Monitora la tua farm di Minecraft con Azure Data Explorer

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QUANTUMDATIS


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DATA
SATURDAYS


community

DATA SATURDAYS

A Real Life Story

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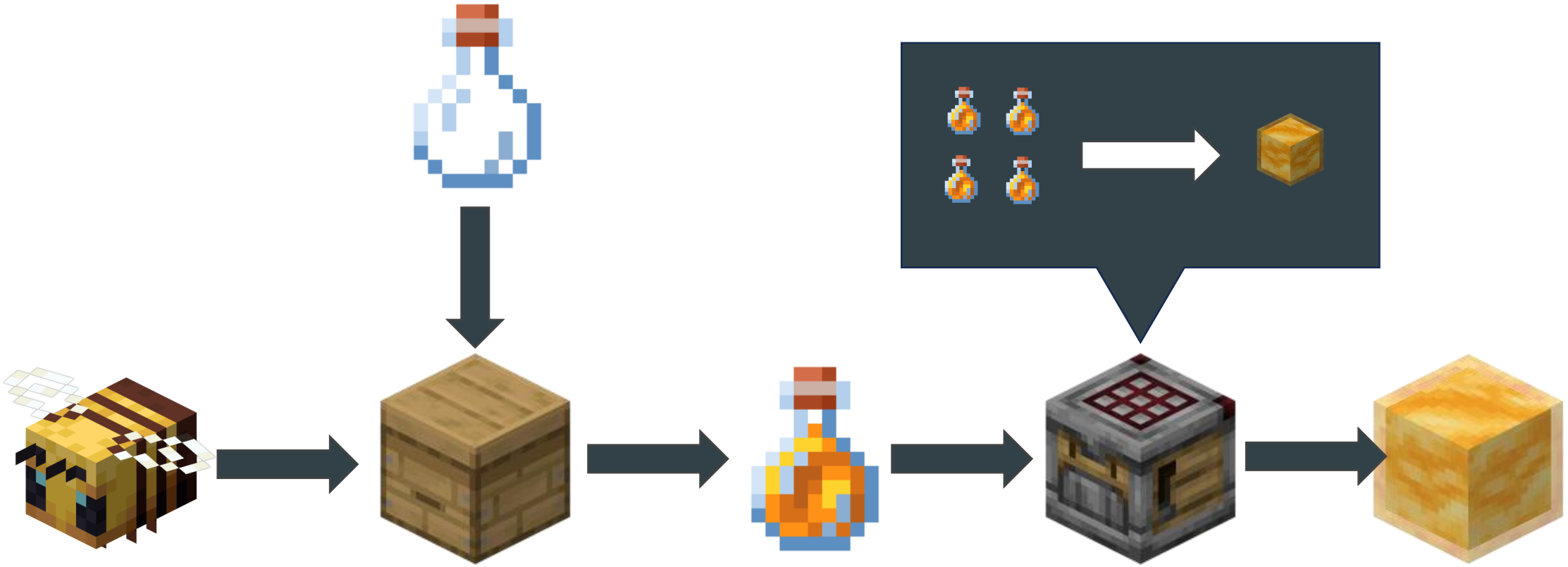
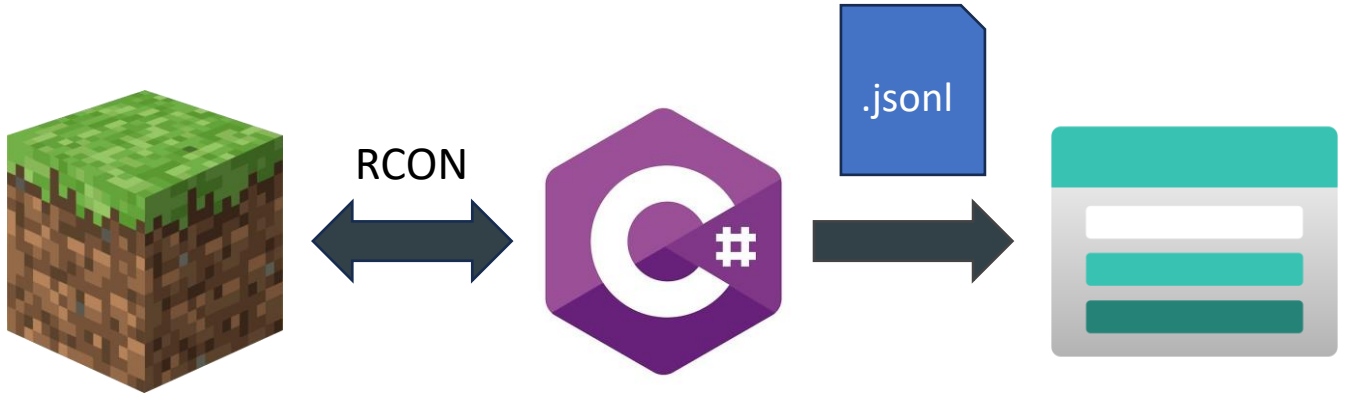
A Real Life Story



A Real Life Story

- Quanto tempo spendono le api nel proprio alveare?
- Tra quanto tempo esaurirò lo spazio per il miele?
- Le api hanno una dimora fissa?

A Real Life Story



DATA SATURDAYS

A Real Life Story

```
async Task<SampleDataItem> SampleDataAsync()
{
    var day = await client.TimeQueryDayAsync();
    var dayTime = await client.TimeQueryDayTimeAsync();

    var beehives = await GetBeehivesAsync();
    var outputChests = await GetChestsContentsAsync();

    return new SampleDataItem(day, dayTime, beehives, outputChests);
}


var timer = new Timer(async _ =>
{
    Console.WriteLine("Reading data...");
    var sampleData = await collector.SampleDataAsync();

    File.AppendAllLines($"day-{sampleData.Day}.jsonl", [
        JsonSerializer.Serialize(new { sampleData.Day, sampleData.DayTime, Type = "OutputChests", Data = sampleData.OutputChests }),
        JsonSerializer.Serialize(new { sampleData.Day, sampleData.DayTime, Type = "Beehives", Data = sampleData.Beehives }),
    ]);

}, null, TimeSpan.Zero, TimeSpan.FromSeconds(5));
```

DATA SATURDAYS

A Real Life Story

{"Day":40,"DayTime":428,"Type":"OutputChests","Data":[[],[],[],[],[],[],[],[],[],[],[],[{"Slot":0,"id":"minecraft:honey_block","Count":64},{"Slot":1,"id":"mine
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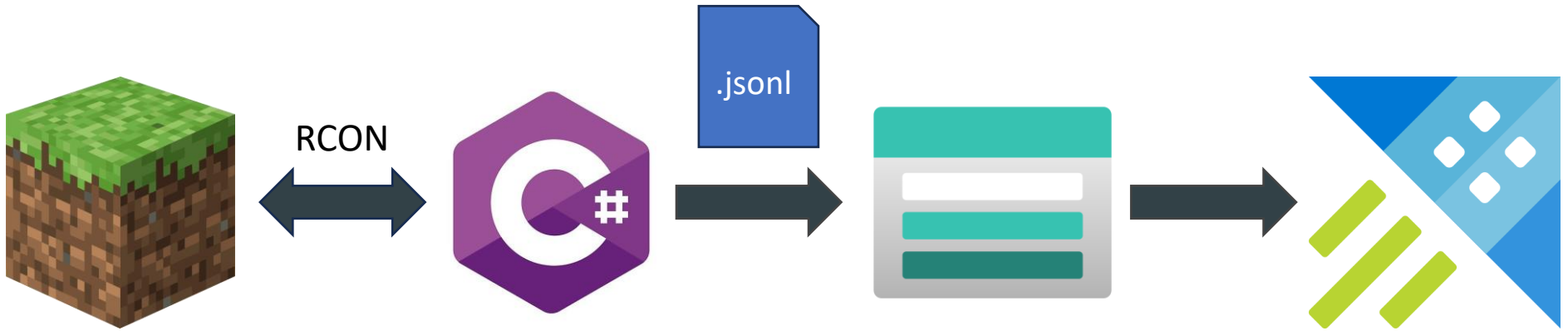
A Real Life Story



DATA SATURDAYS

Azure Data Explorer

Azure Data Explorer

- Servizio di analisi dati veloce
- Serivizio totalmente gestito
- Analisi in tempo reale di grandi volumi di dati, provenienti da applicazioni, siti web, dispositivi IoT ecc…

Azure Data Explorer

Features Principali

- Fast Data Ingestion
- Interactive Data Exploration
- Real Time Analytics on Streaming data
- Scalability
- Integration with other Azure Services

Azure Data Explorer

Quando ha senso utilizzare ADX?

Sliding Window of data	Tante letture	Tanti Insert / Append	Poche Delete	NESSUN Update

Azure Data Explorer

Pricing

ADX Cost + **VMs Cluster Cost** + **Storage Cost**

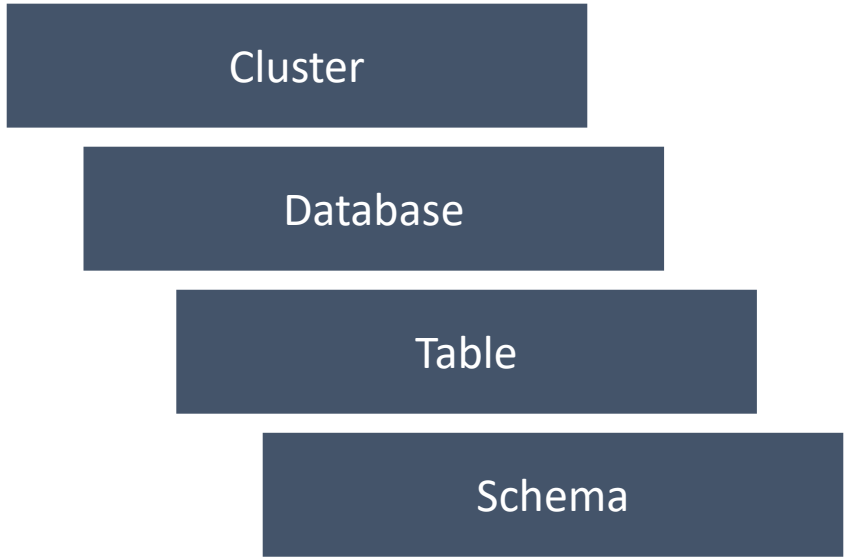
ADX Cost	VMs Cluster Cost	Storage Cost
Dev/Test **Free** (No SLA) Standard $0.11/core per hour	Varies on VM Size $0.126/hour for the smallest VM	Varies by usage

More info on https://azure.microsoft.com/en-us/pricing/details/data-explorer/

Azure Data Explorer

Organizzazione dei dati

Simile ai database relazionali (ex: SqlServer)



Organizzazione dei dati – Differenze rispetto ai RDMS

- No Primary Key
- No Unique Keys
- No Foreign Keys
- Columnstore Indexes
- Data Sharding (Extents)

Azure Data Explorer

Nome	Cognome	Data di Nascita	Sesso
Giovanni	Rossi	15/03/1987	M
Sofia	Bianchi	22/07/1995	F
Marco	Esposito	10/11/1980	M
Laura	Romano	05/09/1990	F
Luca	Russo	20/04/1975	M
Chiara	Colombo	18/06/1988	F
Matteo	Moretti	30/12/1978	M
Alessia	Ferrari	08/02/1992	F
Federico	Conti	25/10/1983	M
Martina	Marini	12/07/1998	F

```
Giovanni....Rossi.......15/03/1987..MSofia..
.....Bianchi.....22/07/1995..FMarco.......Es
posito....10/11/1980..MLaura.......Romano...
...05/09/1990..FLuca........Russo.......20/0
4/1975..MChiara......Colombo.....18/06/1988.
.FMatteo......Moretti.....30/12/1978..MAless
ia.....Ferrari.....08/02/1992..FFederico....
Conti.......25/10/1983..MMartina.....Marini.
.....12/07/1998..F
```

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Federico	Conti	25/10/1983	M
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```
Giovanni....Sofia.......Marco.......Laura...
....Luca.........Chiara......Matteo......Ales
sia.....Federico....Martina.....Rossi.......
Bianchi.....Esposito....Romano......Russo...
....Colombo.....Moretti.....Ferrari.....Cont
i.......Marini......15/03/1987..22/07/1995..
10/11/1980..05/09/1990..20/04/1975..18/06/19
88..30/12/1978..08/02/1992..25/10/1983..12/0
7/1998..MFMFMFMFMF
```

Azure Data Explorer

Data Ingestion

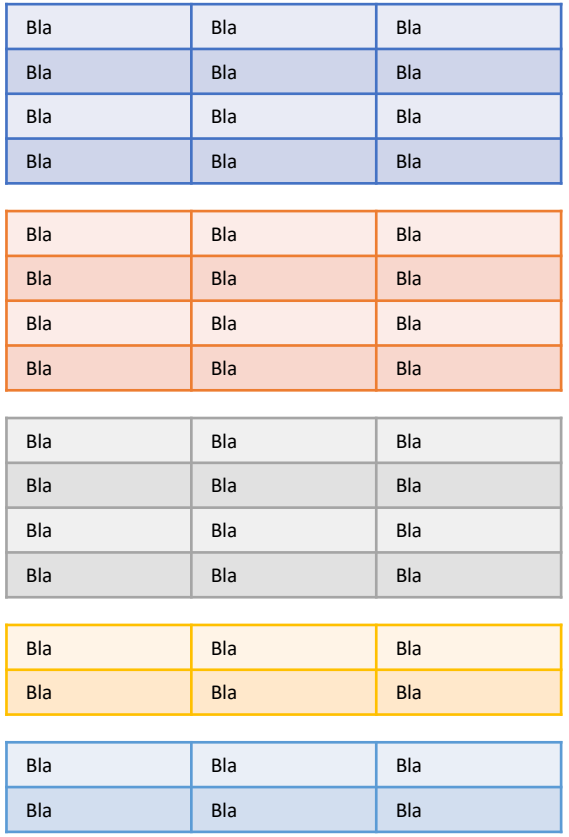
Dietro le quinte

Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla
Bla	Bla	Bla

Azure Data Explorer

Dietro le quinte

I dati delle tabelle sono divisi in extents
(aka shards, partizioni, ...)



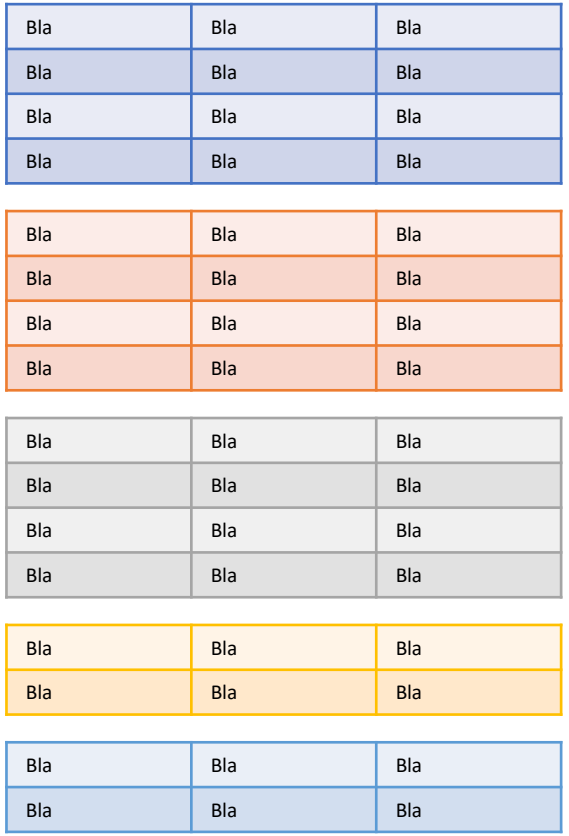
Dietro le quinte

I dati delle tabelle sono divisi in extents (aka shards, partizioni, ...)

Un extent è una mini-tabella che contiene dati e metadati.

Un extent **non può mai essere modificato**, ma può essere cancellato

I dati sono organizzati in colonne



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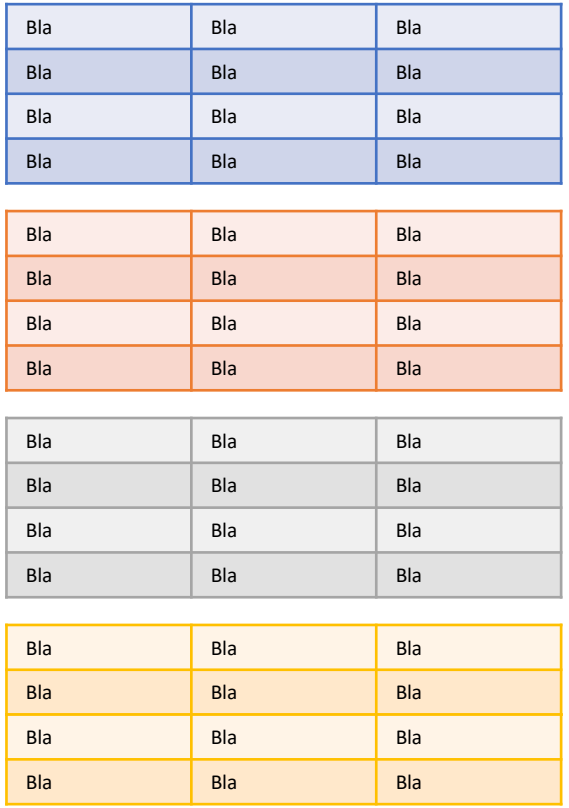
Extent più piccoli possono essere uniti in extent più grandi



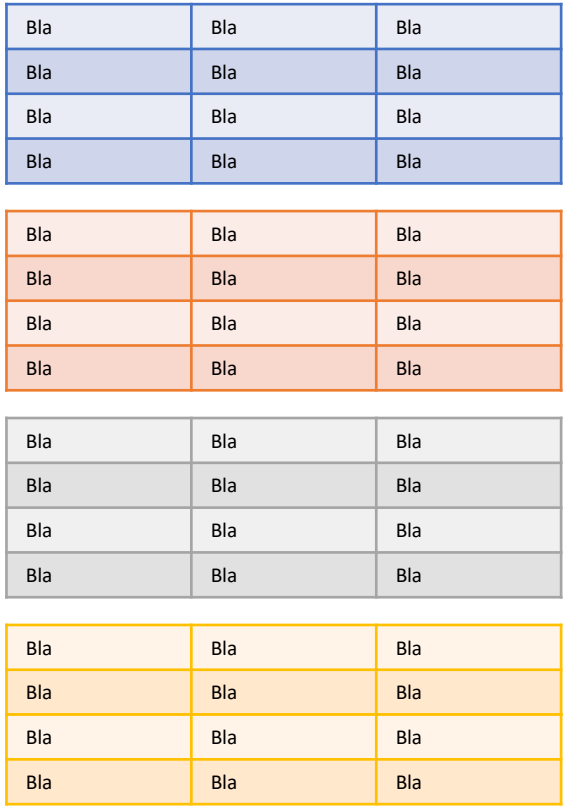
Dietro le quinte

Gli extent sono creati durante le operazioni di inserimento

Un extent è unito ad altri

- Shard rebuild
- Shard merge

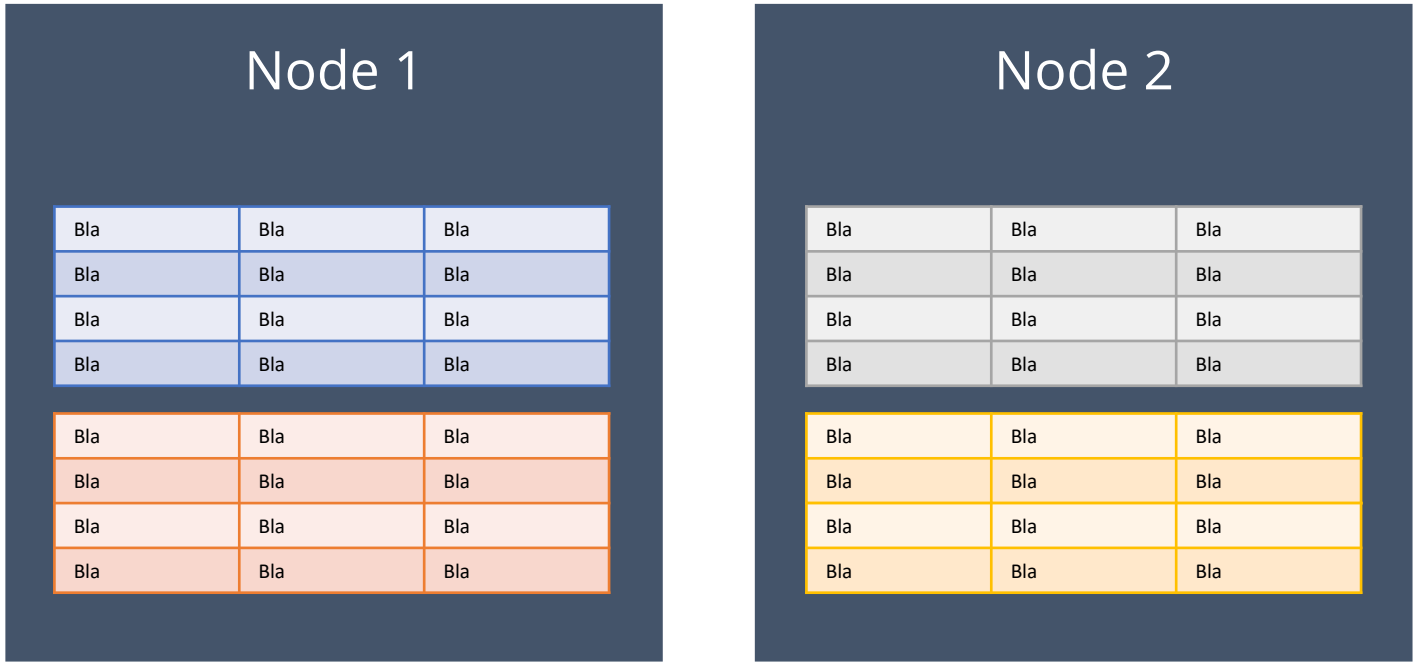
Un extent può essere cancellato con una retention-policy



Azure Data Explorer

Dietro le quinte

Gli shards sono distribuiti tra i nodi del cluster

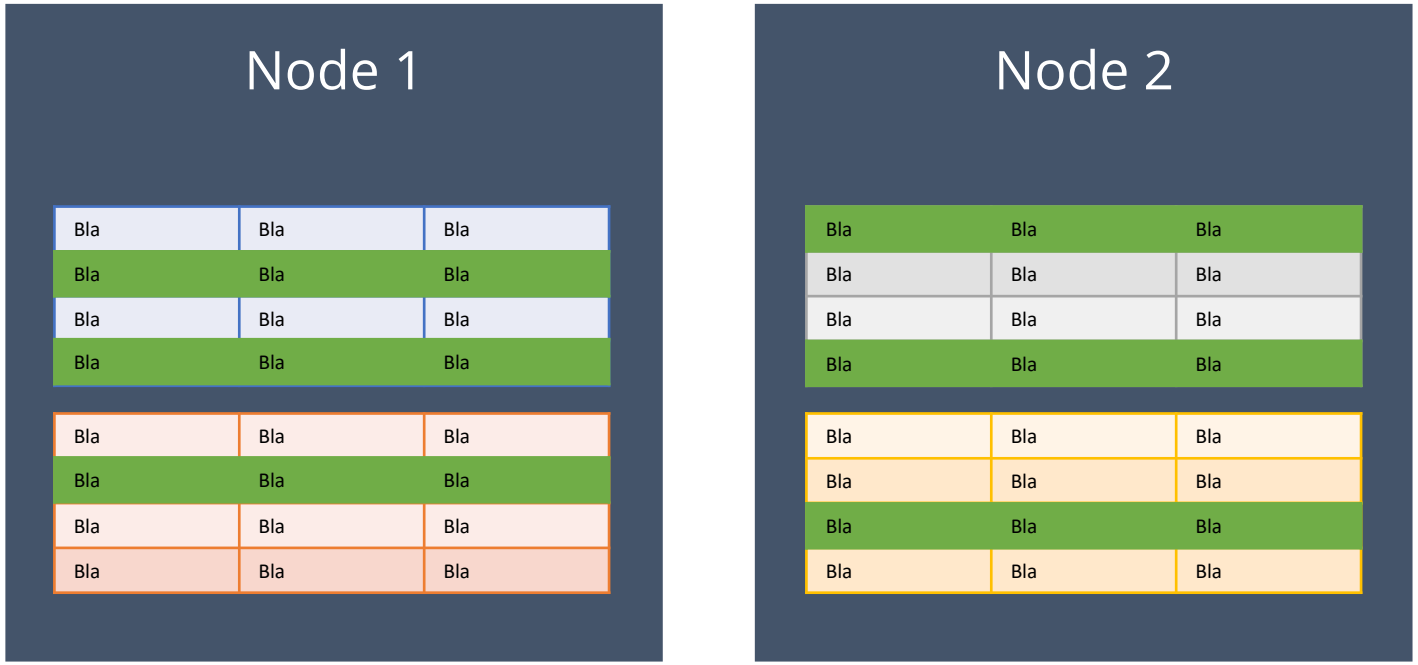


Azure Data Explorer

Una “semplice query” nel cluster

Logs

| where Timestamp > ago(1h)



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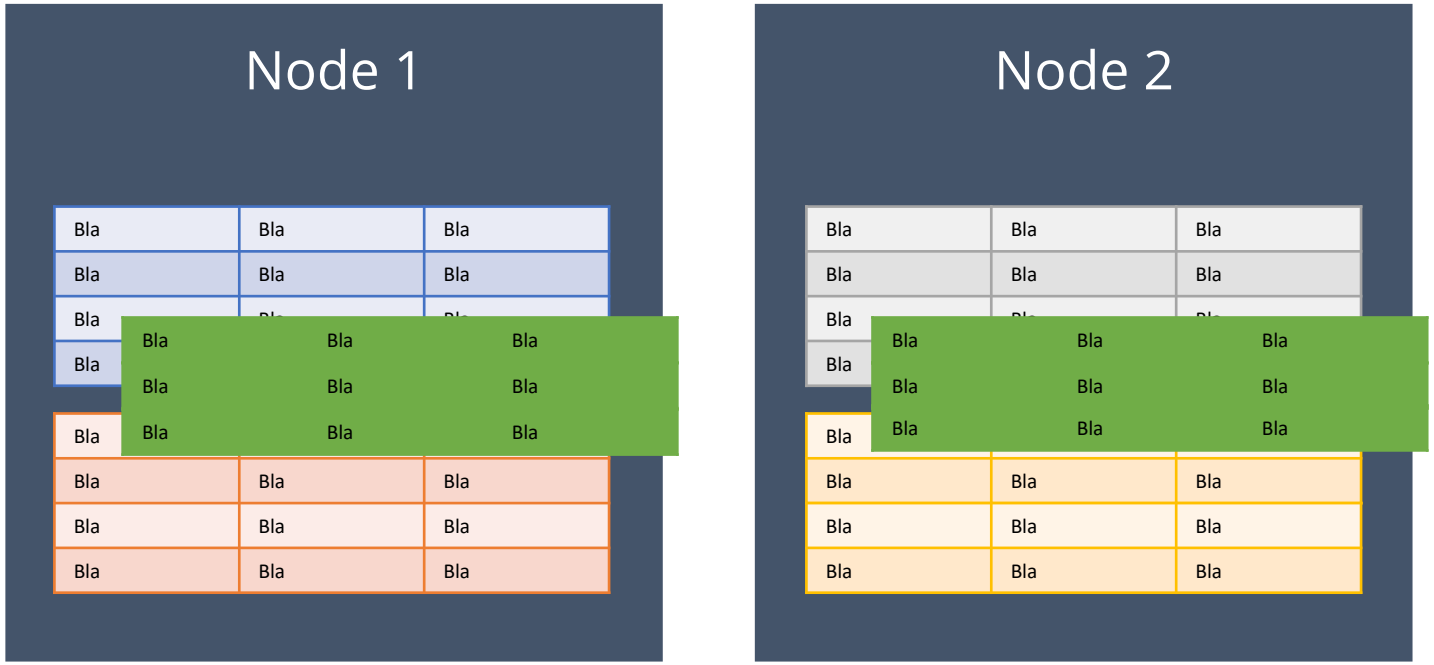

Una “semplice query” nel cluster

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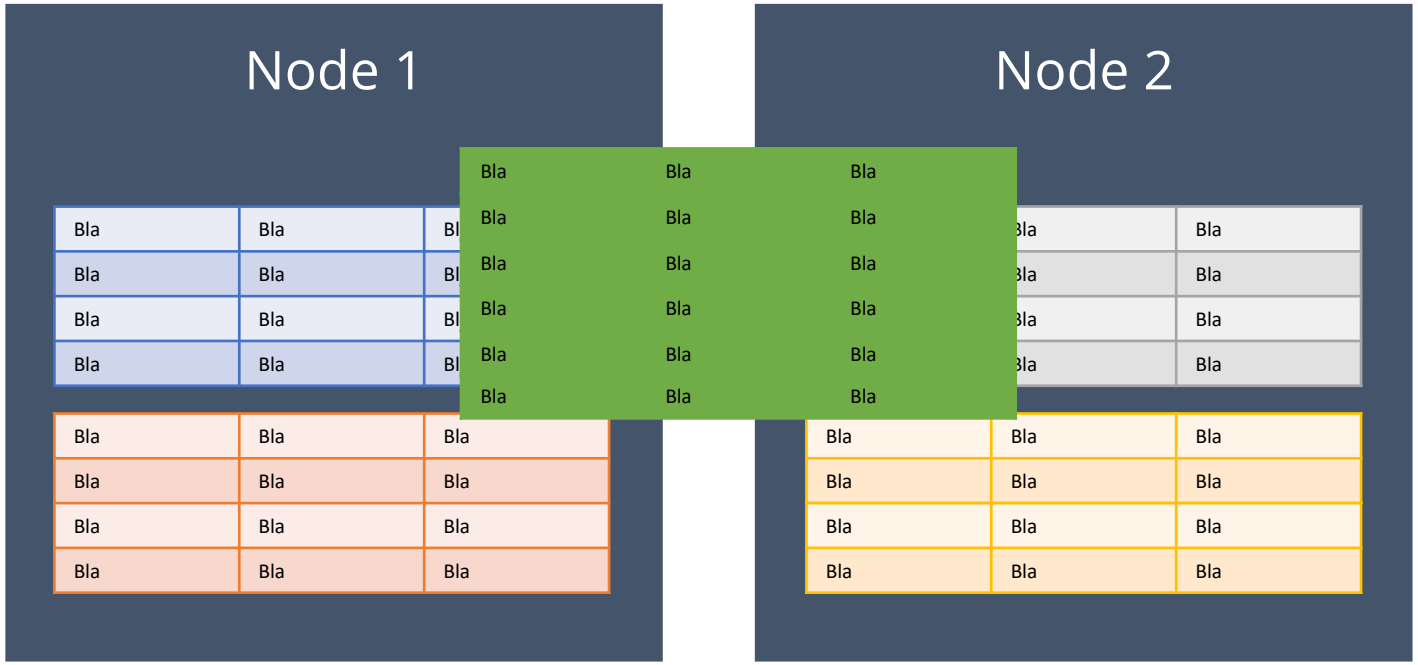


Kusto Query Language

Una query Kusto è una richiesta in sola lettura per il processamento dei dati e la produzione di risulati.

La richiesta è effettuata tramite testo, utilizzando un modello di data-flow che è semplice da leggere, scrivere ed automatizzabile.

Le query Kusto sono composte di una o più istruzioni.

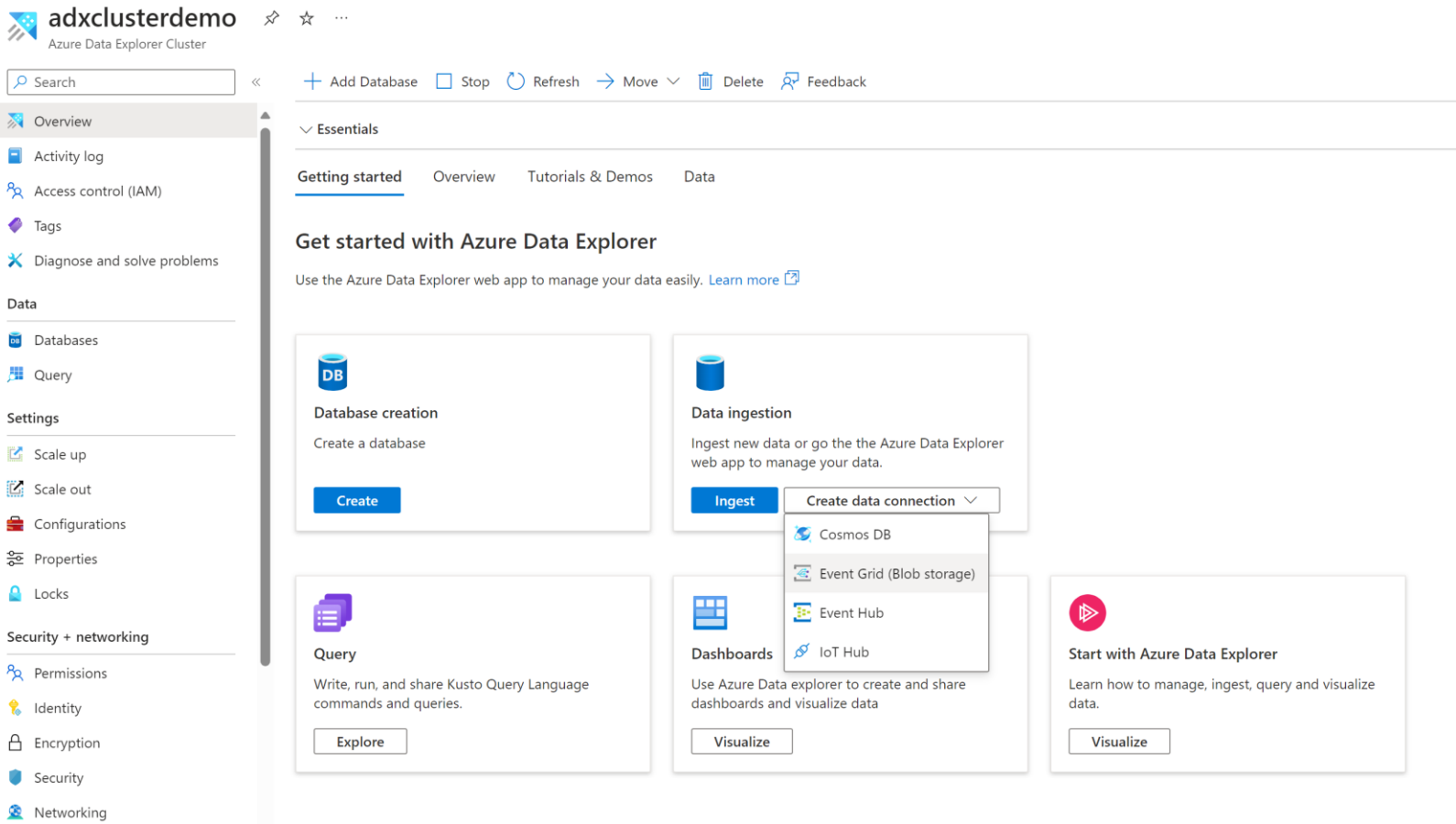
Kusto Query Language

SQL	KQL
SELECT	**project**, extend, project-away, project-keep …
WHERE	**where**, search, …
JOIN	**join kind=inner**
UNION	**union**
GROUP BY	**summarize**
ORDER BY	**sort by**, order by, top by
TOP, LIMIT	**take**

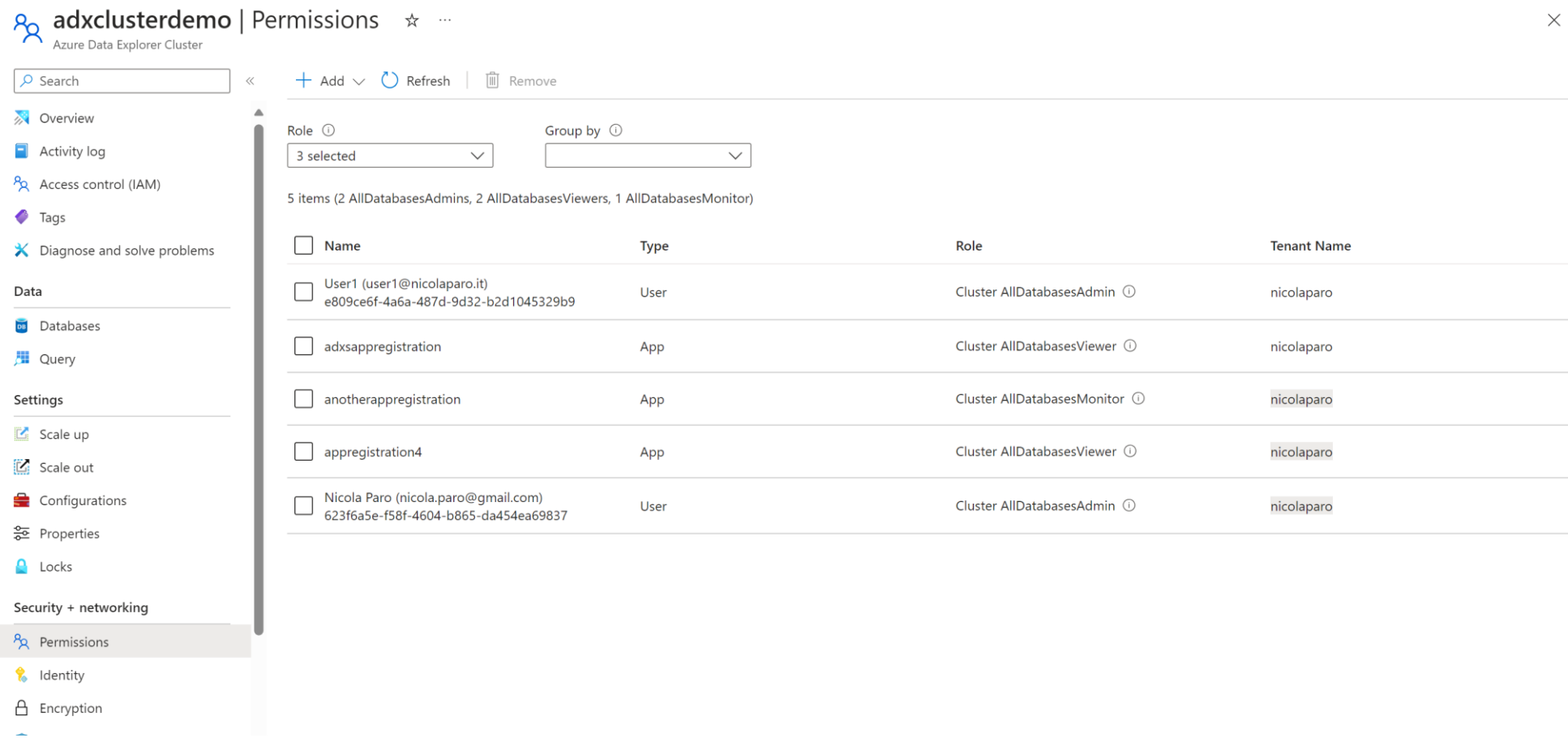
More on https://learn.microsoft.com/en-us/azure/data-explorer/kusto/query/

Demo

DATA SATURDAYS

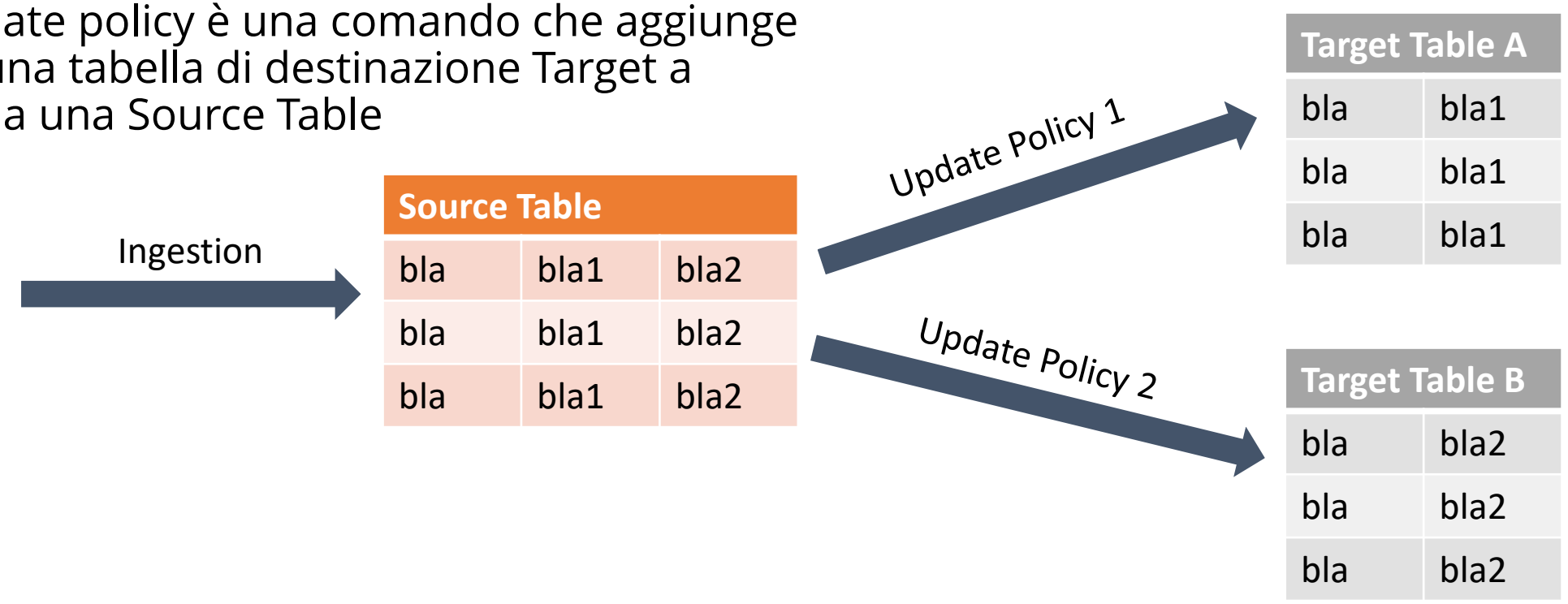


DATA SATURDAYS



Update Policies

Una update policy è una comando che aggiunge dati ad una tabella di destinazione Target a partire da una Source Table



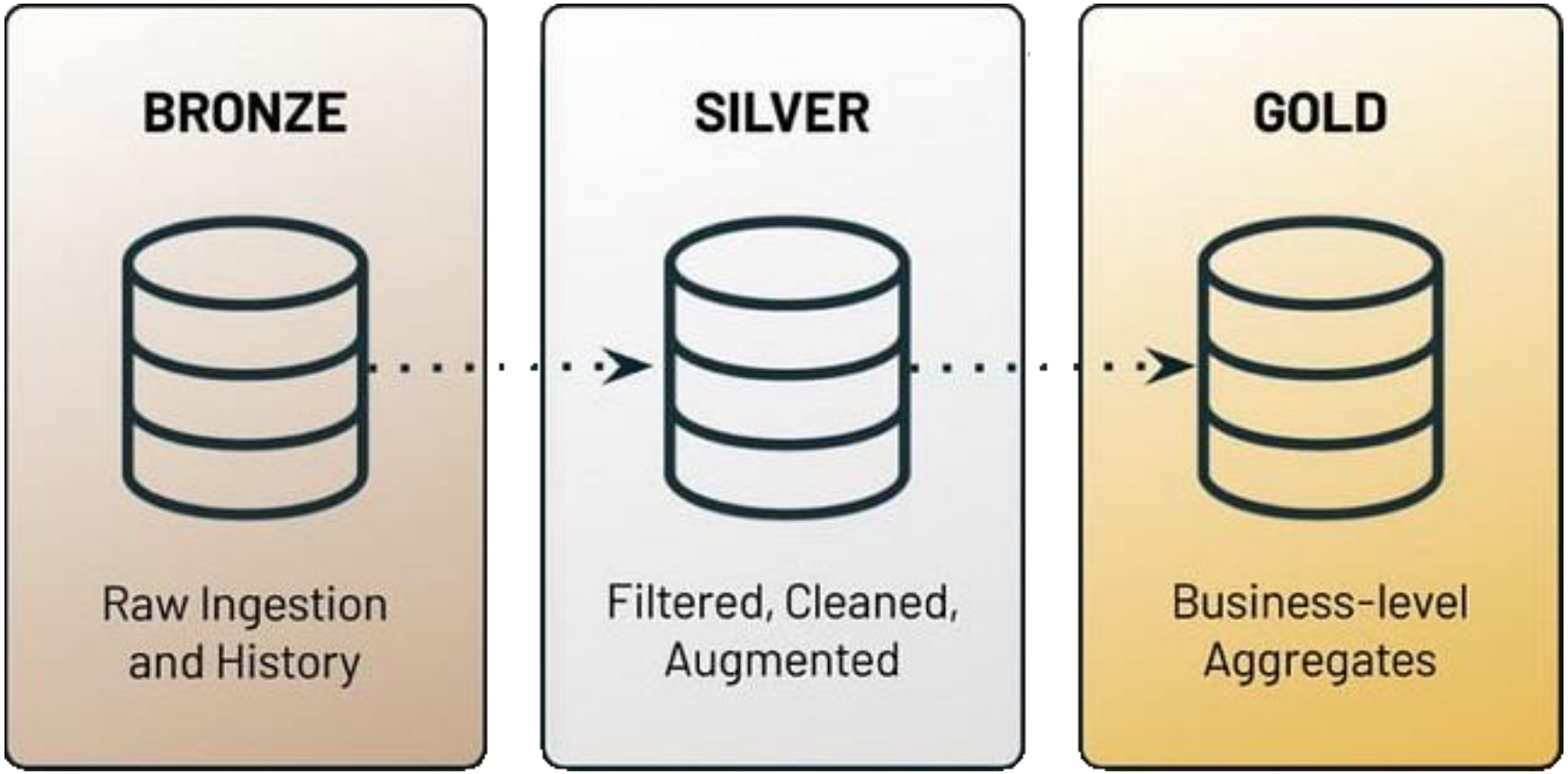
Materialized View

Una Materialized View è una vista aggregate sui dati di una tabella ADX. I dati sono materializzati anche su disco.

Vantaggi nell'adozione delle Materialized View

- Performance Improvement
- Data Freshness
- Cost Reduction

Medallion Architecture



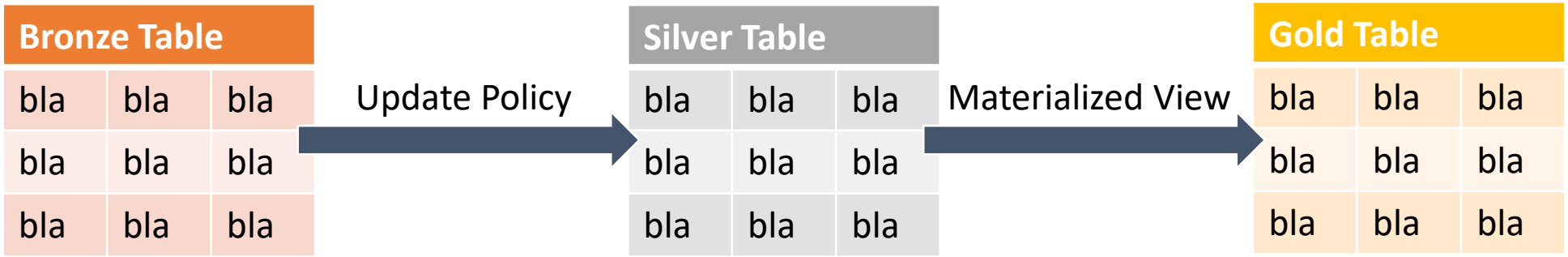
Update Policy o Materialized View?

Update Policy

- Data Transformation
- Data Enrichment

Materialized View

- Data Aggregation

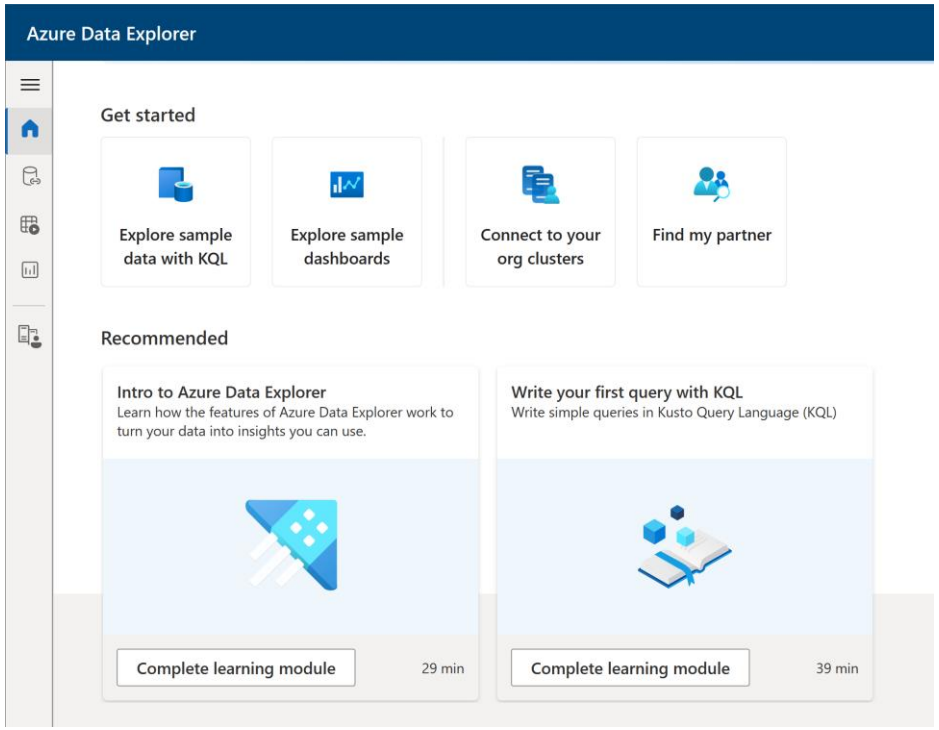


Azure Data Explorer

Devo pagare un cluster per fare pratica con Kusto?

Azure Data Explorer supporta dei database “sample” gratuiti su cui è possibile effettuare delle interrogazioni per provare

https://dataexplorer.azure.com/home



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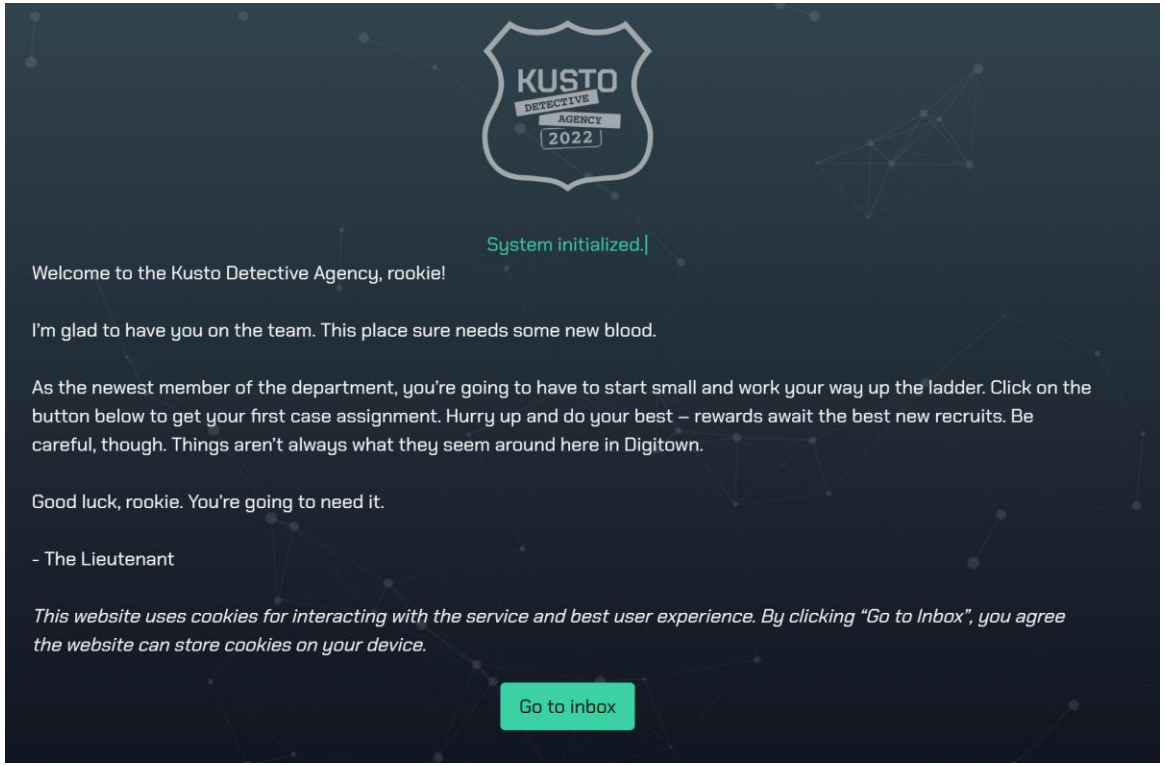
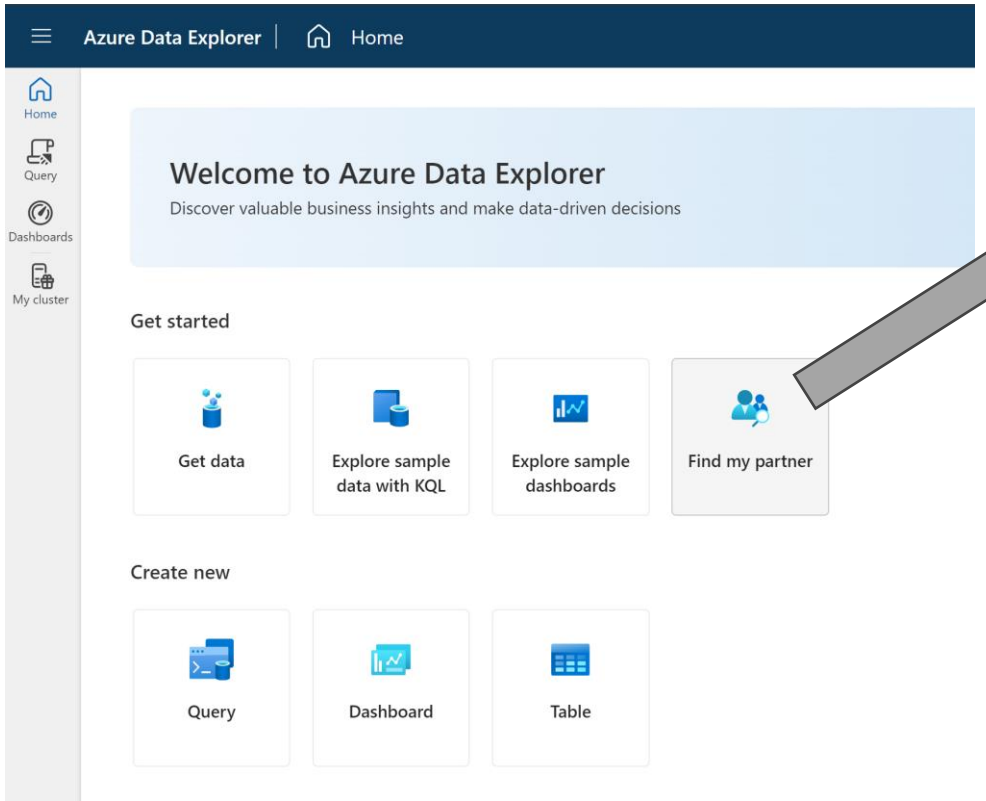


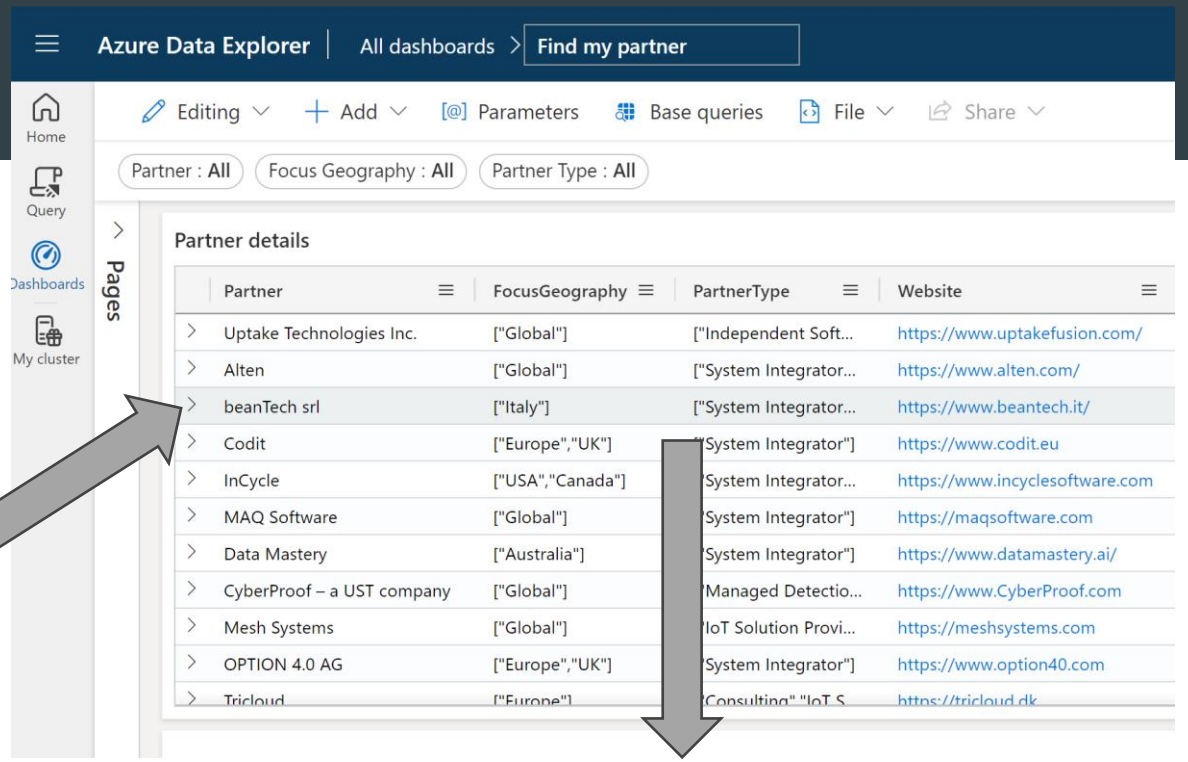
Kusto Detective Agency: una gamification per imparare ad usare kusto.

https://detective.kusto.io/

Azure Data Explorer

Serve una mano?





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Grazie!

About me

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github.com/nicolaparo

DATA SATURDAYS

Inn0va community