor Administrator

- Site@localhost
- Demo
  - Demo 34
    - Amazon 1
    - ArcGIS 2
    - DB 0
    - Ext 9
    - Http 6
      - ArcGIS Server Health
      - California_Test_Hosted
      - Hosting Server Health
      - Portal for ArcGIS Health
      - SampleWorldCities
      - SampleWorldCities_Hosted
- Portal 1
- Process 6
- RDP 0
- System 5
- Tasks 4
Map counters to architecture components

ArcGIS

ArcGIS Data Store
(relational + tile cache)

Web Adaptor

Portal for ArcGIS

Hosting Server

GeoEvent Server

ArcGIS Server
Map counters to architecture components

Infrastructure

- Web Adaptor
- Portal for ArcGIS
- Hosting Server
- GeoEvent Server
- ArcGIS Server
- ArcGIS Data Store
  (relational + tile cache)

ArcGIS Monitor Administrator

- Demo 34
  - Amazon 1
    - AWS
  - ArcGIS 2
    - DB 0
  - Ext 9
    - ArcGIS GeoEvent Server
    - AWS ALB
    - WinEvent: AGM
    - WinEvent: AGS
    - WinEvent: DataStore
    - WinEvents: Portal
    - WinService: AGS
    - WinService: DataStore
    - WinService: Portal
- Http 6
- Portal 1
- Process 6
  - 10.0.3.202-ArcGISDataStore
  - 10.0.3.184-ArcGISPortal
  - 10.0.3.154-ArcSOC
  - 10.0.3.232-mongodb
  - 10.0.3.184-postgres
  - 10.0.3.202-postgres
- RDP 0
- System 5
Start with Critical alerts

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<th>Desc</th>
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Identify “culprit” components

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- **Portal**
- **Data Store**
- **Hosting Server**
- **ArcGIS Server**
- **GeoEvent**
- **Portal**
Map “victims” to culprit candidates

Web “Health” are culprit indicators

Further investigate SampleWorldCities performance degradation
ArcGIS Monitor Demo Site

https://arcgismonitor.esri.com/
### See Us Here

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<th>WORKSHOP</th>
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<td>• Wednesday 7/11/2018</td>
</tr>
<tr>
<td>- Tuning, Testing, and Monitoring</td>
<td>• Room 08</td>
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Please Take Our Survey on the App

1. Download the Esri Events app and find your event.
2. Select the session you attended.
3. Scroll down to find the feedback section.
4. Complete answers and select “Submit.”