WebJobs & Azure Functions in modern and Serverless applications

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Microsoft CERTIFIED Professional

MVP Microsoft Most Valuable Professional

Goals

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- What, when and how to use the “Functions” programming model
- WebJobs Overview
- Serverless Computing
- Azure Functions Overview

What is the Functions programming model?

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- Function as the unit of work
- Functions start, execute and finish
- Functions have inputs and outputs

```
public async static Task ProcessQueueMessageAsyncCancellationToken(
    [QueueTrigger("blobcopyqueue")] string blobName,
    [Blob("textblobs/{queueTrigger}",FileAccess.Read)] Stream blobInput,
    [Blob("textblobs/{queueTrigger}-new",FileAccess.Write)] Stream blobOutput,
    CancellationToken token)
{
    await blobInput.CopyToAsync(blobOutput, 4096, token);
}
```

Best Practices

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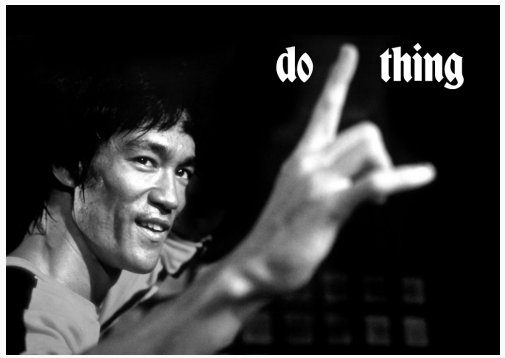
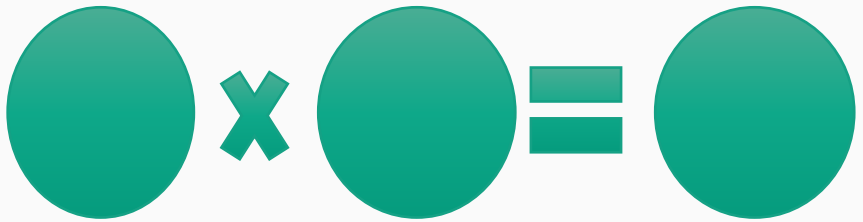
Functions *should:*

- do one thing
- be idempotent
- finish as quickly as possible





How and when to use them?

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Questions:

1. What is that you want to do?
2. What triggers the function?
3. Do I need additional data?
4. Is there output I should produce?

Conclude:

“When __, get __, do __, and output __”.

Azure WebJobs

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"Azure WebJobs provide an easy way to run scripts or programs, on demand, continuously or on a schedule, as background processes on App Service Web Apps."

WebJobs SDK provide bindings and trigger system which works with Storage Blobs, Queues, Tables, Service Bus.

WebJobs Extensions

WebJobs Demo

Serverless Computing

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“Serverless architectures refer to applications that significantly depend on third-party services (knows as Backend as a Service or "BaaS") or on custom code that's run in ephemeral containers (Function as a Service or "FaaS")”

Martin Fowler

Benefits

- Reduced Operational & Development Costs
- Fast and easy Scaling
- Reduced Packaging & Deployment Complexity
- Easy scheduling & event processing
- Reduced time to market / Experimentation

Drawbacks

- Vendor control
- Execution Duration
- Unit Testing
- Limited Tooling

Azure Functions

Process events with serverless code

- Develop in any language C#, node.js, F#, Python…
- Schedule event-driven tasks easily
- Expose Functions as Http API endpoints
- Pay only for what you use
- Scale Functions based on demand

Azure Functions Architecture

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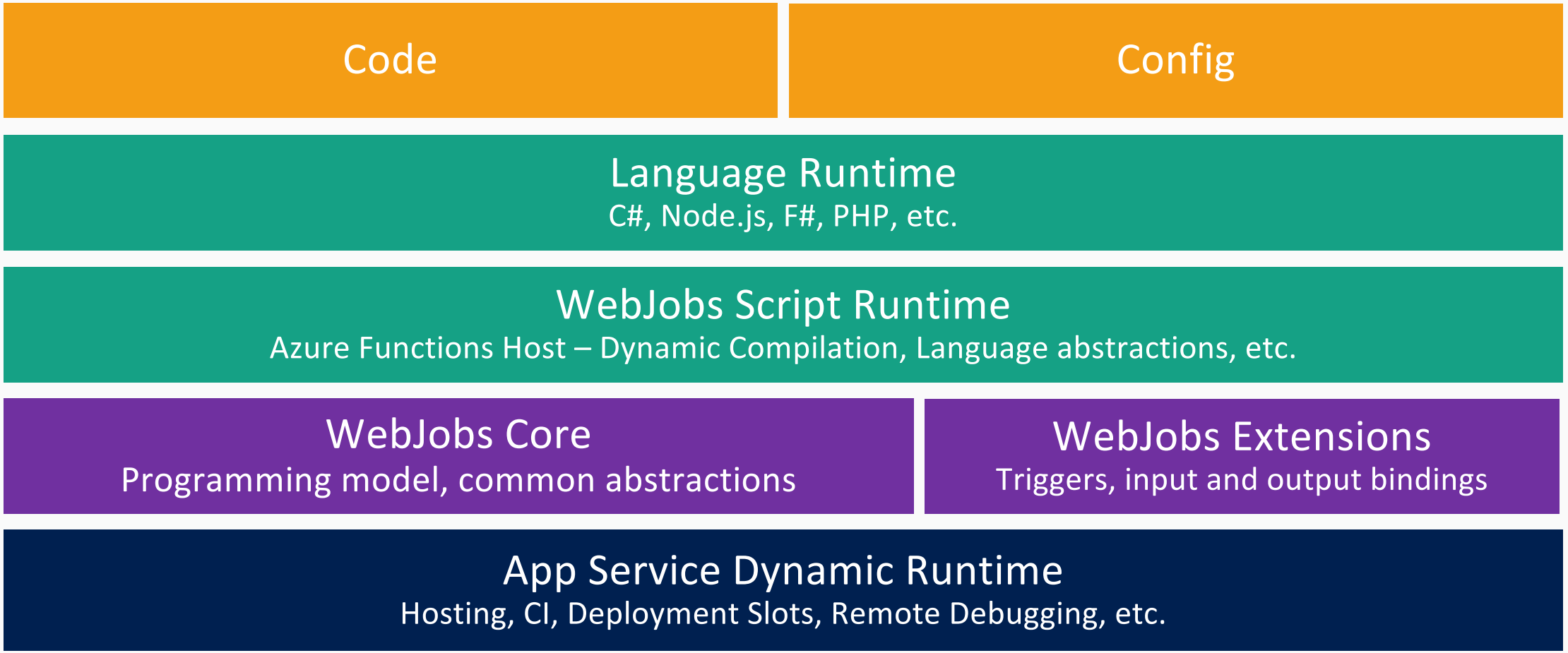
Built on top of App Service & WebJobs SDK



Azure Functions Platform & Pricing

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Dedicated & Dynamic Tiers

Dedicated

- Basic, Standard, Premium App Service Tiers
- Pay based on # of **reserved VMs**
- **You** are responsible for scaling

Dynamic

- Pay based on # of **executions**
- **Platform** responsible for scaling
- Limits

Pricing

(Reserved Memory × Duration) + Number Of Executions = xxx (GB-s)

Execution Time	=	(1,536/1,024	*	2,000,000 - 400,000)	*	€0.000007	=	€17.54
		Function Memory Size converted to GB's		Total Execution time – 400,000 Free Grant		Regional Cost		Monthly Execution Time Cost
Requests	=	(2,000,000-1,000,000)	/	1,000,000	*	€0.16866	=	€0.17
		Total Execution count minus free grant				Price per million Executions		Monthly Execution Cost

Azure Functions

WebJobs vs Azure Functions

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Common Points

- Same “Functions” Programming model
- Support bindings for triggers/inputs/outputs
- WebJobs SDK extensions model
- External libraries support
- Can run locally and be debugged
- Both provide runtime telemetry via Dashboard

WebJobs vs Azure Functions

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Programming model differences

WebJobs

- Attributes for configuring bindings
- Traditional .NET developer experience (Visual Studio, NuGet, MSBuild)
- Many functions per class
- Can access and manipulate many core SDK features
- Can’t listen for HTTP requests*

Azure Functions

- C#, Node.js, F#, Python
- Config files for bindings
- Diverse development (Azure Portal, VS Code)
- Supports HTTP

WebJobs vs Azure Functions

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Hosting model differences

WebJobs

- Supports Host configuration
- Build a console app
- **You** manage scaling
- Runs the service in the background of Web/Mobile/API app
- Runs any console app (not just SDK based ones)

Azure Functions

- Limited control over the host
- Just give it your code/config
- Function app owns the whole host
- Scale is managed **for you**
- Only runs Azure Functions stuff – no other things

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Thank You

https://azure.microsoft.com/en-us/documentation/articles/websites-webjobs-resources/
https://azure.microsoft.com/en-gb/services/functions/
www.azureheads.gr
www.ppolyzos.com

Supported Bindings

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Type	Service	Trigger	Input	Output
Schedule	Azure Functions	✔		
HTTP (REST or WebHook)	Azure Functions	✔		✔
Blob Storage	Azure Storage	✔	✔	✔
Queues	Azure Storage	✔		✔
Tables	Azure Storage		✔	✔
Tables	Azure Mobile Apps Easy Tables		✔	✔
No-SQL DB	Azure DocumentDB		✔	✔
Streams	Azure EventHubs	✔		✔
Push Notifications	Azure Notification Hubs			✔
SaaS	Twillio, SendGrid (experimental)			✔