ArcGIS Performance: Tuning, Testing, and Monitoring

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SEE WHAT OTHERS CAN'T

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

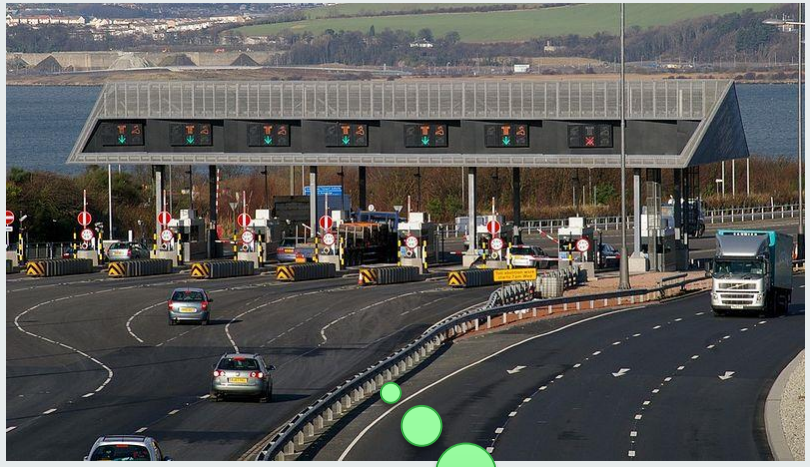
- **The maximum level of output the system can produce, e.g.**
- **X cars/sec**
- **X maps/sec**

At capacity

Over capacity

Bottleneck

- **Resource(s) limiting the performance or capacity**

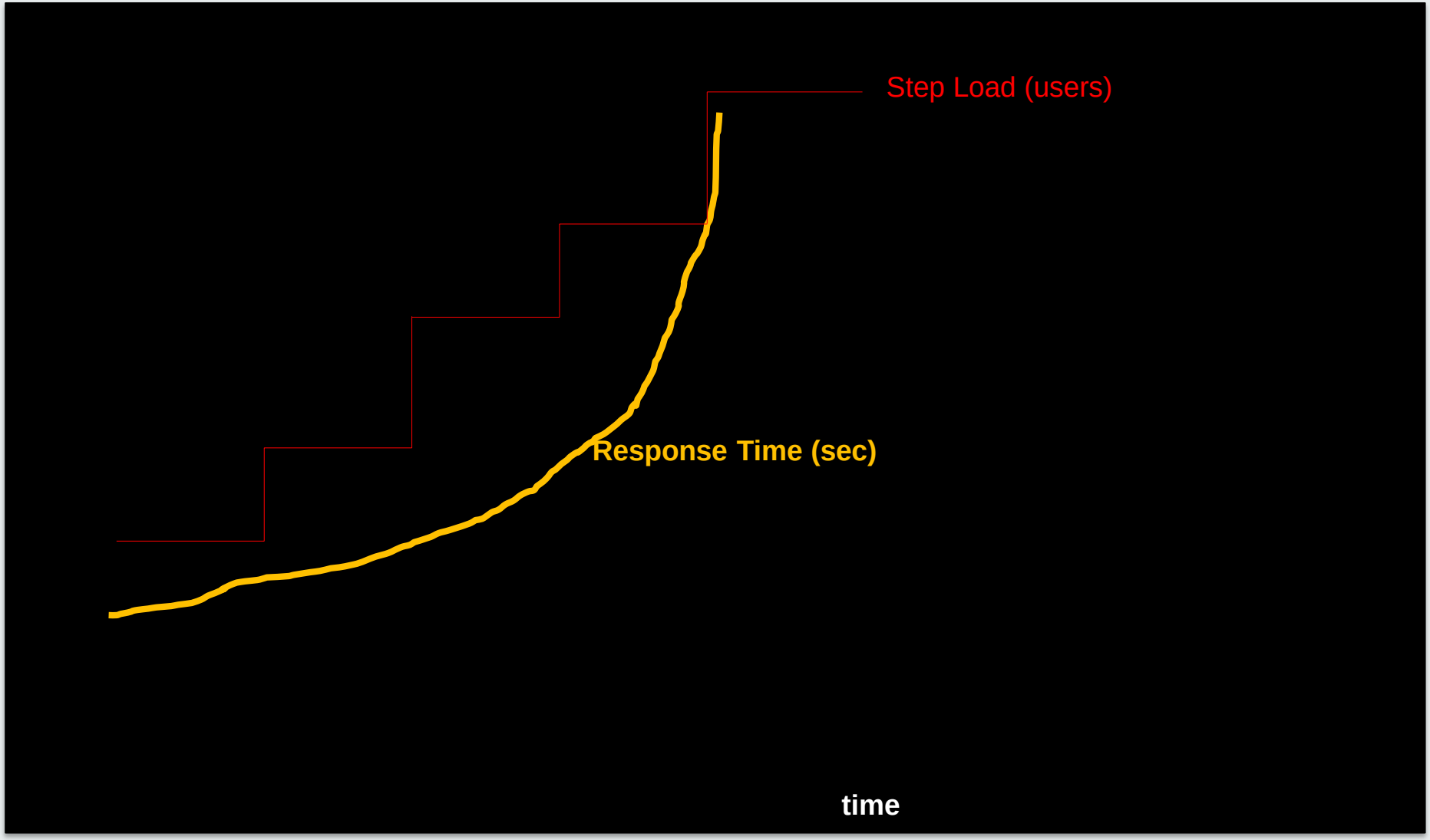


Not bottleneck

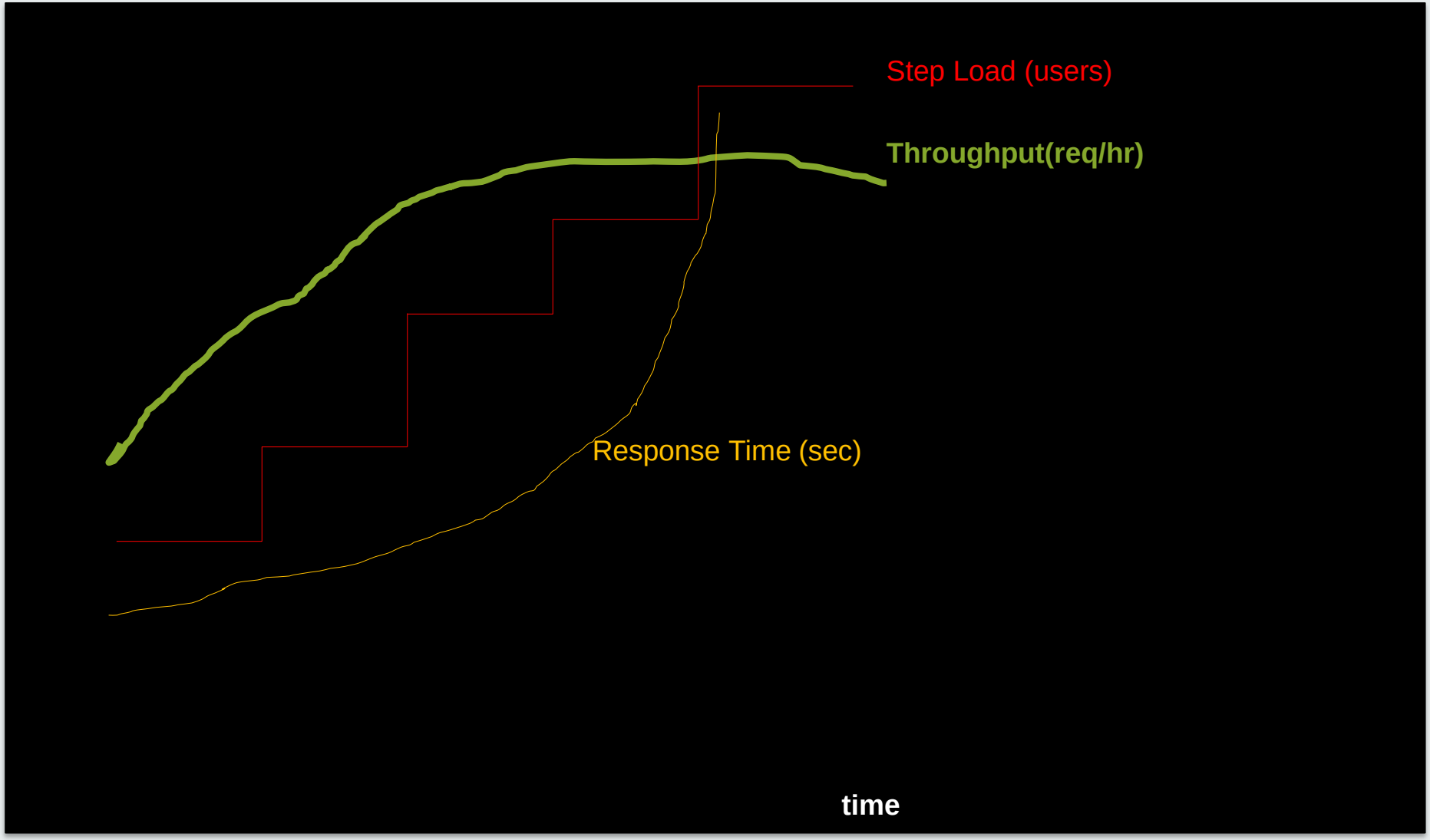
bottleneck

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

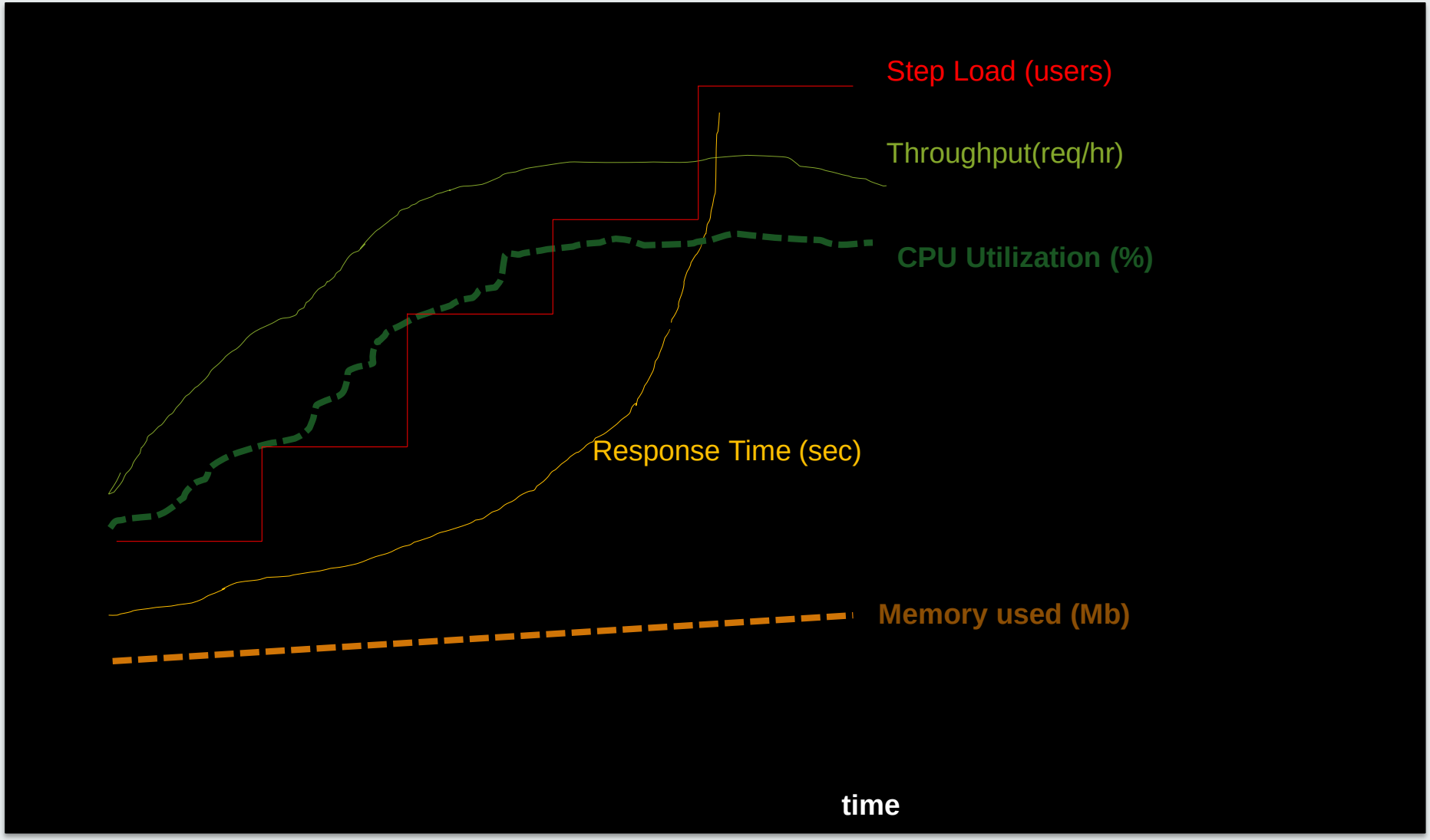
Step Load and Response Time



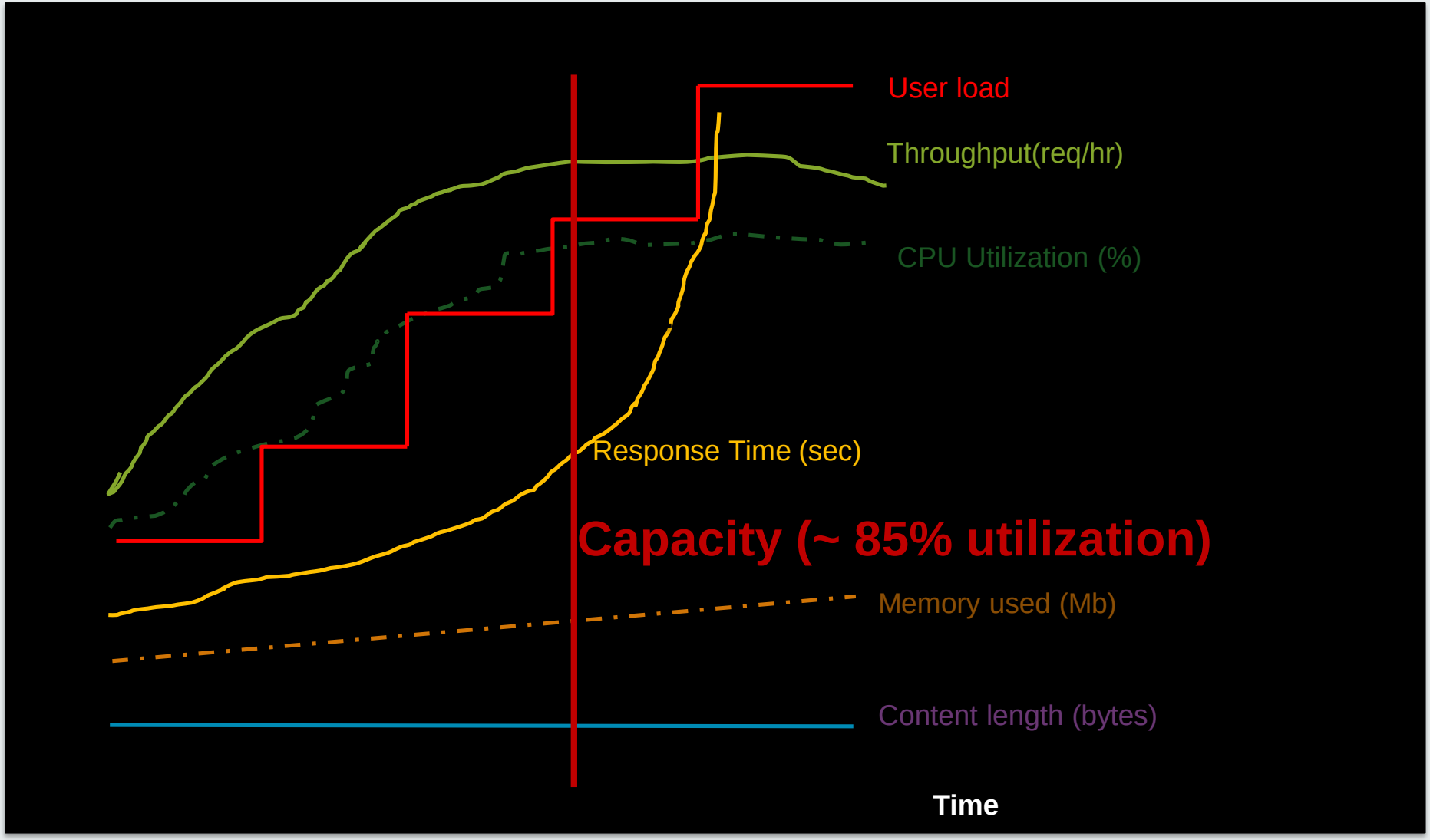
Throughput (request/hr)



Resource utilization: CPU, Memory, Network

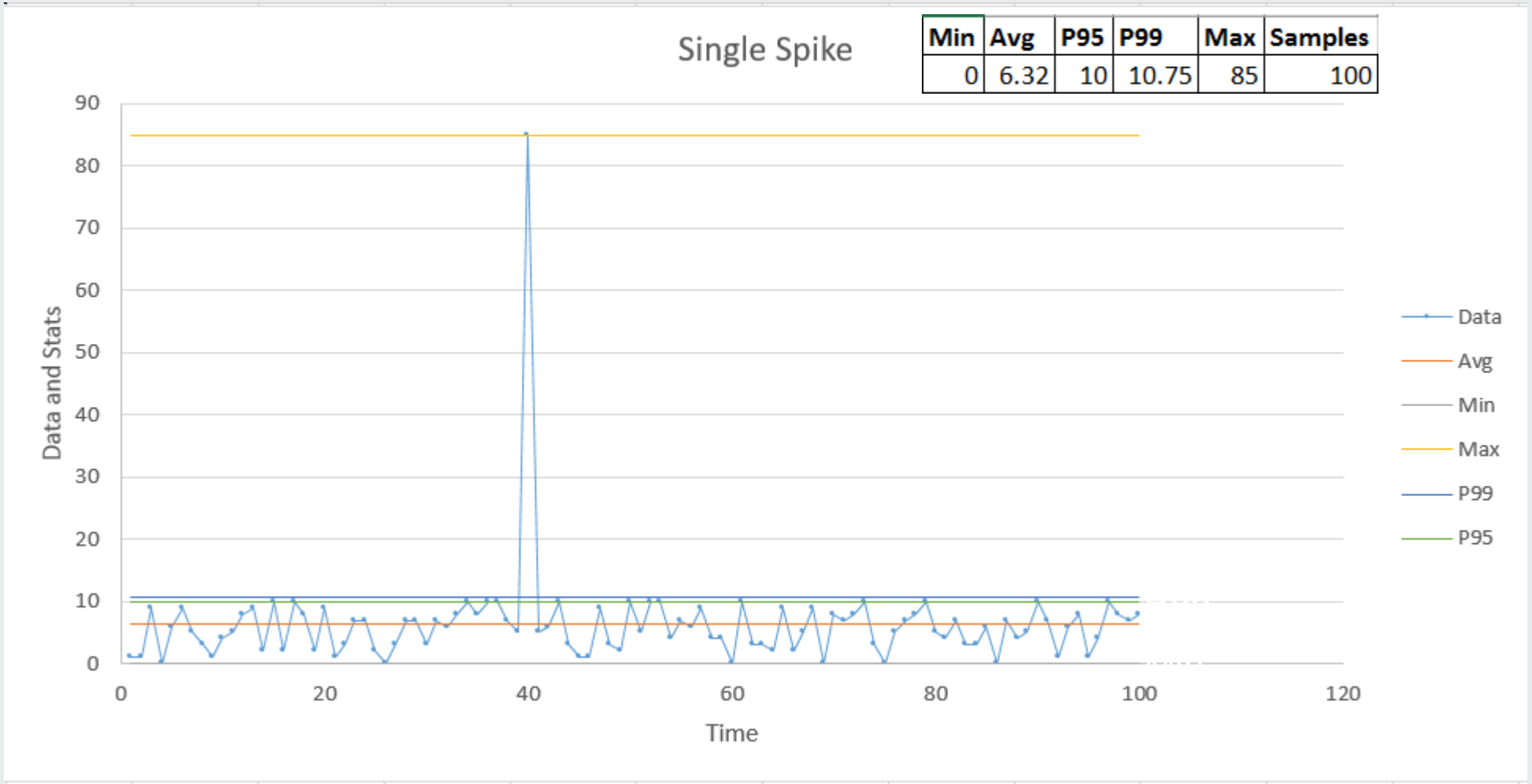


Capacity


User load
Throughput(req/hr)
CPU Utilization (%)
Response Time (sec)
Capacity (~ 85% utilization)
Memory used (Mb)
Content length (bytes)
Time

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

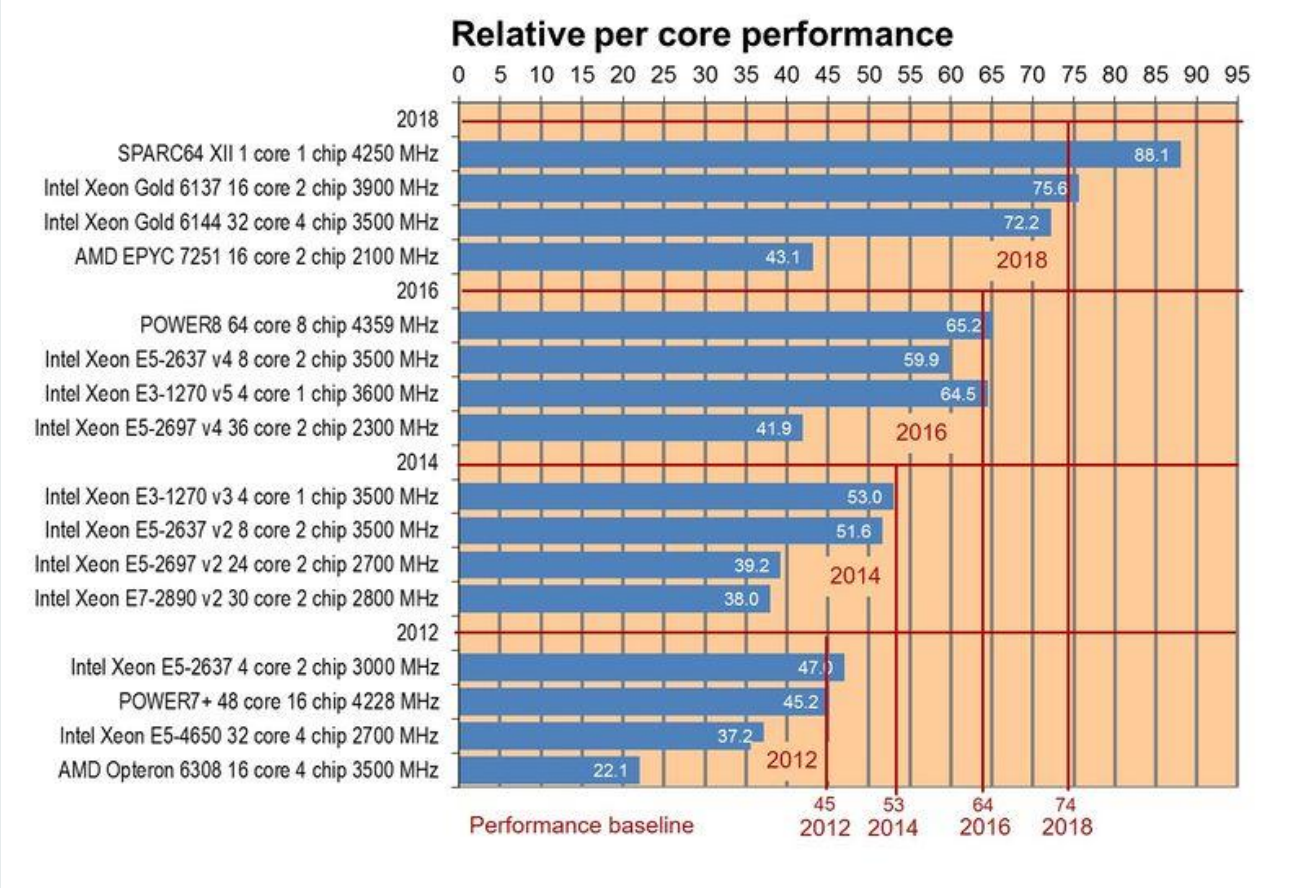
Memory requirements

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**



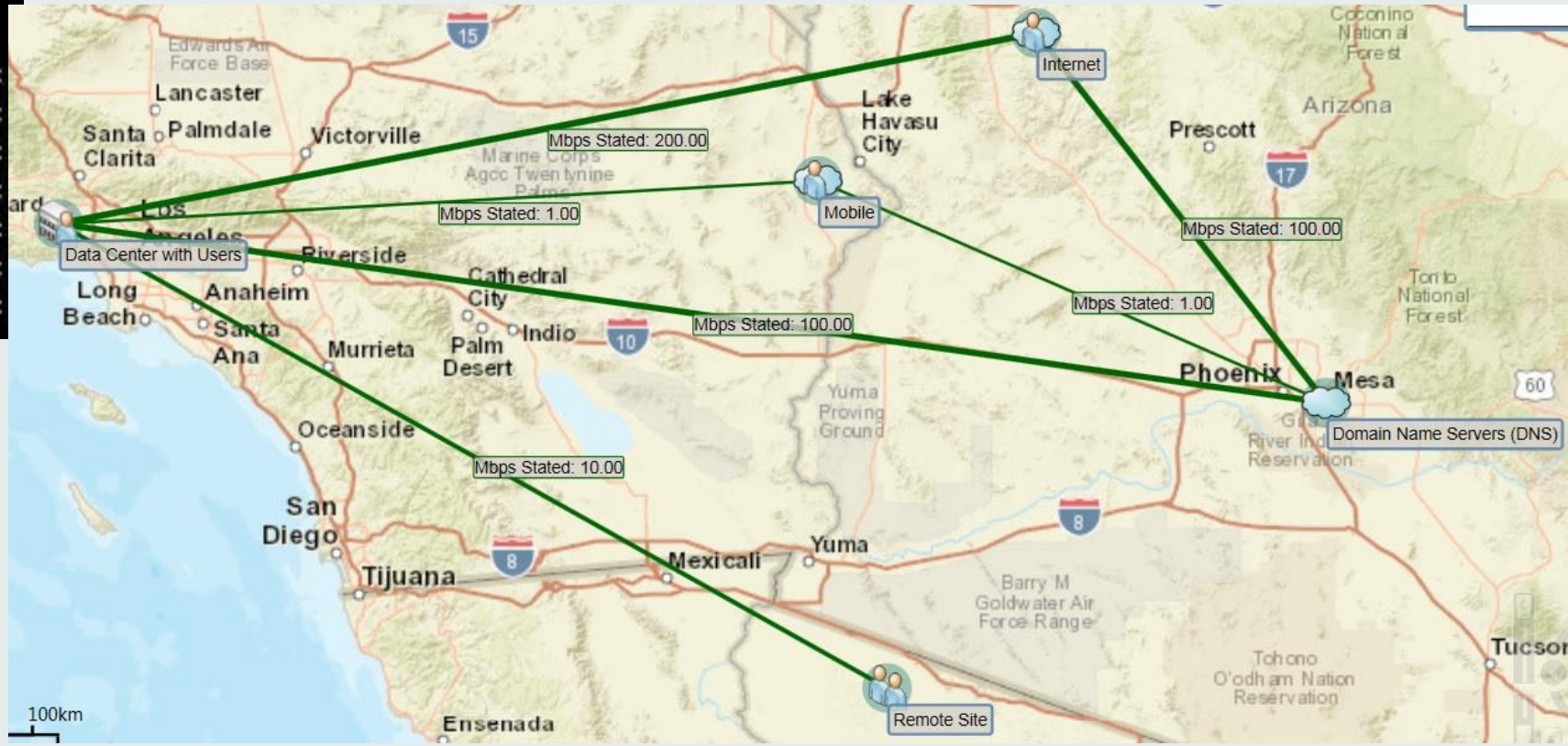
Network Planning

Establish and Configure DNS Appropriately!

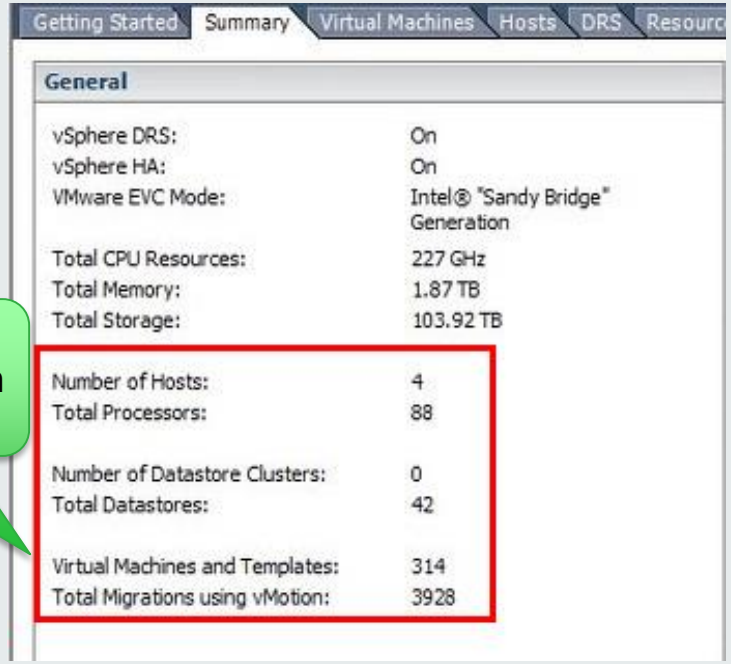
```
C:\Users\          >tracert

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

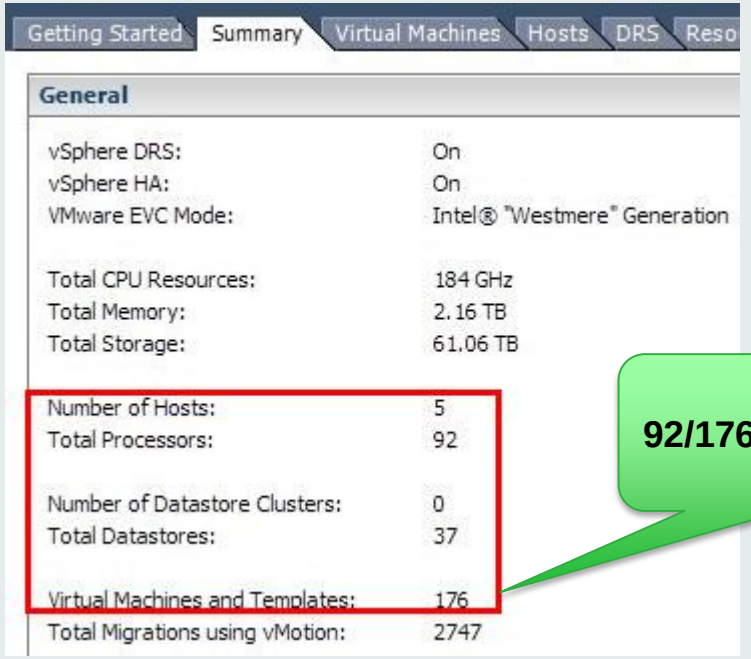
LA Database Server



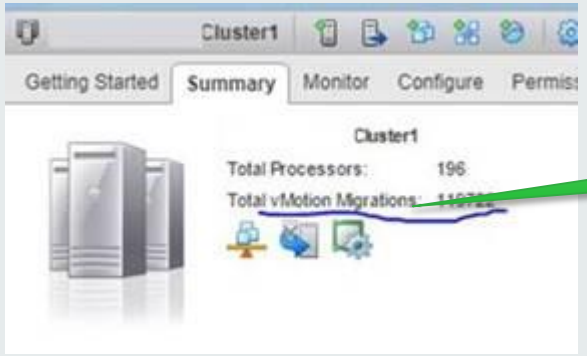
VM – watch out for overallocations



88/314=0.28 cpu/vm



92/176=0.52 cpu/vm



119722 vMotion Migrations

Test Results as Input into Capacity Planning

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

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

$$TH = \frac{Users}{\mathrm{Re}\,sponseTime + ThinkTime}$$

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**

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

- **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)					
					56 kbps	1.54 Mbps	10 Mbps	45 Mbps	100 Mbps	1 Gbps
Application Type	Service/Op	Content	Return Type	Mb/Tr	0.056	1.540	10.000	45.000	100.000	1000.000
ArcGIS Desktop	Map	Vector		10	178.571	6.494	1.000	0.222	0.100	0.010
Citrix/ArcGIS	Map	Vectror+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) $_b$	0.90	sec
Mb/ArcSOC process	0.00	
Mbits/tr $_b$	1.50	Mbits/tr
SpecRate$_b$PerCPU	40	
Target solution input:		
Users	10.00	users
Think Time (sec) $_b$	0.00	sec
SpecRate$_t$PerCPU	40	
%CPU	90	%
TH$_t$	36,000	tr/hr
Output:		
#CPU$_t$	**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.)

Fundamental Laws
http://www.cs.washington.edu/homes/lazowska/qsp/Images/Chap_03.pdf

Workflow Capacity calculator

Utility Network example

- [WorkflowCapacityCalculator.xlsx]

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

$$TH_{workflow} = \frac{ActiveUsers_t}{WorkflowDuration_t + WorkflowPacing_t}$$

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

$$WorkflowDuration_t = \sum((OperationRT_t + OperationThinkTime_t) \times Occurence_t)$$

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 Serv
rastructure (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.

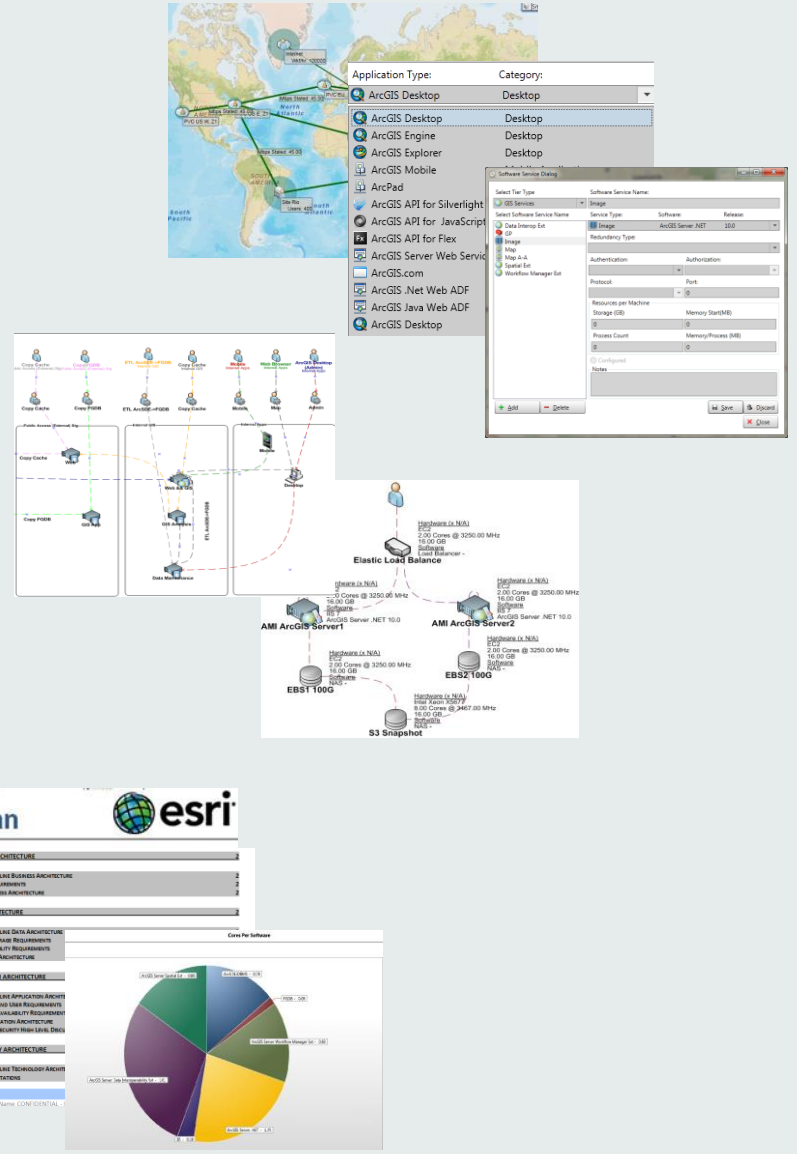
$$TH_t = TH_{workflow} \times Occurrence_t$$

	users	**100**									
	client rendering (% of RT)	0%									
	AGS ST CPU (% of RT)	85%	DO NOT EDIT								
	DB ST CPU (% of RT)	15%				DO NOT EDIT					
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						

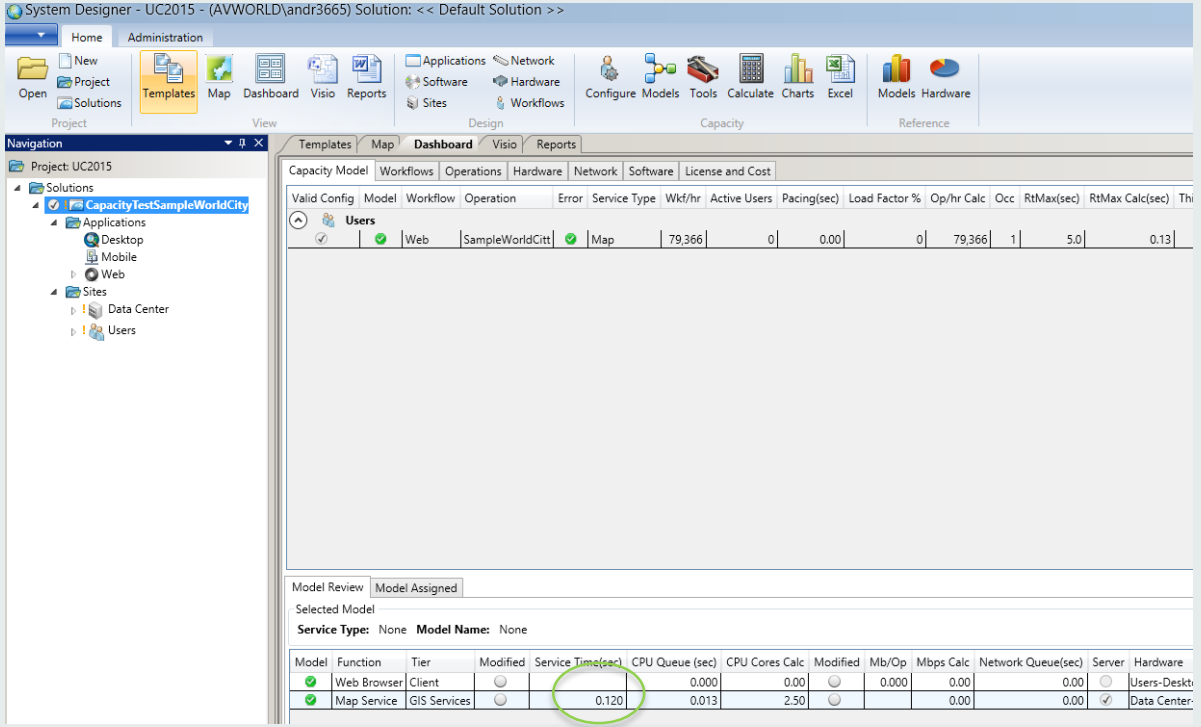
System Designer - what is it?

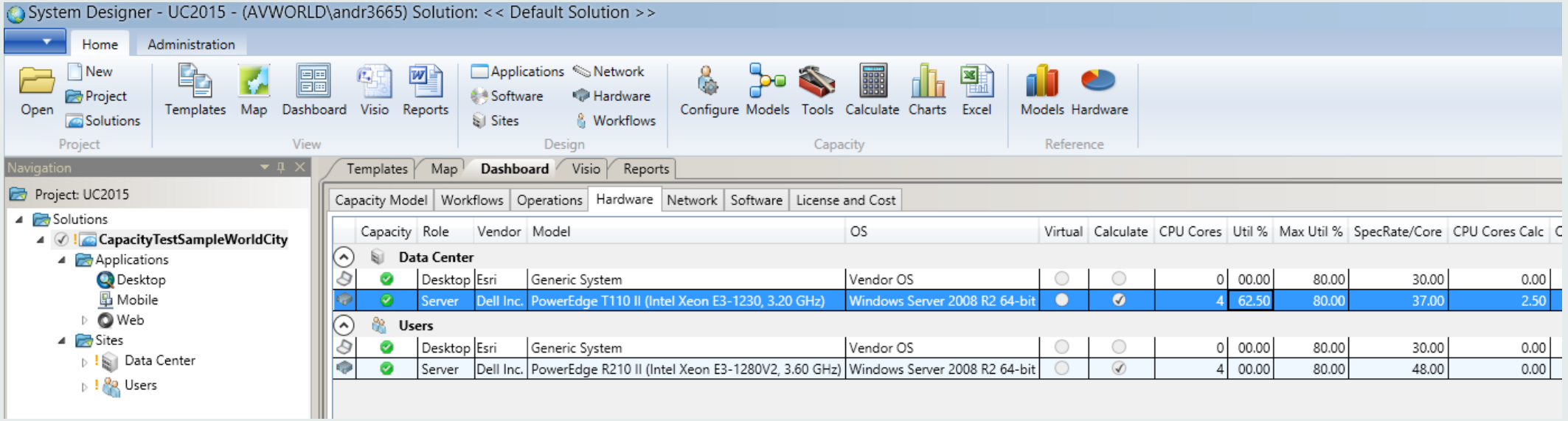
A tool for Solution Architecture design

- **Gathering requirements**
- **Designing**
- **Capacity: CPU, Network, Memory**
- **Reporting**



System Designer output

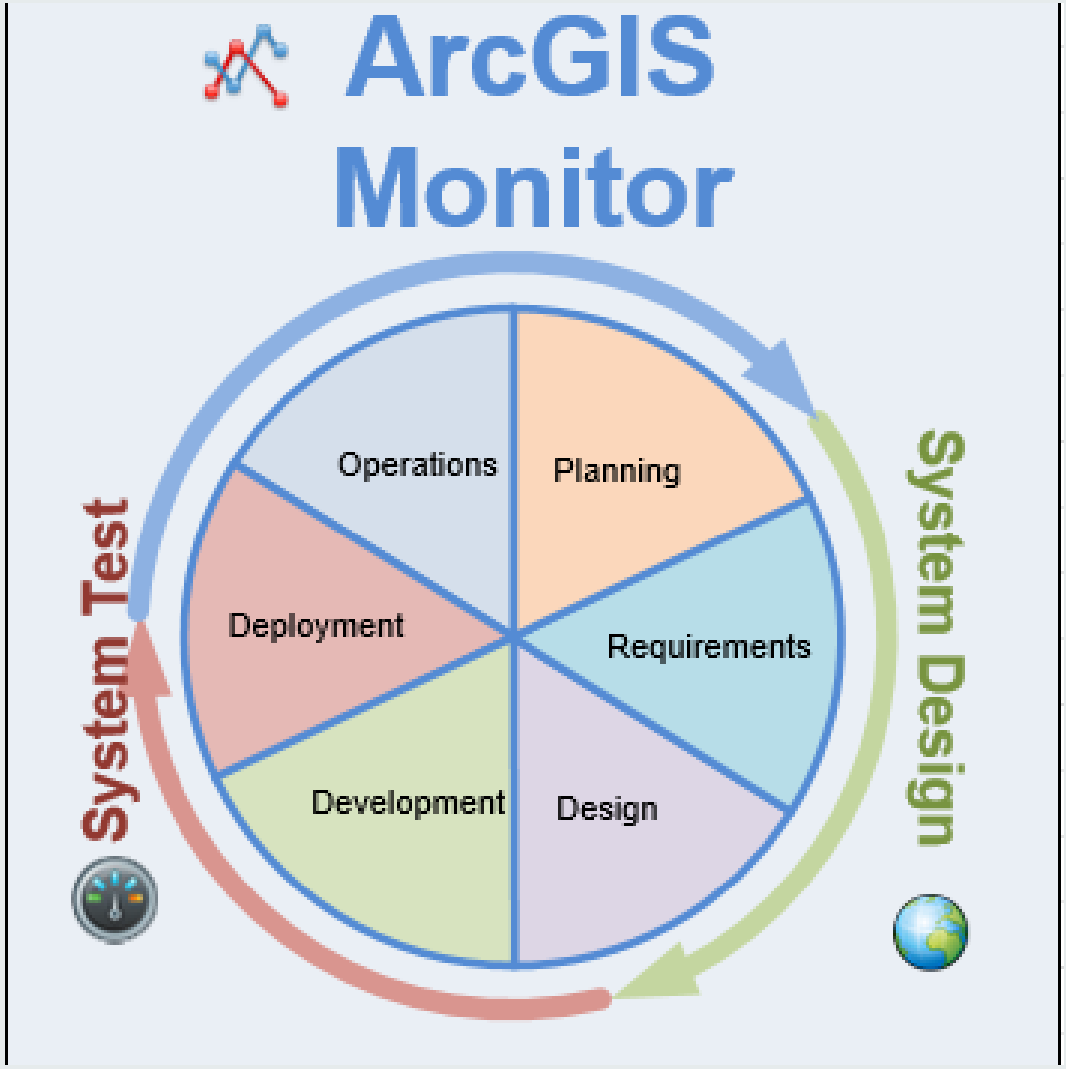




Process, Tools, Value

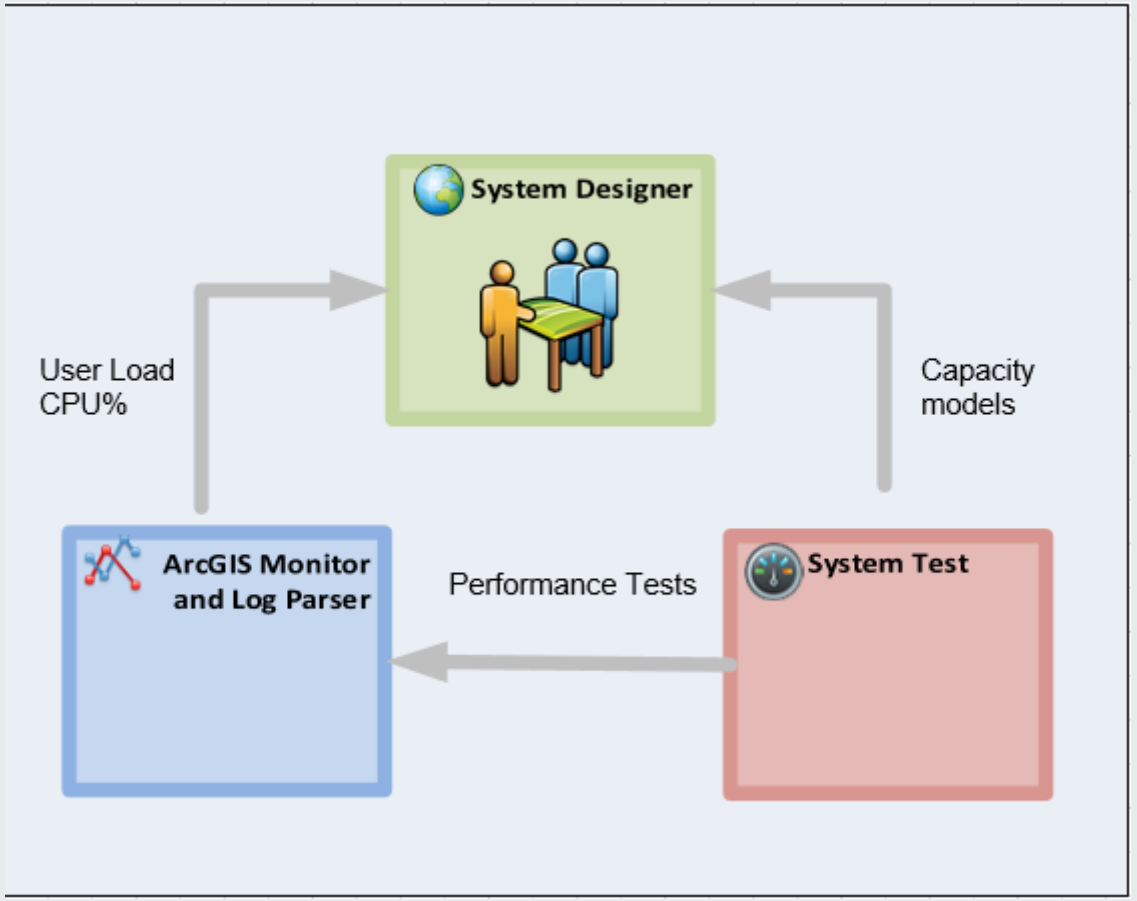
Process and tools

Esri tools



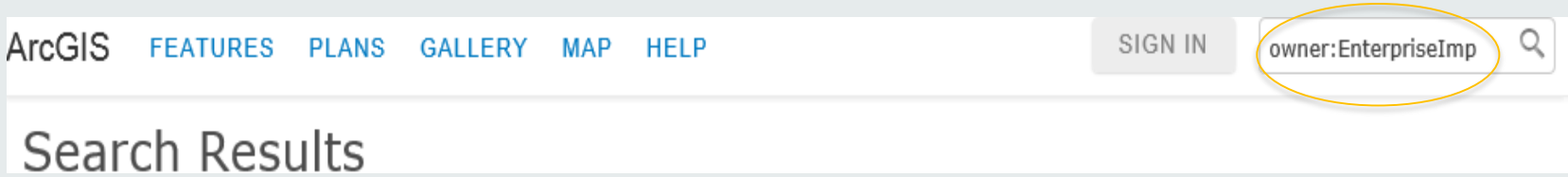
Process and tools

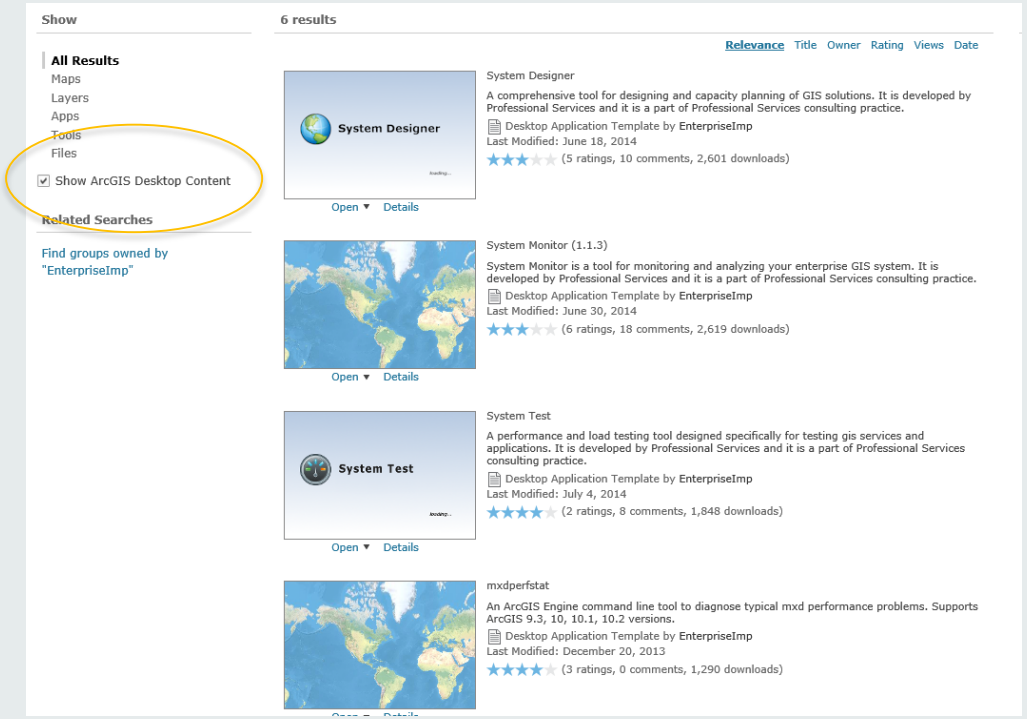
Esri tools



Tools download location

- **ArcGIS Monitor**
  - https://my.esri.com/
- **Others**
  - **http://www.arcgis.com**
  - **owner:EnterpriseImp**
  - **Show ArcGIS Desktop Content**





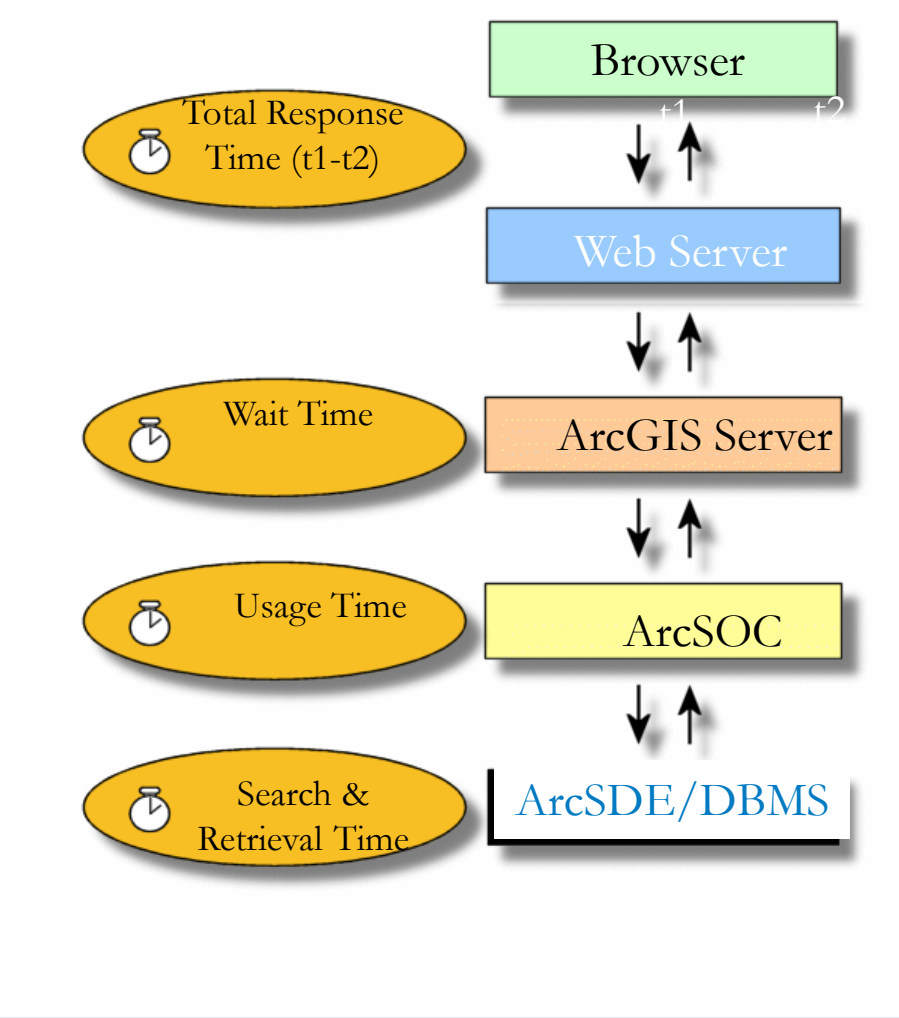
Enterprise Implementation Maturity Model

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

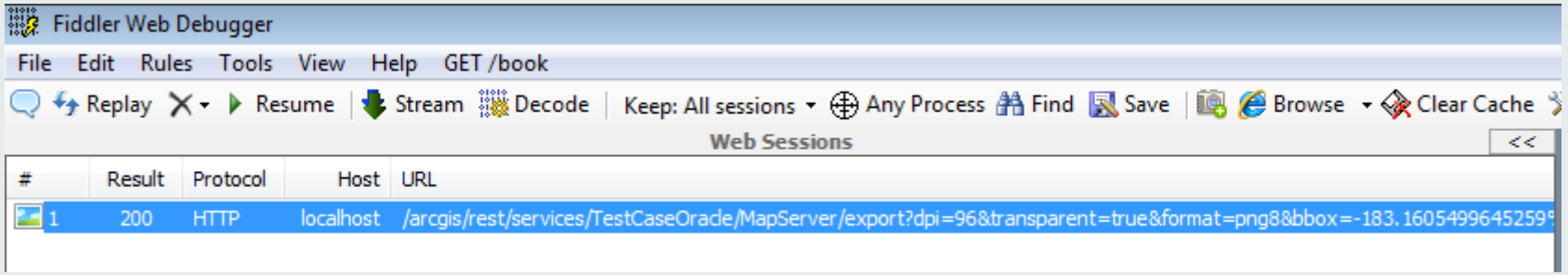
Tuning methodology

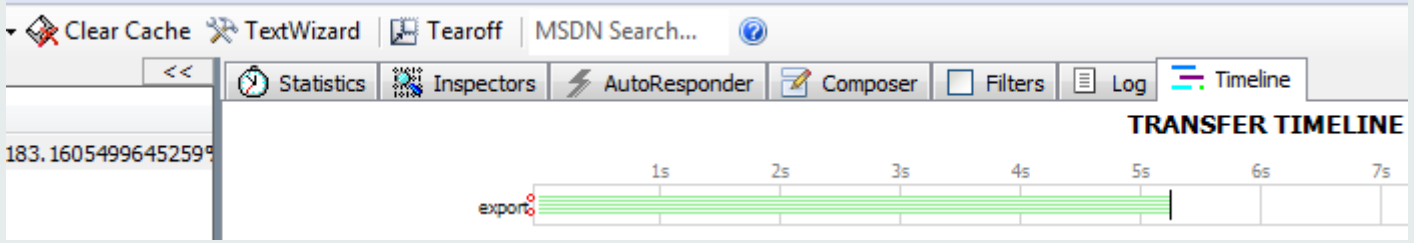
Profile each tier starting from the top



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

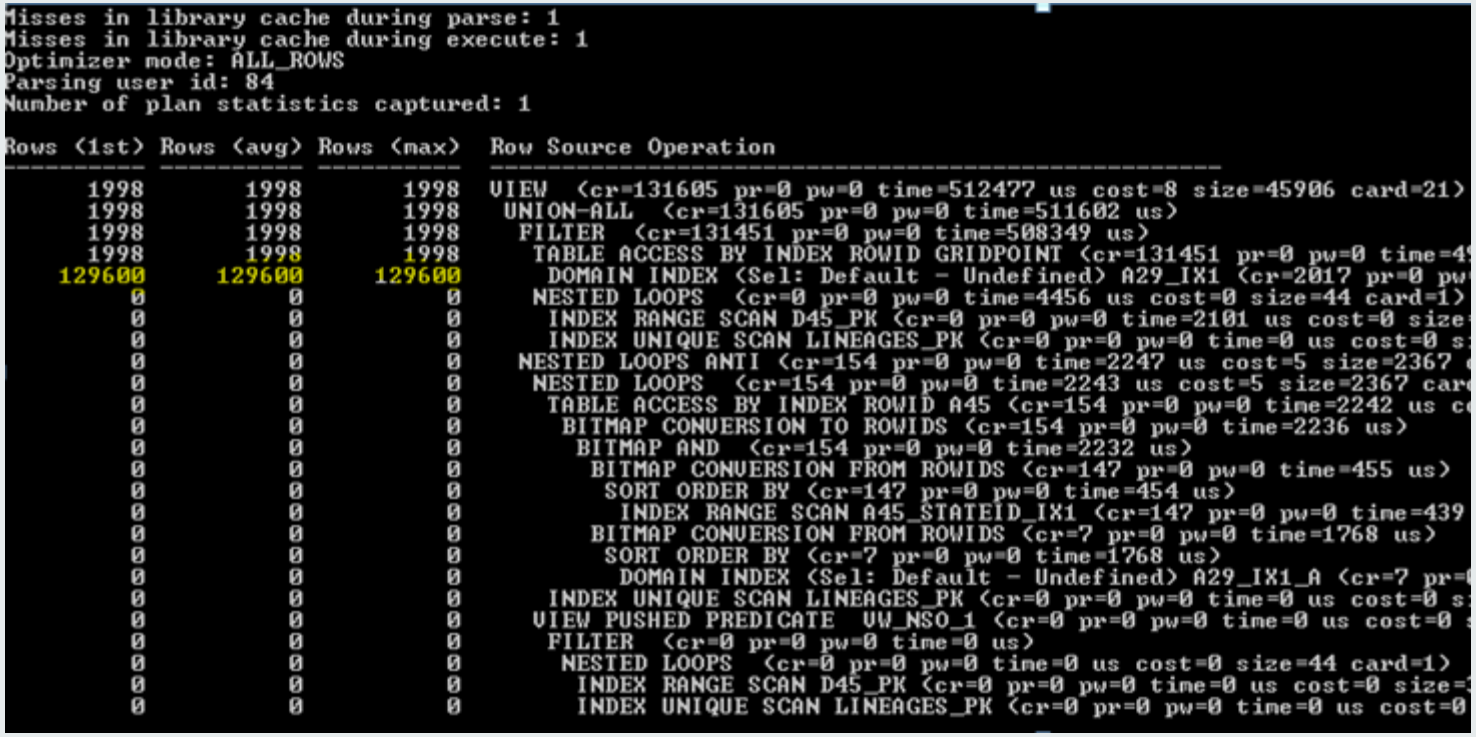
Compare elapsed time

```
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_DELETES_ROW_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_DELETES_ROW_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



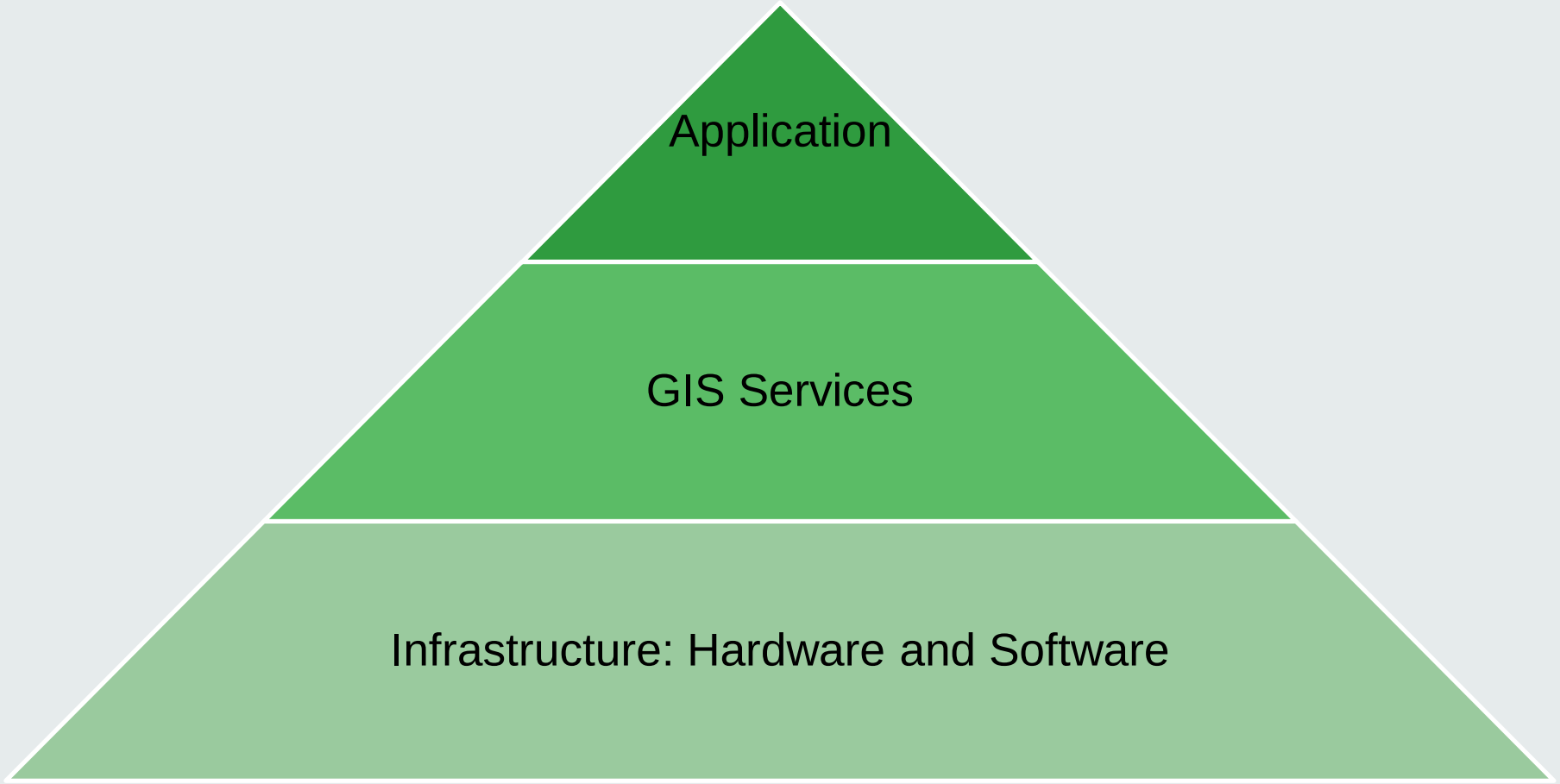
```
Misses in library cache during parse: 1
Misses in library cache during execute: 1
Optimizer mode: ALL_ROWS
Parsing user id: 84
Number of plan statistics captured: 1

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=4
    129600     129600     129600      DOMAIN INDEX (Sel: Default - Undefined) A29_IX1 (cr=2017 pr=0 pw
         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
         0          0          0      INDEX UNIQUE SCAN LINEAGES_PK (cr=0 pr=0 pw=0 time=0 us cost=0 s
         0          0          0    NESTED LOOPS ANTI (cr=154 pr=0 pw=0 time=2247 us cost=5 size=2367
         0          0          0     NESTED LOOPS  (cr=154 pr=0 pw=0 time=2243 us cost=5 size=2367 car
         0          0          0      TABLE ACCESS BY INDEX ROWID A45 (cr=154 pr=0 pw=0 time=2242 us c
         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_IX1 (cr=147 pr=0 pw=0 time=439
         0          0          0         BITMAP CONVERSION 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_IX1_A (cr=7 pr=
         0          0          0      INDEX UNIQUE SCAN LINEAGES_PK (cr=0 pr=0 pw=0 time=0 us cost=0 s
         0          0          0     VIEW PUSHED PREDICATE  VW_NSO_1 (cr=0 pr=0 pw=0 time=0 us cost=0
         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=
         0          0          0        INDEX UNIQUE SCAN LINEAGES_PK (cr=0 pr=0 pw=0 time=0 us cost=0
```

Testing

Testing Objectives

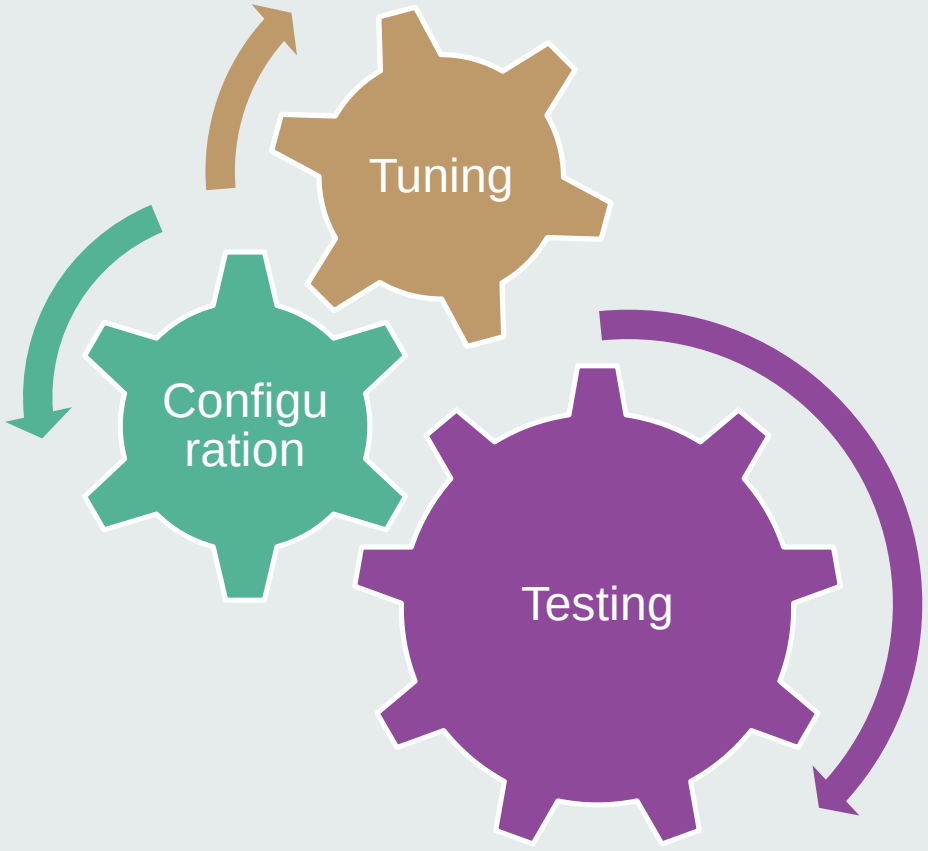
- **Meet Service-Level Agreement (SLA)**
- **Bottlenecks analysis**
- **Capacity planning**
- **Benchmarking different alternatives**

Testing process



Required skill set

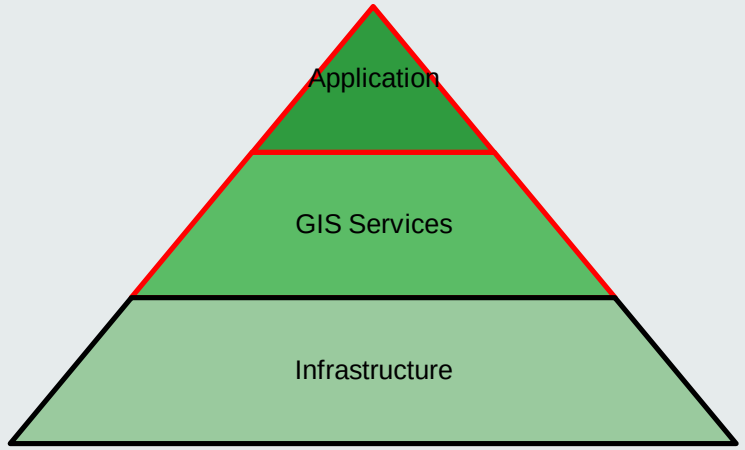
Configuration, Tuning, Testing



System Test for Web

GIS Test Automation

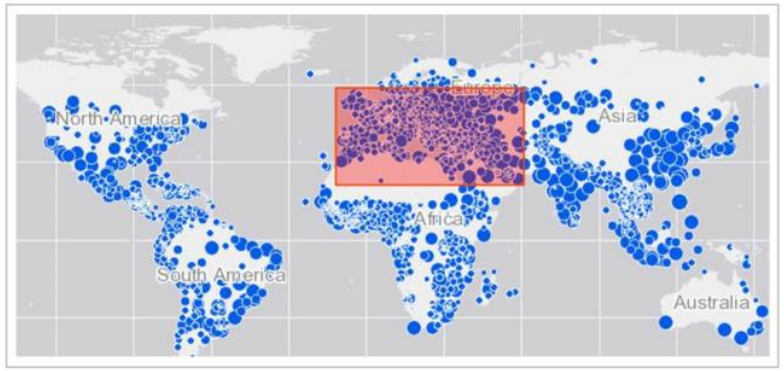
- **ArcGIS Services**
  - **Mapping**
  - **Feature Service**
  - **OGC**
  - **Geocoding**
  - **Image Service**
  - **Network Analyst**
  - **Geoprocessing**
  - **Tile Cache**
- **Application Testing**
- **Discipline relevant report**

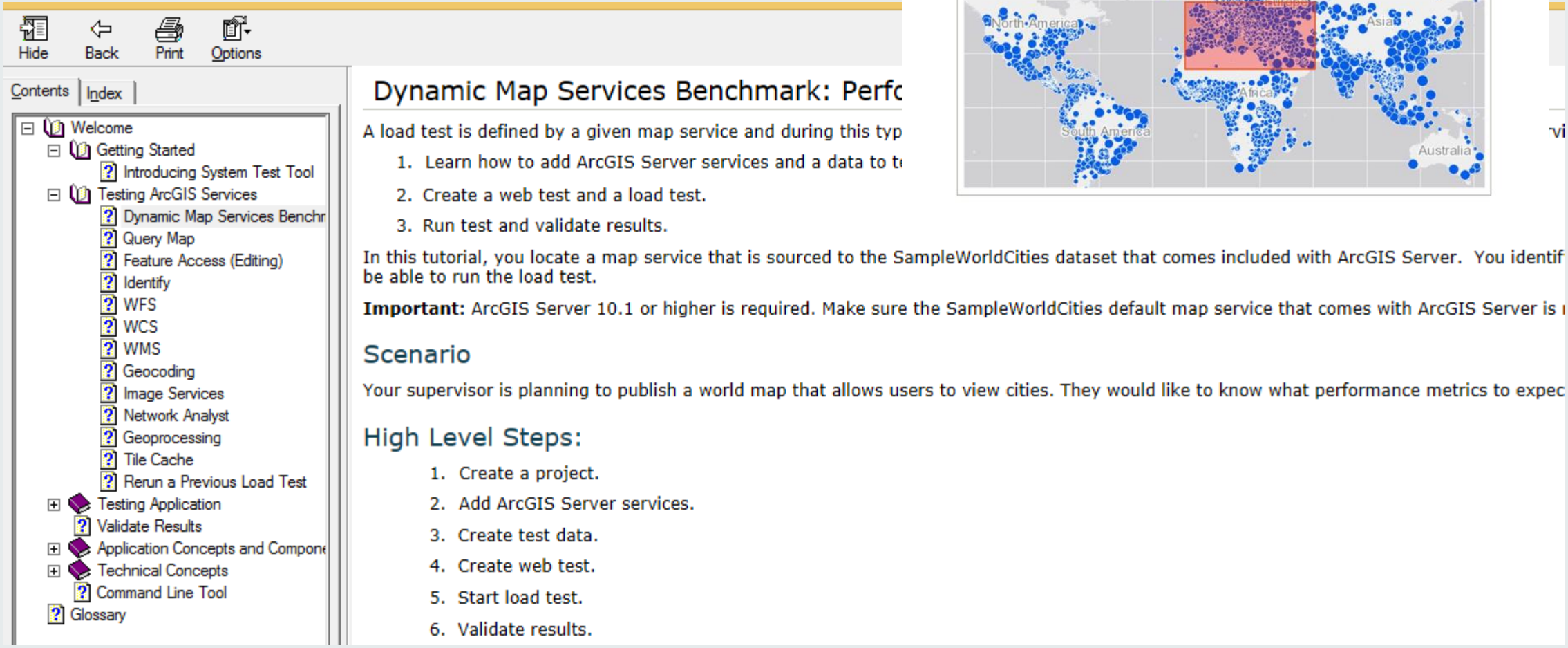


Web test tools feature comparison

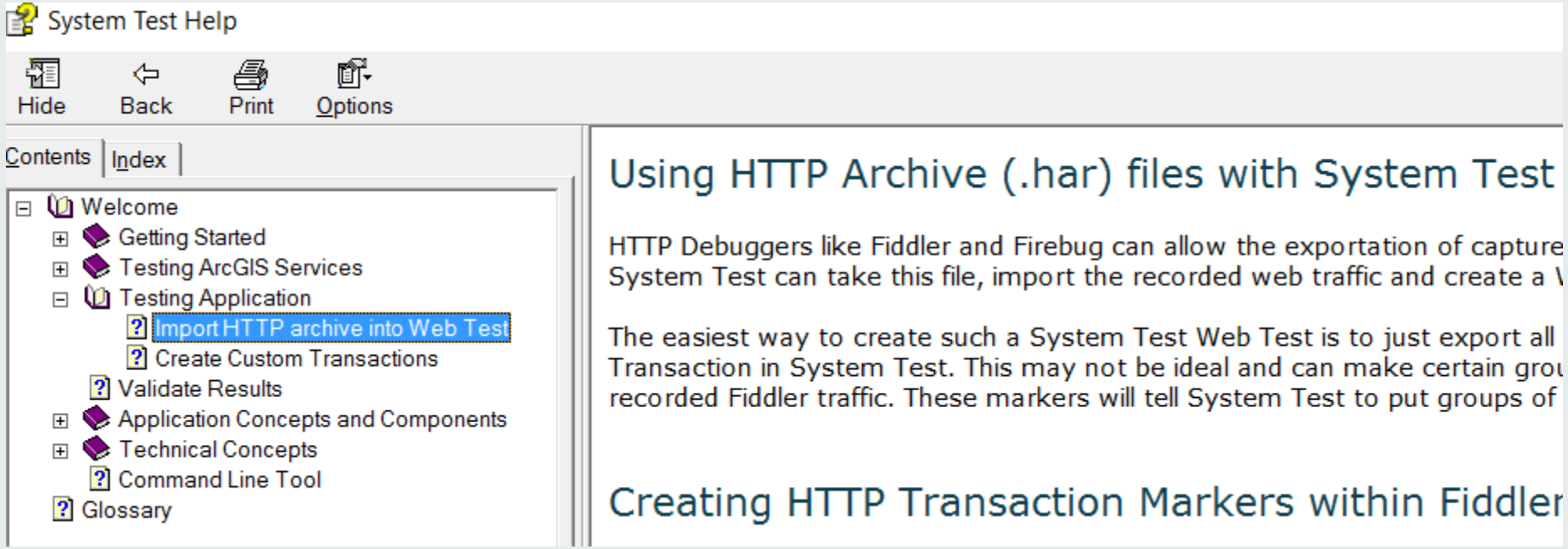
Tool	Cost	Learning Curve	OS Metrics	GIS Data Generation	GIS Test Automation
Load Runner	High	High	Windows/Linux	No	No
Visual Studio	Medium	High	Windows	No	No
JMeter	Free	High	Requires additional plugin	No	No
System Test	Free	Low	Windows/Linux	Yes	Yes

Demo: Dynamic Map Service

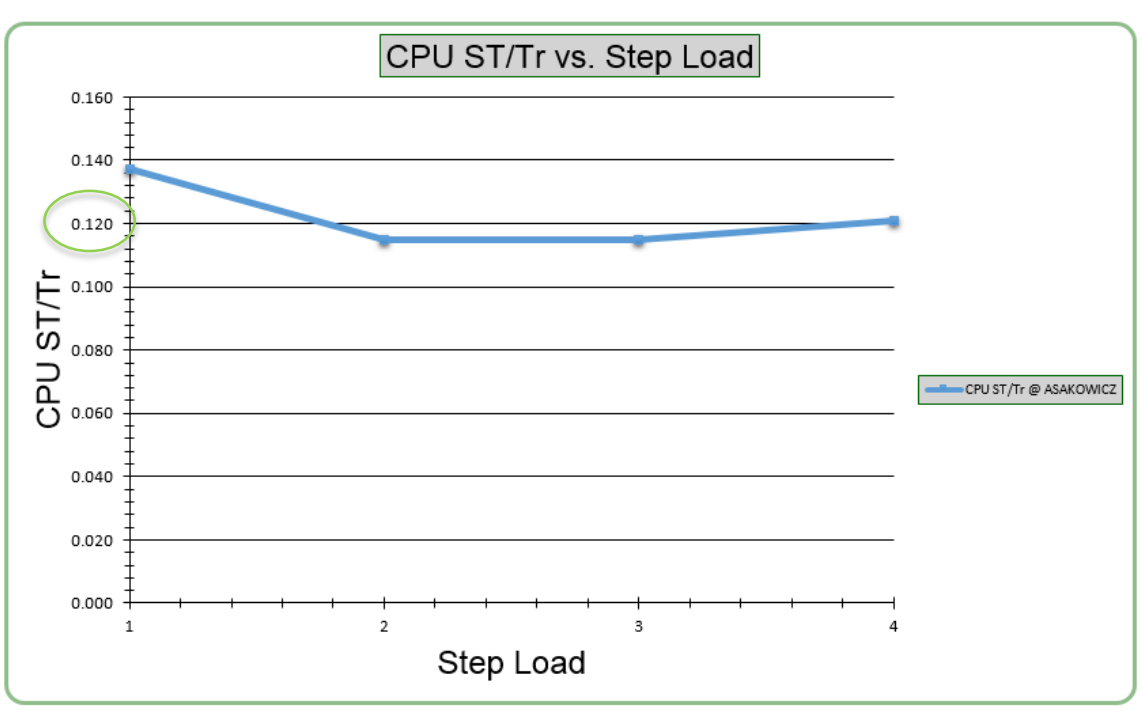


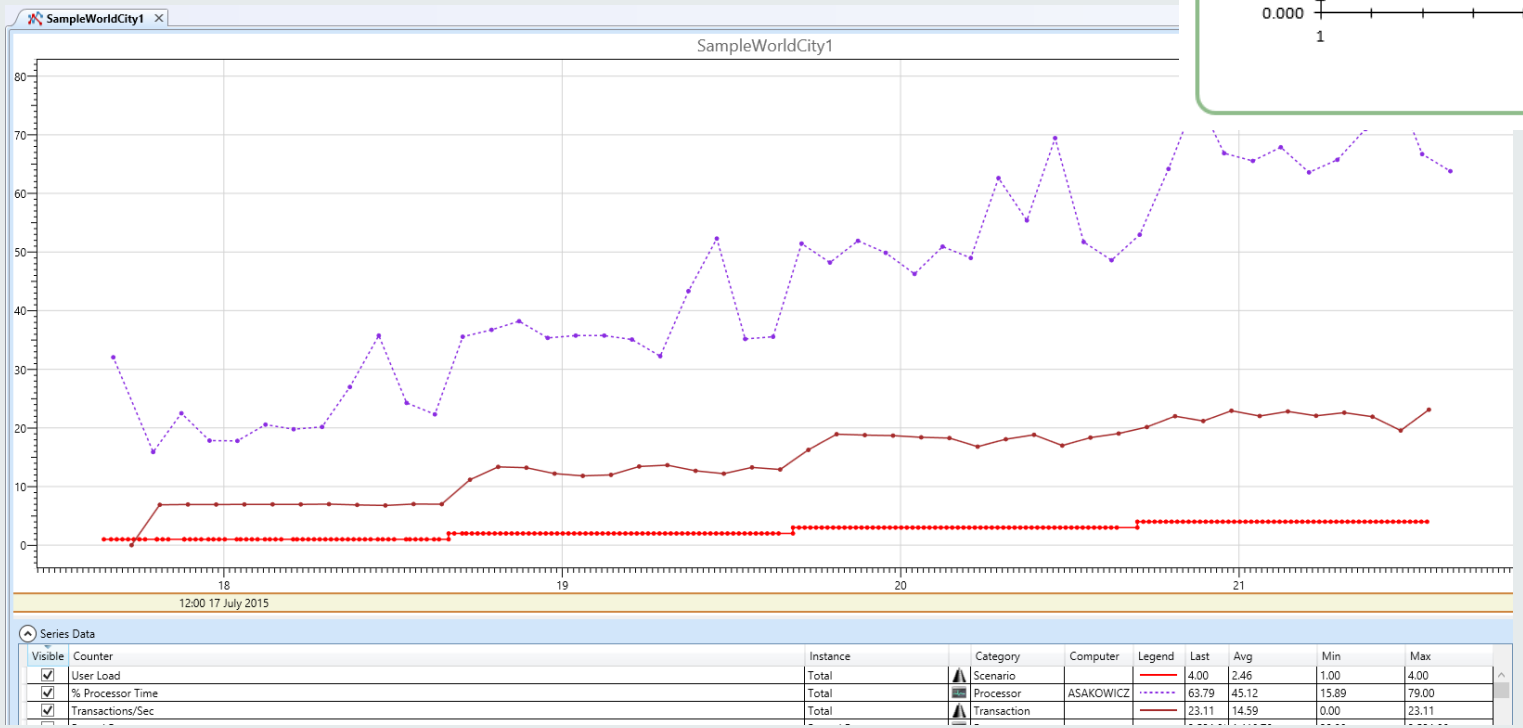


Demo - HAR


System Test Help
Hide
Back
Print
Options
Contents
Index
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
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 grou
recorded Fiddler traffic. These markers will tell System Test to put groups of
Creating HTTP Transaction Markers within Fiddler

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

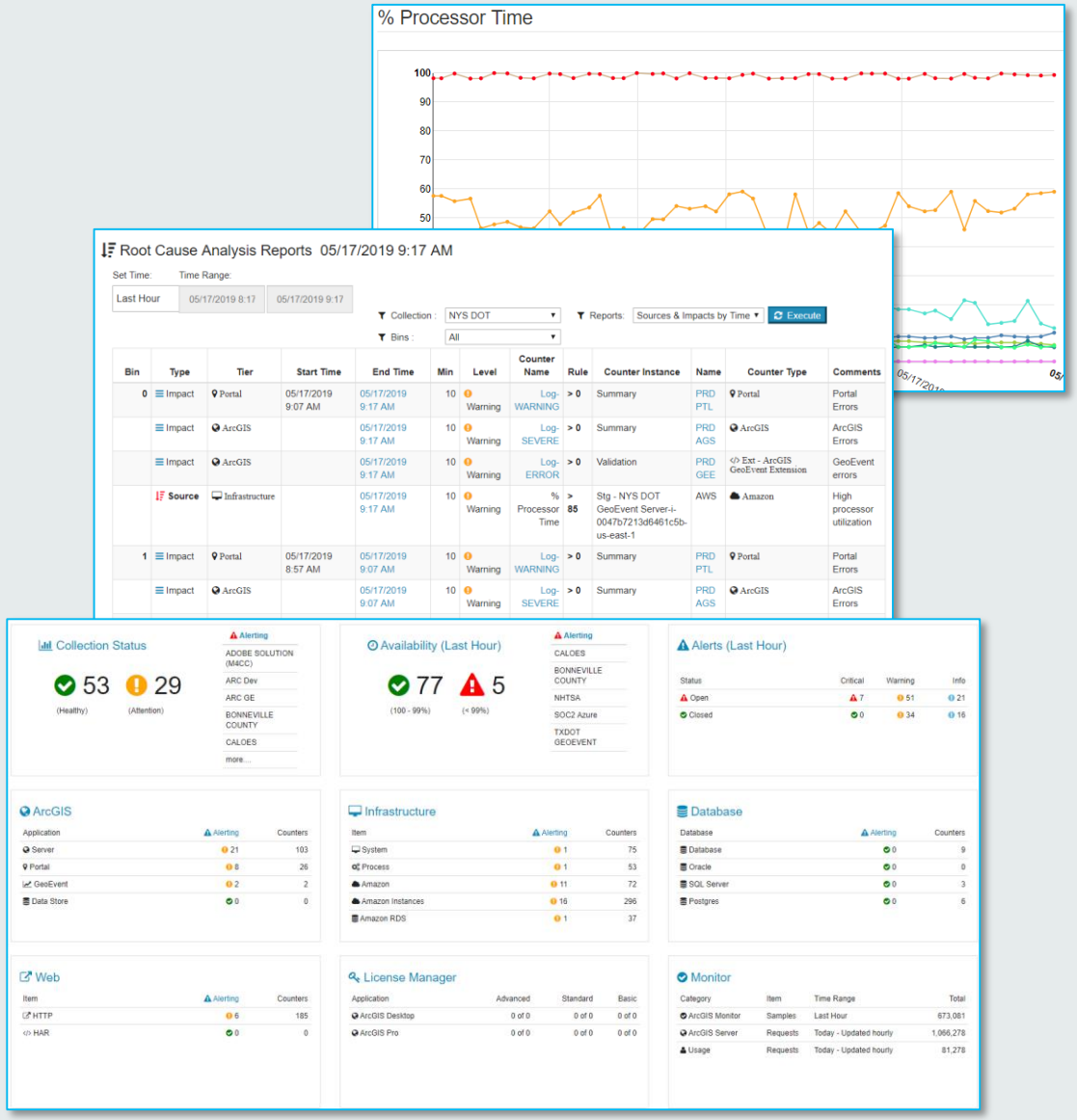
ArcGIS Monitor: Why?

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

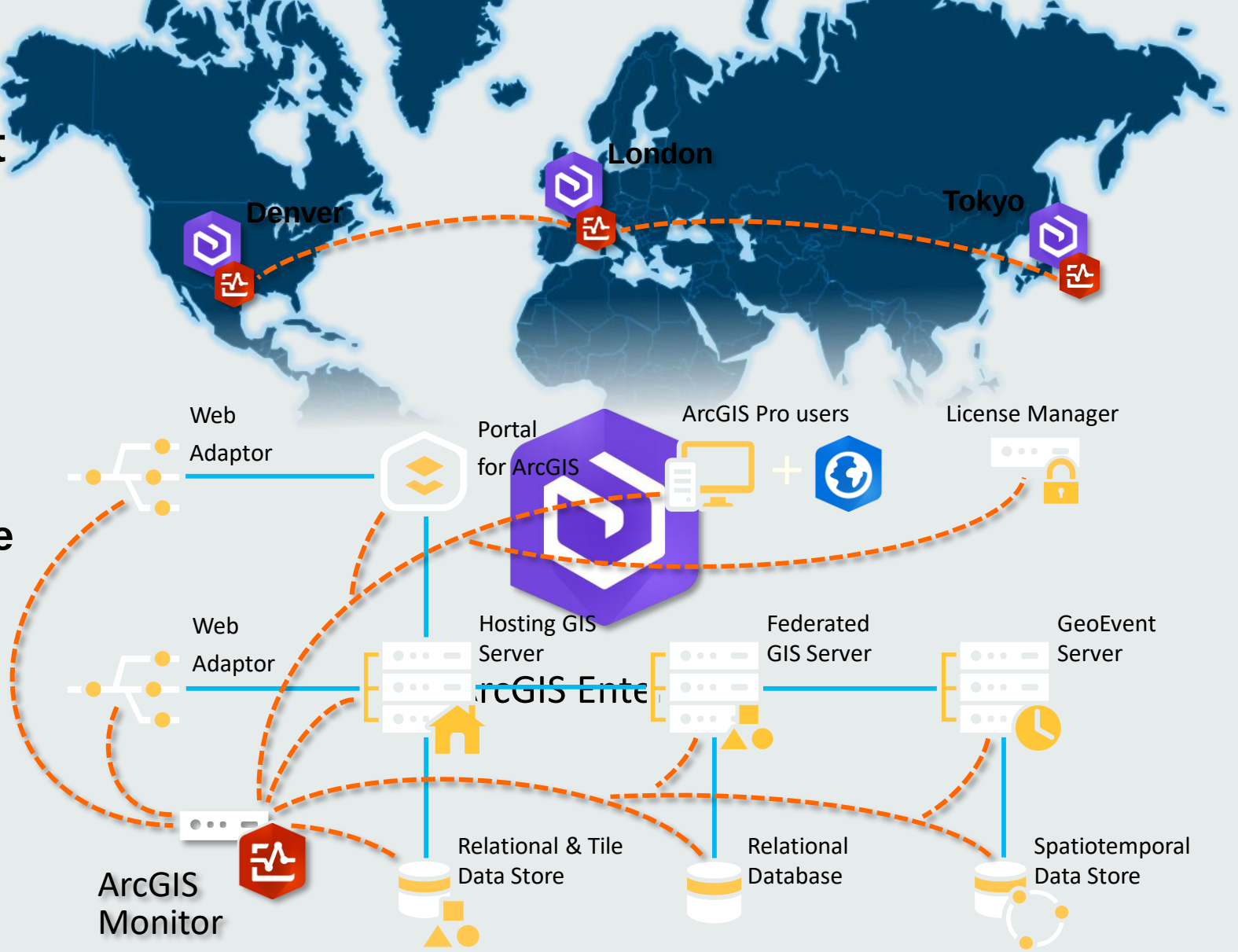


The Monitored Environment

Growing in complexity

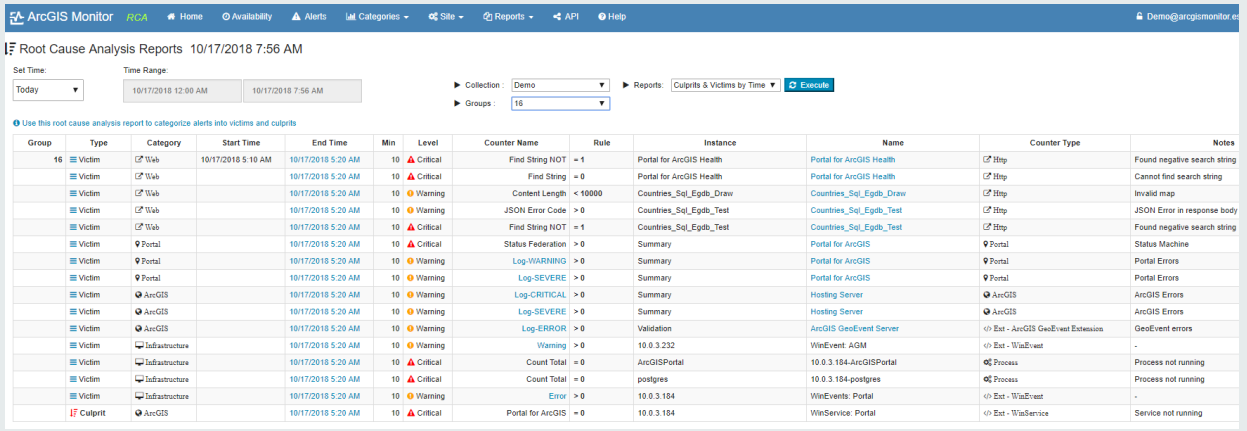
- Dozens of components
- Hundreds of discreet metrics
- Which metrics are important?
- Filter the signal from the noise

- ArcGIS Monitor
  - Tailored for ArcGIS
  - Non-invasive sampling
  - Minimal resource footprint
  - Conforms to the environment
    - Single or multi-datacenter

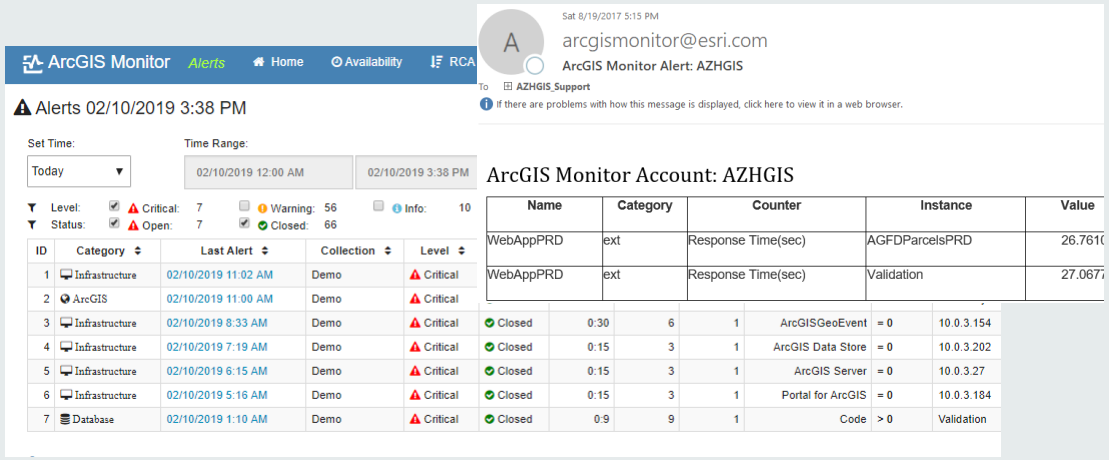


ArcGIS Monitor

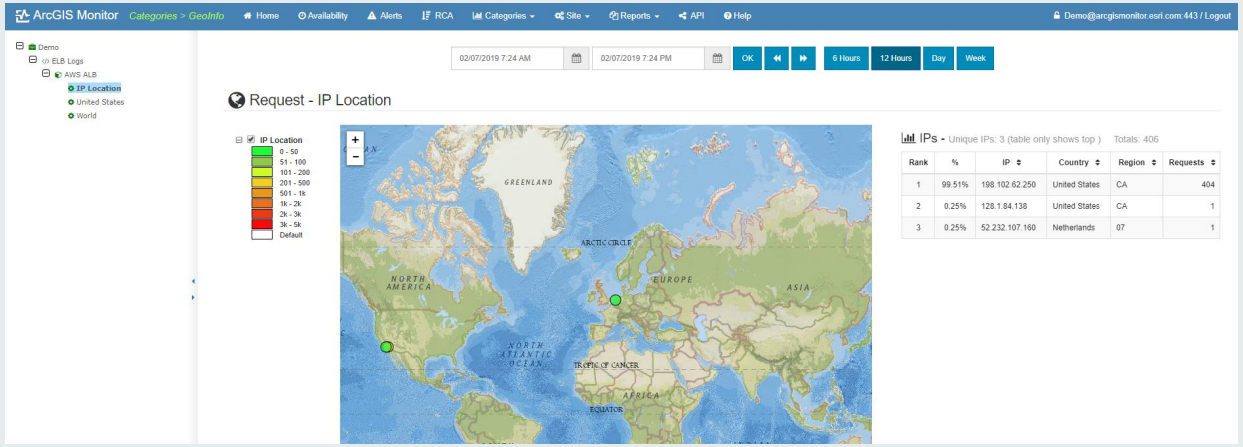
Monitor



Analyze

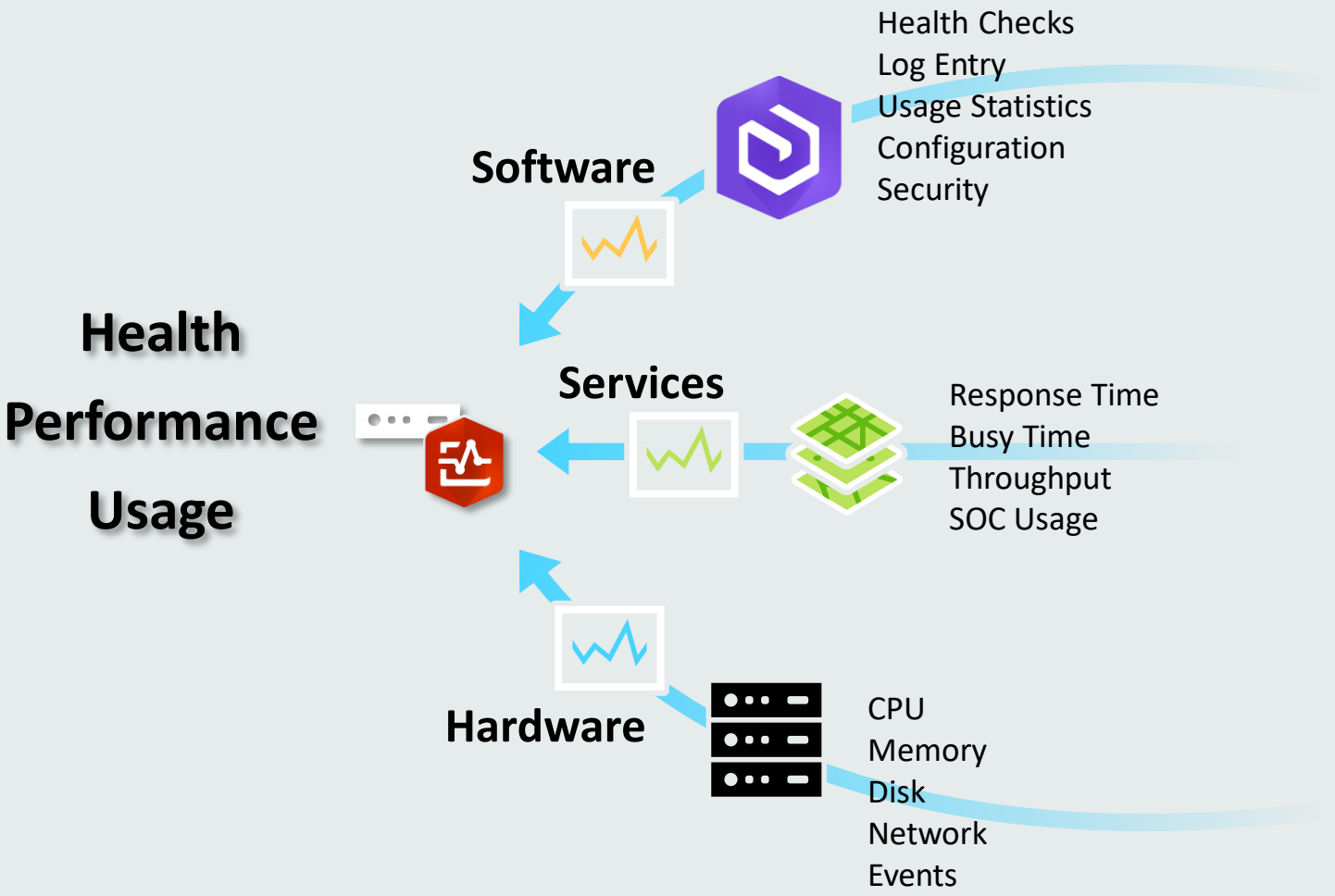


Alert



Report

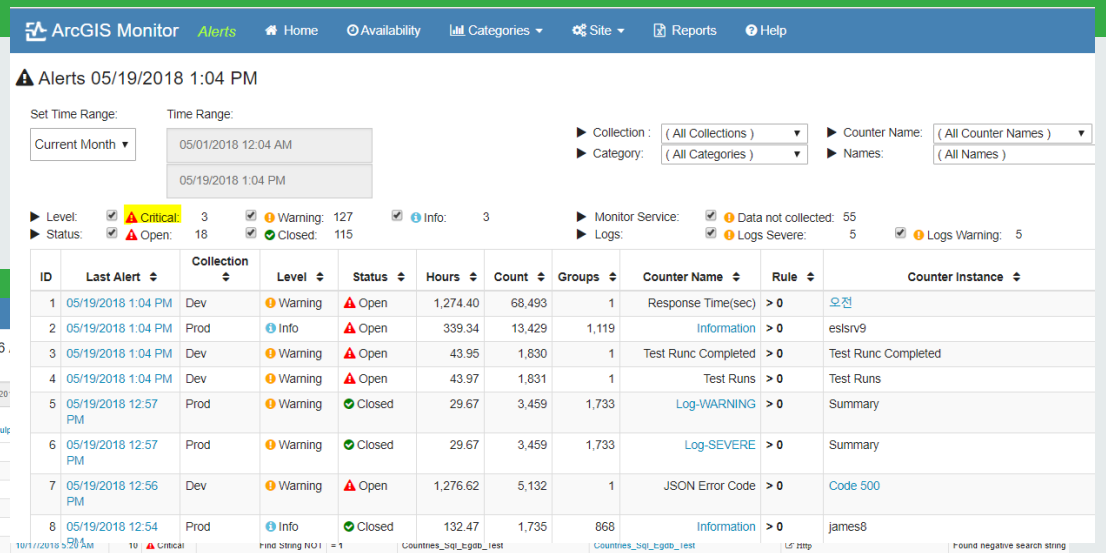
What is monitored?



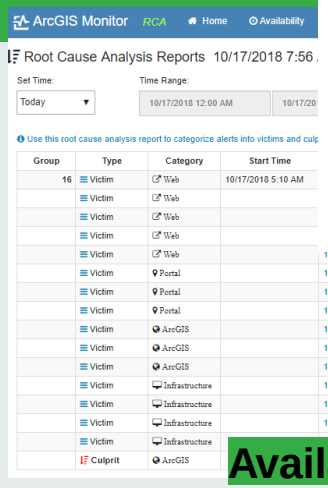
Target Audience

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

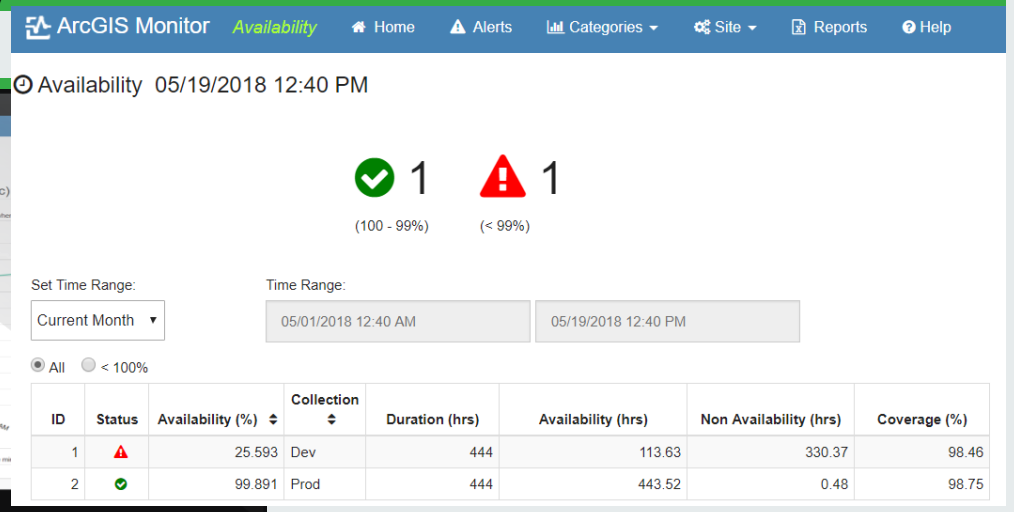
Alerts



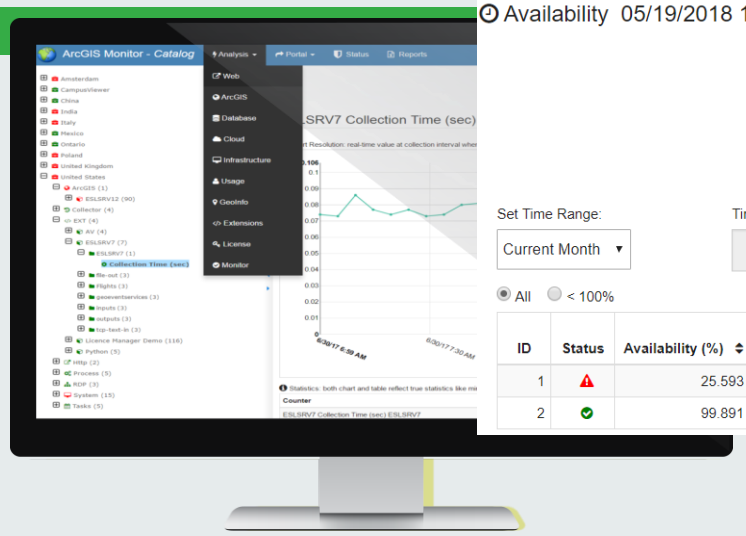
RCA



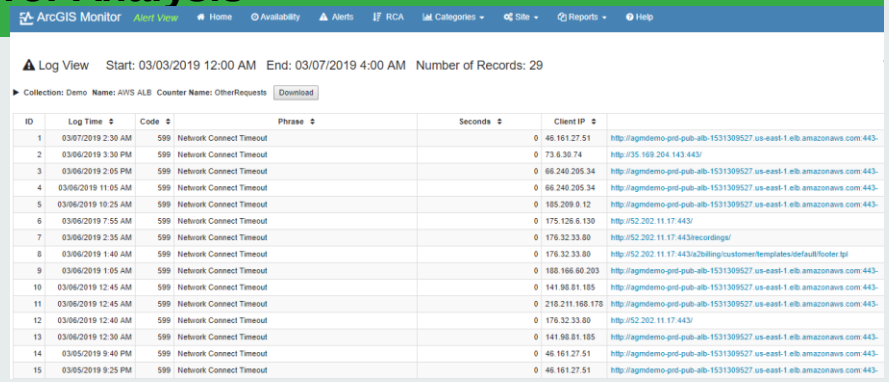
Availability



USAGE



Error Analysis



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

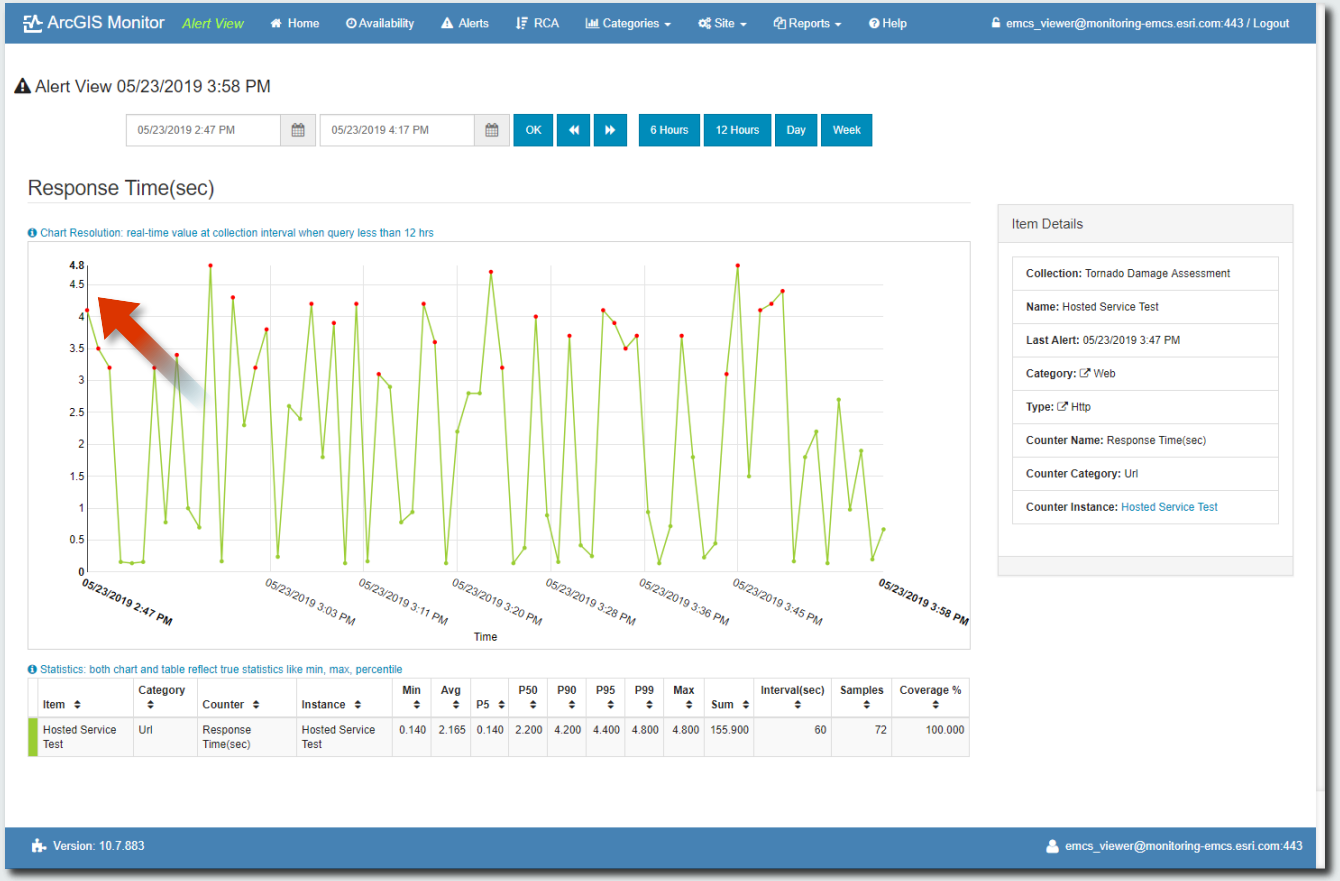
- **Increase communication among GIS and IT staff and senior management**
- **Reduce administration costs**

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

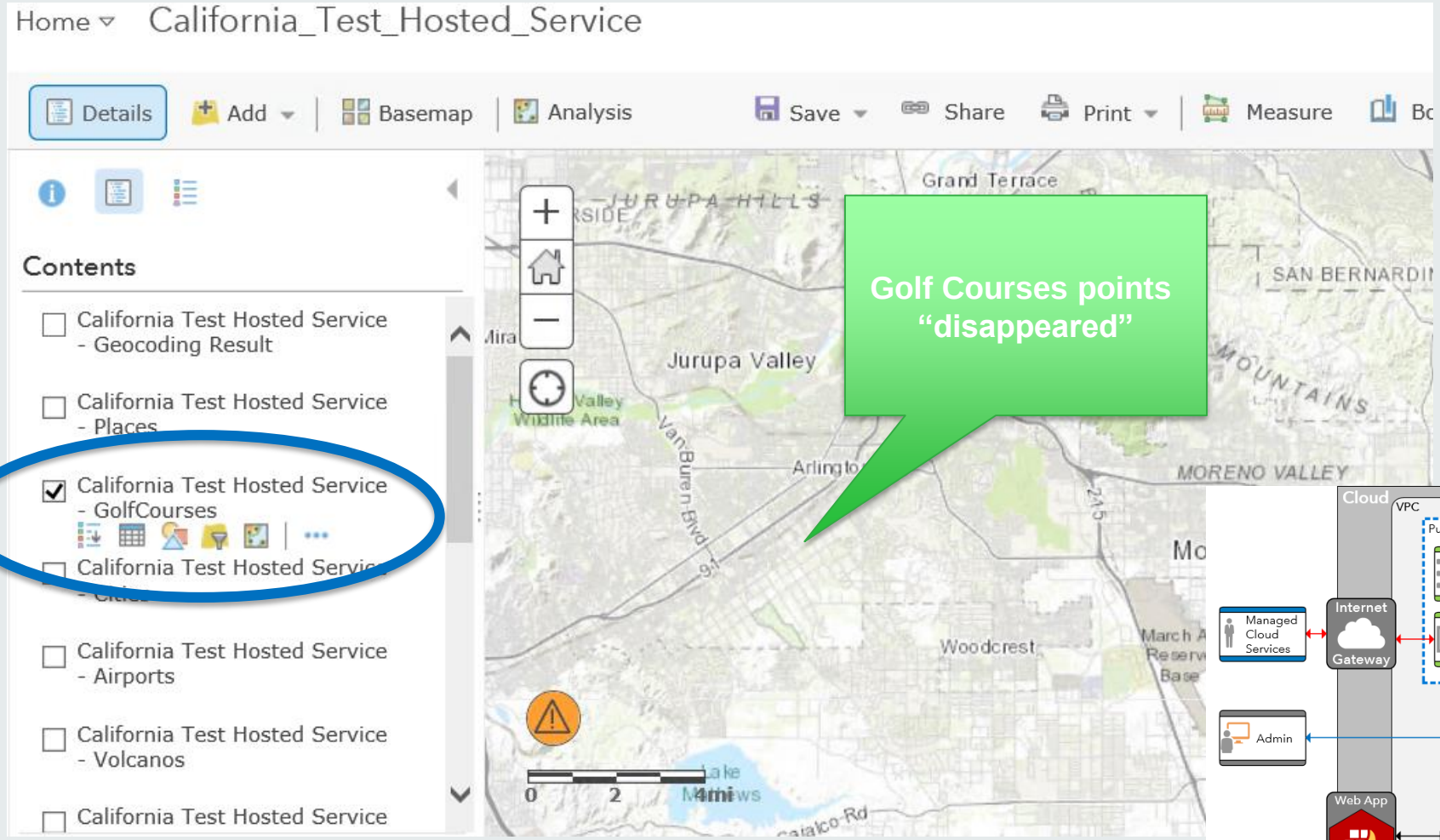


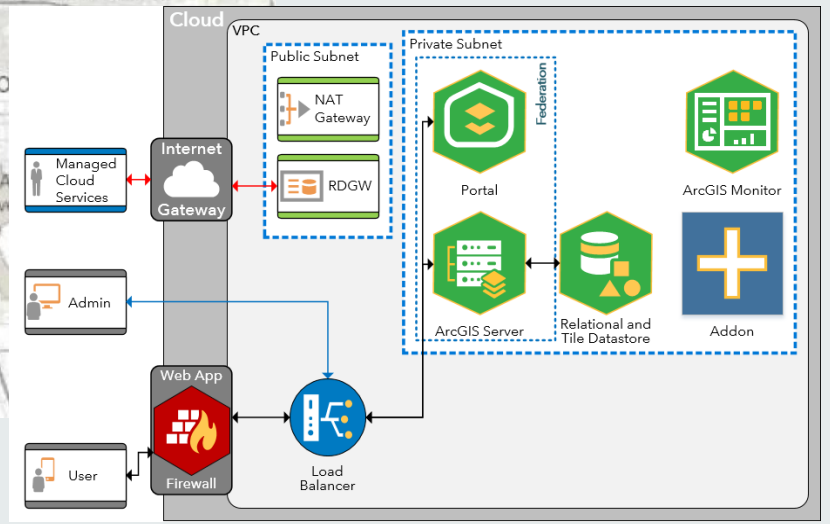
Simple use case

Section Subhead

Problems: Points “disappeared” from a map

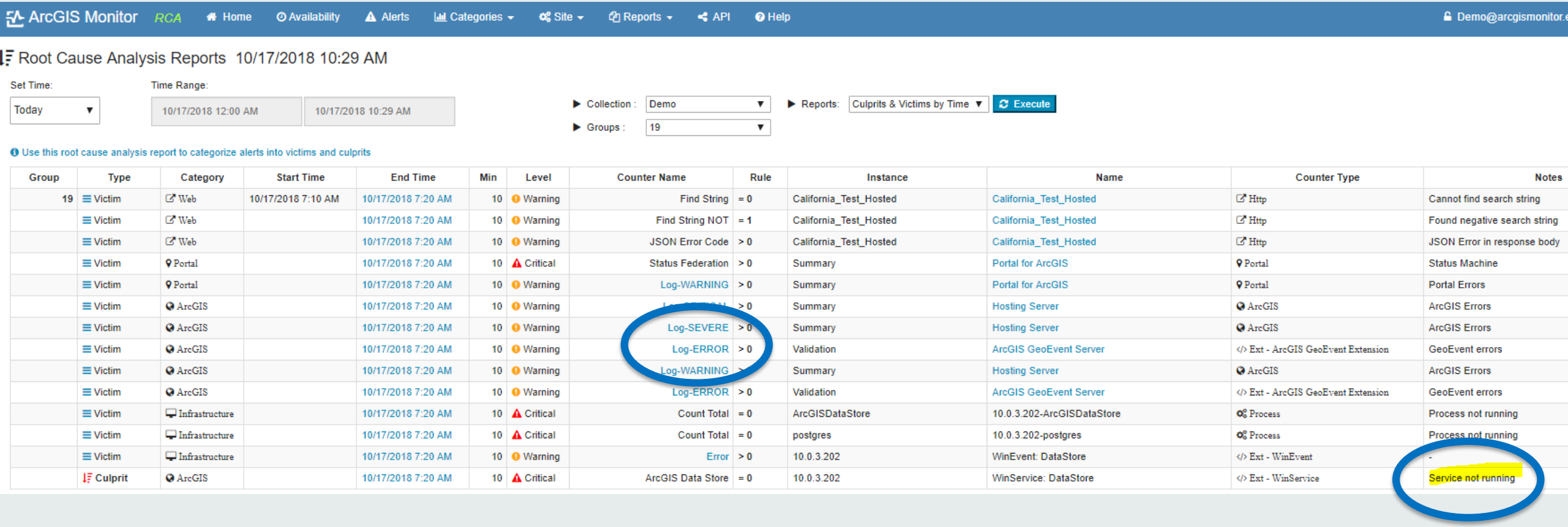
First noticed around 7 am





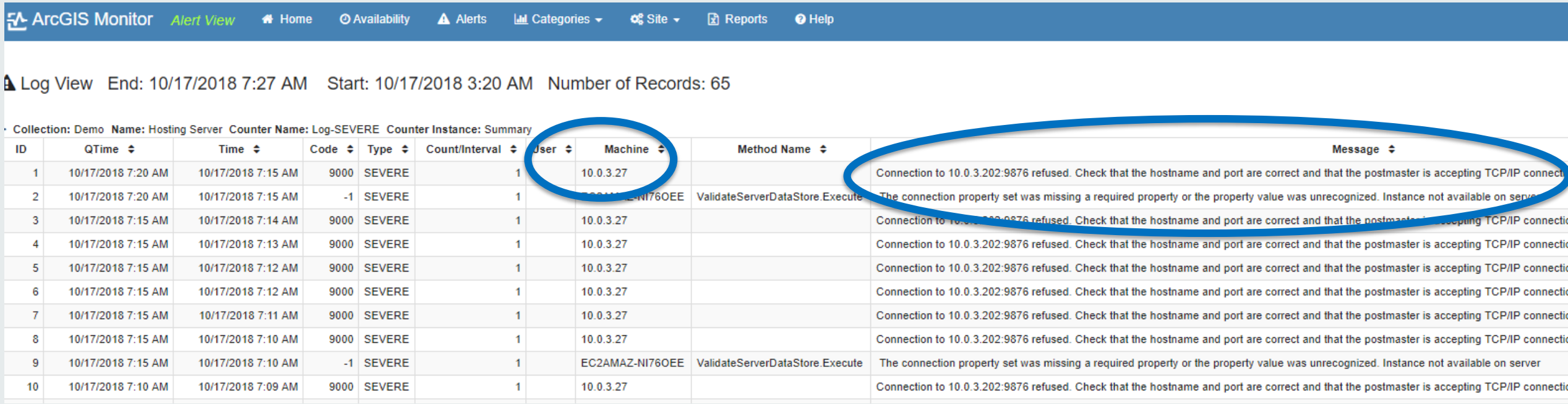
Select RCA for this time range

Analyze Sources and click on Log error messages



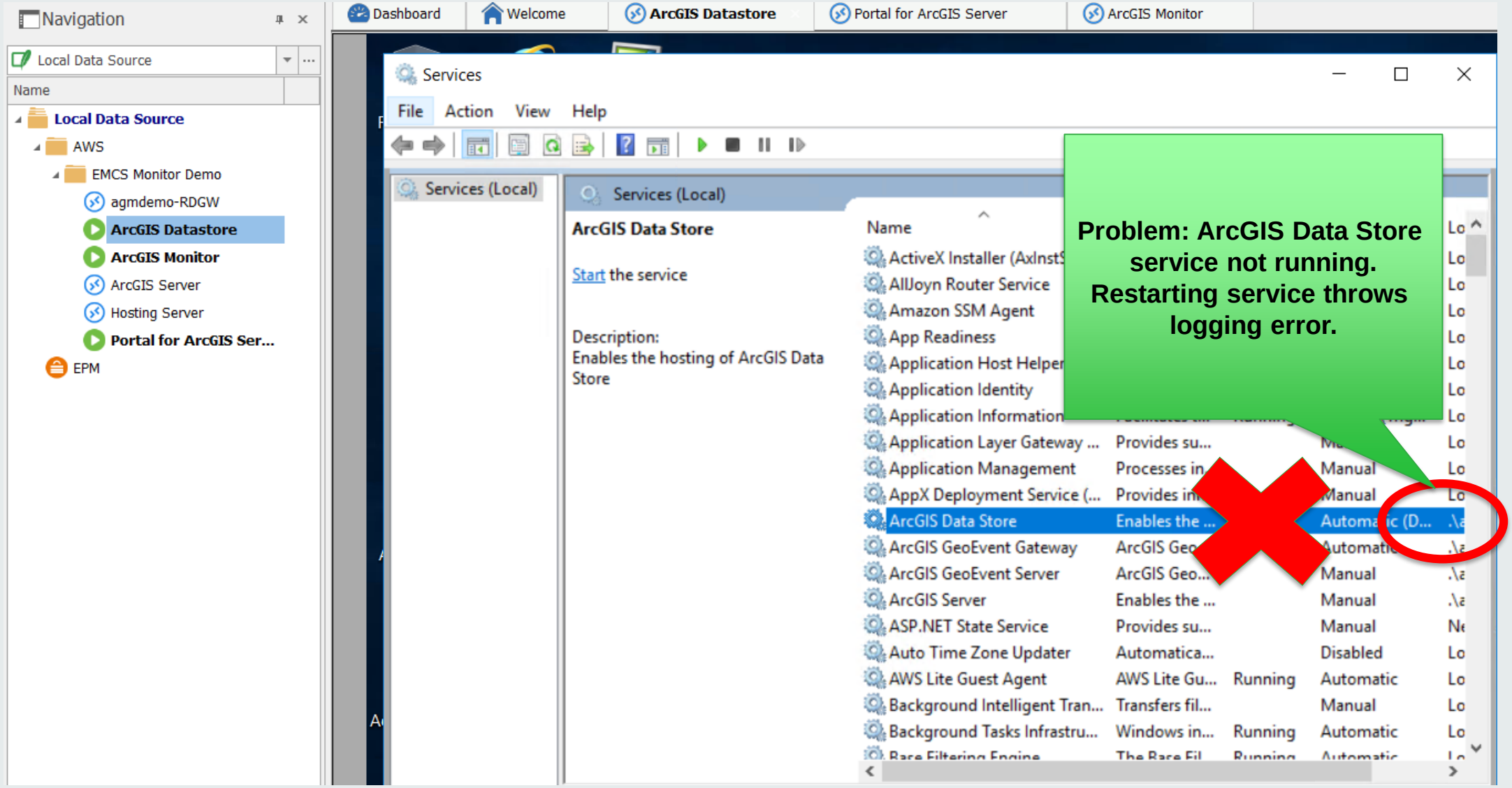
Group	Type	Category	Start Time	End Time	Min	Level	Counter Name	Rule	Instance	Name	Counter Type	Notes
19	Victim	Web	10/17/2018 7:10 AM	10/17/2018 7:20 AM	10	Warning	Find String	= 0	California_Test_Hosted	California_Test_Hosted	Http	Cannot find search string
	Victim	Web		10/17/2018 7:20 AM	10	Warning	Find 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	[illegible]	> 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	>	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

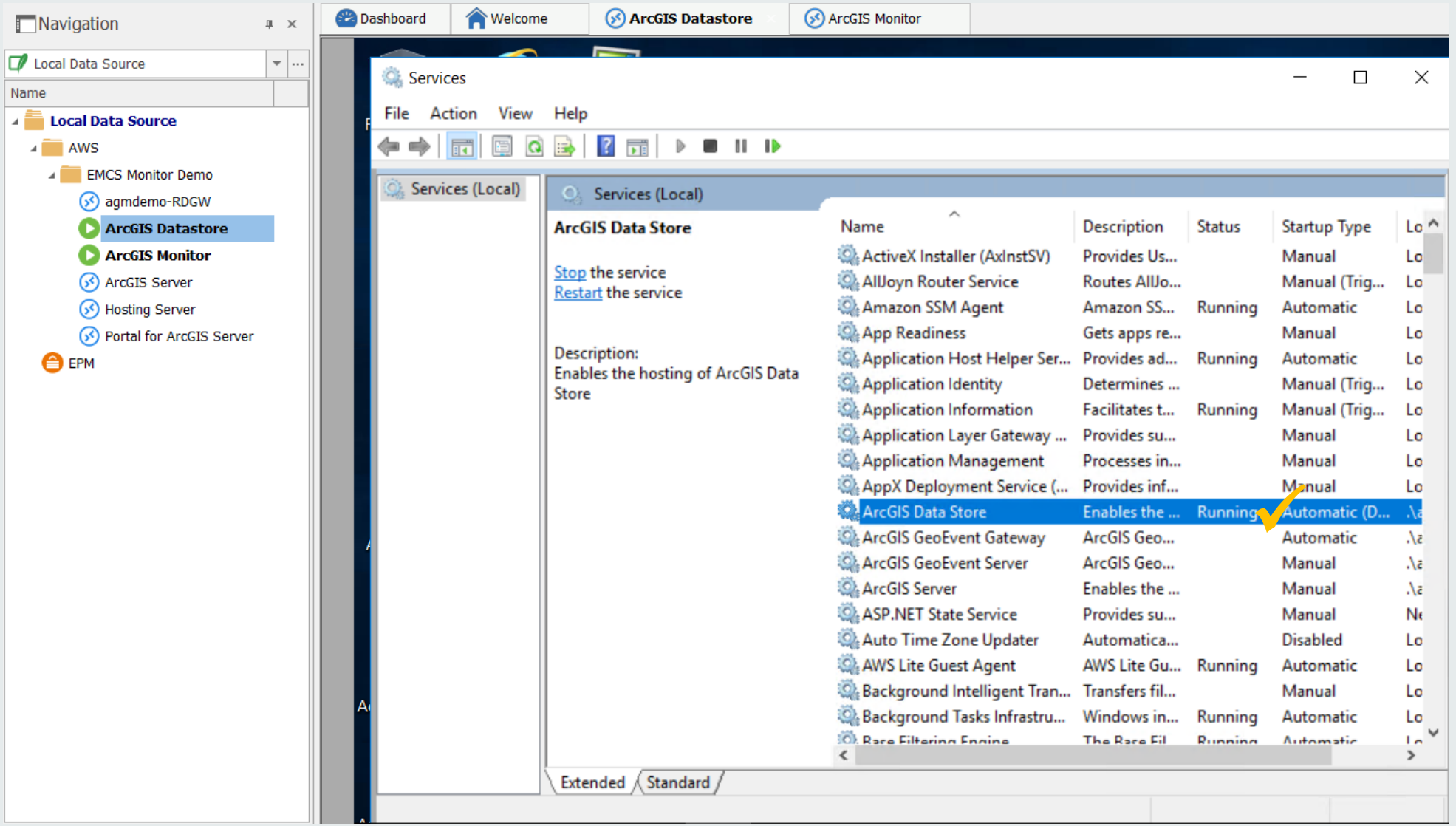


ID	QTime	Time	Code	Type	Count/Interval	User	Machine	Method Name	Message
1	10/17/2018 7:20 AM	10/17/2018 7:15 AM	9000	SEVERE	1		10.0.3.27		Connection to 10.0.3.202:9876 refused. Check that the hostname and port are correct and that the postmaster is accepting TCP/IP connecti
2	10/17/2018 7:20 AM	10/17/2018 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 serve
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 connecti
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 connecti
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 connecti
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 connecti
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 connecti
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 connecti
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 connecti

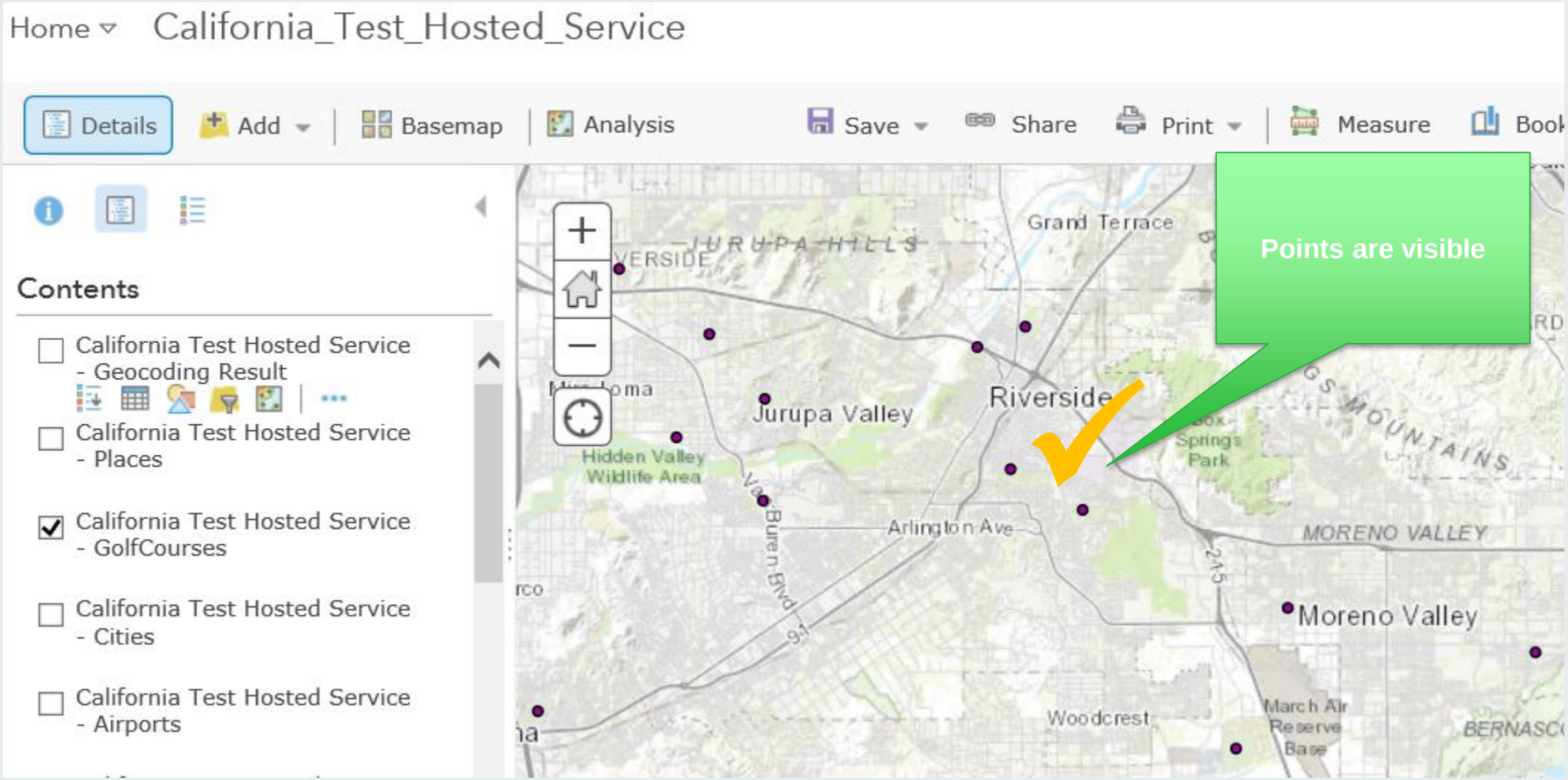
Investigate “Source” machine



Resolve: correct password and start ArcGIS Data Store service

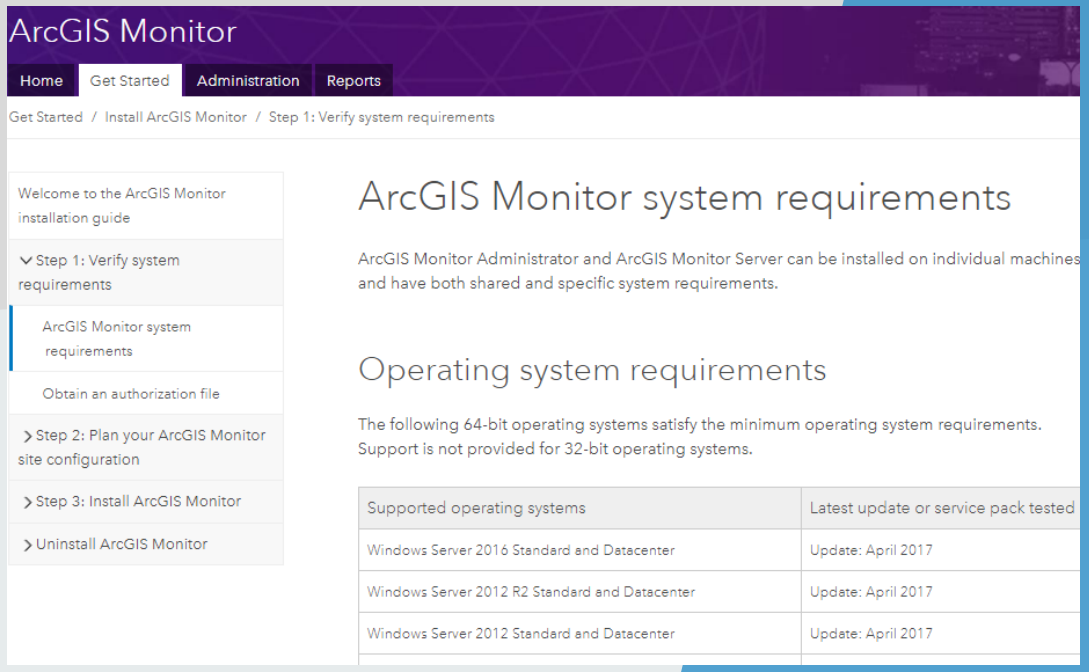


Verify resolution

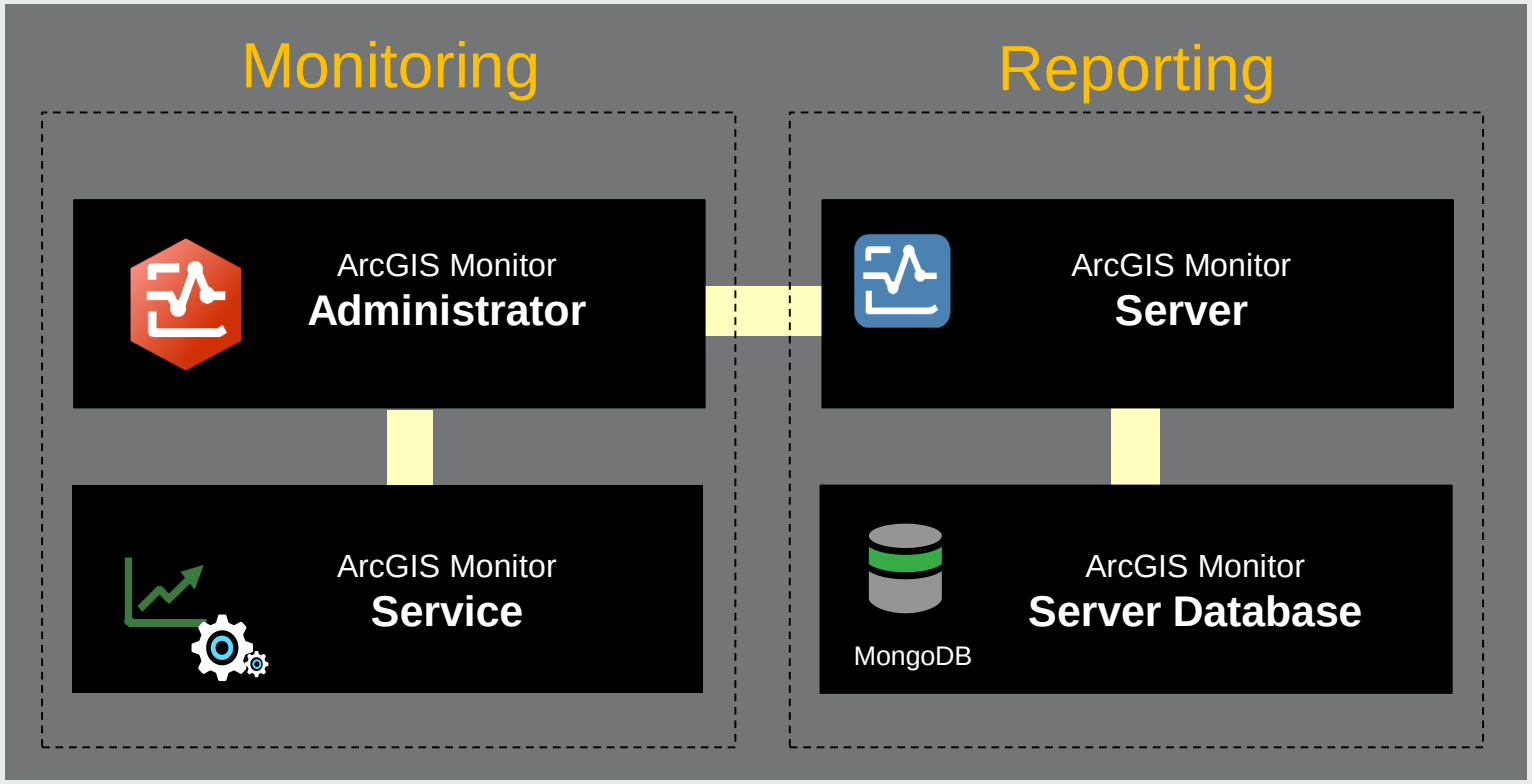


Installation

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



ArcGIS Monitor Components and Functions

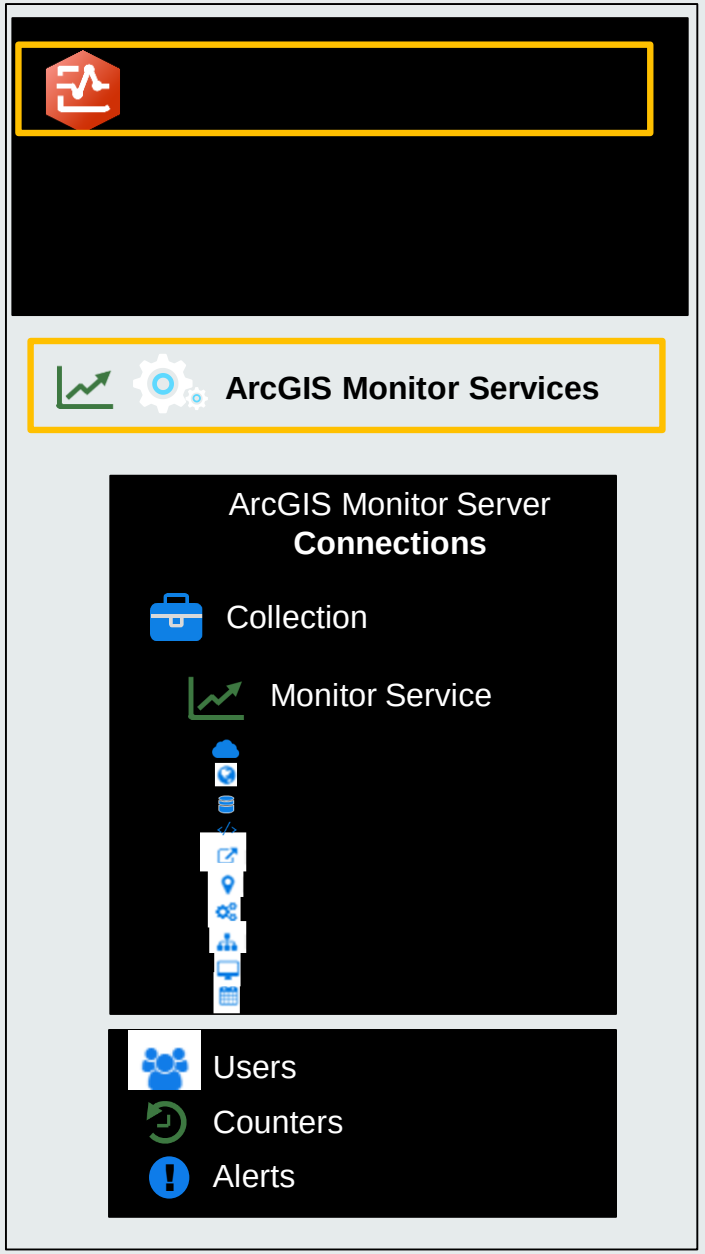


Installation and configuration

- **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**



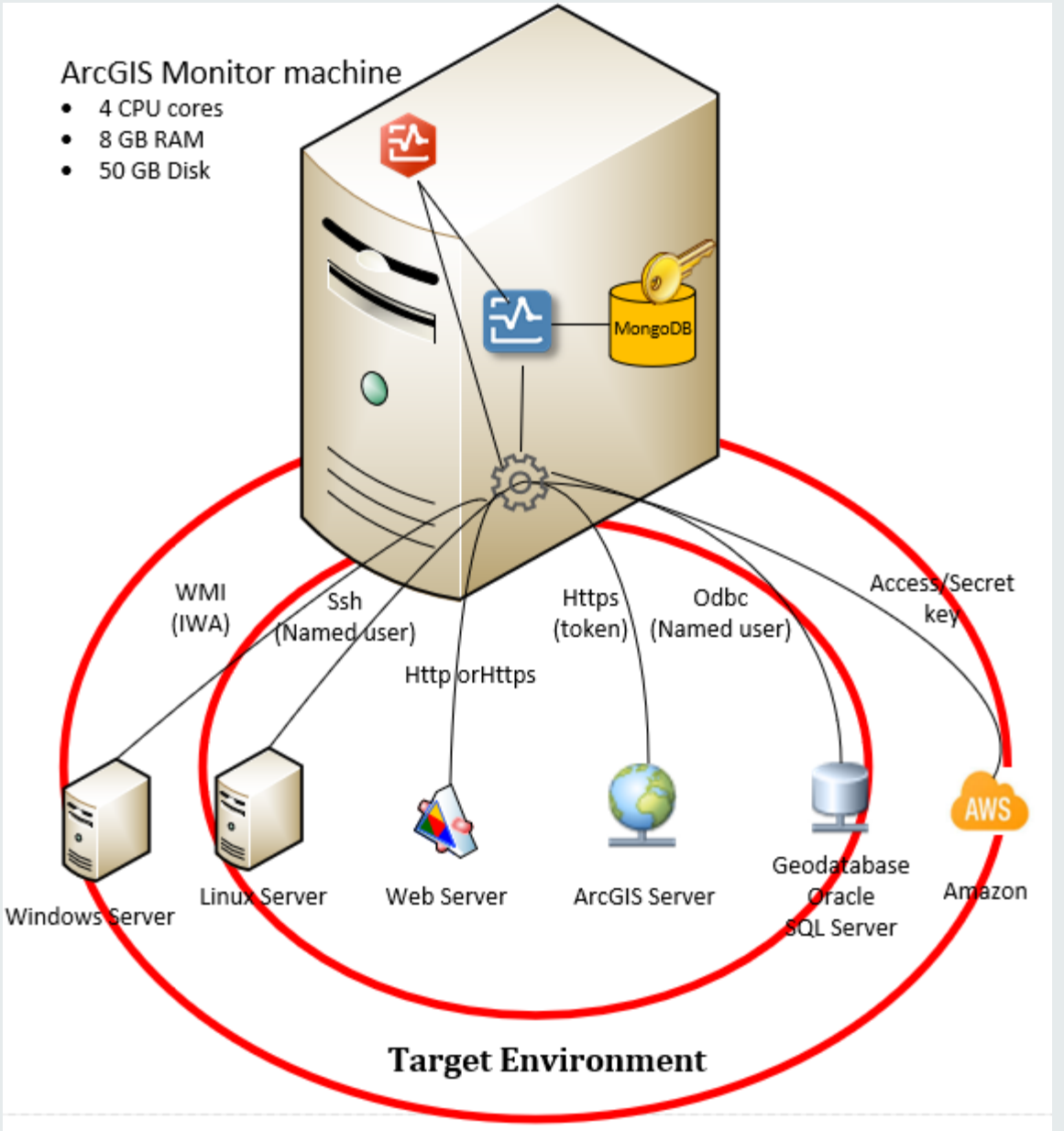
Single machine deployment

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)



Distributed deployment

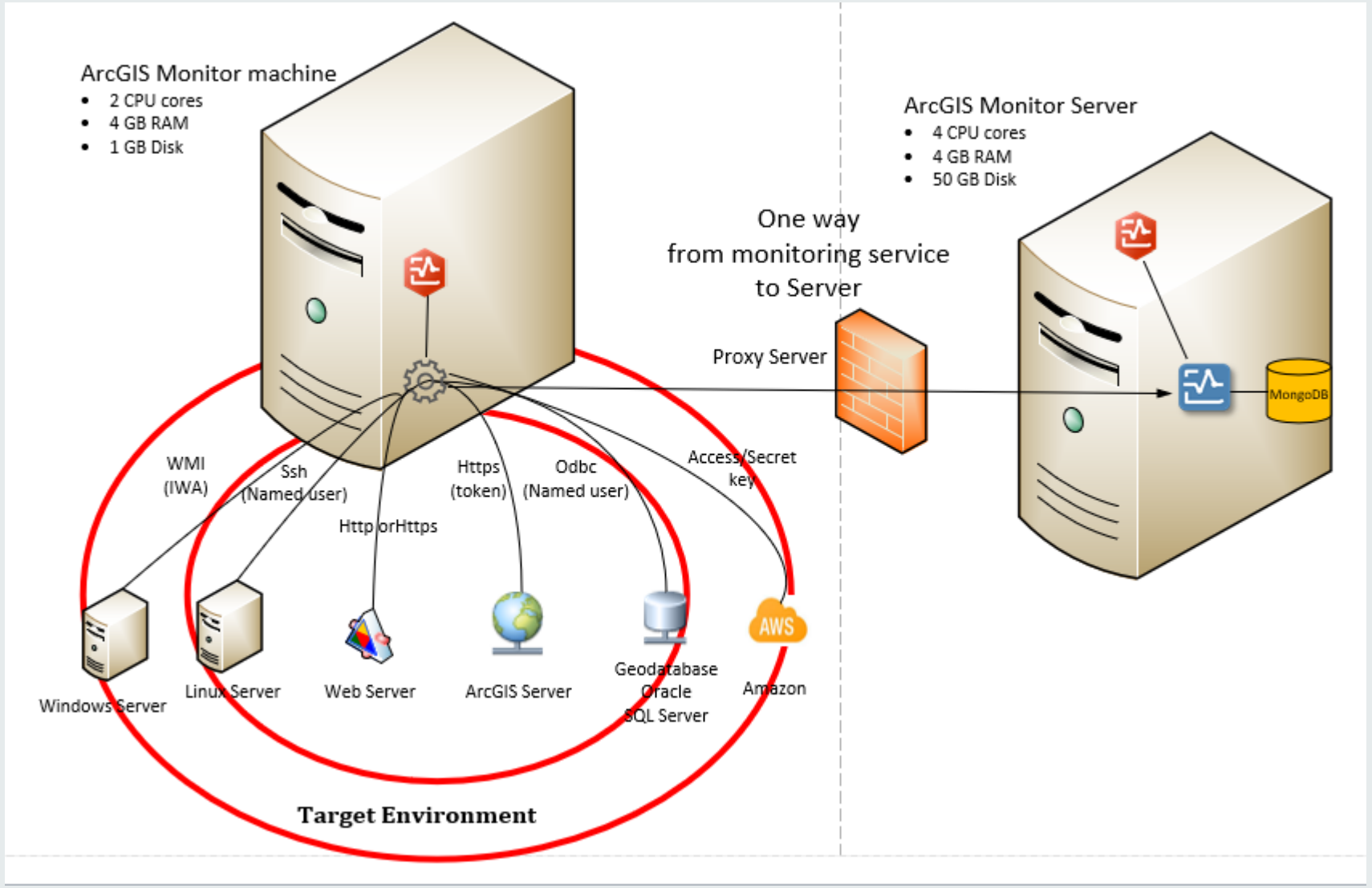
Full stack monitoring

Administrator

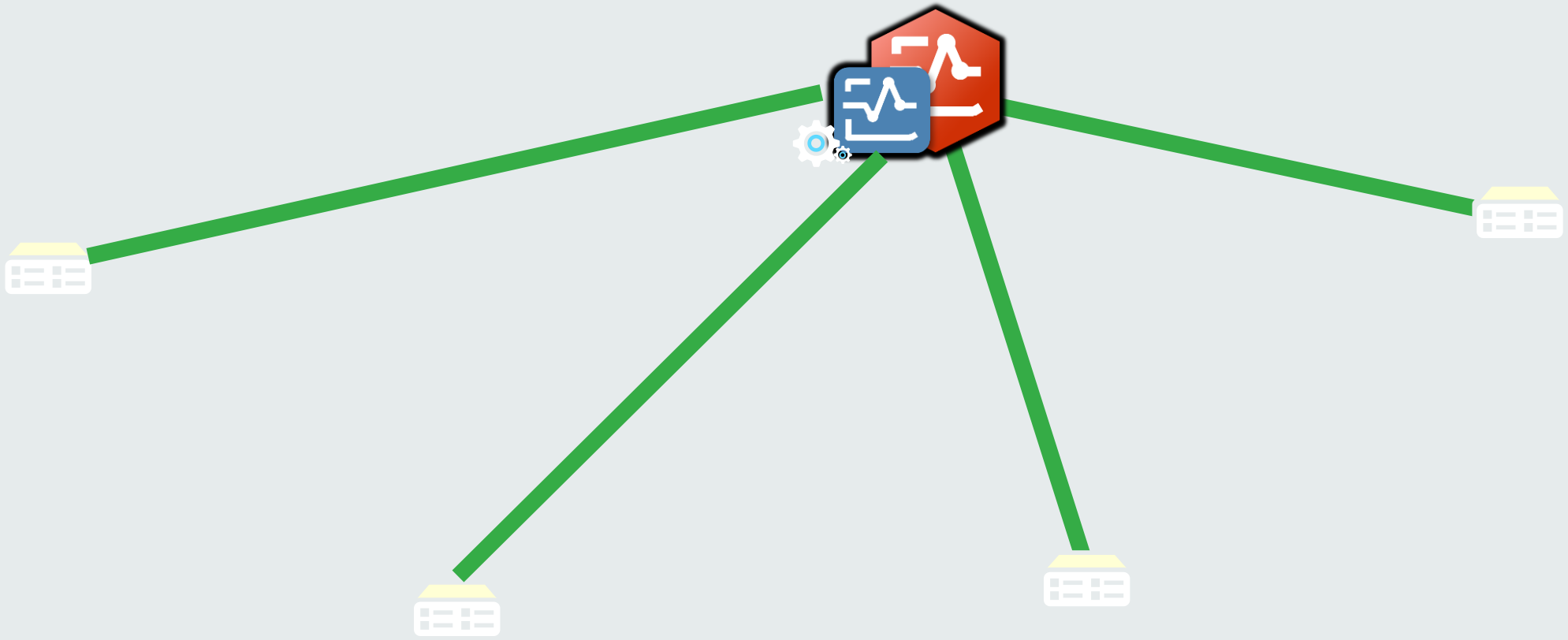
Monitoring Service
(windows service, 8000 or auto assigned port)

Server
https://<hostname>:443 or configurable
Token Authentication , valid 24 hr

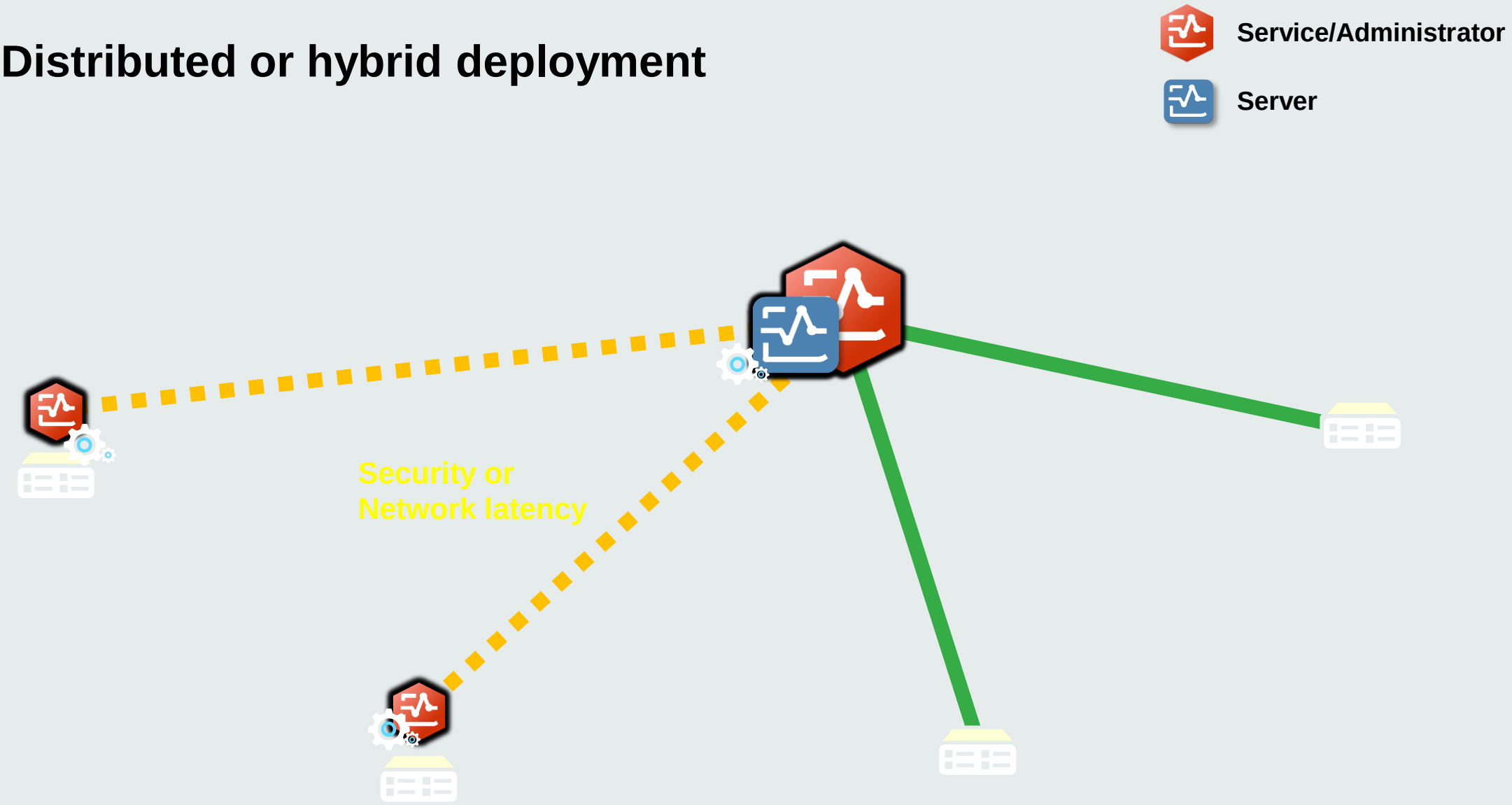
Repository (MongoDB)
(port 27017 or configurable)



Centralized deployment



Distributed or hybrid deployment

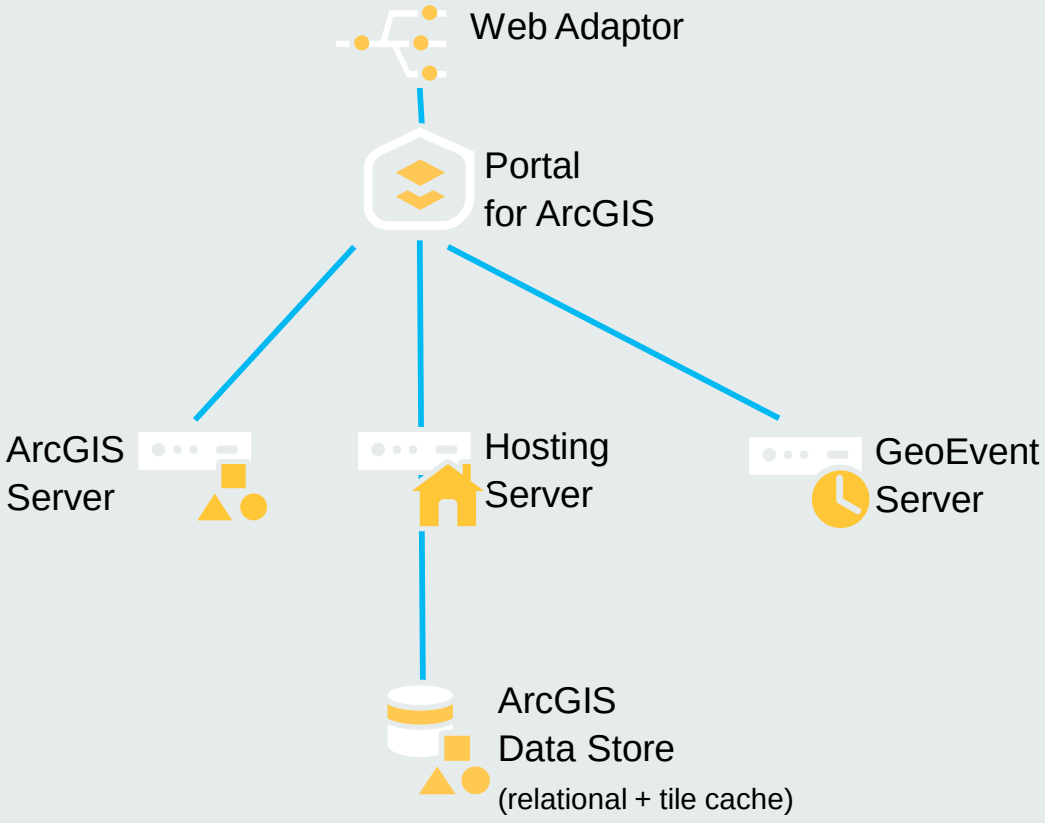


Configuration

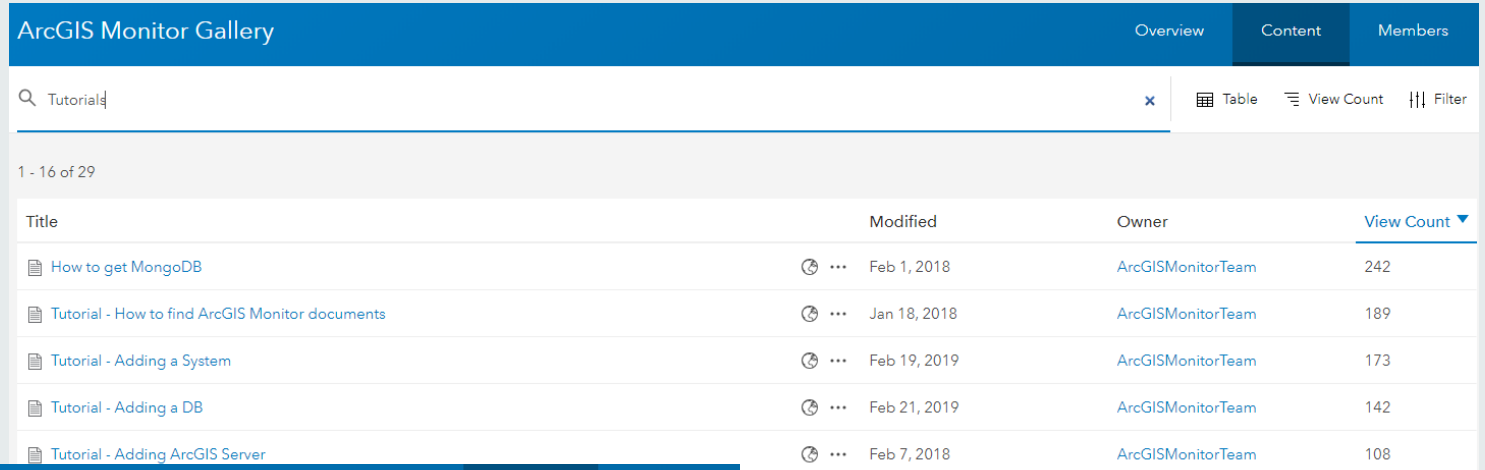
Monitoring service

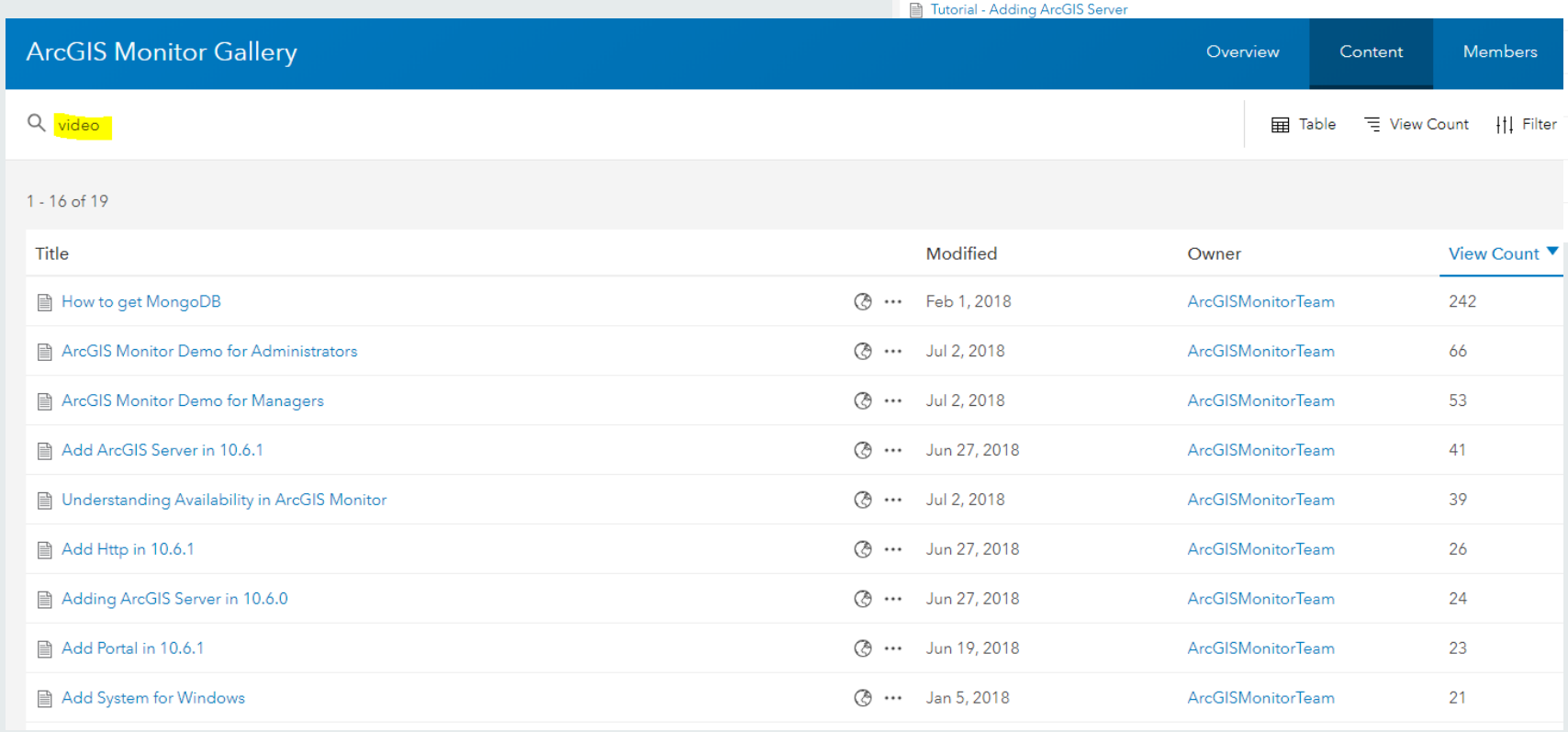
Review your solution(s) architecture

Examples



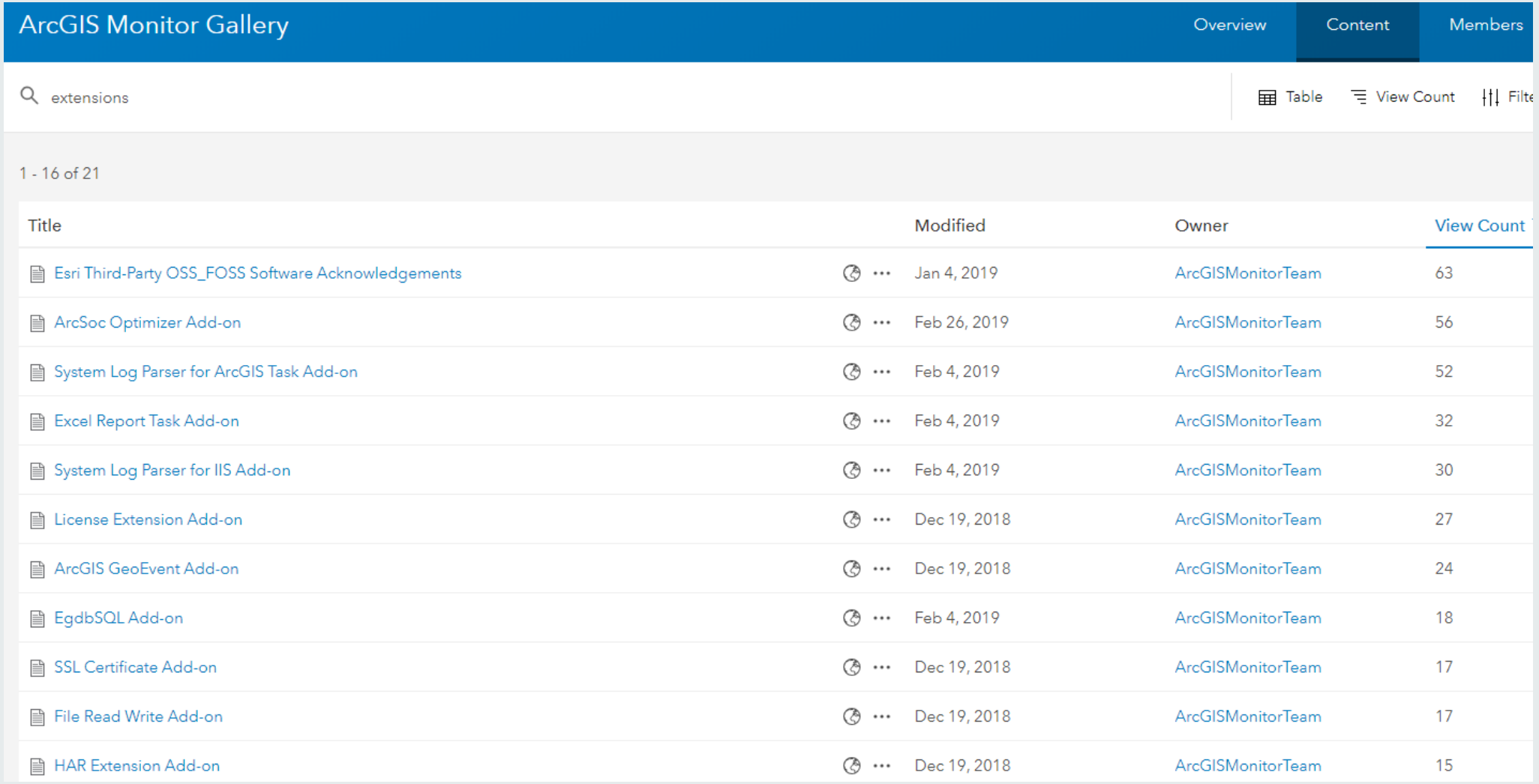
Gallery: Tutorials and Videos





https://arcgismonitor.maps.arcgis.com

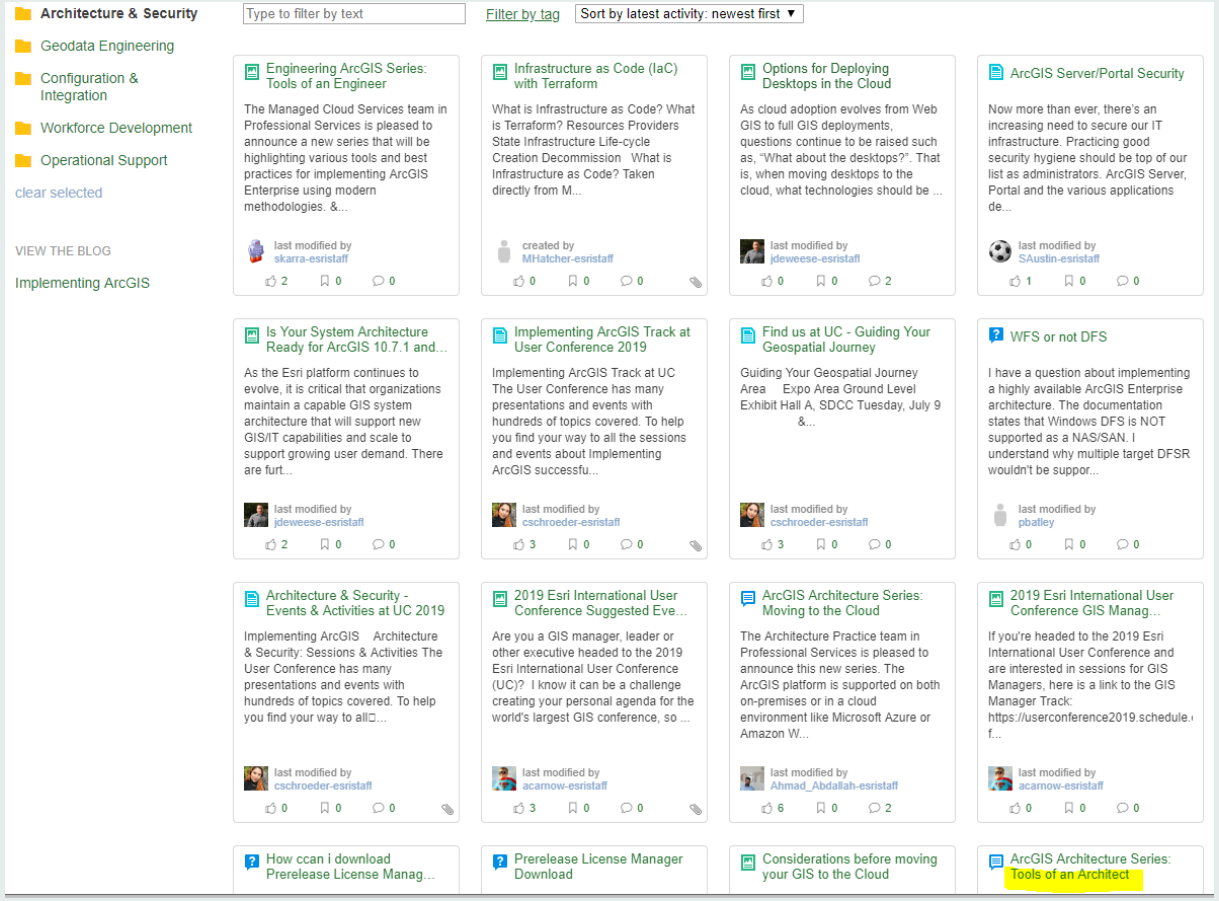
Gallery: Select required Extensions

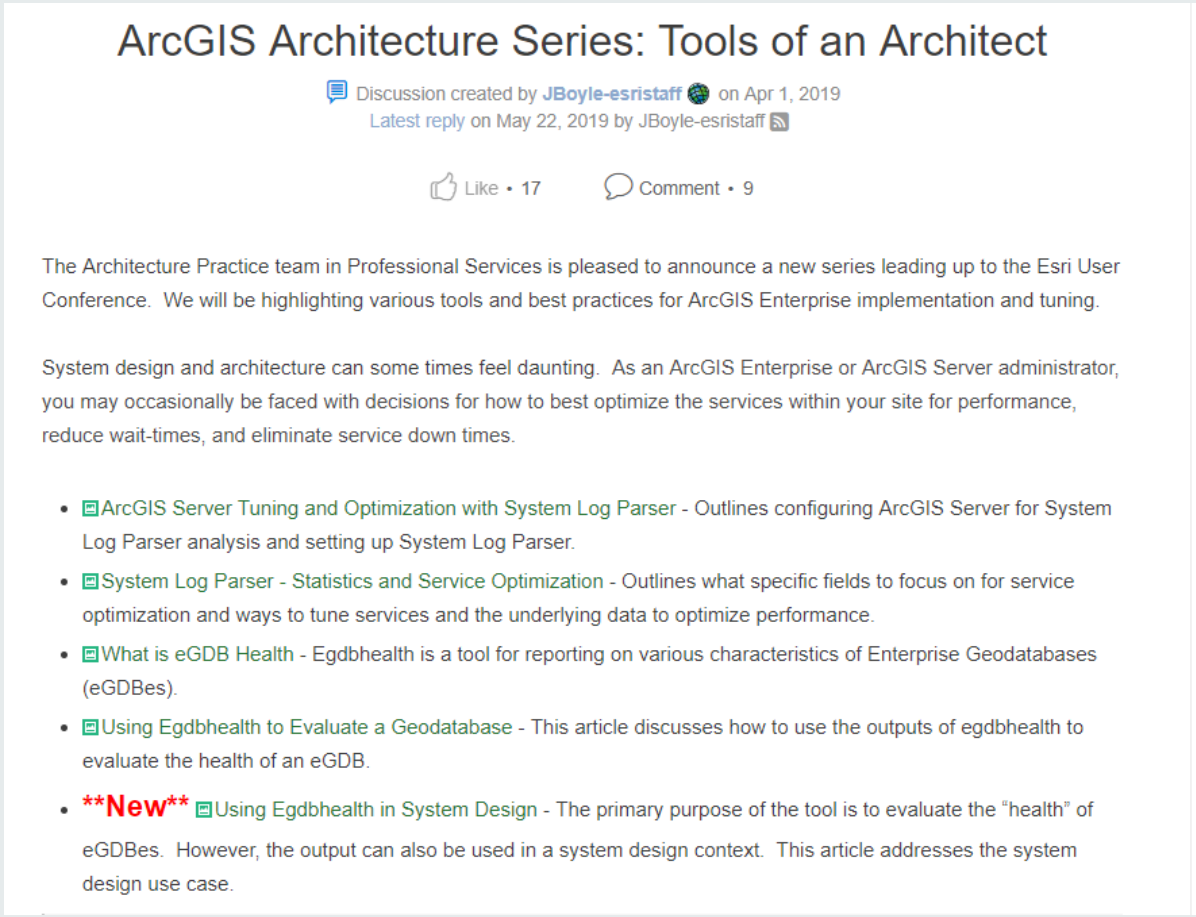


https://arcgismonitor.maps.arcgis.com

Geonet series

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



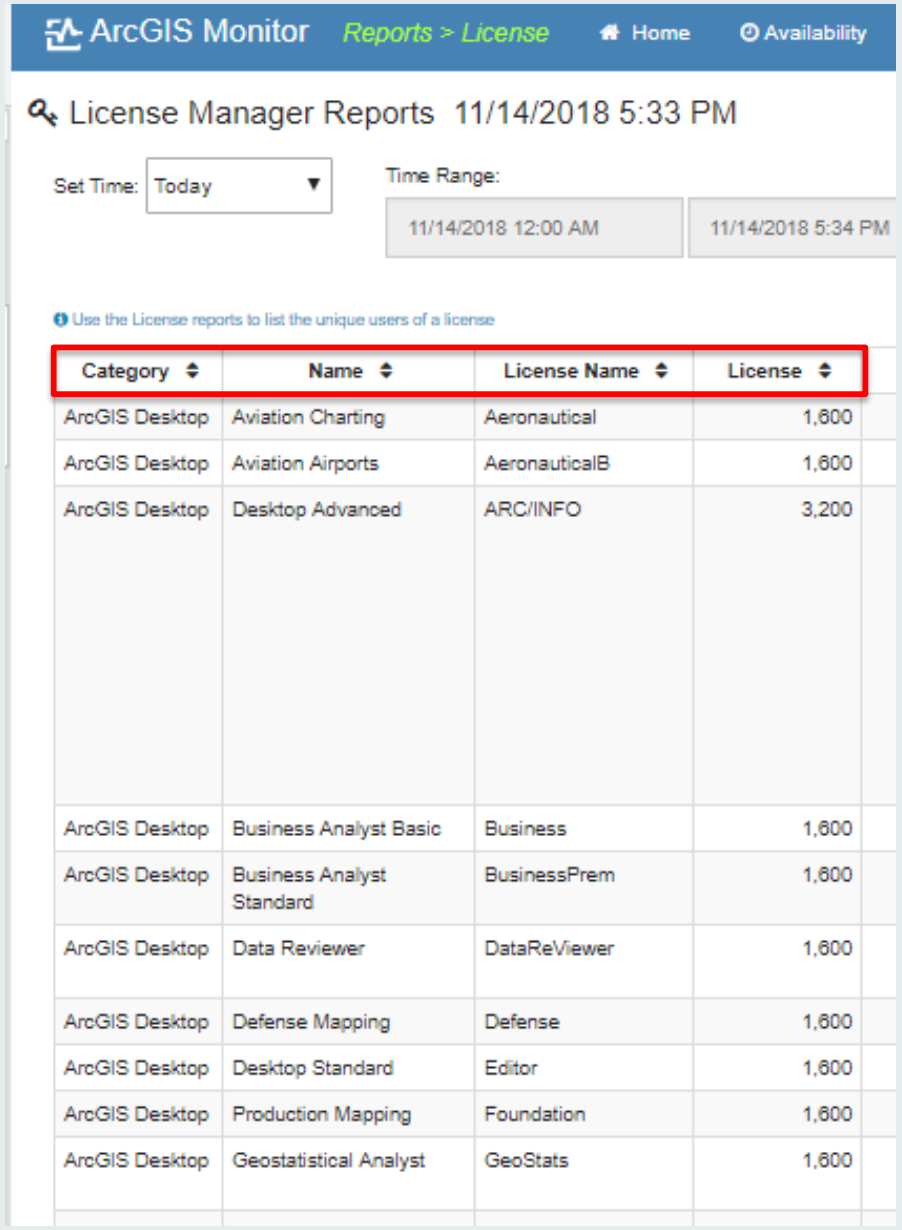


https://community.esri.com/community/implementing-arcgis/content?filterID=contentstatus%5Bpublished%5D~category%5Barchitecture-security%5D&itemView=thumbnail

Extensions

License Inventory

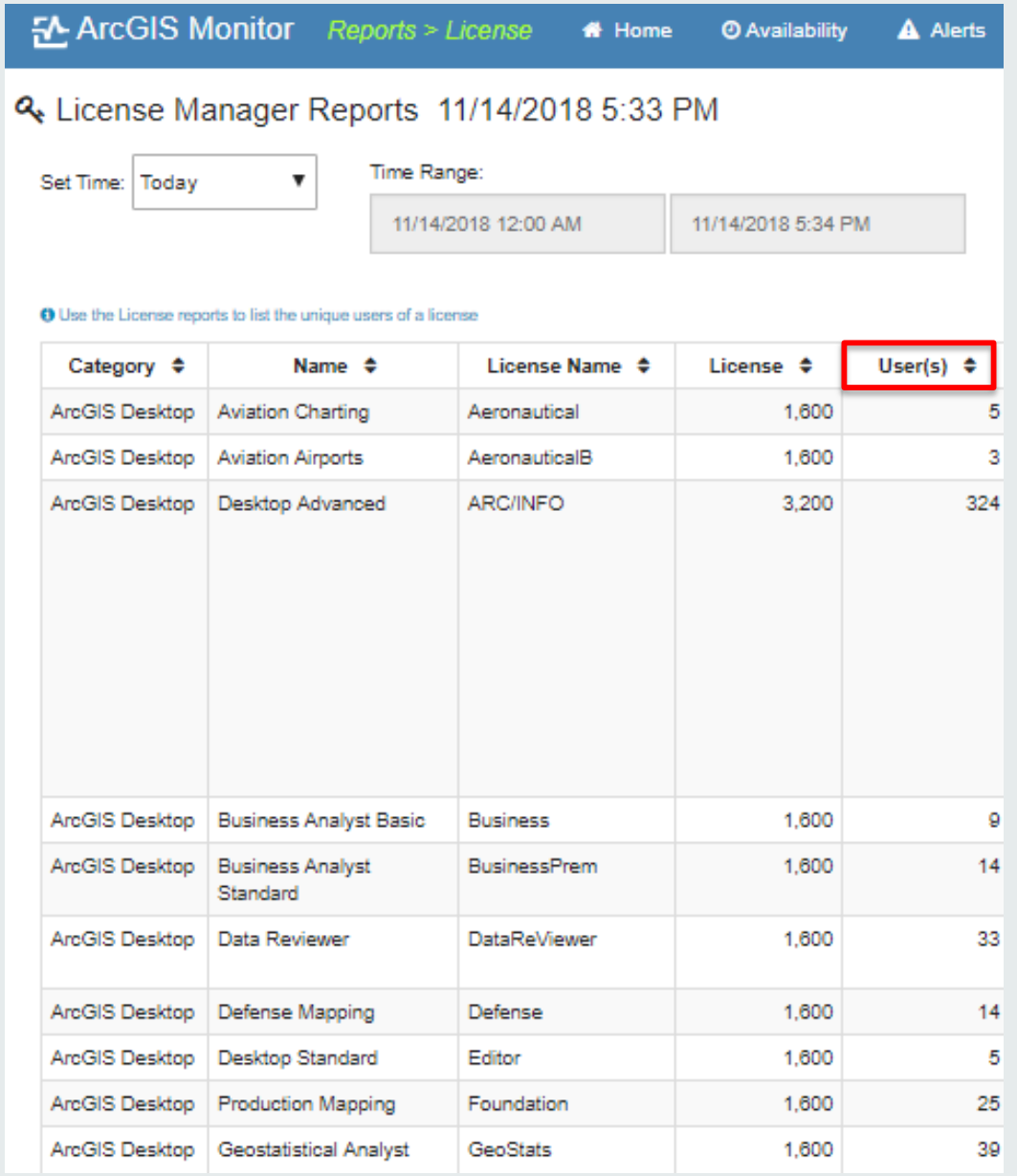
What and how many licenses do we have?



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

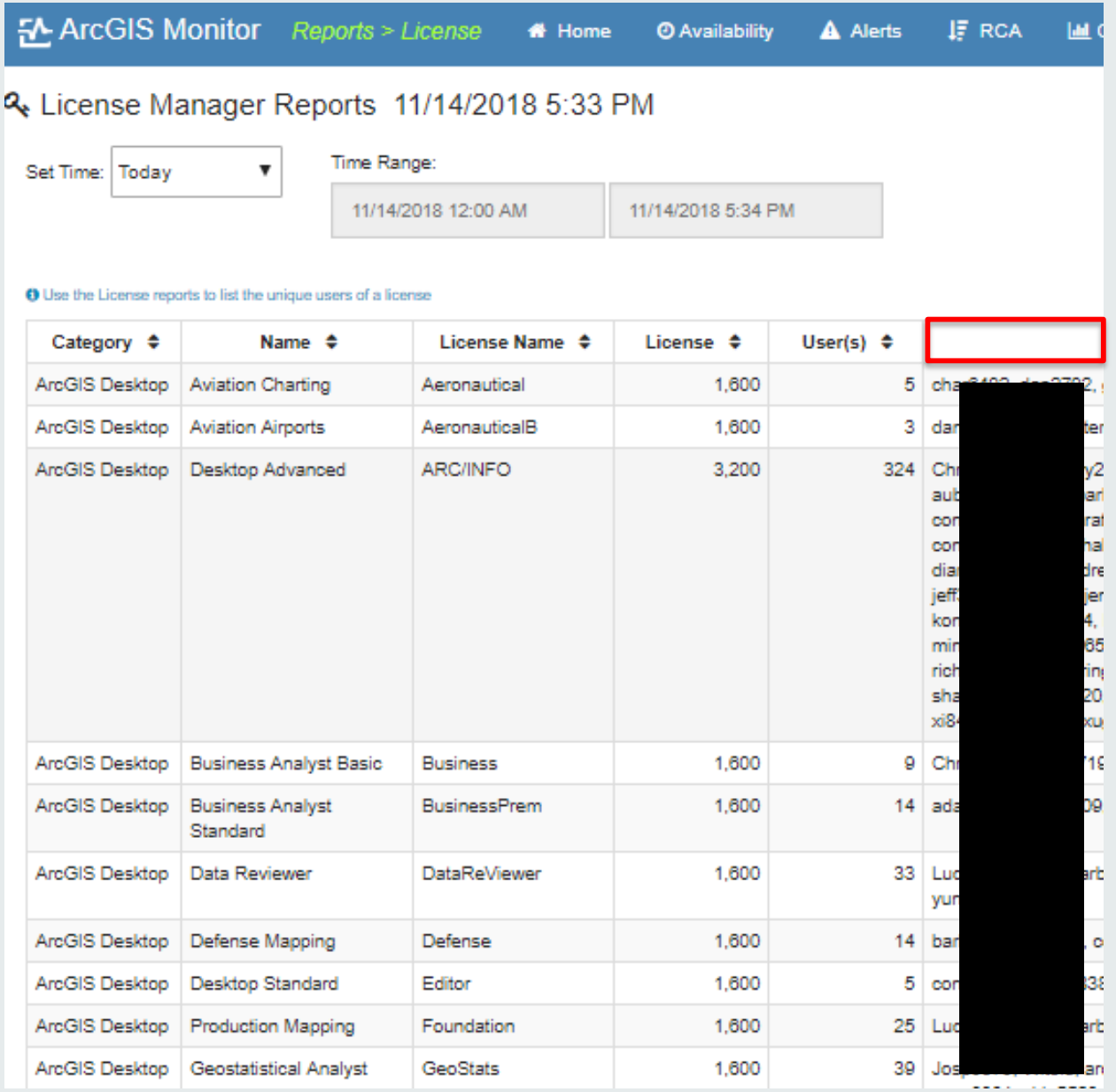
How many unique users were there during this time period?



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?



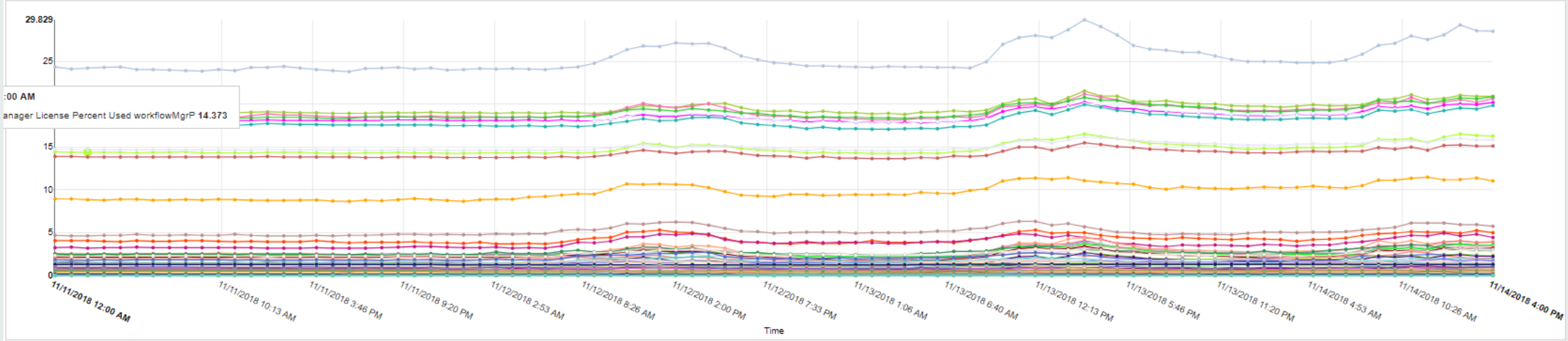
Category	Name	License Name	License	User(s)	
ArcGIS Desktop	Aviation Charting	Aeronautical	1,600	5	cha [redacted]
ArcGIS Desktop	Aviation Airports	AeronauticalB	1,600	3	dar [redacted]
ArcGIS Desktop	Desktop Advanced	ARC/INFO	3,200	324	Chr aub cor cor dia jeff kor mir rich sha xi8 [redacted]
ArcGIS Desktop	Business Analyst Basic	Business	1,600	9	Chr [redacted]
ArcGIS Desktop	Business Analyst Standard	BusinessPrem	1,600	14	ada [redacted]
ArcGIS Desktop	Data Reviewer	DataReViewer	1,600	33	Luc yur [redacted]
ArcGIS Desktop	Defense Mapping	Defense	1,600	14	bar [redacted]
ArcGIS Desktop	Desktop Standard	Editor	1,600	5	cor [redacted]
ArcGIS Desktop	Production Mapping	Foundation	1,600	25	Luc [redacted]
ArcGIS Desktop	Geostatistical Analyst	GeoStats	1,600	39	Jos [redacted]

% of Licenses Used

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

License Percent Used

Chart Resolution: hourly average when query greater than 12 hrs

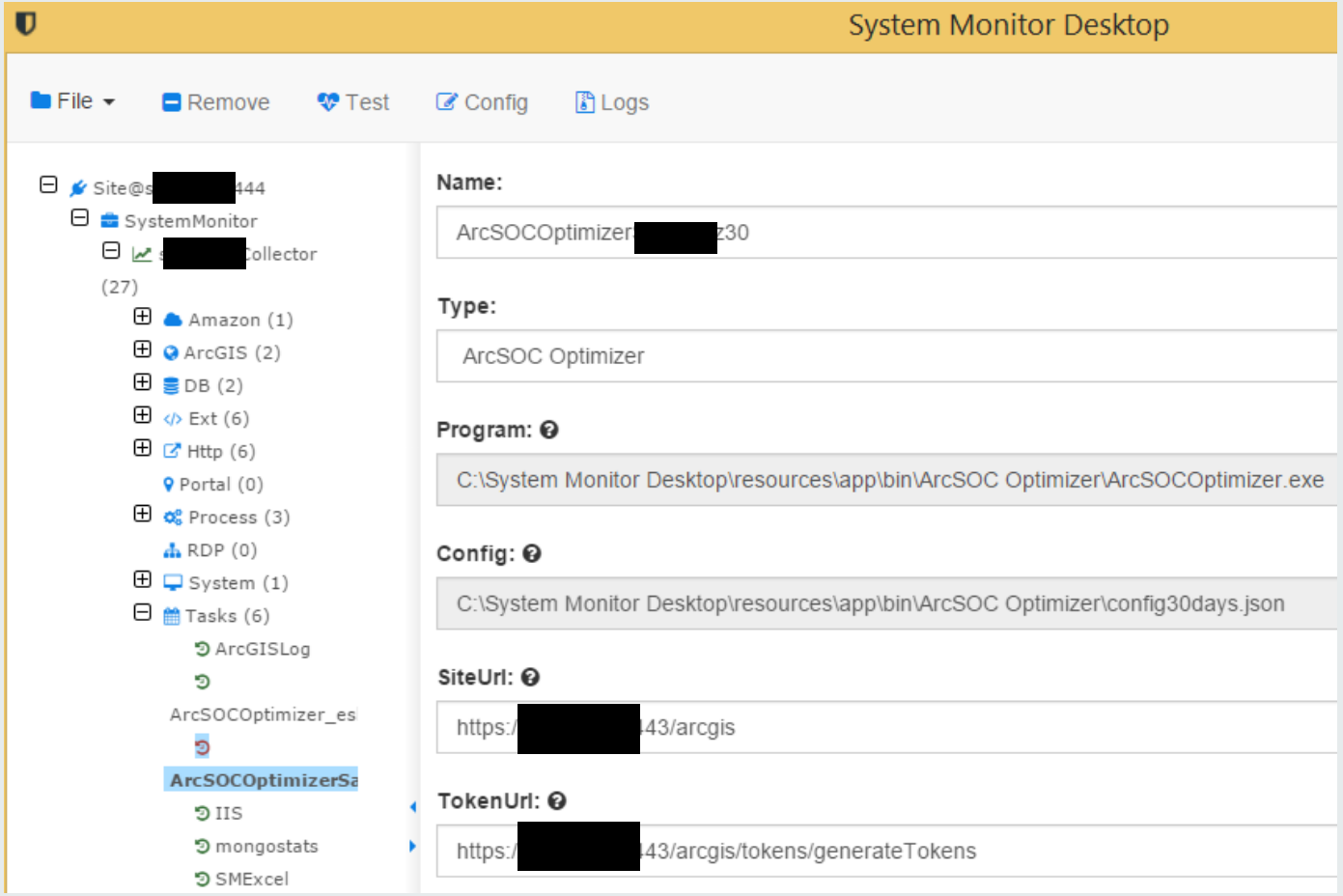


Statistics: only table reflects true statistics like min, max, percentile

Item	Category	Counter	Instance	Min	Avg	P5	P50	P90	P95	P99	Max	Sum	Interval(sec)	Samples	Coverage %
License Manager	License	License Percent Used	desktopAdvP	23.778	25.392	23.900	24.694	27.944	28.554	29.829	29.829	2,285.240	3,600	90	100.000
License Manager	License	License Percent Used	3DAnalystP	18.796	19.553	18.917	19.161	20.620	20.925	21.533	21.533	1,759.739	3,600	90	100.000
License Manager	License	License Percent Used	spatialAnalystP	18.165	19.112	18.287	18.716	20.147	20.513	21.162	21.162	1,720.116	3,600	90	100.000
License Manager	License	License Percent Used	dataReviewerP	18.331	19.072	18.392	18.636	20.341	20.463	20.851	20.851	1,716.498	3,600	90	100.000
License Manager	License	License Percent Used	dataInteropP	17.844	18.565	17.905	18.149	19.671	19.878	20.219	20.219	1,670.839	3,600	90	100.000
License Manager	License	License Percent Used	networkAnalystP	17.633	18.427	17.694	17.999	19.549	19.793	20.073	20.073	1,658.404	3,600	90	100.000
License Manager	License	License Percent Used	geostatAnalystP	17.064	18.023	17.125	17.615	19.266	19.414	19.939	19.939	1,622.044	3,600	90	100.000
License Manager	License	License Percent Used	workflowMgrP	14.251	14.851	14.251	14.495	15.902	16.208	16.514	16.514	1,336.575	3,600	90	100.000
License Manager	License	License Percent Used	smpEuropeP	14.539	15.031	14.600	14.783	15.761	15.863	16.188	16.188	1,352.763	3,600	90	100.000

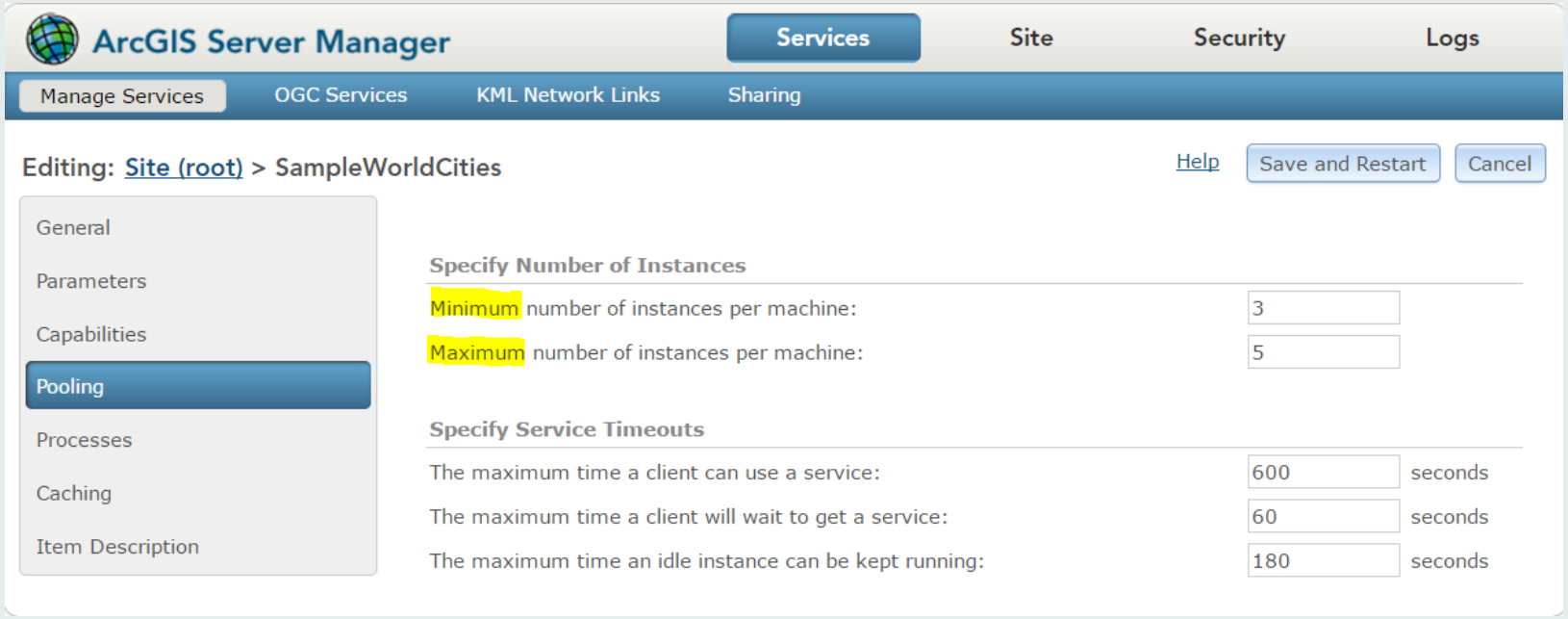
ArcSOC Optimizer

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



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!!!

ExxonMobil

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

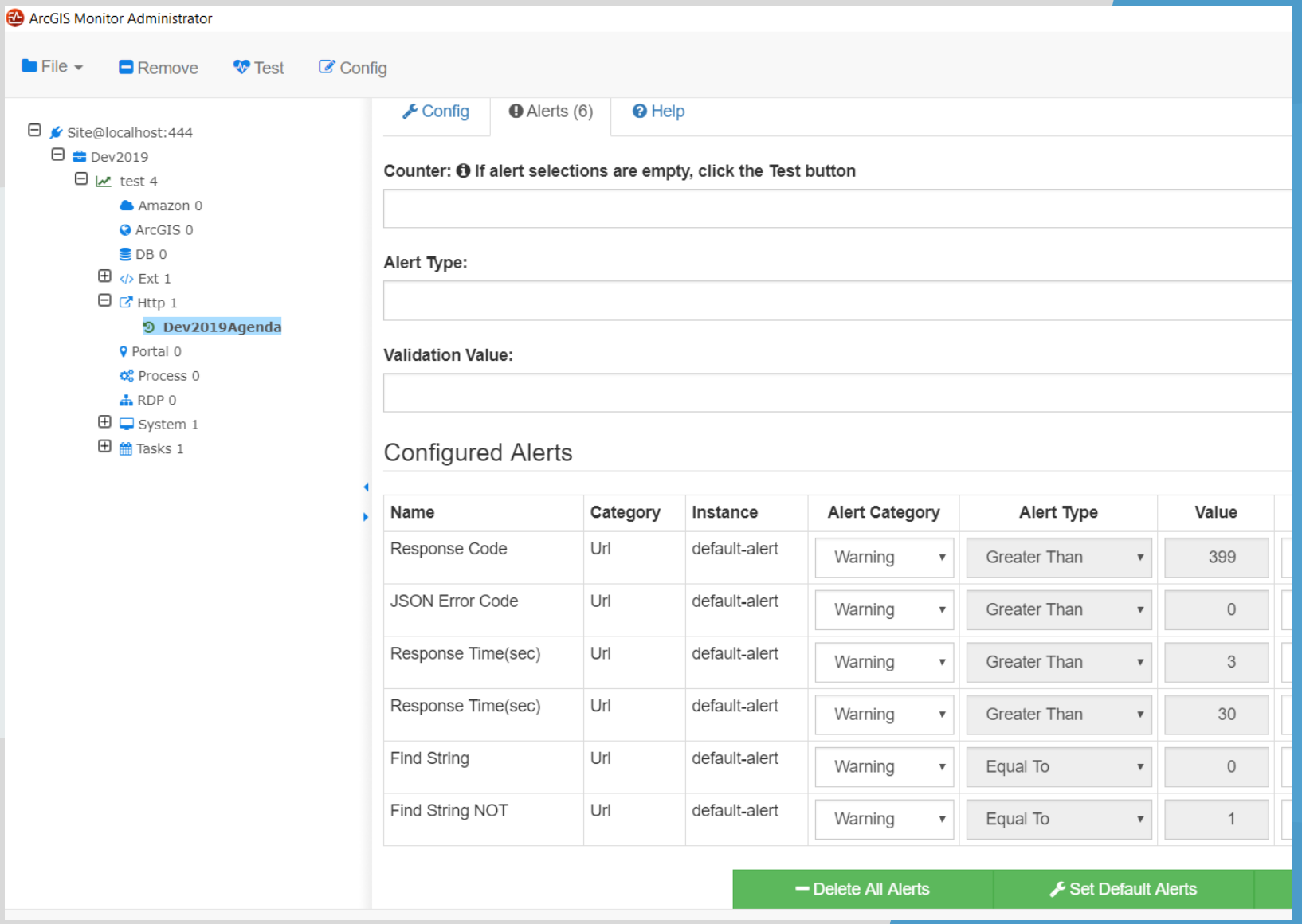
Like • 17 Comment • 9

The Architecture Practice team in Professional Services is pleased to announce a new series leading up to the Esri User Conference. We will be highlighting various tools and best practices for ArcGIS Enterprise implementation and tuning.

System design and architecture can some times 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.

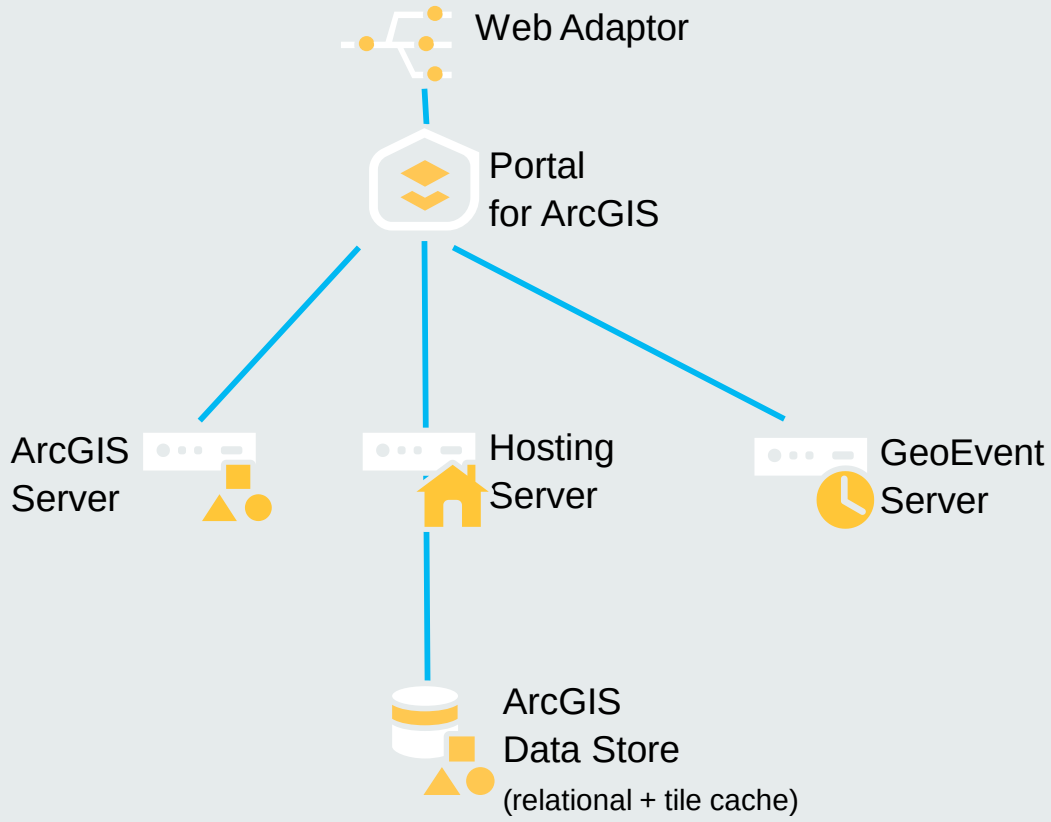
- ArcGIS Server Tuning and Optimization with System Log Parser - Outlines configuring ArcGIS Server for System Log Parser analysis and setting up System Log Parser.
- System Log Parser - Statistics and Service Optimization - Outlines what specific fields to focus on for service optimization and ways to tune services and the underlying data to optimize performance.
- What is eGDB Health - Egdbhealth is a tool for reporting on various characteristics of Enterprise Geodatabases (eGDBes).
- Using Egdbhealth to Evaluate a Geodatabase - This article discusses how to use the outputs of egdbhealth to evaluate the health of an eGDB.
- **New** Using Egdbhealth in System Design - The primary purpose of the tool is to evaluate the "health" of eGDBes. However, the output can also be used in a system design context. This article addresses the system design use case.

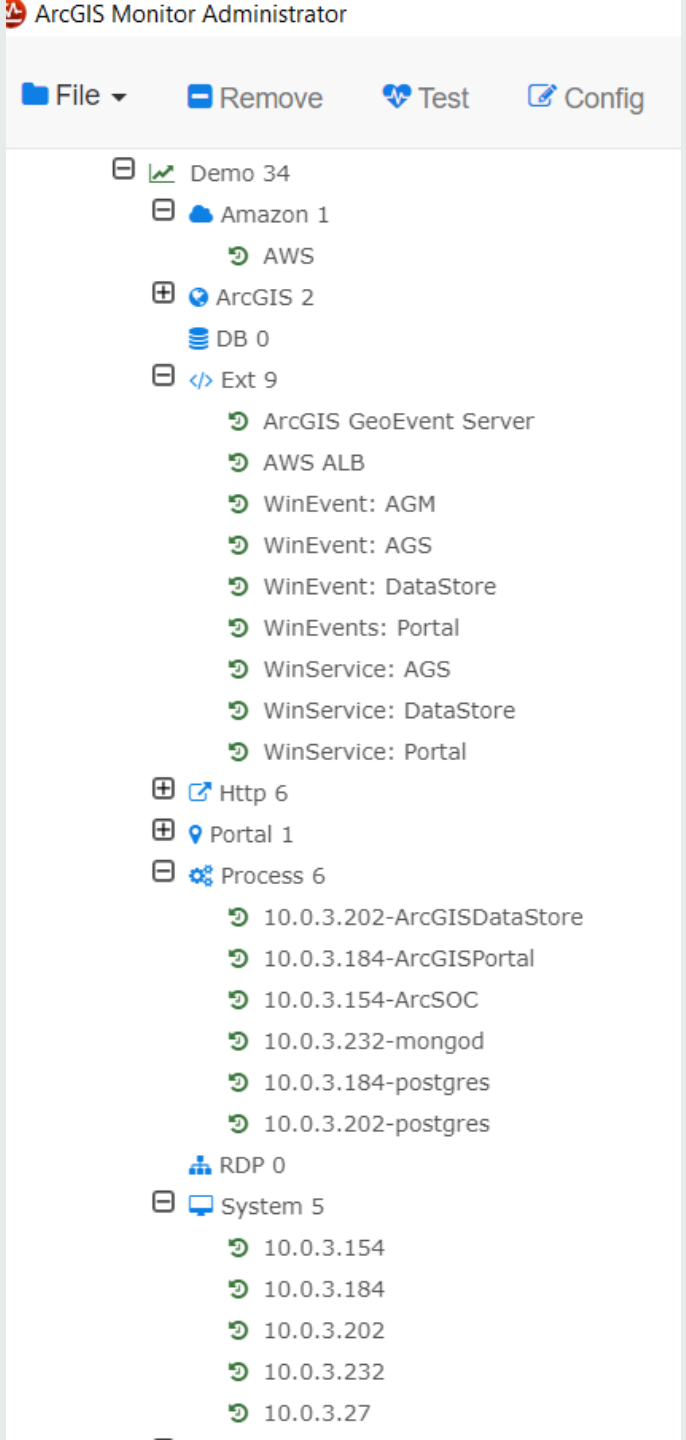
Monitoring service



Mapping counters to architecture components

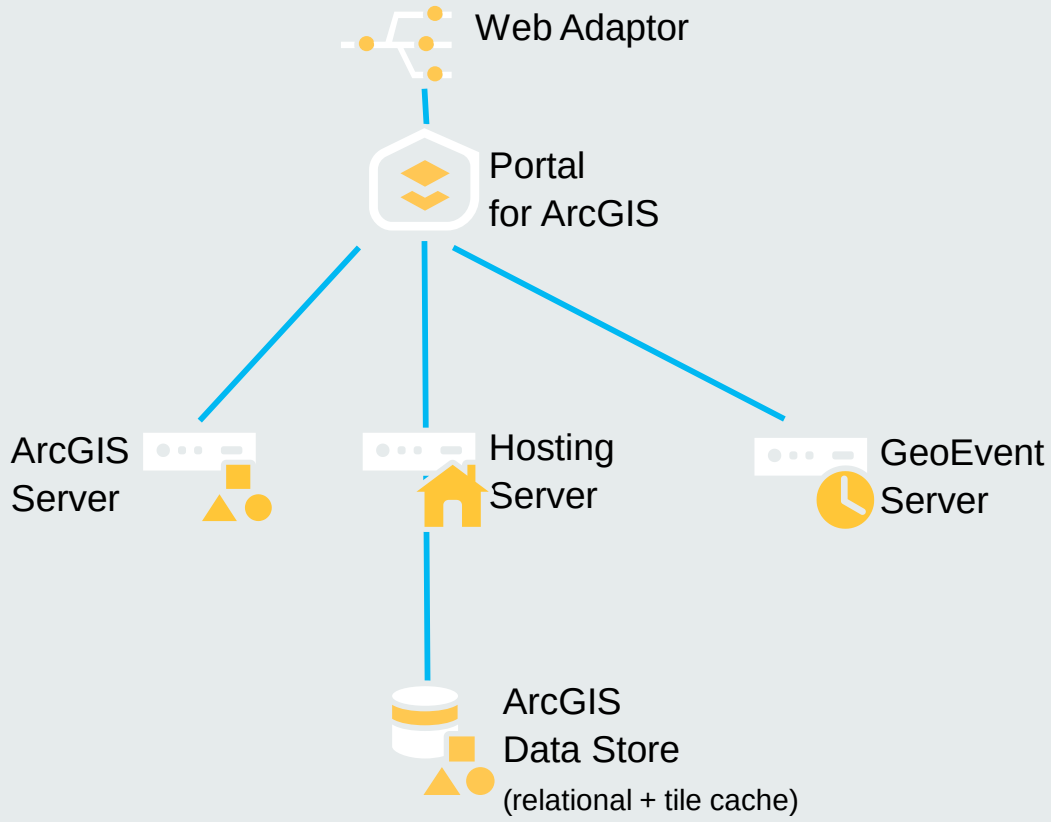
Infrastructure: Administrator view





Mapping counters to architecture components

Infrastructure: Server view

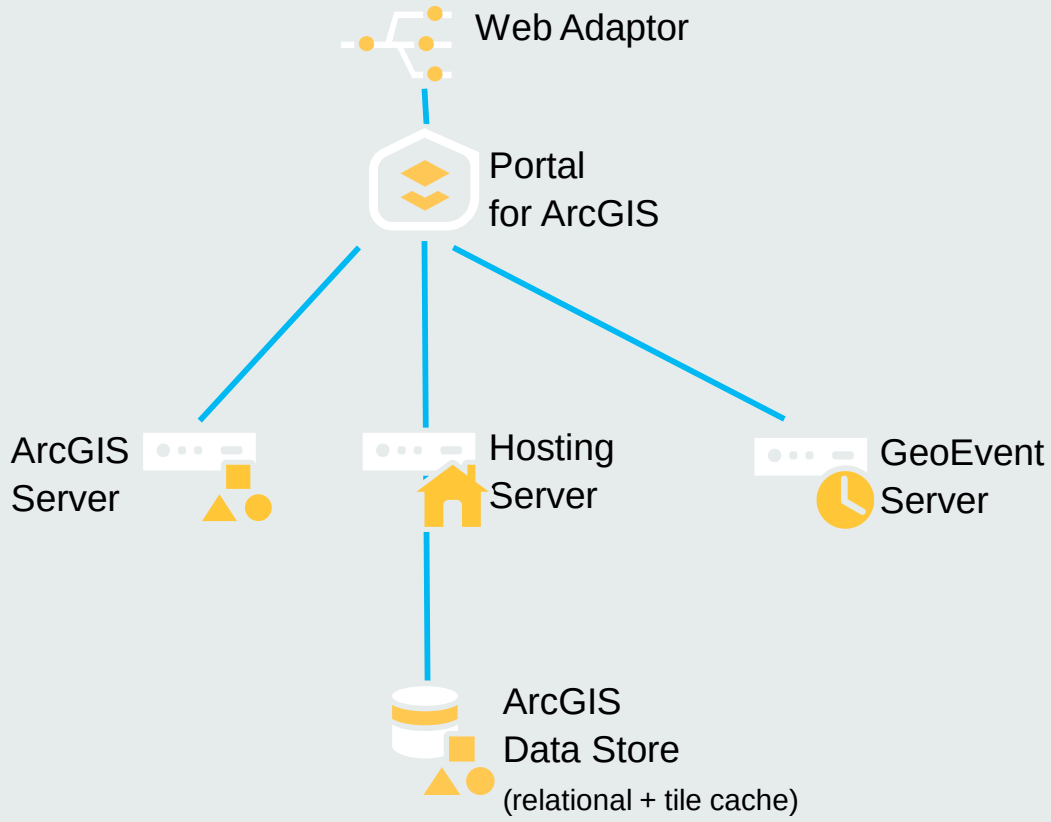


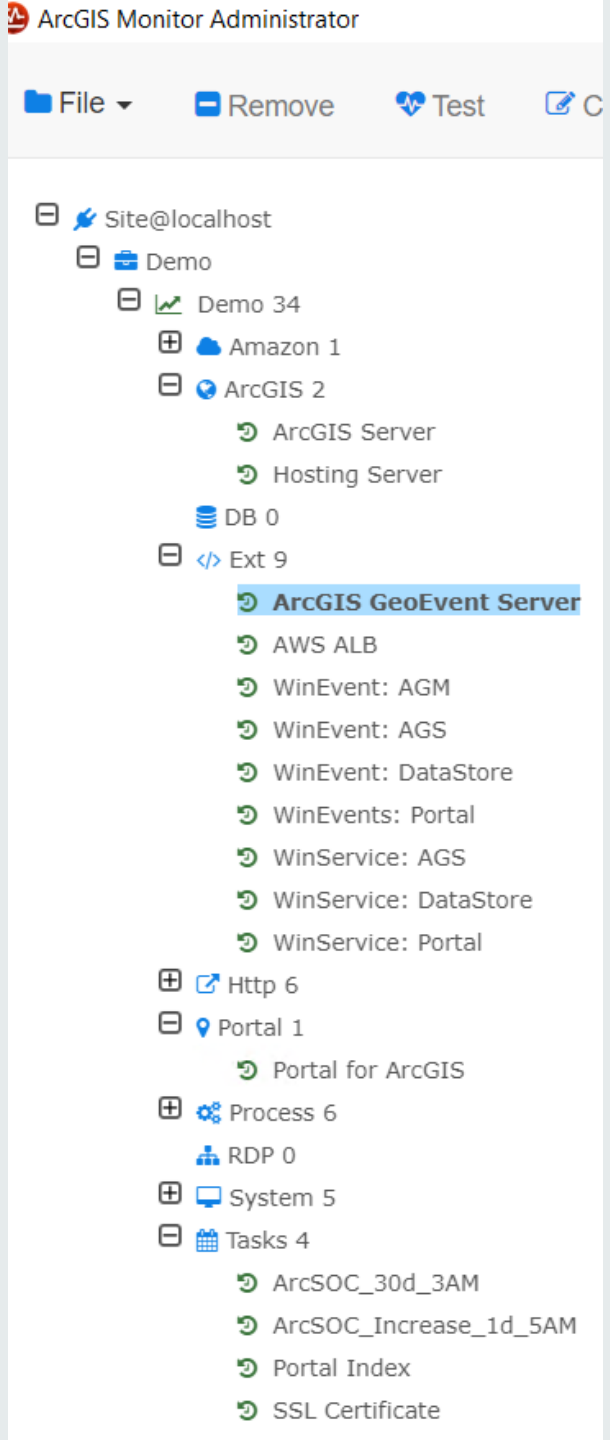
ArcGIS Monitor *Categories > Infrastructure*

- 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

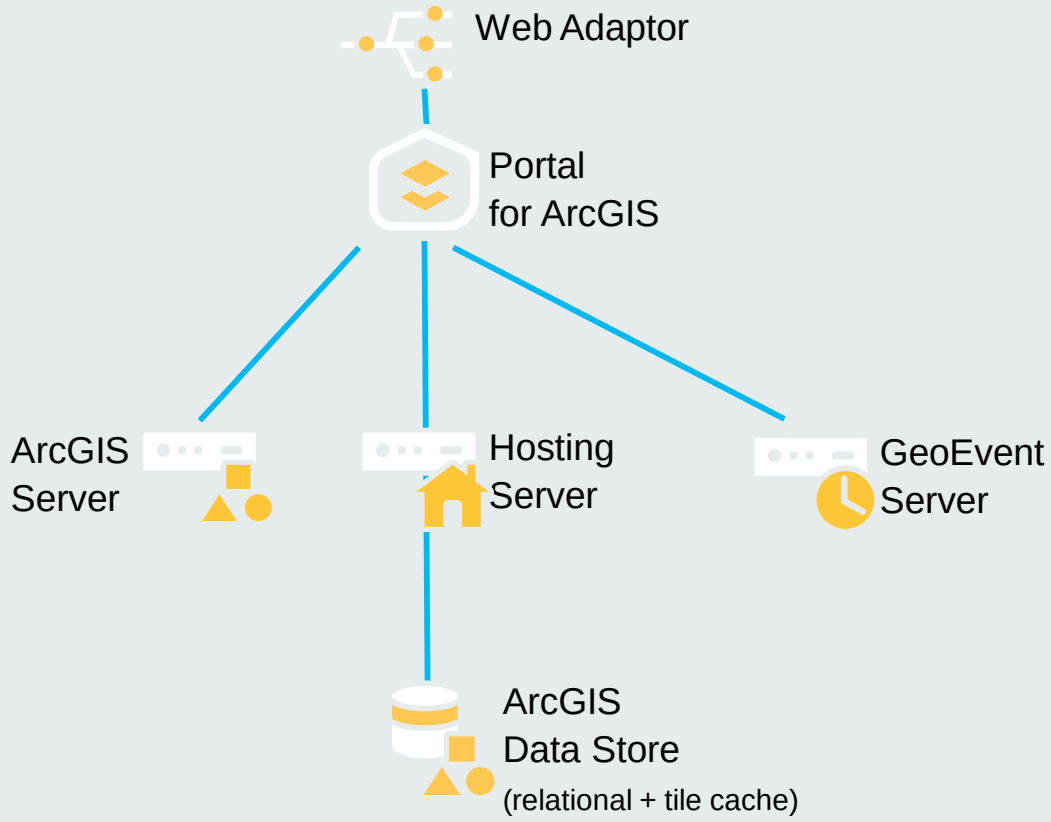
ArcGIS: Administrator view





Mapping counters to architecture components

ArcGIS: Server view

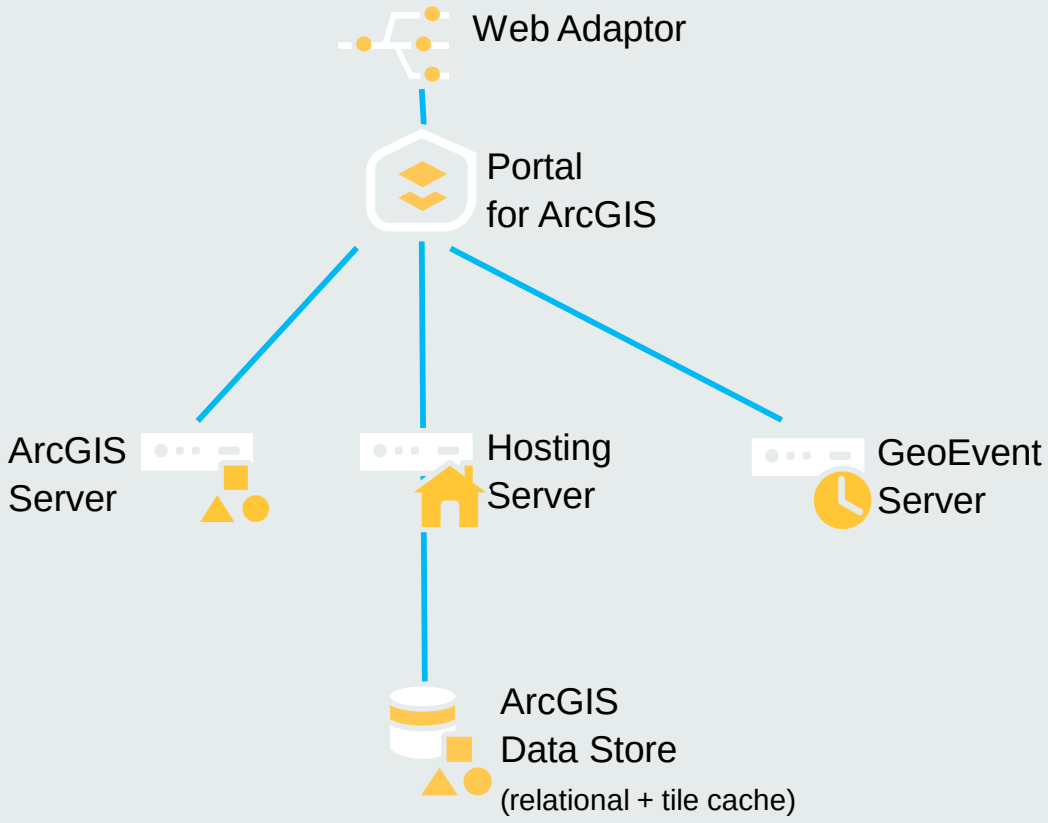


ArcGIS Monitor Categories > ArcGIS

- Demo
  - ArcGIS
    - ArcGIS Server
      - Busy
      - Busy Time per Tr(sec)
      - Collection Time(sec)
      - Free
      - Health Check
      - License Expires(Days)
      - License-Extension Expires(Days)
      - Log-SEVERE
      - Log-WARNING
      - Max
      - Min
      - Throughput (Tr/sec)
      - Total Busy Time
      - Tr
      - Transactions
    - Hosting Server
  - ArcSOC Optimizer
  - GeoEvent
    - ArcGIS GeoEvent Server
      - Collection Time(sec)
      - Log-ERROR
      - Log-WARN
      - Service-ERROR
      - Throughput (Tr/sec)
      - Tr
      - Transactions
  - Portal
    - Portal for ArcGIS
      - Collection Time(sec)
      - Health Check
      - License Expires(Days)
      - Log-SEVERE
      - Log-WARNING
      - Login/Interval
      - Status Federation
      - Status Machine
      - Storage Available
  - Portal Index
    - Portal Index
      - Collection Time(sec)
      - Status Code
      - Status Index Groups

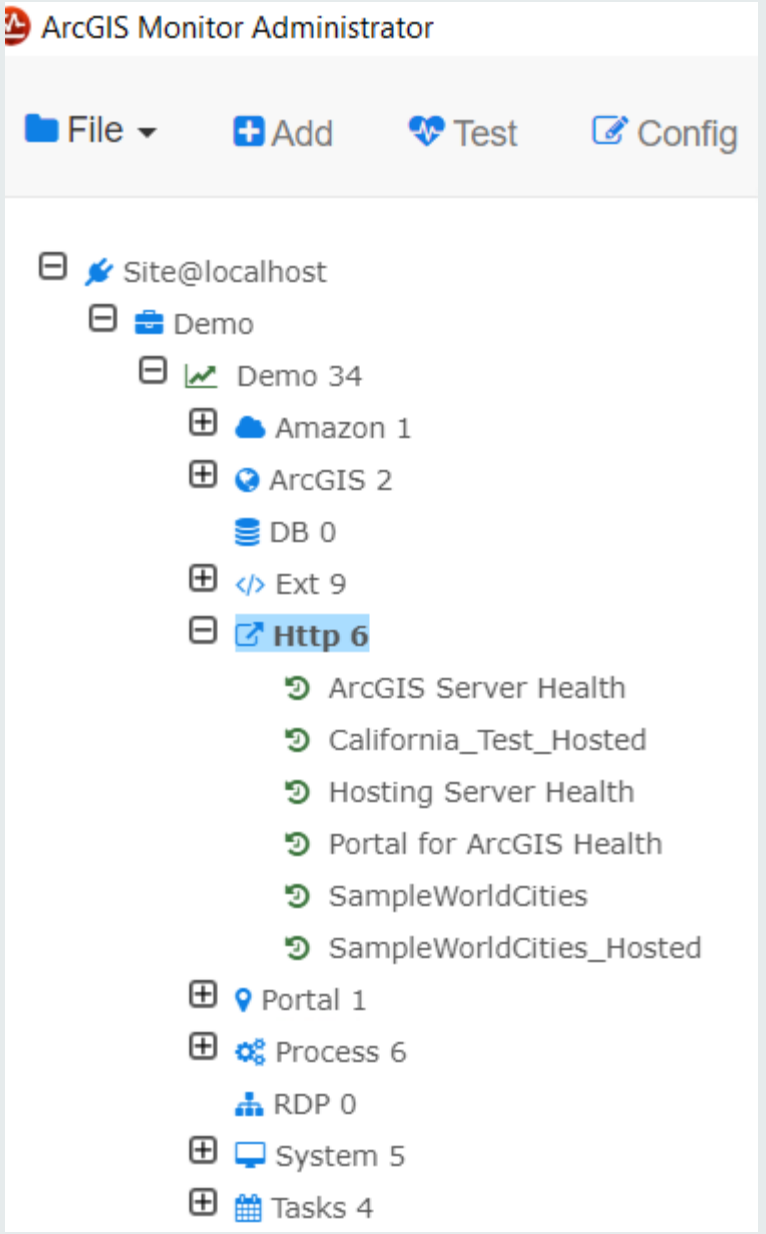
Mapping counters to architecture components

Web



Server view

Administrator view



Availability

Availability

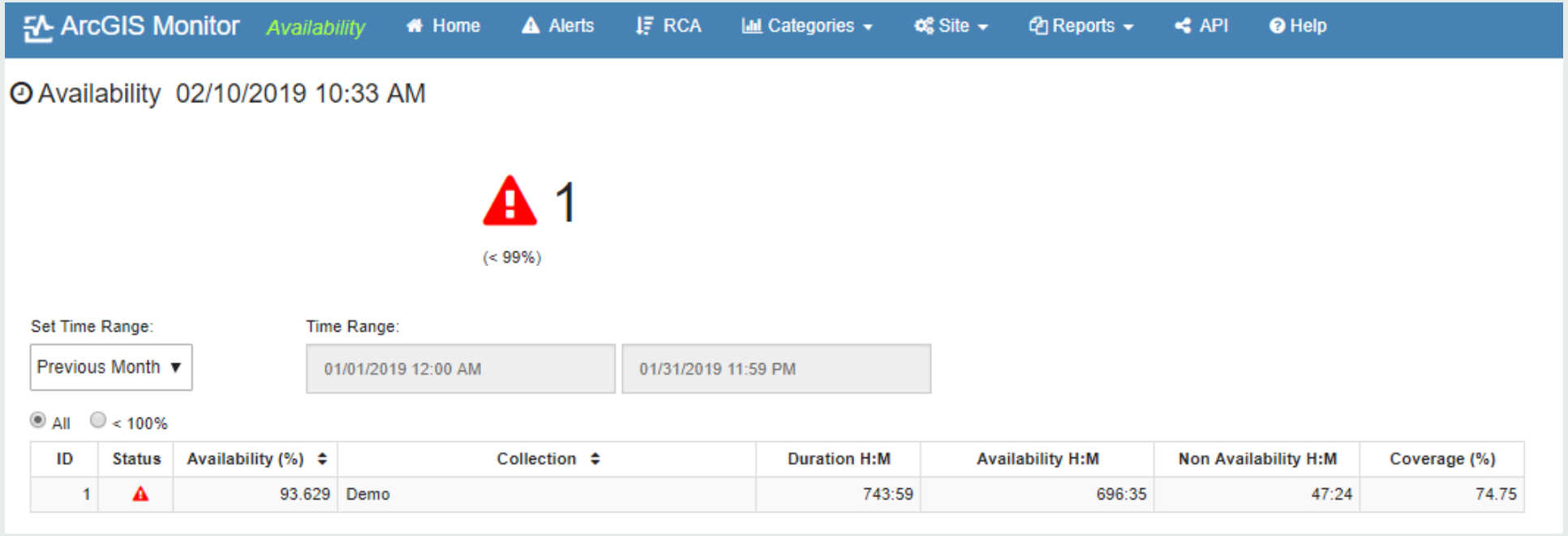
- **Availability is usually expressed as a percentage of uptime in a given time span (typically 1 month) and calculated as follows:**

Availability (%) = (Total time – Downtime) / Total Time *100%

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

Availability

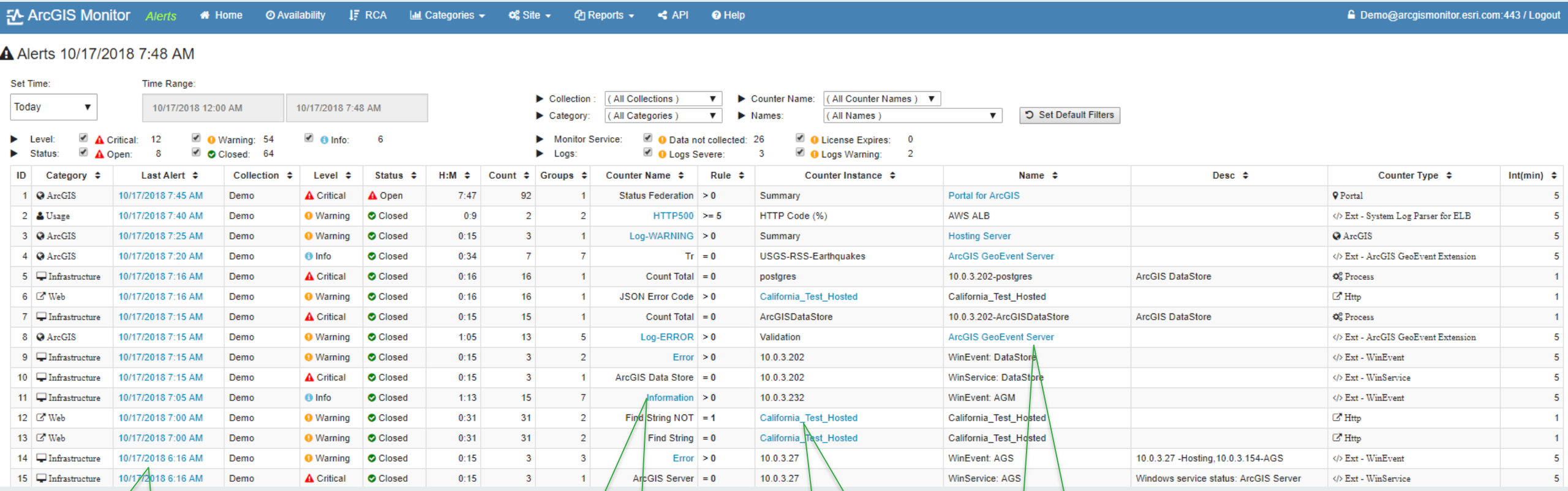
- **In the case below, in January 2019:**
  - **Total Time= 31*24 = 744 hours (44640 minutes) , see Duration H:M; the total downtime**
  - **Downtime = 47 hours and 24 minutes (2844 minutes), see Non Availability H:M).**
  - **Availability (%) = (44640-2844)/44640*100=93.629%**



Alerts

Alerts

Starting point for troubleshooting



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

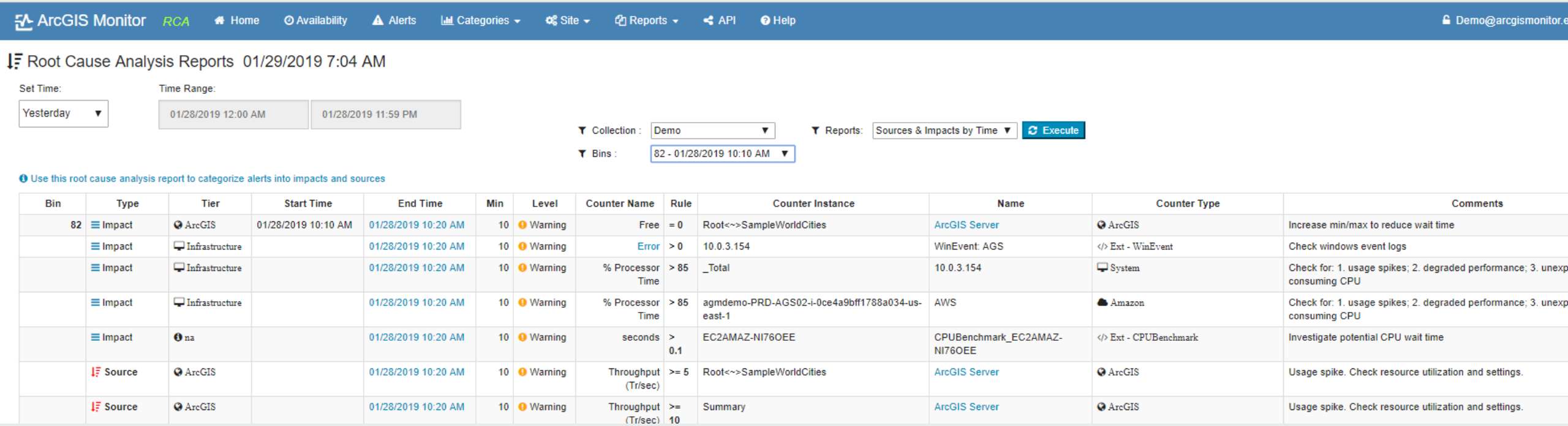
Details and Logs

Source Urls

Admin Url

Root Cause Analysis (RCA)

Root Cause Analysis (RCA) Source and Impact by time



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

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

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: 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 | Demo@arcgismonitor

Today | 01/28/2019 12:00 AM | 01/28/2019 6:29 PM | Collection : Demo | Reports: Impact List | Execute

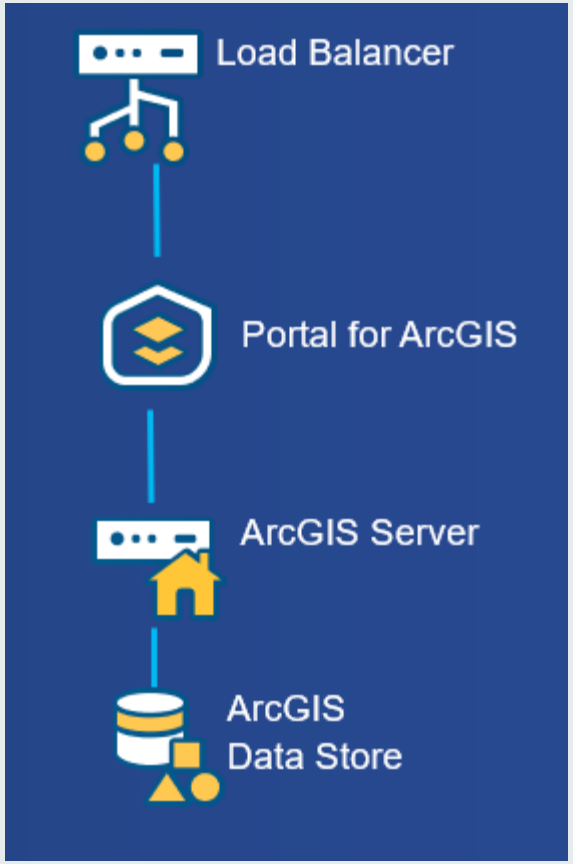
Use this root cause analysis report to list the impacts

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

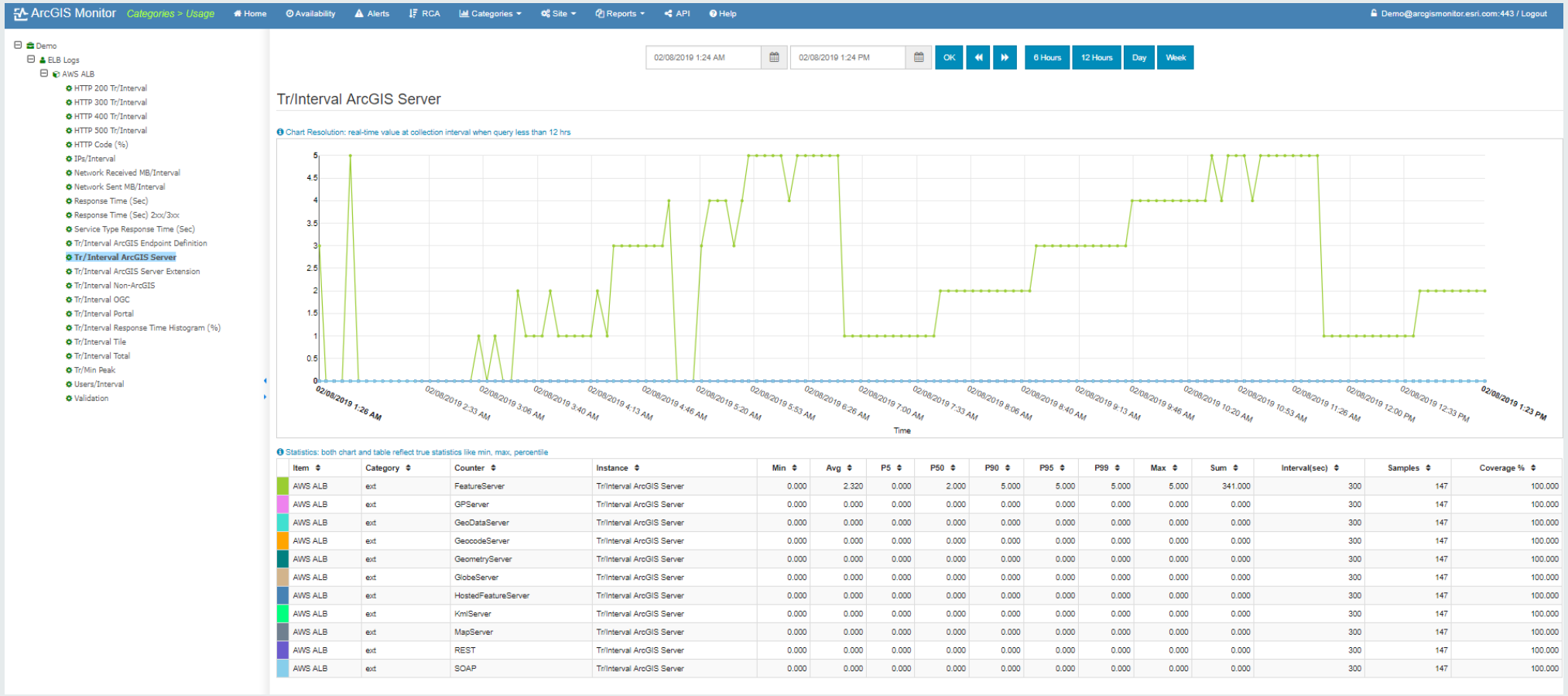
- **Usage (or user load) is typically measured using:**
  - **Transactions or requests per time, e.g. per seconds, 5 min, day.**
  - **User IP per time, e.g. per seconds, 5 min, day.**
  - **Users per time, e.g. per seconds, 5 min, day.**
- **Measured at:**
  - **Load balancer (LB)**
  - **Web server**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



Usage at LB: transactions (or requests)

Categories > Usage > Tr/Interval

- **Chart format**

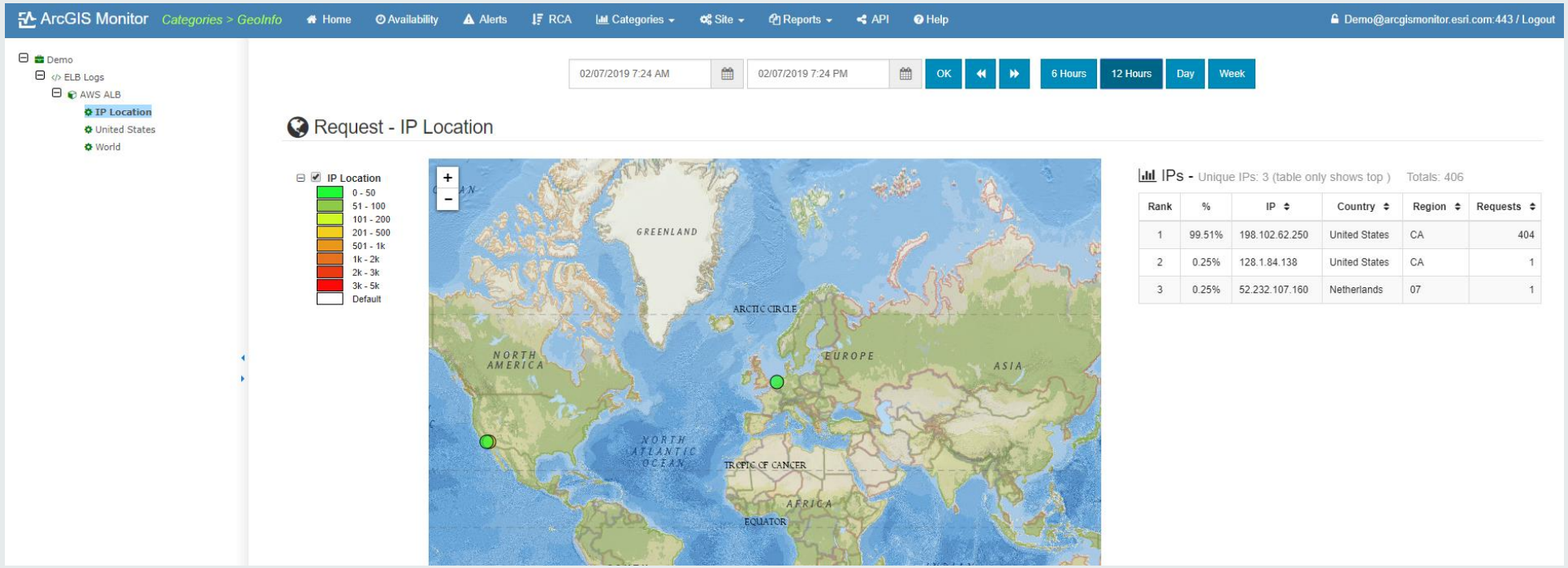


Item	Category	Counter	Instance	Min	Avg	P5	P50	P90	P95	P99	Max	Sum	Interval(sec)	Samples	Coverage %
AWS ALB	ext	FeatureServer	Tr/Interval ArcGIS Server	0.000	2.320	0.000	2.000	5.000	5.000	5.000	5.000	341.000	300	147	100.000
AWS ALB	ext	GPServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	GeoDataServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	GeocodeServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	GeometryServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	GlobeServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	HostedFeatureServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	KmlServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	MapServer	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	REST	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000
AWS ALB	ext	SOAP	Tr/Interval ArcGIS Server	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	300	147	100.000

Usage at LB : users and transactions

Categories > GeoInfo > IP Location

- **Map format**



Usage at LB : users

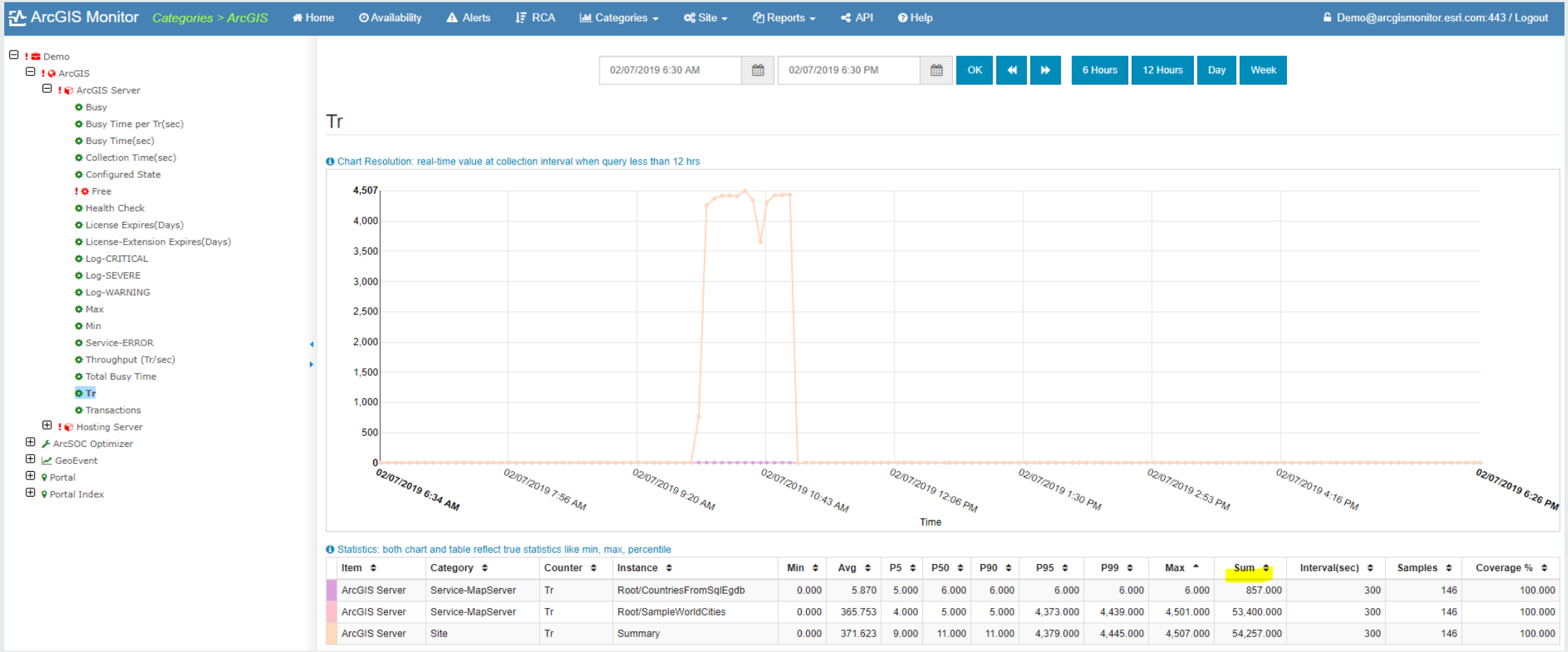
Categories > Usage > IP / Interval

- **Chart format**

Usage at ArcGIS Server: transactions

Categories > ArcGIS > Tr

- **Chart format**

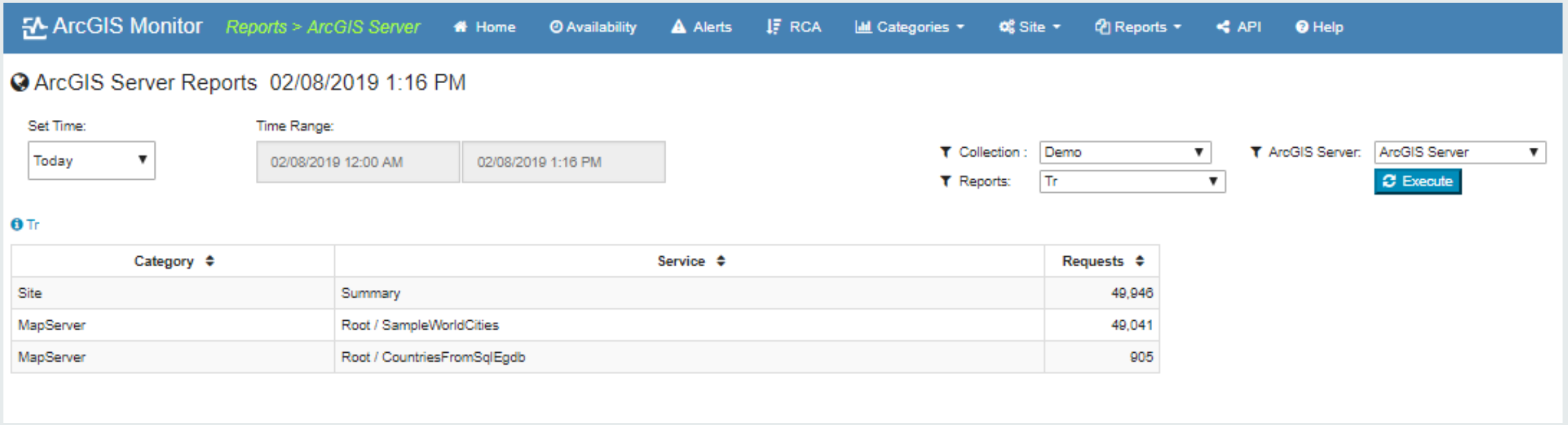


Item	Category	Counter	Instance	Min	Avg	P5	P50	P90	P95	P99	Max	Sum	Interval(sec)	Samples	Coverage %
ArcGIS Server	Service-MapServer	Tr	Root/CountriesFromSqlEgdb	0.000	5.870	5.000	6.000	6.000	6.000	6.000	6.000	857.000	300	146	100.000
ArcGIS Server	Service-MapServer	Tr	Root/SampleWorldCities	0.000	365.753	4.000	5.000	5.000	4,373.000	4,439.000	4,501.000	53,400.000	300	146	100.000
ArcGIS Server	Site	Tr	Summary	0.000	371.623	9.000	11.000	11.000	4,379.000	4,445.000	4,507.000	54,257.000	300	146	100.000

Usage at ArcGIS Server : transactions

Reports > ArcGIS > Tr

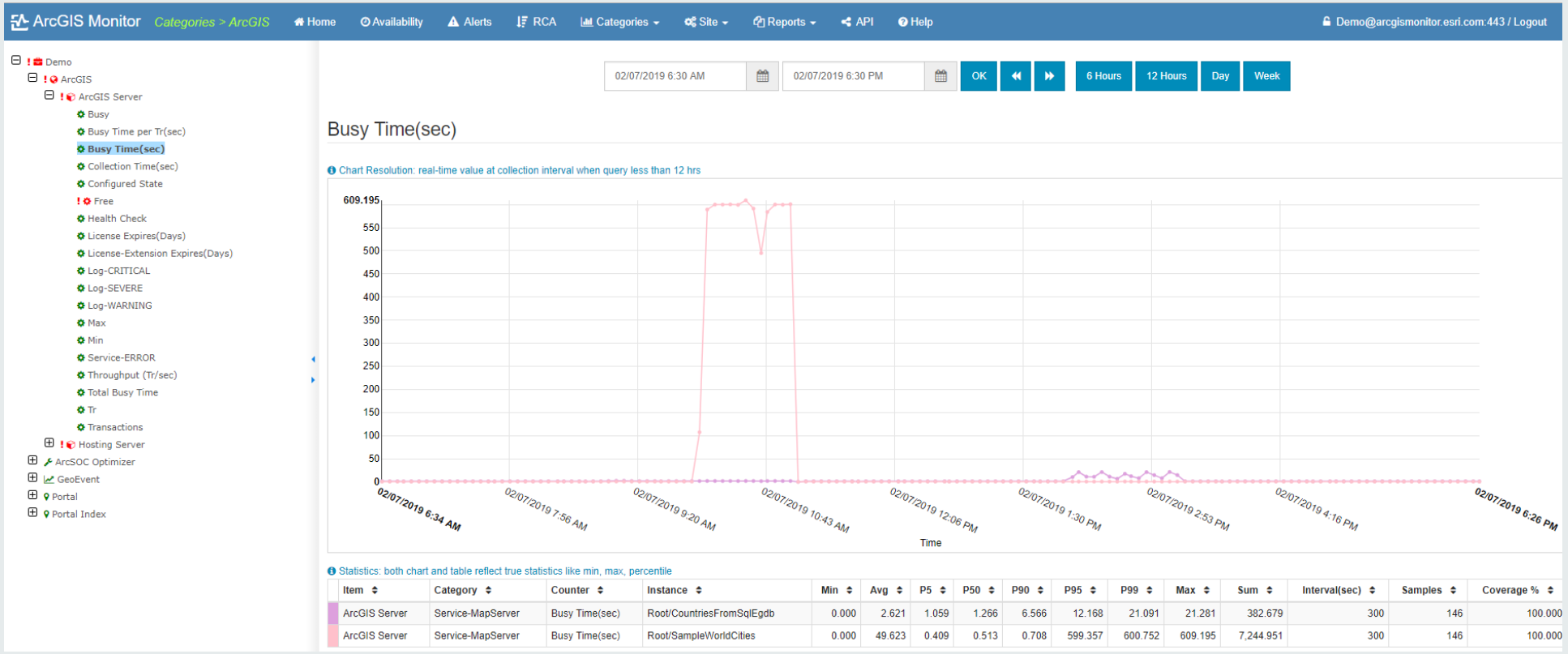
- **Table format**



Usage at ArcGIS Server: CPU time

Categories > ArcGIS > Busy Time (sec)

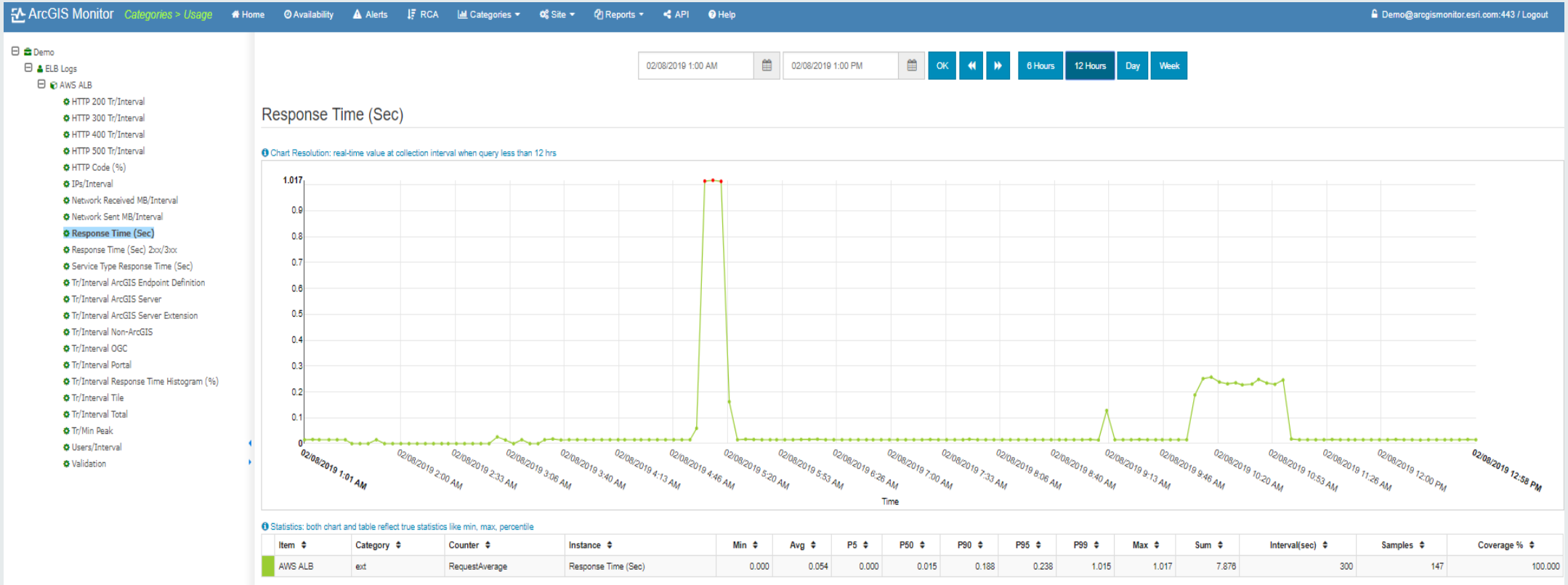
- **CPU time a given service took at ArcGIS Server level.**
- **Use to identify top cpu consumers at ArcGIS Server.**



Performance

Performance at LB

Reports > Usage > Response Time (sec)



Performance at ArcGIS Server

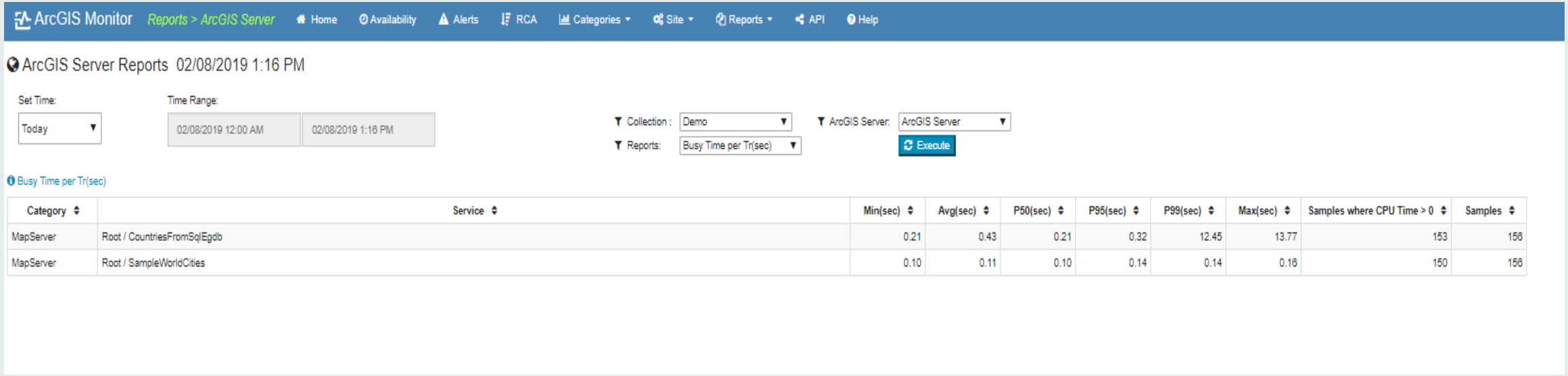
Categories > ArcGIS > Busy Time per Tr (sec)

- **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**

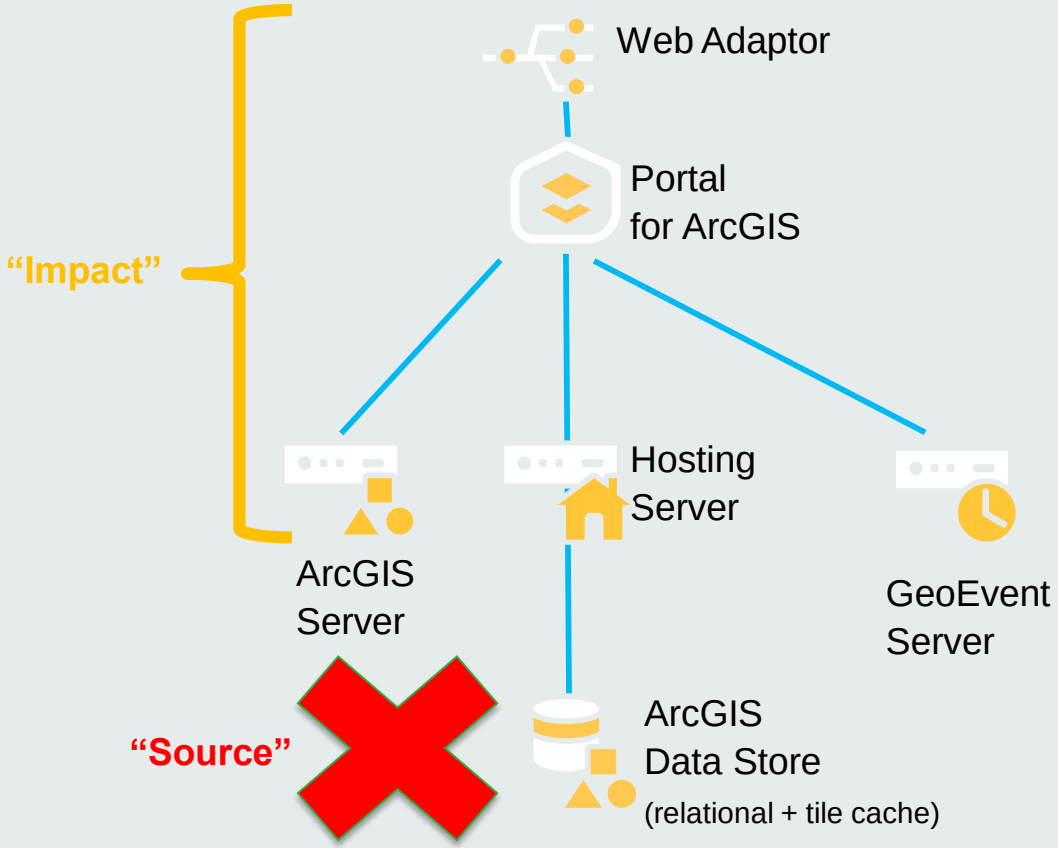


Category	Service	Min(sec)	Avg(sec)	P50(sec)	P95(sec)	P99(sec)	Max(sec)	Samples where CPU Time > 0	Samples
MapServer	Root / CountriesFromSqlEgdb	0.21	0.43	0.21	0.32	12.45	13.77	153	156
MapServer	Root / SampleWorldCities	0.10	0.11	0.10	0.14	0.14	0.16	150	156

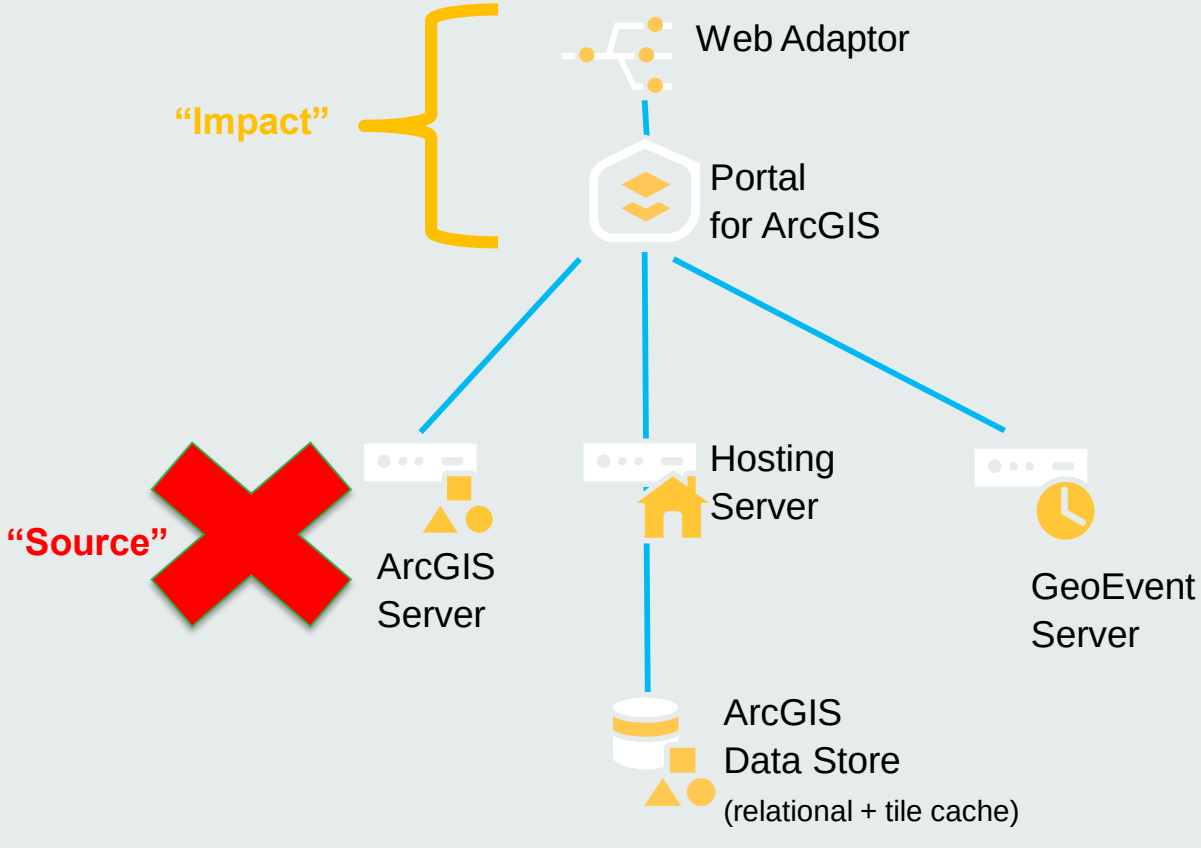
Typical cases and Root Cause Analysis (RCA)

Root Cause Analysis (RCA)

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



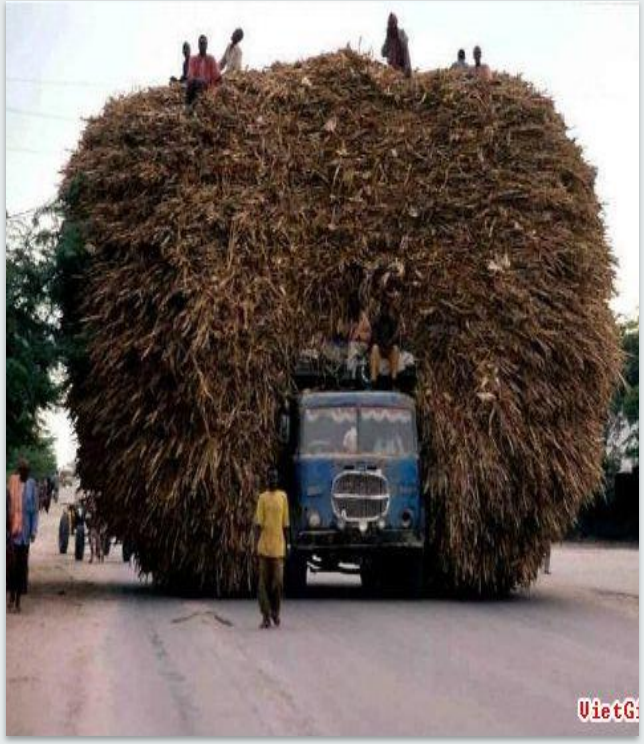
Example 1

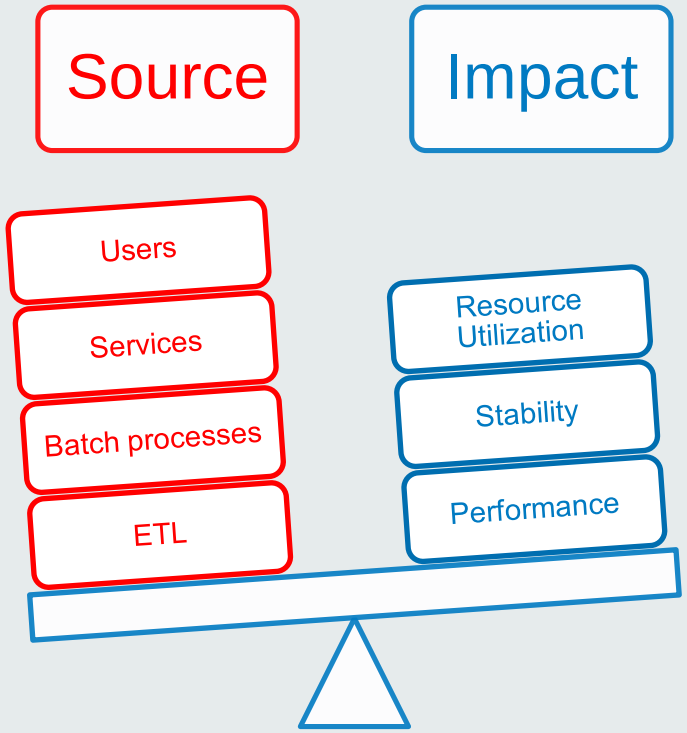


Example 2

Overloaded system

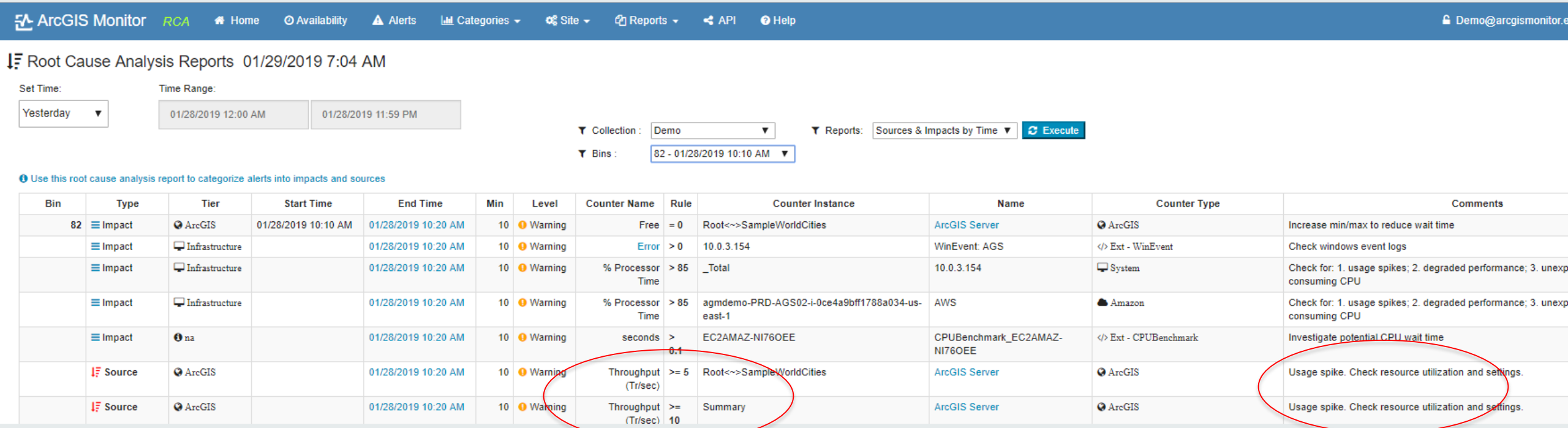
Load exceeds the designed capacity





RCA: Usage spike

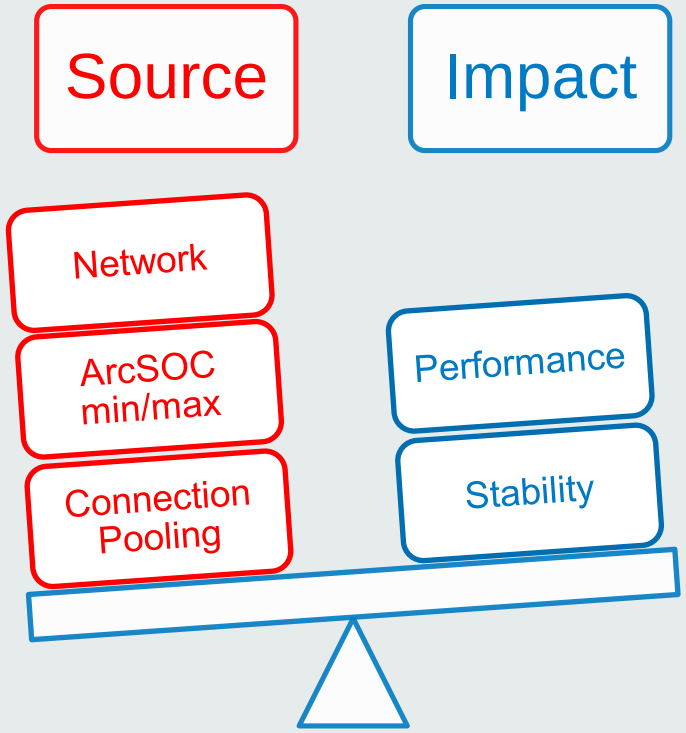
Throughput (tr/s)



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.

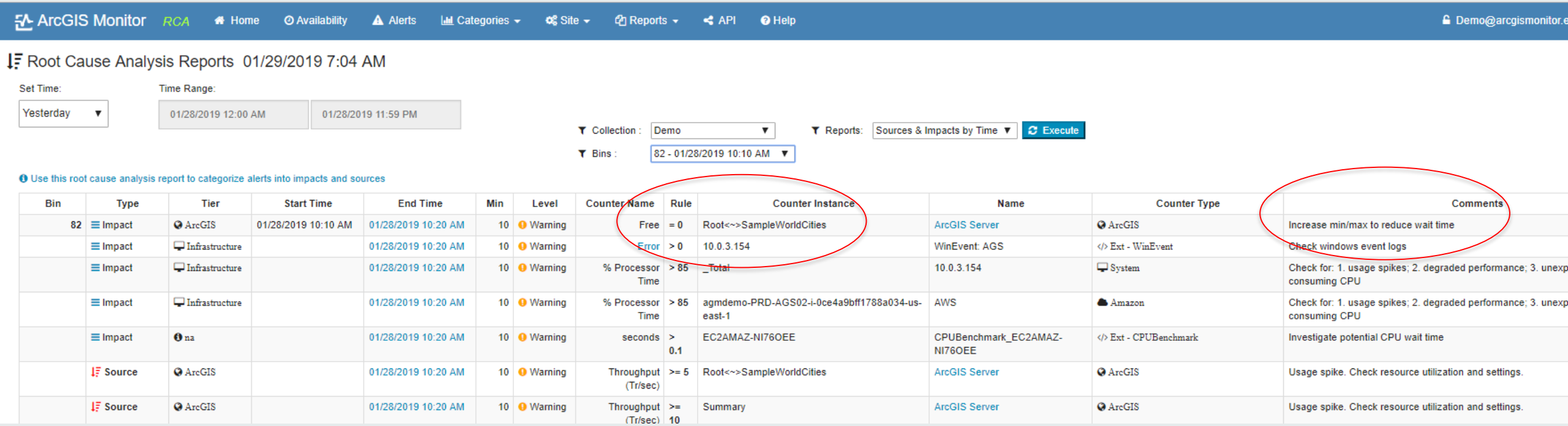
Bottleneck


CASH
FASTRAK
CLOSED
CASH
FASTRAK


Source
Impact
Network
ArcSOC
min/max
Connection
Pooling
Performance
Stability

RCA: Free instances = 0

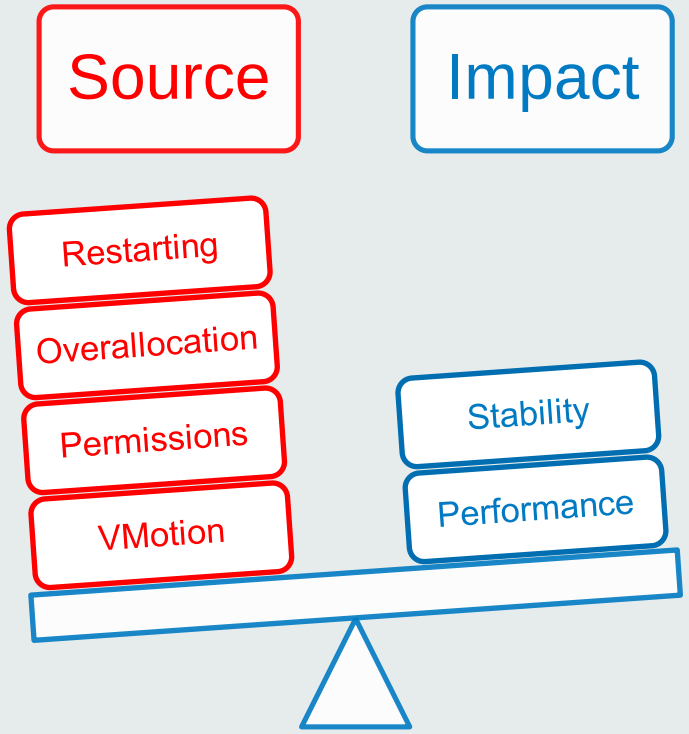
Bottleneck are often created by increased load



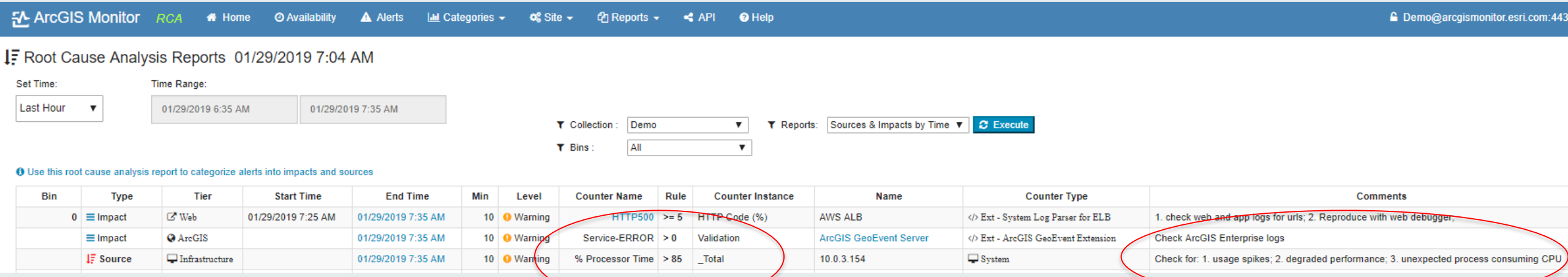
Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
82	Impact	ArcGIS	01/28/2019 10:10 AM	01/28/2019 10:20 AM	10	Warning	Free	= 0	Root<~>SampleWorldCities	ArcGIS Server	ArcGIS	Increase min/max to reduce wait time
	Impact	Infrastructure		01/28/2019 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

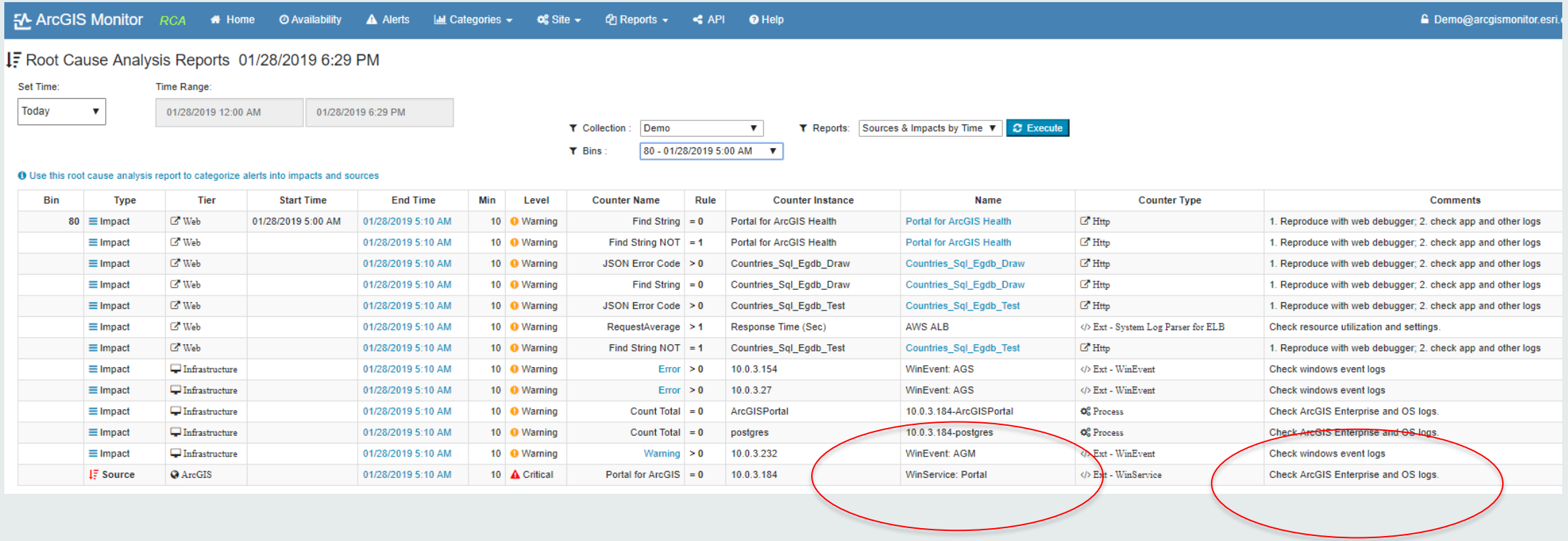
Interruption to the underlying resources



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



RCA: Portal for ArcGIS Server service stopped



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

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

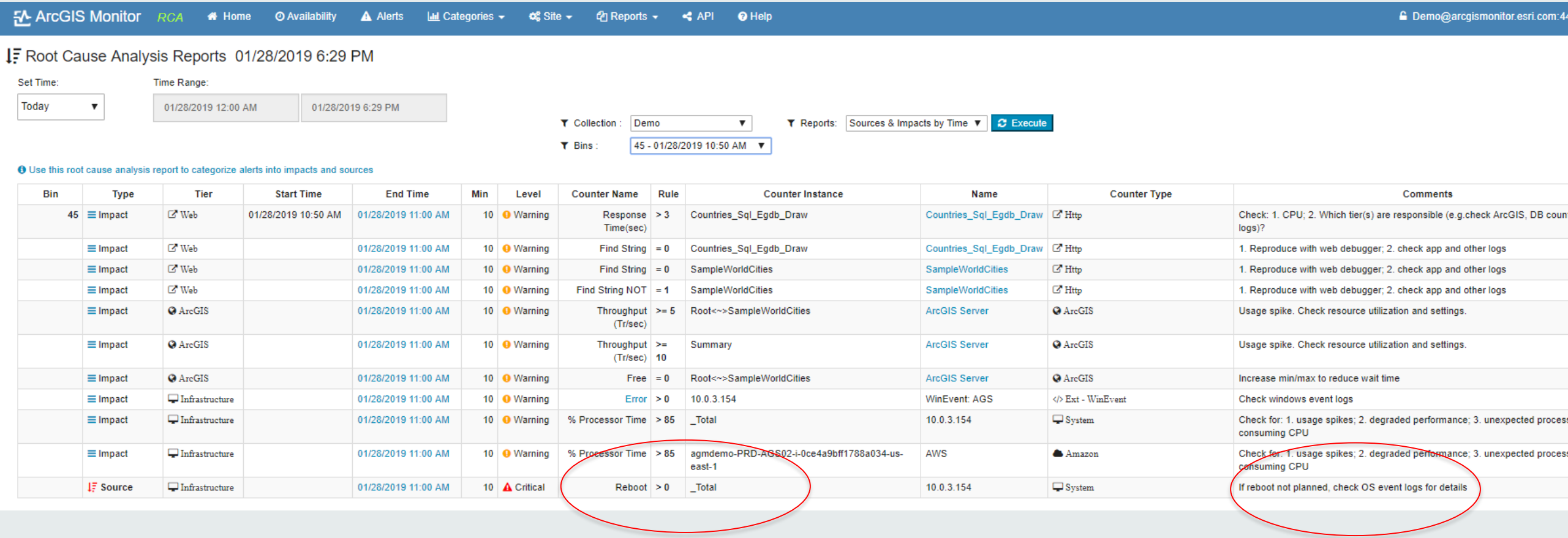
Collection : Demo | Reports: Sources & Impacts by Time | Execute

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

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

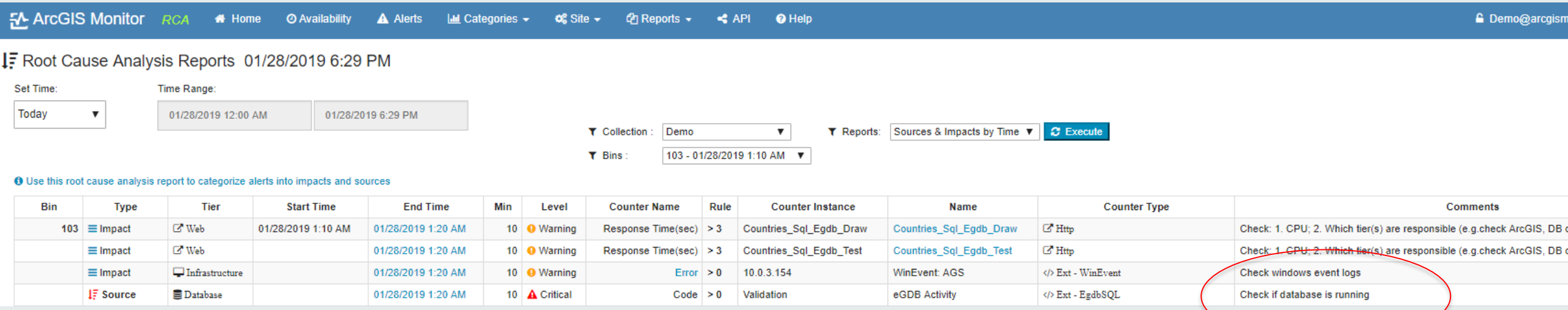
Bin	Type	Tier	Start Time	End Time	Min	Level	Counter Name	Rule	Counter Instance	Name	Counter Type	Comments
80	Impact	Web	01/28/2019 5:00 AM	01/28/2019 5:10 AM	10	Warning	Find String	= 0	Portal for ArcGIS Health	Portal for ArcGIS Health	Http	1. Reproduce with web debugger; 2. check app and other logs
	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



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 coun 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

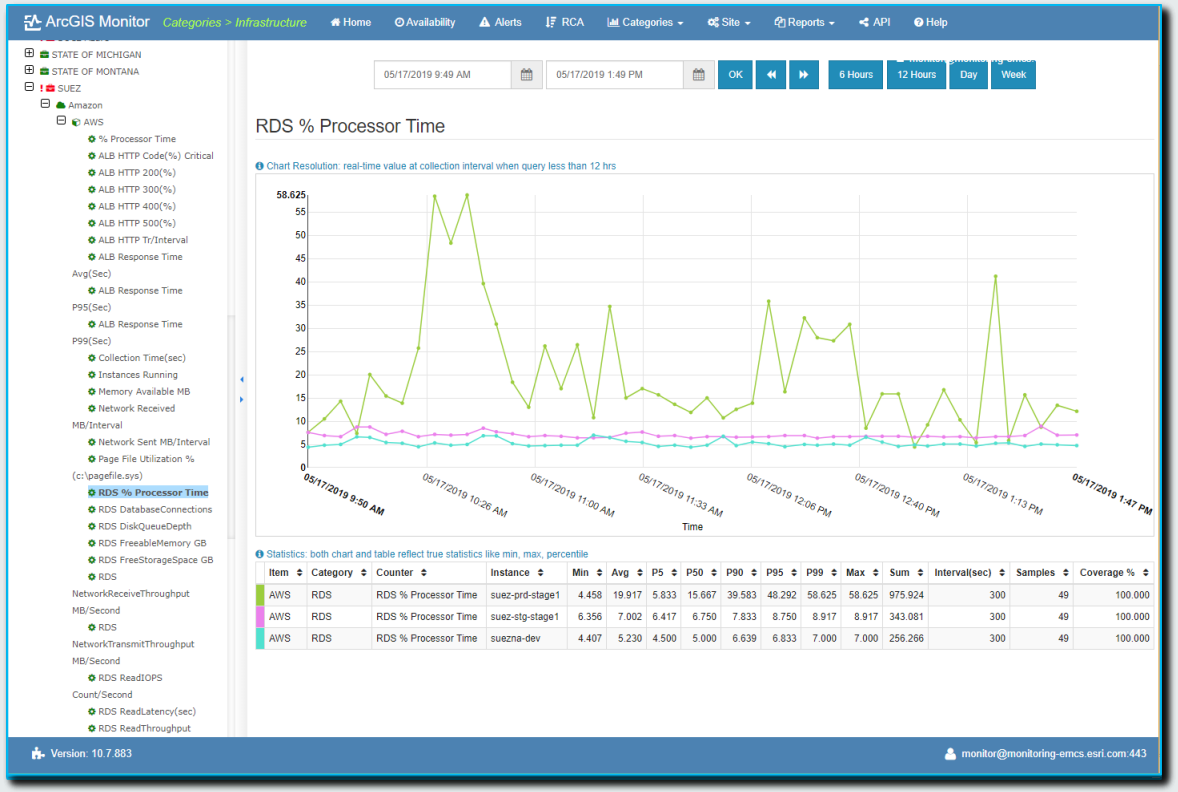
RCA: Database not running



2019 Releases

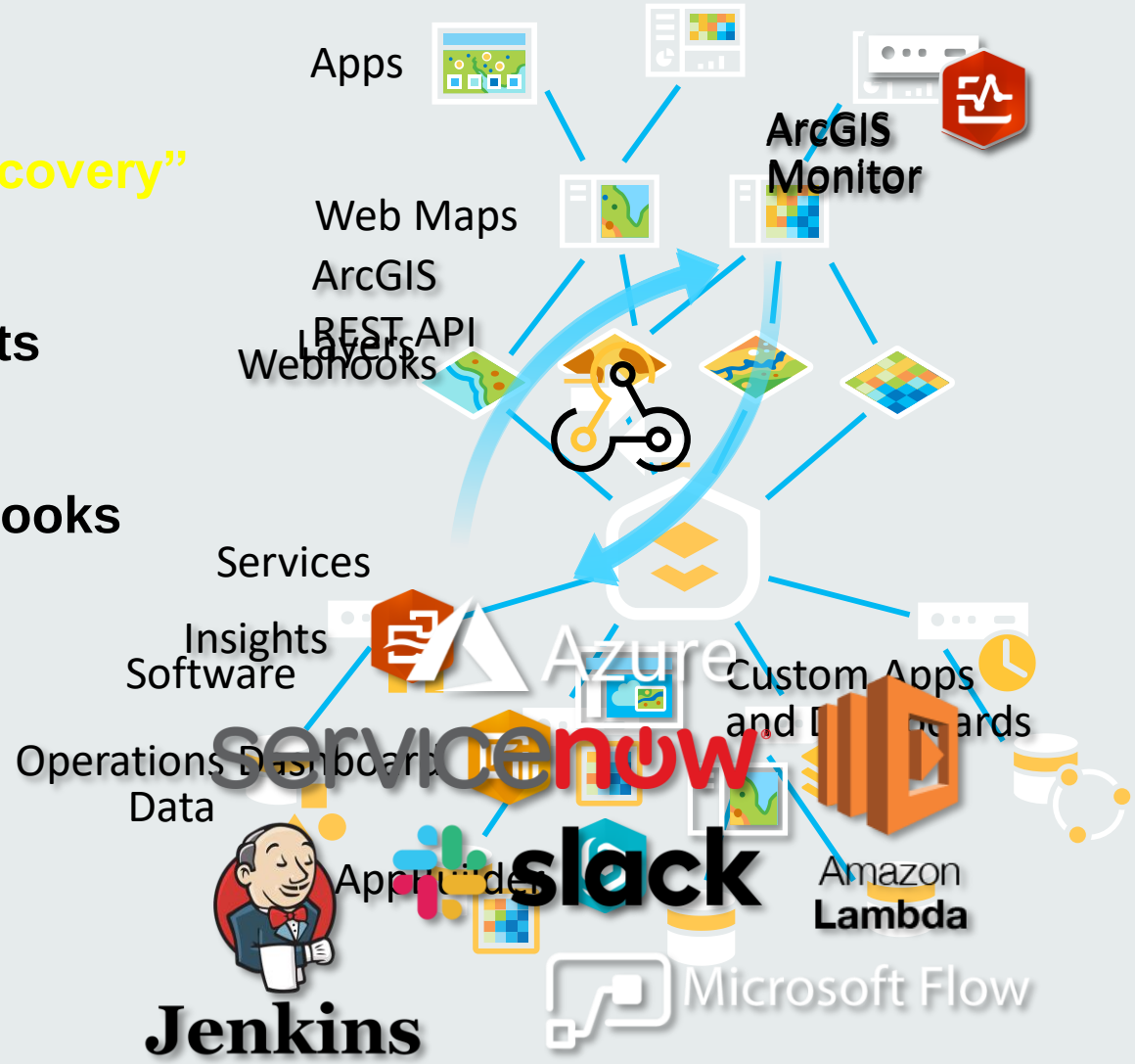
- **10.7**
  - Root Cause Analysis
  - Dashboard home page
  - REST API
  - Additional default alerts
  - Health and utilization reports
  - Additional metrics added

- **10.7.1**
  - Minor bug fixes
  - Usability improvements



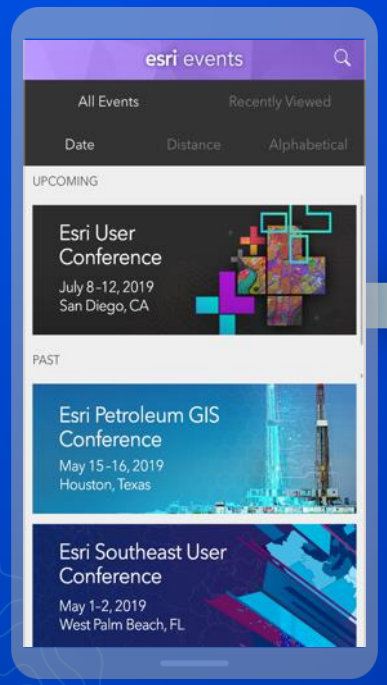
2020 Enhancements

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

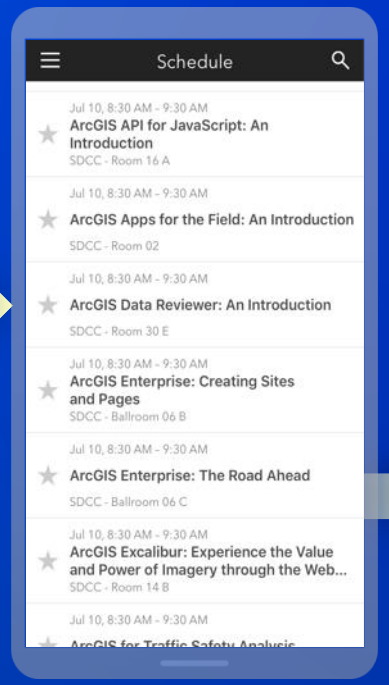


Please Share Your Feedback in the App

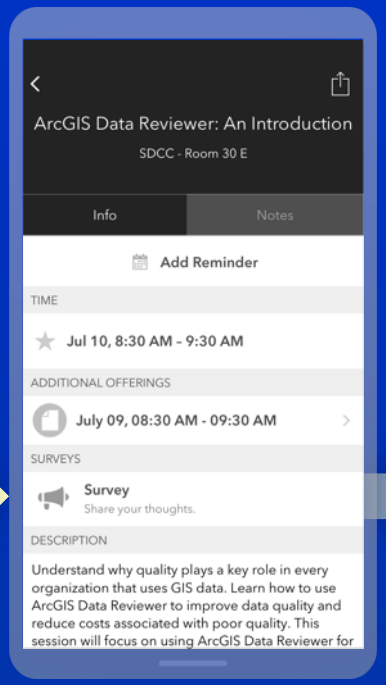
Download the Esri Events app and find your event



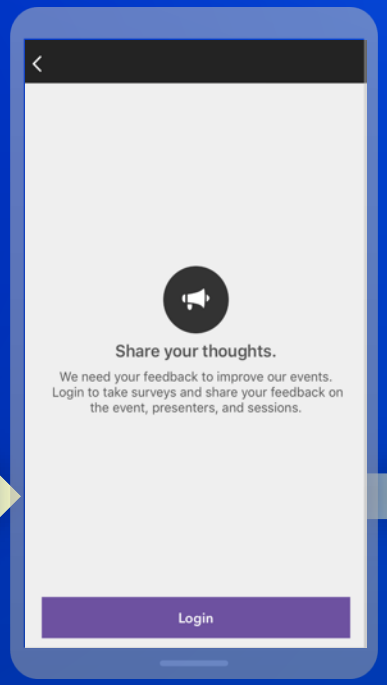
Select the session you attended



Scroll down to “Survey”



Log in to access the survey



Complete the survey and select “Submit”