

360° monitoring for Azure Kubernetes Service & container applications

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Why it's important to have native monitoring for AKS?

- Users are expecting a single pane of glass
 - Azure portal
- Monitoring solution that runs outside of the AKS cluster
 - PaaS solution – Azure Monitor without overhead
 - PaaS solution – Application Insights without overhead
- Example
 - Uses Prometheus for container monitoring
 - Prometheus runs on the same AKS cluster where the container applications are running
 - Uses Azure Monitor for containers to monitor AKS cluster health state

Questions

- Ever had the need or the requirement to get live logging data for debugging or monitoring purposes?
- Ever asked the question to your developers how much CPU and memory the container application needs for its operation?

Demo – Azure Monitor for containers

>>

Dashboard > demo-azst-aks1 - Insights > Containers



demo-azst-aks1 - Containers

Kubernetes service

Search (Ctrl+ /)

Overview

Activity log

Access control (IAM)

Tags

Settings

Upgrade

Scale

Dev Spaces

Properties

Locks

Automation script

Monitoring

Insights

Metrics (preview)

Logs

Support + troubleshooting

New support request

AZURE MONITOR

Onboarding to Azure Monitor for containers

With Azure Kubernetes Service, you will get CPU and memory usage metrics for each node. In addition, you can enable container monitoring capabilities and get performance and health of your entire Kubernetes cluster.

You will be billed based on the amount of data ingested and your data retention settings. We create a default workspace for you if you don't have one in the subscription. It will take 5- 10 minutes for the onboarding process to complete.

[Learn more about container health and performance monitoring](#)[Learn more about pricing](#)

Log Analytics workspace ⓘ

(new) DefaultWorkspace-05499249-2bf5-4767-b121-db90943e363e-WEU

Enable

NamespaceserviceNodeTime range

<All><All><All>Last 6 hours

ClusterNodesControllersContainers

Learn moreFeedback

Search by name...

Metric: CPU Usage (millicores)MinAvg50th90th95thMax

All 3 item(s)

NAME	STATUS	95TH %	95TH	CONTAINERS	UPTIME	CONTROLLER	TREND 95TH % (1 BAR = 15M)
aks-nodepool1-2767394...	Ok	11%	217 mc	8	79 days	-	
Other Processes	-	4%	84 mc	-	-	-	
tunnelfront-67d6c...	Ok	6%	110 mc	1	18 hours	tunnelfront-67d6c8...	
tunnel-front	Ok	6%	110 mc	1	18 hours	tunnelfront-67d6c8...	View Logs
omsagent-2mj8d	Ok	0.3%	7 mc	1	18 hours	omsagent	

Monitor - Containers

Microsoft

Search (Ctrl+/)



Refresh

Feedback



Overview



Activity log



Alerts



Metrics



Logs



Service Health

Insights



Applications



Virtual Machines (preview)



Containers



Network



More

Settings



Diagnostics settings



Autoscale

Cluster Status Summary

4

Total

0

Critical



0

Warning



0

Unknown



AKS Healthy

2



AKS-engine Healthy

1



Non-monitored

1

Monitored clusters (3)

Non-monitored clusters (1)

Forums



L

Search by name...

CLUSTER NAME	CLUSTER TYPE	STATUS	↑↓ NODES	USER PODS	SYSTEM PODS
aks-engine	AKS-engine	Healthy	4 / 4	15 / 15	32 / 32
azst-aks1	AKS	Healthy	4 / 4	20 / 20	33 / 33
azst-aks2	AKS	Healthy	4 / 4	5 / 5	23 / 23

azst-aks1 - Insights

Kubernetes service

Refresh

Monitor resource group

Feedback

Time range = Last 6 hours

Add Filter

Cluster

Nodes

Controllers

Containers

Forums

Learn more

Search by name...

Metric: Memory working set

Min

Avg

50th

90th

95th

Max

4 items

NAME	STATUS	95TH %	95TH	CONTAINERS	UPTIME	CONTROLLER	TREND 95TH % (1 BAR = 15M)
aks-agentpool-14987...	Ok	24%	1.87 GB	29	21 hours	-	
aks-agentpool-14987...	Ok	24%	1.86 GB	28	21 hours	-	
aks-agentpool-14987...	Ok	21%	1.64 GB	25	21 hours	-	
virtual-node-aci-linux	Ok	-	-	10	-	-	
aci-helloworld-84...	Ok	0%	15.56 MB	1	6 mins	aci-helloworld-84...	
aci-hellowo...	Ok	0%	15.56 MB	1	6 mins	aci-helloworld-84...	
aci-helloworld-84...	Ok	0%	15.43 MB	1	6 mins	aci-helloworld-84...	
aci-hellowo...	Ok	0%	15.43 MB	1	6 mins	aci-helloworld-84...	
aci-helloworld-84...	Ok	0%	15.42 MB	1	6 mins	aci-helloworld-84...	
aci-hellowo...	Ok	0%	15.42 MB	1	6 mins	aci-helloworld-84...	
aci-helloworld-84...	Ok	0%	15.42 MB	1	6 mins	aci-helloworld-84...	

aci-helloworld

Container

View container live logs (preview)

View container logs

Container Name

aci-helloworld

Container ID

e5f4915334aa472d4be6f31cc6cede518ac0c23d1787c6157e3f150daa6dde10

Container Status

running

Image

-

Image Tag

-

Container Creation Time Stamp

2/14/2019, 6:04:40 AM

Start Time

-

Finish Time

-

CPU Limit

800000 mc

Logs

container-servicefabric

New Query 1*



Help

container-servicefabric



Run

Time range: Set in query



Save



Copy link



Export

Schema

Filter (preview)



Filter by name or type...



Collapse all

Active

container-servicefabric



ApplicationInsights

ContainerInsights

Containers

LogManagement

Custom Logs

Functions

Favorite workspaces

iotedge

```
let startDateTime = datetime('2019-02-11T12:00:00.000Z');
let endDateTime = datetime('2019-02-14T14:05:23.724Z');
let ContainerIdList = KubePodInventory
| where TimeGenerated >= startDateTime and TimeGenerated < endDateTime
| where ContainerName =~ '289b8f44-2fb0-11e9-ad49-0a58ac1f1aab/function-akscnicalc'
| where ClusterName =~ "azst-aks1"
| distinct ContainerID;
ContainerLog
| where TimeGenerated >= startDateTime and TimeGenerated < endDateTime
| where ContainerID in (ContainerIdList)
| project LogEntrySource, LogEntry, TimeGenerated, Computer, Image, Name, ContainerID
```

Completed

00

TABLE CHART Columns

Drag a column header and drop it here to group by that column

	LogEntrySource	LogEntry	TimeGenerated [UTC]	Computer	Image	Name
>	stdout	Hosting environment: Production	2019-02-13T16:58:54.077	aks-agentpool-14987876-3	neumannndaniel/akscnicalc:1.0.0	285
>	stdout	Content root path: /	2019-02-13T16:58:54.077	aks-agentpool-14987876-3	neumannndaniel/akscnicalc:1.0.0	285
>	stdout	Now listening on: http://[::]:80	2019-02-13T16:58:54.077	aks-agentpool-14987876-3	neumannndaniel/akscnicalc:1.0.0	285
>	stdout	Application started. Press Ctrl+C to shut down.	2019-02-13T16:58:54.077	aks-agentpool-14987876-3	neumannndaniel/akscnicalc:1.0.0	285

Refresh

Monitor resource group

Feedback

Time range = Last 3 days

Add Filter

Cluster Nodes Controllers Containers

Forums Learn more

Search by name...

Metric: Memory working set

Min Avg 50th 90th 95th Max

407 of 408 items matching

NAME	STATUS	95TH %	95TH	POD	NODE	RESTARTS	UPTIME	TREND 95TH % (1 BAR = 4H)
go-webapp	Ok	35%	3.54 MB	go-webapp-5b88...	aks-agentpool-1...	0	20 hours	
go-webapp	Ok	35%	3.54 MB	go-webapp-5b88...	aks-agentpool-1...	0	21 hours	
heapster	Ok	19%	25.95 MB	heapster-5fb748...	aks-agentpool-1...	0	21 hours	
omsagent	Ok	17%	87.38 MB	omsagent-rs-6b9...	aks-agentpool-1...	0	21 hours	
cluster-autoscaler	Ok	14%	43.41 MB	cluster-autoscale...	aks-agentpool-1...	0	21 hours	
heapster-nanny	Ok	12%	10.74 MB	heapster-5fb748...	aks-agentpool-1...	0	21 hours	
coredns	Ok	8%	13.79 MB	coredns-754f947...	aks-agentpool-1...	0	21 hours	
coredns	Ok	8%	13.62 MB	coredns-754f947...	aks-agentpool-1...	0	21 hours	

cluster-autoscaler-8667bd7ccb-9gdhz (cluster-autoscaler)

(No New Logs)

aks 9/19

Scroll || Pause Clear

2019-02-14T14:06:44.843893878Z I0214 14:06:44.843763 1 scale_down.go:641] No candidates for scale down
2019-02-14T14:06:54.872411165Z I0214 14:06:54.872111 1 azure_manager.go:261] Refreshed ASG list, next refresh after 2019-02-14 14:07:54.872093654 +0000 UTC m=+76166.562875138
2019-02-14T14:06:55.012894572Z I0214 14:06:55.012581 1 utils.go:514] No pod using affinity / antiaffinity found in cluster, disabling affinity predicate for this loop
2019-02-14T14:06:55.013226683Z I0214 14:06:55.012970 1 static_autoscaler.go:250] No unschedulable pods
2019-02-14T14:06:55.096830463Z I0214 14:06:55.095980 1 utils.go:471] Skipping aks-agentpool-14987876-1 - node group min size reached
2019-02-14T14:06:55.096875864Z I0214 14:06:55.096007 1 utils.go:471] Skipping aks-agentpool-14987876-3 - node group min size reached
2019-02-14T14:06:55.096883365Z I0214 14:06:55.096015 1 utils.go:471] Skipping aks-agentpool-14987876-0 - node group min size reached
2019-02-14T14:06:55.175217756Z I0214 14:06:55.174655 1 scale_down.go:641] No candidates for scale down

cluster-autoscaler

Container

View container live logs (preview)

View container logs

Container Name

cluster-autoscaler

Container ID

e9bdd7e052cfa7549dd1ffba4f42366b703e74a9d3c17a78361459a4547121c5

Container Status

running

Image

cluster-autoscaler

Image Tag

v1.12.2

Container Creation Time Stamp

2/13/2019, 8:58:22 AM

Start Time

2/13/2019, 8:58:22 AM

Finish Time

-

CPU Limit

100 mc

CPU Request

100 mc

Memory Limit

azst-aks1 - Insights

Kubernetes service

Refresh

Monitor resource group

Feedback

Time range = Last 3 days

Add Filter

Cluster

Nodes

Controllers

Containers

Forums

Learn more

Search by name...

Metric: Memory working set

Min

Avg

50th

90th

95th

Max

407 of 408 items matching

NAME	STATUS	95T...	95TH	POD	NODE	RESTARTS	UPTIME	TREND 95TH % (1 BAR = 4H)
omsagent	Ok	87%	262.02 ...	omsagent-s52...	aks-agentpoo...	0	21 hours	
function-figlet	Ok	77%	99.06 MB	helloworld-fu...	aks-agentpoo...	0	21 hours	
appinsights	Ok	68%	87.55 MB	appinsights-7...	aks-agentpoo...	0	20 hours	
appinsights	Ok	67%	85.48 MB	appinsights-7...	aks-agentpoo...	0	21 hours	
function-akscnicalc	Ok	60%	76.64 MB	akscnicalc-fun...	aks-agentpoo...	0	21 hours	
omsagent	Ok	46%	139.06 ...	omsagent-j5t4r	aks-agentpoo...	0	20 hours	
omsagent	Ok	42%	126.06 ...	omsagent-ht...	aks-agentpoo...	0	21 hours	
go-webapp	Ok	37%	3.72 MB	go-webapp-5...	aks-agentpoo...	0	20 hours	
go-webapp	Ok	35%	3.54 MB	go-webapp-5...	aks-agentpoo...	0	20 hours	
go-webapp	Ok	35%	3.54 MB	go-webapp-5...	aks-agentpoo...	0	21 hours	
heapster	Ok	19%	25.95 MB	heapster-5fb7...	aks-agentpoo...	0	21 hours	

cluster-autoscaler

Container

View container live logs (preview)

View container logs

Container Name

cluster-autoscaler

Container ID

e9bdd7e052cfa7549dd1ffba4f42366b703e74a9d3c17a78361459a4547121c5

Container Status

running

Image

cluster-autoscaler

Image Tag

v1.12.2

Container Creation Time Stamp

2/13/2019, 8:58:22 AM

Start Time


2/13/2019, 8:58:22 AM


Finish Time






-

CPU Limit








100 mc

 Search (Ctrl+*/*)








-  Overview
-  Activity log
-  Access control (IAM)
-  Tags
-  Events

Settings

-  Quickstart
-  Resource costs
-  Deployments
-  Policies
-  Properties
-  Locks
-  Automation script


Monitoring


-  Insights (preview)
-  Alerts
-  Metrics
-  Diagnostic settings

 Refresh

 Subscription 


DANEUM Microsoft



Resource group 

aks



Resource type 

Kubernetes services



Resource 

Type to start filtering ...



DANEUM Microsoft > aks

 Select any of the resources to view logs.

NAME	RESOURCE TYPE	RESOURCE GROUP	DIAGNOSTICS STATUS
 azst-aks1	Kubernetes service	aks	 Enabled
 azst-aks2	Kubernetes service	aks	 Enabled
 demo-azst-aks1	Kubernetes service	aks	 Disabled

>>

Dashboard > aks - Diagnostic settings > Diagnostics settings

+

Home

Apps

Settings

Star

Grid

Cloud

Monitor

Network

Security

Alerts

Heart

Folder

Box

Monitor

Grid

Cloud

Monitor

Grid

Lightning

Diagnostics settings

Save

Discard

Delete

Name

azst-aks1-master

☒ Archive to a storage account

Storage account

aksmasterlogs

>

☐ Stream to an event hub

☐ Send to Log Analytics

LOG

☒ kube-apiserver

Retention (days) ⓘ

7

☒ kube-controller-manager

Retention (days) ⓘ

7

☒ kube-scheduler

Retention (days) ⓘ

7

☒ guard

Retention (days) ⓘ

7

☒ cluster-autoscaler

Retention (days) ⓘ

7

☒ kube-audit

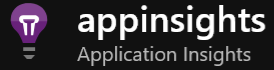
Retention (days) ⓘ

7

Questions

- How to integrate operations and development in one process for monitoring?

Demo – Azure Application Insights



Search (Ctrl+ /)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Investigate

Application map

Smart Detection

Live Metrics Stream

Metrics

★ Application Dashboard

Getting started

Search

Analytics

Monitor resource group

Refresh

Feedback

Resource group ([change](#))
operations-management

Status

Location

West Europe

Subscription ([change](#))
DANEUM Microsoft

Subscription ID

05499249-2bf5-4767-b121-db90943e363e

Instrumentation Key

816e29a6-c9d9-425f-914f-113

Tags ([change](#))

[Click here to add tags](#)



Show data for last:

30 minutes

1 hour

6 hours

12 hours

1 day

3 days

7 days

30 days

Failed requests



100

80

60

Server response time



20ms

15ms

UTC Time : Past 24 hours





2 servers online

Pause

Pin

Open in Analytics

Learn more

Feedback



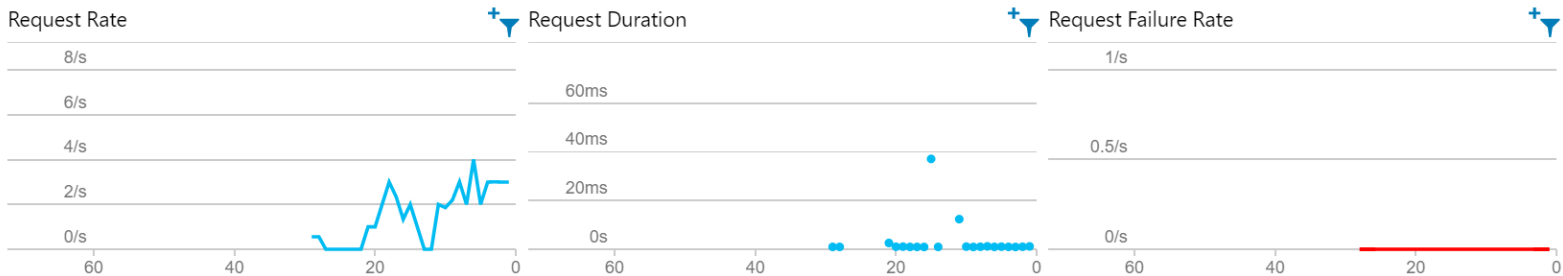
Sample Telemetry



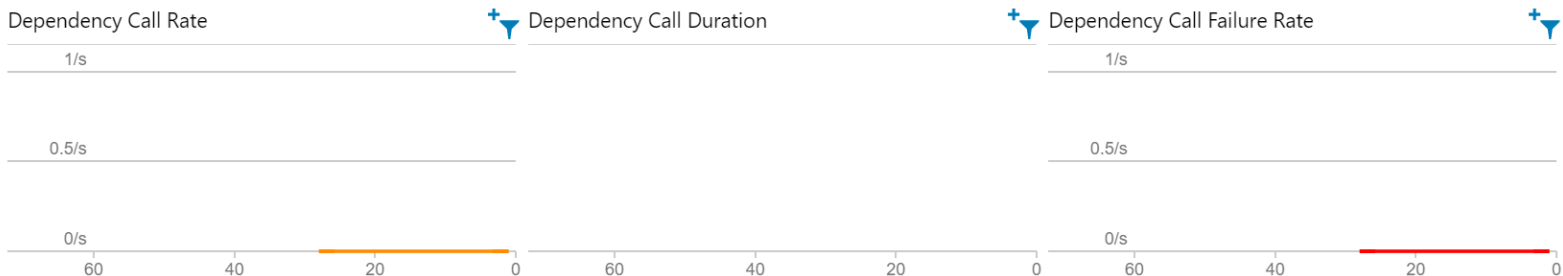
No telemetry yet

To view details please select a document from the above list

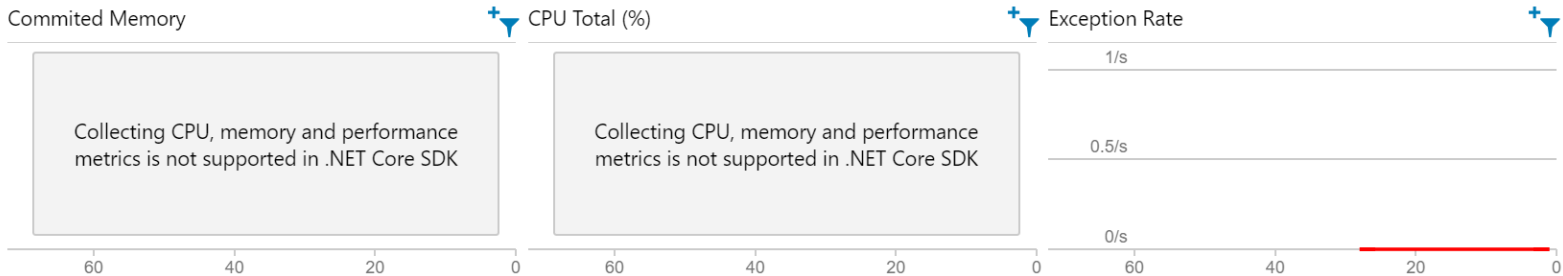
Incoming Requests



Outgoing Requests






Overall Health



Servers

Select columns




ae8a876

(outgoing)  = Exception  = Profiler trace  = Debug snapshot

1 MS

2 MS

3 MS

View all telemetry  Feedback  Create work item

appinsights.trafficmanager.net

GET /About

Request Properties

[Show all](#)

Event time	2/14/2019, 6:20:07 AM	
Request name	GET /About	...
Response code	500	...
Successful request	false	...
Response time	3.5 ms	...
Request URL	http://appinsights.trafficmanager.net/About	...

Custom Properties

AspNetCoreEnvironment	Production	...
-----------------------	------------	-----

Call Stack

 Show Just My Code 


```
System.Exception:
  at appinsights.Pages.AboutModel.OnGet (appinsights, Version=1.0.0.0)
  at Microsoft.AspNetCore.Mvc.RazorPages.Internal.ExecutorFactory+
  at Microsoft.AspNetCore.Mvc.RazorPages.Internal.PageActionInvoke
  at System.Runtime.ExceptionServices.ExceptionDispatchInfo.Throw
  at System.Runtime.CompilerServices.TaskAwaiter.HandleNonSuccessA
  at Microsoft.AspNetCore.Mvc.RazorPages.Internal.PageActionInvoke
  at System.Runtime.ExceptionServices.ExceptionDispatchInfo.Throw
  at Microsoft.AspNetCore.Mvc.RazorPages.Internal.PageActionInvoke
  at Microsoft.AspNetCore.Mvc.RazorPages.Internal.PageActionInvoke
  at Microsoft.AspNetCore.Mvc.RazorPages.Internal.PageActionInvoke
  at System.Runtime.ExceptionServices.ExceptionDispatchInfo.Throw
```



New Work Item

GitHub * Title 

Issue with appinsights.trafficmanager.net GET /About

Details 

```
_MS.ProcessedByMetricExtractors: (Name:'Requests', Ver:'1.1')
Account Id: <undefined>
Application version: 1.0.0.0
AspNetCoreEnvironment: Production
Auth user Id: <undefined>
Browser version: <not collected>
City: <undefined>
```


OK

Ready demo: Issue with appinsights.trafficmanager.net

GET /About #3

Edit

New issue

 Open

neumannndaniel opened this issue 4 minutes ago · 0 comments

neumannndaniel commented 4 minutes ago

+ 😊 ...

MS.ProcessedByMetricExtractors: (Name:'Requests', Ver:'1.1')

Account Id:

Application version: 1.0.0.0

AspNetCoreEnvironment: Production

Auth user Id:

Browser version:

City:

Client IP address: 0.0.0.0

Cloud role instance: appinsights-7ddf77fddd-ggmqr

Cloud role name:

Country or region:

Device model:

Device type: PC

Event time: 2/14/2019, 6:20:07 AM

Operating system:

Operation Id: a6f2bdf702df404bbcfbc47f7ae8a876

Operation name: GET /About

Parent Id: a6f2bdf702df404bbcfbc47f7ae8a876

Request Id: |a6f2bdf702df404bbcfbc47f7ae8a876.cdd7e849

Request name: GET /About

Request source:

Request URL: <http://appinsights.trafficmanager.net/About>

Response code: 500

Response time: 3.48 ms

Sample Rate: 100

SDK version: aspnet5c:2.5.1

Session Id: bP5Wk

Source of synthetic traffic:


State or province:

Successful request: false

Telemetry type: request

User Id: s3PqP

[View this instance in the Azure portal](#)<\a>

Assignees 

No one—assign yourself

Labels 

None yet


Projects 

None yet

Milestone 


No milestone



Notifications


 Unsubscribe

You're receiving notifications because you authored the thread.


1 participant

 Lock conversation

 Pin issue 

 Transfer issue

Beta

 Delete issue

Session takeaways

- Use Azure Monitor for containers as full-time monitoring solution for AKS or part time when using 3rd party tools like Prometheus
 - Integrated into the Azure portal experience
 - Runs outside of AKS as PaaS
 - Monitors nodes and containers
- Application Insights is a perfect addition to Azure Monitor to gain detailed insights about the container application itself
 - Bridge between operations and development
 - Runs outside of AKS as PaaS
 - Monitors the application inside the container

Session resources

- Onboard AKS to Azure Monitor for containers
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/insights/container-insights-onboard#next-steps>
- AKS monitoring
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/insights/container-insights-analyze>
- Live logging
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/insights/container-insights-live-logs?toc=%2Fen-us%2Fazure%2Faks%2FTOC.json&bc=%2Fen-us%2Fazure%2Fbread%2Ftoc.json>
- AKS master logs
 - <https://docs.microsoft.com/en-us/azure/aks/view-master-logs>

Session resources

- Application Insights example ASP.NET Core application
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/app/asp-net-core>
- Application Insights dashboard
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/app/overview-dashboard>
- Diagnosing failures using the Azure portal
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/app/asp-net-exceptions#diagnosing-failures-using-the-azure-portal>
- Application Insights live stream
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/app/live-stream>
- Application Insights Application Map
 - <https://docs.microsoft.com/en-us/azure/azure-monitor/app/app-map>