



# ArcGIS Performance: Tuning, Testing, and Monitoring

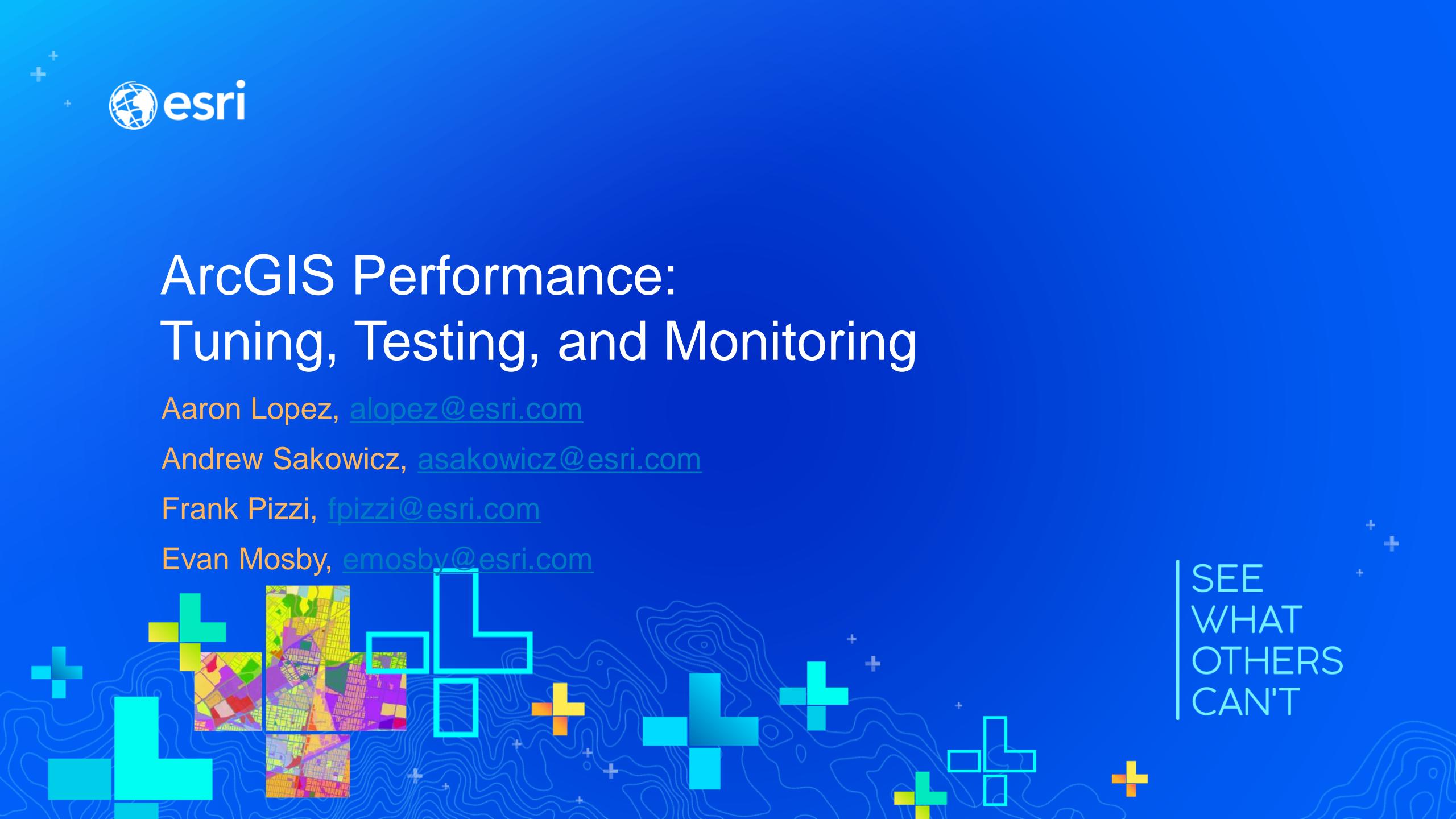
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SEE  
WHAT  
OTHERS  
CAN'T

The background of the slide features a blue-toned topographic map with contour lines. Overlaid on this map are several performance monitoring and data analysis icons, including a large green plus sign, a red minus sign, a yellow square, a blue square, and a cyan square. There are also several smaller cyan plus signs and a cyan L-shaped bracket icon. The overall theme is data analysis and performance optimization.

# **Breaks**

- **Breaks**
- **8:30 Start**
- **10:00-10:15 Break**
- **12:13:30 Lunch**
- **15:15:15 Break**
- **16:30-17:00 Questions**

# Agenda

- **Fundamentals**
- **Capacity Planning**
- **Performance tuning**
- **Performance testing**
- **Monitoring**
- **QA**

# Introduction

- **Roles**
- **Workshop expectations**

# Fundamentals

## Prerequisite knowledge

- Enterprise architecture
- Enterprise administration
- Performance tuning
- Capacity
- Statistics

# Performance

- Speed, e.g. response time (seconds)



# Scalability

- The ability to increase output and maintain acceptable performance



# Capacity

- The maximum level of output the system can produce, e.g.
- X cars/sec
- X maps/sec



At capacity



Over capacity

# Bottleneck

- Resource(s) limiting the performance or capacity



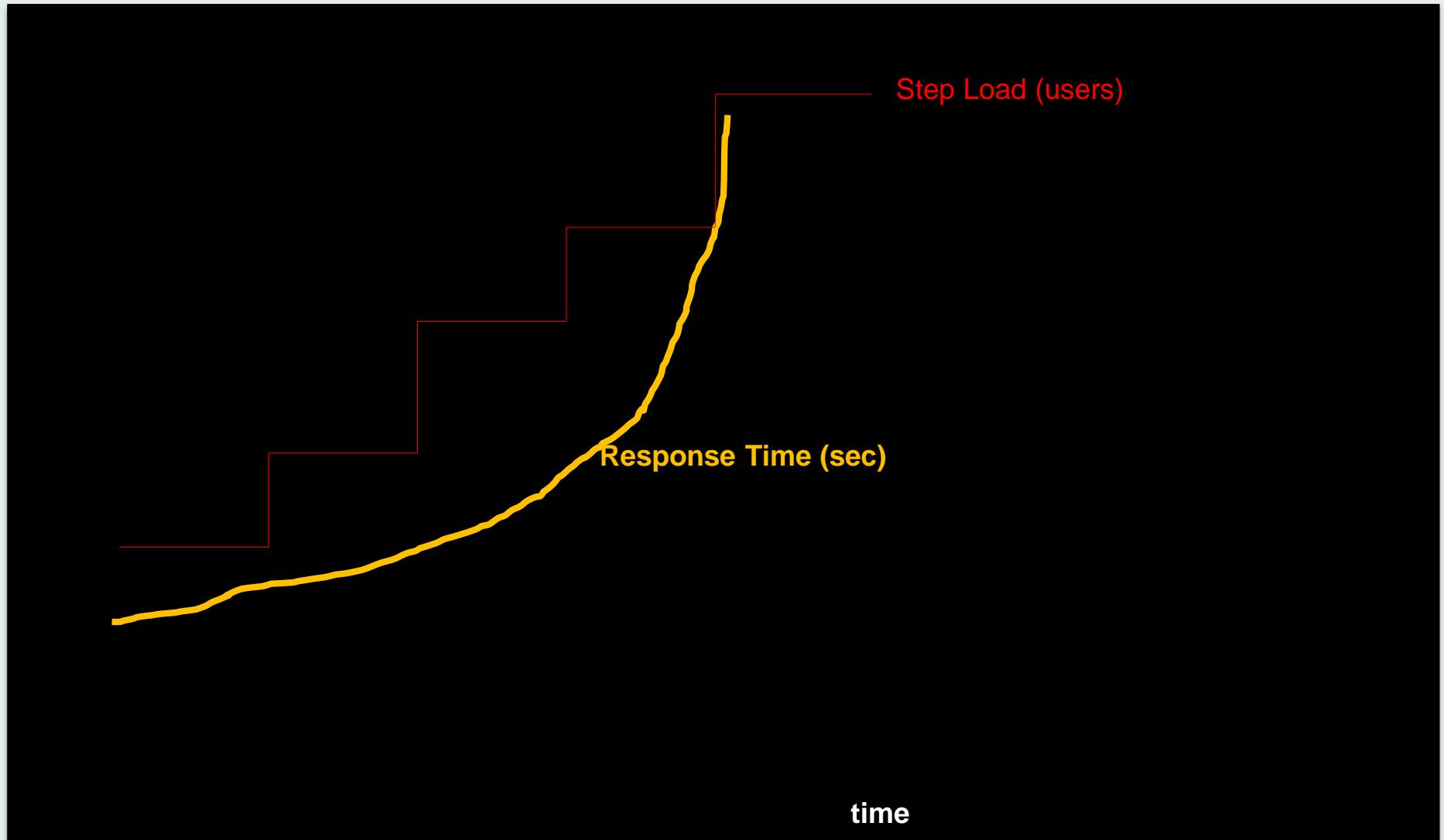
Not bottleneck



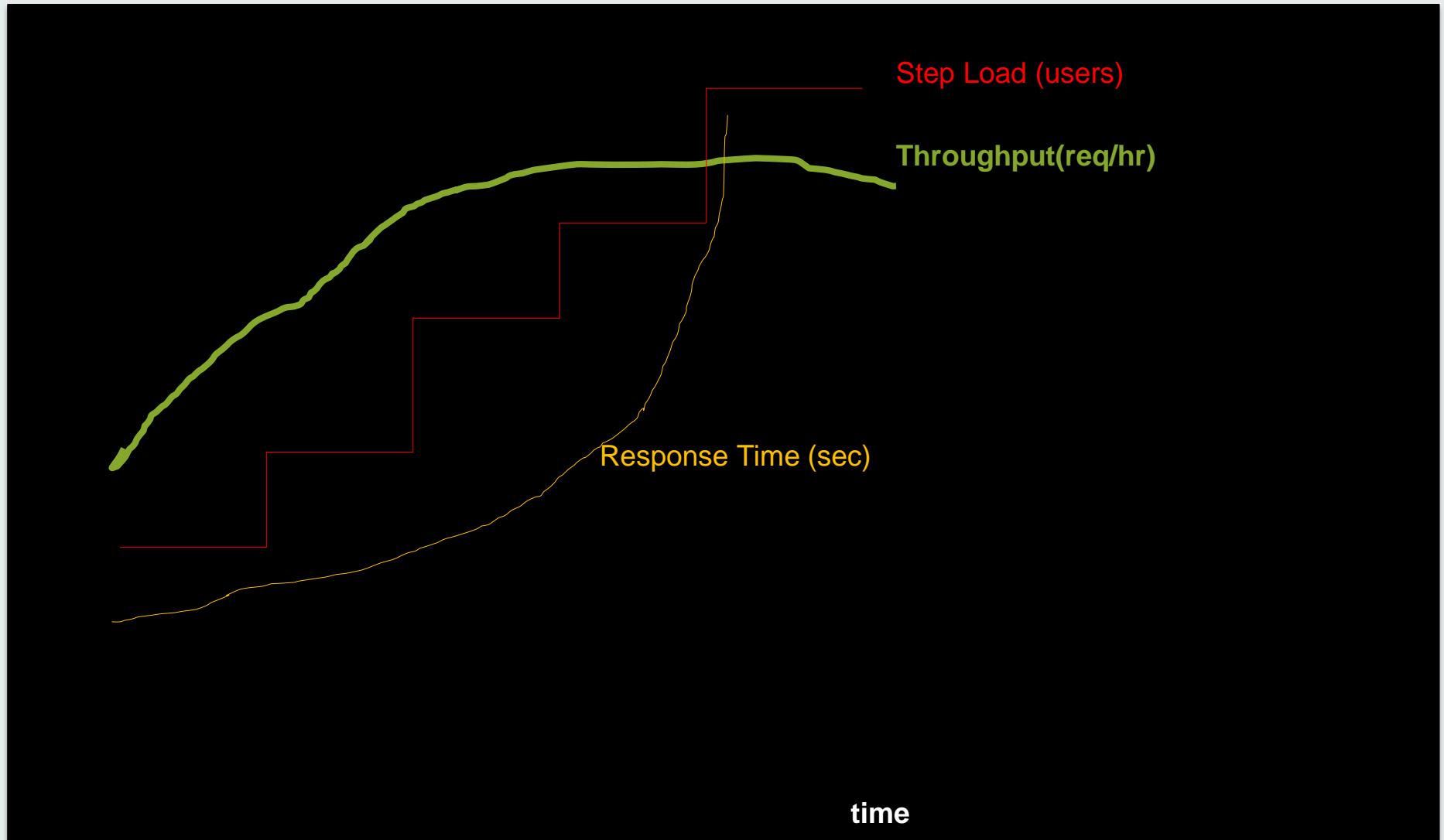
bottleneck

Think of :  
Lanes -as CPU processor  
Toll -as ArcGIS Server instances  
Cars -as map requests

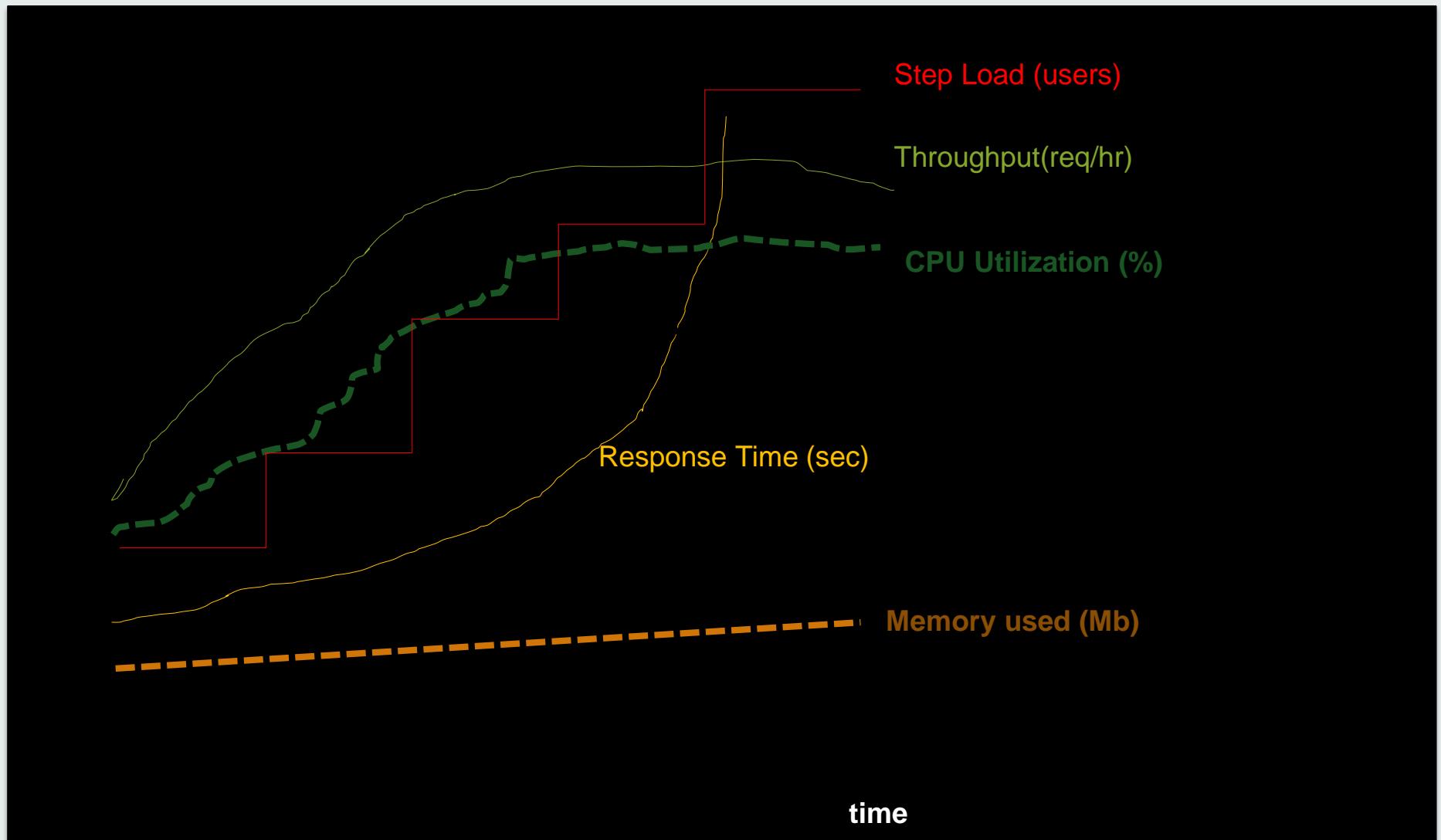
# Step Load and Response Time



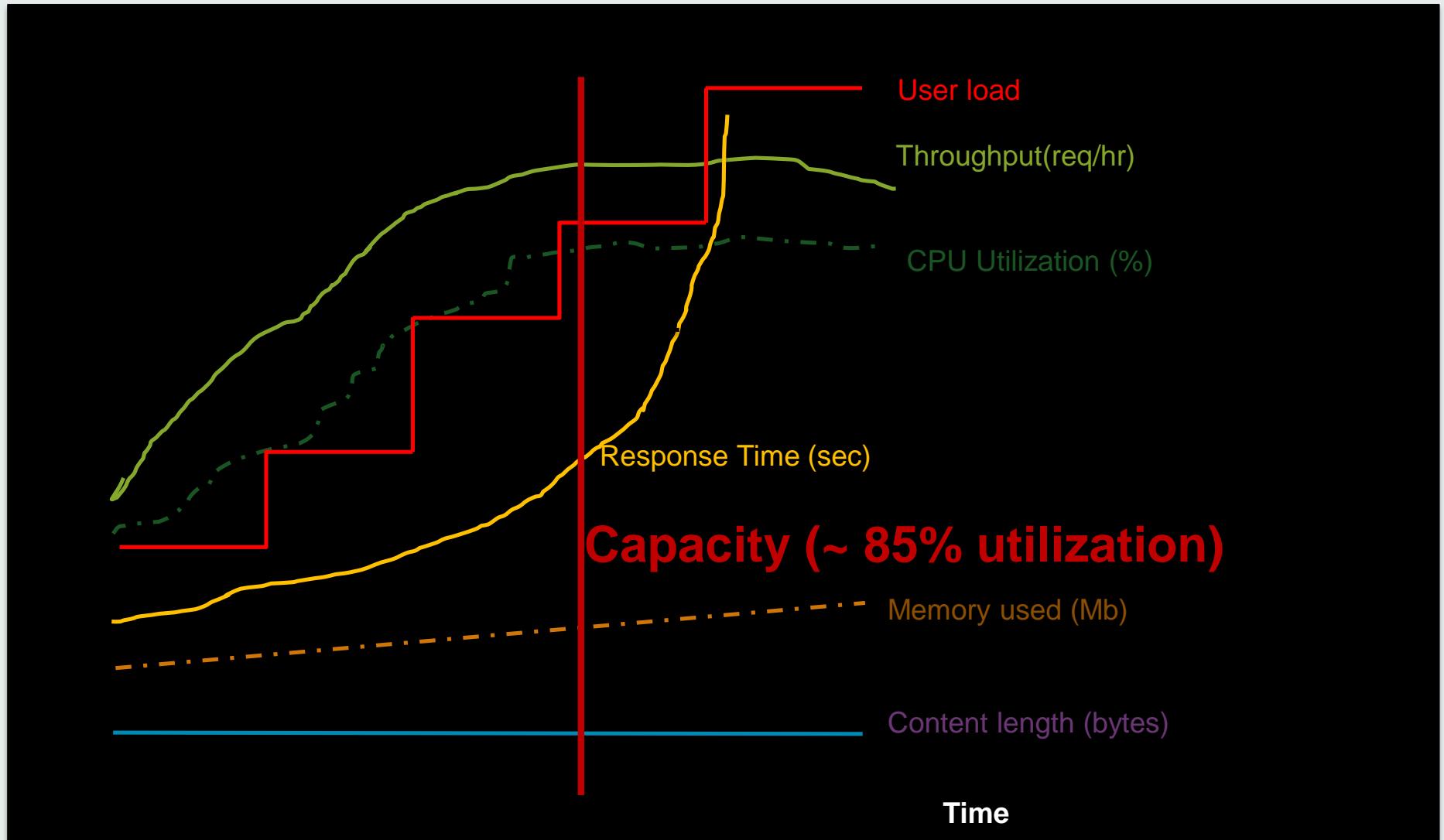
# Throughput (request/hr)



# Resource utilization: CPU, Memory, Network

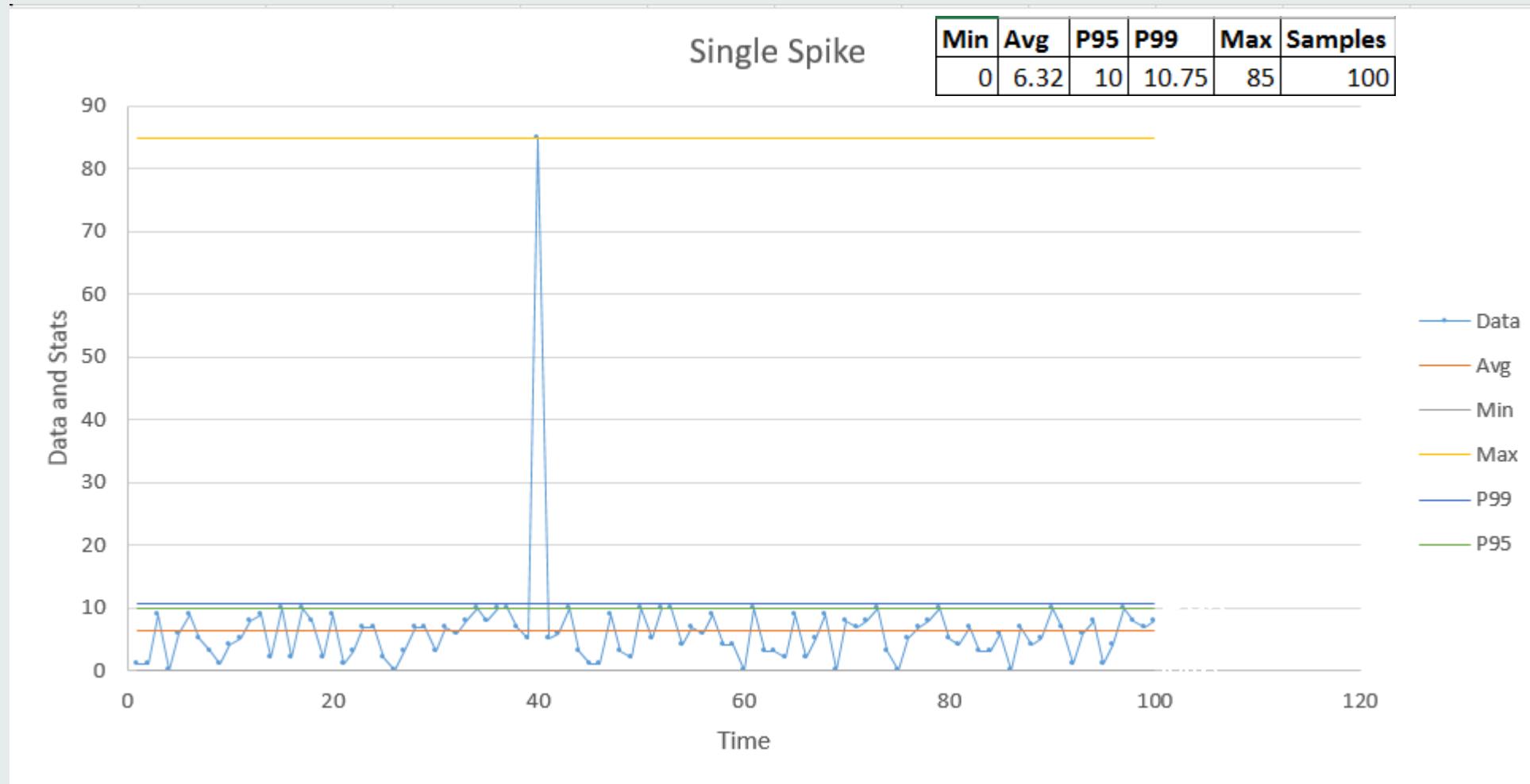


# Capacity



# Single Spike

Max very high while other stats low



# Capacity Planning

# Scaling Direction

- **Scaling up**
  - Adding resources to your existing machine
  - Usually RAM
  - Commonly, due to lots of service instances
- **Scaling out**
  - Add more machines
  - Usually to get more compute power, sometimes for high availability
  - Commonly, due to increased user demand



# Provide sufficient hardware resources

Most systems are CPU bound

**GIS Systems are bound by:**

1. CPU - typically
2. Memory – when large number of services
3. Disk – Image Service, Synchronization
4. Network – low bandwidth deployment
5. Poorly configured virtualization can result in 30% or higher performance degradation

# Infrastructure

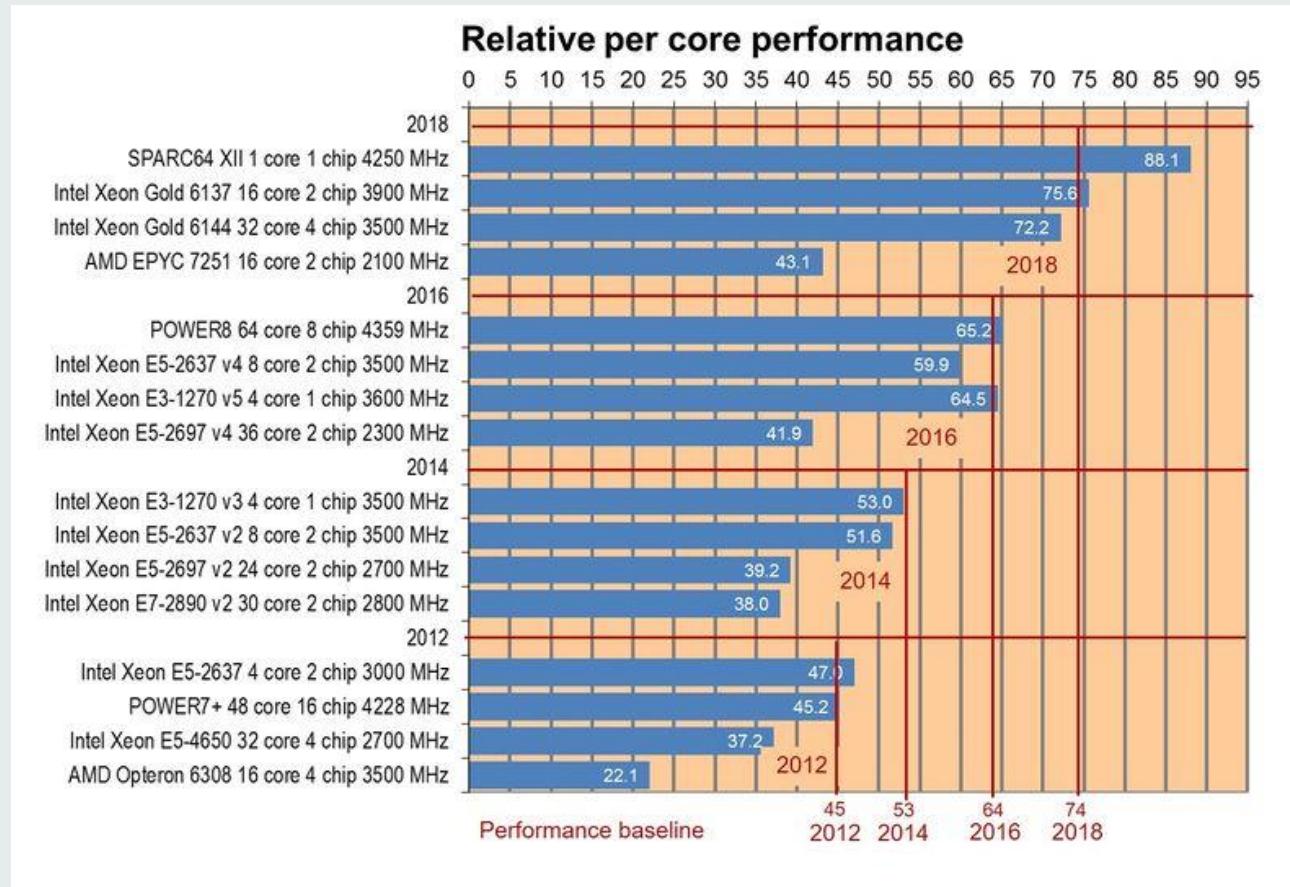
## Memory requirements

Item	Low	High
ArcSOC Map	50 MB	500 MB
ArcSOC Image	20 MB	1,024 MB
ArcSOC GP	100 MB	2,000 MB
XenApp Session	500 MB	1.2 GB
Database Session	10 MB	75 MB
Database Cache	200 MB	200 GB

*Wide ranges of memory consumptions*

# Server CPU Spec

- Performance is impacted by SPEC Rate Per Core
- Scalability is impacted by number of cores and SPEC Rate Per Core



# Network Planning

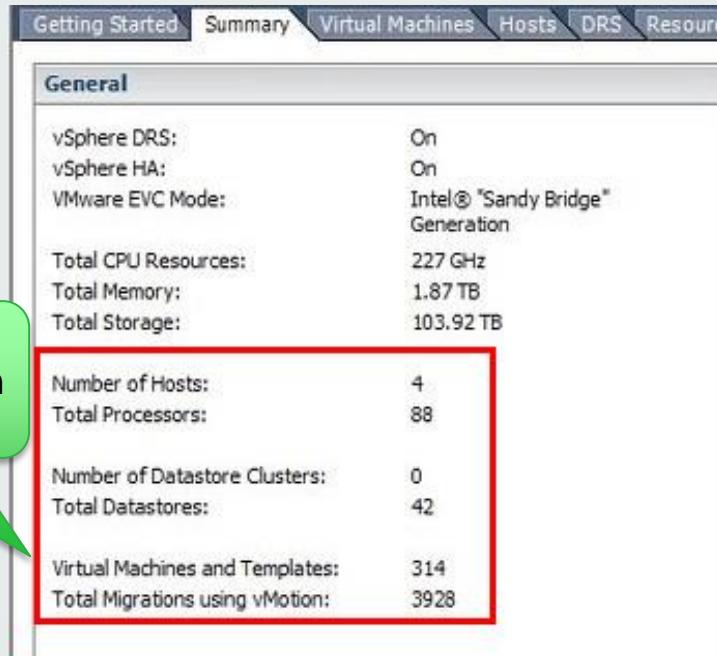
Establish and Configure DNS Appropriately!

```
C:\Users>tracert  
Tracing route to  
over a maximum of 30 hops:  
1  55 ms  55 ms  55 ms  
2  55 ms  55 ms  55 ms  
3  115 ms  58 ms  62 ms  
4  111 ms  111 ms  112 ms  
5  110 ms  109 ms  110 ms  
6  110 ms  113 ms  110 ms  
7  109 ms  109 ms  109 ms
```

Trace Route: LA Workstation → Phoenix DNS  
LA Database Server



# VM – watch out for overallocations



Getting Started Summary Virtual Machines Hosts DRS Resources

**General**

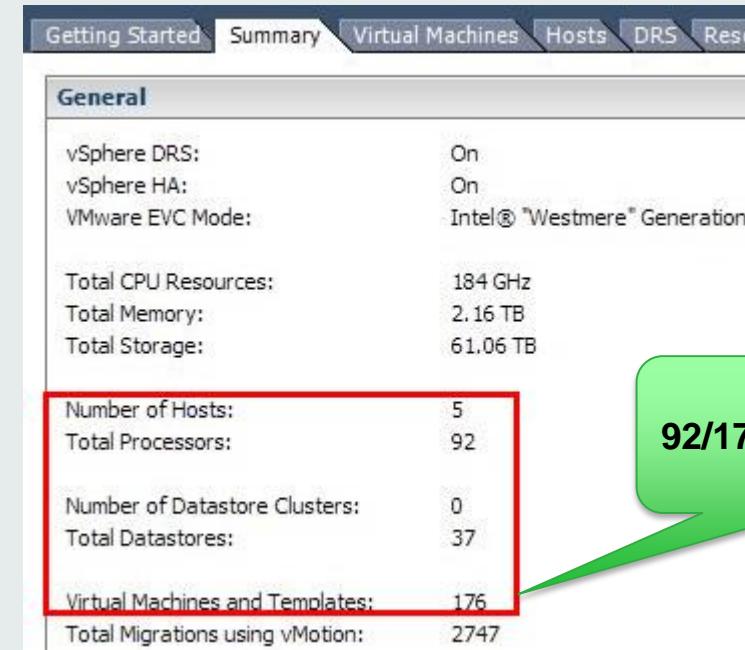
vSphere DRS:	On
vSphere HA:	On
VMware EVC Mode:	Intel® "Sandy Bridge" Generation
Total CPU Resources:	227 GHz
Total Memory:	1.87 TB
Total Storage:	103.92 TB

Number of Hosts: 4  
Total Processors: 88

Number of Datastore Clusters: 0  
Total Datastores: 42

Virtual Machines and Templates: 314  
Total Migrations using vMotion: 3928

$$88/314=0.28 \text{ cpu/vm}$$



Getting Started Summary Virtual Machines Hosts DRS Resources

**General**

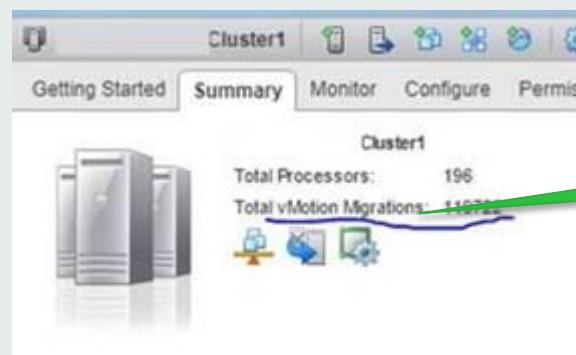
vSphere DRS:	On
vSphere HA:	On
VMware EVC Mode:	Intel® "Westmere" Generation
Total CPU Resources:	184 GHz
Total Memory:	2.16 TB
Total Storage:	61.06 TB

Number of Hosts: 5  
Total Processors: 92

Number of Datastore Clusters: 0  
Total Datastores: 37

Virtual Machines and Templates: 176  
Total Migrations using vMotion: 2747

$$92/176=0.52 \text{ cpu/vm}$$



Cluster1 Getting Started Summary Monitor Configure Permissions

**Cluster1**

Total Processors:	196
Total vMotion Migrations:	119722

119722 vMotion Migrations

# Test Results as Input into Capacity Planning

Service time and Mb/tr models as input into capacity planning

$$ST = \frac{\#CPU \times 3600 \times \%CPU}{TH \times 100}$$

$$TH = \frac{Users}{ResponseTime + ThinkTime}$$

ST - CPU service time (sec)

#CPU – number of physical CPU cores

%CPU - percent CPU

TH – throughput (tr/sec)

# CPU capacity

1. User load: Concurrent users or throughput
2. Operation CPU service time (model)–performance
3. CPU SpecRate

$$\#CPU_t = \frac{ST_b \times TH_t \times 100}{3600 \times \%CPU_t} \times \frac{SpecRatePerCPU_b}{SpecRatePerCPU_t}$$

subscript t = target

subscript b = benchmark

ST = CPU service time

TH = throughput

%CPU = percent CPU

# Network capacity

## Network transport time

- **Required bandwidth**
  - Response size
  - Number of transactions

$$Mbps = \frac{TH \times Mbits / req}{3600}$$

- **Network transport time**
  - Response size
  - Effective bandwidth

$$Transport(sec) = \frac{Mbits / req}{Mbps - Mbps_{used}}$$

- All Built into System Designer

# Performance Factors

## Network transport time

- **Impact of service and return type on network transport time**
  - **Compression**
  - **Content, e.g., Vector vs. Raster**
  - **Return type, e.g., JPEG vs. PNG**

		Network Traffic Transport Time (sec)								
Application Type	Service/Op	Content	Return Type	Mb/Tr	56 kbps	1.54 Mbps	10 Mbps	45 Mbps	100 Mbps	1 Gbps
ArcGIS Desktop	Map	Vector		10	178.571	6.494	1.000	0.222	0.100	0.010
Citrix/ArcGIS	Map	Vector+Image	ICA Comp	1	17.857	0.649	0.100	0.022	0.010	0.001
Citrix/ArcGIS	Map	Vector	ICA Comp	0.3	5.357	0.195	0.030	0.007	0.003	0.000
ArcGIS Server	Map	Vector	PNG	1.5	26.786	0.974	0.150	0.033	0.015	0.002
ArcGIS Server	Image		JPG	0.3	5.357	0.195	0.030	0.007	0.003	0.000
ArcGIS Server	Map Cache	Vector	PNG	0.1	1.786	0.065	0.010	0.002	0.001	0.000
ArcGIS Server	Map Cache	Vector+Image	JPG	0.3	5.357	0.195	0.030	0.007	0.003	0.000

# Operation Capacity Calculator

- [OperationCapacityCalculator.xlsx](#)

Benchmark input:		
Response Time (sec)	1.00	sec
%CPU of Rt (enter 100 when CPU is used during the entire RT time)	90%	
CPU Service Time (sec) <sub>b</sub>	0.90	sec
Mb/ArcSOC process	0.00	
Mbits/tr <sub>b</sub>	1.50	Mbits/tr
SpecRate <sub>b</sub> PerCPU	40	
Target solution input:		
Users	10.00	users
Think Time (sec) <sub>b</sub>	0.00	sec
SpecRate <sub>t</sub> PerCPU	40	
%CPU	90	%
TH <sub>t</sub>	36,000	tr/hr
Output:		
#CPU <sub>t</sub>	10.00	CPU cores
Mbps	15.00	Mbps
	user required input	

$$\#CPU_t = \frac{ST_b \times TH_t \times 100}{3600 \times \%CPU_t} \times \frac{SpecRatePerCPU_b}{SpecRatePerCPU_t}$$

$$TH_t = \frac{Users_t \times 3600}{RT_t + Think_t}$$

$$Mbps_t = \frac{TH_t \times Mbitsptr_b}{3600}$$

ST—Service time

RT - Response time

Q - Queue time

#CPU - Number of CPU cores

%CPU - Percentage of CPU utilization (Typically a target threshold is set between 85% and 95%).

TH - Maximum throughput

Think - Assumed think time (sec.) between transactions

Users - User load

b (subscripted)—Benchmarked inputs

t (subscripted)—Target outputs

[SpecRate—SpecRate CINT 2006 benchmarked system \(See <http://www.spec.org/cpu2006/results/cint2006.html>.\)](http://www.spec.org/cpu2006/results/cint2006.html)

Fundamental Laws

[http://www.cs.washington.edu/homes/lazowska/qsp/Images/Chap\\_03.pdf](http://www.cs.washington.edu/homes/lazowska/qsp/Images/Chap_03.pdf)

# Workflow Capacity calculator

## Utility Network example

- [WorkflowCapacityCalculator.xlsx](#)

users		100									
		client rendering (% of RT)	0%								
		AGS ST CPU (% of RT)	85% DO NOT EDIT								
		DB ST CPU (% of RT)	15%								
ID	Operation Name	RT(sec)	Occurance	Think(sec)	(rt+think)*occ	TH tr/hr	AGS ST(sec)	DB ST(sec)	AGS cores	DB cores	Total cores
1	New Version Window	0.60	1	6	6.60	178	0.51	0.09	0.03	0.00	0.03
2	Create New Version	23.50	1	6	29.50	178	19.98	3.53	0.99	0.17	1.16
3	Navigational Bookmark	11.92	1	10	21.92	178	10.13	1.79	0.50	0.09	0.59
4	Pan & Zoom	2.11	20	6	162.13	3555	1.79	0.32	1.77	0.31	2.08
5	Select By Attribute	3.40	2	30	66.80	355	2.89	0.51	0.29	0.05	0.34
5	Trace	20.00	2	10	60.00	355	17.00	3.00	1.68	0.30	1.97
5	Pan & Zoom (cache)	0.00	5	6	30.00	889	0.00	0.00	0.00	0.00	0.00
6	Edit 1: Create PriResidentialUG / Transformer / Meter	3.85	10	30	338.47	1777	3.27	0.58	1.61	0.28	1.90
7	Pan & Zoom	2.11	5	6	40.53	889	1.79	0.32	0.44	0.08	0.52
8	Pan & Zoom (cache)	0.00	15	6	90.00	2666	0.00	0.00	0.00	0.00	0.00
9	Edit 2: Create PriResidentialUG / Transformer / Meter	3.85	10	30	338.47	1777	3.27	0.58	1.61	0.28	1.90
10	Pan & Zoom	2.11	5	6	40.53	889	1.79	0.32	0.44	0.08	0.52
11	Pan & Zoom (cache)	0.00	15	6	90.00	2666	0.00	0.00	0.00	0.00	0.00
12	Edit 3: Create PriResidentialUG / Transformer / Meter	3.85	10	30	338.47	1777	3.27	0.58	1.61	0.28	1.90
13	Validate	8.31	2	15	46.61	355	7.06	1.25	0.70	0.12	0.82
14	Save	0.42	3	6	19.27	533	0.36	0.06	0.05	0.01	0.06
15	Close Pro	0.12	1	6	6.12	178	0.10	0.02	0.01	0.00	0.01
workflow pacing (sec)			1	300	300.00	19196			11.73	2.07	13.80
workflow duration (min)					28.76		avg ST		2.20	0.39	
workflow duration+pacing (min)					33.76	DO NOT					
TH workflow/hour					177.74						

1. Calculate Workflow throughput based on the number of active users and the frequency at which they perform work:

$$TH_{\text{workflow}} = \frac{\text{ActiveUsers}_t}{\text{WorkflowDuration}_t + \text{WorkflowPacing}_t}$$

- **ActiveUsers<sub>t</sub>**—the number of users in the Peak Planning Period that are engaged in the Workflow at the rate described by the Workflow Pacing.
- **WorkflowDuration<sub>t</sub>**—the length of time it takes to complete a Workflow. See the formula below.
- **WorkflowPacing<sub>t</sub>**—the interval between Workflows. In some environments, the interval between workflows may be zero. That would mean that away. In other cases, even in the Peak Planning Period, there is a delay between workflow iterations to file paperwork, confer with colleagues, or time.

$$\text{WorkflowDuration}_t = \sum ((\text{OperationRT}_t + \text{OperationThinkTime}_t) \times \text{Occurrence}_t)$$

This formula establishes the Workflow duration used in the calculation of the Throughput demand.

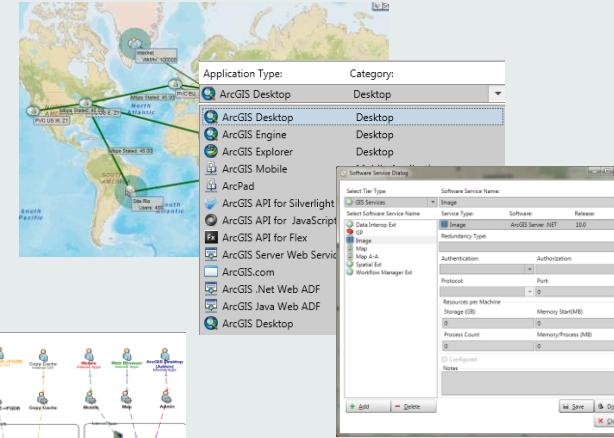
peration (e.g. "ExportMap") to complete. This is calculated by System Designer based on the Service Structure (or the "Stated Delay" that is stipulated).  
een Operations. For example, with many Desktop workflows it is commonly assumed that users le workflow, that a given Operation happens. For example, a Workflow might typically cause a ma Operation.

$$TH_t = TH_{\text{workflow}} \times \text{Occurrence}_t$$

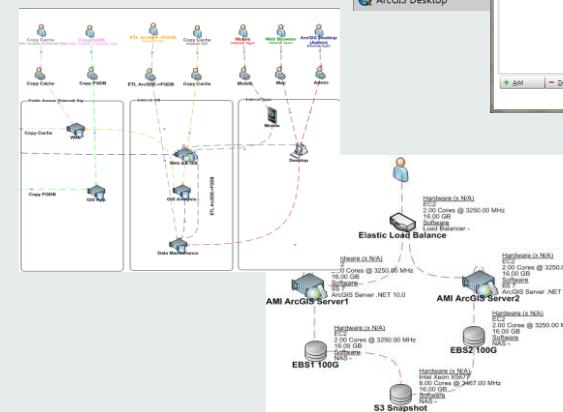
# System Designer - what is it?

A tool for Solution Architecture design

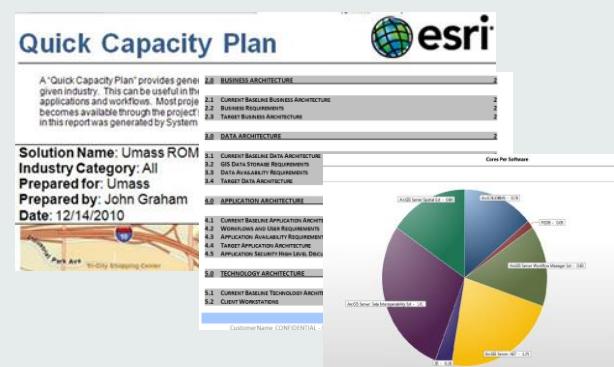
- Gathering requirements



- Designing
- Capacity: CPU, Network, Memory



- Reporting



# System Designer output

System Designer - UC2015 - (AVWORLD\andr3665) Solution: << Default Solution >>

Home Administration

Project Open Solutions View

Templates Map Dashboard Visio Reports

Applications Network Software Hardware

Sites Workflows

Configure Models Tools Calculate Charts Excel

Capacity

Design

Reference

Navigation Project: UC2015 Solutions CapacityTestSampleWorldCity Applications Desktop Mobile Web Sites Data Center Users

Capacity Model Workflows Operations Hardware Network Software License and Cost

Valid Config Model Workflow Operation Error Service Type Wkf/hr Active Users Pacing(sec) Load Factor % Op/hr Calc Occ RtMax(sec) RtMax Calc(sec) Th

Users 79,366 0 0.00 0 79,366 1 5.0 0.13

Model Review Model Assigned

Selected Model

Service Type: None Model Name: None

Model Function Tier Modified Service Time(sec) CPU Queue(sec) CPU Cores Calc Modified Mb/Op Mbps Calc Network Queue(sec) Server Hardware

Web Browser	Client		0.00	0.00	0.00	0.00	0.00	0.00	Users-Deskt
Map Service	GIS Services		0.120	0.013	2.50	0.00	0.00	0.00	Data Center

System Designer - UC2015 - (AVWORLD\andr3665) Solution: << Default Solution >>

Home Administration

Project Open Solutions View

Templates Map Dashboard Visio Reports

Applications Network Software Hardware

Sites Workflows

Configure Models Tools Calculate Charts Excel

Capacity

Design

Reference

Navigation Project: UC2015 Solutions CapacityTestSampleWorldCity Applications Desktop Mobile Web Sites Data Center Users

Capacity Model Workflows Operations Hardware Network Software License and Cost

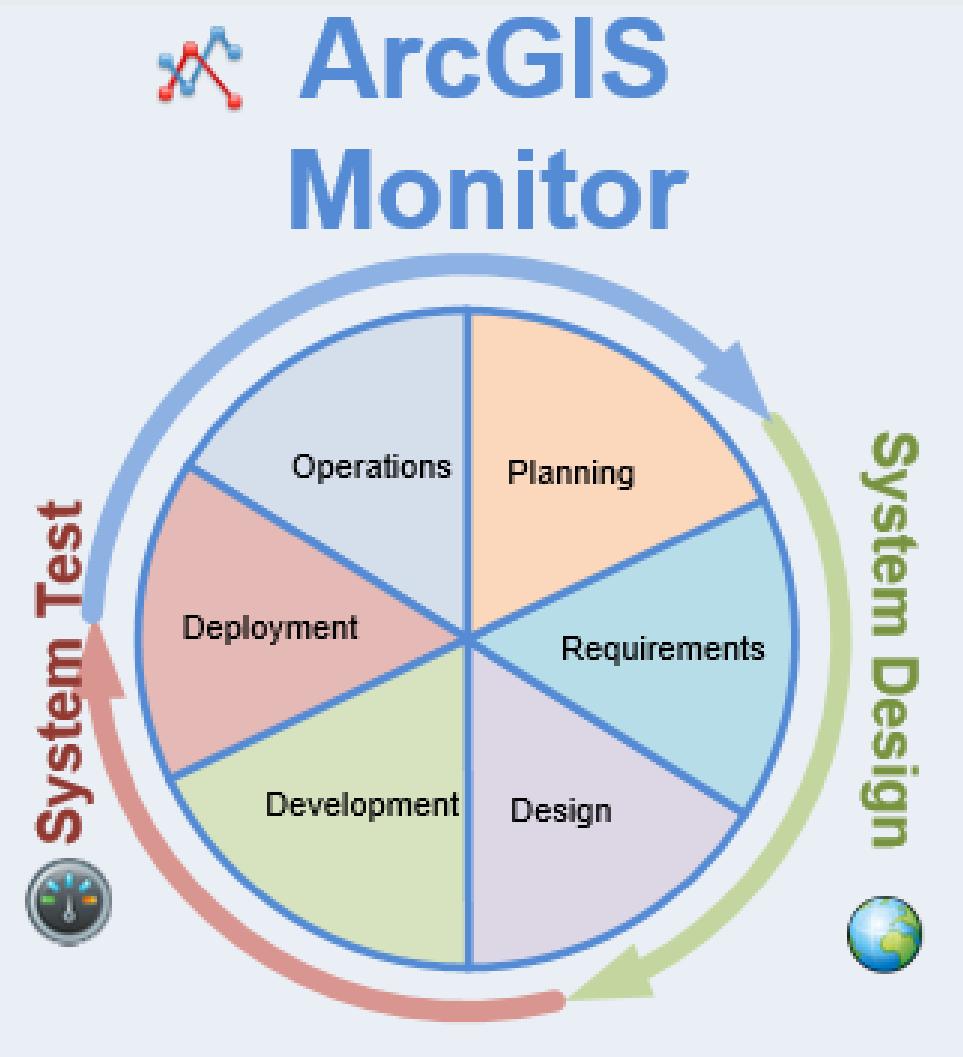
Capacity Role Vendor Model OS Virtual Calculate CPU Cores Util % Max Util % SpecRate/Core CPU Cores Calc C

Capacity	Role	Vendor	Model	OS	Virtual	Calculate	CPU Cores	Util %	Max Util %	SpecRate/Core	CPU Cores Calc	C
Data Center												
Desktop	Desktop	Esri	Generic System	Vendor OS			0	0.00	80.00	30.00	0.00	
Server	Server	Dell Inc.	PowerEdge T110 II (Intel Xeon E3-1230, 3.20 GHz)	Windows Server 2008 R2 64-bit	●	✓	4	62.50	80.00	37.00	2.50	
Users												
Desktop	Desktop	Esri	Generic System	Vendor OS			0	0.00	80.00	30.00	0.00	
Server	Server	Dell Inc.	PowerEdge R210 II (Intel Xeon E3-1280V2, 3.60 GHz)	Windows Server 2008 R2 64-bit	○	✓	4	0.00	80.00	48.00	0.00	

# **Process, Tools, Value**

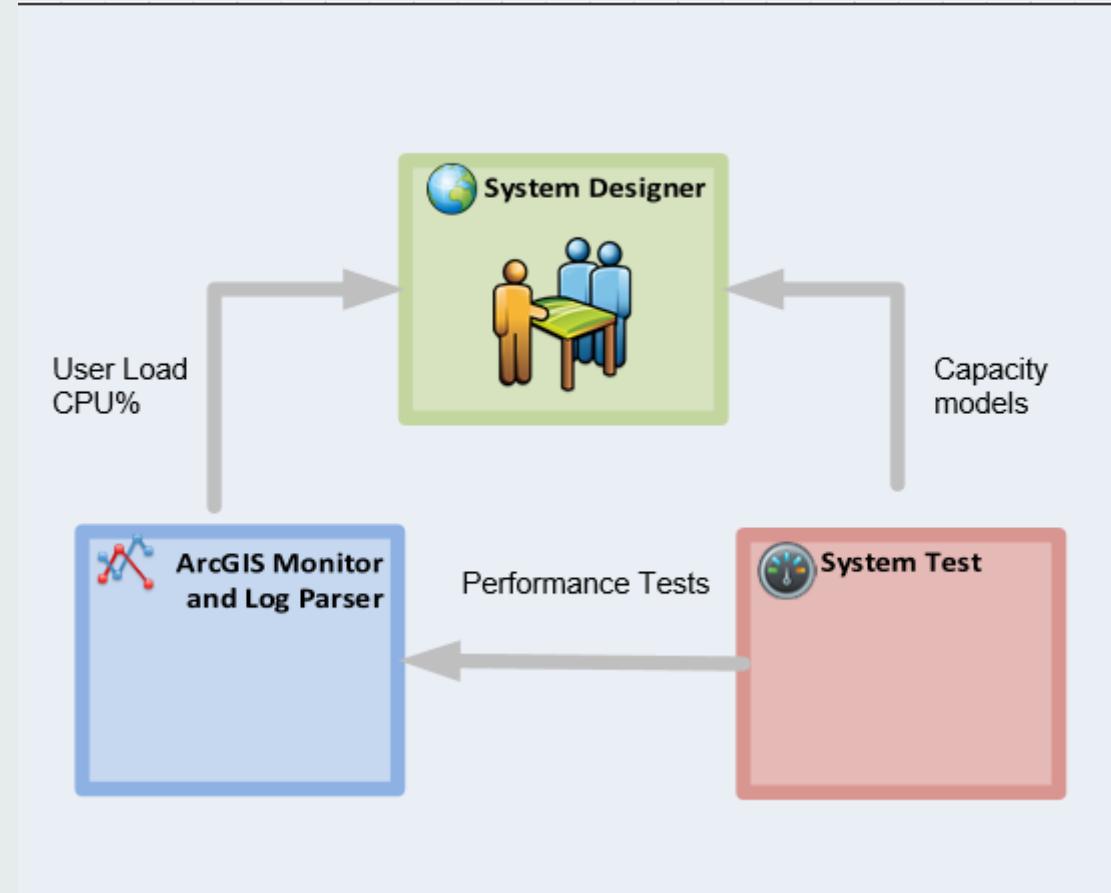
## Process and tools

### Esri tools



# Process and tools

## Esri tools



# Tools download location

- **ArcGIS Monitor**

- <https://my.esri.com/>

- **Others**

- <http://www.arcgis.com>
  - **owner:EnterpriseImp**
  - **Show ArcGIS Desktop Content**

The screenshot shows the ArcGIS search results page with the following details:

- Header:** ArcGIS, FEATURES, PLANS, GALLERY, MAP, HELP, SIGN IN, owner:EnterpriseImp (search bar circled in yellow).
- Section:** Search Results
- Show Filter:** All Results (Maps, Layers, Apps, Tools, Files), Show ArcGIS Desktop Content (checkbox checked, circled in yellow).
- Search Results:** 6 results
- System Designer:** A comprehensive tool for designing and capacity planning of GIS solutions. It is developed by Professional Services and it is a part of Professional Services consulting practice. Desktop Application Template by EnterpriseImp, Last Modified: June 18, 2014, 5 ratings, 10 comments, 2,601 downloads.
- System Monitor:** A tool for monitoring and analyzing your enterprise GIS system. It is developed by Professional Services and it is a part of Professional Services consulting practice. Desktop Application Template by EnterpriseImp, Last Modified: June 30, 2014, 6 ratings, 18 comments, 2,619 downloads.
- System Test:** A performance and load testing tool designed specifically for testing gis services and applications. It is developed by Professional Services and it is a part of Professional Services consulting practice. Desktop Application Template by EnterpriseImp, Last Modified: July 4, 2014, 2 ratings, 8 comments, 1,848 downloads.
- mxdperfcstat:** An ArcGIS Engine command line tool to diagnose typical mxd performance problems. Supports ArcGIS 9.3, 10, 10.1, 10.2 versions. Desktop Application Template by EnterpriseImp, Last Modified: December 20, 2013, 3 ratings, 0 comments, 1,290 downloads.

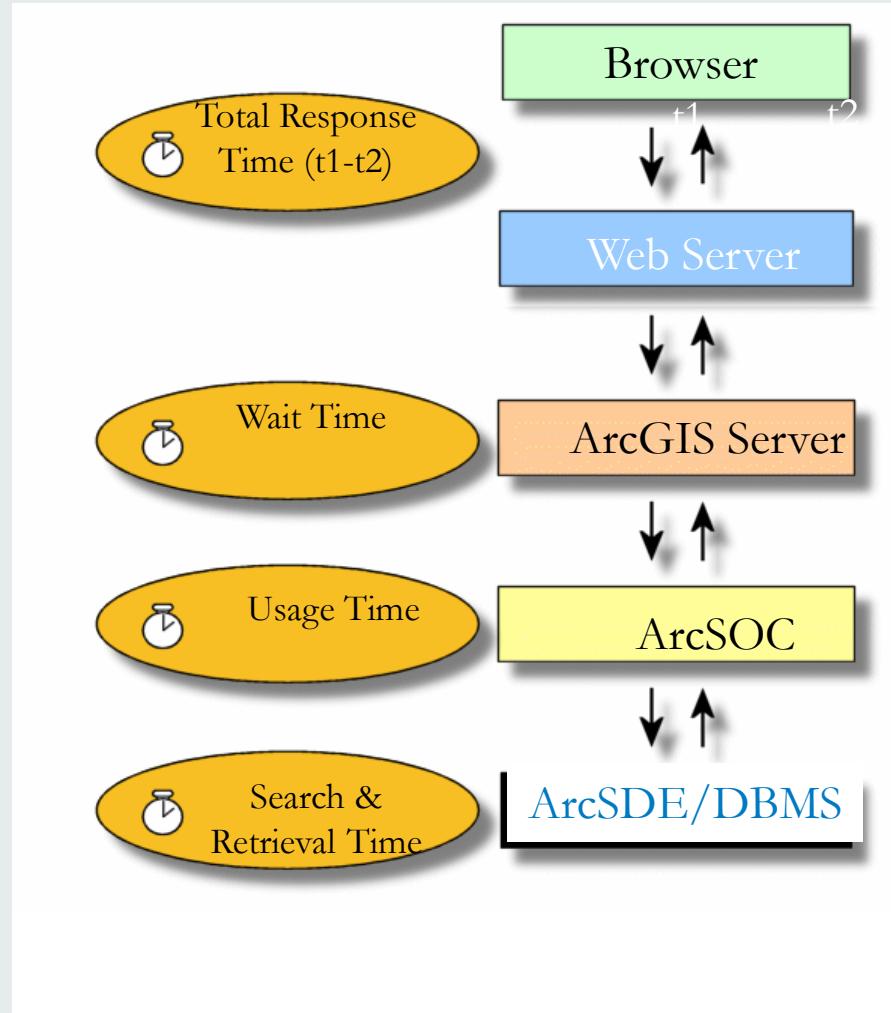
# Enterprise Implementation Maturity Model

Level	Architectural Design and Capacity Planning	Performance and Scalability Testing	Monitoring	Trend Analysis and Quantification
0	No	No	No	No
1	Yes	No	No	No
2	Yes	Yes	No	No
3	Yes	Yes	Yes	No
4	Yes	Yes	Yes	Yes

# Tuning

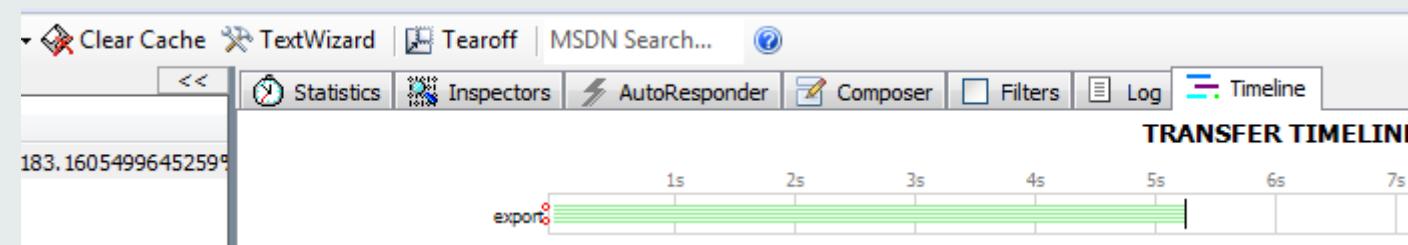
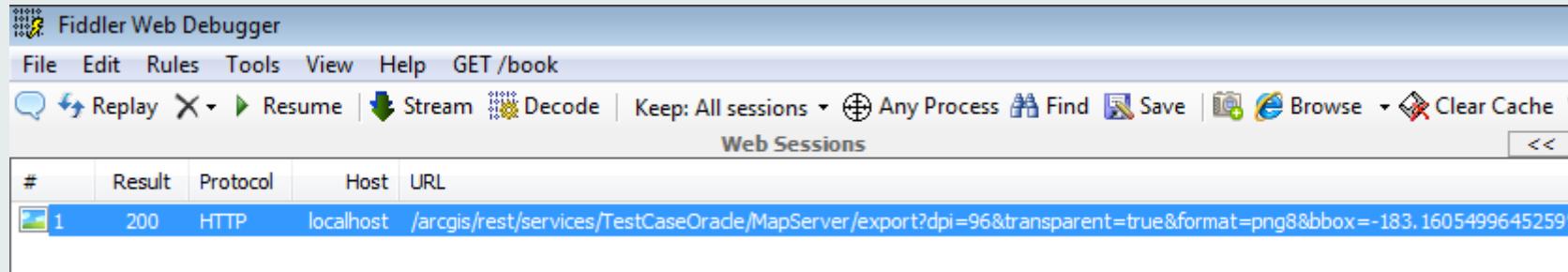
# Tuning methodology

Profile each tier starting from the top



# Fiddler

Fiddler measurement approximately 5.2 seconds



# Mxdperfstat

<http://www.arcgis.com/home/item.html?id=a269d03aa1c840638680e2902dadecac>

Item	At Scale	Layer Name	Refresh Time (sec)	Recommendations	Features	Vertices	Labeling	Geography Phase (sec)	Graphics Phase (sec)	Cursor Phase (sec)	DBMS CPU	DBMS LIO
1	167,935,665	SDE.GridPoint	4.75	run DBMS trace: oraCPU=4.74; run DBMS trace, check oracle execution plan: oraLIO=130936; check if index exist for query def attributes;	1,998		False	4.74	.00	4.56	4.74	130,936

DBMS LIO	DBMS PIO	Source	LayerType	Layer Spatial Reference	LayerQueryDef
130,936		esriDBMS_Oracle,asakowicz,sde:oracle\$asakowicz:1521/gis2,sde	esriGeometryPoint	GCS_WGS_1984	ID<1000

# Oracle Trace

## Compare elapsed time

```
SQL ID: 6p20xrg10fw4n Plan Hash: 569628948
SELECT  V_45.st_SHAPE$, V_45.OID,  V_45.st_points,V_45.st_numpts,
        V_45.st_entity,V_45.st_minx,V_45.st_miny,V_45.st_maxx,V_45.st_maxy,
        V_45.st_minz,V_45.st_maxz,V_45.st_minm,V_45.st_maxm,V_45.st_area$,
        V_45.st_len$,V_45.st_rowid
FROM
<SELECT b.OID,b.GX,b.GY,b.ID,1 st_SHAPE$ ,b.SHAPE.points as st_points,
        b.SHAPE.numpts as st_numpts,b.SHAPE.entity as st_entity,b.SHAPE.minx as
        st_minx,b.SHAPE.miny as st_miny,b.SHAPE.maxx as st_maxx,b.SHAPE.maxy as
        st_maxy,b.SHAPE.minz as st_minz,b.SHAPE.maxz as st_maxz,b.SHAPE.minm as
        st_minm,b.SHAPE.maxm as st_maxm,b.SHAPE.area as st_area$,b.SHAPE.len as
        st_len$,b.rowid as st_rowid FROM SDE.GridPoint b WHERE
        SDE.ST_EnvIntersects(b.SHAPE,:1,:2,:3,:4) = 1 AND b.OID NOT IN <SELECT /*+
        HASH_AJ */ SDE_DELETE_ROWS_ID FROM SDE.D45 WHERE DELETED_AT IN <SELECT
        l.lineage_id FROM SDE.state_lineages l WHERE l.lineage_name =
        :lineage_name1 AND l.lineage_id <= :state_id1) AND SDE_STATE_ID = 0> UNION
        ALL <SELECT a.OID,a.GX,a.GY,a.ID,2 st_SHAPE$ ,a.SHAPE.points as st_points,
        a.SHAPE.numpts as st_numpts,a.SHAPE.entity as st_entity,a.SHAPE.minx as
        st_minx,a.SHAPE.miny as st_miny,a.SHAPE.maxx as st_maxx,a.SHAPE.maxy as
        st_maxy,a.SHAPE.minz as st_minz,a.SHAPE.maxz as st_maxz,a.SHAPE.minm as
        st_minm,a.SHAPE.maxm as st_maxm,a.SHAPE.area as st_area$,a.SHAPE.len as
        st_len$,a.rowid as st_rowid FROM SDE.A45 a,SDE.state_lineages SL WHERE
        SDE.ST_EnvIntersects(a.SHAPE,:5,:6,:7,:8) = 1 AND (a.OID, a.SDE_STATE_ID)
        NOT IN <SELECT /*+ HASH_AJ */ SDE_DELETE_ROWS_ID, SDE_STATE_ID FROM SDE.D45
        WHERE DELETED_AT IN <SELECT l.lineage_id FROM SDE.state_lineages l WHERE
        l.lineage_name = :lineage_name2 AND l.lineage_id <= :state_id2) AND
        SDE_STATE_ID > 0> AND a.SDE_STATE_ID = SL.lineage_id AND SL.lineage_name =
        :lineage_name3 AND SL.lineage_id <= :state_id3> V_45 WHERE <ID<1000>

call      count        cpu      elapsed      disk      query      current      rows
-----  -----  -----  -----  -----  -----  -----  -----
Parse        0        0.00        0.00        0          0          0          0
Execute      1        0.03        0.02        0          0          0          0
Fetch       20       9.67       9.64        0  129581          0        1998
-----  -----  -----  -----  -----  -----  -----  -----
total      21       9.70       9.66        0  129581          0        1998
```

Elapsed time slightly changed due to different test runs

# Oracle Execution plan

## Inefficient spatial index

```
Misses in library cache during parse: 1
Misses in library cache during execute: 1
Optimizer mode: ALL_ROWS
Parsing user id: 84
Number of plan statistics captured: 1

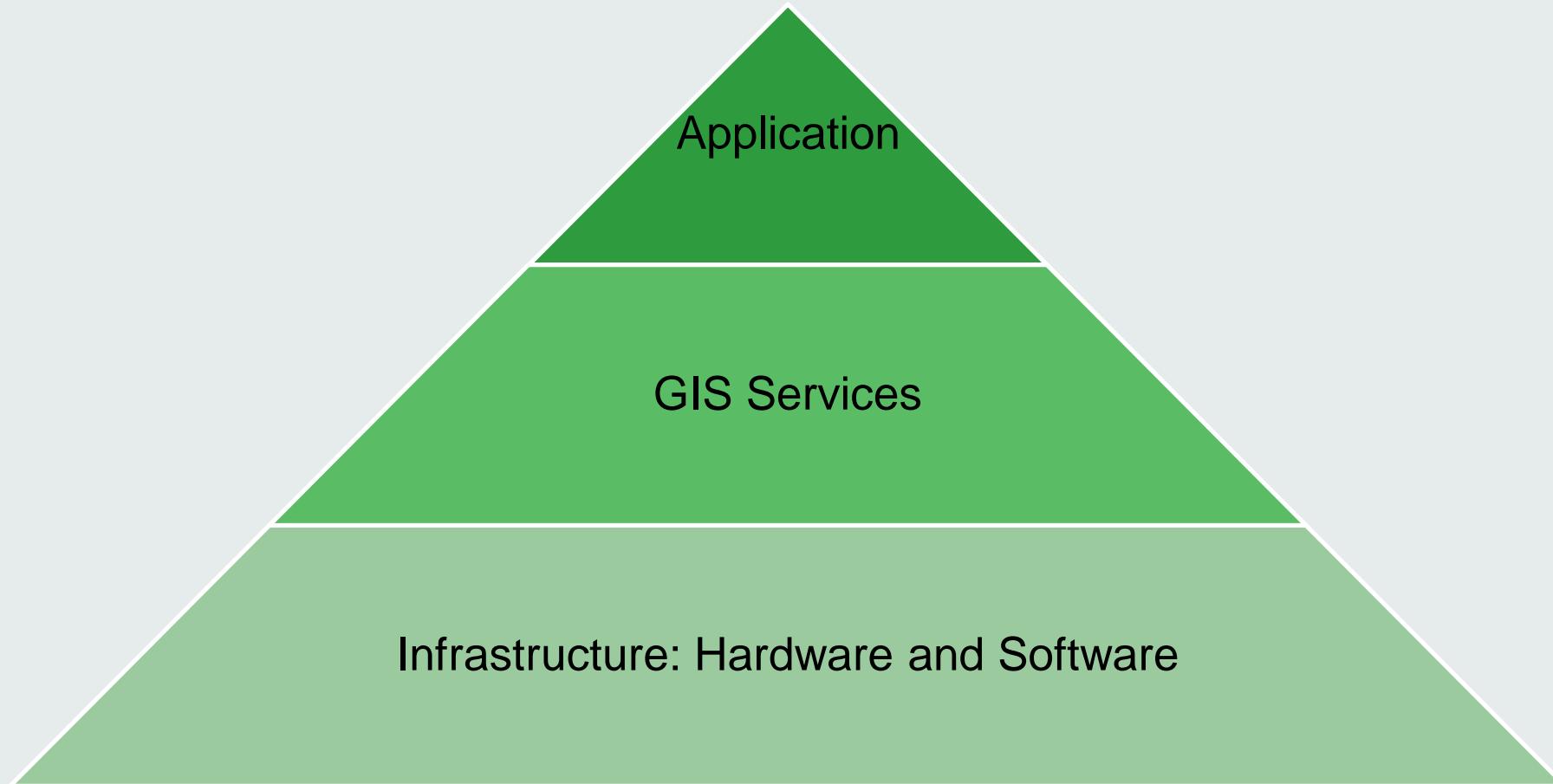
Rows <1st> Rows <avg> Rows <max>  Row Source Operation
      1998      1998      1998  VIEW  <cr=131605 pr=0 pw=0 time=512477 us cost=8 size=45906 card=21>
      1998      1998      1998  UNION-ALL <cr=131605 pr=0 pw=0 time=511602 us>
      1998      1998      1998  FILTER  <cr=131451 pr=0 pw=0 time=508349 us>
      1998      1998      1998  TABLE ACCESS BY INDEX ROWID GRIDPOINT <cr=131451 pr=0 pw=0 time=497861 us cost=5 size=21 card=1>
      129600  129600  129600  DOMAIN INDEX <Sel: Default - Undefined> A29_IK1 <cr=2017 pr=0 pw=0 time=497861 us cost=5 size=21 card=1>
      0          0          0  NESTED LOOPS <cr=0 pr=0 pw=0 time=4456 us cost=0 size=44 card=1>
      0          0          0  INDEX RANGE SCAN D45_PK <cr=0 pr=0 pw=0 time=2101 us cost=0 size=44 card=1>
      0          0          0  INDEX UNIQUE SCAN LINEAGES_PK <cr=0 pr=0 pw=0 time=0 us cost=0 size=1 card=1>
      0          0          0  NESTED LOOPS ANTI <cr=154 pr=0 pw=0 time=2247 us cost=5 size=2367 card=1>
      0          0          0  NESTED LOOPS <cr=154 pr=0 pw=0 time=2243 us cost=5 size=2367 card=1>
      0          0          0  TABLE ACCESS BY INDEX ROWID A45 <cr=154 pr=0 pw=0 time=2242 us cost=5 size=2367 card=1>
      0          0          0  BITMAP CONVERSION TO ROWIDS <cr=154 pr=0 pw=0 time=2236 us>
      0          0          0  BITMAP AND <cr=154 pr=0 pw=0 time=2232 us>
      0          0          0  BITMAP CONVERSION FROM ROWIDS <cr=147 pr=0 pw=0 time=455 us>
      0          0          0  SORT ORDER BY <cr=147 pr=0 pw=0 time=454 us>
      0          0          0  INDEX RANGE SCAN A45_STATEID_IK1 <cr=147 pr=0 pw=0 time=439 us cost=0 size=1 card=1>
      0          0          0  BITMAP CONUERSION FROM ROWIDS <cr=7 pr=0 pw=0 time=1768 us>
      0          0          0  SORT ORDER BY <cr=7 pr=0 pw=0 time=1768 us>
      0          0          0  DOMAIN INDEX <Sel: Default - Undefined> A29_IK1_A <cr=7 pr=0 pw=0 time=455 us cost=5 size=21 card=1>
      0          0          0  INDEX UNIQUE SCAN LINEAGES_PK <cr=0 pr=0 pw=0 time=0 us cost=0 size=1 card=1>
      0          0          0  VIEW PUSHED PREDICATE VW_NSO_1 <cr=0 pr=0 pw=0 time=0 us cost=0 size=1 card=1>
      0          0          0  FILTER  <cr=0 pr=0 pw=0 time=0 us>
      0          0          0  NESTED LOOPS <cr=0 pr=0 pw=0 time=0 us cost=0 size=44 card=1>
      0          0          0  INDEX RANGE SCAN D45_PK <cr=0 pr=0 pw=0 time=0 us cost=0 size=44 card=1>
      0          0          0  INDEX UNIQUE SCAN LINEAGES_PK <cr=0 pr=0 pw=0 time=0 us cost=0 size=1 card=1>
```

# Testing

# Testing Objectives

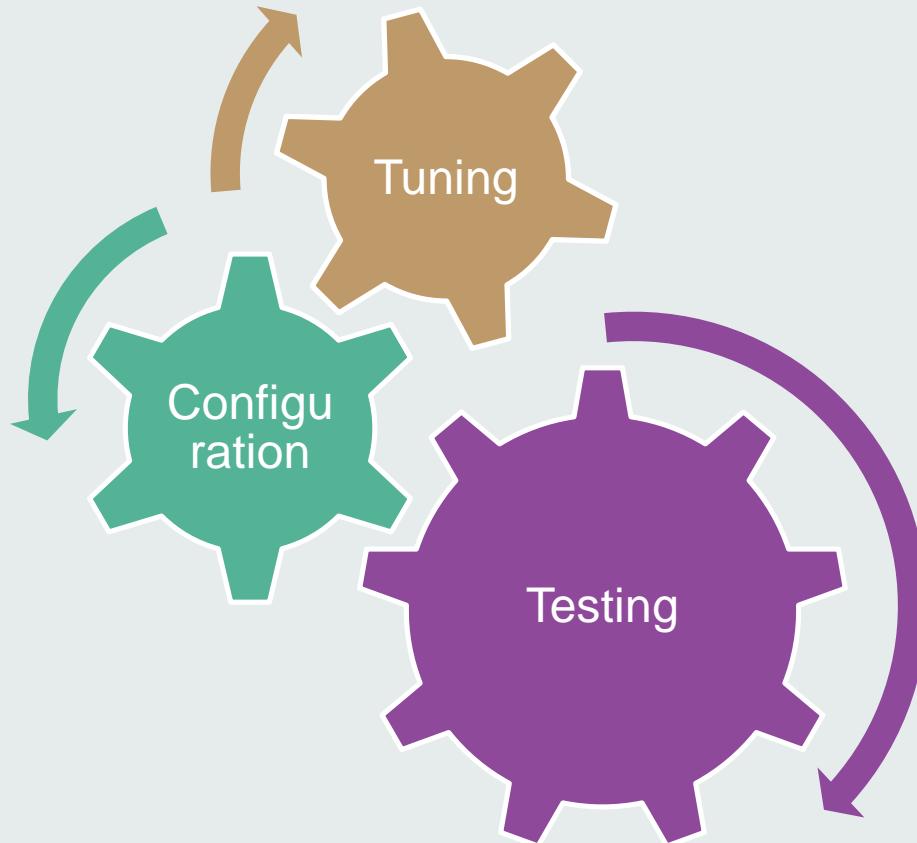
- Meet Service-Level Agreement (SLA)
- Bottlenecks analysis
- Capacity planning
- Benchmarking different alternatives

# Testing process



# Required skill set

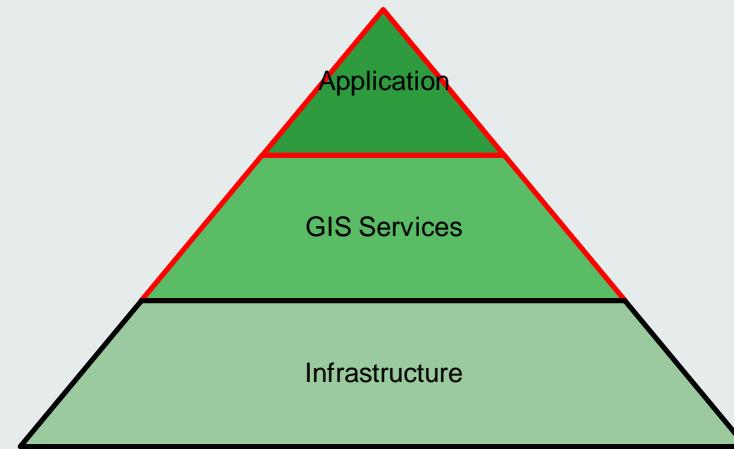
Configuration, Tuning, Testing



# System Test for Web

## GIS Test Automation

- **ArcGIS Services**
  - **Mapping**
  - **Feature Service**
  - **OGC**
  - **Geocoding**
  - **Image Service**
  - **Network Analyst**
  - **Geoprocessing**
  - **Tile Cache**
- **Application Testing**
- **Discipline relevant report**



# Web test tools feature comparison

Tool	Cost	Learning Curve	OS Metrics	GIS Data Generation	GIS Test Automation
Load Runner	High	High	Windows/Linux	No	No
Visual Studio	Medium	High	Windows	No	No
JMeter	Free	High	Requires additional plugin	No	No
System Test	Free	Low	Windows/Linux	Yes	Yes

# Demo: Dynamic Map Service

Hide Back Print Options

Contents Index

- Welcome
  - Getting Started
    - Introducing System Test Tool
  - Testing ArcGIS Services
    - Dynamic Map Services Benchmark
    - Query Map
    - Feature Access (Editing)
    - Identify
    - WFS
    - WCS
    - WMS
    - Geocoding
    - Image Services
    - Network Analyst
    - Geoprocessing
    - Tile Cache
    - Rerun a Previous Load Test
  - Testing Application
    - Validate Results
  - Application Concepts and Components
  - Technical Concepts
    - Command Line Tool
  - Glossary

## Dynamic Map Services Benchmark: Perf

A load test is defined by a given map service and during this typ

1. Learn how to add ArcGIS Server services and a data to t
2. Create a web test and a load test.
3. Run test and validate results.

In this tutorial, you locate a map service that is sourced to the SampleWorldCities dataset that comes included with ArcGIS Server. You identif  
be able to run the load test.

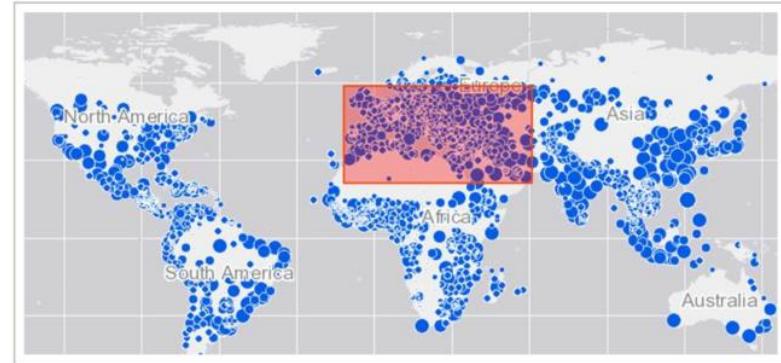
**Important:** ArcGIS Server 10.1 or higher is required. Make sure the SampleWorldCities default map service that comes with ArcGIS Server is i

### Scenario

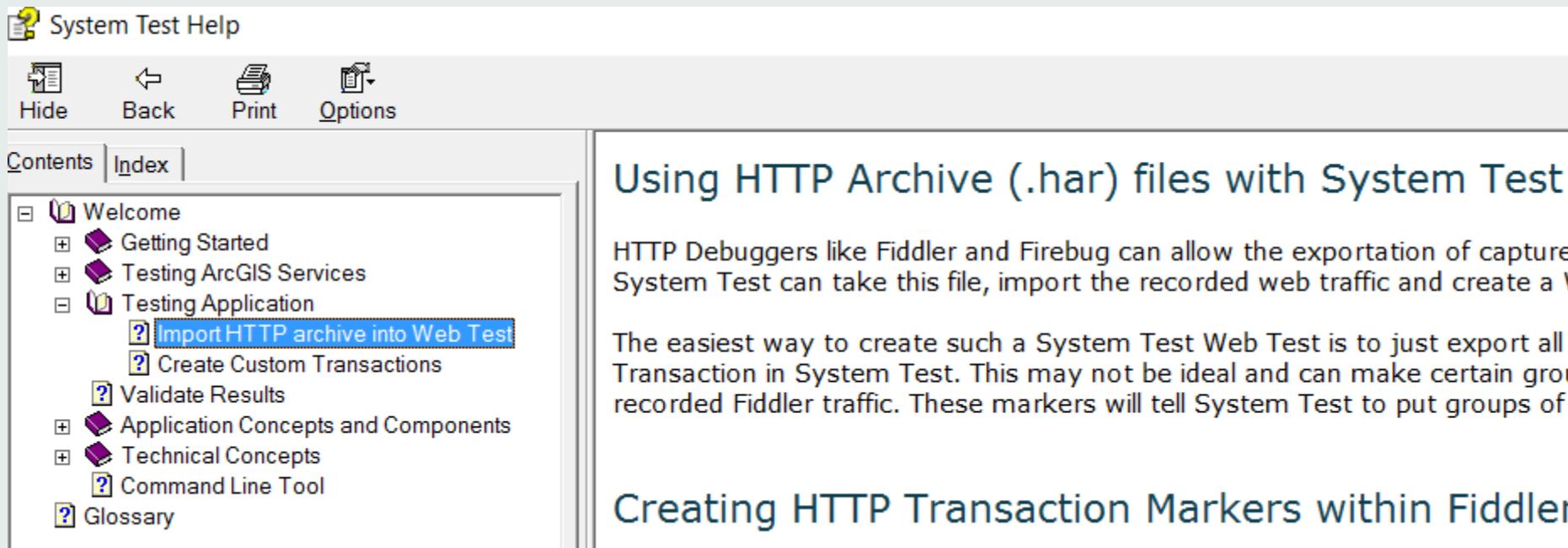
Your supervisor is planning to publish a world map that allows users to view cities. They would like to know what performance metrics to expect

### High Level Steps:

1. Create a project.
2. Add ArcGIS Server services.
3. Create test data.
4. Create web test.
5. Start load test.
6. Validate results.



# Demo - HAR



The screenshot shows the 'System Test Help' window. The title bar has a yellow icon and the text 'System Test Help'. The menu bar includes 'Hide', 'Back', 'Print', and 'Options'. Below the menu is a navigation bar with 'Contents' and 'Index' tabs, where 'Contents' is selected. The main content area displays a topic titled 'Using HTTP Archive (.har) files with System Test'. The topic text explains that Fiddler and Firebug can export captured traffic as .har files, which can then be imported into System Test to create a Web Test. It also notes that users can export all transactions from System Test as a .har file. Below this, another topic is listed: 'Creating HTTP Transaction Markers within Fiddler'. The left sidebar contains a table of contents with sections like 'Welcome', 'Getting Started', 'Testing ArcGIS Services', 'Testing Application' (which is expanded to show 'Import HTTP archive into Web Test' and 'Create Custom Transactions'), 'Validate Results', 'Application Concepts and Components', 'Technical Concepts', 'Command Line Tool', and 'Glossary'.

System Test Help

Hide Back Print Options

Contents Index

Using HTTP Archive (.har) files with System Test

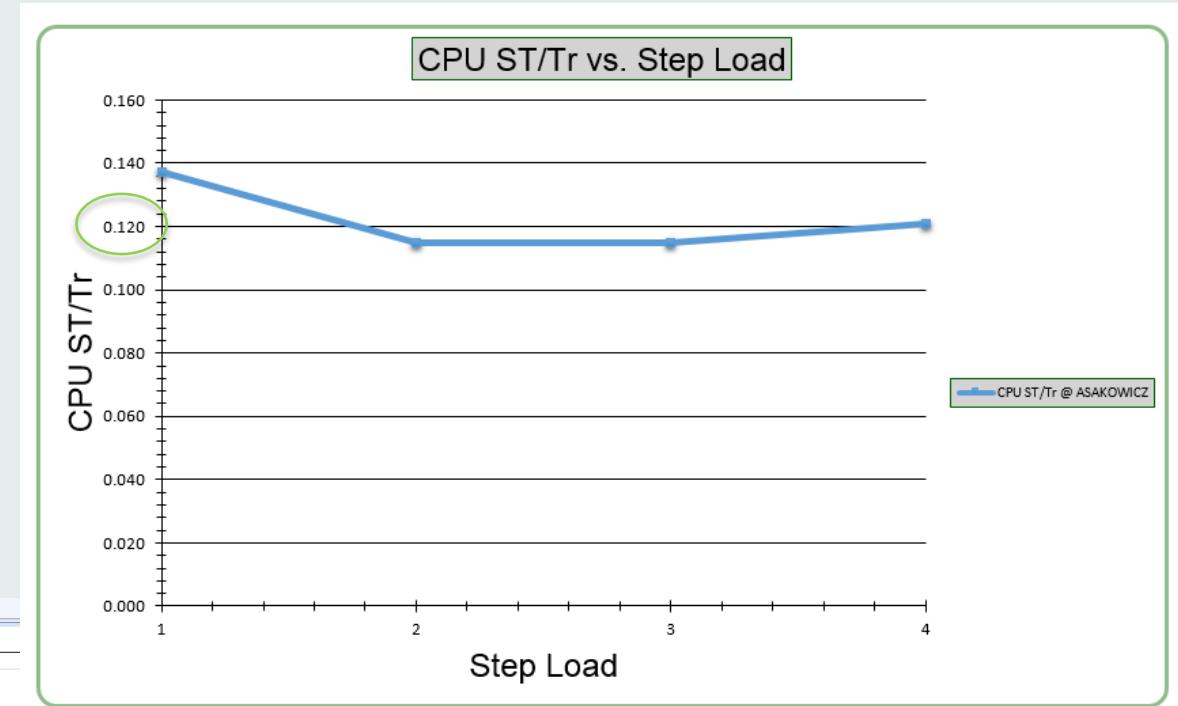
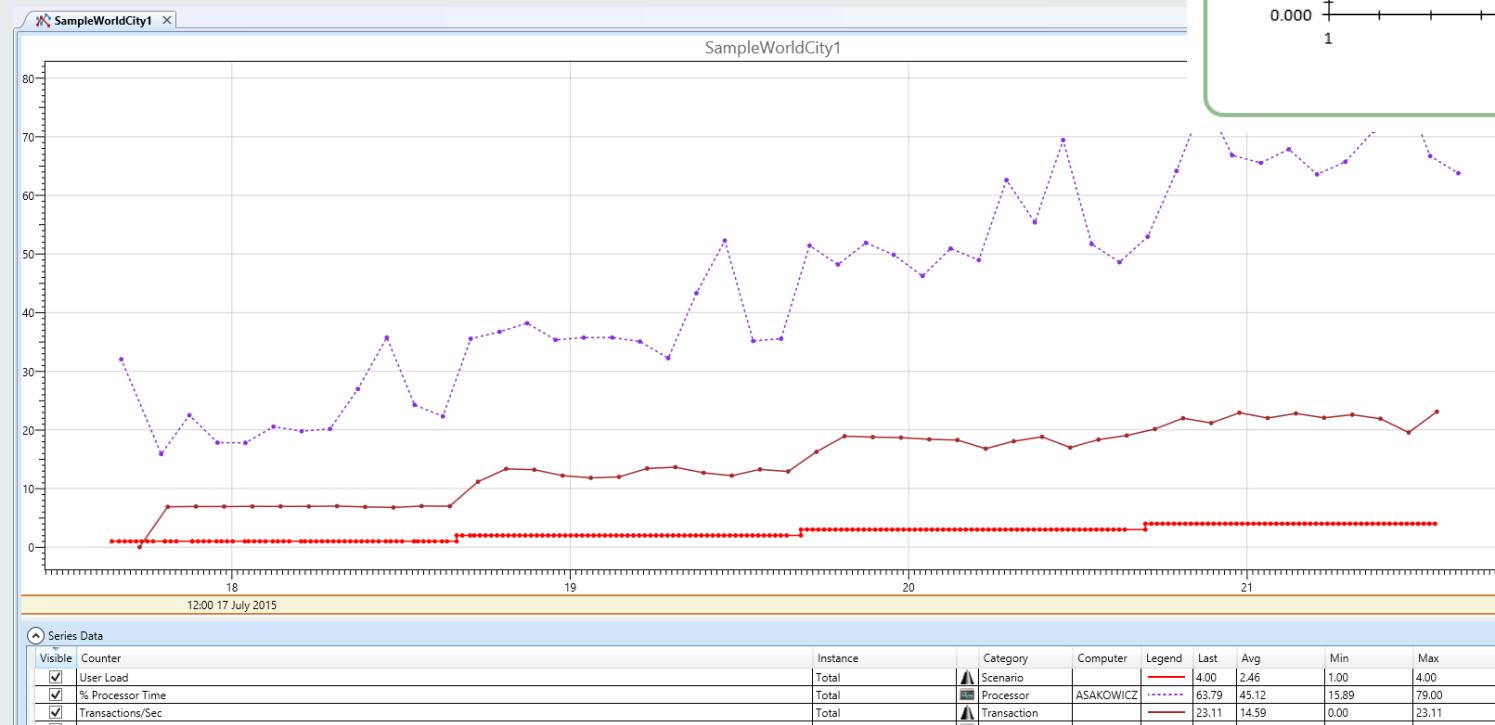
HTTP Debuggers like Fiddler and Firebug can allow the exportation of capture System Test can take this file, import the recorded web traffic and create a \

The easiest way to create such a System Test Web Test is to just export all Transaction in System Test. This may not be ideal and can make certain groups recorded Fiddler traffic. These markers will tell System Test to put groups of

Creating HTTP Transaction Markers within Fiddler

- Welcome
- Getting Started
- Testing ArcGIS Services
- Testing Application
  - Import HTTP archive into Web Test
  - Create Custom Transactions
- Validate Results
- Application Concepts and Components
- Technical Concepts
- Command Line Tool
- Glossary

# System Test output



# Monitoring

Presenter Names



SEE  
WHAT  
OTHERS  
CAN'T

# Agenda

- Motivation and audience
- Use cases
- Installation and Configuration
- Availability
- Alerts
- Usage
- Performance
- Root Cause Analysis (RCA)



# ArcGIS Monitor: Why?

Optimize Your Enterprise GIS Deployments

- Need end to end monitoring for effective diagnostics
- Standard monitoring tools:
  - Focus on infrastructure only
  - IT controlled
  - No ArcGIS components
  - Low success of ArcGIS troubleshooting
  - Integrating “ArcGIS” has challenges and high LOE

*Average cost of IT downtime is \$5,600 per minute. Source: Gartner*



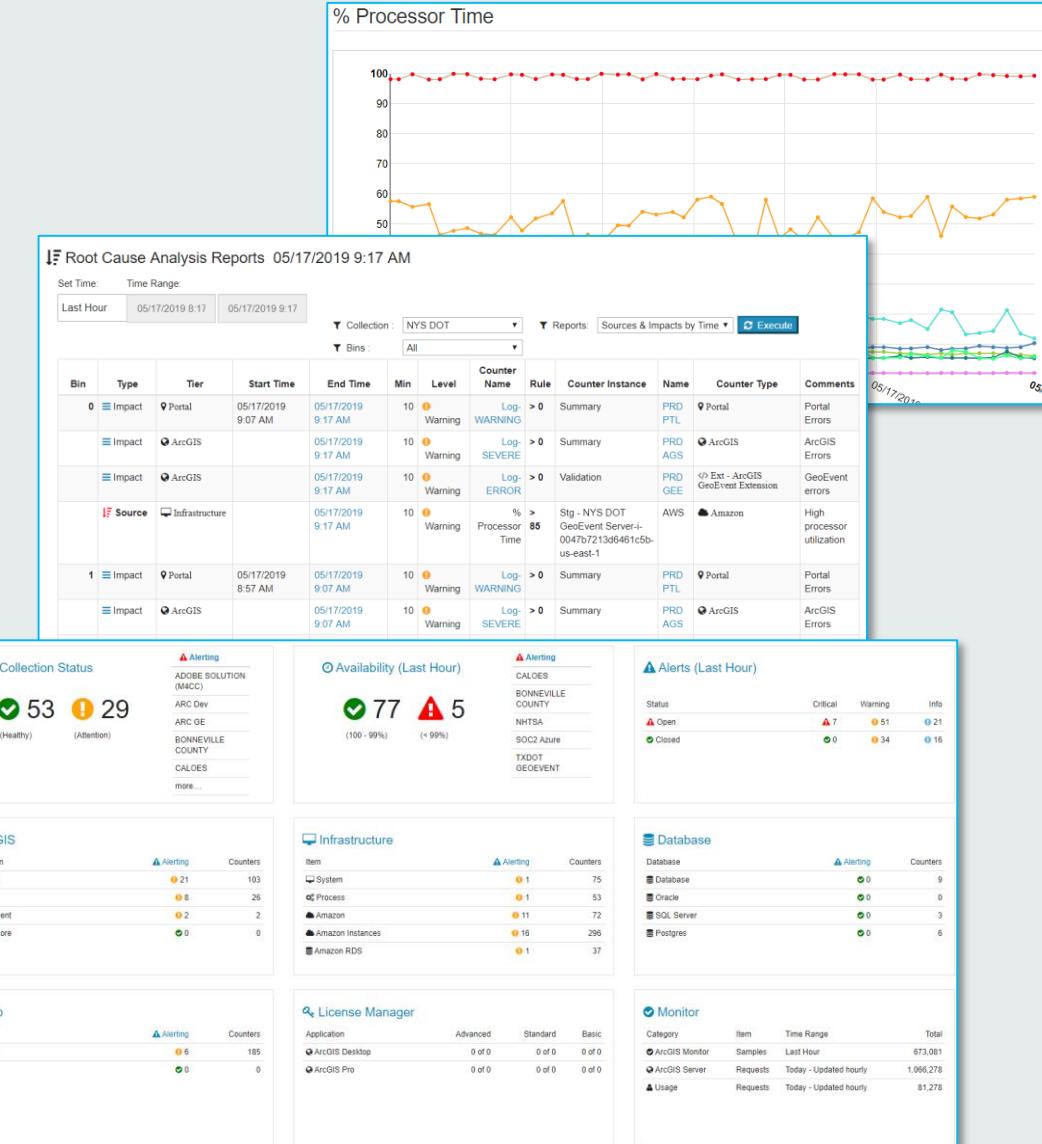
# ArcGIS Monitor: Why?

Optimize Your Enterprise GIS Deployments

- **Customers require:**
  - Faster resolution time
  - Better performance
  - Lower cost of administration
  - End-user satisfaction

# ArcGIS Monitor Summary

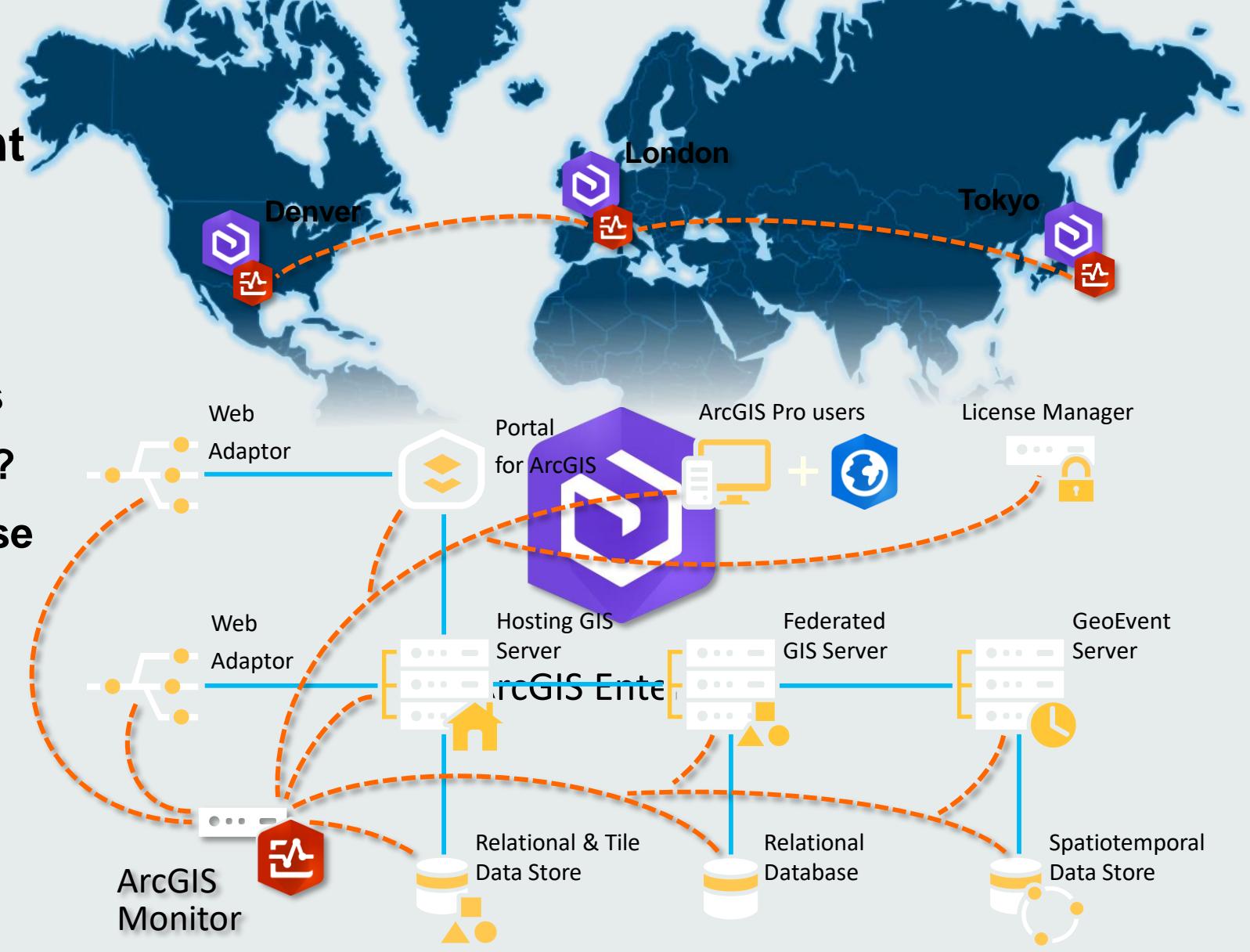
- Introduced January 2018
- Ubiquitous system monitoring for ArcGIS
- Timely metrics and analysis
- Proactive insights, alerting, and reports
- Optimize the GIS environment



## The Monitored Environment

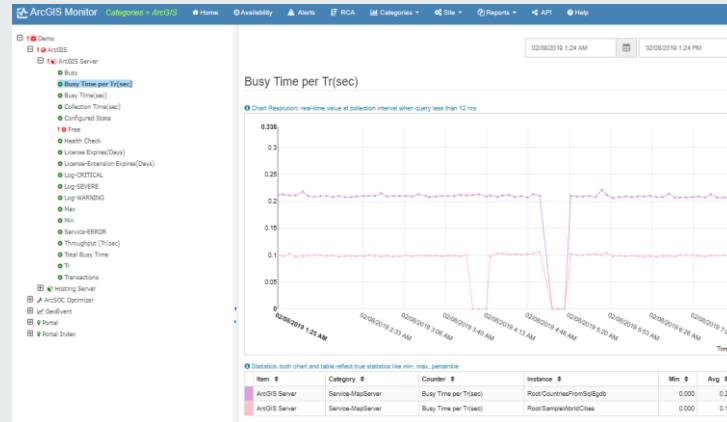
## Growing in complexity

- **Dozens of components**
- **Hundreds of discreet metrics**
- **Which metrics are important?**
- **Filter the signal from the noise**
- **ArcGIS Monitor**
  - **Tailored for ArcGIS**
  - **Non-invasive sampling**
  - **Minimal resource footprint**
  - **Conforms to the environment**
    - **Single or multi-datacenter**





# ArcGIS Monitor



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 | Collection: Demo | Reports: Culprits & Victims by Time | Groups: 16 | Execute

Group	Type	Category	Start Time	End Time	Min	Level	Counter Name	Rule	Instance	Name	Counter Type	Notes
16	Victim	Web	10/17/2018 5:10 AM	10/17/2018 5:20 AM	10	Critical	Find String NOT = 1	Portal for ArcGIS Health	Portal for ArcGIS Health	HTTP	Found negative search string	
	Victim	Web	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Critical	Find String	Portal for ArcGIS Health	Portal for ArcGIS Health	HTTP	Cannot find search string	
	Victim	Web	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Content Length < 10000	Countries_Sql_Egdb_Draw	Countries_Sql_Egdb_Draw	HTTP	Invalid map	
	Victim	Web	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	JSON Error Code > 0	Countries_Sql_Egdb_Test	Countries_Sql_Egdb_Test	HTTP	JSON Error in response body	
	Victim	Web	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Critical	Find String NOT = 1	Countries_Sql_Egdb_Test	Countries_Sql_Egdb_Test	HTTP	Found negative search string	
	Victim	Portal	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Critical	Status Federation = 0	Summary	Portal for ArcGIS	Portal	Status Machine	
	Victim	Portal	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Log.WARNING > 0	Summary	Portal for ArcGIS	Portal	Portal Errors	
	Victim	Portal	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Log.SEVERE > 0	Summary	Portal for ArcGIS	Portal	Portal Errors	
	Victim	ArcGIS	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Log.CRITICAL > 0	Summary	Hosting Server	ArcGIS	ArcGIS Errors	
	Victim	ArcGIS	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Log.SEVERE > 0	Summary	Hosting Server	ArcGIS	ArcGIS Errors	
	Victim	ArcGIS	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Log.ERROR > 0	Validation	ArcGIS GeoEvent Server	Ext - ArcGIS GeoEvent Extension	GeoEvent errors	
	Victim	Infrastructure	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Warning	10.0.3.232	WinEvent AGM	Ext - WinEvent	-	
	Victim	Infrastructure	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Critical	Count Total = 0	ArcGISPortal	10.0.3.104-ArcGISPortal	Process	Process not running	
	Victim	Infrastructure	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Critical	Count Total = 0	postgres	10.0.3.104-postgres	Process	Process not running	
	Victim	Infrastructure	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Warning	Error > 0	10.0.3.104	WinEvent_Portal	Ext - WinEvent	-	
	Culprit	ArcGIS	10/17/2018 5:20 AM	10/17/2018 5:20 AM	10	Critical	Portal for ArcGIS = 0	10.0.3.184	WinService_Portal	Ext - WinService	Service not running	

## Monitor

Alerts 02/10/2019 3:38 PM

Set Time: Today | Time Range: 02/10/2019 12:00 AM to 02/10/2019 3:38 PM

Level:  Critical: 7  Warning: 56  Info: 10

Status:  Open: 7  Closed: 66

ID	Category	Last Alert	Collection	Level
1	Infrastructure	02/10/2019 11:02 AM	Demo	Critical
2	ArcGIS	02/10/2019 11:00 AM	Demo	Critical
3	Infrastructure	02/10/2019 8:33 AM	Demo	Critical
4	Infrastructure	02/10/2019 7:19 AM	Demo	Critical
5	Infrastructure	02/10/2019 6:15 AM	Demo	Critical
6	Infrastructure	02/10/2019 5:16 AM	Demo	Critical
7	Database	02/10/2019 1:10 AM	Demo	Critical

**ArcGIS Monitor Account: AZHGIS**

Name	Category	Counter	Instance	Value
WebAppPRD	ext	Response Time(sec)	AGFDParcelsPRD	26.7610
WebAppPRD	ext	Response Time(sec)	Validation	27.0677

## Alert

Request - IP Location

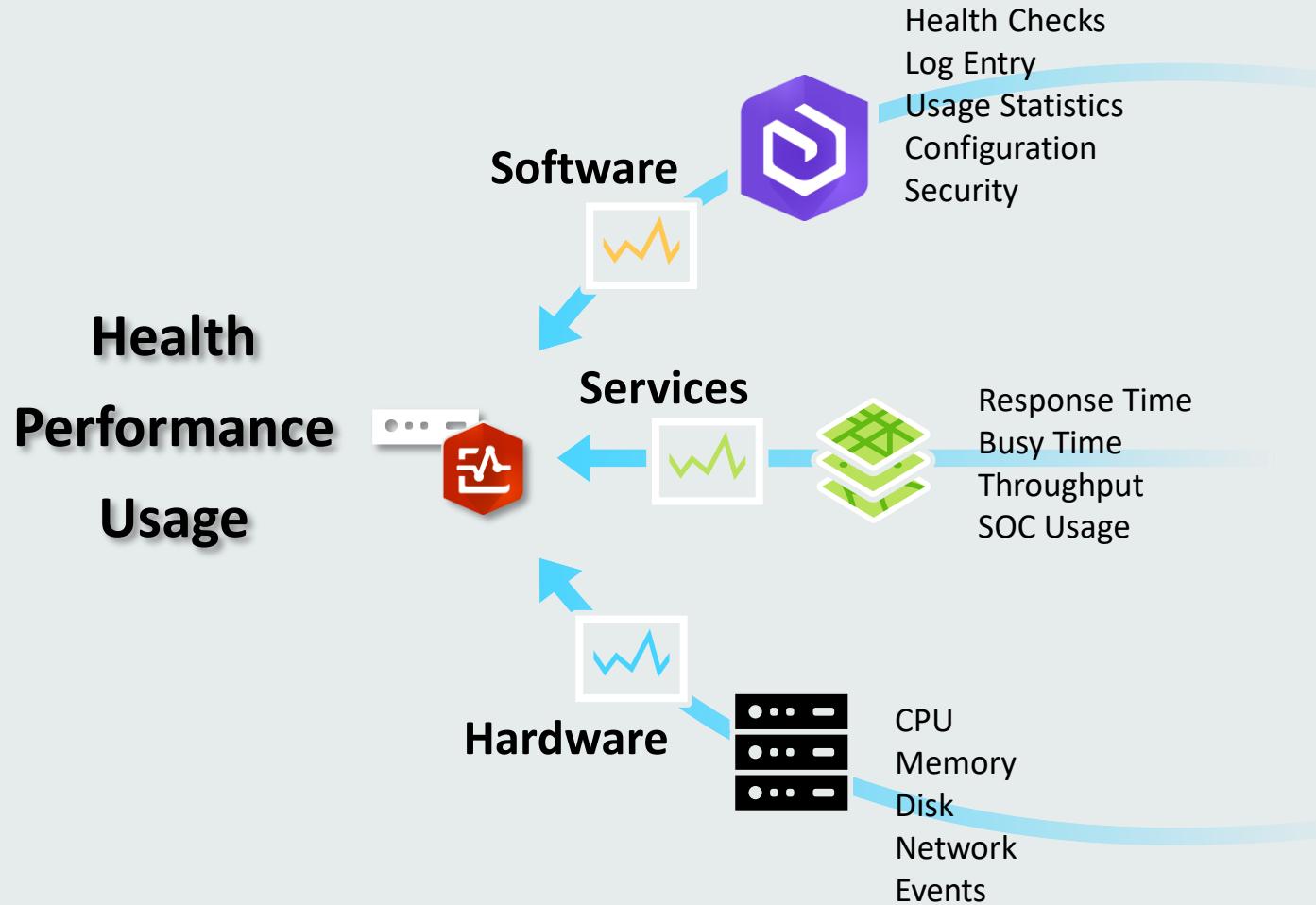
IP Location: 0 - 50, 51 - 100, 101 - 200, 201 - 500, 501 - 1k, 1k - 2k, 2k - 5k, 5k - 10k, Default

IPs - Unique IPs: 3 (table only shows top) Totals: 404

Rank	%	IP	Country	Region	Requests
1	99.51%	198.102.62.250	United States	CA	404
2	0.25%	128.184.138	United States	CA	1
3	0.25%	52.232.107.160	Netherlands	07	1

## Report

# What is monitored?



# Target Audience

- **Administrators:**
  - Alerts
  - Root Cause Analysis (RCA)
- **Managers:**
  - Availability
  - Performance
  - Usage
- **Developers:**
  - errors analysis
  - customization

## Alerts

## Availability

⌚ ArcGIS Monitor Availability Home Alerts Categories Site Reports Help

⌚ Availability 05/19/2018 12:40 PM

1 (100 - 99%) 1 (< 99%)

Set Time Range: Time Range: 05/01/2018 12:40 AM 05/19/2018 12:40 PM

All  < 100%

ID	Status	Availability (%)	Collection	Duration (hrs)	Availability (hrs)	Non Availability (hrs)	Coverage (%)
1	⚠	25.593	Dev	444	113.63	330.37	98.46
2	✓	99.891	Prod	444	443.52	0.48	98.75

## USAGE

① Availability 05/19/2019

**SRV7 Collection Time (sec)**

1.106  
1.05  
1.00  
0.95  
0.90  
0.85  
0.80  
0.75  
0.70  
0.65  
0.60  
0.55  
0.50  
0.45  
0.40  
0.35  
0.30  
0.25  
0.20  
0.15  
0.10  
0.05  
0.00

2017-05-19 00:00:00 2017-05-19 08:00:00

Statistics: both chart and table reflect true statistics like ms  
Counter: ESLSRV7 Collection Time (sec) ESLSRV7

**Set Time Range:**

Current Month ▾

All  < 100%

ID	Status	Availability (%)
1	⚠	25
2	✓	99

# Why Monitor: GIS Administrators and Managers

- Seek to optimize system utilization and performance

 ArcSOC Optimizer analyzes for efficient configuration

- Must quickly detect, diagnose, and resolve issues as they arise

 Proactively detects issues via Alerts and Root Cause Analysis

- Enable users to implement ArcGIS, plan for the future

 Continuously monitors the entire system

# Who is it for and what is the value?

## Optimize your Enterprise GIS

### 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

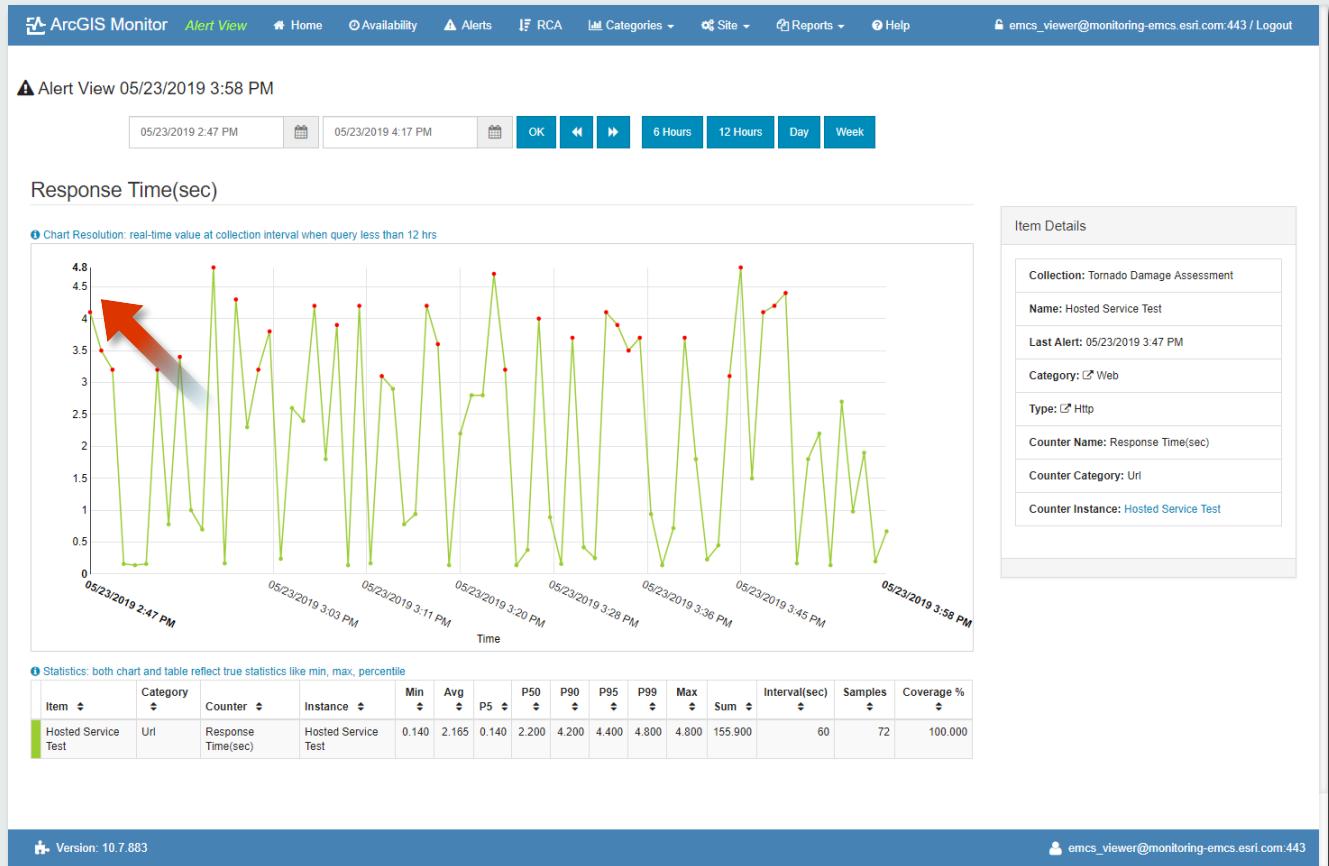
### Users



- Improve end-user satisfaction

# Use case: degraded feature service performance

- Dashboard – preemptive warnings
- Root Cause Analysis – high CPU
- Raw metrics confirm analysis
- Options for resolution



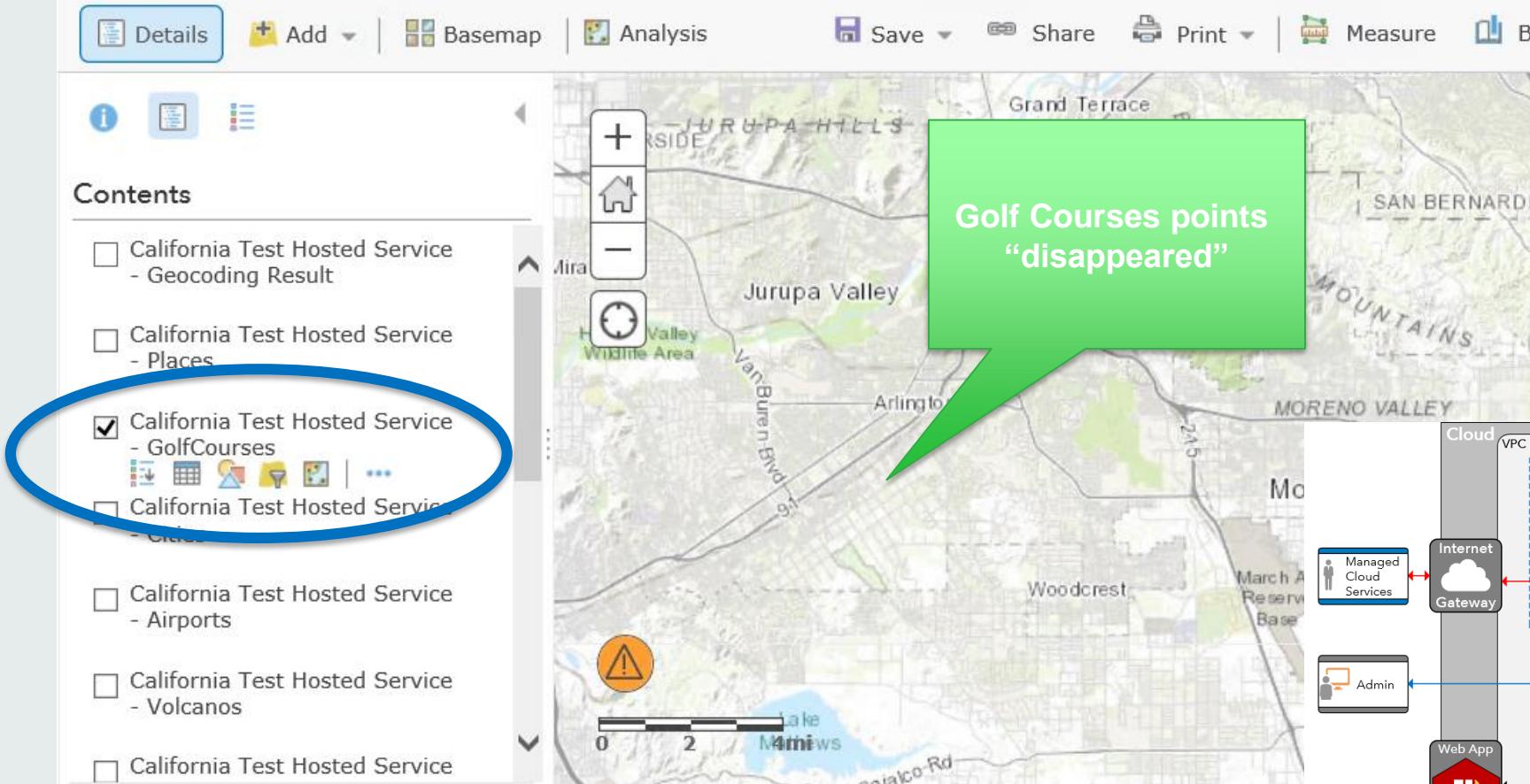
# Simple use case

Section Subhead

# Problems: Points “disappeared” from a map

First noticed around 7 am

Home ▾ California\_Test\_Hosted\_Service

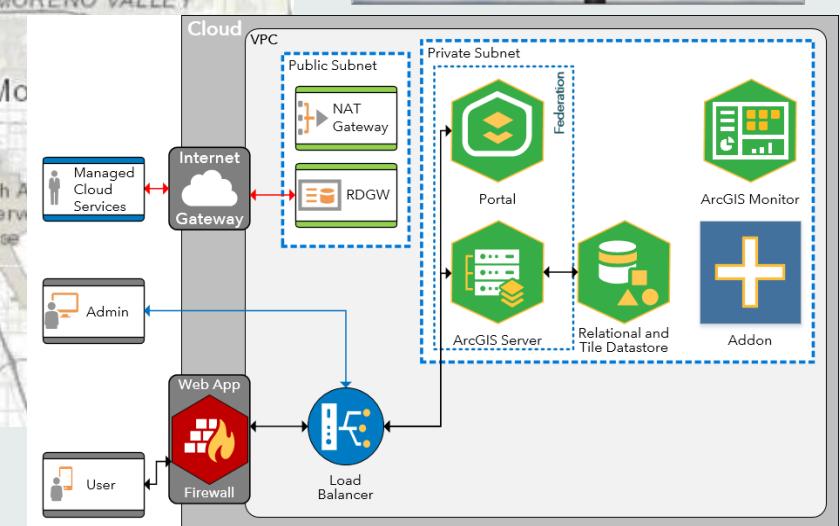


Details Add Basemap Analysis Save Share Print Measure Back

Contents

- California Test Hosted Service - Geocoding Result
- California Test Hosted Service - Places
- California Test Hosted Service - GolfCourses
- California Test Hosted Service - Cities
- California Test Hosted Service - Airports
- California Test Hosted Service - Volcanos
- California Test Hosted Service

0 2



# Select RCA for this time range

Analyze Sources and click on Log error messages

ArcGIS Monitor **RCA** Home Availability Alerts Categories Site Reports API Help Demo@arcgismonitor.com

## Root Cause Analysis Reports 10/17/2018 10:29 AM

Set Time: Time Range: Collection: Demo Reports: Culprits & Victims by Time Execute Groups: 19

Today 10/17/2018 12:00 AM 10/17/2018 10:29 AM

Use this root cause analysis report to categorize alerts into victims and culprits

Group	Type	Category	Start Time	End Time	Min	Level	Counter Name	Rule	Instance	Name	Counter Type	Notes
19	Victim	Web	10/17/2018 7:10 AM	10/17/2018 7:20 AM	10	Warning	Find String	= 0	California_Test_Hosted	California_Test_Hosted	Http	Cannot find search string
	Victim	Web		10/17/2018 7:20 AM	10	Warning	Find String NOT	= 1	California_Test_Hosted	California_Test_Hosted	Http	Found negative search string
	Victim	Web		10/17/2018 7:20 AM	10	Warning	JSON Error Code	> 0	California_Test_Hosted	California_Test_Hosted	Http	JSON Error in response body
	Victim	Portal		10/17/2018 7:20 AM	10	Critical	Status Federation	> 0	Summary	Portal for ArcGIS	Portal	Status Machine
	Victim	Portal		10/17/2018 7:20 AM	10	Warning	Log-WARNING	> 0	Summary	Portal for ArcGIS	Portal	Portal Errors
	Victim	ArcGIS		10/17/2018 7:20 AM	10	Warning	Log-SEVERE	> 0	Summary	Hosting Server	ArcGIS	ArcGIS Errors
	Victim	ArcGIS		10/17/2018 7:20 AM	10	Warning	Log-SEVERE	> 0	Summary	Hosting Server	ArcGIS	ArcGIS Errors
	Victim	ArcGIS		10/17/2018 7:20 AM	10	Warning	Log-ERROR	> 0	Validation	ArcGIS GeoEvent Server	</> Ext - ArcGIS GeoEvent Extension	GeoEvent errors
	Victim	ArcGIS		10/17/2018 7:20 AM	10	Warning	Log-WARNING	> 0	Summary	Hosting Server	ArcGIS	ArcGIS Errors
	Victim	ArcGIS		10/17/2018 7:20 AM	10	Warning	Log-ERROR	> 0	Validation	ArcGIS GeoEvent Server	</> Ext - ArcGIS GeoEvent Extension	GeoEvent errors
	Victim	Infrastructure		10/17/2018 7:20 AM	10	Critical	Count Total	= 0	ArcGISDataStore	10.0.3.202-ArcGISDataStore	Process	Process not running
	Victim	Infrastructure		10/17/2018 7:20 AM	10	Critical	Count Total	= 0	postgres	10.0.3.202-postgres	Process	Process not running
	Victim	Infrastructure		10/17/2018 7:20 AM	10	Warning	Error	> 0	10.0.3.202	WinEvent: DataStore	</> Ext - WinEvent	-
	Culprit	ArcGIS		10/17/2018 7:20 AM	10	Critical	ArcGIS Data Store	= 0	10.0.3.202	WinService: DataStore	</> Ext - WinService	Service not running

# Analyze error message

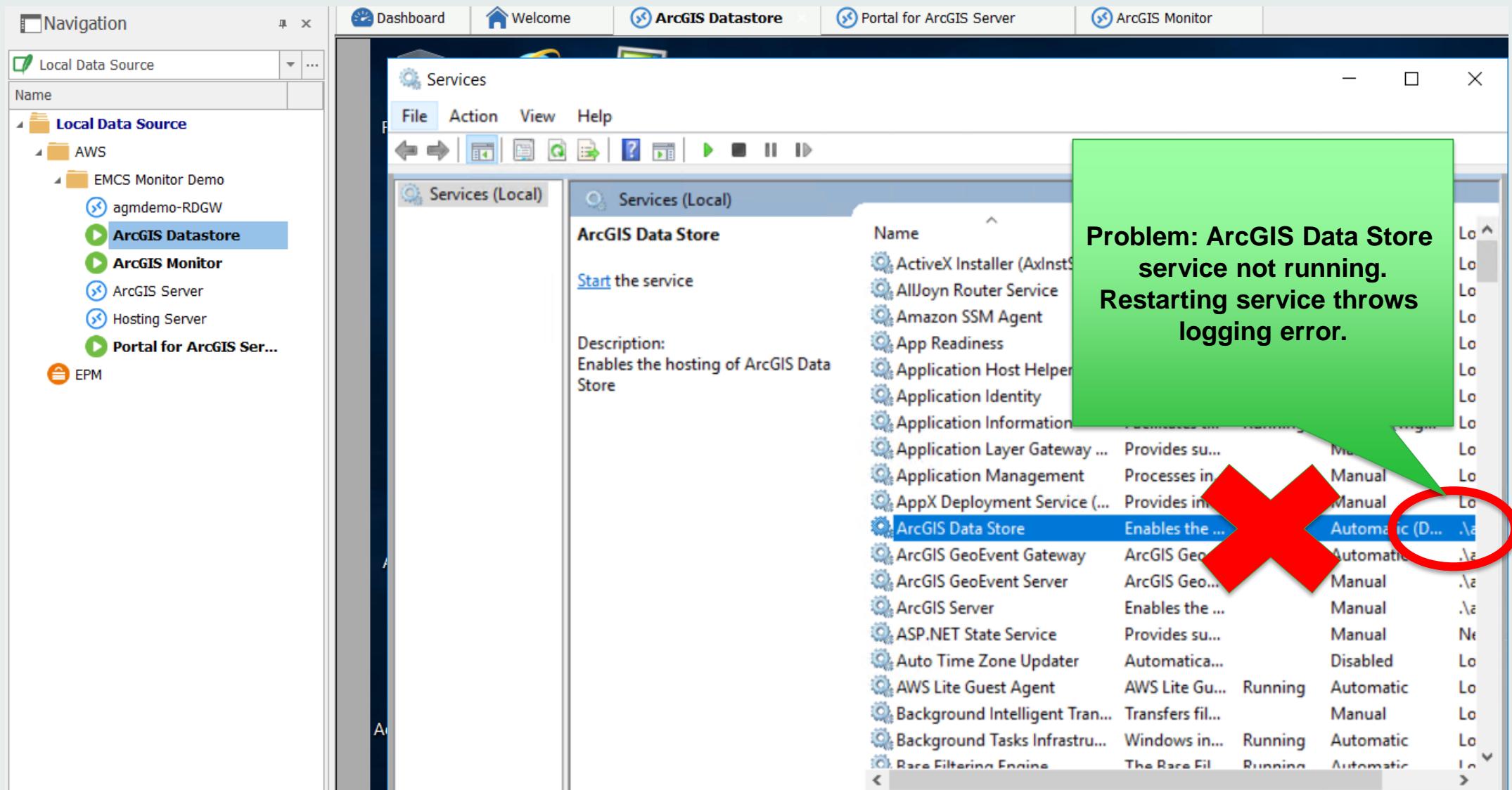
ArcGIS Monitor Alert View Home Availability Alerts Categories Site Reports Help

Log View End: 10/17/2018 7:27 AM Start: 10/17/2018 3:20 AM Number of Records: 65

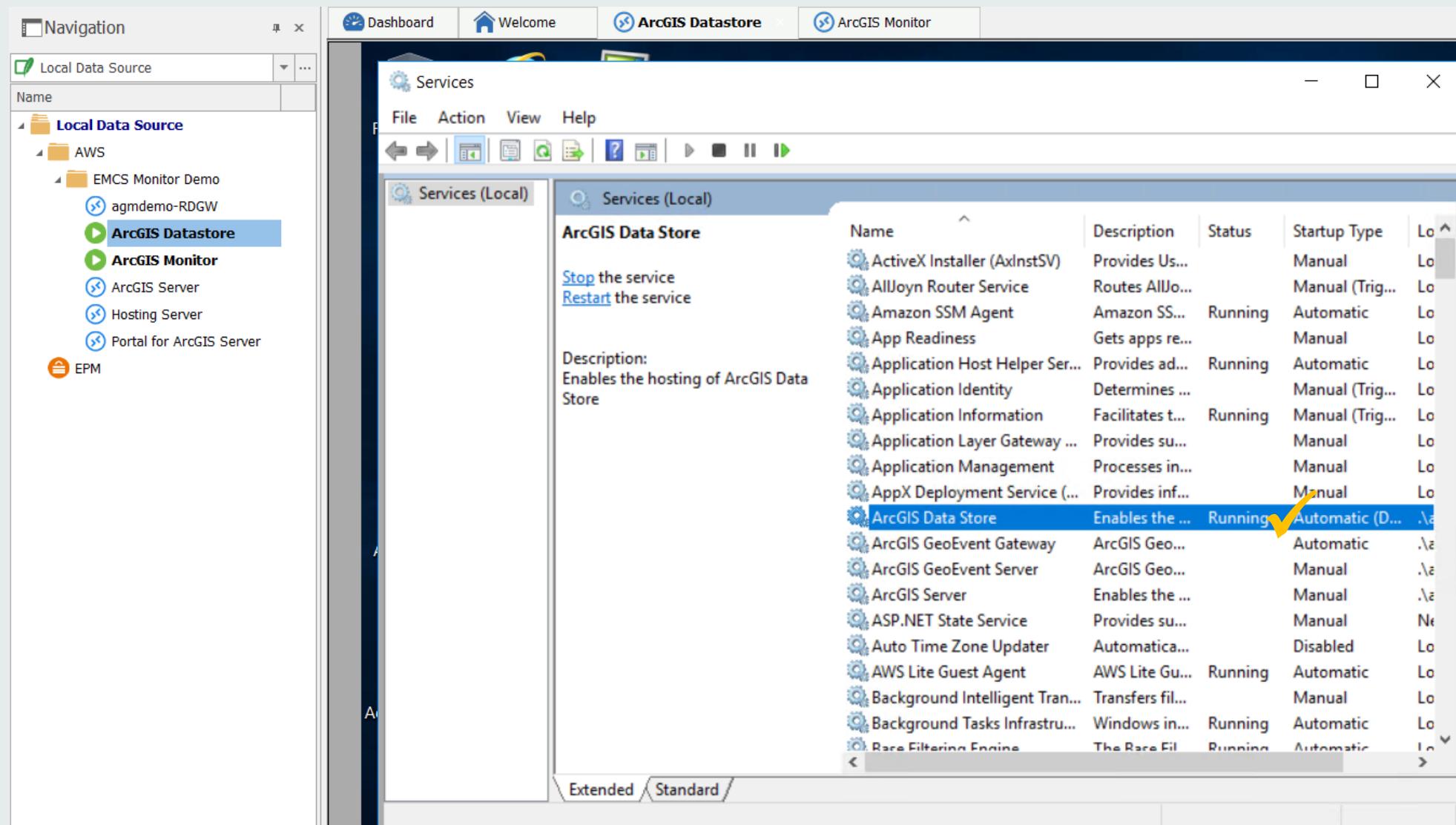
Collection: Demo Name: Hosting Server Counter Name: Log-SEVERE Counter Instance: Summary

ID	QTime	Time	Code	Type	Count/Interval	User	Machine	Method Name	Message
1	10/17/2018 7:20 AM	10/17/2018 7:15 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect
2	10/17/2018 7:20 AM	10/17/2018 7:15 AM	-1	SEVERE	1	EC2AMAZ-NI76OEE	ValidateServerDataStore	Execute	The connection property set was missing a required property or the property value was unrecognized. Instance not available on server
3	10/17/2018 7:15 AM	10/17/2018 7:14 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect
4	10/17/2018 7:15 AM	10/17/2018 7:13 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect
5	10/17/2018 7:15 AM	10/17/2018 7:12 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect
6	10/17/2018 7:15 AM	10/17/2018 7:12 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect
7	10/17/2018 7:15 AM	10/17/2018 7:11 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect
8	10/17/2018 7:15 AM	10/17/2018 7:10 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect
9	10/17/2018 7:15 AM	10/17/2018 7:10 AM	-1	SEVERE	1	EC2AMAZ-NI76OEE	ValidateServerDataStore	Execute	The connection property set was missing a required property or the property value was unrecognized. Instance not available on server
10	10/17/2018 7:10 AM	10/17/2018 7:09 AM	9000	SEVERE	1	10.0.3.27			Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connect

# Investigate “Source” machine



# Resolve: correct password and start ArcGIS Data Store service



## Verify resolution

Home ▾ California\_Test\_Hosted\_Service

Details Add Basemap Analysis Save Share Print Measure Bookmarks

Info Print Layout

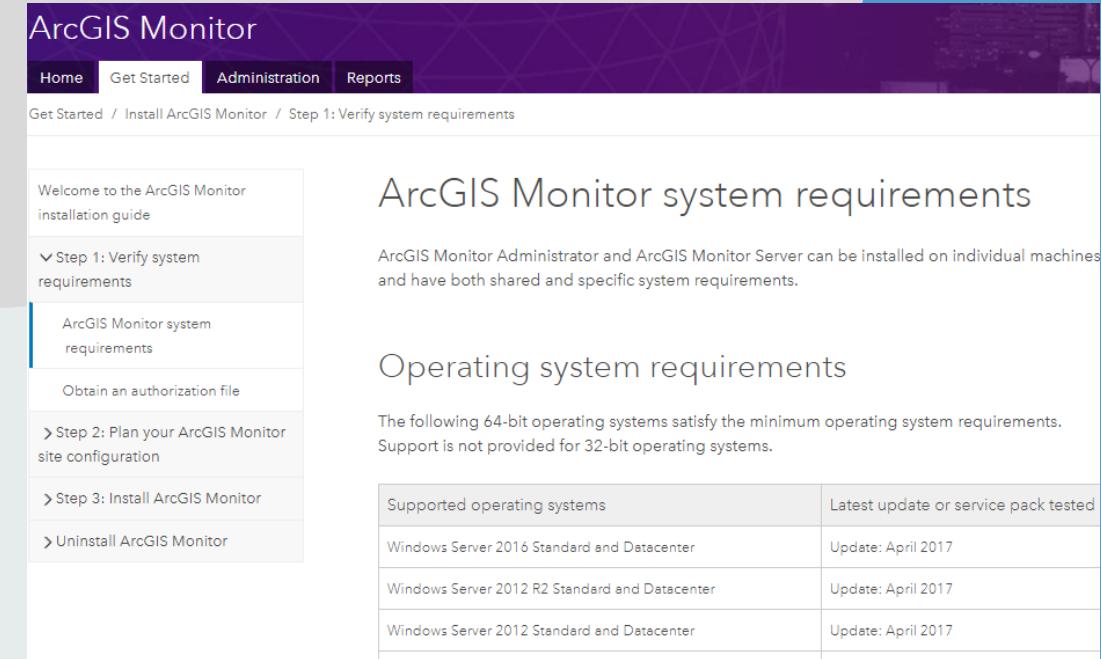
Contents

- California Test Hosted Service - Geocoding Result
- California Test Hosted Service - Places
- California Test Hosted Service - GolfCourses
- California Test Hosted Service - Cities
- California Test Hosted Service - Airports

Points are visible

# Installation

<https://enterprise.arcgis.com/en/monitor/latest/get-started/arcgis-monitor-system-requirements.htm>



The screenshot shows the ArcGIS Monitor 'Get Started' page. The navigation bar includes 'Home', 'Get Started' (which is active), 'Administration', and 'Reports'. The breadcrumb navigation shows 'Get Started / Install ArcGIS Monitor / Step 1: Verify system requirements'. The main content area has a sidebar with 'Welcome to the ArcGIS Monitor installation guide' and a list of steps: 'Step 1: Verify system requirements' (selected), 'ArcGIS Monitor system requirements', 'Obtain an authorization file', 'Step 2: Plan your ArcGIS Monitor site configuration', 'Step 3: Install ArcGIS Monitor', and 'Uninstall ArcGIS Monitor'. The main content area displays the 'ArcGIS Monitor system requirements' section, which states: 'ArcGIS Monitor Administrator and ArcGIS Monitor Server can be installed on individual machines and have both shared and specific system requirements.'

## ArcGIS Monitor system requirements

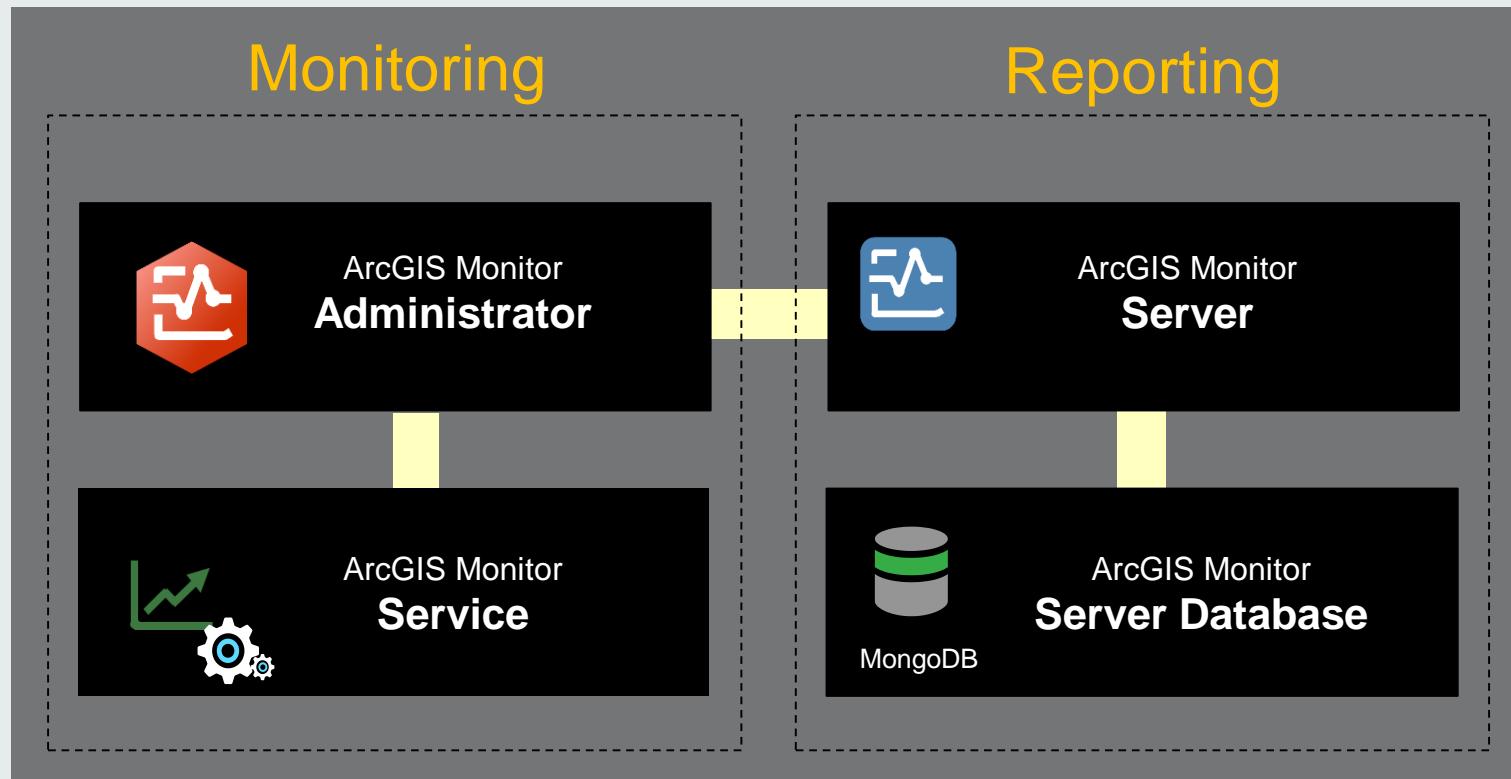
ArcGIS Monitor Administrator and ArcGIS Monitor Server can be installed on individual machines and have both shared and specific system requirements.

### Operating system requirements

The following 64-bit operating systems satisfy the minimum operating system requirements. Support is not provided for 32-bit operating systems.

Supported operating systems	Latest update or service pack tested
Windows Server 2016 Standard and Datacenter	Update: April 2017
Windows Server 2012 R2 Standard and Datacenter	Update: April 2017
Windows Server 2012 Standard and Datacenter	Update: April 2017

# ArcGIS Monitor Components and Functions

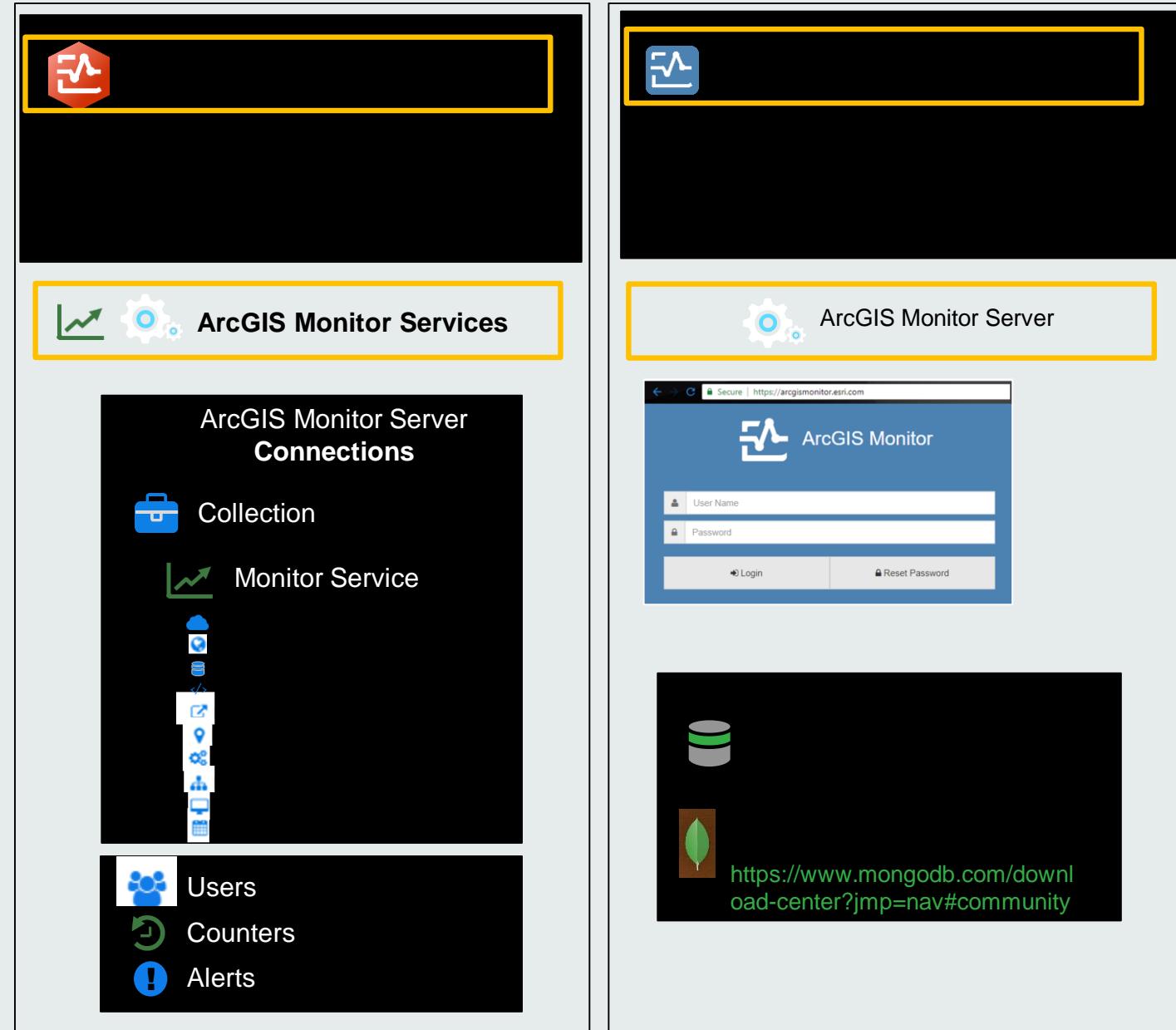


# Installation and configuration

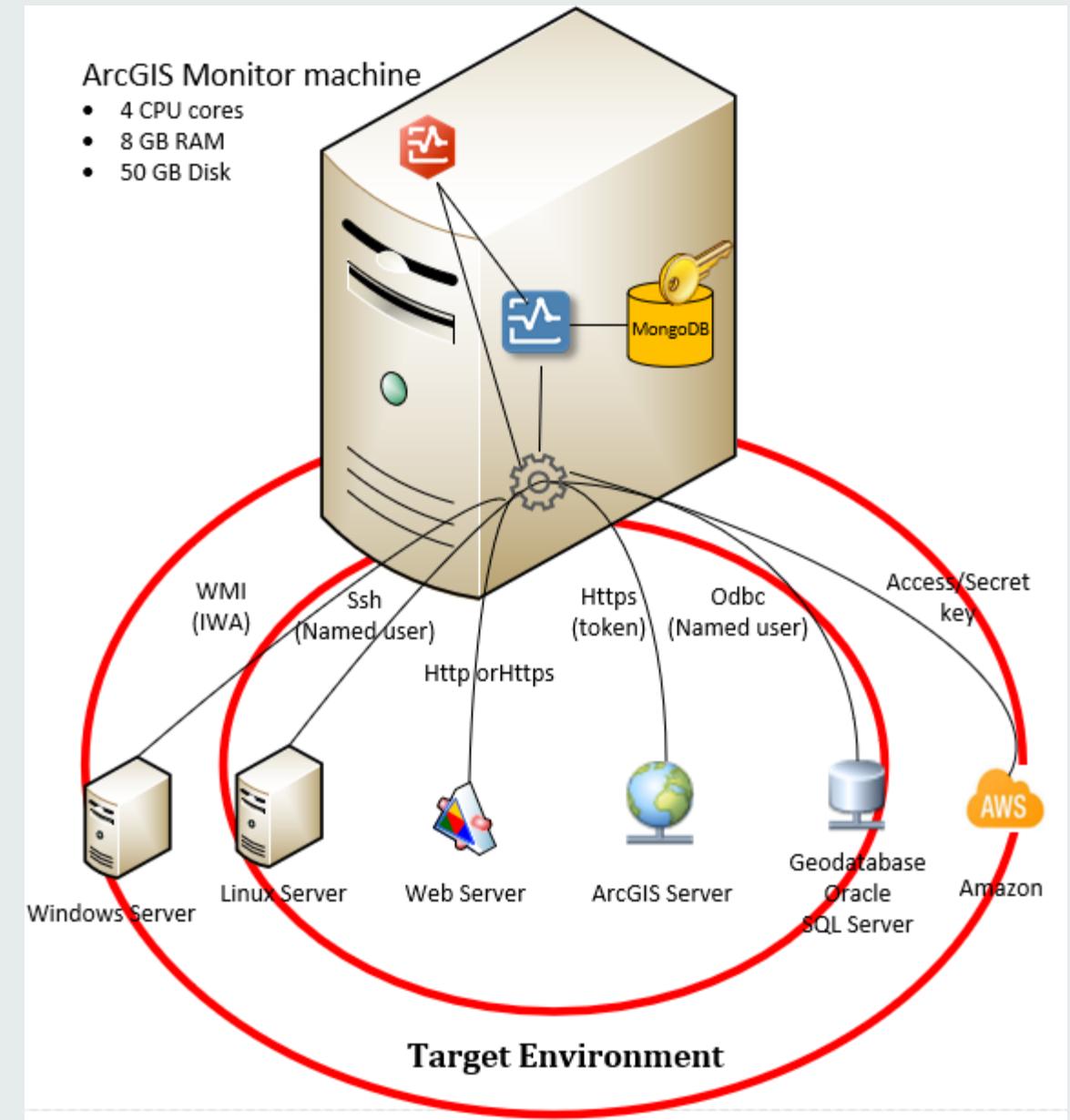
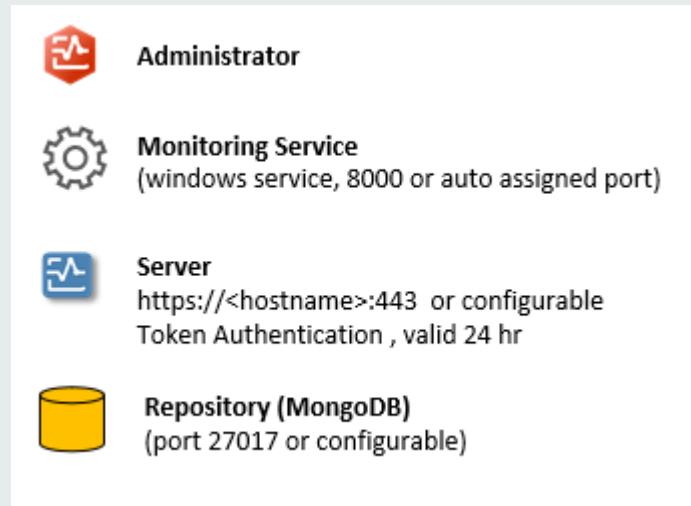
- **ArcGIS Monitor Server**
  1. **Install MongoDB bin**
  2. **Install server**
  3. **Connect to server**

## ArcGIS Monitor Administrator

1. **Open Administrator**
2. **Register Collection**
3. **Add Counters**



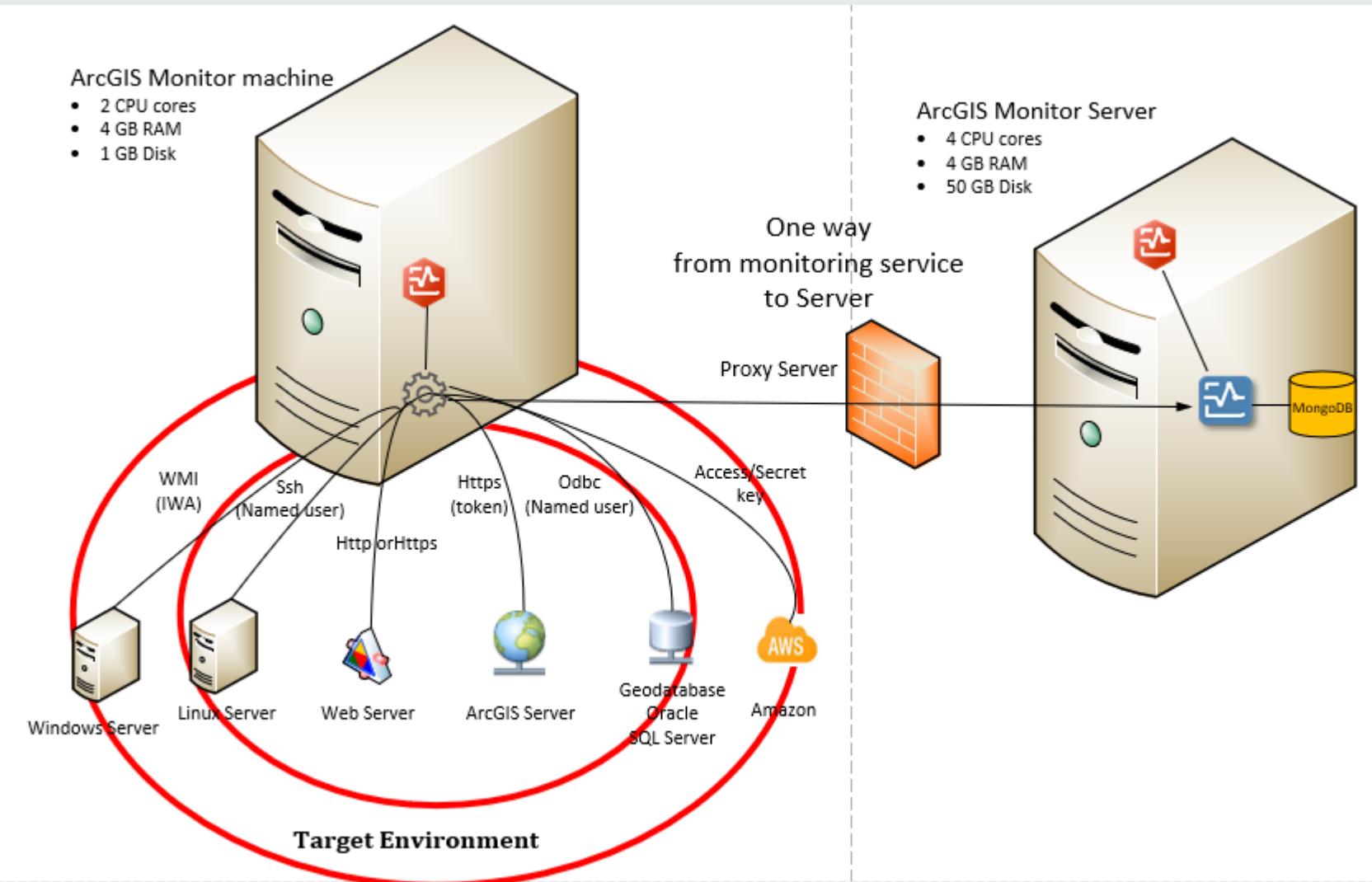
# Single machine deployment



# Distributed deployment

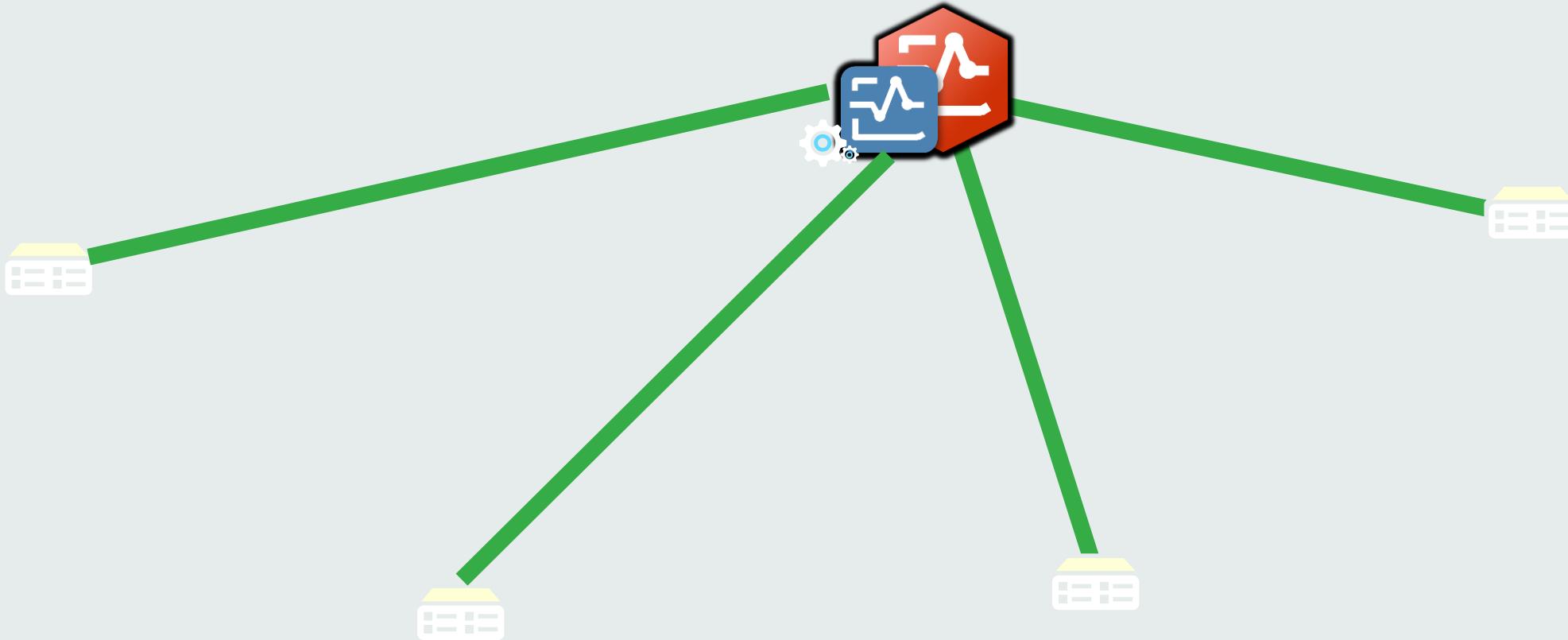
## Full stack monitoring

- Administrator**
- Monitoring Service**  
(windows service, 8000 or auto assigned port)
- Server**  
`https://<hostname>:443` or configurable  
Token Authentication , valid 24 hr
- Repository (MongoDB)**  
(port 27017 or configurable)



# Centralized deployment

-  Service/Administrator
-  Server



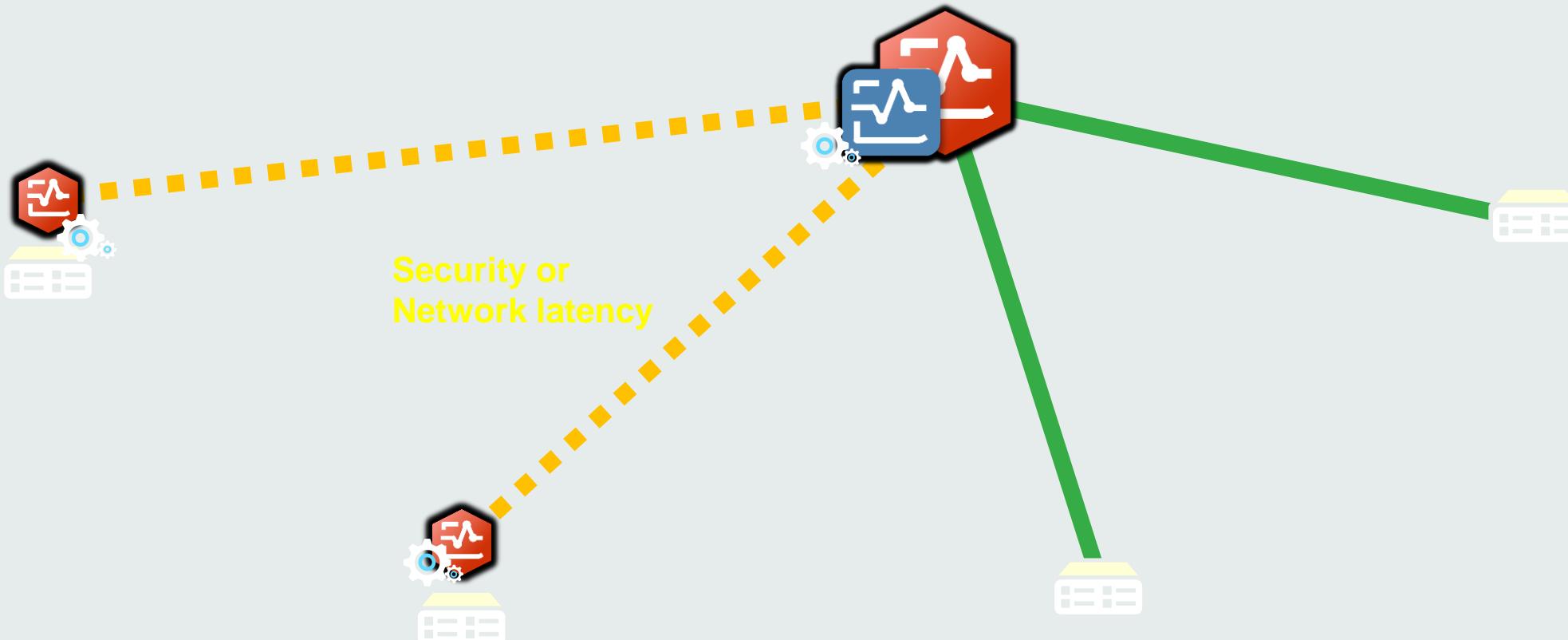
# Distributed or hybrid deployment



Service/Administrator



Server

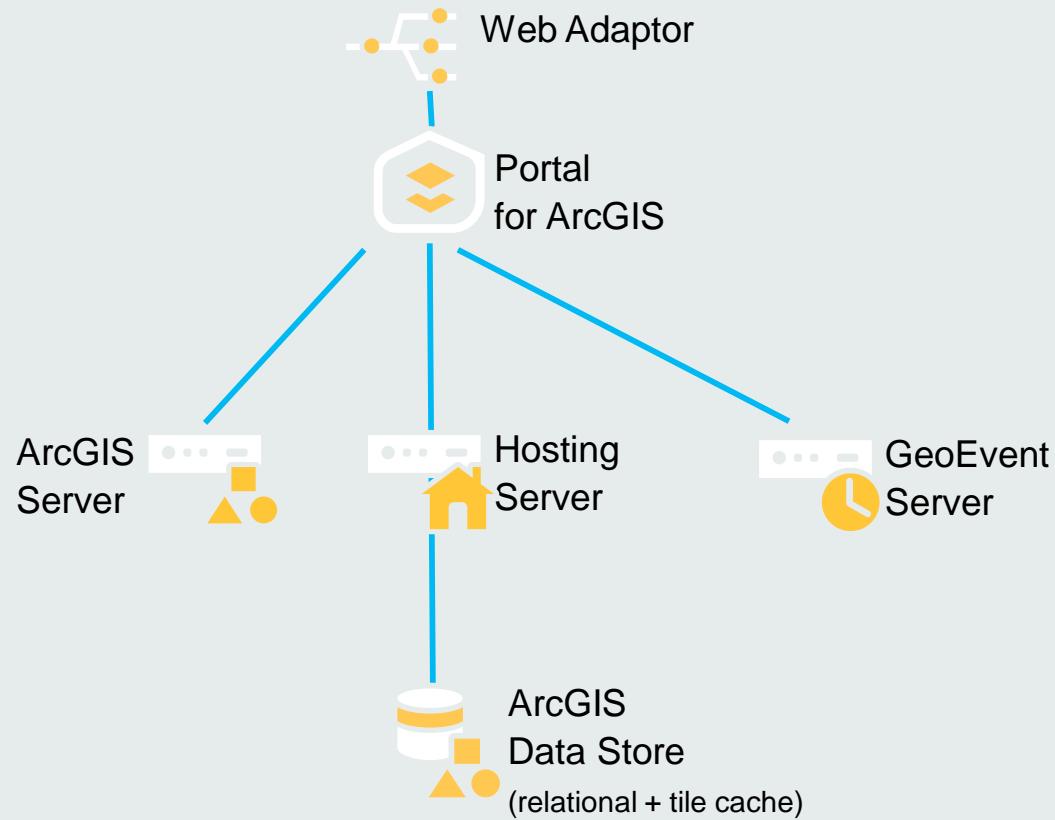


# Configuration

Monitoring service

# Review your solution(s) architecture

## Examples



# Gallery: Tutorials and Videos

## ArcGIS Monitor Gallery



video

1 - 16 of 19

Title

[How to get MongoDB](#)

[ArcGIS Monitor Demo for Administrators](#)

[ArcGIS Monitor Demo for Managers](#)

[Add ArcGIS Server in 10.6.1](#)

[Understanding Availability in ArcGIS Monitor](#)

[Add Http in 10.6.1](#)

[Adding ArcGIS Server in 10.6.0](#)

[Add Portal in 10.6.1](#)

[Add System for Windows](#)

## ArcGIS Monitor Gallery

Overview

Content

Members

Tutorials x

Table View Count Filter

1 - 16 of 29

Title

Modified

Owner

View Count ▾

[How to get MongoDB](#)

... Feb 1, 2018

ArcGISMonitorTeam

242

[Tutorial - How to find ArcGIS Monitor documents](#)

... Jan 18, 2018

ArcGISMonitorTeam

189

[Tutorial - Adding a System](#)

... Feb 19, 2019

ArcGISMonitorTeam

173

[Tutorial - Adding a DB](#)

... Feb 21, 2019

ArcGISMonitorTeam

142

[Tutorial - Adding ArcGIS Server](#)

... Feb 7, 2018

ArcGISMonitorTeam

108

Overview

Content

Members

Table

View Count

Filter

1 - 16 of 19

Title

[How to get MongoDB](#)

... Feb 1, 2018

ArcGISMonitorTeam

242

[ArcGIS Monitor Demo for Administrators](#)

... Jul 2, 2018

ArcGISMonitorTeam

66

[ArcGIS Monitor Demo for Managers](#)

... Jul 2, 2018

ArcGISMonitorTeam

53

[Add ArcGIS Server in 10.6.1](#)

... Jun 27, 2018

ArcGISMonitorTeam

41

[Understanding Availability in ArcGIS Monitor](#)

... Jul 2, 2018

ArcGISMonitorTeam

39

[Add Http in 10.6.1](#)

... Jun 27, 2018

ArcGISMonitorTeam

26

[Adding ArcGIS Server in 10.6.0](#)

... Jun 27, 2018

ArcGISMonitorTeam

24

[Add Portal in 10.6.1](#)

... Jun 19, 2018

ArcGISMonitorTeam

23

[Add System for Windows](#)

... Jan 5, 2018

ArcGISMonitorTeam

21

<https://arcgismonitor.maps.arcgis.com>

# Gallery: Select required Extensions

ArcGIS Monitor Gallery

Overview Content Members

1 - 16 of 21

Title	Modified	Owner	View Count
<a href="#">Esri Third-Party OSS_FOSS Software Acknowledgements</a>	Jan 4, 2019	ArcGISMonitorTeam	63
<a href="#">ArcSoc Optimizer Add-on</a>	Feb 26, 2019	ArcGISMonitorTeam	56
<a href="#">System Log Parser for ArcGIS Task Add-on</a>	Feb 4, 2019	ArcGISMonitorTeam	52
<a href="#">Excel Report Task Add-on</a>	Feb 4, 2019	ArcGISMonitorTeam	32
<a href="#">System Log Parser for IIS Add-on</a>	Feb 4, 2019	ArcGISMonitorTeam	30
<a href="#">License Extension Add-on</a>	Dec 19, 2018	ArcGISMonitorTeam	27
<a href="#">ArcGIS GeoEvent Add-on</a>	Dec 19, 2018	ArcGISMonitorTeam	24
<a href="#">EgdbSQL Add-on</a>	Feb 4, 2019	ArcGISMonitorTeam	18
<a href="#">SSL Certificate Add-on</a>	Dec 19, 2018	ArcGISMonitorTeam	17
<a href="#">File Read Write Add-on</a>	Dec 19, 2018	ArcGISMonitorTeam	17
<a href="#">HAR Extension Add-on</a>	Dec 19, 2018	ArcGISMonitorTeam	15

<https://arcgismonitor.maps.arcgis.com>

# Geonet series

<https://community.esri.com/thread/231451-arcgis-architecture-series-tools-of-an-architect>

ArcGIS Architecture Series: Tools of an Architect

Discussion created by **JBoyle-esristaff**  on Apr 1, 2019

Latest reply on May 22, 2019 by JBoyle-esristaff 

Like • 17

Comment • 9

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System design and architecture can sometimes feel daunting. As an ArcGIS Enterprise or ArcGIS Server administrator, you may occasionally be faced with decisions for how to best optimize the services within your site for performance, reduce wait-times, and eliminate service down times.

- [ArcGIS Server Tuning and Optimization with System Log Parser](#) - Outlines configuring ArcGIS Server for System Log Parser analysis and setting up System Log Parser.
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<https://community.esri.com/community/implementing-arcgis/content?filterID=contentstatus%5Bpublished%5D~category%5Barchitecture-security%5D&itemView=thumbnail>

# Extensions

# License Inventory

What and how many licenses do we have?

ArcGIS Monitor [Reports > License](#) [Home](#) [Availability](#)

License Manager Reports 11/14/2018 5:33 PM

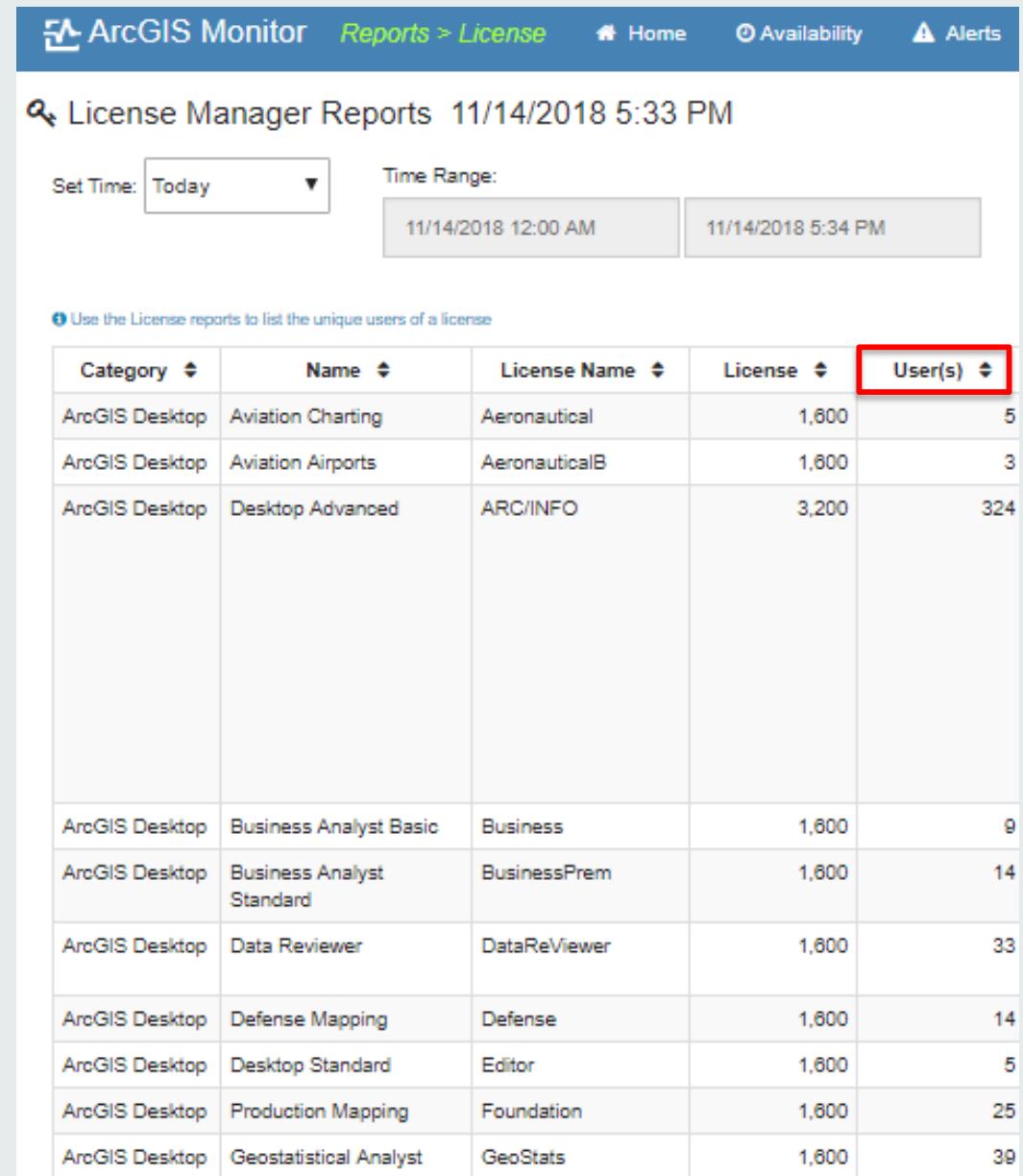
Set Time:  Time Range:

Use the License reports to list the unique users of a license

Category	Name	License Name	License
ArcGIS Desktop	Aviation Charting	Aeronautical	1,600
ArcGIS Desktop	Aviation Airports	AeronauticalB	1,600
ArcGIS Desktop	Desktop Advanced	ARC/INFO	3,200
ArcGIS Desktop	Business Analyst Basic	Business	1,600
ArcGIS Desktop	Business Analyst Standard	BusinessPrem	1,600
ArcGIS Desktop	Data Reviewer	DataReViewer	1,600
ArcGIS Desktop	Defense Mapping	Defense	1,600
ArcGIS Desktop	Desktop Standard	Editor	1,600
ArcGIS Desktop	Production Mapping	Foundation	1,600
ArcGIS Desktop	Geostatistical Analyst	GeoStats	1,600

# Number of Users

How many unique users were there during this time period?



The screenshot shows the ArcGIS Monitor interface with the 'Reports > License' tab selected. The page title is 'License Manager Reports 11/14/2018 5:33 PM'. There are filters for 'Set Time' (set to 'Today') and 'Time Range' (from '11/14/2018 12:00 AM' to '11/14/2018 5:34 PM'). A note at the top says 'Use the License reports to list the unique users of a license'. The table below lists 11 ArcGIS Desktop licenses with their respective names, license names, license counts, and unique user counts. The 'User(s)' column is highlighted with a red border.

Category	Name	License Name	License	User(s)
ArcGIS Desktop	Aviation Charting	Aeronautical	1,600	5
ArcGIS Desktop	Aviation Airports	AeronauticalB	1,600	3
ArcGIS Desktop	Desktop Advanced	ARC/INFO	3,200	324
ArcGIS Desktop	Business Analyst Basic	Business	1,600	9
ArcGIS Desktop	Business Analyst Standard	BusinessPrem	1,600	14
ArcGIS Desktop	Data Reviewer	DataReviewer	1,600	33
ArcGIS Desktop	Defense Mapping	Defense	1,600	14
ArcGIS Desktop	Desktop Standard	Editor	1,600	5
ArcGIS Desktop	Production Mapping	Foundation	1,600	25
ArcGIS Desktop	Geostatistical Analyst	GeoStats	1,600	39

# User Names

Who were the specific users during this time period?

ArcGIS Monitor Reports > License Home Availability Alerts RCA

License Manager Reports 11/14/2018 5:33 PM

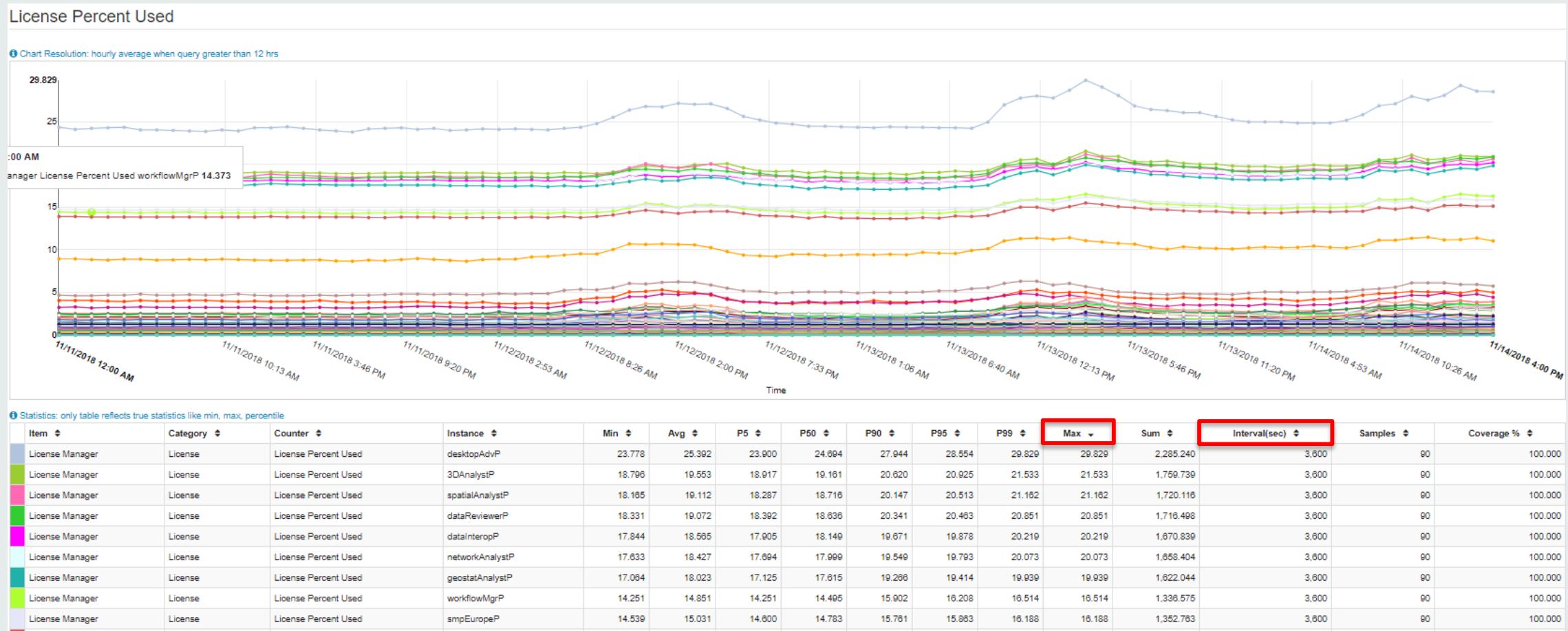
Set Time: Today Time Range: 11/14/2018 12:00 AM 11/14/2018 5:34 PM

Use the License reports to list the unique users of a license

Category	Name	License Name	License	User(s)	
ArcGIS Desktop	Aviation Charting	Aeronautical	1,600	5	charlie, j...2722,...
ArcGIS Desktop	Aviation Airports	AeronauticalB	1,600	3	dan, ...ter
ArcGIS Desktop	Desktop Advanced	ARC/INFO	3,200	324	Ch...y2, aut...arl, con...ral, con...nal, dia...dre, jeff...jer, k...4, min...65, rich...in, sha...20, xi8...ku
ArcGIS Desktop	Business Analyst Basic	Business	1,600	9	Ch...19
ArcGIS Desktop	Business Analyst Standard	BusinessPrem	1,600	14	ada...09
ArcGIS Desktop	Data Reviewer	DataReViewer	1,600	33	Luc...art, yun...art
ArcGIS Desktop	Defense Mapping	Defense	1,600	14	bar...o
ArcGIS Desktop	Desktop Standard	Editor	1,600	5	co...38
ArcGIS Desktop	Production Mapping	Foundation	1,600	25	Luc...art
ArcGIS Desktop	Geostatistical Analyst	GeoStats	1,600	39	Jos...an

# % of Licenses Used

What percentage of the licenses were used during this time period?



# ArcSOC Optimizer

Setting min / max instances across 100 to 1000s of services  
in dynamic environments is challenging

System Monitor Desktop

File Remove Test Config Logs

Name: ArcSOCOptimizer [z30]

Type: ArcSOC Optimizer

Program: C:\System Monitor Desktop\resources\app\bin\ArcSOC Optimizer\ArcSOCOptimizer.exe

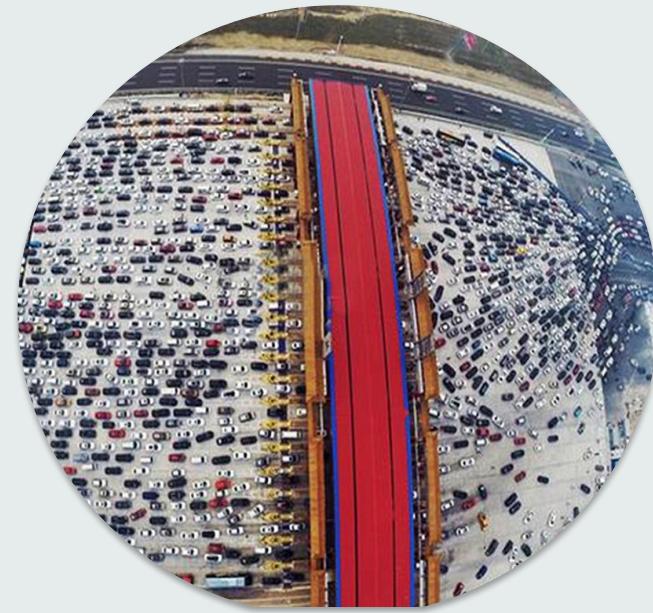
Config: C:\System Monitor Desktop\resources\app\bin\ArcSOC Optimizer\config30days.json

SiteUrl: https://[REDACTED]43/arcgis

TokenUrl: https://[REDACTED]43/arcgis/tokens/generateTokens

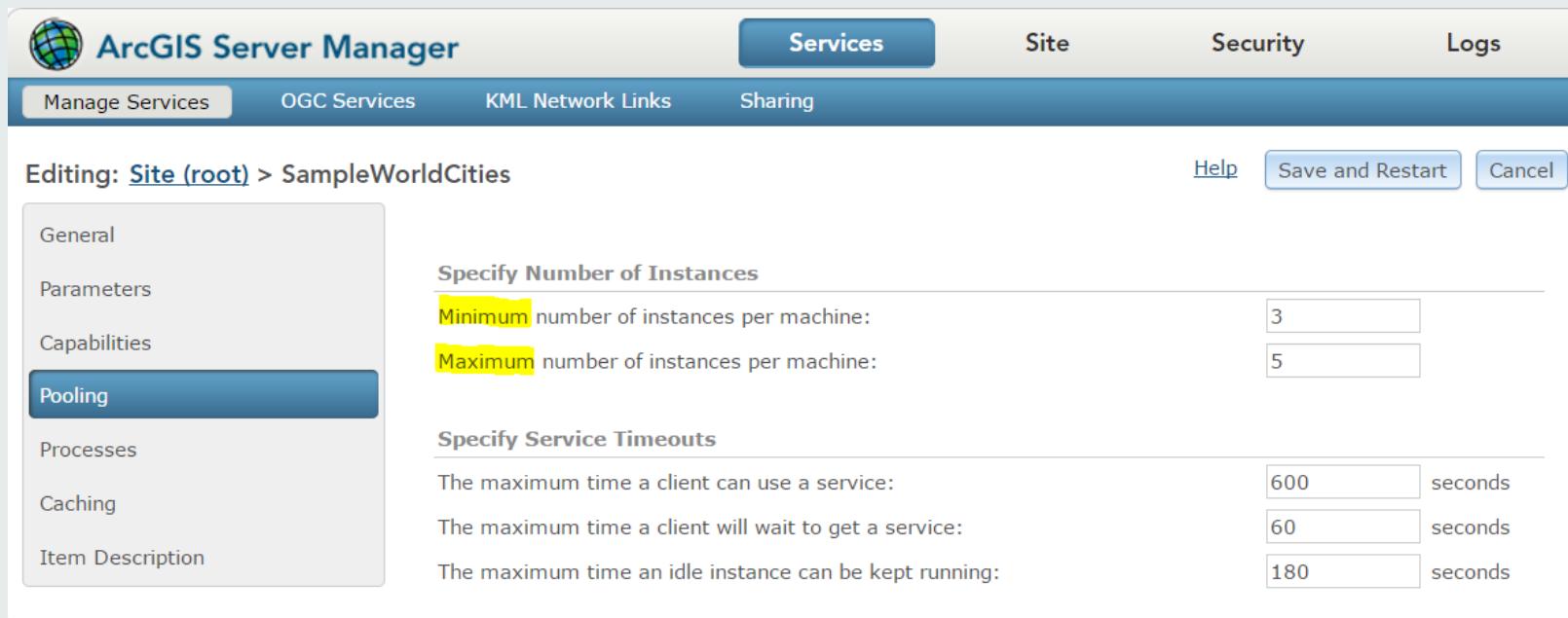
Site@[REDACTED]444

- SystemMonitor
- SystemMonitor Collector (27)
  - Amazon (1)
  - ArcGIS (2)
  - DB (2)
  - Ext (6)
  - Http (6)
  - Portal (0)
  - Process (3)
  - RDP (0)
  - System (1)
- Tasks (6)
  - ArcGISLog
  - ArcSOCOptimizer\_es
  - ArcSOCOptimizerSa
    - IIS
    - mongostats
    - SMEExcel



# ArcSOC Optimizer

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



# Results & Benefits

- The results speak for themselves
  - **Vastly improved stability of ArcGIS Server**
  - **Improved response times of services**
  - **Staff time freed for other activities**
  - **Happy WebGIS users!!!**



# System Log Parser and Egdbhealth

<https://community.esri.com/thread/231451-arcgis-architecture-series-tools-of-an-architect>

## ArcGIS Architecture Series: Tools of an Architect

Discussion created by JBoyle-esristaff on Apr 1, 2019  
Latest reply on May 22, 2019 by JBoyle-esristaff

Like • 17 Comment • 9

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# Monitoring service

ArcGIS Monitor Administrator

File ▾ Remove Test Config

Site@localhost:444

Dev2019

test 4

Amazon 0

ArcGIS 0

DB 0

Ext 1

Http 1

Dev2019Agenda

Portal 0

Process 0

RDP 0

System 1

Tasks 1

Config Alerts (6) Help

Counter: If alert selections are empty, click the Test button

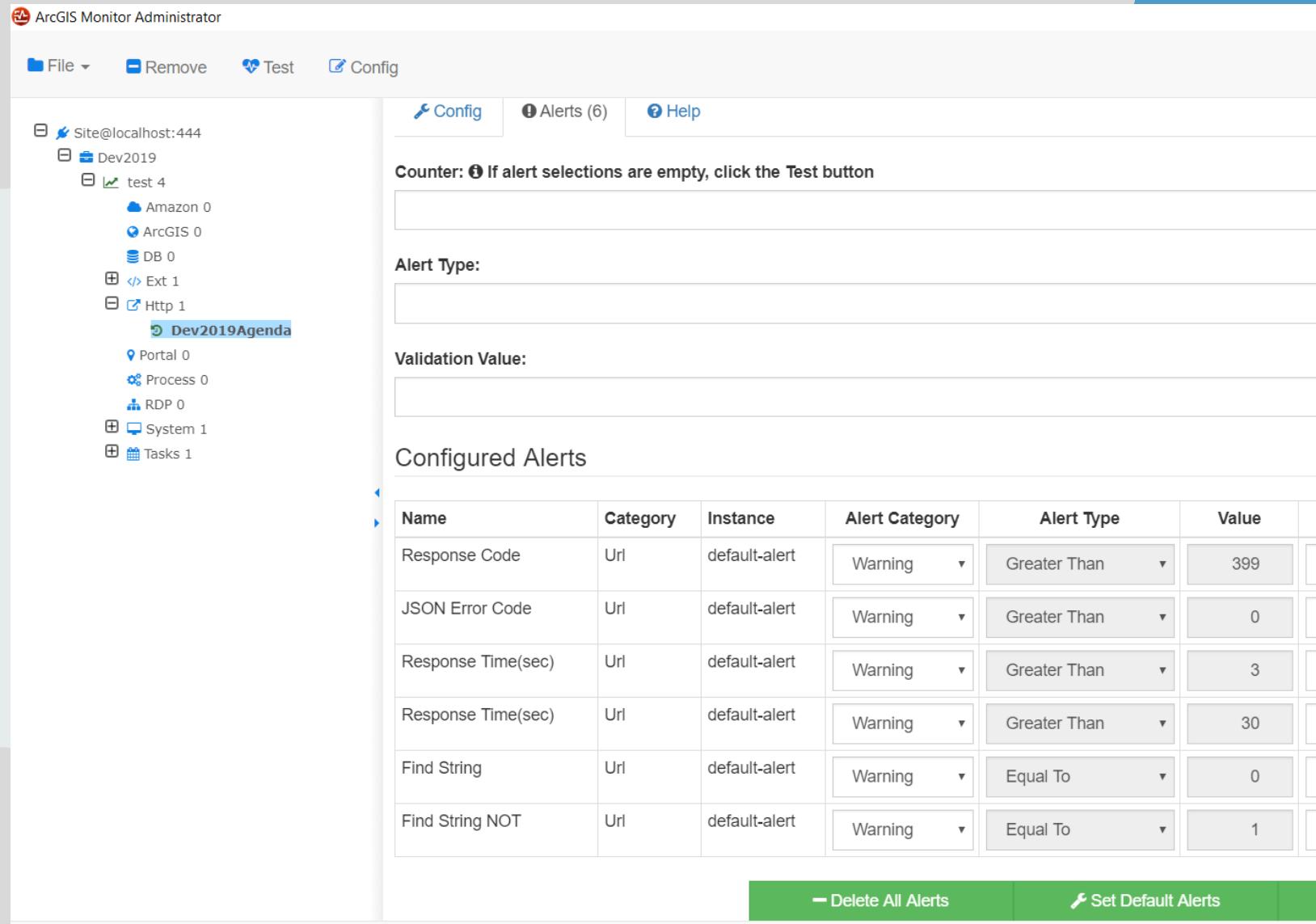
Alert Type:

Validation Value:

Configured Alerts

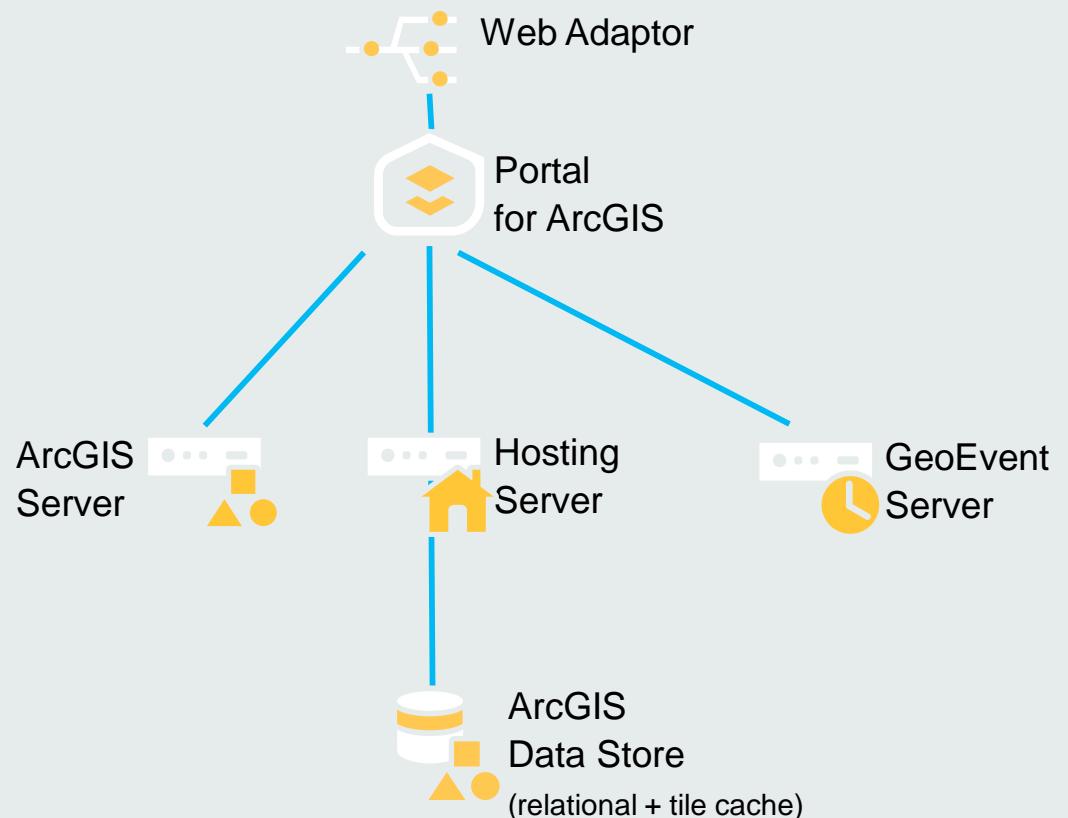
Name	Category	Instance	Alert Category	Alert Type	Value
Response Code	Url	default-alert	Warning	Greater Than	399
JSON Error Code	Url	default-alert	Warning	Greater Than	0
Response Time(sec)	Url	default-alert	Warning	Greater Than	3
Response Time(sec)	Url	default-alert	Warning	Greater Than	30
Find String	Url	default-alert	Warning	Equal To	0
Find String NOT	Url	default-alert	Warning	Equal To	1

— Delete All Alerts Set Default Alerts



# Mapping counters to architecture components

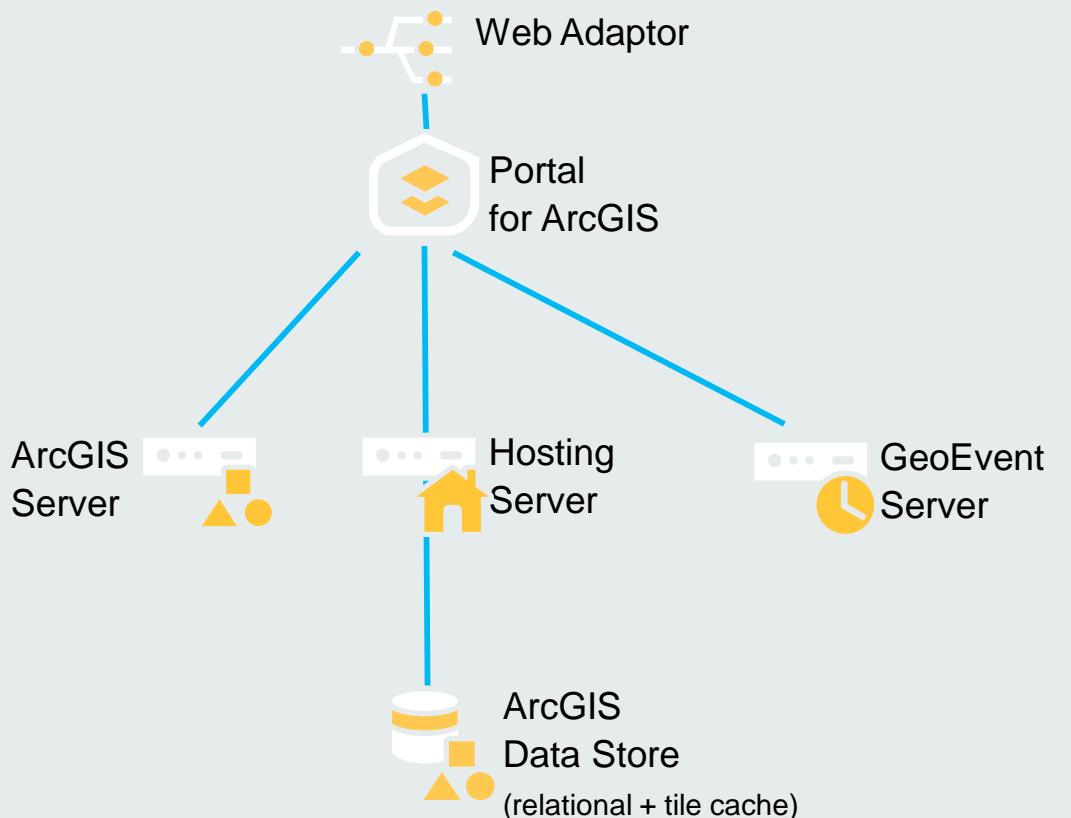
## Infrastructure: Administrator view



File	<a href="#">File</a>
Remove	<a href="#">Remove</a>
Test	<a href="#">Test</a>
Config	<a href="#">Config</a>
Demo 34	<a href="#">Demo 34</a>
Amazon 1	<a href="#">Amazon 1</a>
AWS	<a href="#">AWS</a>
ArcGIS 2	<a href="#">ArcGIS 2</a>
DB 0	<a href="#">DB 0</a>
Ext 9	<a href="#">Ext 9</a>
ArcGIS GeoEvent Server	<a href="#">ArcGIS GeoEvent Server</a>
AWS ALB	<a href="#">AWS ALB</a>
WinEvent: AGM	<a href="#">WinEvent: AGM</a>
WinEvent: AGS	<a href="#">WinEvent: AGS</a>
WinEvent: DataStore	<a href="#">WinEvent: DataStore</a>
WinEvents: Portal	<a href="#">WinEvents: Portal</a>
WinService: AGS	<a href="#">WinService: AGS</a>
WinService: DataStore	<a href="#">WinService: DataStore</a>
WinService: Portal	<a href="#">WinService: Portal</a>
Http 6	<a href="#">Http 6</a>
Portal 1	<a href="#">Portal 1</a>
Process 6	<a href="#">Process 6</a>
10.0.3.202-ArcGISDataStore	<a href="#">10.0.3.202-ArcGISDataStore</a>
10.0.3.184-ArcGISPortal	<a href="#">10.0.3.184-ArcGISPortal</a>
10.0.3.154-ArcSOC	<a href="#">10.0.3.154-ArcSOC</a>
10.0.3.232-mongod	<a href="#">10.0.3.232-mongod</a>
10.0.3.184-postgres	<a href="#">10.0.3.184-postgres</a>
10.0.3.202-postgres	<a href="#">10.0.3.202-postgres</a>
RDP 0	<a href="#">RDP 0</a>
System 5	<a href="#">System 5</a>
10.0.3.154	<a href="#">10.0.3.154</a>
10.0.3.184	<a href="#">10.0.3.184</a>
10.0.3.202	<a href="#">10.0.3.202</a>
10.0.3.232	<a href="#">10.0.3.232</a>
10.0.3.27	<a href="#">10.0.3.27</a>

# Mapping counters to architecture components

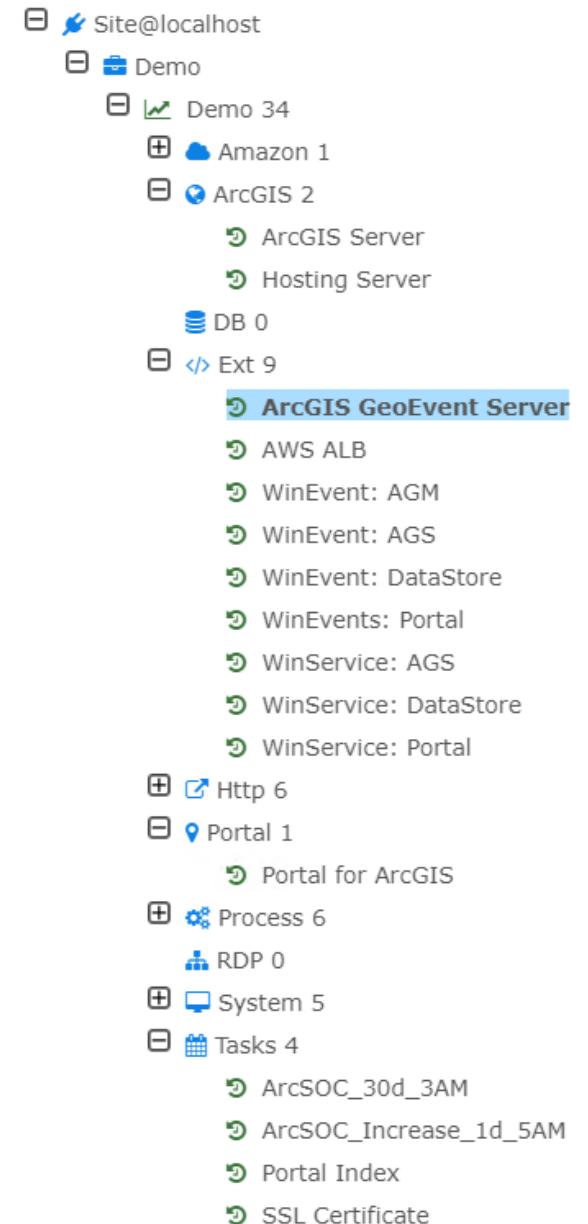
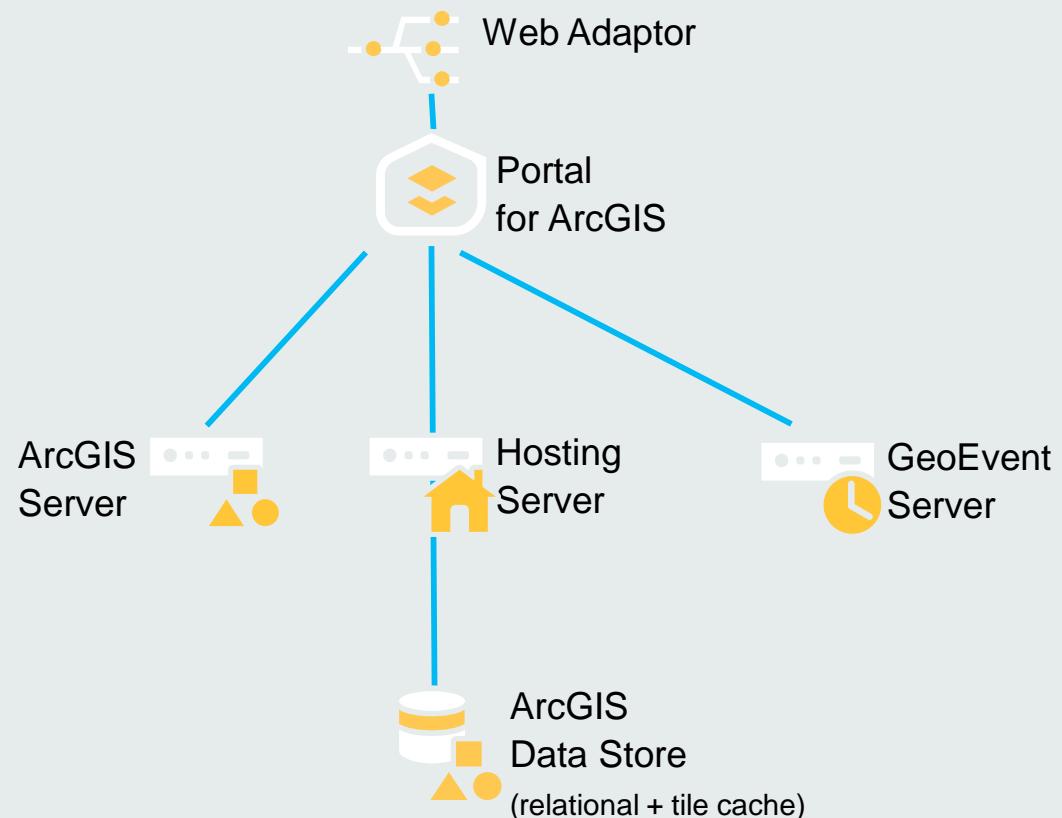
## Infrastructure: Server view



- ! Demo
- Amazon
- Process
  - % Processor Time
  - Collection Time(sec)
  - Count Active
  - Count Idle
  - Count Total
  - Private GB
  - Virtual GB
- SSL Certificate
- System
  - % Processor Time
  - % Utilization Memory
  - % Utilization Virtual
  - Available Disk GB
  - Available Memory GB
  - Collection Time(sec)
  - Committed Memory GB
  - Disk % Idle
  - Disk % Used
  - Network Received mbps
  - Network Sent mbps
  - Paging File % Usage
  - Paging File Free GB
  - Paging File Usage GB
  - Virtual Memory Free GB
  - Virtual Memory Usage GB
- Windows Events
  - ! WinEvent: AGM
    - Code
    - Collection Time(sec)
    - Critical
    - Error
    - Information
    - Warning
  - ! WinEvent: AGS
  - ! WinEvent: DataStore
  - ! WinEvents: Portal
- Windows Services
  - WinService: AGS
    - ArcGIS Server
    - Code
    - Collection Time(sec)

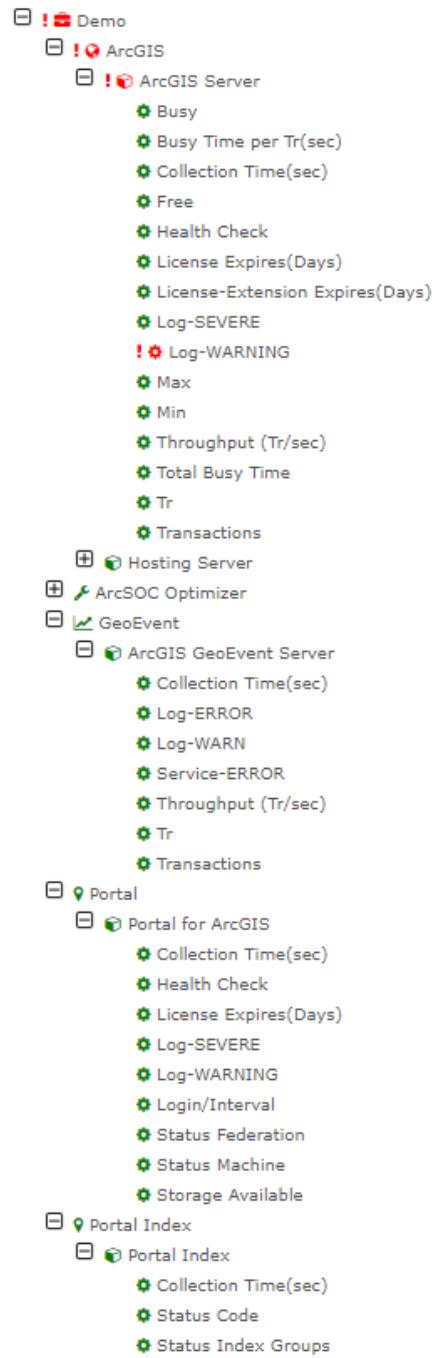
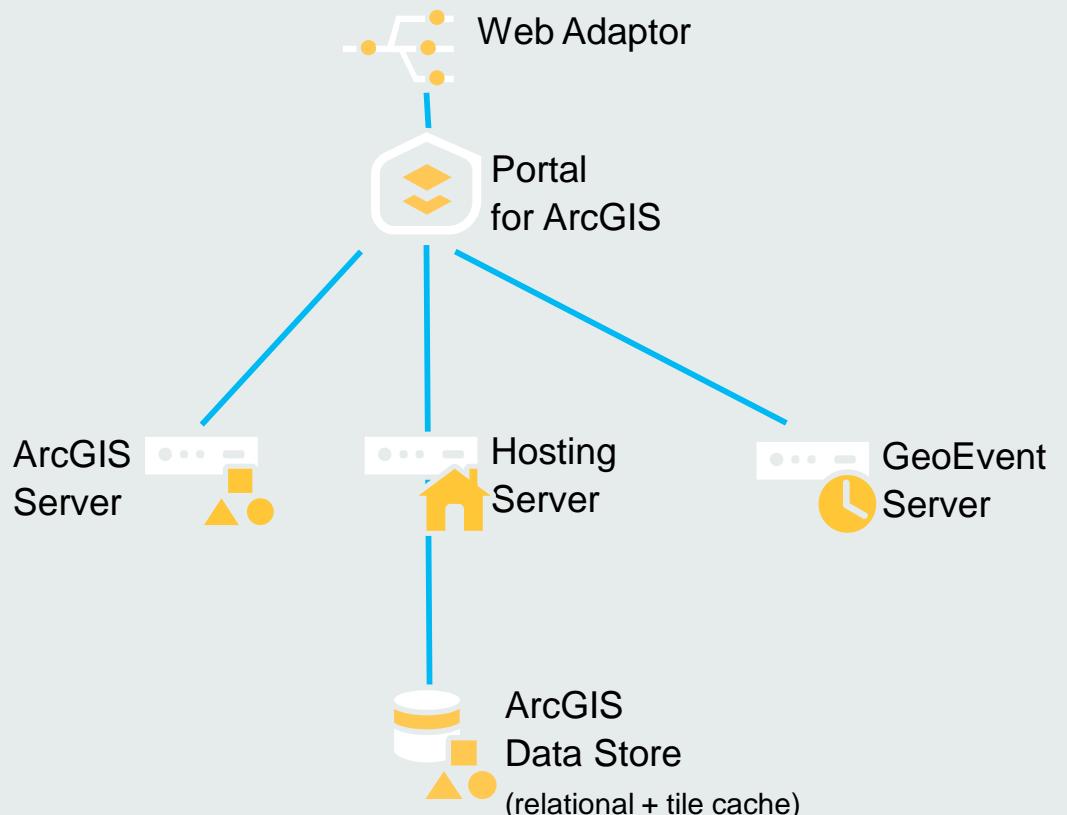
# Mapping counters to architecture components

## ArcGIS: Administrator view



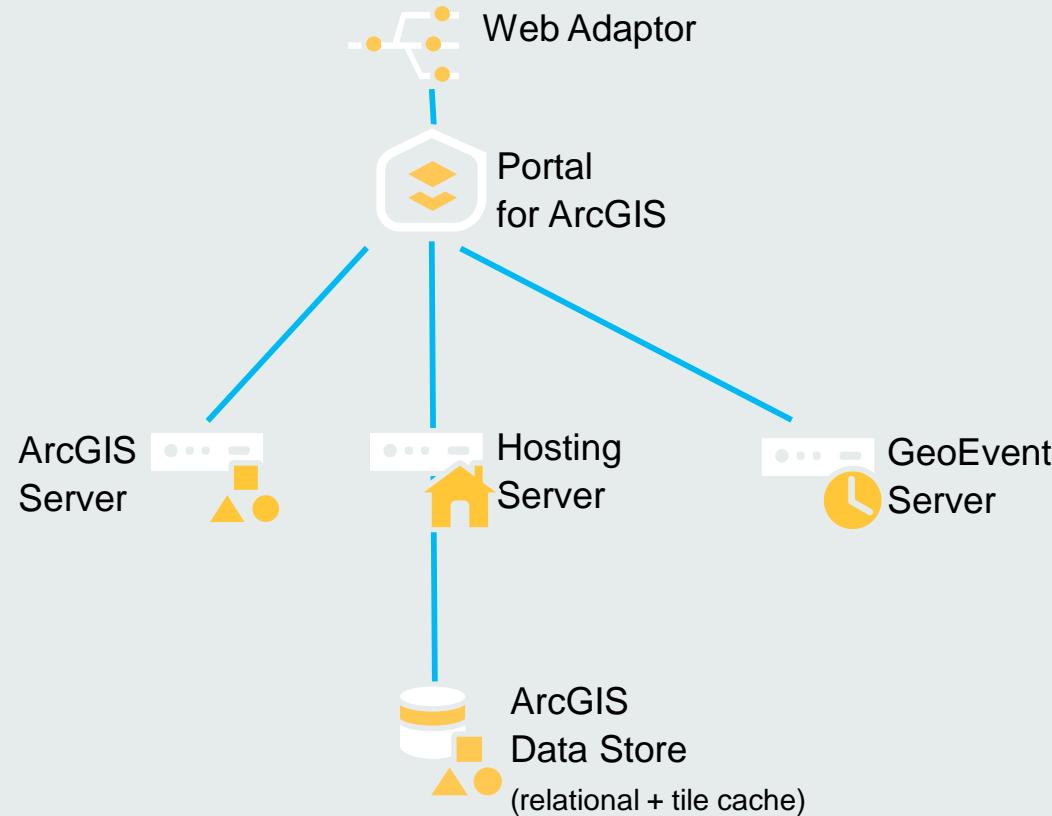
# Mapping counters to architecture components

## ArcGIS: Server view



# Mapping counters to architecture components

## Web



## Server view

**ArcGIS Monitor Categories > Web**

- Demo**
  - HTTP**
    - Collection Time(sec)
    - Content Length
    - Find String
    - Find String NOT
    - JSON Error Code
    - Network Time(sec)
    - Response Code
    - Response Time(sec)
    - Server Time(sec)

## Administrator view

**ArcGIS Monitor Administrator**

**File** **Add** **Test** **Config**

- 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**

# Availability

# Availability

- Availability is usually expressed as a percentage of uptime in a given time span (typically 1 month) and calculated as follows:

$$\text{Availability} (\%) = (\text{Total time} - \text{Downtime}) / \text{Total Time} *100\%$$

- ArcGIS Monitor defines downtime based on a critical alert duration.

# Availability

- In the case below, in January 2019:
  - Total Time=  $31*24 = 744$  hours (44640 minutes) , see Duration H:M; the total downtime
  - Downtime = 47 hours and 24 minutes (2844 minutes), see Non Availability H:M).
  - Availability (%) =  $(44640-2844)/44640*100=93.629\%$

The screenshot shows the ArcGIS Monitor interface with the 'Availability' tab selected. The main content area displays a red warning icon with the number '1' and the text '(< 99%)'. Below this, there are time range selection controls: 'Set Time Range:' with 'Previous Month' selected, and 'Time Range:' showing '01/01/2019 12:00 AM' to '01/31/2019 11:59 PM'. Under these controls are two radio buttons: 'All' (selected) and '< 100%'. A table at the bottom provides detailed availability statistics:

ID	Status	Availability (%)	Collection	Duration H:M	Availability H:M	Non Availability H:M	Coverage (%)
1	⚠	93.629	Demo	743:59	696:35	47:24	74.75

# Alerts

# Alerts

## Starting point for troubleshooting

ArcGIS Monitor **Alerts** Home Availability RCA Categories Site Reports API Help Demo@arcgismonitor.esri.com:443 / Logout

⚠ Alerts 10/17/2018 7:48 AM

Set Time: Time Range: Today 10/17/2018 12:00 AM 10/17/2018 7:48 AM

▶ Collection: (All Collections) Counter Name: (All Counter Names) ▶ Category: (All Categories) Names: (All Names) Set Default Filters

▶ Level:  Critical: 12  Warning: 54  Info: 6

▶ Status:  Open: 8  Closed: 64

▶ Monitor Service:  Data not collected: 26  License Expires: 0

▶ Logs:  Logs Severe: 3  Logs Warning: 2

ID	Category	Last Alert	Collection	Level	Status	H:M	Count	Groups	Counter Name	Rule	Counter Instance	Name	Desc	Counter Type	Int(min)
1	ArcGIS	10/17/2018 7:45 AM	Demo	Critical	Open	7:47	92	1	Status Federation	> 0	Summary	Portal for ArcGIS		Portal	5
2	Usage	10/17/2018 7:40 AM	Demo	Warning	Closed	0:9	2	2	HTTP500	>= 5	HTTP Code (%)	AWS ALB		Ext - System Log Parser for ELB	5
3	ArcGIS	10/17/2018 7:25 AM	Demo	Warning	Closed	0:15	3	1	Log-WARNING	> 0	Summary	Hosting Server		ArcGIS	5
4	ArcGIS	10/17/2018 7:20 AM	Demo	Info	Closed	0:34	7	7	Tr	= 0	USGS-RSS-Earthquakes	ArcGIS GeoEvent Server		Ext - ArcGIS GeoEvent Extension	5
5	Infrastructure	10/17/2018 7:16 AM	Demo	Critical	Closed	0:16	16	1	Count Total	= 0	postgres	10.0.3.202-postgres	ArcGIS DataStore	Process	1
6	Web	10/17/2018 7:16 AM	Demo	Warning	Closed	0:16	16	1	JSON Error Code	> 0	California_Test_Hosted	California_Test_Hosted		Http	1
7	Infrastructure	10/17/2018 7:15 AM	Demo	Critical	Closed	0:15	15	1	Count Total	= 0	ArcGISDataStore	10.0.3.202-ArcGISDataStore	ArcGIS DataStore	Process	1
8	ArcGIS	10/17/2018 7:15 AM	Demo	Warning	Closed	1:05	13	5	Log-ERROR	> 0	Validation	ArcGIS GeoEvent Server		Ext - ArcGIS GeoEvent Extension	5
9	Infrastructure	10/17/2018 7:15 AM	Demo	Warning	Closed	0:15	3	2	Error	> 0	10.0.3.202	WinEvent: DataStore		Ext - WinEvent	5
10	Infrastructure	10/17/2018 7:15 AM	Demo	Critical	Closed	0:15	3	1	ArcGIS Data Store	= 0	10.0.3.202	WinService: DataStore		Ext - WinService	5
11	Infrastructure	10/17/2018 7:05 AM	Demo	Info	Closed	1:13	15	7	Information	> 0	10.0.3.232	WinEvent: AGM		Ext - WinEvent	5
12	Web	10/17/2018 7:00 AM	Demo	Warning	Closed	0:31	31	2	Find String NOT	= 1	California_Test_Hosted	California_Test_Hosted		Http	1
13	Web	10/17/2018 7:00 AM	Demo	Warning	Closed	0:31	31	2	Find String	= 0	California_Test_Hosted	California_Test_Hosted		Http	1
14	Infrastructure	10/17/2018 6:16 AM	Demo	Warning	Closed	0:15	3	3	Error	> 0	10.0.3.27	WinEvent: AGS	10.0.3.27 -Hosting, 10.0.3.154-AGS	Ext - WinEvent	5
15	Infrastructure	10/17/2018 6:16 AM	Demo	Critical	Closed	0:15	3	1	ArcGIS Server	= 0	10.0.3.27	WinService: AGS	Windows service status: ArcGIS Server	Ext - WinService	5

Charts and Stats

Details and Logs

SourceUrls

Admin Url

# **Root Cause Analysis (RCA)**

# Root Cause Analysis (RCA) Source and Impact by time

ArcGIS Monitor **RCA** Home Availability Alerts Categories Site Reports API Help Demo@arcgismonitor.e

Root Cause Analysis Reports 01/29/2019 7:04 AM

Set Time: Time Range: Yesterday 01/28/2019 12:00 AM 01/28/2019 11:59 PM

Collection: Demo Reports: Sources & Impacts by Time Execute

Bins: 82 - 01/28/2019 10:10 AM

Use this root cause analysis report to categorize alerts into impacts and sources

Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
82	Impact	ArcGIS	01/28/2019 10:10 AM	01/28/2019 10:20 AM	10	Warning	Free	= 0	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Increase min/max to reduce wait time
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	Error	> 0	10.0.3.154	WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	% Processor Time	> 85	_Total	10.0.3.154	System	Check for: 1. usage spikes; 2. degraded performance; 3. unexp consuming CPU
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	% Processor Time	> 85	agmdemo-PRD-AGS02-i-0ce4a9bff1788a034-us-east-1	AWS	Amazon	Check for: 1. usage spikes; 2. degraded performance; 3. unexp consuming CPU
	Impact	na		01/28/2019 10:20 AM	10	Warning	seconds	> 0.1	EC2AMAZ-NI76OEE	CPUBenchmark_EC2AMAZ-NI76OEE	</> Ext - CPUBenchmark	Investigate potential CPU wait time
	Source	ArcGIS		01/28/2019 10:20 AM	10	Warning	Throughput (Tr/sec)	>= 5	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.
	Source	ArcGIS		01/28/2019 10:20 AM	10	Warning	Throughput (Tr/sec)	>= 10	Summary	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.

# RCA Source list

**RCA** Home Availability Alerts Categories Site Reports API Help

**Root Cause Analysis Reports 01/28/2019 6:29 PM**

Set Time: Time Range: Today 01/28/2019 12:00 AM 01/28/2019 6:29 PM Collection: Demo Reports: Source List Execute

Use this root cause analysis report to list sources

Type	Tier	Last Alert	Level	Status	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
Source	Infrastructure	01/28/2019 12:10 AM	Warning	Closed	% Processor Time	> 85	_Total	10.0.3.27	System	Check for: 1. usage spikes; 2. degraded performance; 3. unexpected process consuming CPU
Source	Database	01/28/2019 1:20 AM	Critical	Closed	Code	> 0	Validation	eGDB Activity	</> Ext - EgdbSQL	Check if database is running
Source	ArcGIS	01/28/2019 5:20 AM	Critical	Closed	Portal for ArcGIS	= 0	10.0.3.184	WinService: Portal	</> Ext - WinService	Check ArcGIS Enterprise and OS logs.
Source	ArcGIS	01/28/2019 6:20 AM	Critical	Closed	ArcGIS Server	= 0	10.0.3.27	WinService: AGS	</> Ext - WinService	Check ArcGIS Enterprise and OS logs.
Source	ArcGIS	01/28/2019 7:20 AM	Critical	Closed	ArcGIS Data Store	= 0	10.0.3.202	WinService: DataStore	</> Ext - WinService	Check ArcGIS Enterprise and OS logs.
Source	Infrastructure	01/28/2019 7:30 AM	Warning	Closed	Error	> 0	10.0.3.202	WinEvent: DataStore	</> Ext - WinEvent	Check windows event logs
Source	Infrastructure	01/28/2019 8:00 AM	Warning	Closed	Error	> 0	10.0.3.27	WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
Source	Infrastructure	01/28/2019 8:00 AM	Warning	Closed	Error	> 0	10.0.3.184	WinEvents: Portal	</> Ext - WinEvent	Check windows event logs
Source	Infrastructure	01/28/2019 8:00 AM	Warning	Closed	Count Total	= 0	ArcGISGeoEvent	10.0.3.154-ArcGISGeoEvent	Process	Check ArcGIS Enterprise and OS logs.
Source	ArcGIS	01/28/2019 8:40 AM	Critical	Closed	ArcGISGeoEvent	= 0	10.0.3.154	WinService:GeoEvent	</> Ext - WinService	Check ArcGIS Enterprise and OS logs.
Source	Infrastructure	01/28/2019 10:00 AM	Warning	Closed	% Processor Time	> 85	_Total	10.0.3.154	System	Check for: 1. usage spikes; 2. degraded performance; 3. unexpected process consuming CPU
Source	ArcGIS	01/28/2019 10:50 AM	Warning	Closed	Throughput (Tr/sec)	>= 5	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.
Source	ArcGIS	01/28/2019 10:50 AM	Warning	Closed	Throughput (Tr/sec)	>= 10	Summary	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.
Source	Infrastructure	01/28/2019 11:10 AM	Critical	Closed	Reboot	> 0	_Total	10.0.3.154	System	If reboot not planned, check OS event logs for details
Source	Infrastructure	01/28/2019 3:00 PM	Warning	Closed	% Processor Time	> 85	postgres	10.0.3.202-postgres	Process	Check for: 1. usage spikes; 2. degraded performance
Source	Infrastructure	01/28/2019 3:50 PM	Warning	Closed	% Processor Time	> 85	postgres	10.0.3.184-postgres	Process	Check for: 1. usage spikes; 2. degraded performance
Source	Infrastructure	01/28/2019 5:20 PM	Warning	Closed	Warning	> 0	10.0.3.27	WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
Source	Infrastructure	01/28/2019 6:29 PM	Warning	Open	Error	> 0	10.0.3.154	WinEvent: AGS	</> Ext - WinEvent	Check windows event logs

# RCA Impact list

ArcGIS Monitor RCA Home Availability Alerts Categories Site Reports API Help

Today 01/28/2019 12:00 AM 01/28/2019 6:29 PM

Collection: Demo Reports: Impact List Execute

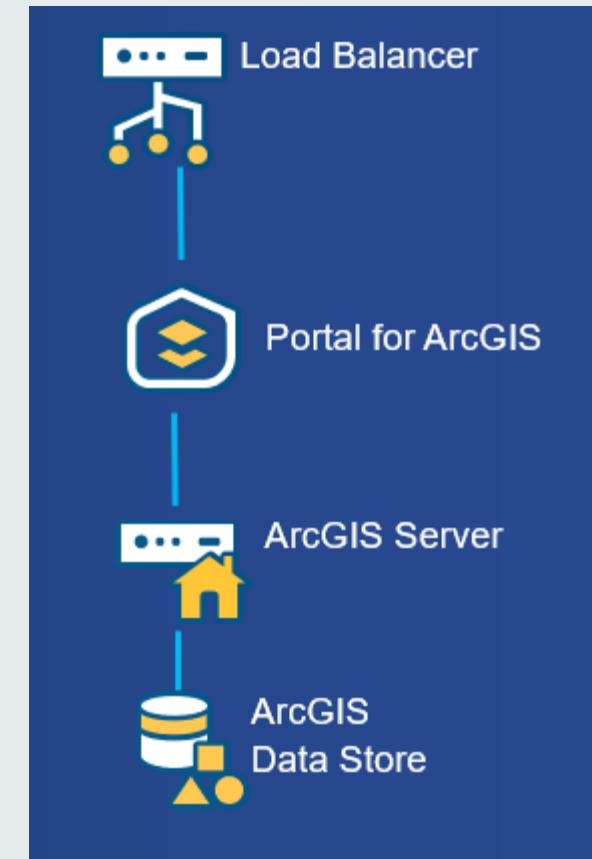
i Use this root cause analysis report to list the impacts

Type	Tier	Last Alert	Level	Status	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
Impact	Web	01/28/2019 5:20 AM	Warning	Closed	Find String	= 0	Portal for ArcGIS Health	Portal for ArcGIS Health	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 5:20 AM	Warning	Closed	Find String NOT	= 1	Portal for ArcGIS Health	Portal for ArcGIS Health	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 5:20 AM	Warning	Closed	JSON Error Code	> 0	Countries_Sql_Egdb_Draw	Countries_Sql_Egdb_Draw	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 5:20 AM	Warning	Closed	JSON Error Code	> 0	Countries_Sql_Egdb_Test	Countries_Sql_Egdb_Test	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 5:20 AM	Warning	Closed	Find String NOT	= 1	Countries_Sql_Egdb_Test	Countries_Sql_Egdb_Test	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Infrastructure	01/28/2019 5:20 AM	Warning	Closed	Count Total	= 0	ArcGISPortal	10.0.3.184-ArcGISPortal	Process	Check ArcGIS Enterprise and OS logs.
Impact	Infrastructure	01/28/2019 5:20 AM	Warning	Closed	Count Total	= 0	postgres	10.0.3.184-postgres	Process	Check ArcGIS Enterprise and OS logs.
Impact	Infrastructure	01/28/2019 5:20 AM	Warning	Closed	Warning	> 0	10.0.3.232	WinEvent: AGM	Ext - WinEvent	Check windows event logs
Impact	Web	01/28/2019 5:30 AM	Warning	Closed	RequestAverage	> 1	Response Time (Sec)	AWS ALB	Ext - System Log Parser for ELB	Check resource utilization and settings.
Impact	Infrastructure	01/28/2019 6:10 AM	Warning	Closed	% Processor Time	> 85	postgres	10.0.3.184-postgres	Process	Check for: 1. usage spikes; 2. degraded performance
Impact	Web	01/28/2019 6:20 AM	Warning	Closed	Find String NOT	= 1	SampleWorldCities_Hosted	SampleWorldCities_Hosted	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 6:20 AM	Warning	Closed	Find String	= 0	SampleWorldCities_Hosted	SampleWorldCities_Hosted	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 6:20 AM	Warning	Closed	Response Time(sec)	> 3	California_Test_Hosted	California_Test_Hosted	Http	Check: 1. CPU; 2. Which tier(s) are responsible (e.g. check ArcGIS, DB cou
Impact	Infrastructure	01/28/2019 6:20 AM	Warning	Closed	Error	> 0	10.0.3.27	WinEvent: AGS	Ext - WinEvent	Check windows event logs
Impact	Web	01/28/2019 7:20 AM	Warning	Closed	JSON Error Code	> 0	California_Test_Hosted	California_Test_Hosted	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 7:20 AM	Warning	Closed	Find String	= 0	California_Test_Hosted	California_Test_Hosted	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Web	01/28/2019 7:20 AM	Warning	Closed	Find String NOT	= 1	California_Test_Hosted	California_Test_Hosted	Http	1. Reproduce with web debugger; 2. check app and other logs
Impact	Infrastructure	01/28/2019 7:20 AM	Warning	Closed	Count Total	= 0	postgres	10.0.3.202-postgres	Process	Check ArcGIS Enterprise and OS logs.
Impact	Infrastructure	01/28/2019 7:20 AM	Warning	Closed	Count Total	= 0	ArcGISDataStore	10.0.3.202-ArcGISDataStore	Process	Check ArcGIS Enterprise and OS logs.
Impact	Portal	01/28/2019 7:30 AM	Critical	Closed	Status Federation	> 0	Summary	Portal for ArcGIS	Portal	Check ArcGIS Enterprise logs
Impact	Infrastructure	01/28/2019 8:10 AM	Warning	Closed	Error	> 0	10.0.3.184	WinEvents: Portal	Ext - WinEvent	Check windows event logs
Impact	ArcGIS	01/28/2019 8:40 AM	Warning	Closed	Service-ERROR	> 0	Validation	ArcGIS GeoEvent Server	Ext - ArcGIS GeoEvent Extension	Check ArcGIS Enterprise logs
Impact	Infrastructure	01/28/2019 8:40 AM	Warning	Closed	Count Total	= 0	ArcGISGeoEvent	10.0.3.154-ArcGISGeoEvent	Process	Check ArcGIS Enterprise and OS logs.
Impact	Infrastructure	01/28/2019 10:30 AM	Warning	Closed	Error	> 0	10.0.3.202	WinEvent: DataStore	Ext - WinEvent	Check windows event logs
Impact	Web	01/28/2019 11:10 AM	Warning	Closed	Find String	= 0	Countries_Sql_Egdb_Draw	Countries_Sql_Egdb_Draw	Http	1. Reproduce with web debugger; 2. check app and other logs

# Usage

# Usage

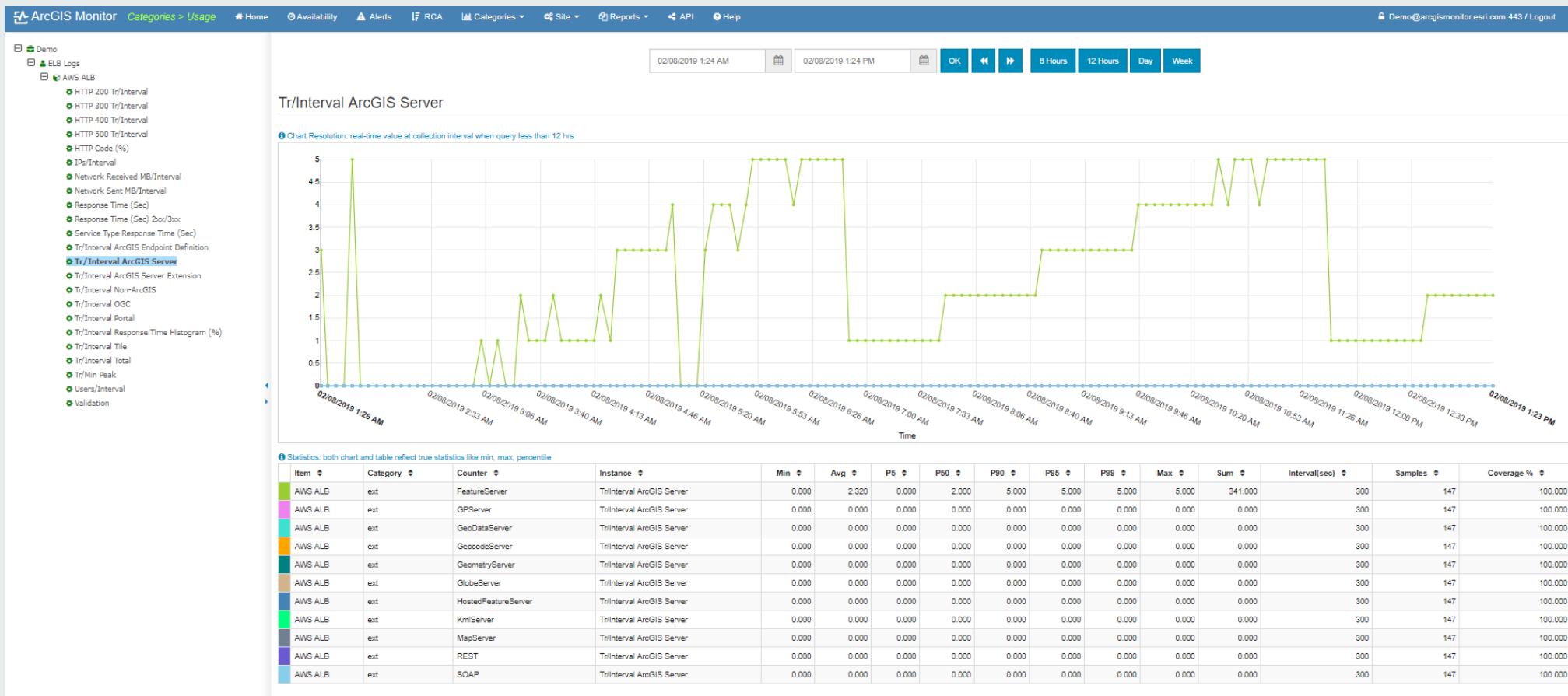
- **Usage (or user load) is typically measured using:**
  - Transactions or requests per time, e.g. per seconds, 5 min, day.
  - User IP per time, e.g. per seconds, 5 min, day.
  - Users per time, e.g. per seconds, 5 min, day.
- **Measured at:**
  - **Load balancer (LB)**
  - **Web server**
  - **ArcGIS Server**
  - **Database**
- **Format:**
  - **Chart time series**
  - **Table**
  - **Map**



# Usage at LB: transactions (or requests)

Categories > Usage > Tr/Interval

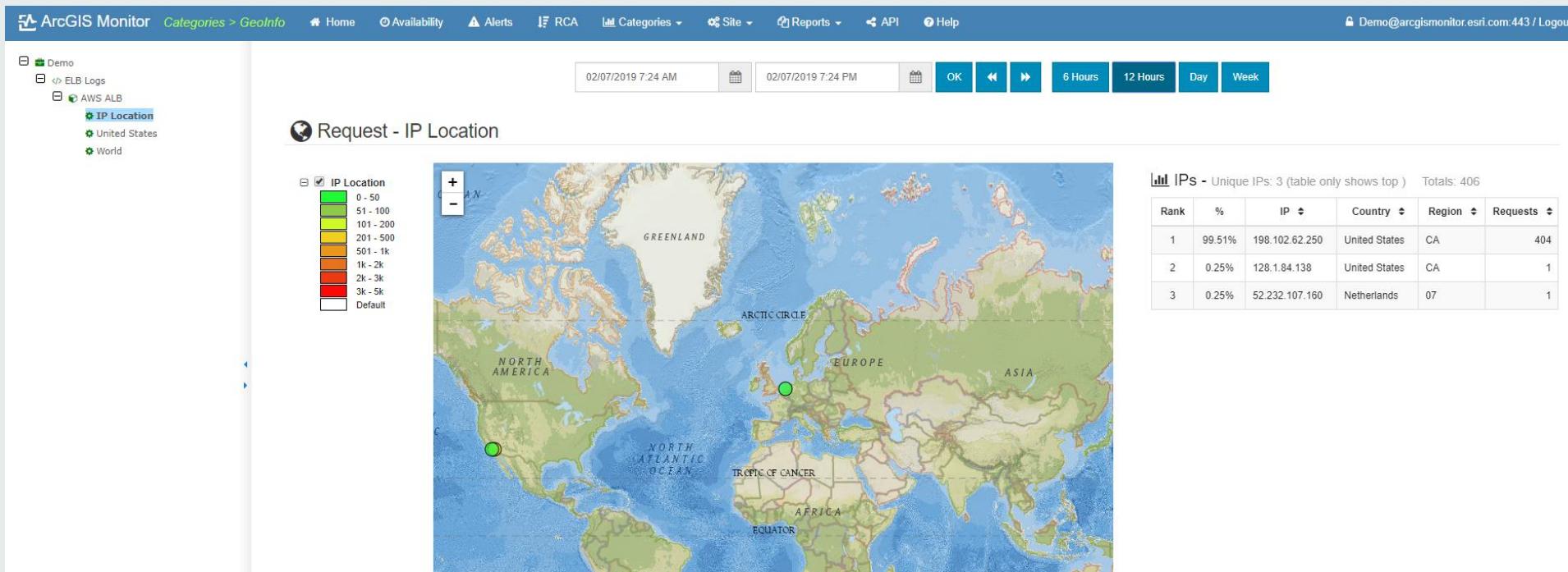
- **Chart format**



# Usage at LB : users and transactions

Categories > GeoInfo > IP Location

- Map format



# Usage at LB : users

Categories > Usage > IP / Interval

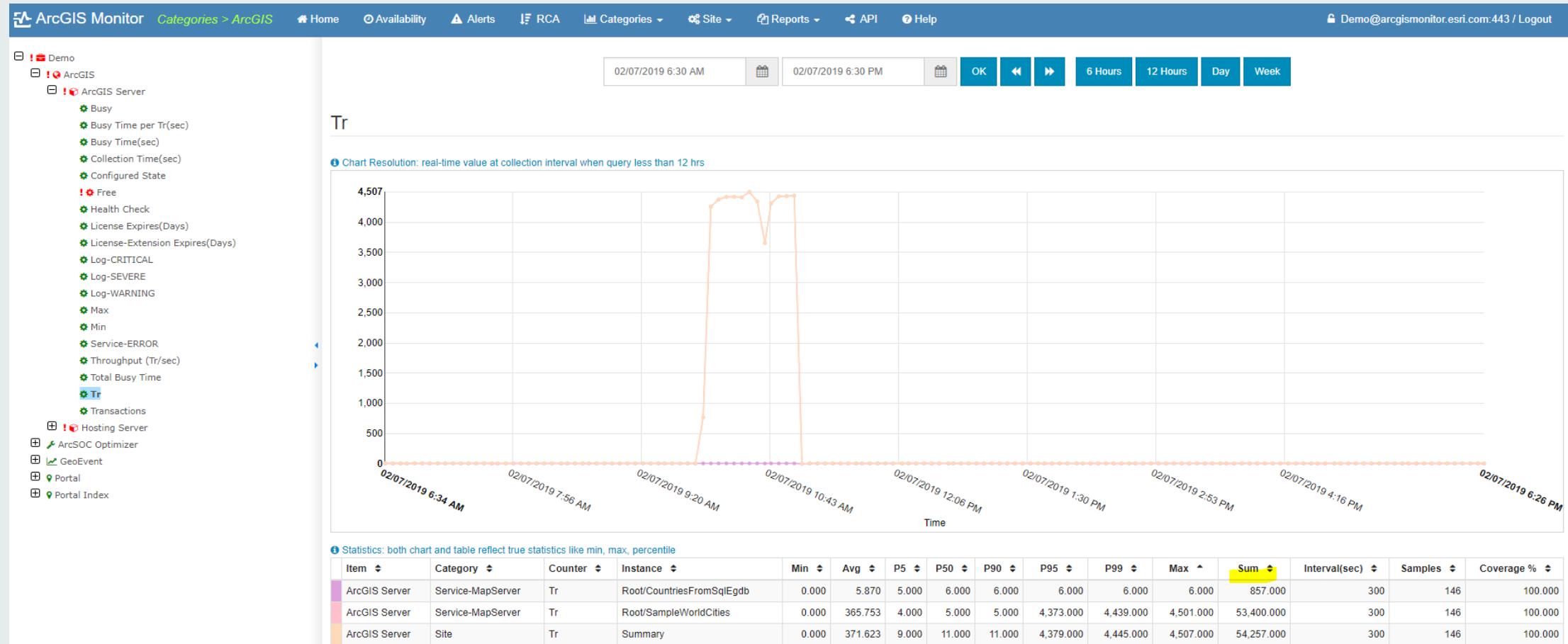
- **Chart format**



# Usage at ArcGIS Server: transactions

Categories > ArcGIS > Tr

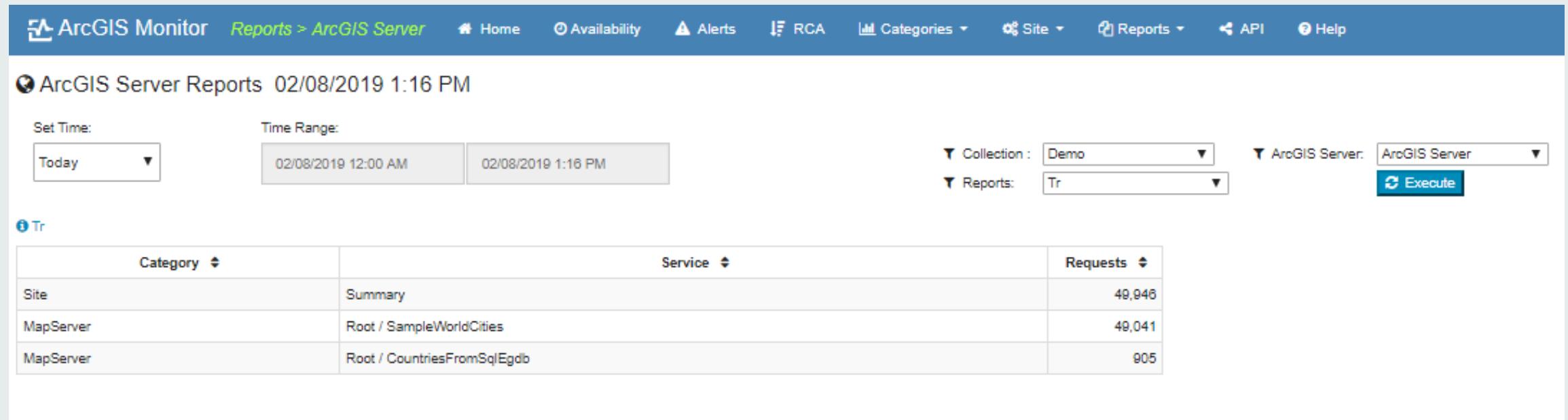
- **Chart format**



# Usage at ArcGIS Server : transactions

Reports > ArcGIS > Tr

- Table format



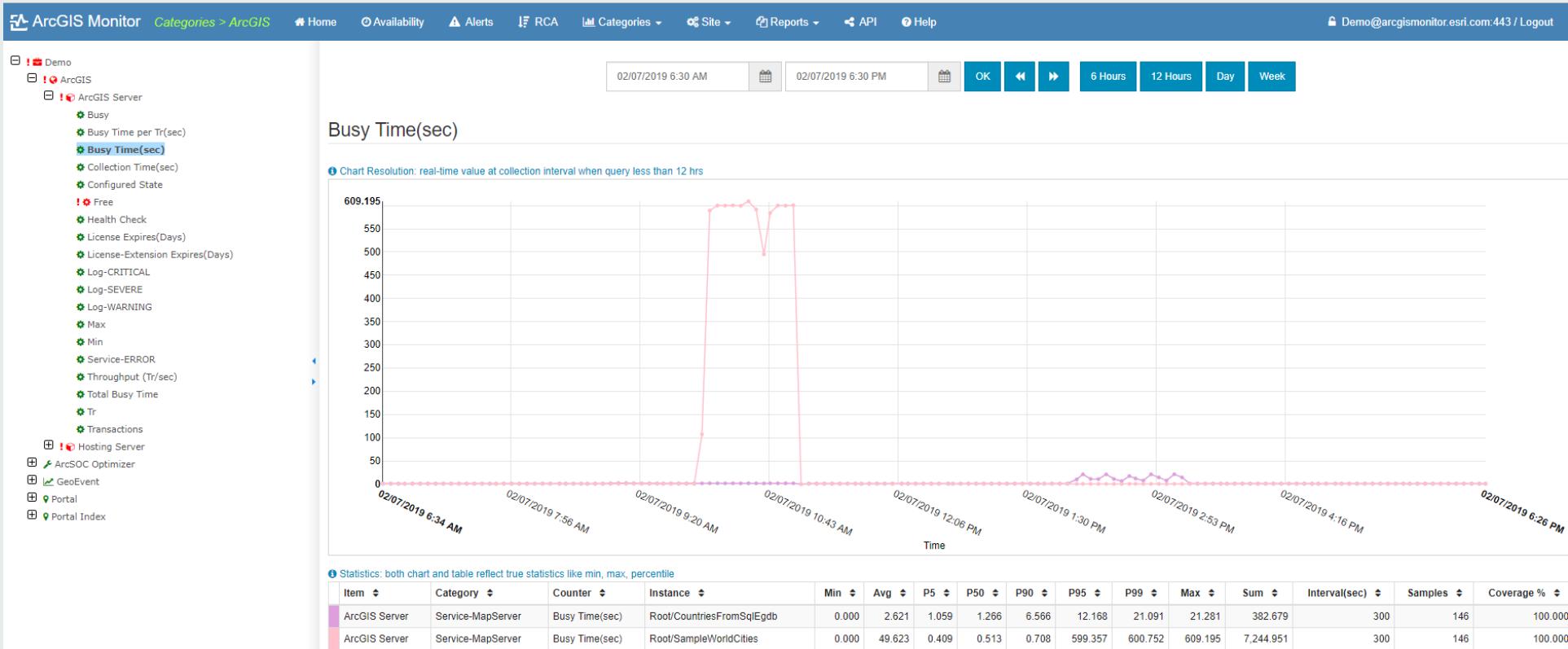
The screenshot shows the ArcGIS Monitor interface with the 'Reports > ArcGIS Server' path selected. The main content area displays the 'Tr' (Transactions) report for ArcGIS Server on 02/08/2019 at 1:16 PM. The report includes filters for 'Collection: Demo', 'Reports: Tr', and 'ArcGIS Server: ArcGIS Server'. The data table shows the following transactions:

Category	Service	Requests
Site	Summary	49,946
MapServer	Root / SampleWorldCities	49,041
MapServer	Root / CountriesFromSqlEgdb	905

# Usage at ArcGIS Server: CPU time

Categories > ArcGIS > Busy Time (sec)

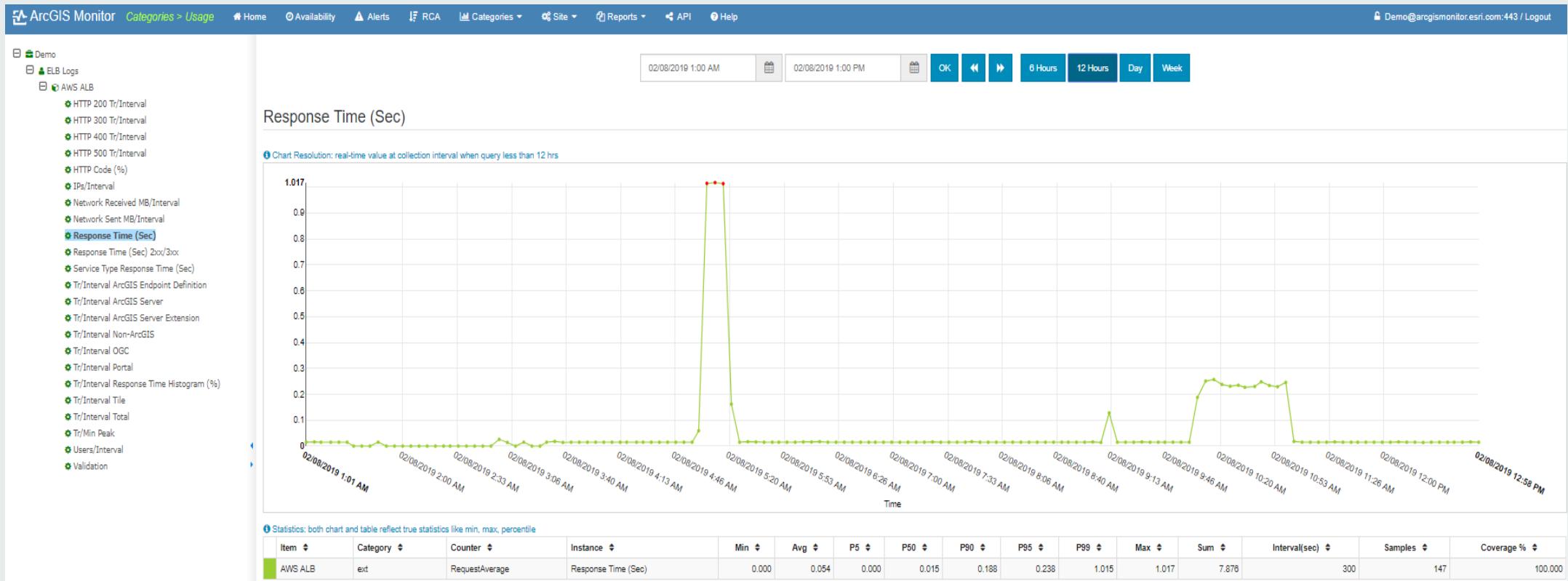
- CPU time a given service took at ArcGIS Server level.
- Use to identify top cpu consumers at ArcGIS Server.



# Performance

# Performance at LB

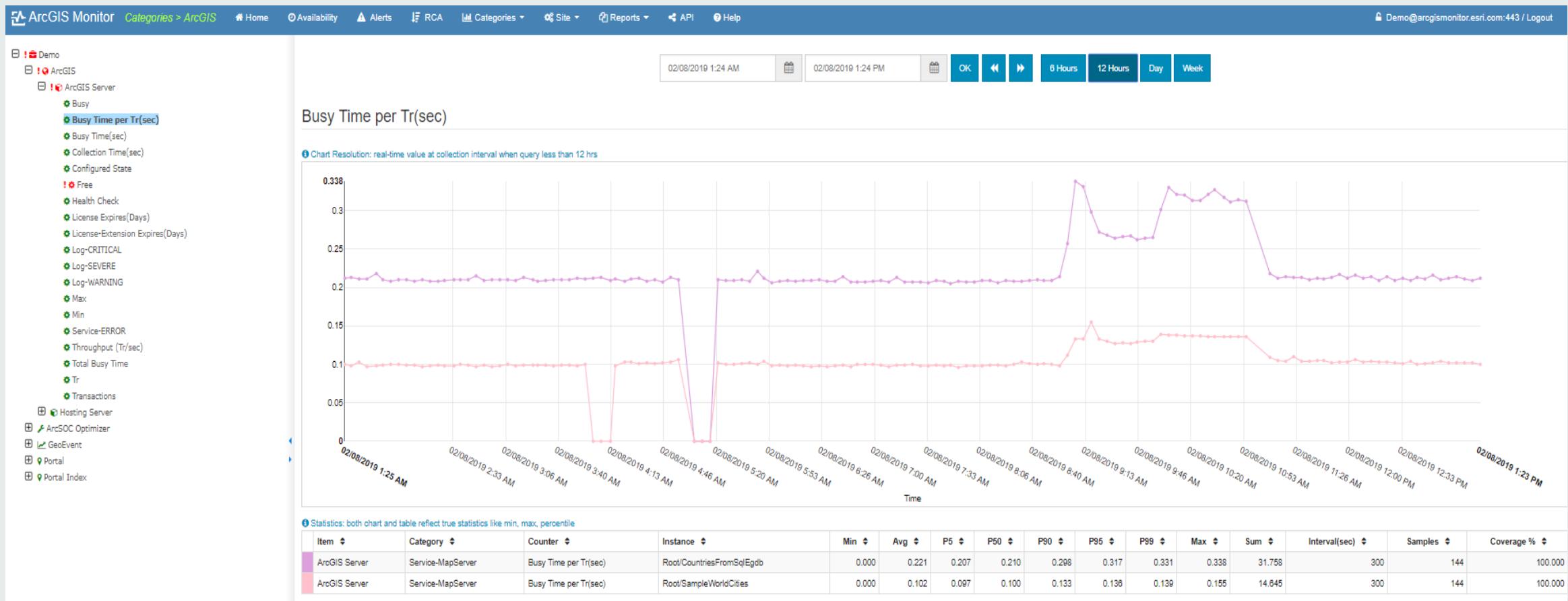
## Reports > Usage > Response Time (sec)



# Performance at ArcGIS Server

## Categories > ArcGIS > Busy Time per Tr (sec)

- **Busy Time per Tr (sec)** is the total time (seconds) per transaction consumed by ArcGIS Server service.



# Performance at ArcGIS Server

## Categories > ArcGIS > Busy Time per Tr (sec)

- Table format

ArcGIS Monitor Reports > ArcGIS Server Home Availability Alerts RCA Categories Site Reports API Help

ArcGIS Server Reports 02/08/2019 1:16 PM

Set Time: Today Time Range: 02/08/2019 12:00 AM 02/08/2019 1:16 PM

Collection: Demo ArcGIS Server: ArcGIS Server

Reports: Busy Time per Tr(sec) Execute

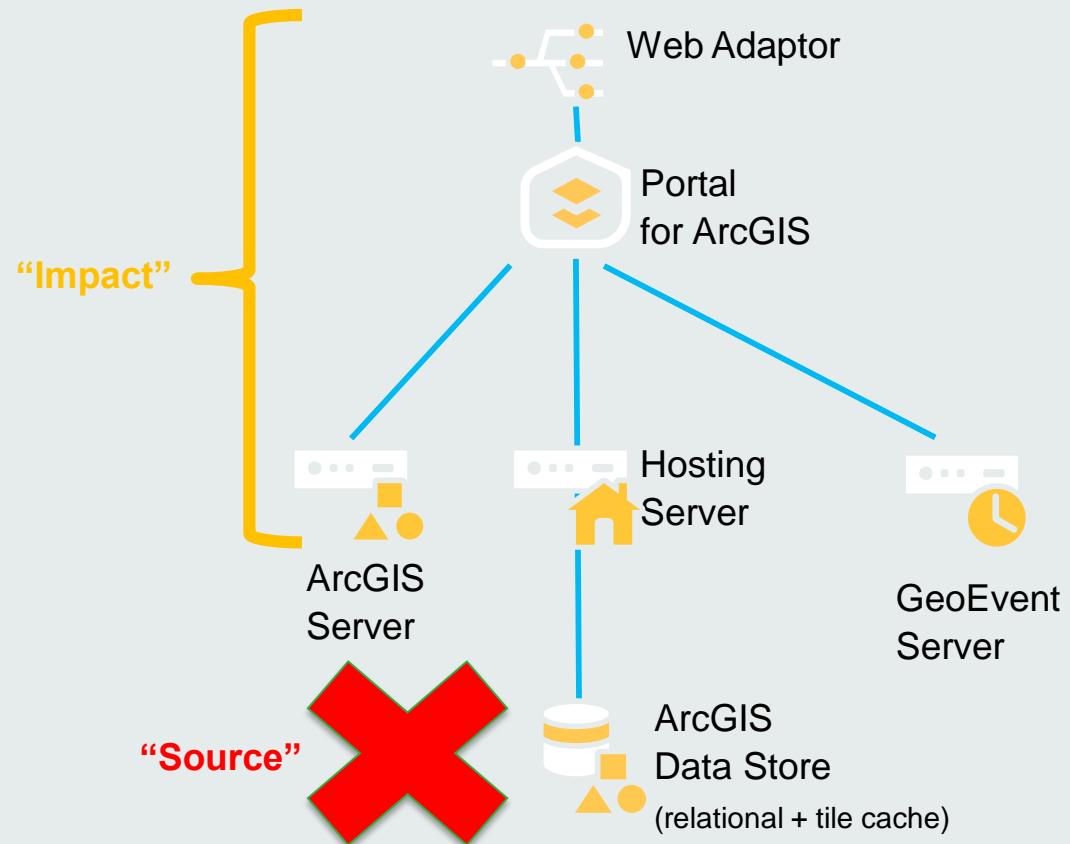
Busy Time per Tr(sec)

Category	Service	Min(sec)	Avg(sec)	P50(sec)	P95(sec)	P99(sec)	Max(sec)	Samples where CPU Time > 0	Samples
MapServer	Root / CountriesFromSqlEgdb	0.21	0.43	0.21	0.32	12.45	13.77	153	156
MapServer	Root / SampleWorldCities	0.10	0.11	0.10	0.14	0.14	0.16	150	156

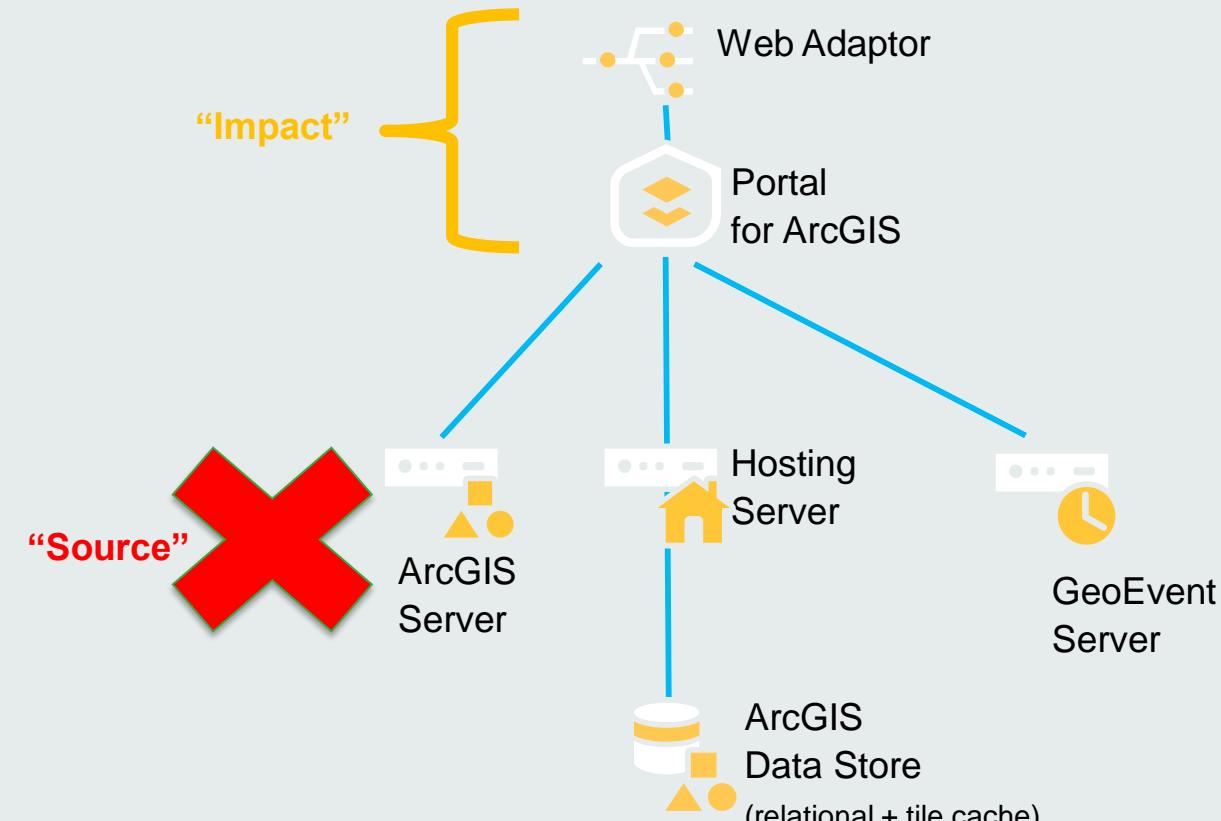
# **Typical cases and Root Cause Analysis (RCA)**

# Root Cause Analysis (RCA)

“Source” - the most downstream failing component  
“Impact” – all upstream failing components



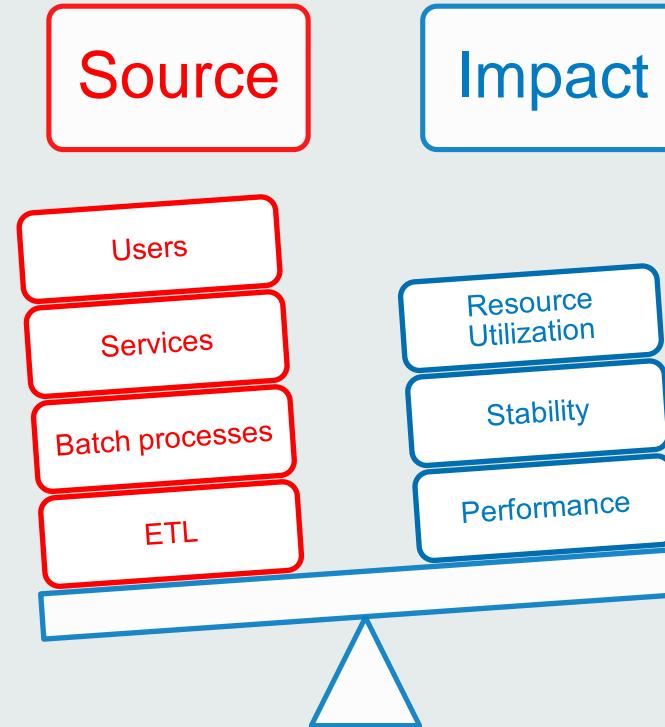
Example 1



Example 2

# Overloaded system

Load exceeds the designed capacity



# RCA: Usage spike

## Throughput (tr/s)

ArcGIS Monitor **RCA** Home Availability Alerts Categories Site Reports API Help Demo@arcgismonitor.e...

Root Cause Analysis Reports 01/29/2019 7:04 AM

Set Time: Time Range: Yesterday 01/28/2019 12:00 AM 01/28/2019 11:59 PM

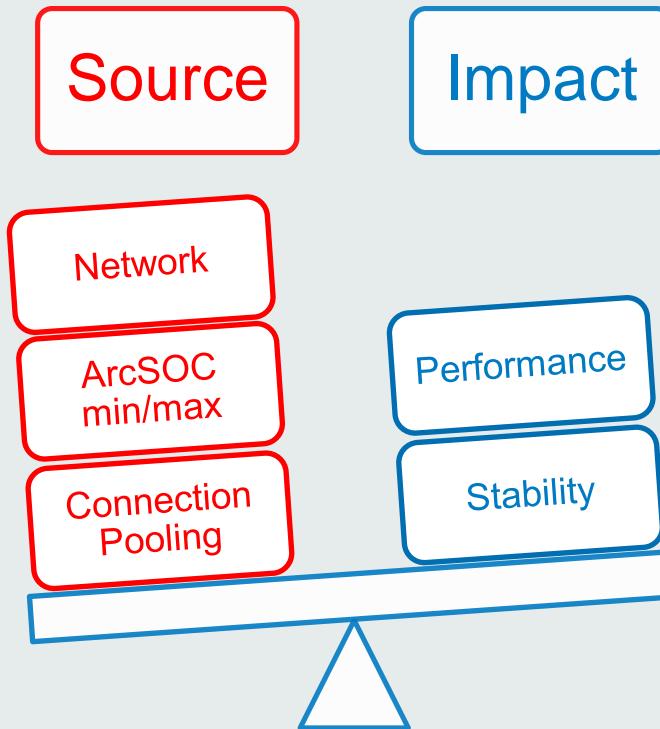
Collection: Demo Reports: Sources & Impacts by Time Execute

Bins: 82 - 01/28/2019 10:10 AM

Use this root cause analysis report to categorize alerts into impacts and sources

Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
82	Impact	ArcGIS	01/28/2019 10:10 AM	01/28/2019 10:20 AM	10	Warning	Free	= 0	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Increase min/max to reduce wait time
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	Error	> 0	10.0.3.154	WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	% Processor Time	> 85	_Total	10.0.3.154	System	Check for: 1. usage spikes; 2. degraded performance; 3. unexp...
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	% Processor Time	> 85	agmdemo-PRD-AGS02-i-0ce4a9bff1788a034-us-east-1	AWS	Amazon	Check for: 1. usage spikes; 2. degraded performance; 3. unexp...
	Impact	na		01/28/2019 10:20 AM	10	Warning	seconds	> 0.1	EC2AMAZ-NI76OEE	CPUBenchmark_EC2AMAZ-NI76OEE	</> Ext - CPUBenchmark	Investigate potential CPU wait time
	Source	ArcGIS		01/28/2019 10:20 AM	10	Warning	Throughput (Tr/sec)	>= 5	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.
	Source	ArcGIS		01/28/2019 10:20 AM	10	Warning	Throughput (Tr/sec)	>= 10	Summary	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.

# Bottleneck



# RCA: Free instances = 0

Bottleneck are often created by increased load

ArcGIS Monitor **RCA** Home Availability Alerts Categories Site Reports API Help Demo@arcgismonitor.e

Root Cause Analysis Reports 01/29/2019 7:04 AM

Set Time: Time Range: Yesterday 01/28/2019 12:00 AM 01/28/2019 11:59 PM

Collection: Demo Reports: Sources & Impacts by Time Execute

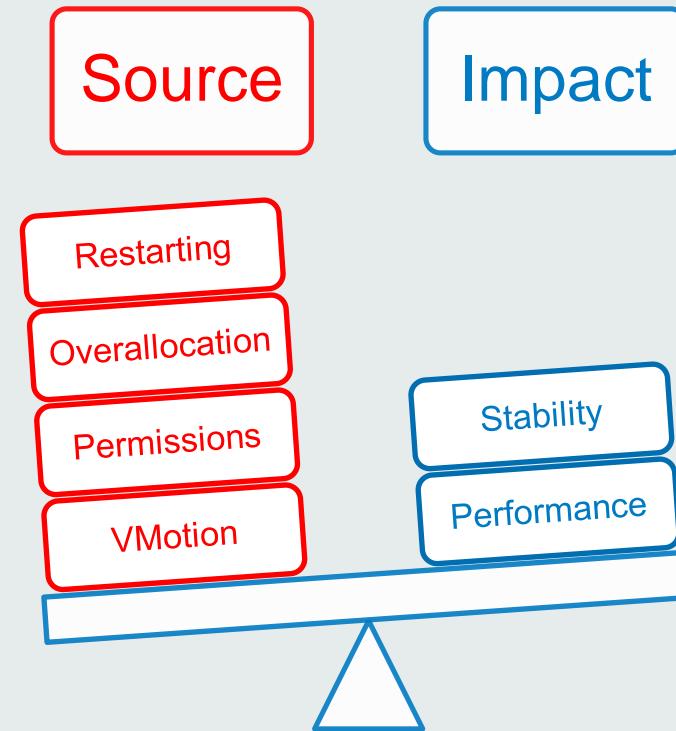
Bins: 82 - 01/28/2019 10:10 AM

Use this root cause analysis report to categorize alerts into impacts and sources

Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
82	Impact	ArcGIS	01/28/2019 10:10 AM	01/28/2019 10:20 AM	10	Warning	Free	= 0	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Increase min/max to reduce wait time
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	Error	> 0	10.0.3.154	WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	% Processor Time	> 85	_Total	10.0.3.154	System	Check for: 1. usage spikes; 2. degraded performance; 3. unexp consuming CPU
	Impact	Infrastructure		01/28/2019 10:20 AM	10	Warning	% Processor Time	> 85	agmdemo-PRD-AGS02-i-0ce4a9bff1788a034-us-east-1	AWS	Amazon	Check for: 1. usage spikes; 2. degraded performance; 3. unexp consuming CPU
	Impact	na		01/28/2019 10:20 AM	10	Warning	seconds	> 0.1	EC2AMAZ-NI76OEE	CPUBenchmark_EC2AMAZ-NI76OEE	</> Ext - CPUBenchmark	Investigate potential CPU wait time
	Source	ArcGIS		01/28/2019 10:20 AM	10	Warning	Throughput (Tr/sec)	>= 5	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.
	Source	ArcGIS		01/28/2019 10:20 AM	10	Warning	Throughput (Tr/sec)	>= 10	Summary	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.

# Unstable Infrastructure

Interruption to the underlying resources



# RCA: CPU spike by unexpected process, e.g. virous scan

ArcGIS Monitor **RCA** Home Availability Alerts Categories Site Reports API Help Demo@arcgismonitor.esri.com:443

Root Cause Analysis Reports 01/29/2019 7:04 AM

Set Time: Time Range: Collection: Demo Reports: Sources & Impacts by Time Execute

Last Hour 01/29/2019 6:35 AM 01/29/2019 7:35 AM Bins: All

Use this root cause analysis report to categorize alerts into impacts and sources

Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
0	Impact	Web	01/29/2019 7:25 AM	01/29/2019 7:35 AM	10	Warning	HTTP500	>= 5	HTTP-Code (%)	AWS ALB	</> Ext - System Log Parser for ELB	1. check web and app logs for urls; 2. Reproduce with web debugger;
	Impact	ArcGIS		01/29/2019 7:35 AM	10	Warning	Service-ERROR	> 0	Validation	ArcGIS GeoEvent Server	</> Ext - ArcGIS GeoEvent Extension	Check ArcGIS Enterprise logs
	Source	Infrastructure		01/29/2019 7:35 AM	10	Warning	% Processor Time	> 85	_Total	10.0.3.154	System	Check for: 1. usage spikes; 2. degraded performance; 3. unexpected process consuming CPU

# RCA: Portal for ArcGIS Server service stopped

ArcGIS Monitor **RCA** Home Availability Alerts Categories Site Reports API Help Demo@arcgismonitor.esri.com

## Root Cause Analysis Reports 01/28/2019 6:29 PM

Set Time: Today Time Range: 01/28/2019 12:00 AM 01/28/2019 6:29 PM

Collection: Demo Reports: Sources & Impacts by Time Execute

Bins: 80 - 01/28/2019 5:00 AM

Use this root cause analysis report to categorize alerts into impacts and sources

Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
80	Impact	Web	01/28/2019 5:00 AM	01/28/2019 5:10 AM	10	Warning	Find String = 0	Portal for ArcGIS Health		Portal for ArcGIS Health	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Web		01/28/2019 5:10 AM	10	Warning	Find String NOT = 1	Portal for ArcGIS Health		Portal for ArcGIS Health	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Web		01/28/2019 5:10 AM	10	Warning	JSON Error Code > 0	Countries_Sql_Egdb_Draw		Countries_Sql_Egdb_Draw	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Web		01/28/2019 5:10 AM	10	Warning	Find String = 0	Countries_Sql_Egdb_Draw		Countries_Sql_Egdb_Draw	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Web		01/28/2019 5:10 AM	10	Warning	JSON Error Code > 0	Countries_Sql_Egdb_Test		Countries_Sql_Egdb_Test	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Web		01/28/2019 5:10 AM	10	Warning	RequestAverage > 1	Response Time (Sec)		AWS ALB	</> Ext - System Log Parser for ELB	Check resource utilization and settings.
	Impact	Web		01/28/2019 5:10 AM	10	Warning	Find String NOT = 1	Countries_Sql_Egdb_Test		Countries_Sql_Egdb_Test	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Infrastructure		01/28/2019 5:10 AM	10	Warning	Error > 0	10.0.3.154		WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
	Impact	Infrastructure		01/28/2019 5:10 AM	10	Warning	Error > 0	10.0.3.27		WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
	Impact	Infrastructure		01/28/2019 5:10 AM	10	Warning	Count Total = 0	ArcGISPortal		10.0.3.184-ArcGISPortal	Process	Check ArcGIS Enterprise and OS logs.
	Impact	Infrastructure		01/28/2019 5:10 AM	10	Warning	Count Total = 0	postgres		10.0.3.184-postgres	Process	Check ArcGIS Enterprise and OS logs.
	Impact	Infrastructure		01/28/2019 5:10 AM	10	Warning	Warning > 0	10.0.3.232		WinEvent: AGM	</> Ext - WinEvent	Check windows event logs
	Source	ArcGIS		01/28/2019 5:10 AM	10	Critical	Portal for ArcGIS = 0	10.0.3.184		WinService: Portal	</> Ext - WinService	Check ArcGIS Enterprise and OS logs.

# RCA: ArcGIS Server machine rebooted

ArcGIS Monitor    **RCA**    [Home](#)    [Availability](#)    [Alerts](#)    [Categories](#) ▾    [Site](#) ▾    [Reports](#) ▾    [API](#)    [Help](#)

[Demo@arcgismonitor.esri.com:443](#)

## Root Cause Analysis Reports 01/28/2019 6:29 PM

Set Time:  Time Range:   Collection: Demo Reports: Sources & Impacts by Time  Bins: 45 - 01/28/2019 10:50 AM

Use this root cause analysis report to categorize alerts into impacts and sources

Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
45	Impact	Web	01/28/2019 10:50 AM	01/28/2019 11:00 AM	10	Warning	Response Time(sec)	> 3	Countries_Sql_Egdb_Draw	Countries_Sql_Egdb_Draw	Http	Check: 1. CPU; 2. Which tier(s) are responsible (e.g. check ArcGIS, DB logs)?
	Impact	Web		01/28/2019 11:00 AM	10	Warning	Find String	= 0	Countries_Sql_Egdb_Draw	Countries_Sql_Egdb_Draw	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Web		01/28/2019 11:00 AM	10	Warning	Find String	= 0	SampleWorldCities	SampleWorldCities	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	Web		01/28/2019 11:00 AM	10	Warning	Find String NOT	= 1	SampleWorldCities	SampleWorldCities	Http	1. Reproduce with web debugger; 2. check app and other logs
	Impact	ArcGIS		01/28/2019 11:00 AM	10	Warning	Throughput (Tr/sec)	>= 5	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.
	Impact	ArcGIS		01/28/2019 11:00 AM	10	Warning	Throughput (Tr/sec)	>= 10	Summary	ArcGIS Server	ArcGIS	Usage spike. Check resource utilization and settings.
	Impact	ArcGIS		01/28/2019 11:00 AM	10	Warning	Free	= 0	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Increase min/max to reduce wait time
	Impact	Infrastructure		01/28/2019 11:00 AM	10	Warning	Error	> 0	10.0.3.154	WinEvent: AGS	Ext - WinEvent	Check windows event logs
	Impact	Infrastructure		01/28/2019 11:00 AM	10	Warning	% Processor Time	> 85	_Total	10.0.3.154	System	Check for: 1. usage spikes; 2. degraded performance; 3. unexpected process consuming CPU
	Impact	Infrastructure		01/28/2019 11:00 AM	10	Warning	% Processor Time	> 85	agmdemo-PRD-AGS02-i-0ce4a9bff1788a034-us-east-1	AWS	Amazon	Check for: 1. usage spikes; 2. degraded performance; 3. unexpected process consuming CPU
	Source	Infrastructure		01/28/2019 11:00 AM	10	Critical	Reboot	> 0	_Total	10.0.3.154	System	If reboot not planned, check OS event logs for details

# RCA: Database not running

ArcGIS Monitor **RCA** Home Availability Alerts Categories Site Reports API Help Demo@arcgism

## Root Cause Analysis Reports 01/28/2019 6:29 PM

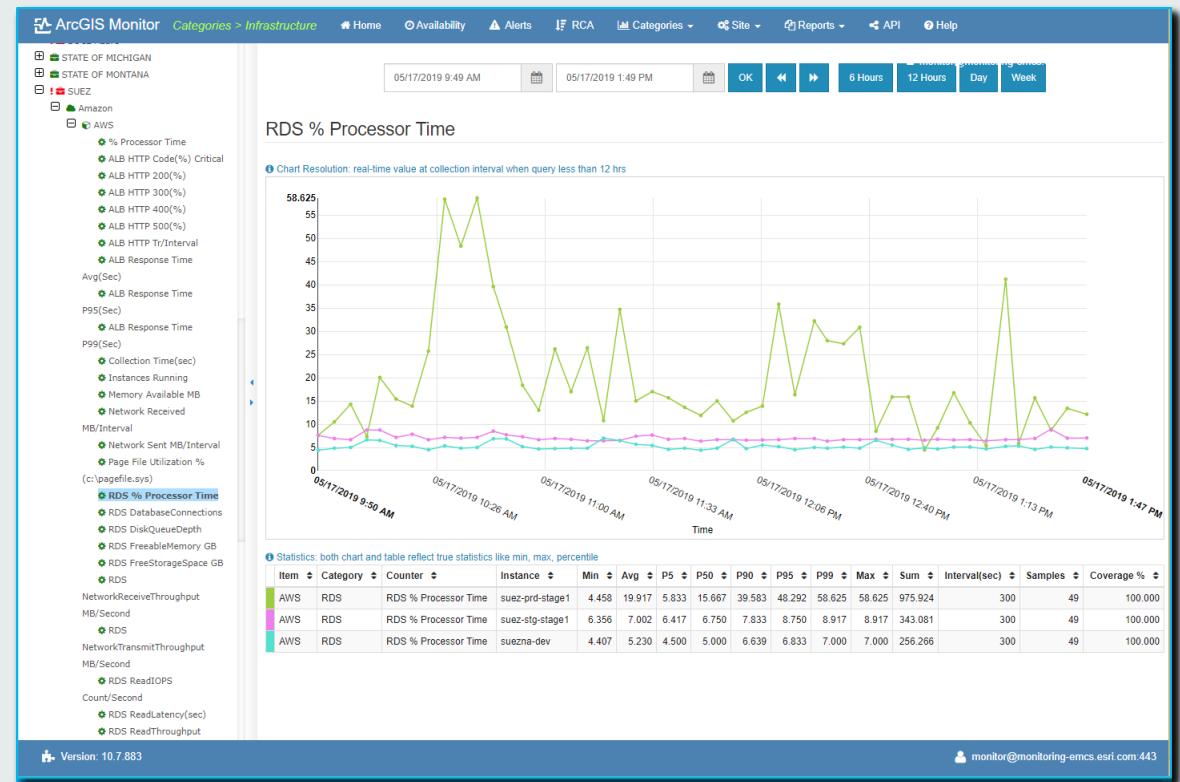
Set Time: Today 01/28/2019 12:00 AM 01/28/2019 6:29 PM Time Range: Collection: Demo Reports: Sources & Impacts by Time Execute Bins: 103 - 01/28/2019 1:10 AM

Use this root cause analysis report to categorize alerts into impacts and sources

Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
103	Impact	Web	01/28/2019 1:10 AM	01/28/2019 1:20 AM	10	Warning	Response Time(sec)	> 3	Countries_Sql_Egdb_Draw	Countries_Sql_Egdb_Draw	Http	Check: 1. CPU; 2. Which tier(s) are responsible (e.g. check ArcGIS, DB etc)
	Impact	Web		01/28/2019 1:20 AM	10	Warning	Response Time(sec)	> 3	Countries_Sql_Egdb_Test	Countries_Sql_Egdb_Test	Http	Check: 1. CPU; 2. Which tier(s) are responsible (e.g. check ArcGIS, DB etc)
	Impact	Infrastructure		01/28/2019 1:20 AM	10	Warning	Error	> 0	10.0.3.154	WinEvent: AGS	</> Ext - WinEvent	Check windows event logs
	Source	Database		01/28/2019 1:20 AM	10	Critical	Code	> 0	Validation	eGDB Activity	</> Ext - EgdbSQL	Check if database is running

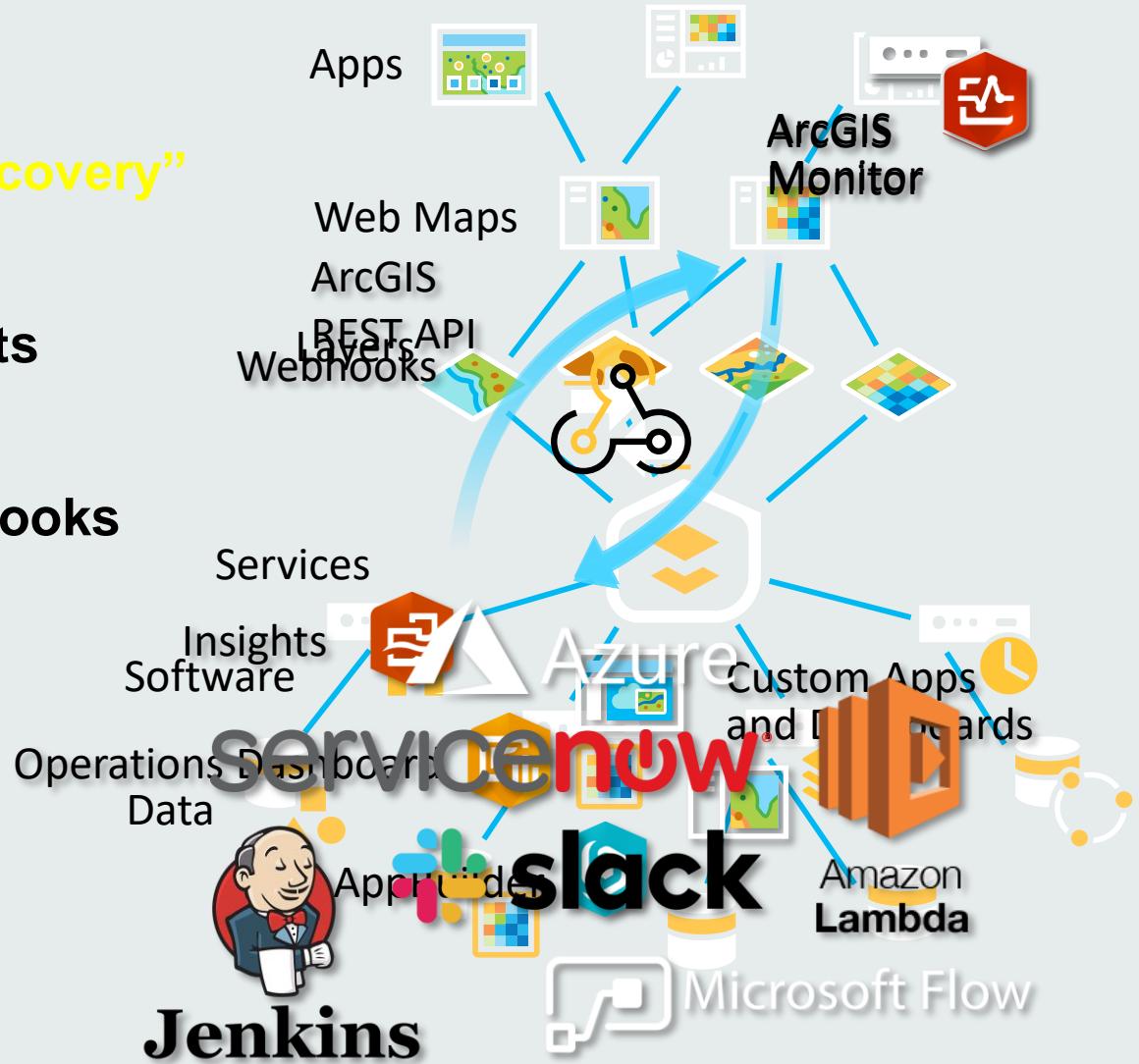
# 2019 Releases

- **10.7**
  - Root Cause Analysis
  - Dashboard home page
  - REST API
  - Additional default alerts
  - Health and utilization reports
  - Additional metrics added
- **10.7.1**
  - Minor bug fixes
  - Usability improvements



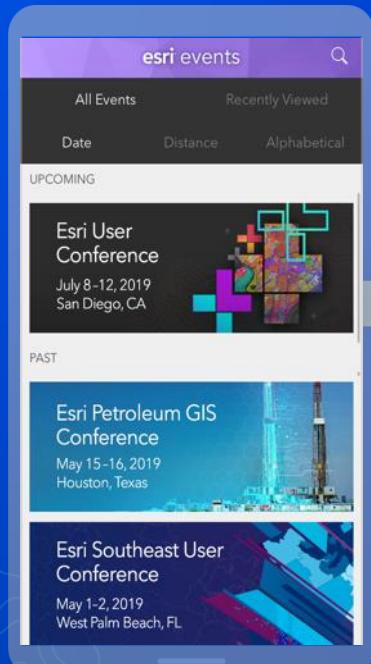
# 2020 Enhancements

- Simplify configuration through “auto-discovery”
- Utilize Operations Dashboard and Insights
- Integrate with external systems via webhooks
- Modernize UI/UX experience

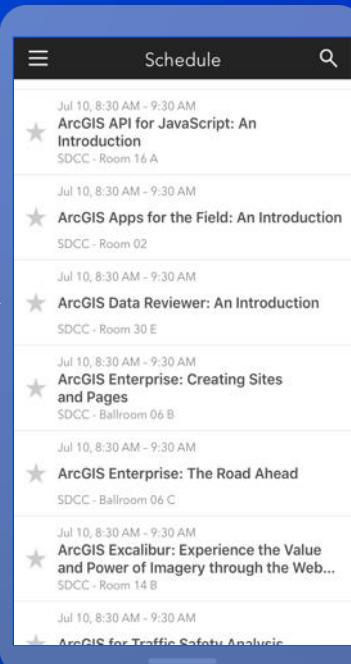


# Please Share Your Feedback in the App

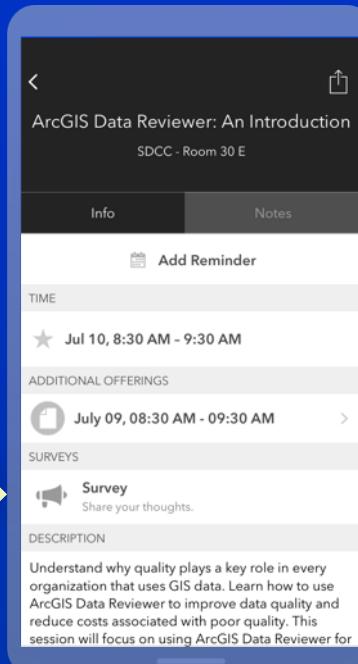
Download the Esri Events app and find your event



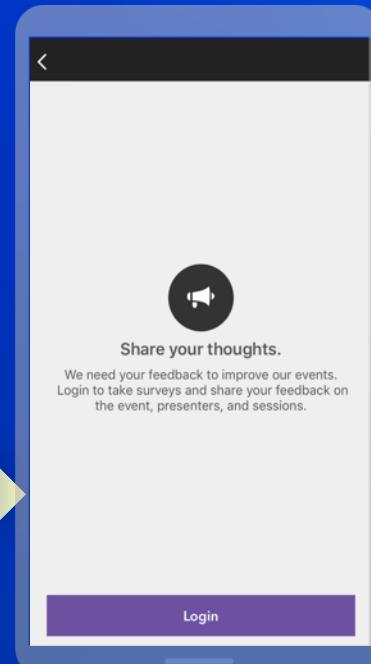
Select the session you attended



Scroll down to "Survey"



Log in to access the survey



Complete the survey and select "Submit"

