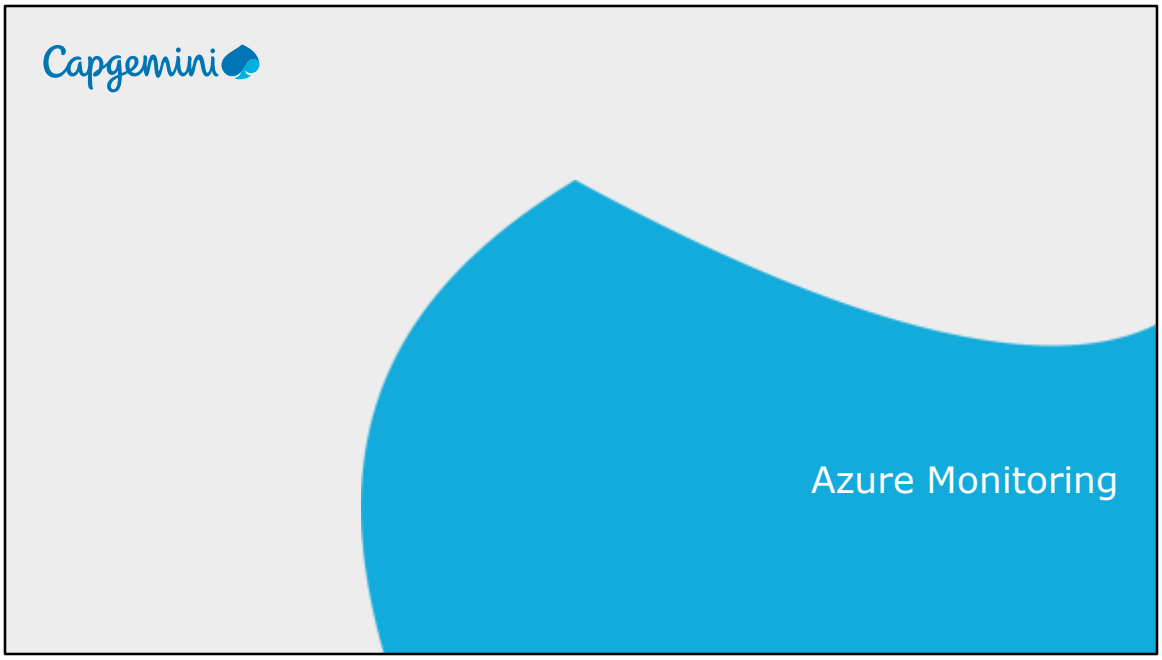
Capgemini
Azure Monitoring

Lesson Objectives

At the end of this module you will be able to:

- ✓ Explain brief overview of the Azure monitor
- ✓ Demonstrate how to view metrics, activity logs and diagnostics settings
- ✓ Explain in detail about Application insights in terms of data sources, type of data collected, storage, analytics and visualization of data.

Monitoring

- Azure Monitor is part of Microsoft Azure's overall monitoring solution
- Azure Monitor helps to track performance, maintain security, and identify trends.
- Using Azure monitor we can centrally explore the data collected (Activity logs, Metrics and Diagnostic logs)
- Azure Monitoring can be done at
  - **Resource Level** : Using Internal tools , metrics and alert rules
  - **Resource Group Level** : Using Monitor Blade
  - **Enterprise Level** : Using Hybrid Nodes, Log Analytics

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Metrics
Provides you an insight into performance and health of your workloads in Azure

Activity log
Provides data about operations performed on the resource

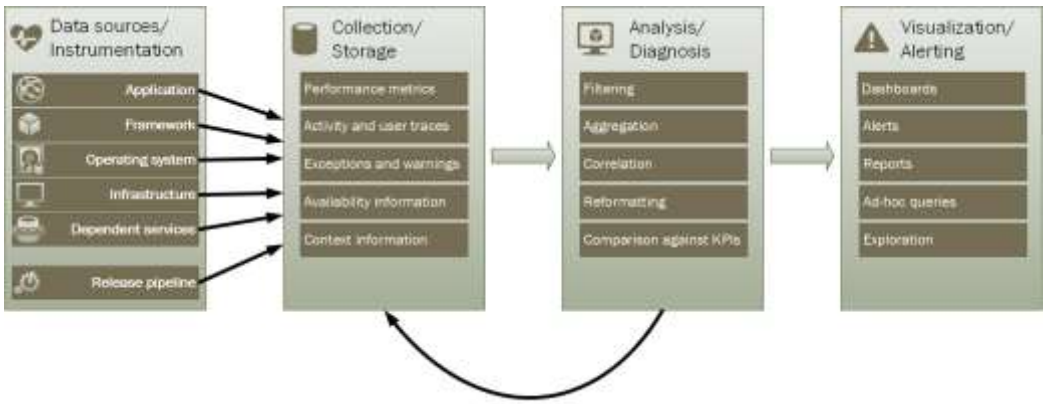
Diagnostic log
Provides information about operations performed by the resource itself

At Resource level monitoring we can use internal tools which resides inside the VM like Performance Monitor, Task Manager as usual and also from the Azure portal in the virtual machine properties, graph, metrics, and create alert rules.

At Resource group level to monitor we can use configuration blade available in the Azure portal called Monitor, which makes us to perform searches across diagnostics and log data across multiple VMs

At Enterprise level to monitor servers both in on premises data center, as well as in one or more Azure virtual networks. We need to turn to the Log Analytics service that's part of Operations Management Suite.

Monitoring and Diagnostics Pipeline



Telemetry
An automated communications process by which measurements and other data are collected at remote or inaccessible points and transmitted to receiving equipment for monitoring.

In the Azure public cloud, you don't have any physical access to Azure data centers or the actual hardware hosts that run your workloads.

Applications, frameworks, VM operating systems generates the data which tells us how the VM is being used and any problems.

Now we need some kind of method to centrally collect and store all of that different disparate data. i.e. You may have trace data from applications, code that's been written by application developers, availability information, context etc.

Then perform business intelligence on it by filtering, aggregation, data cleanup, correlation, reformatting,

Finally take that filtered data and prepare dashboards, generate meaningful alerts, reports, which will be used by business developers or business intelligence data team members who want to perform Ad-Hoc queries against that data

Azure Monitor Sources

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Route

You can stream monitoring data to other locations. Send to Application Insights so you can use its richer visualization and analysis tools. Send to Event Hubs so you can route to third-party tool

Store and Archive

Some monitoring data is already stored and available in Azure Monitor for a set amount of time. If you want to store data longer than the time periods listed above, you can use an Azure storage. Monitoring data is kept in your storage account based on a retention policy you set. You do have to pay for the space the data takes up in Azure storage.

Query

You can use the Azure Monitor REST API, cross platform Command-Line Interface (CLI) commands, PowerShell cmdlets, or the .NET SDK to access the data in the system or Azure storage

Visualize

Visualizing your monitoring data in graphics and charts helps you find trends quicker than looking through the data itself. For Visualization use the Azure portal, Route data to Azure Application Insights, Route data to Microsoft PowerBI and 3-rd party tools.

Automate

In the Azure alerts, you can use monitoring data to trigger alerts or even whole processes**.**

Metrics

- Azure Monitor enables you to consume telemetry to gain visibility into the performance and health of your workloads on Azure.
- Metrics can be used to
  - Track Performance
  - Notify an issue
  - Take automated actions
  - Perform analytics
- Metrics can be exported to
  - Storage Account, Event Hubs, Power BI & Log Analytics

Activity Log

- Azure Activity log that provides insight into the operations that were performed on resources in your subscription
- Activity log can be used
  - For auditing
  - To create a alert
- Activity log can be exported to
  - Storage Account, Event Hubs, Power BI & Log Analytics

Diagnostics Log

- Azure diagnostic logs are the logs emitted by a resource that provides rich, frequent data about operation of that resource
- Azure Diagnostics is the capability within Azure that enables the collection of diagnostic data on a deployed application.
- Diagnostic logs can be exported to
  - Storage Account, Event Hubs, Power BI & Log Analytics

Alerts

- Alerts can be configured based on metrics and activity logs
  - Metric values : Alert can be raised when the value of the specific metric exceeds a threshold
  - Activity log : Alert can be triggered on every event or only when certain event occurs
- Alert can be configured to do the following
  - Email Notification
  - Webhooks
- Alerts can be configured suing Azure Portal, CLI, Powershell, Resource Manager Template

Webhook

A way for an app to provide other application with real-time information. It is also called as web callback or an HTTP push API. It will be in JSON Payload

AutoScale

- Autoscale helps us to ensure that we have the right amount of resources running to handle the load of the application
  - It allows us to add resources to handle increase in load and also save money by removing resources when it is in idle
- Autoscale setting consists of
  - Autoscale profile
    - Capacity (Min,Max and Default)
    - Rule (Trigger & Scale action)
    - Recurrance
  - Notification
    - Emails & Webhooks

Webhook

A way for an app to provide other application with real-time information. It is also called as web callback or an HTTP push API. It will be in JSON Payload

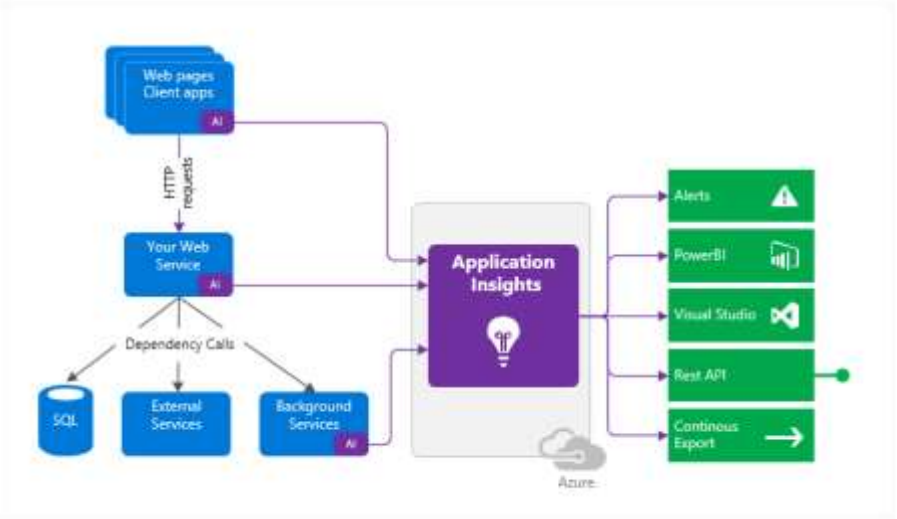
Application Insights

- Application Insights is an extensible Application Performance Management (APM) service for web developers on multiple platforms.
  - It is used to monitor your live web application
  - It will automatically detect performance anomalies
  - It's designed to help you continuously improve performance and usability
  - It works for apps on a wide variety of platforms including .NET, Node.js and J2EE, hosted on-premises or in the cloud
  - It integrates with your DevOps process, and has connection points to a variety of development tools.
  - It can monitor and analyze telemetry from mobile apps by integrating with Visual Studio App Center and HockeyApp.

Application Insights is aimed at the development team, to help you understand how your app is performing and how it's being used. It monitors:

Request rates, response times, and failure rates: Find out which pages are most popular, at what times of day, and where your users are. See which pages perform best. If your response times and failure rates go high when there are more requests, then perhaps you have a resourcing problem.
Dependency rates, response times, and failure rates: Find out whether external services are slowing you down.
Exceptions : Analyse the aggregated statistics, or pick specific instances and drill into the stack trace and related requests. Both server and browser exceptions are reported.
Page views and load performance: reported by your users' browsers.
AJAX calls from web pages: rates, response times, and failure rates.
User and session counts.
Performance counters from your Windows or Linux server machines, such as CPU, memory, and network usage.
Host diagnostics from Docker or Azure.
Diagnostic trace logs from your app - so that you can correlate trace events with requests.
Custom events and metrics that you write yourself in the client or server code, to track business events such as items sold or games won.

How does Application Insights work?



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You install a small instrumentation package in your application, and set up an Application Insights resource in the Microsoft Azure portal. The instrumentation monitors your app and sends telemetry data to the portal. (The application can run anywhere - it doesn't have to be hosted in Azure.)

You can instrument not only the web service application, but also any background components, and the JavaScript in the web pages themselves.

In addition, you can pull in telemetry from the host environments such as performance counters, Azure diagnostics, or Docker logs. You can also set up web tests that periodically send synthetic requests to your web service.

All these telemetry streams are integrated in the Azure portal, where you can apply powerful analytic and search tools to the raw data.

Summary

- Metrics provides you an insight into performance and health of your workloads in Azure
- Activity log provides data about operations performed on the resource
- Diagnostic log provides information about operations performed by the resource itself
- Azure Monitoring can be done at Resource Level, Resource Group Level and Enterprise Level

Summary

- Telemetry is an automated communications process by which measurements and other data are collected at remote or inaccessible points and transmitted to receiving equipment for monitoring.
- Application Insights is aimed to help you understand how your app is performing and how it's being used
- Webhook is a way for an app to provide real-time information with other application. It is also called as web callback or an HTTP push API

People matter, results count.

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