

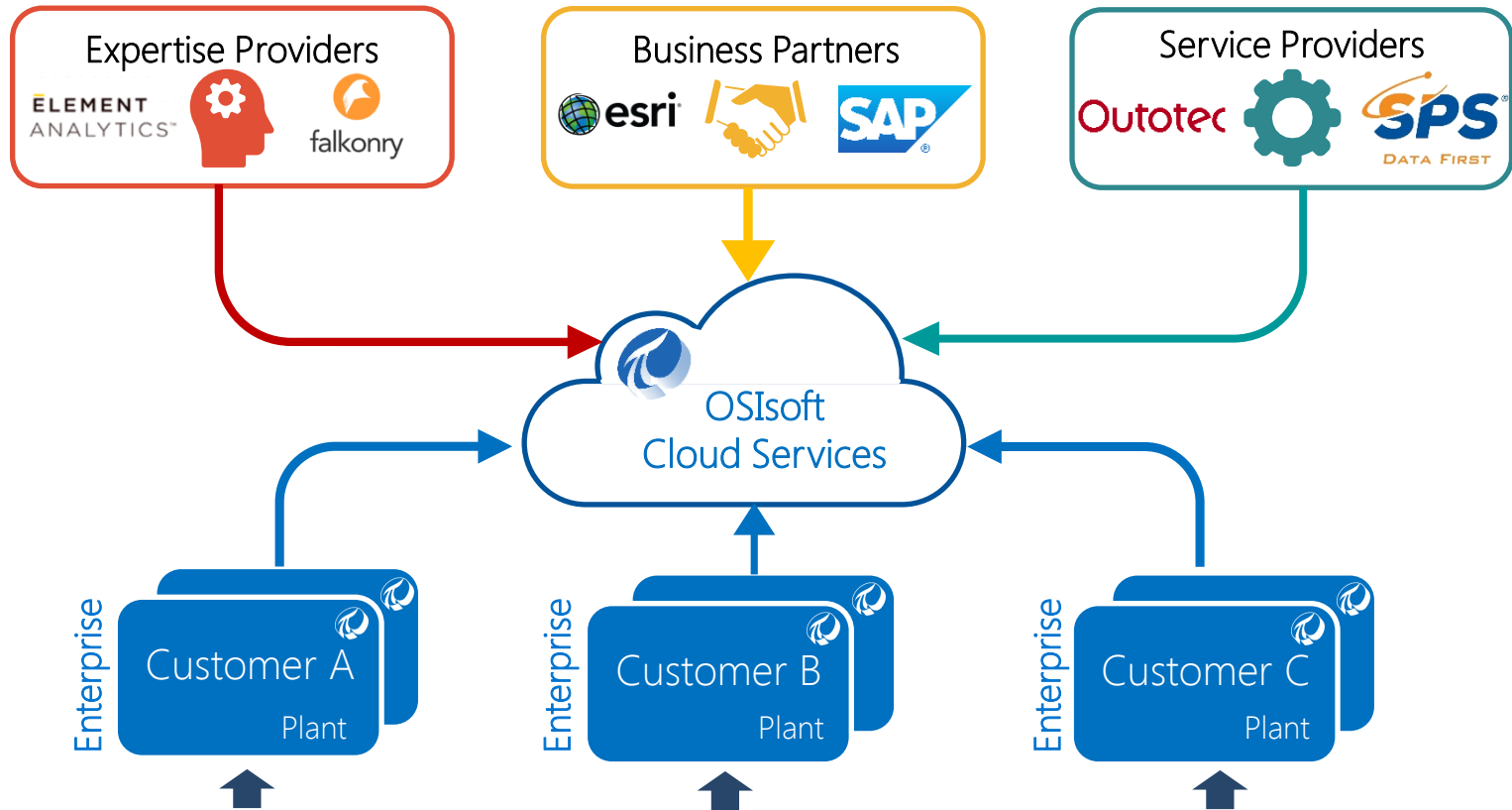


OSIsoft Cloud Services

Part 1 / 4

- Distributed Data Store -

Presented by **Erwin Gove,**
Laurent Garrigues



Process Equipment



Control Hardware



IT Hardware



Other Operational Data

- IT hardware
- Facilities
- Logistics
- Etc.

OSIsoft Cloud Services

- Secure, distributed, multi-tenants platform
- Hosted & Managed by OSIsoft
 - on Microsoft Azure
- Complementary to PI Systems on premises
 - Easily share your PI data
 - Access new technologies

An Infrastructure Approach...



Sign-up
Services



Account
Management



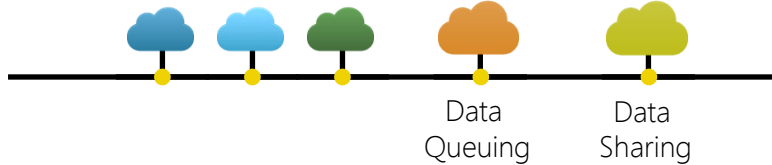
Logging &
Telemetry

Cloud Services Platform

An Infrastructure Approach...

First Commercial Offering

Cloud Connect



Cloud Services Platform

Extend the Platform and Add New Offerings

More Commercial Offerings

Cloud Connect



Data Sharing



Display Sharing



Partners App.



Cloud Services Platform

Distributed Sequential Data Store (project Qi)

Qi Technology vs Distributed Data Store

- Qi as a Technology implements data store primitives
- Data Store hosts Qi as a Platform as a Service (PaaS)
 - Not a distributed historian
 - Not Qi
 - Platform as a Service
 - We take care of servers, operating system, hardware, Qi
 - You focus on the business

Distributed Sequential Data Store (project Qi)

Qi Technology vs Distributed Data Store

- Qi as a Technology implements data store primitives
- Data Store hosts Qi as a Platform as a Service (PaaS)

Distributed Data Store

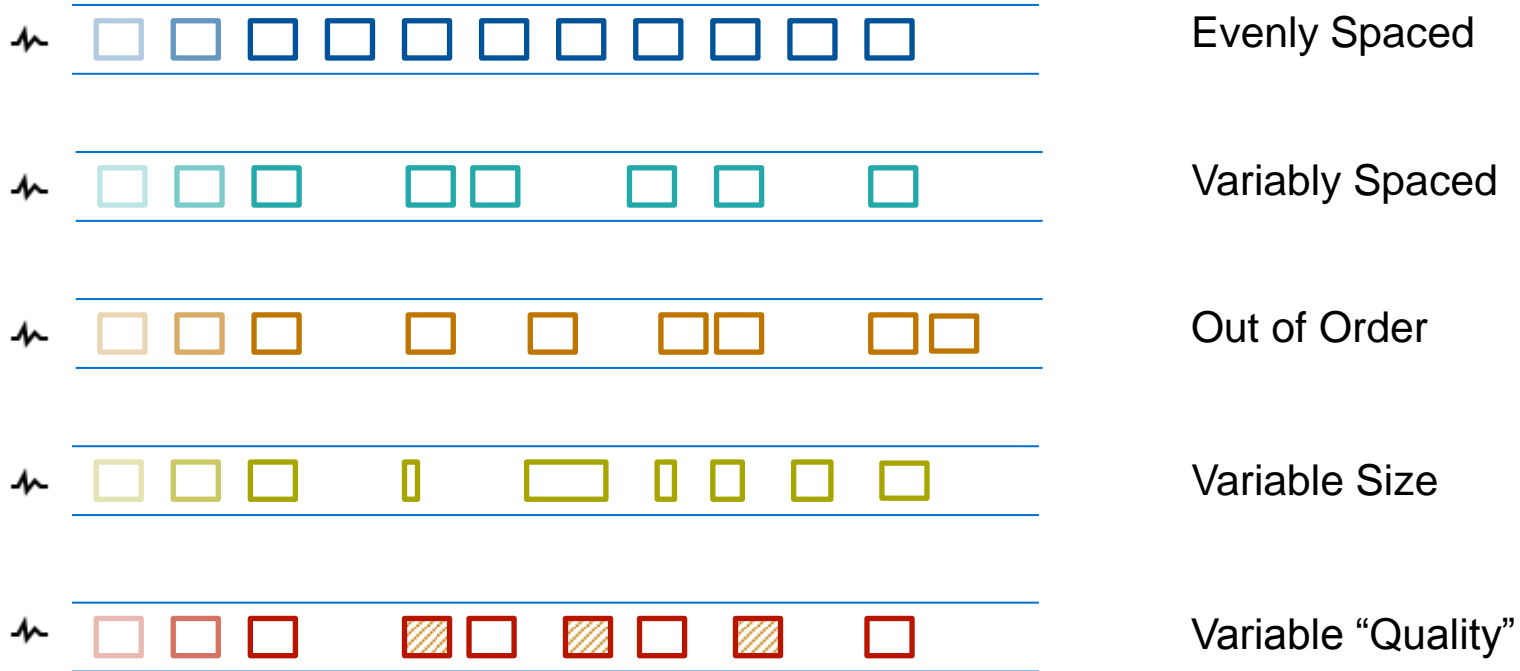
- PaaS – hosted by OSISoft
- Multi-tenant – shared resources
- Secure
- Isolation of data

Distributed Sequential Data Store - Goals

Why a Data Store

- Store observations/events
- Organize
- Enables sharing
- No deployment
- Scale

Distributed Sequential Data Store - Goals



Distributed Sequential Data Store - Goals

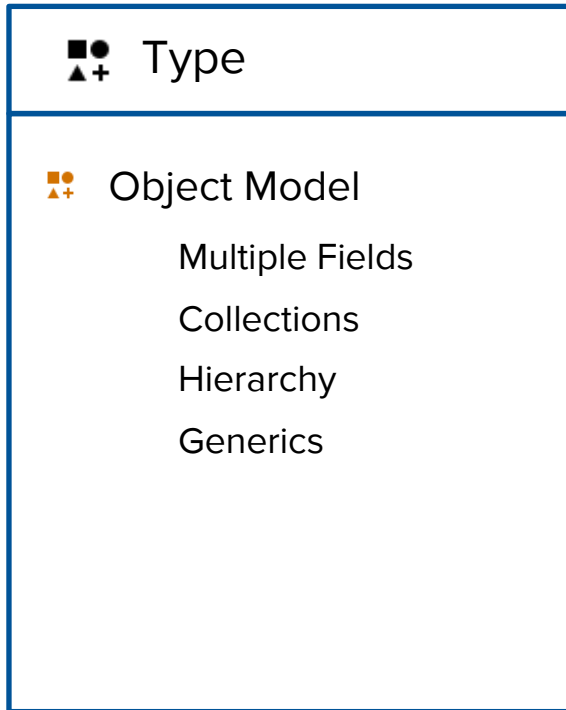
Some features you might not expect from an historian:

- Complex types
- Advanced indexing
 - Non-time series
 - Compound
 - Secondary
- No distinction between future and past data
- Nearly unbounded event size
- High-precision timestamps

Distributed Data Store Basics – Namespaces

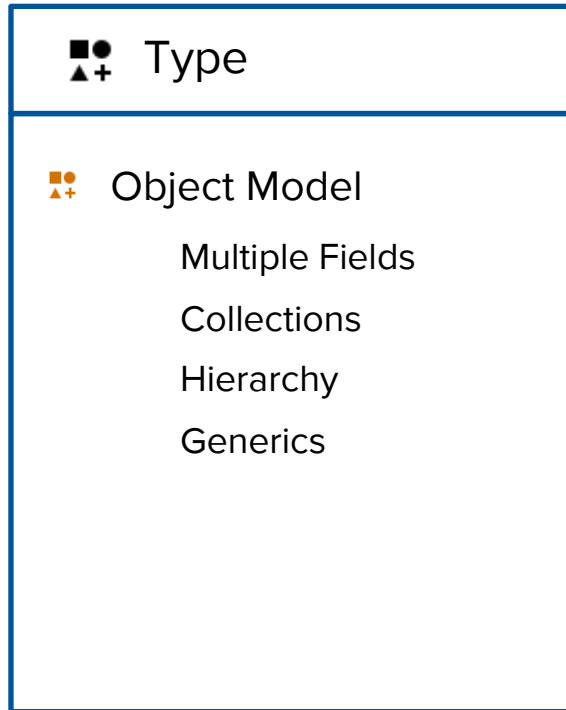
- Used for Isolation / Segregation
 - Different groups within a larger enterprise
 - Different users or developers working within the same account
- Not about scale

Distributed Data Store Basics – Types



- The Type, QiType, describes the form of the data to be stored
- Types provide a model that defines events in a Stream

Distributed Data Store Basics – Types



```
public class WaveData
{
    [Key]
    public int Order { get; set; }

    public double Tau { get; set; }
    public double Radians { get; set; }
    public double Sin { get; set; }
    public double Cos { get; set; }
    public double Tan { get; set; }
    public double Sinh { get; set; }
    public double Cosh { get; set; }
    public double Tanh { get; set; }
}
```

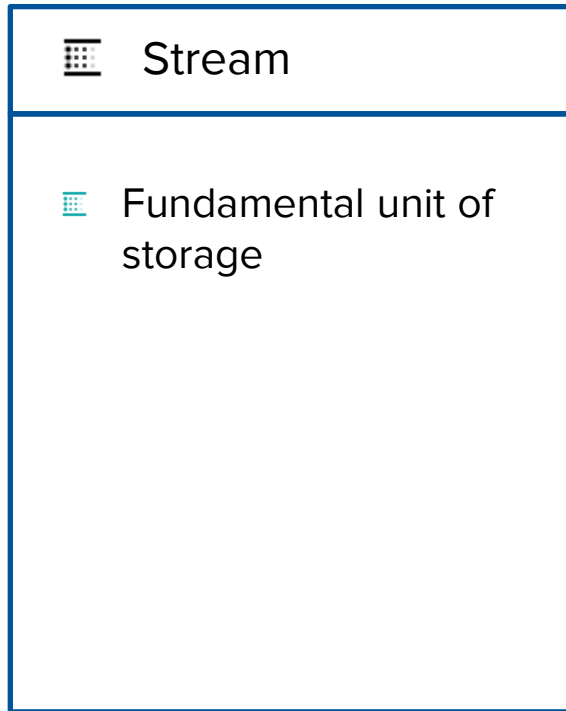
Distributed Data Store Basics – Types

Type	
Object Model	Multiple Fields Collections Hierarchy Generics
Index	Typed Multiple Fields

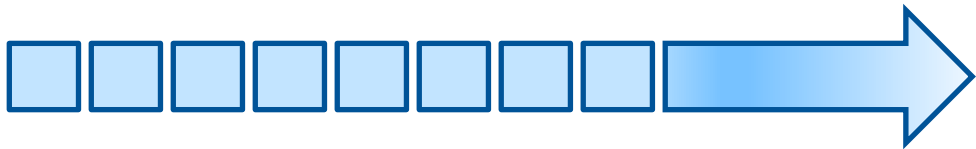
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Distributed Data Store Basics – Streams

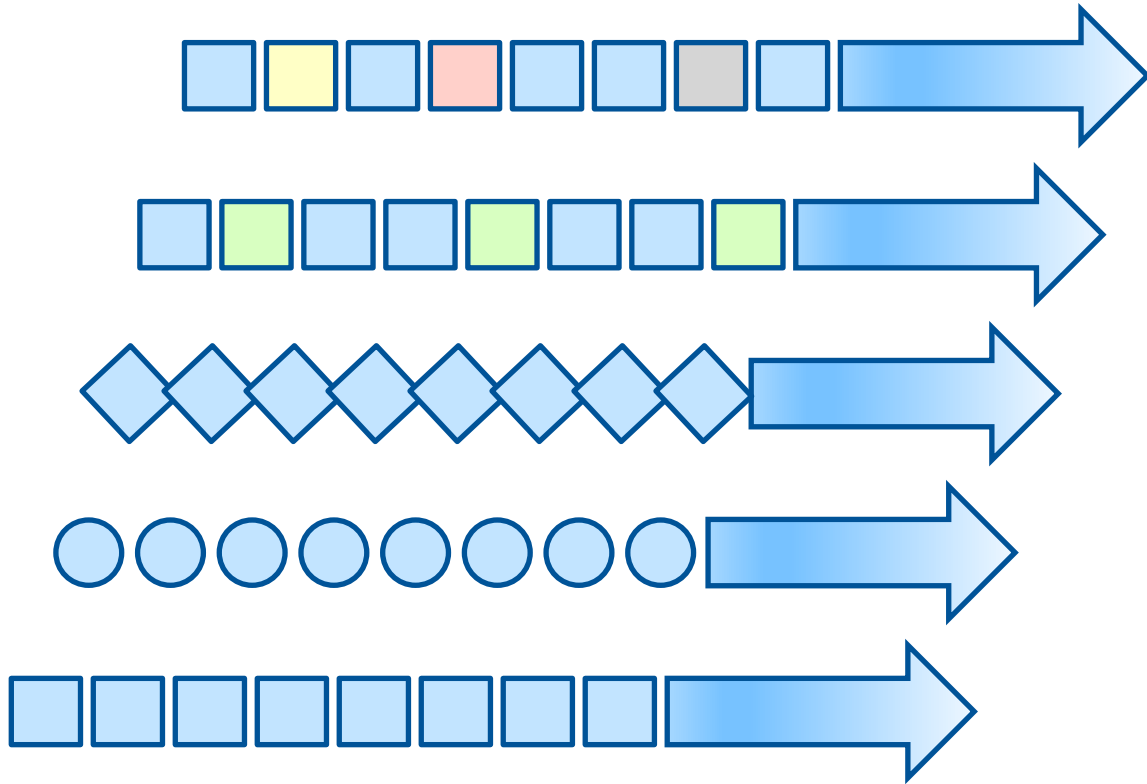


- A QiStream is the fundamental unit of storage in Qi.
- A stream represents an ordered series of events or observations for a particular item of interest
- Many streams defined in a namespace



Distributed Data Store Basics – Streams

 Stream
 Fundamental unit of storage
 Type Reference
 Secondary Indexing



Distributed Data Store Basics – Querying Capabilities

Reading

Get `GetDistinctValueAsync<Sample>(streamId, index)`

First, Last `GetFirstValue<Sample>(streamId)`

Find `FindDistinctValue<Sample, DateTime>(streamId, DateTime.Now, QiSearchMode.ExactOrPrevious)`

Window `GetWindowValues<Sample>(streamId, start, end)`

Range `GetRangeValues<Sample>(streamId, start, count)`

Filter

Expressions that can be applied to Range and Window calls to conditionally eliminate undesired events.

`GetWindowValues<Sample>(streamId, start, end, “Val lt 100”)`

`GetRangeValues<Sample>(streamId, start, count, “endswith(Val, ‘Lo’)”)`

Fictitious Scenario for OSIsoft Cloud Services (OCS)

Story of Unified Petroleum's digital transformation

Desire to improve safety and reduce cost

- optimize drilling
- share across regions
- discourage isolation
- smooth interaction w/ latest technologies
- available everywhere
- do not want to maintain an IT staff

Fictitious Scenario for OSIsoft Cloud Services (OCS)

- Unified Petroleum is actively drilling in...
 - Gulf of Mexico
 - North Sea
 - Lookout, Oklahoma
- Data source
 - Wellsite Information Transfer Standard Markup Language (WITSML)
 - **WITSML** is a “*standard*” for sharing well data in the petroleum industry.



Fictitious Scenario for OSIsoft Cloud Services (OCS)

- Employees have experience with WITSML
 - Chose to write their own WITSML interface
- Chose OSIsoft Cloud Services because of
 - No deployment
 - Reduces maintenance
 - Easy to interact with
 - Greatly extends available tools by supporting current standards

Quick Look at some code

Next Steps...

UC NA 2017
San Francisco



UC EMEA 2017
London



uservoice

UC NA 2018
San Francisco



uservoice

UC EMEA 2018



uservoice

Open Beta

- Storage
- Ingress
- Calculations
- Visualization

CTP

- Data Sharing
- Display Sharing

Gen. Av.

- Data Sharing
- Display Sharing
- Partners App.

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Questions

Please wait for the **microphone** before asking your questions



State your **name & company**

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감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado