

Azure DevOps

Agenda

- What is Azure DevOps?
- Azure DevOps Services
- Tour Azure DevOps environment
- Create Build & Release pipelines

Azure DevOps

- **Set of managed services for teams**
 - Plan work and track work items
 - Use source control for versioning and team collaboration
 - Create pipelines for automated application deployments
 - Define processes / guidelines for projects
- **Types of Pipelines**
 - Continuous Integration (CI)
 - Continuous Deployment (CD)
- **Azure DevOps can be used in:**
 - Cloud (using Azure DevOps services)
 - On-premises (using Azure DevOps server)
- **Supports integration** with GitHub and other external services

Azure DevOps Services

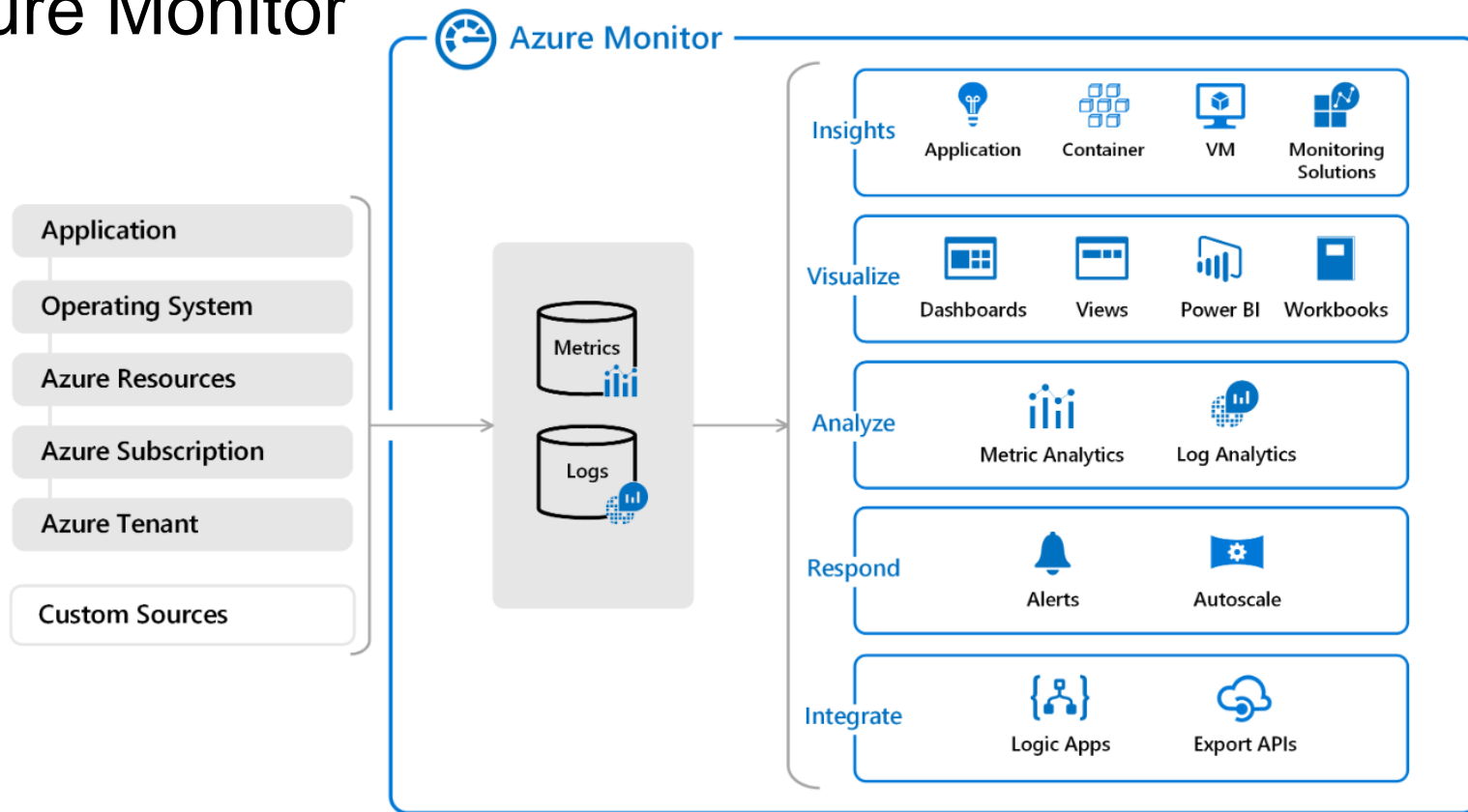
- **Azure Boards**
 - Set of Agile tools to plan & track work items, issues, and their progress
 - Supports Scrum and Kanban
- **Azure Repos**
 - Source control repositories
 - Supports Git and Team Foundation Version Control (TFVC)
- **Azure Pipelines**
 - Create build (CI) and release (CD) pipelines
 - Supports pre-built templates for variety of applications
- **Azure Test Plans**
 - Supports various tools for application testing (manual & continuous)
- **Azure Artifacts**
 - Common place to share packages (NuGet, Maven etc.)

Azure Monitoring

Agenda

- What is Azure Monitor?
- Monitoring Options
- Use monitoring services
 - Metrics, Service Health, Activity Logs
 - Setup Alerts
 - Log Analytics
 - Application Insights

Azure Monitor



Monitoring

- Metrics
 - Numerical numbers captured by Azure Monitor for each service in Azure, related to the service performance and behavior
- Activity Logs
 - All activities that are happening on resources
 - Operations on a resource from the outside (control plane)
- Diagnostics Logs
 - Emitted by resource
 - Provide information about operations of that resource (data plane)
- Alerts
 - Proactive actions can be taken by specifying target criteria

Log Analytics

- Capture data from any place or any source
- Collect and query the data using LA workspace
- Run Kusto Query Language on top of LA repository
- Examples of collecting data from:
 - Azure resources in subscription
 - On-premises machines monitored by System Center Operations Manager
 - Diagnostics or log data from Azure storage / VMs

Application Insights

- Extensible Application Performance Management (APM) service for web developers on multiple platforms
- Works on multiple type of platform including .NET, Node.js and Java EE, hosted on-premises, hybrid, or any public cloud
- Monitors:
 - Request rates, response times, and failure rates
 - Page views and load performance
 - User and session counts
 - AJAX calls
 - Performance counters etc.

Azure Data Services - Introduction

Agenda

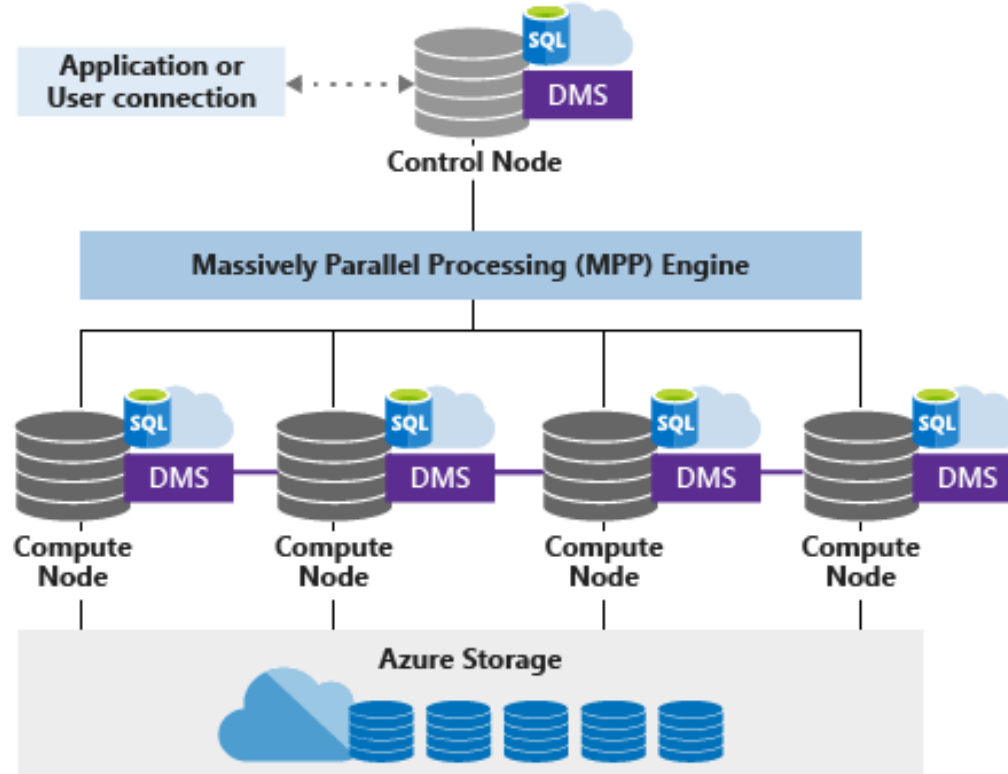
- Data Storage options
- Data Processing options
- Other options
- Reference Architectures

Storage Options

Relational Storage

- SMP options
 - SQL Server on VM
 - Azure SQL databases – for SQL Server, MySQL and PostgreSQL
 - Azure SQL Managed Instance
- MPP options
 - Dedicated SQL Pool (earlier known as Azure SQL Data Warehouse)
 - Based on MPP architecture, performs distributed processing of data

Dedicated SQL Pool Architecture



Storage Options

Non-Relational Storage

- Azure Storage
 - Blob storage, File Storage, Table storage
- Azure Data Lake Gen1
 - WebHDFS compliant
- Azure Data Lake Gen2
 - Built on top of Azure Storage + WebHDFS compliant
- Azure Disks
- Azure Cosmos DB
 - Table API, Core (SQL) API, MongoDB API, Cassandra API, Gremlin API

Storage Options

Log Storage

- Azure Log Analytics
 - Managed service, based on Log database – Kusto
 - Collect & store log data from multiple sources
- Azure Data Explorer
 - Managed service, based on Log database – Kusto
 - More control. Used to build custom solutions

Message/Event Storage

- Azure Service Bus
- Azure Storage Queues
- Azure Event Hubs

Processing Options

Batch Processing

- **Azure Databricks**
 - Spark based unified analytics platform
 - Independent company - hosts Databricks on Azure
- **Azure HDInsight**
 - Previously, open source distribution of HDP (Hortonworks Data Platform)
 - Now, Microsoft's own distribution of open source technologies
 - Hadoop, HBase, Interactive Query, Kafka, Spark, Storm & ML clusters
- **Azure Data Lake Analytics**
 - On-demand analytics service to process big data

Processing Options

Batch Processing

- Azure Synapse Analytics
 - Unified analytics service, with multiple Azure Data services integrated into it
 - Includes Dedicated SQL Pool, Apache Spark, Serverless SQL, Synapse Pipelines, Data Lake Gen2
 - Connects to various other Azure services, like Power BI, Azure ML, Cosmos DB, Azure Purview etc.

Processing Options

Stream Processing

- **Azure Stream Analytics**
 - Microsoft's own service for stream data processing
 - Managed service; Has SQL-like syntax
- **Azure Databricks**
 - Use Spark Structured Streaming on Azure Databricks for stream processing
- **Azure HDInsight**
 - Use Spark Structured Streaming on Spark cluster for stream processing
 - Use Storm cluster for streaming

Other Options

Ingestion and Orchestration

- Azure Data Factory
 - Ingest data using COPY activity
 - Perform code-free transformations using Mapping Data Flows
 - Orchestrate end-to-end pipelines

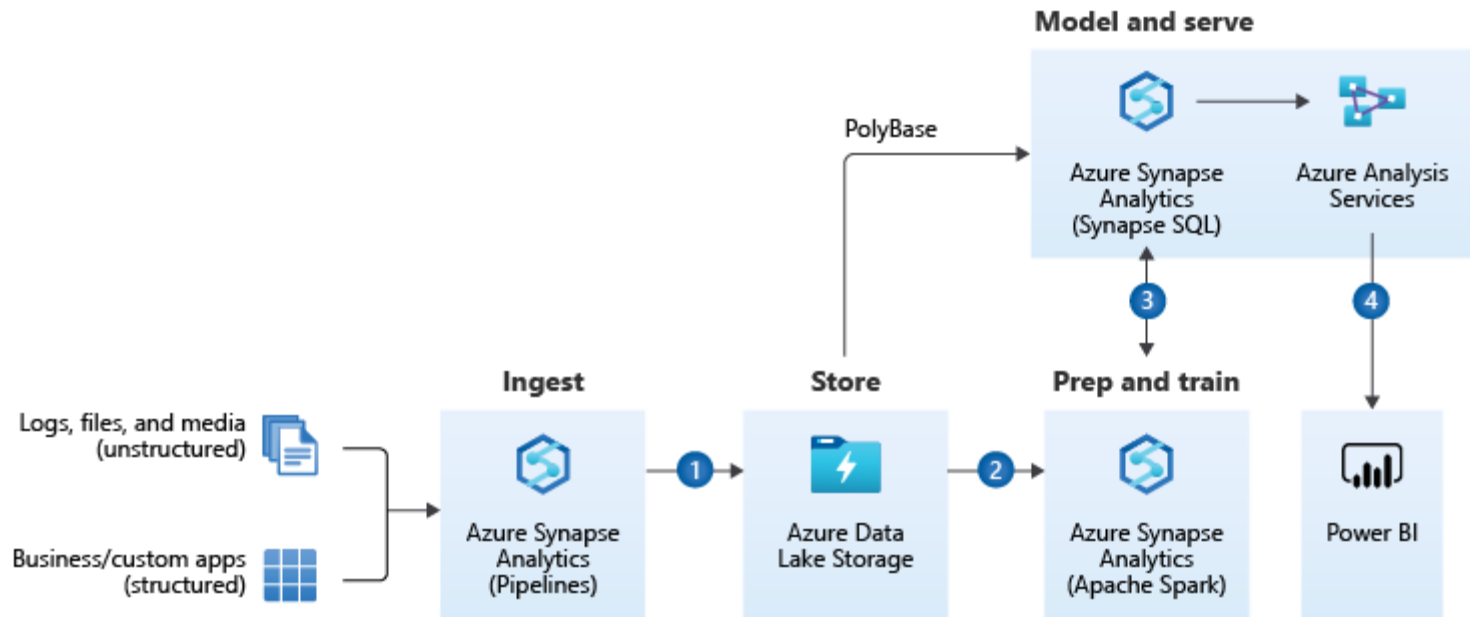
Analytics

- Azure Analysis Services
 - Build enterprise-grade data models
 - Managed service; Highly scalable SQL Server Analysis Services in cloud

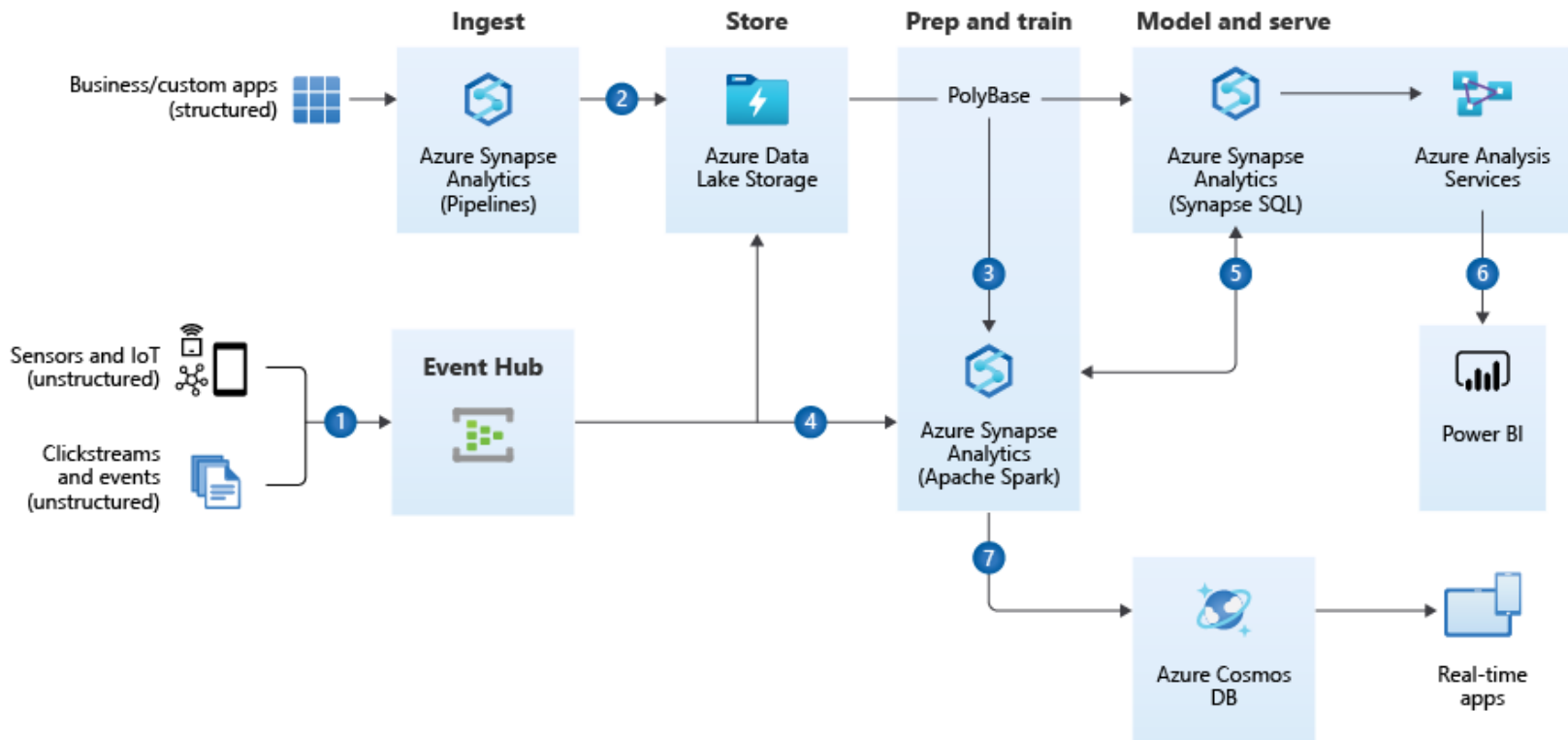
Visualization

- Power BI

Modern Data Warehouse Architecture



Real Time Analytics Architecture

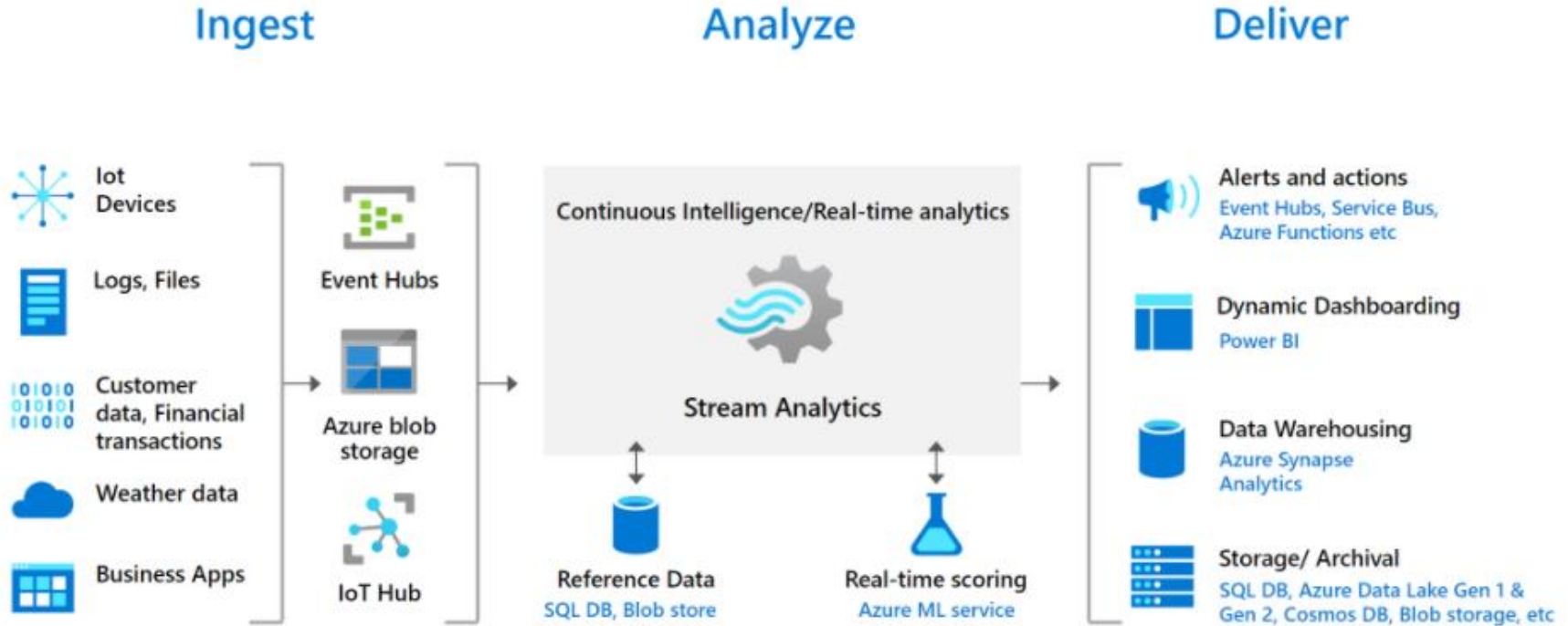


Azure Stream Analytics

Agenda

- What is Azure Stream Analytics?
- Streaming Architecture
- Build an end-to-end Streaming Pipeline

Azure Stream Analytics



Azure Stream Analytics

- Fully managed, stream processing service from Microsoft
- Available in cloud, and on Edge devices
- **Data sources**
 - **Stream input** – Azure Event Hubs, IoT Hub, Blob storage & Data Lake Gen2
 - **Reference input** – Azure Blob storage, Data Lake Gen2 & Azure SQL
 - **Stream output** – Data Lake, Synapse, Event Hubs, Power BI, Cosmos DB etc.
- Process data from multiple streams together
- SQL-like syntax
- Supports user-defined functions (UDFs) & user-defined aggregates (UDAs)
- UDFs and UDAs can be written in JavaScript (in cloud) and C# (in edge)

Azure Cost Management

Agenda

- Calculator
- Budgets & Alerts
- Azure Advisor