



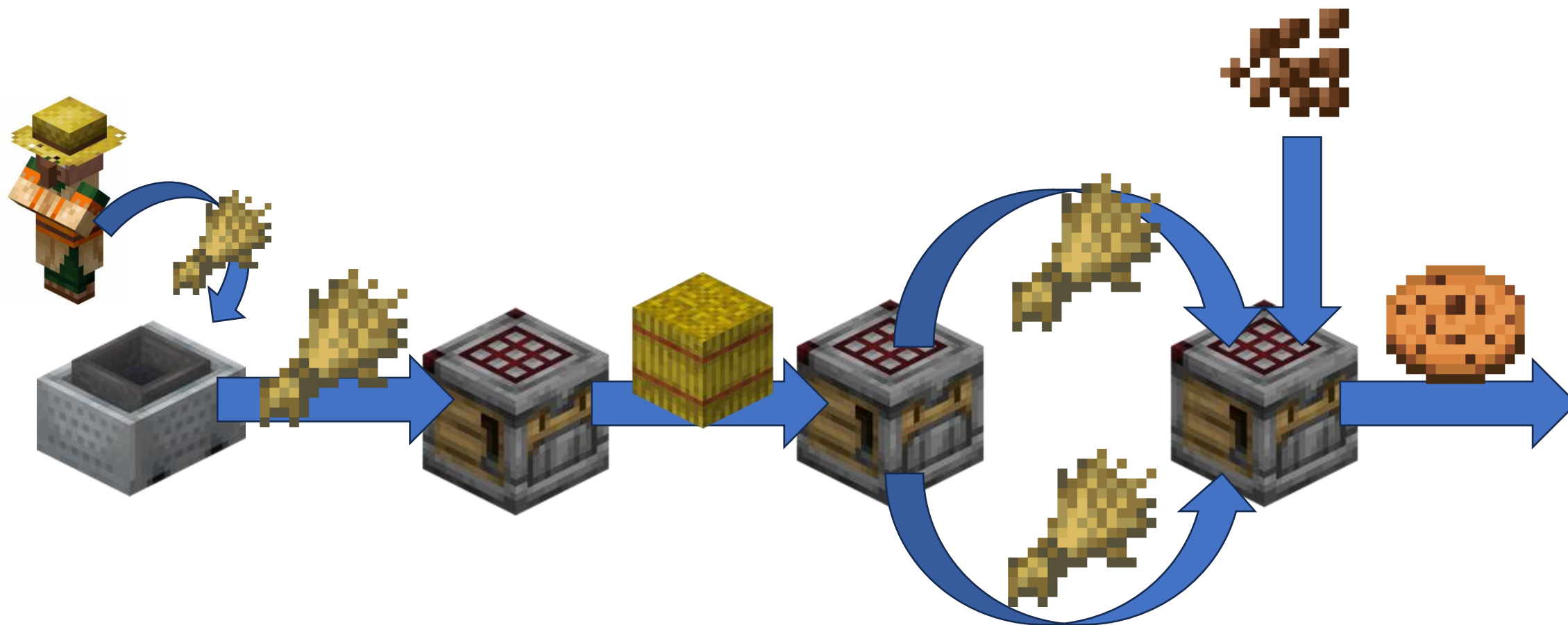
Monitora la tua farm di Minecraft con i Servizi Gratuiti di Azure

Nicola Paro





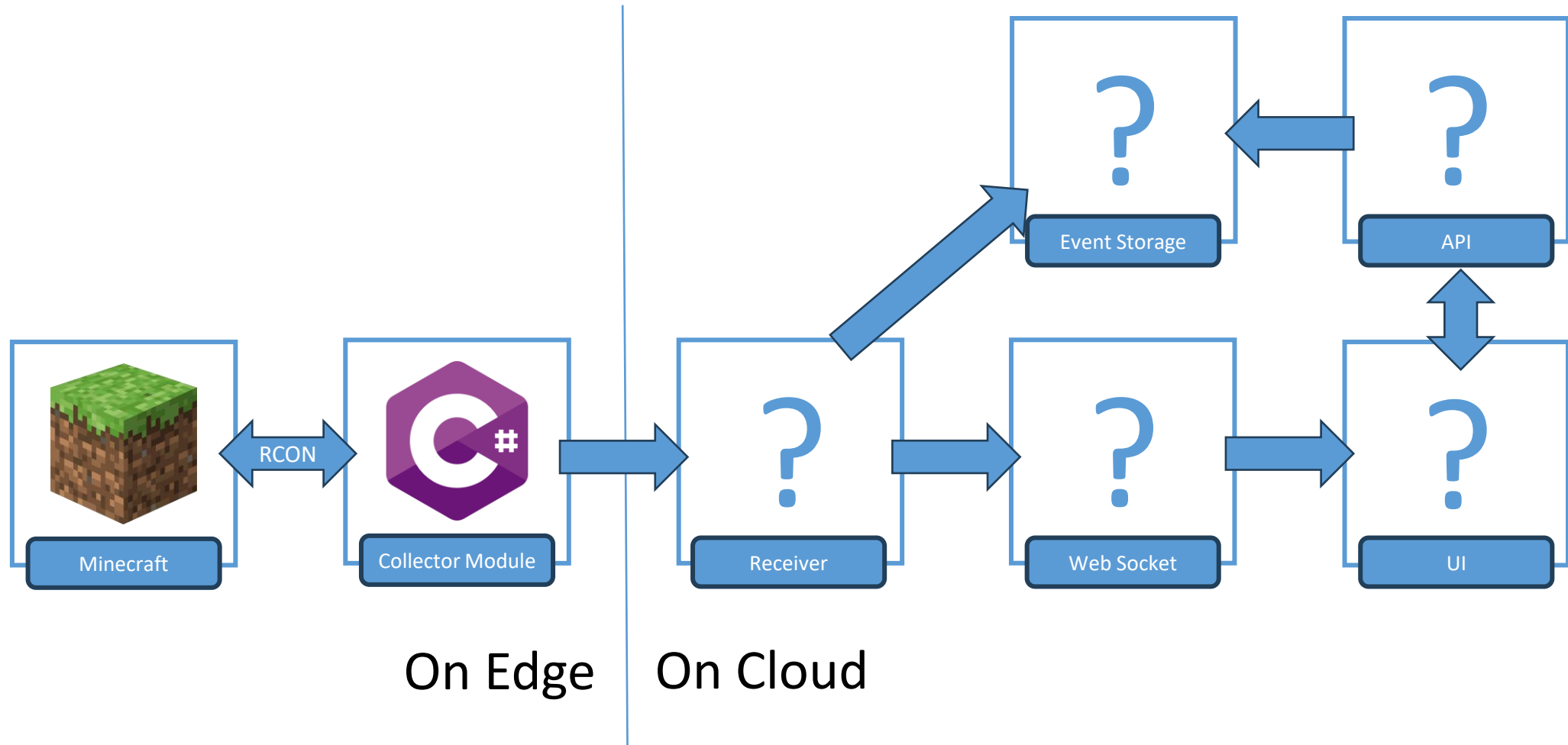
A Real life story



[illegible]

<https://azure.microsoft.com/en-us/pricing/free-services>

Monitoring Platform Overview



Monitoring Platform – Event Storage

- Deve persistere gli eventi dell'impianto produttivo per poterli successivamente interrogare
- Deve permettere analitiche in modo semplice



Cosmos DB

- Database gestito sia NoSQL che relazionale
- Globalmente distribuito, altamente responsive e sempre online
- Puoi usare l'API che preferisci

NoSQL

MongoDB

Apache
Cassandra

Apache
Gremlin

Table

PostgreSQL

- Free Tier: Max throughput 1000 RU/s + 25 GB storage

Azure SQL

- Database relazionale totalmente gestito
- Costituito sullo stesso engine di SQL Server
- Free Tier con 100,000 secondi * vCore e 32GB di storage limit al mese **per sempre**
 - Puoi scegliere di metterlo in auto-pause quando il limite è raggiunto
 - Oppure continuare ad utilizzarlo e pagare solamente per la parte extra

Azure

- Datab
- Costri

- Free T
- per se

- Puc
- Op

nte gesti
di SQL S

i * vCore

to-pause

il mese



Cost summary

General Purpose (GP_Gen5_2)	
Cost per vCore (in EUR) ¹	114.41
vCores selected	x 2
<hr/>	
Cost per GB (in EUR)	0.13
Max storage selected (in GB)	x 41.6
<hr/>	
ESTIMATED COST / MONTH	234.16 EUR

NOTES

¹ The dev/test discount has been automatically applied for your selected subscription. [Learn more](#)

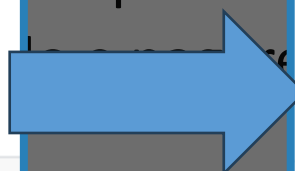


Cost summary

General Purpose (GP_S_Gen5_2)	
Cost per GB (in EUR)	0.00
Max storage selected (in GB)	x 41.6
<hr/>	
💜 First 32 GB storage free	
💜 First 100,000 vCore seconds free	
<hr/>	
Overage billing ¹	Disabled
<hr/>	
ESTIMATED STORAGE COST / MONTH	0.00 EUR
COMPUTE COST / VCORE SECOND ²	0.000000 EUR

¹ There will be no charges for usage within the free limits. The database will be paused automatically when the free limits are reached.

² Serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization. [Learn more about serverless billing](#)



Monitoring Platform – Event Storage

Cosmos o SQL ?



Monitoring Platform – Event Storage

Cosmos o SQL ?



Monitoring Platform – Web Socket

- Deve notificare gli eventi dell'impianto al frontend per garantire un rapido intervento



Azure SignalR & Web PubSub

Pensati per applicazioni che richiedono dati in tempo reale

High
frequency
updates

Live
dashboards e
monitoring

Cross-
platform live
chat

Real-time
location on
map

Real-time
targeted ads

Collaborative
apps

Push
notifications

Real-time
broadcasting

IoT

Automation

Azure SignalR vs Web PubSub



- Stai già usando SignalR
- Esiste un client SignalR nel linguaggio scelto
 - Clients supportati da MS:

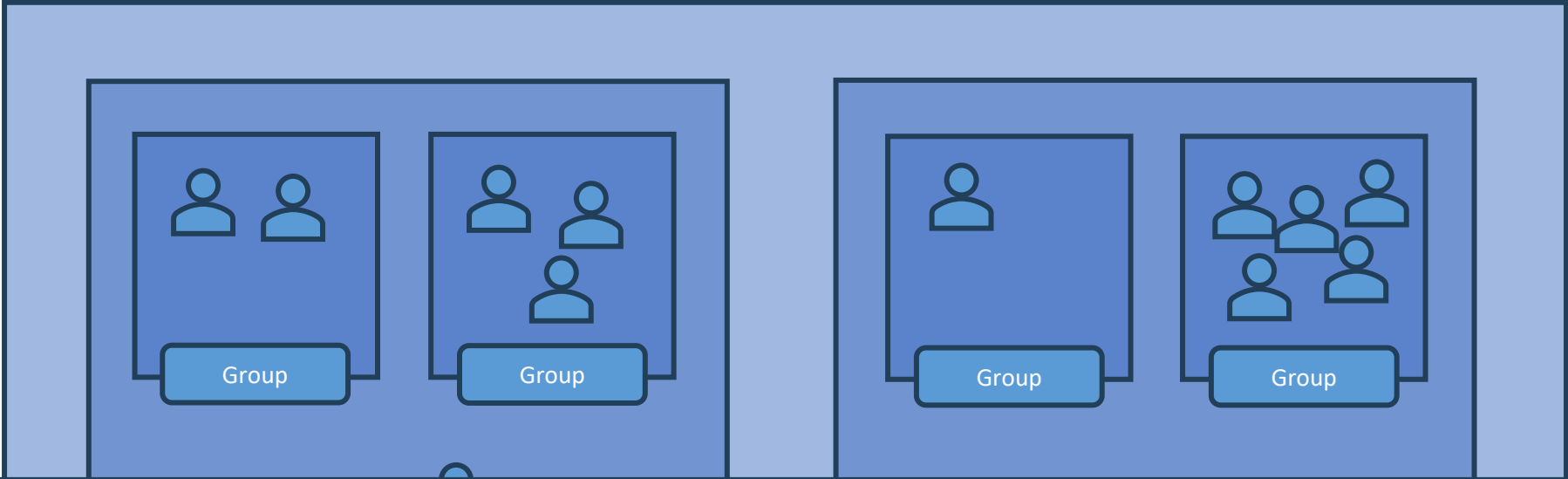


- Hai necessità di più protocolli di trasporto
 - WebSocket
 - Server sent events
 - Long polling



- Hai bisogno solo di WebSocket
- Subprotocollo custom over WebSocket
 - MQTT over WebSocket
 - AMQP over WebSocket
- È sufficiente un'infrastruttura «lite» per la tua applicazione

Inside Azure Web PubSub



The diagram illustrates the Azure Web PubSub architecture. It shows two main hubs, each represented by a large blue rectangle. Inside each hub, there are two smaller blue rectangles representing groups. Each group contains user icons (blue circles with black outlines) and a label 'Group' in a blue box. The left hub contains two groups: the first has two users and the second has three users. The right hub also contains two groups: the first has one user and the second has four users.

Client URL Generator

Hub *

User ID

Token Lifetime (Minutes) *

Select Sign Key ☒ Primary ☐ Secondary

Roles

☒ Send To Groups

☒ Allow Sending To All Groups

☐ Allow Sending To Specific Groups

☒ Join/Leave Groups

☒ Allow Joining/Leaving All Groups

☐ Allow Joining/Leaving Specific Groups

Client Access URL

Sending Data with Azure Web PubSub

- ServiceClient C#









Azure.Messaging.WebPubSub

- AzFunction Bindings

Microsoft.Azure.WebJobs.Extensions.WebPubSub

```
[FunctionName(nameof(EventNotifier))]  
public static async Task NotifyEventAsync(  
    [ServiceBusTrigger("%TopicName%", "%SubscriptionName%", Connection = "ServiceBusConnectionString")] string rawpayload  
    , [WebPubSub(Hub = "alarms", Connection = "WebPubSubConnectionString")] IAsyncCollector<WebPubSubAction> alarms  
    , ILogger log  
)  
{  
    var payload = Payloads.DeserializePayload(rawpayload);  
  
    if (payload is null)  
        return;  
  
    if (payload is AlarmPayload)  
    {  
        await alarms.AddAsync(WebPubSubAction.CreateSendToAllAction(rawpayload));  
        await alarms.FlushAsync();  
    }  
}
```


Azure SignalR & Web PubSub Pricing

Pricing tier	<input checked="" type="radio"/> Free For individual dev/test	<input type="radio"/> Standard For production workloads	<input type="radio"/> Premium(Preview) For production workloads with more supported features
Features			
 Connections	Up to 20 connections	1,000 connections/unit	1,000 connections/unit
 Included Messages	20,000/Day	1,000,000/Unit/Day	1,000,000/Unit/Day
 Additional Messages	-	Unlimited	Unlimited
 SLA	-	99.9%	99.95%
 SSL	✓	✓	✓
 Autoscale ⓘ	-	-	✓
 Availability Zone ⓘ	-	-	✓ (In supported regions) ↗
 Custom Domains	-	-	✓
Pricing			
Estimated Price	-	41.41 EUR/Month/Unit	51.44 EUR/Month/Unit
Additional Message Costs ⓘ	-	0.84 EUR per million messages	0.84 EUR per million messages

Monitoring Platform – Web Socket

Web Pub Sub o SignalR?



Monitoring Platform – Web Socket

Web Pub Sub o SignalR?



Monitoring Platform - Receiver

- Deve ricevere degli eventi sporadici dall'impianto produttivo
- Deve persistere questi eventi sull'Event Storage
- Deve notificare via WebSocket ogni evento

```
[FunctionName("ReceiverFunction")]
public static async Task<IActionResult> Run(
    [HttpTrigger(AuthorizationLevel.Function, "post", Route = null)] HttpRequest req,
    [WebPubSub(Hub = "CookieFactoryEvents", Connection = "WebPubSubConnectionString")] IAsyncCollector<WebPubSubAction> pubsub,
    [Sql("CookieFactoryEvents", "SqlConnectionString")] IAsyncCollector<CookieFactoryEvent> database,
    ILogger log)
{
    string requestBody = await new StreamReader(req.Body).ReadToEndAsync();
    var cloudEvent = JsonSerializer.Deserialize<CloudEvent>(requestBody);
    await pubsub.AddAsync(WebPubSubAction.CreateSendToAllAction(requestBody));
    await pubsub.FlushAsync();

    var cookieFactoryEvent = cloudEvent.Data.Deserialize<CookieFactoryEvent>();
    await database.AddAsync(cookieFactoryEvent);
    await database.FlushAsync();

    return new OkResult();
}
```

Azure Functions Free grant

- Solamente con **Consumption Plan** in sottoscrizioni **Pay As You Go**
- Fino a 400.000 GBs ed 1 milioni di invocazioni
- Oppure le posso hostare in un AppServicePlan free
- Nonostante abbiano il free grant, le Azure Functions richiedono sempre lo **Storage Account** per funzionare (che non è gratuito)

Monitoring Platform - Receiver

Azure Functions o Azure Functions ?



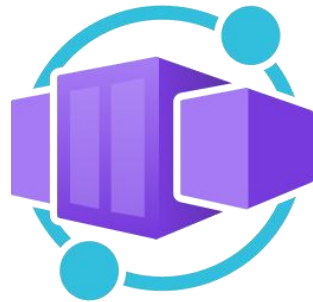
Monitoring Platform - Receiver

Azure Functions o Azure Functions ?



Monitoring Platform - API

- Deve leggere gli eventi dall'Event Storage
- Deve fare delle piccole aggregate
- Deve esporre i contenuti via REST per renderli disponibili alla UI



Azure App Service Web Apps

Servizio gestito per hostare applicazioni web e REST API

Vasta scelta di
linguaggi
utilizzabili

Supporta
container docker

Aggiornamenti e
patch di sicurezza
gestite

Supporto
all'autenticazione
senza modificare il
codice applicativo

Gestione del CORS
out of the box

Azure App Service Plan Free Tier

Posso avere solo un'istanza di App Service Plan Free per sottoscrizione

	Name	ACU/vCPU	vCPU	Memory (GB)	Remote Storage (GB)	Scale (instance)	Cost per hour (instance)	Cost per month (instance)
▼	Dev/Test (For less demanding workloads)							
✓	Free F1	60 minutes/day...	N/A	1	1	N/A	Free	Free
	Basic B1	100	1	1.75	10	3	0.017 EUR	12.30 EUR
	Basic B2	100	2	3.5	10	3	0.034 EUR	24.60 EUR
	Basic B3	100	4	7	10	3	0.066 EUR	48.516 EUR
▼	Production (For most production workloads)							
	Premium v3 P0V3	195*	1	4	250	30	0.079 EUR	57.809 EUR
	Premium v3 P1V3	195	2	8	250	30	0.127 EUR	92.932 EUR
	Premium v3 P2V3	195	4	16	250	30	0.255 EUR	185.864 EUR
	Premium v3 P3V3	195	8	32	250	30	0.509 EUR	371.728 EUR
	Standard S1	100	1	1.75	50	10	0.089 EUR	64.915 EUR

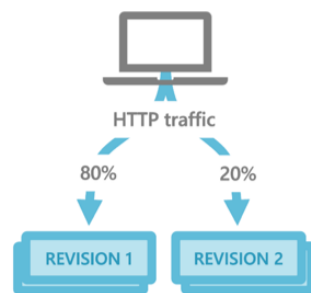
Azure Container Apps

Piattaforma
serverless per
l'esecuzione di
applicazioni
containerizzate



Azure Container Apps: Example scenarios

PUBLIC API ENDPOINTS



HTTP requests are split between two versions of the container app where the first revision gets 80% of the traffic, while a new revision receives the remaining 20%.

AUTO-SCALE CRITERIA

Scaling is determined by the number of concurrent HTTP requests.

BACKGROUND PROCESSING



A background job that transforms data in a database.

AUTO-SCALE CRITERIA

Triggered by a schedule, on demand, or based on events.

EVENT-DRIVEN PROCESSING

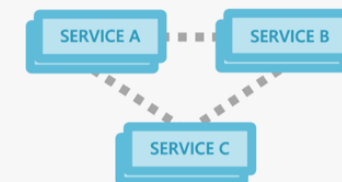


A queue reader application that processes messages as they arrive in a queue.

AUTO-SCALE CRITERIA

Scaling is determined by the number of messages in the queue.

MICROSERVICES



Deploy and manage a microservices architecture with the option to integrate with Dapr.

AUTO-SCALE CRITERIA

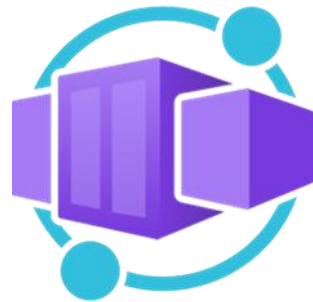
Individual microservices can scale according to any KEDA scale triggers.

Azure Container Apps Free Grant

- Ogni mese, gratis:
 - Fino a 180,000 vCPU-seconds
 - 360,000 GiB-seconds
 - 2 million di richieste
- Altre opzioni per ~~non pagarle~~ pagare di meno:
 - Scalare a 0 il numero di repliche
 - Quando non ci sono richieste HTTP in ingresso ed il numero di repliche è al minimo, viene applicato un prezzo ridotto

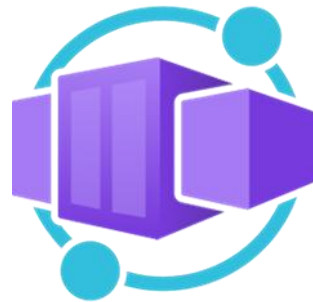
Monitoring Platform - API

Container Apps o Web Apps?



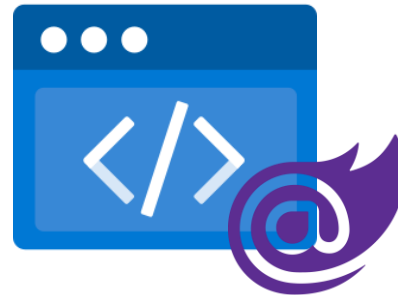
Monitoring Platform - API

Container Apps o Web Apps?



Monitoring Platform - UI

- Applicativo per la consultazione degli eventi storici e la ricezione delle notifiche dall'impianto produttivo
- Non ha necessità di un backend applicativo. Si può appoggiare alle API già implementate



Azure Static WebApp

È un servizio che consente di creare applicazioni Web statiche.

Pubblicazione di
contenuti statici
con HTML, CSS e
JavaScript

Supporto alle API

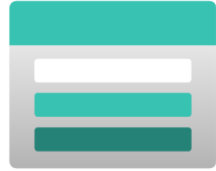
CI/CD con GitHub
and Azure DevOps

Contenuto statico
distribuito
globalmente

Certificato SSL
gratuito

Gestione di
ambiente di
Staging

Azure Blob Static Website vs Azure Static WebApp

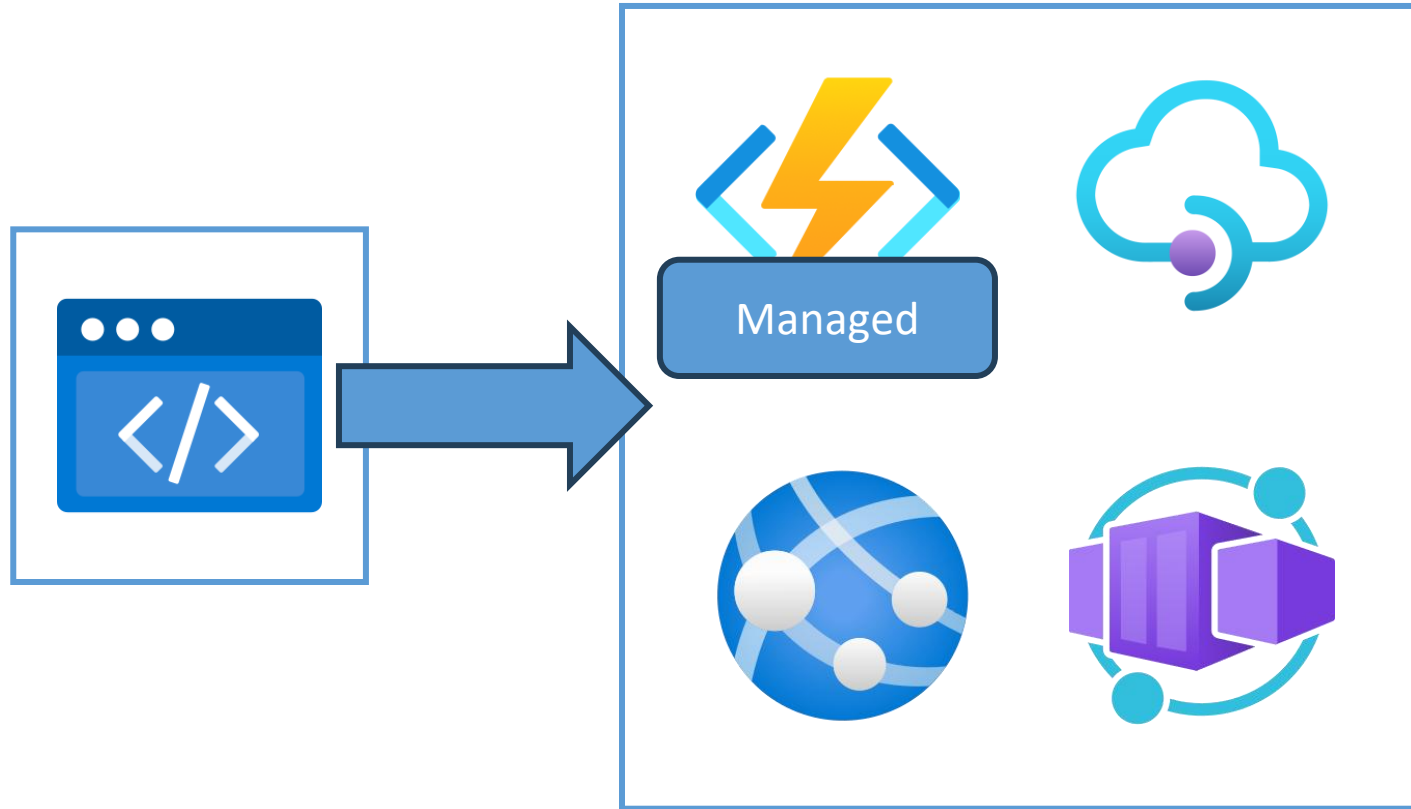


- ✓ SSL
- 😞 CI/CD non gestito
- ✗ No Multiregion
- ✓ Custom Domain
- ✗ No HTTPS con Custom Domains

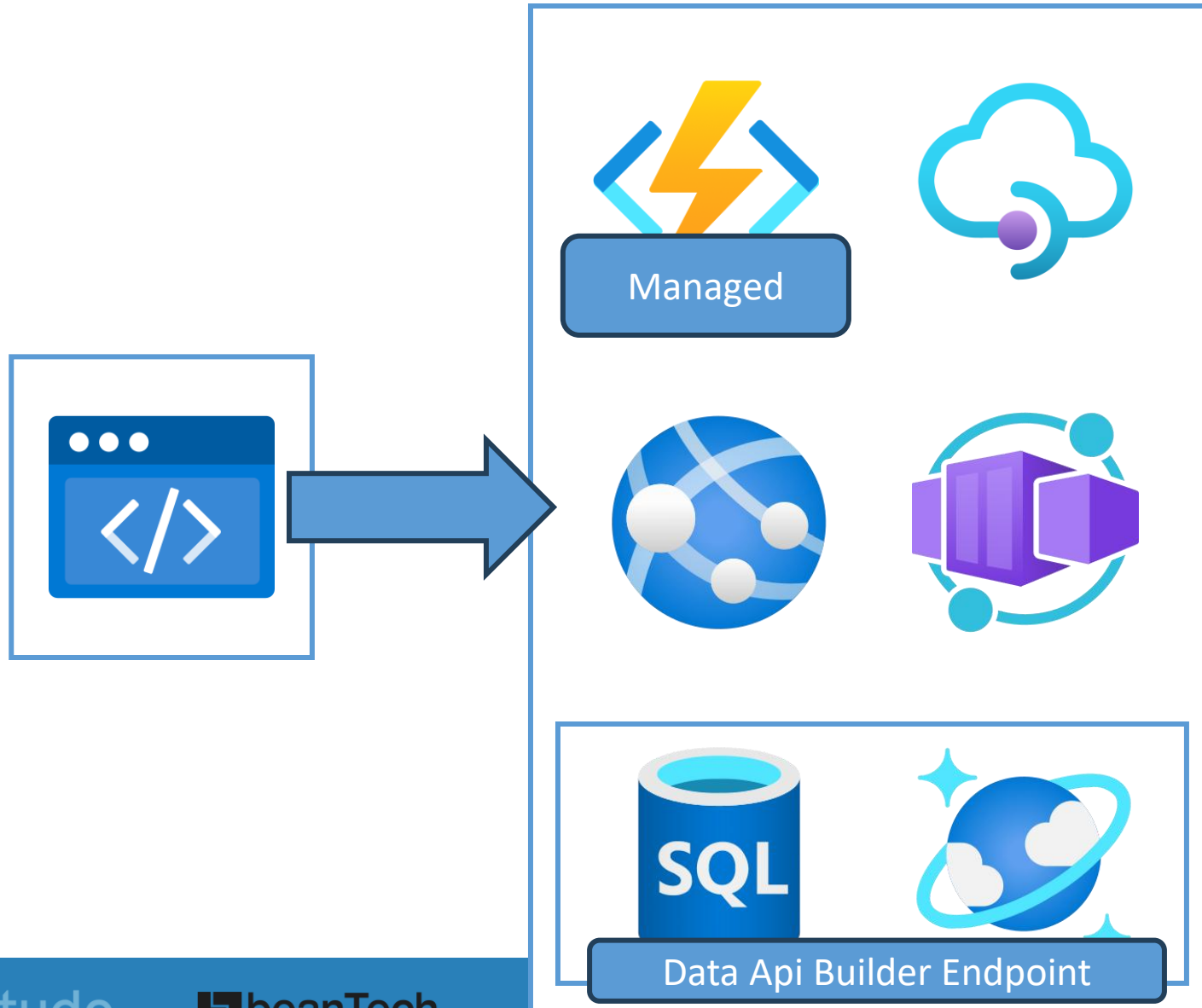


- ✓ SSL
- ✓ CI/CD integrate
- ✓ Globalmente distribuito
- ✓ Custom Domain
- ✓ HTTPS con Custom Domain

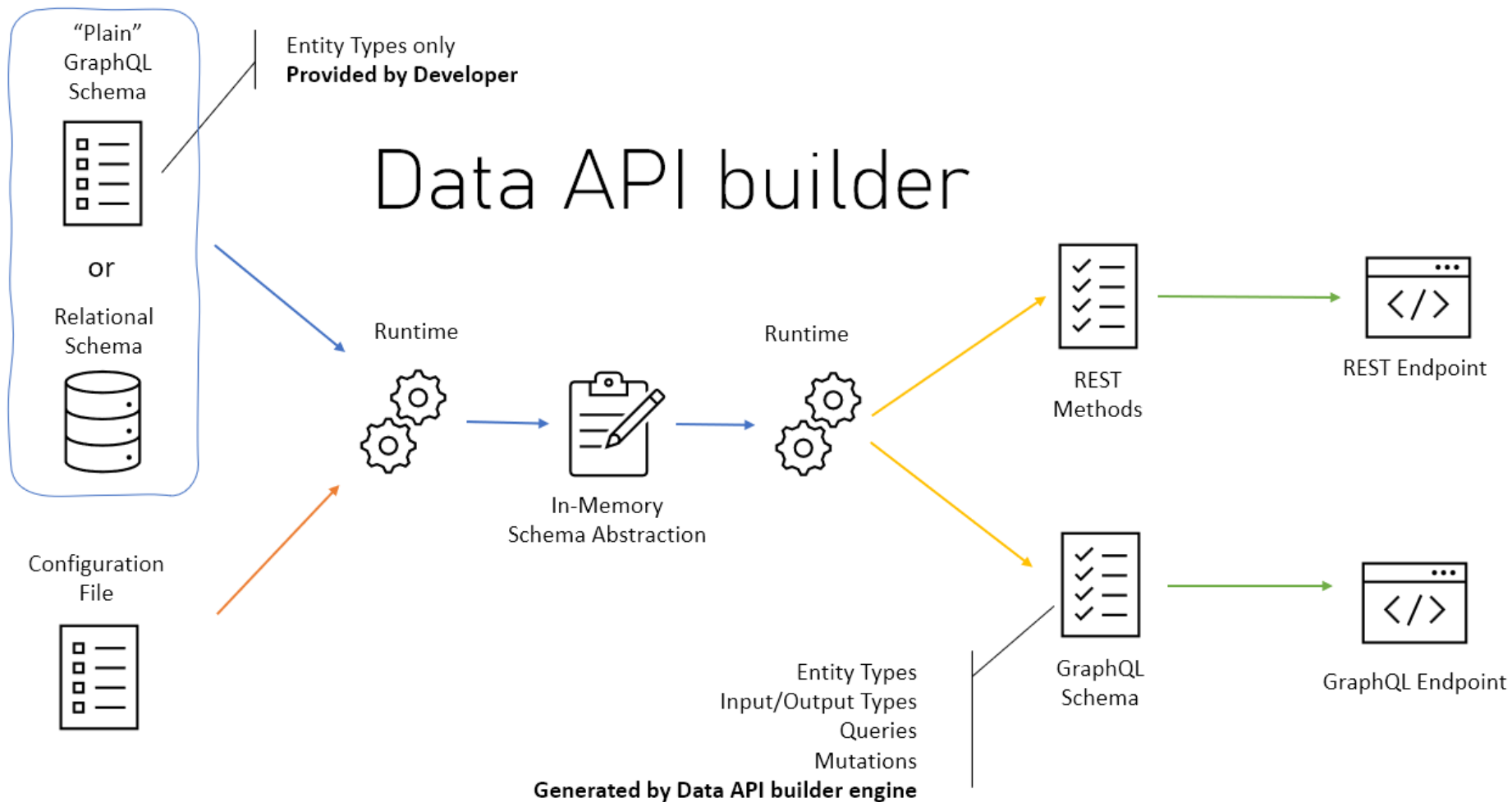
Azure Static WebApp... Ma il backend?



Azure Static WebApp... Ma il backend?



Data API Builder?



Per utilizzare DAB in locale

```
dotnet tool install Microsoft.DataApiBuilder
```

Azure Static WebApp Pricing

Plan/Features	<input checked="" type="radio"/> Free For hobby or personal projects	<input type="radio"/> Standard For general purpose production apps
Price	Free	8.42 EUR per app per month
Included bandwidth	100 GB per subscription	100 GB per subscription
Bandwidth overage	Free	0.19 EUR per GB per subscription
Custom domains	2 per app	5 per app
SSL certificates	Free	Free
Custom authentication	-	✓
Private endpoints	-	✓
Max app size	250 MB	500 MB
Staging environments	3	10
Azure functions	Managed	Managed or Bring your own
Enterprise-grade edge	-	16.40 EUR per app per month

Required Tools to work with this technology

Static Web App Command line tool (swa)

```
npm install -g @azure/static-web-apps-cli
```

Wasm tools to output Blazor wasm

```
dotnet workload install -g wasm-tools-net6
```

<https://azure.github.io/static-web-apps-cli/docs/use/install/>

Monitoring Platform - UI

Azure Static Web App o Azure Static Web App?

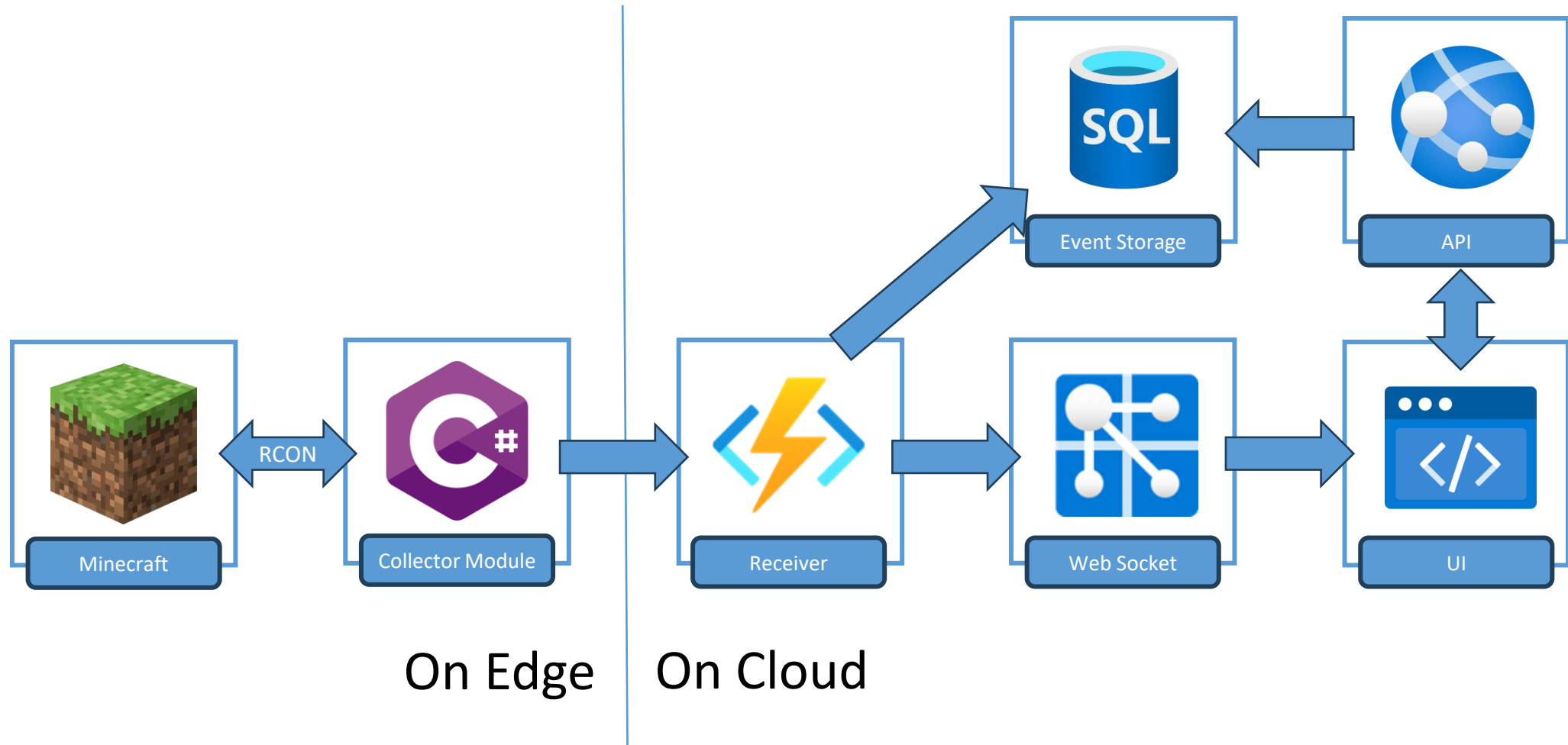


Monitoring Platform - UI

Azure Static Web App o Azure Static Web App?



Monitoring Platform Overview





DEMO



Grazie!

About me

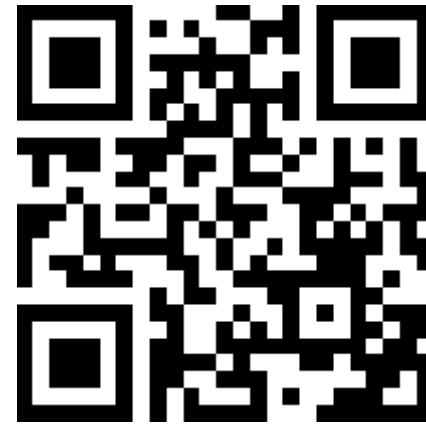
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