Online Meeting Rules

- If not muted, mute yourself.
- Ask your questions in the chat window.
- Use mic if you are explicitly asked.
- If you want to show something, we will make you be a presenter
- If you like you can activate your camera. We love to see you all ☺
- Please do not spam the chat window.
- Do not post inappropriate content.
- Have a fun. ☺

Azure Meetup

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2021

Modern Serverless Applications with Azure Durable Functions and Azure Container Instances

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AGENDA

- Azure Functions
- Durable Functions
- ACI/Docker
- Durable Entities

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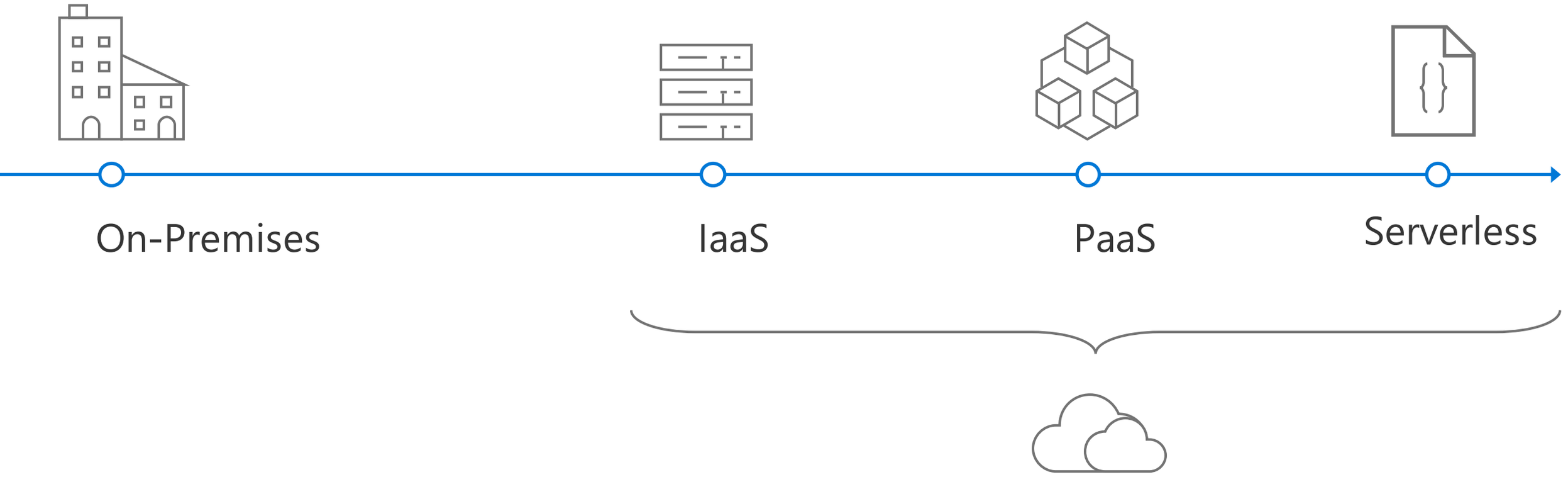
Azure Functions

Platform Evolution
Serverless

The “evolution” of application platforms



What is Serverless?

Abstraction of servers

Event-driven/ instant scale

Micro-billing

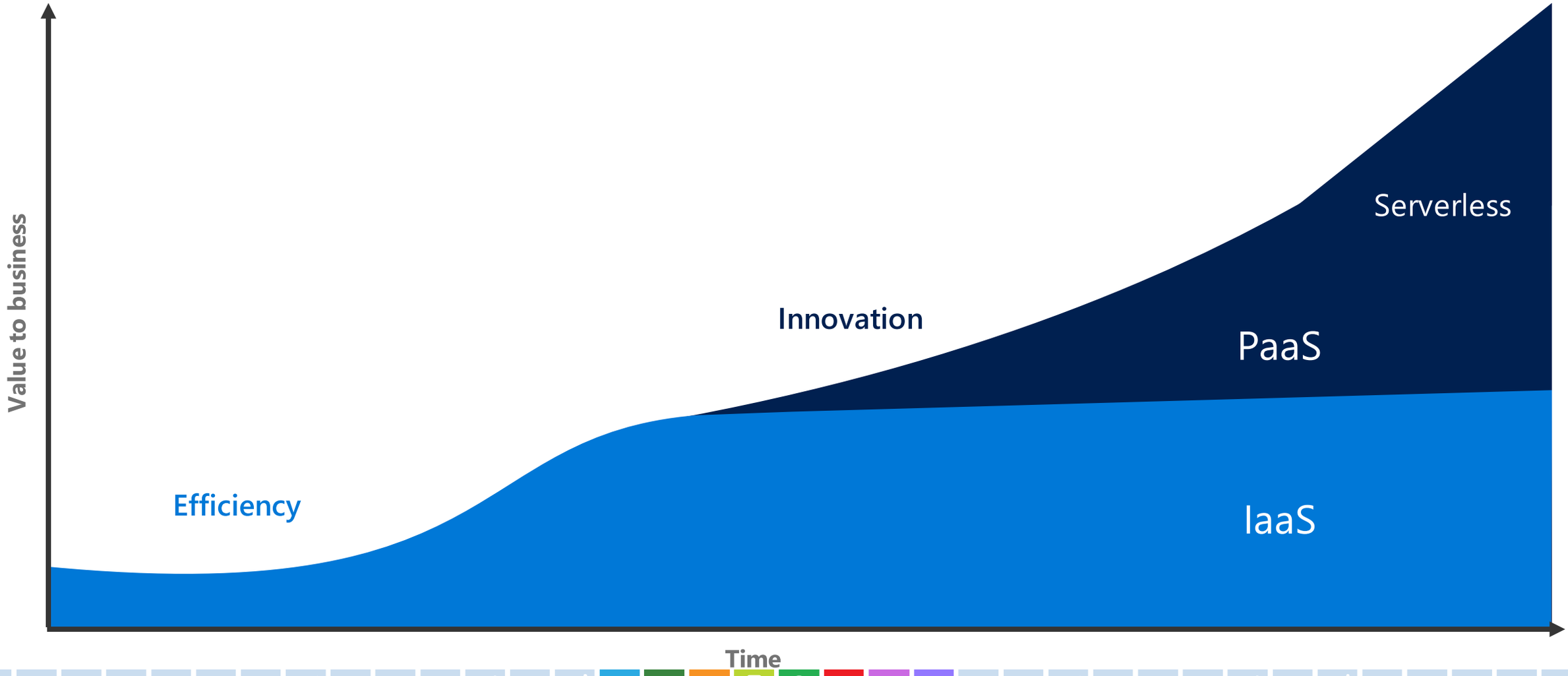
Benefits of Serverless

Reduced DevOps

Focus on business logic

Faster time to market

Build apps faster with Serverless

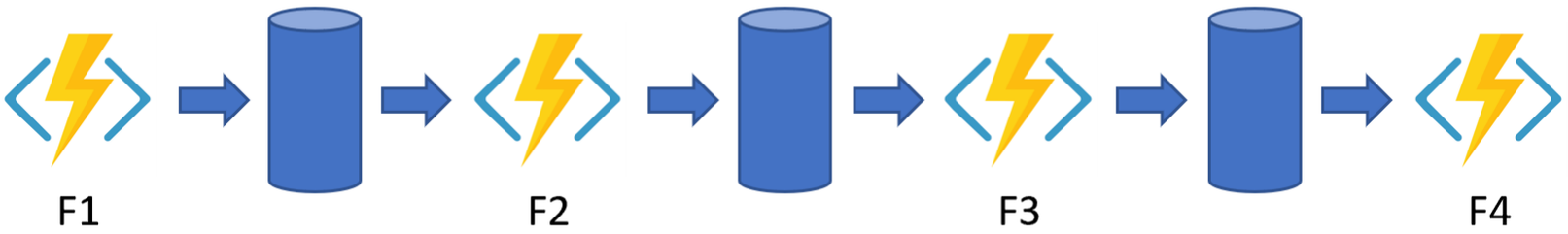


Azure Durable Functions

Serverless
Stateful
Long-running
Development
Deployment
Monitoring

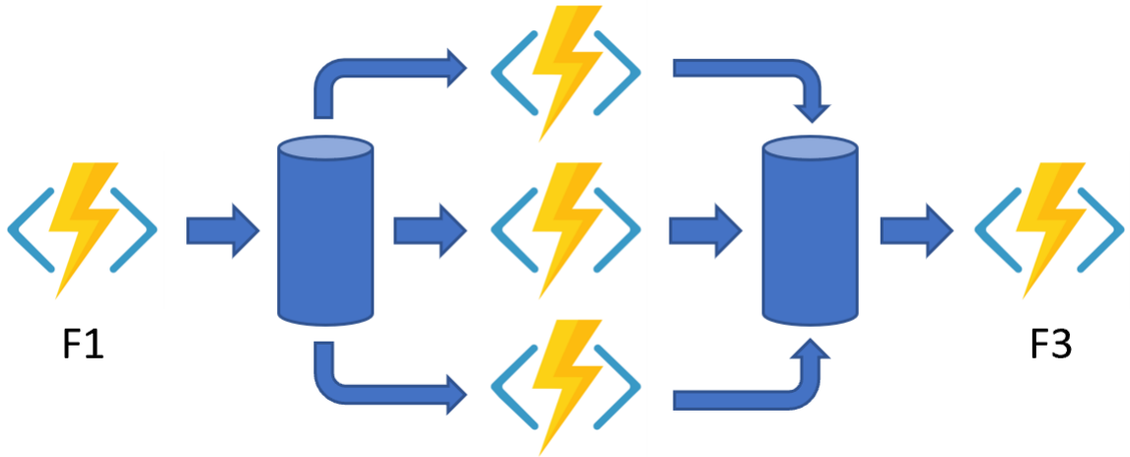
Job Sequence

```
[FunctionName("Function1")]
public static async Task<List<string>> RunOrchestrator1(
[OrchestrationTrigger] IDurableOrchestrationContext context)
{
            var outputs = new List<string>();

           outputs.Add(await context.CallActivityAsync<string>("ExecuteJob", “Arg1"));
            outputs.Add(await context.CallActivityAsync<string>("ExecuteJob", “Arg2"));
            outputs.Add(await context.CallActivityAsync<string>("ExecuteJob", “Arg3"));


            return outputs;
}
```

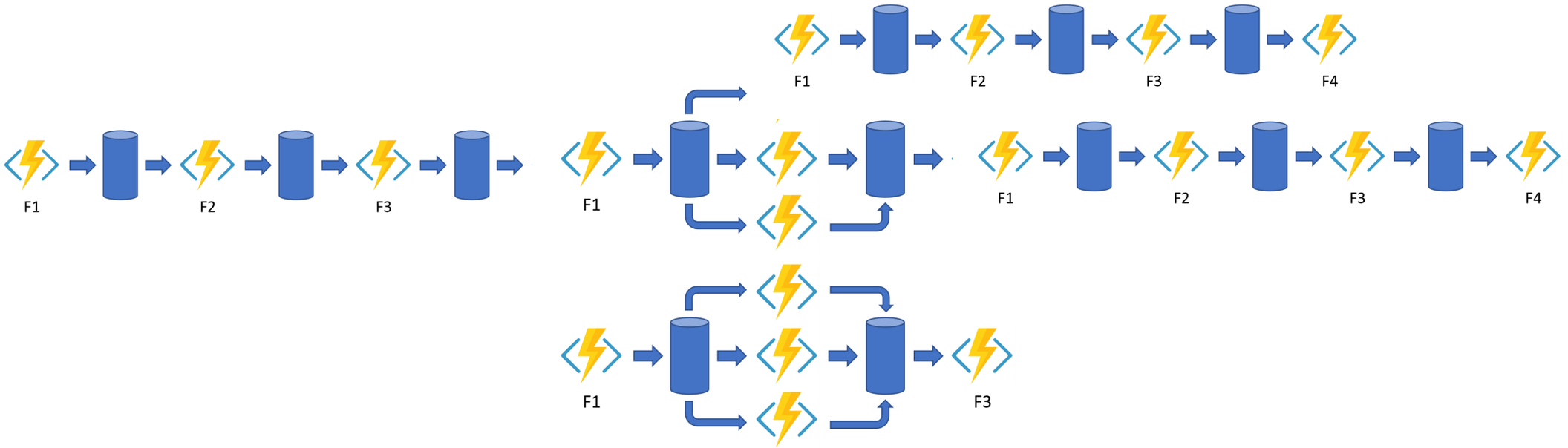


Fan-out Fan-In

```
[FunctionName("Function2")]
 public static async Task<List<string>> RunOrchestrator2(
 [OrchestrationTrigger] IDurableOrchestrationContext context)
 {
            var tasks = new Task<string>[3];

            var outputs = new List<string>();

            // Replace "hello" with the name of your Durable Activity Function.
            tasks[0] = context.CallActivityAsync<string>("ExecuteJob", “Arg1");
            tasks[1] = context.CallActivityAsync<string>("ExecuteJob", “Arg2");
            tasks[2] = context.CallActivityAsync<string>("ExecuteJob", “Arg3");

            await Task.WhenAll(tasks);

            outputs.Add(tasks[0].Result);
            outputs.Add(tasks[1].Result);
            outputs.Add(tasks[2].Result);

            return outputs;
}
```



Even more crazy ☺



Azure Durable Functions Recap

- Long Running
- Stateful
- Create in VS
- Sequence, fan-in, fan-out and crazy patterns
- Deployment to Azure
- Can run anywhere (On-Prem)
- Can run in docker

Azure Container Instances

Create Docker Image
Push image to registry
Run in ACI

Create docker image

```
> docker login -u name -p *** name.azurecr.io
```

```
> docker tag dockerconsole:bla damir.azurecr.io/dockerconsole:latest
```

```
> docker push name.azurecr.io/dockerconsole:latest
```

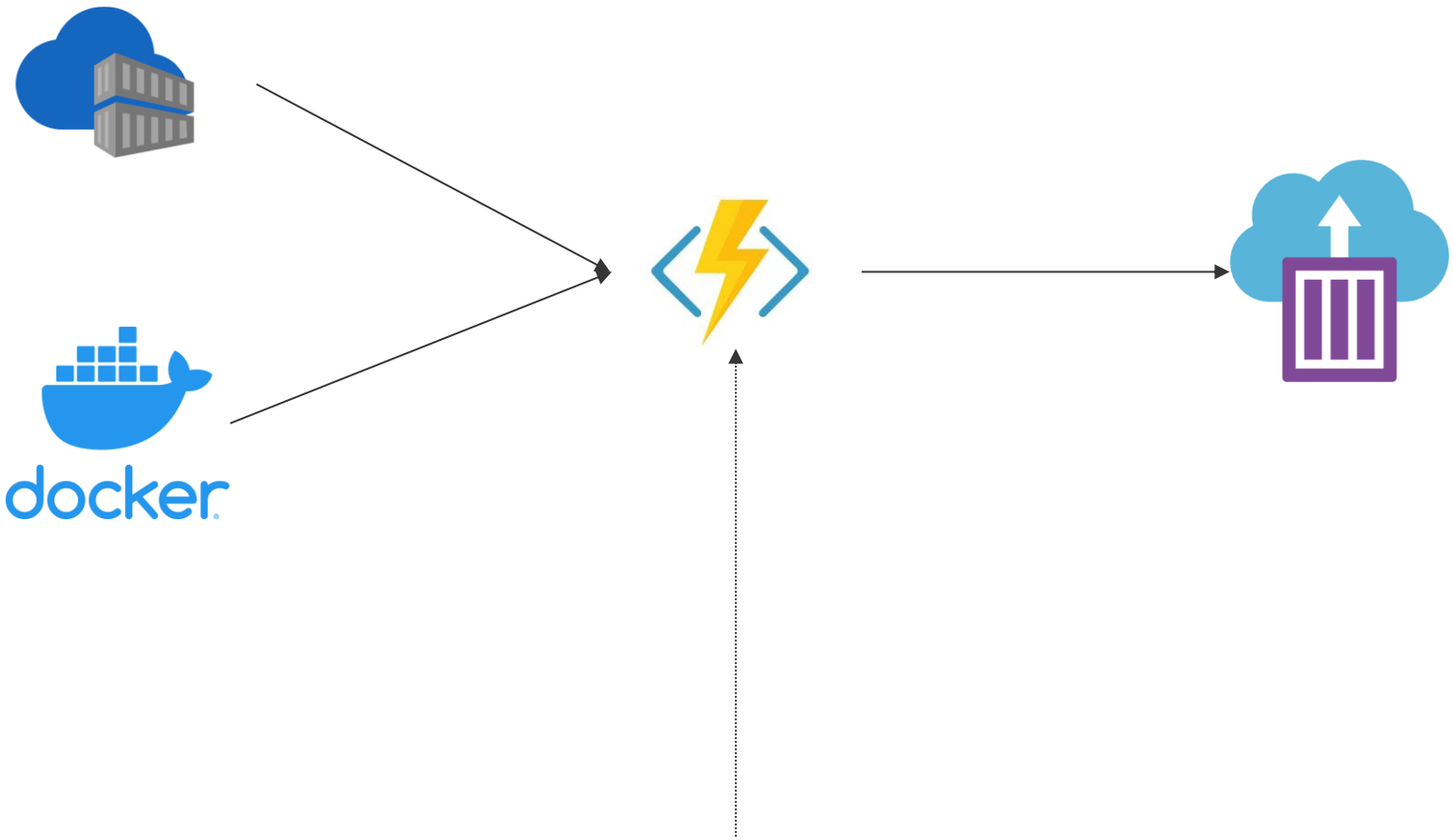
Run image in ACI

```
az container create
--resource-group RG-DURABLEDELME --name name
--cpu 4 --memory 6
--image damir.azurecr.io/dockerconsole:latest
--registry-username username --registry-password “***”
--restart-policy Never
--environment-variables Arg1="ENV1" Arg2="ENV2"
```

Deploy Image from the Azure Function

Image is already published to registry
Write code to deploy image
Write code to track image execution

Deploying Docker Images



Nuget package: **Microsoft.Azure.Management.Fluent**

Create the Principal for Deployment

```
az ad sp create-for-rbac -n "principalname"
--role owner
--scopes subscriptions/$subscriptionId/resourceGroups/$rg
```

References

- Durable Functions
  - https://docs.microsoft.com/en-us/users/register?redirectUrl=https%3A%2F%2Fdocs.microsoft.com%2Fen-us%2Fazure%2Fazure-functions%2Fdurable%2Fdurable-functions-overview%3Ftabs%3Dcsharp
- Netherite Backend

  https://github.com/microsoft/durabletask-netherite
- SQL Backend
- https://github.com/microsoft/durabletask-mssql
- Learn Azure with us
  - https://www.gfu.net/seminare-schulungen-kurse/cloud-computing_sk102/azure-fuer-entwickler-und-architekten_s2290.html
- Demos
  - ddobric/azureglobal2021: Demo from Azure Global 2021 (github.com)

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