

General Descriptions: (Subject to frequent changes)

The Azure portal brings together all of the cloud resources, team members, and life-cycle stages of applications and provides the user with a centralized place to plan, develop, test, provision, deploy, scale, and monitor those applications. Created:060718

Understanding the Azure Hosting: Services, Admin Accounts & Structure, The Ever-Growing TOOL list....

An Azure free account

https://azure.microsoft.com/en-us/free/storage/search/?&OCID=AID2000128_SEM_hxYN1yhJ&lnkd=Bing_Azure_Brand&msclkid=3bf73f6c46da13debee2624fc4c276d9&dclid=ClnA9oDxpeMCFdFnwQod0wMMTA

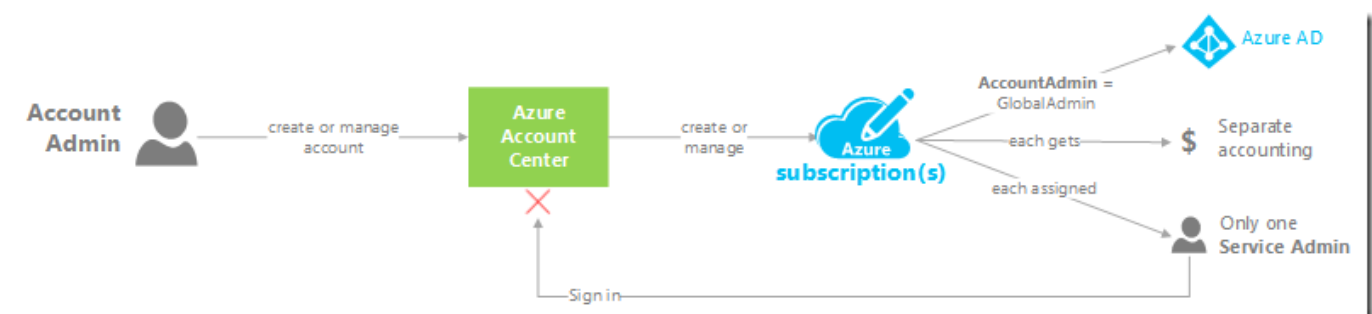
Account (Parent) - can have many Subscriptions

An Azure **account** determines how Azure usage is reported and who the Account Administrator is.

Subscriptions help you organize access to cloud service resources. They also help you control how resource usage is reported, billed, and paid for.

- Each subscription can have a different billing and payment setup, so you can have different subscriptions and different plans by department, project, regional office, and so on.
- Every cloud service belongs to a subscription, and the subscription ID may be required for programmatic operations.
- Each Azure subscription is associated with one Azure Active Directory (AD) directory. Users, groups, and applications from that directory can manage resources in the Azure subscription.

The following graphic depicts the primary role that the Account Administrator plays in creating and managing Azure subscriptions.



Access control in Azure starts from a billing perspective.

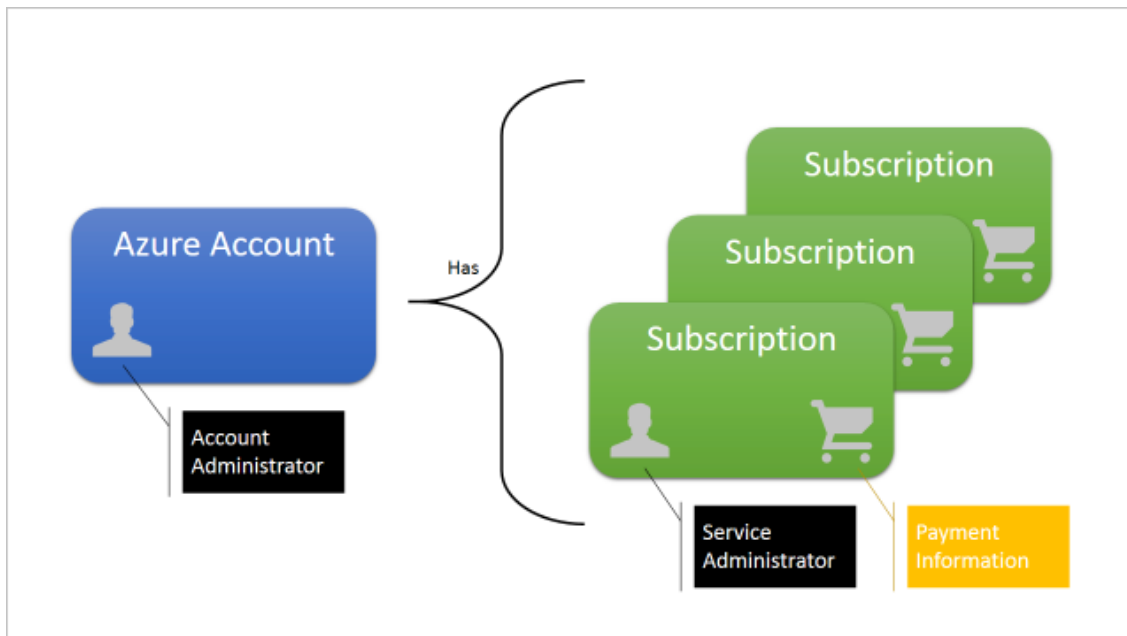
1. The owner of an Azure account, accessed by visiting the [Azure Accounts Center](#), is the Account Administrator (AA).
2. Subscriptions are a container for billing, but they also act as a security boundary:

- a. Each subscription has a Service Administrator (SA) who can add, remove, and modify Azure resources in that subscription by using the [Azure classic portal](#).
3. The default SA of a new subscription is the AA, but the AA can change the SA in the Azure Accounts Center.

There are three kinds of administrator roles in Microsoft Azure:

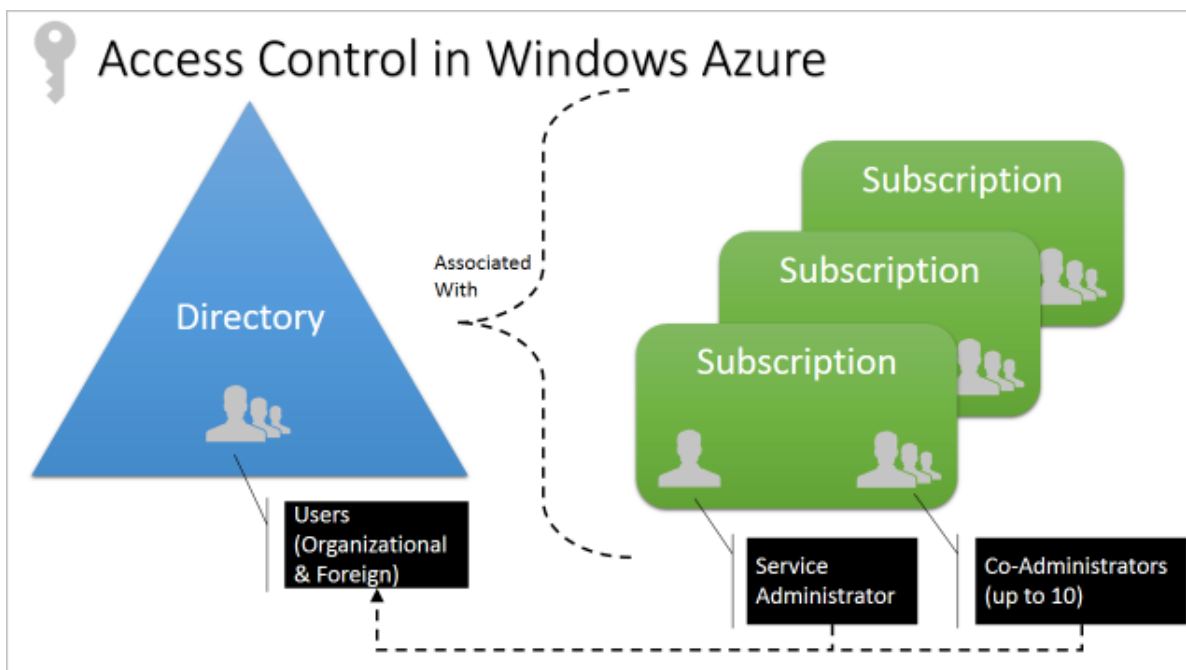
Administrative role	Limit	Description
Account Administrator (AA)	1 per Azure account	This is the person who signed up for or bought Azure subscriptions, and is authorized to access the Account Center and perform various management tasks. These include being able to create subscriptions, cancel subscriptions, change the billing for a subscription, and change the Service Administrator.
Service Administrator (SA)	1 per Azure subscription	This role is authorized to manage services in the Azure portal . By default, for a new subscription, the Account Administrator is also the Service Administrator.
Co-administrator (CA) in the Azure classic portal	200 per subscription	This role has the same access privileges as the Service Administrator, but can't change the association of subscriptions to Azure directories.

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Subscriptions also have an association with a directory.

1. The directory defines a set of users. These can be users from the work or school that created the directory or they can be external users (that is, Microsoft Accounts).
2. Subscriptions are accessible by a subset of those directory users who have been assigned as either Service Administrator (SA) or Co-Administrator (CA);
3. The only exception is that, for legacy reasons, Microsoft Accounts (formerly Windows Live ID) can be assigned as SA or CA without being present in the directory.



The RBAC role that you assign dictates what resources the user, group, or application can manage within that scope.

Role Based Access: <https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-what-is>

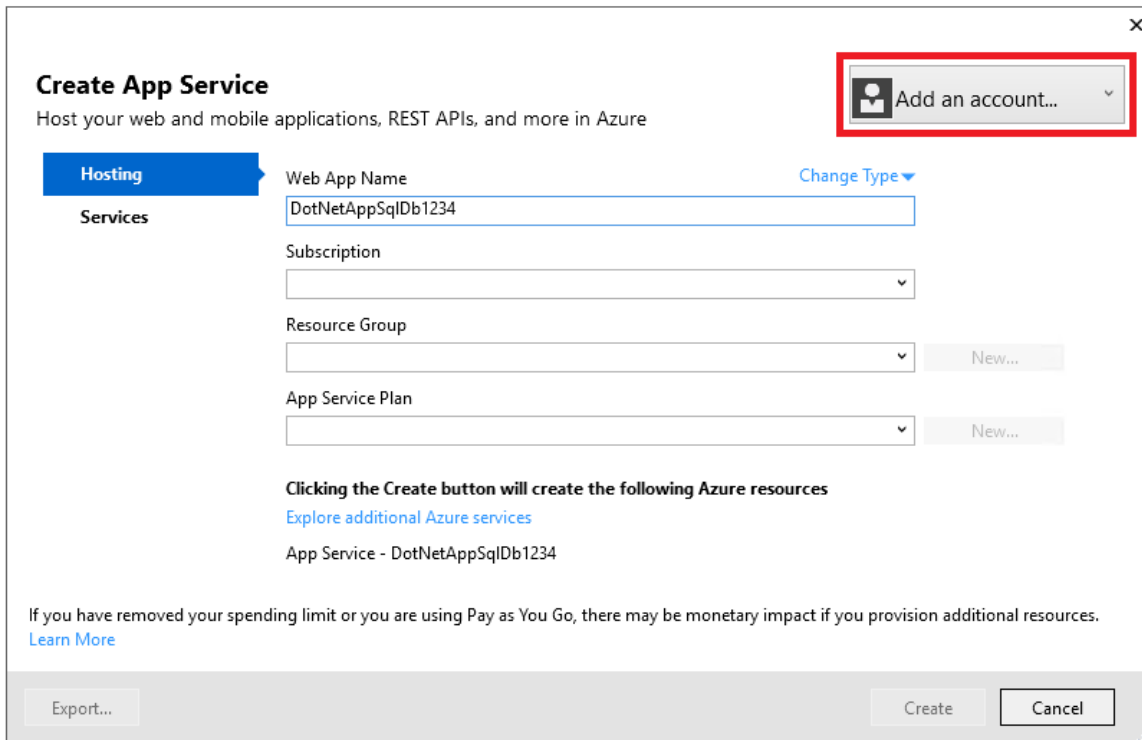
The “Deployment Containers”

Resource Group

- A resource group is a logical container into which Azure resources like web apps, databases, and storage accounts are deployed and managed together.
- Serves as the lifecycle boundary for every resource that's within it.
- A single resource group can have multiple App Service plans.
- Allocate different apps to different physical resources.
- Multiple plans in a single resource group also define an application that spans geographical regions.
- Example:
 - A highly available app running in two regions includes at least two plans, one for each region, and one app associated with each plan.
 - All the copies of the app are then contained in a single resource group.
 - Having a resource group with multiple plans and multiple apps makes it easy to manage, control, and view the health of the application.

App Service Plan: <https://azure.microsoft.com/en-us/pricing/details/app-service/plans/>

- Each App Service plan defines:
 - Region (West US, East US, etc.)
 - Number of VM instances
 - Size of VM instances (Small, Medium, Large)
 - Pricing tier (Free, Shared, Basic, Standard, Premium, PremiumV2, Isolated, Consumption)
- The pricing tier of an App Service plan determines what App Service features you get and how much you pay for the plan. There are a few categories of pricing tiers:
- You can save money when hosting multiple apps by configuring the web apps to share a single App Service plan.



There are two types of services: stateless and stateful.

- Stateless services can store persistent state in an external storage service such as Azure Storage, Azure SQL Database, or Azure Cosmos DB.
- Use a stateless service when the service has no persistent storage at all.
- A stateful service uses Service Fabric to manage your service's state via its Reliable Collections or Reliable Actors programming models

Azure regions – locations of deployed applications or services

Three core areas of the Windows Azure platform:

- Windows Azure (which provides virtual machines and massively-scalable storage through Blobs, Tables, and Queues)
- SQL Azure (which is a large subset of SQL Server), offering a full relational database up to 50GB
- Windows Azure Service Fabric powers many Microsoft services today, including Azure SQL Database, Azure Cosmos DB, Cortana, Microsoft Power BI, Microsoft Intune, Azure Event Hubs, Azure IoT Hub, Dynamics 365, Skype for Business, and many core Azure services.
 - <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-overview>
 - AppFabric (a set of services that you can opt into, currently comprising access control, connectivity, and caching) replaced by Service Fabric

The Service Fabric

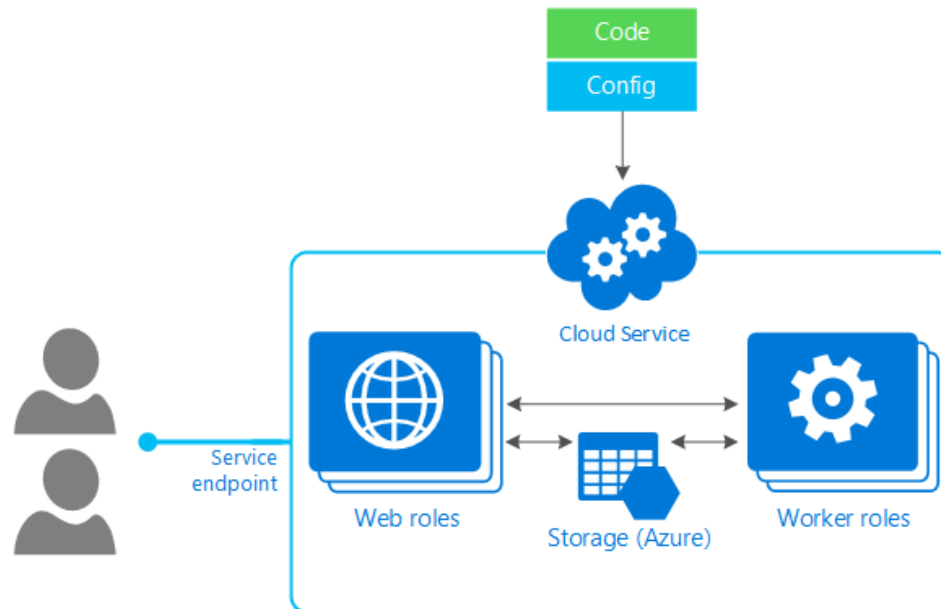
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**Programming models available on Service Fabric:**

1. Reliable Actors
 - a. Are isolated, independent units of compute and state with single-threaded execution and their lifetime is not tied to the in-memory representation. As a result, they do not need to be explicitly created or destroyed.
 - b. <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-reliable-actors-introduction>
2. Reliable Services
 - a. Are out-of-the-box options for stateful or stateless services.
 - b. <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-reliable-services-introduction>
3. Azure Redis Cache
 - a. Is an implementation of the open source Redis cache that runs as a service in an Azure datacenter that provides a caching service that can be accessed from any Azure application whether the application is implemented as a cloud service, a website, or inside an Azure virtual machine.
 - b. Caches can be shared by client applications that have the appropriate access key.
 - c. <https://azure.microsoft.com/en-us/services/cache/>

Cloud Service Role with two varieties: Web Role and Worker Role

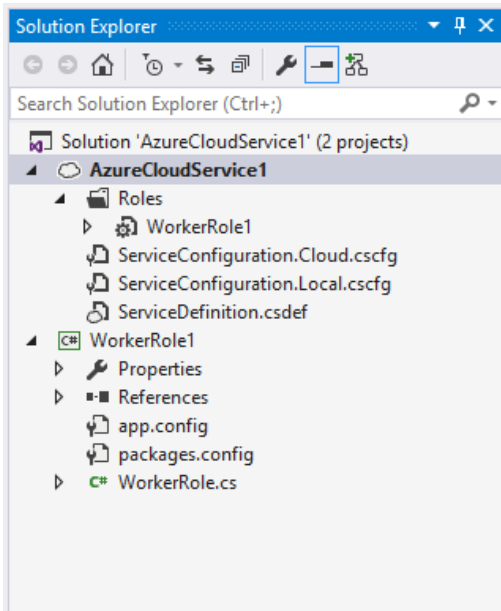
<https://docs.microsoft.com/en-us/azure/cloud-services/cloud-services-choose-me>

**Compute Options****Audience**

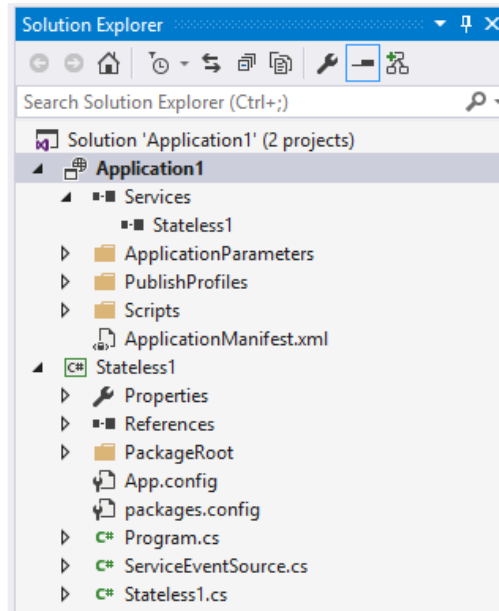
App Service	Scalable Web Apps, Mobile Apps, API Apps, and Logic Apps for any device
Cloud Services	Highly available, scalable n-tier cloud apps with more control of the OS
Virtual Machines	Customized Windows and Linux VMs with complete control of the OS

1. A Cloud Service Role is a collection of managed, load-balanced, Platform-as-a-Service virtual machines that work together to perform common tasks.
 - a. Cloud Service Roles are managed by Azure fabric controller and provide the ultimate combination of scalability, control, and customization
2. Web Role: Automatically deploys and hosts your app through IIS.
3. Worker Role: Does not use IIS and runs your app standalone.
4. The main difference between the two is that a Web Role support and runs Internet Information Services (IIS), while an instance of a Worker Role does not.

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Cloud Services



Service Fabric

Azure Tools:

1. Azure Storage Explorer
 - a. <https://azure.microsoft.com/en-us/features/storage-explorer/>
2. Using the Azure Cloud Shell editor
 - a. <https://docs.microsoft.com/en-us/azure/cloud-shell/using-cloud-shell-editor>
3. What is Azure Data Studio?
 - a. <https://docs.microsoft.com/en-us/sql/azure-data-studio/what-is?view=sql-server-2017>
4. Azure Storage Client Tools (3rd Party)
 - a. <https://docs.microsoft.com/en-us/azure/storage/common/storage-explorers?toc=%2fazure%2fstorage%2fblobs%2ftoc.json>
5. SQL Tools and Utilities for SQL Server, Azure SQL Database, and Azure SQL Data Warehouse
 - a. <https://docs.microsoft.com/en-us/sql/tools/overview-sql-tools?view=sql-server-2017>

General Discussions

6. Azure Storage Documentation
 - a. <https://docs.microsoft.com/en-us/azure/storage/>
7. App Service overview
 - a. <https://docs.microsoft.com/en-us/azure/app-service/overview>
8. API Apps
 - a. <https://azure.microsoft.com/en-us/services/app-service/api/>
9. Container Service Documentation
 - a. <https://docs.microsoft.com/en-us/azure/container-service/>
10. Overview of Azure Service Fabric
 - a. <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-overview>

11. Introducing orchestrators

- a. <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-cluster-resource-manager-introduction#introducing-orchestrators>

Tutorials:

12. Create a Web App

- a. <https://azure.microsoft.com/en-us/get-started/web-app/>

13. Get started with Storage Explorer

- a. <https://docs.microsoft.com/en-us/azure/vs-azure-tools-storage-manage-with-storage-explorer?tabs=windows>

14. Quickstart: Upload, download, and list blobs with the Azure portal

- a. <https://docs.microsoft.com/en-us/azure/storage/blobs/storage-quickstart-blobs-portal>

15. Quickstart: Create a single database in Azure SQL Database using the Azure portal

- a. <https://docs.microsoft.com/en-us/azure/sql-database/sql-database-single-database-get-started>

16. Quickstart: Use the Azure portal's SQL query editor to connect and query data

- a. <https://docs.microsoft.com/en-us/azure/sql-database/sql-database-connect-query-portal>

17. Quickstart: Use Azure Data Studio to connect and query Azure SQL database

- a. <https://docs.microsoft.com/en-us/sql/azure-data-studio/quickstart-sql-database?view=sql-server-2017>

18. Tutorial: Use the Transact-SQL editor to create database objects - Azure Data Studio

- a. <https://docs.microsoft.com/en-us/sql/azure-data-studio/tutorial-sql-editor?view=sql-server-2017>

19. Quickstart: Create a Windows virtual machine in the Azure portal

- a. <https://docs.microsoft.com/en-us/azure/virtual-machines/windows/quick-create-portal>

20. Enable Azure Active Directory Domain Services using the Azure portal

- a. <https://docs.microsoft.com/en-us/azure/active-directory-domain-services/create-instance>

21. Create an ASP.NET Core web app in Azure - *myFirstAzureWebApp*

- a. <https://docs.microsoft.com/en-us/azure/app-service/app-service-web-get-started-dotnet>

22. Tutorial: Create a web API with ASP.NET Core

- a. <https://docs.microsoft.com/en-us/aspnet/core/tutorials/first-web-api?view=aspnetcore-2.2&tabs=visual-studio>

23. How to: Create a Basic WCF Web HTTP Service

- a. <https://docs.microsoft.com/en-us/dotnet/framework/wcf/feature-details/how-to-create-a-basic-wcf-web-http-service>

24. Tutorial: Get started with ASP.NET Core SignalR – Chat

- a. <https://docs.microsoft.com/en-us/aspnet/core/tutorials/signalr?view=aspnetcore-2.2&tabs=visual-studio>

Other Azure Topics

1. **App Service Web App** a fully managed platform that lets you build, deploy, and scale enterprise-grade web apps.

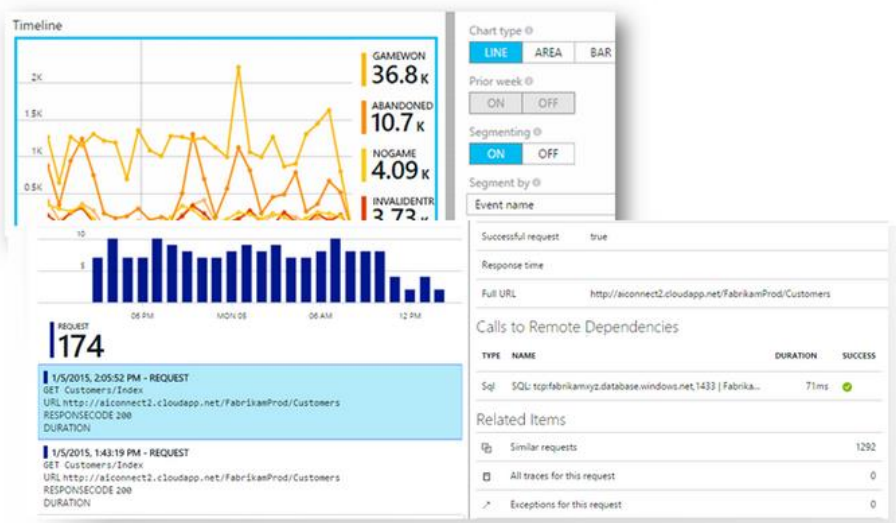
- a. <https://azure.microsoft.com/en-us/documentation/learning-paths/appservice-webapps/>

2. **Fault Analysis Service** is designed for testing services that are built on Service Fabric by inducing meaningful faults and run complete test scenarios against your applications.

- a. <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-testability-overview>

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3. **Azure Service Bus** when you need highly-reliable cloud messaging service between applications and services, even when one or more is offline.
 - a. <https://azure.microsoft.com/en-us/services/service-bus/>
4. **Azure Functions:** <https://docs.microsoft.com/en-us/azure/azure-functions/functions-overview>
 - a. A solution for easily running small pieces of code, or "functions," in the cloud.
 - b. Write just the code you need for the problem at hand, without worrying about a whole application or the infrastructure to run it.
 - c. Functions can make development even more productive, and you can use your development language of choice, such as C#, F#, Node.js, Java, or PHP.
 - d. Pay only for the time your code runs and trust Azure to scale as needed. Azure Functions lets you develop serverless applications on Microsoft Azure.
5. **Cloud Service startup tasks:**
 - a. Perform operations before a role starts. Operations that you might want to perform include installing a component, registering COM components, setting registry keys, or starting a long running process.
 - b. The AppCmd.exe command-line tool can be used to manage IIS settings at startup on Azure.
 - c. <https://docs.microsoft.com/en-us/azure/cloud-services/cloud-services-startup-tasks-common>
6. **SQL Database** is a general-purpose relational database service in Microsoft Azure that supports structures such as relational data, JSON, spatial, and XML.
 - a. <https://docs.microsoft.com/en-us/azure/sql-database/sql-database-technical-overview>
7. **Storage**
 - a. Blob storage
 - b. Azure Files
 - c. Queue storage
 - d. Table storage
 - e. Disk storage
 - f. <https://docs.microsoft.com/en-us/azure/storage/common/storage-introduction>
8. **Application Insights** is an extensible Application Performance Management (APM) service for web developers on multiple platforms. Use it to monitor your live web application.



a.

It monitors:

- b. 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.
- c. Dependency rates, response times, and failure rates - Find out whether external services are slowing you down.
- d. 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.
- e. Page views and load performance - reported by your users' browsers.
- f. AJAX calls from web pages - rates, response times, and failure rates.
- g. User and session counts.
- h. Performance counters from your Windows or Linux server machines, such as CPU, memory, and network usage.
- i. Host diagnostics from Docker or Azure.
- j. Diagnostic trace logs from your app - so that you can correlate trace events with requests.
- k. 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.
- l. <https://docs.microsoft.com/en-us/azure/application-insights/app-insights-overview>

9. Azure Product List

- a. By Alpha: <https://azure.microsoft.com/en-us/services/?sort=alpha>
- b. By Region: <https://azure.microsoft.com/en-us/regions/services/>

Resources

- 1. Introducing Microsoft Azure: <https://docs.microsoft.com/en-us/azure/fundamentals-introduction-to-azure>
- 2. Azure Web Apps - video 5mins: <https://docs.microsoft.com/en-us/azure/app-service-web/app-service-web-overview>
 - a. Azure App Service Plans: <https://docs.microsoft.com/en-us/azure/app-service/azure-web-sites-web-hosting-plans-in-depth-overview>
- 3. Overview of Azure Service Fabric- video 1.5 mins: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-overview>
 - a. Service Fabric – Big Picture: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-content-roadmap>
- 4. Role Based Access: <https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-what-is>
- 5. Azure Service Fabric application model: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-application-model>
- 6. Guest executable: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-deploy-existing-app>
- 7. Reliable Actors: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-reliable-actors-introduction>
- 8. Reliable Services: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-reliable-services-introduction>

9. Azure Redis Cache: <https://docs.microsoft.com/en-us/azure/architecture/best-practices/caching>
10. Azure SQL Database service: <https://docs.microsoft.com/en-us/azure/sql-database/sql-database-technical-overview>
11. An introduction to Azure Functions: <https://docs.microsoft.com/en-us/azure/azure-functions/functions-overview>

Lab that overviews Publishing to Azure

12. To Do List: Build an ASP.NET app in Azure with SQL Database: <https://docs.microsoft.com/en-us/azure/app-service-web/app-service-web-tutorial-dotnet-sqldatabase>

And other related discussions:

1. Continuous Integration and Continuous Deployment (CI/CD) – DOCKER
 - a. <https://www.docker.com/solutions/cicd>
2. Introduction To CI/CD
 - a. <https://www.mabl.com/blog/what-is-cicd>
3. Scale out not UP – Virtual Machine strategy...
 - a. <https://www.slideshare.net/randybias/architectures-for-open-and-scalable-clouds/20>

GitHub Windows Shell

4. TortoiseGit provides overlay icons showing the file status, a powerful context menu for Git
 - a. <https://tortoisegit.org/>