Microsoft Azure

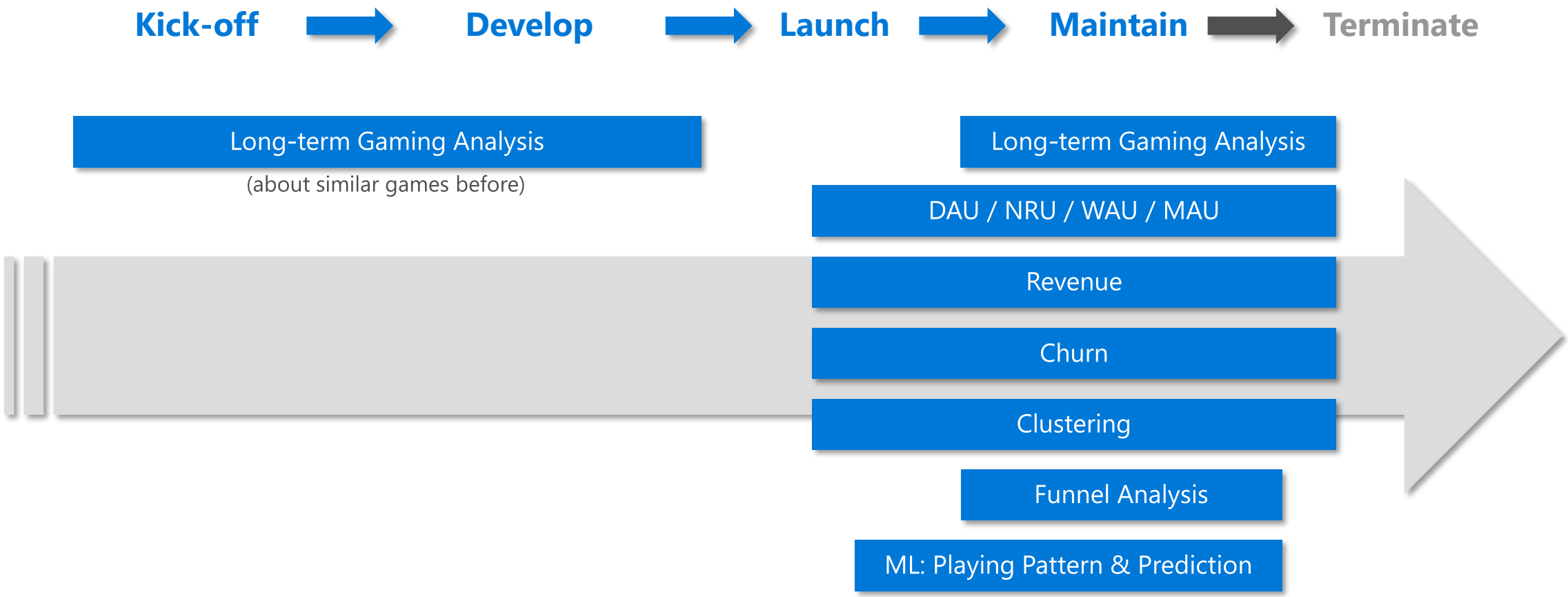
Gaming Data Analytics & Cognitive Services on Azure

Jisun Kim
GBB, Gaming Data & AI

Gaming Data Analytics on Azure

Big Data Analytics in Gaming

Gaming: Life cycle



Azure Data Explorer in Gaming Analytics

- Fast & Low latency
- Comfortable for co-working
- Optimized for streaming & batching ingestion for in-time analytics
- Strong query language covers user analytics, machine learning, etc.
- Data Lake to put various data altogether
- Cost effective for data mining process

Log Exploration & Analytics

Integration / Ingestion

Apache Kafka for HDInsight

Azure Data Factory

Exploration

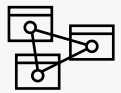
Azure Data Explorer

Analytics

Azure Databricks

sparklyr Spark ML SparkR Spark Streaming

Modeling



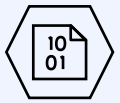
Azure Analysis Services

Azure SQL Data Warehouse

Visualization

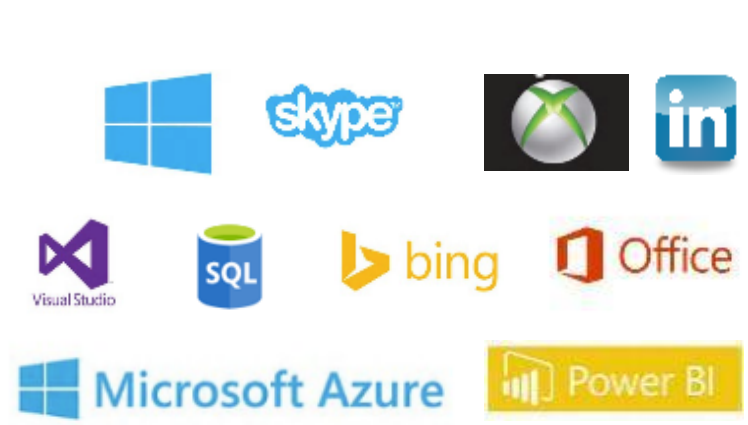
Power BI

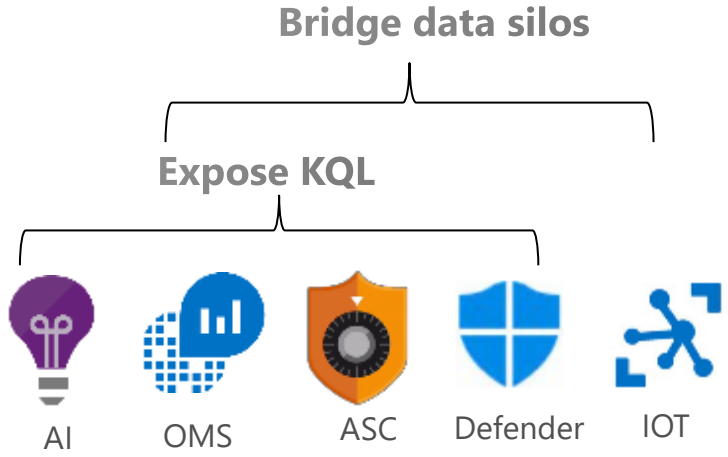
Storage



Azure Data Lake Storage

Azure Data Explorer - Evolution





Kusto as a Platform

Telemetry Analytics for internal	Analytics Data Platform for products	Interactive Analytics Big Data Platform
2015 - 2016	2017	2019
Starting with 1st party validation Building modern analytics Vision of analytics platform for MSFT	Analytics engine for 3rd party offers Unified platform across OMS/AI Expanded scenarios for IOT timeseries Bridged across client/server security	GA - February 2019

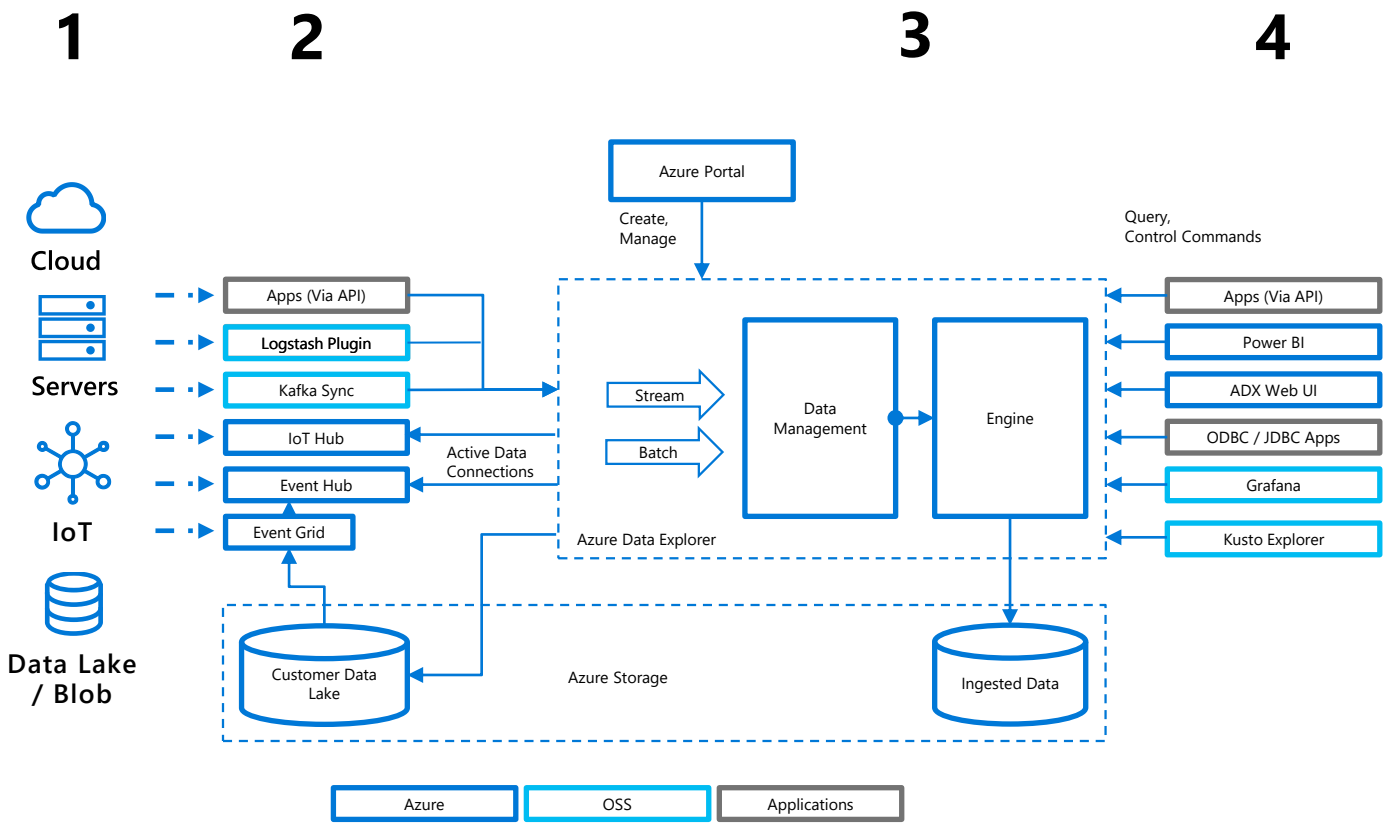
Azure Data Explorer: overview

1. **Capability for many data types, formats, and sources**
   Structured (numbers), semi-structured (JSON\XML), and free text

2. **Batch or streaming ingestion**
   Use managed ingestion pipeline or queue a request for pull ingestion

3. **Compute and storage isolation**
   - Independent scale out / scale in
   - Persistent data in Azure Blob Storage
   - Caching for low-latency on compute

4. **Multiple options to support data consumption**
   Use out-of-the box tools such as Kusto Explorer and connectors
   or use APIs/SDKs for custom solution



Simple provisioning: Fully Managed for Efficiency

Easy provisioning

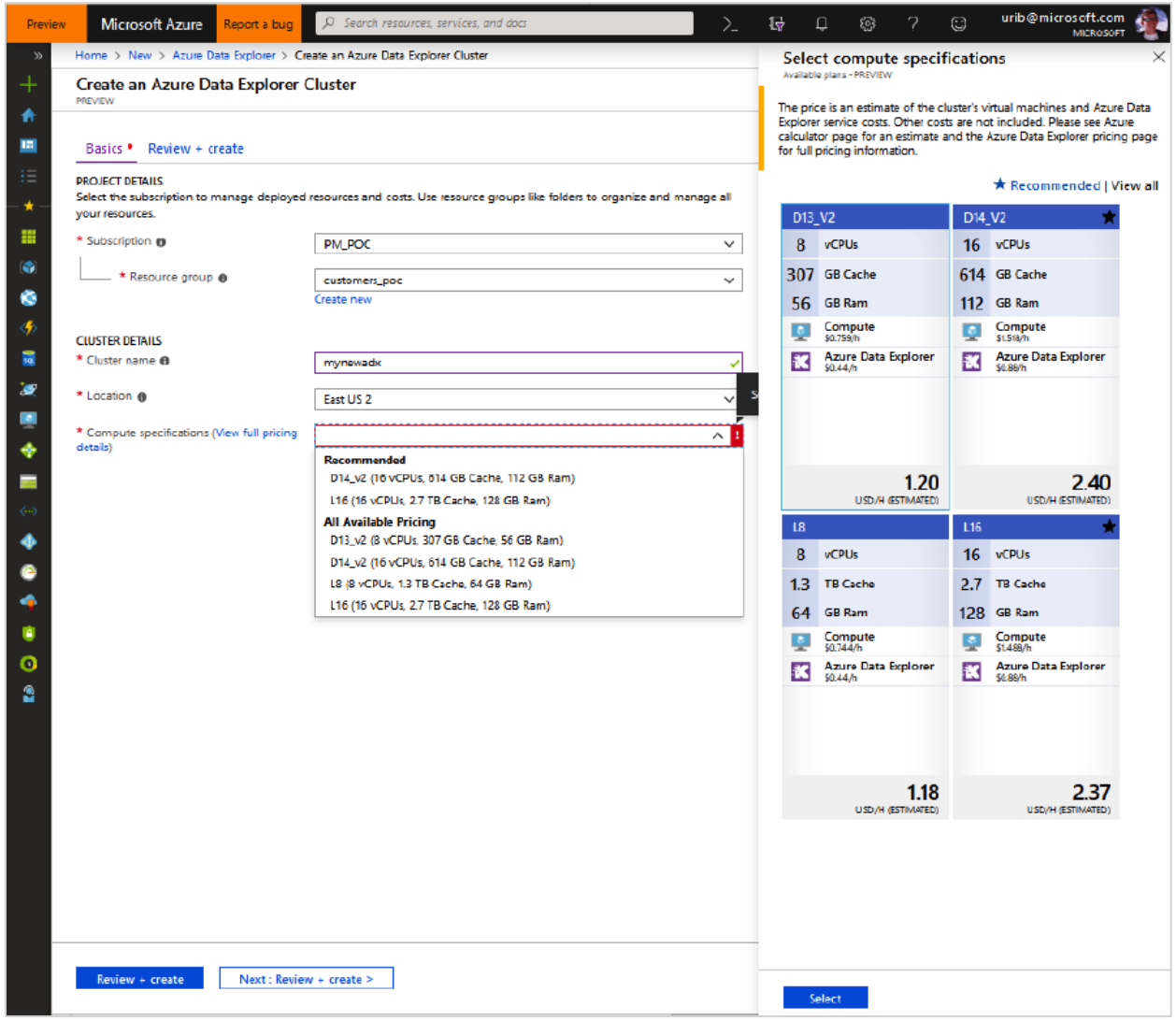
- No infrastructure to manage: Azure PaaS
- Use Azure Portal, APIs, or PowerShell to provision
- Storage Optimize/Compute Optimize SKUs
- Flexible data caching and retention options at database and table level

Rapid elasticity

- Buy only what you need
- Scale out/in manually or use autoscale
- Dedicated resources

Maintenance-free

- All columns are compressed and indexed during ingestion
- No index maintenance required



Fast ingestion: Optimized for Streaming Data

Easy input from multiple data sources

Multiple data sources

- Managed ingestion (e.g. Event Hub, IoT Hub) or programmatic ingestion (e.g. connectors, SDKs)

Versatile ingestion

- Use batch or streaming ingestion

Easy input from multiple formats

- Tabular formats: CSV, TSV, PSV, SCSV
- JSON (line-separated, multiline), Avro
- ZIP and GZIP compression (for Batch)

Instant integration with simple transforms

- Reshape the data with update policies (Database Ingest Triggers)

Managed services


Azure Event Grid


Azure Event Hub


Azure IoT Hub

Azure Blob

Azure Data Lake

Connectors/Plugins

SDKs and APIs

Intuitive querying: Designed for Data Exploration

Simple and powerful

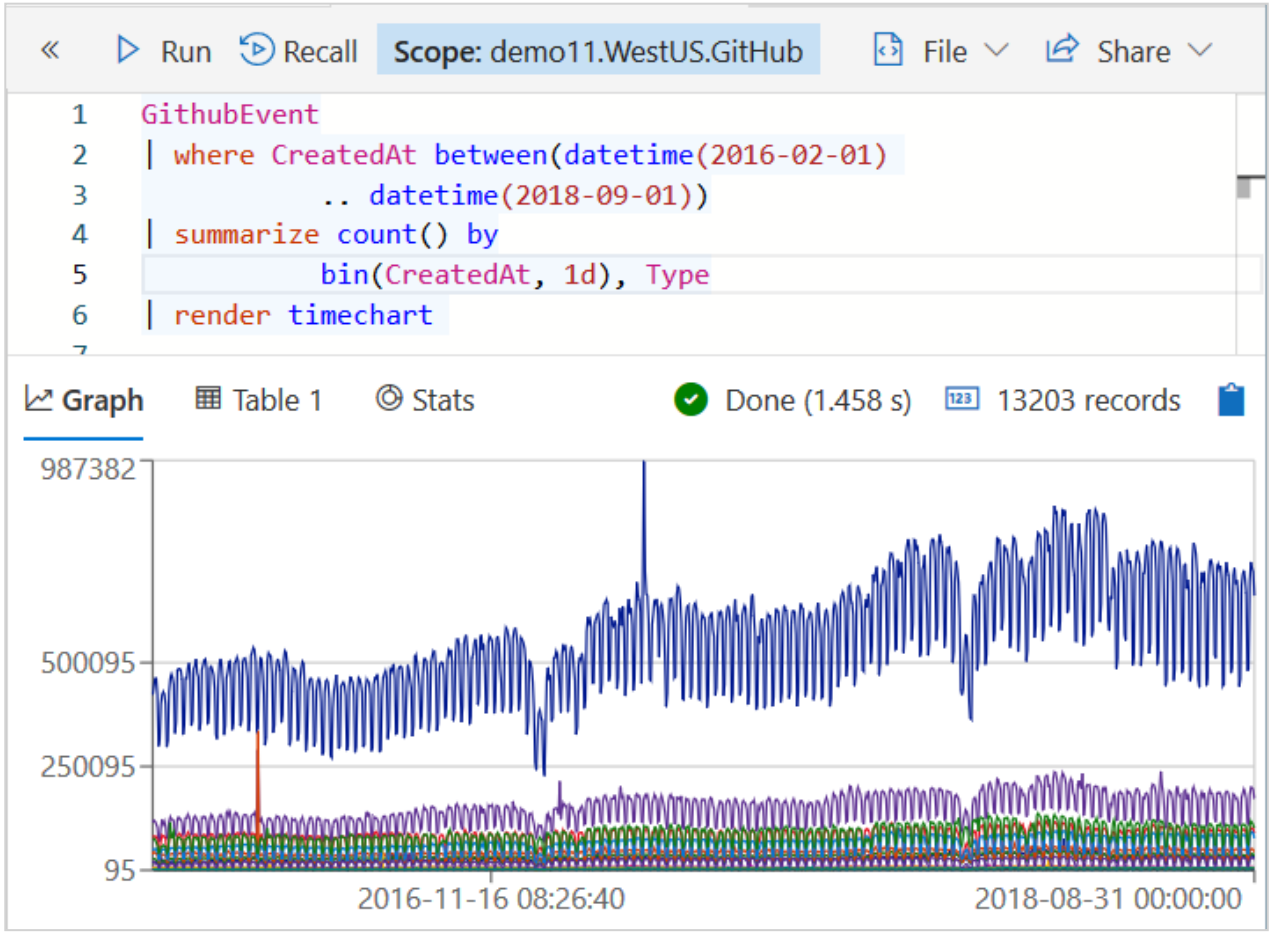
- Rich rational query language (filter, aggregate, join, calculated columns, and more)
- Built-in full-text search, time series, user analytics, and machine learning operators
- Out-of-the box visualization (render)
- Easy-to-use syntax + Microsoft IntelliSense
- Highly recognizable hierarchical schema entities

Comprehensive

- Built for querying over structured, semi-structured and unstructured data simultaneously

Extensible

- In-line Python
- SQL



Azure Cognitive Services

Microsoft Cognitive Services

Give your apps a human side

Vision

From faces to feelings, allow your apps to understand images and video

Speech

Hear and speak to your users by filtering noise, identifying speakers, and understanding intent

Language

Process text and learn how to recognize what users want

Knowledge

Map complex information and data in order to solve specific tasks

Search

Access billions of web pages, images, videos, and news with the power of Bing

Labs

An early look at emerging Cognitive Services technologies: discover, try, and give feedback on new technologies before general availability

Why Microsoft Cognitive Services?

Easy

Roll your own with REST APIs

Simple to add: just a few lines of code required

Get a key, Build

Flexible

Integrate into the language and platform of your choice

Breadth of offerings helps you find the right for your app

Bring your own data for your custom experience

Tested

Built by experts in their field from Microsoft Research, Bing, and Azure Machine Learning

Quality documentation, sample code, and community support

Microsoft Cognitive Services

Vision

- Video Indexer
- Computer Vision
- Face
- Emotion
- Content Moderator
- Custom Vision

Speech

- Speaker Recognition
- Bing Speech
- Custom Speech
- Translator Speech
- Unified Speech
  - Speech to Text w. Custom Speech
  - Text to Speech w. Custom Voice
  - Speech Translation w. Custom Translator

Language

- Text Analytics
- Bing Spell Check
- Translator Text
- Language Understanding (LUIS)

Knowledge

- QnA Maker
- Custom Decision

Search

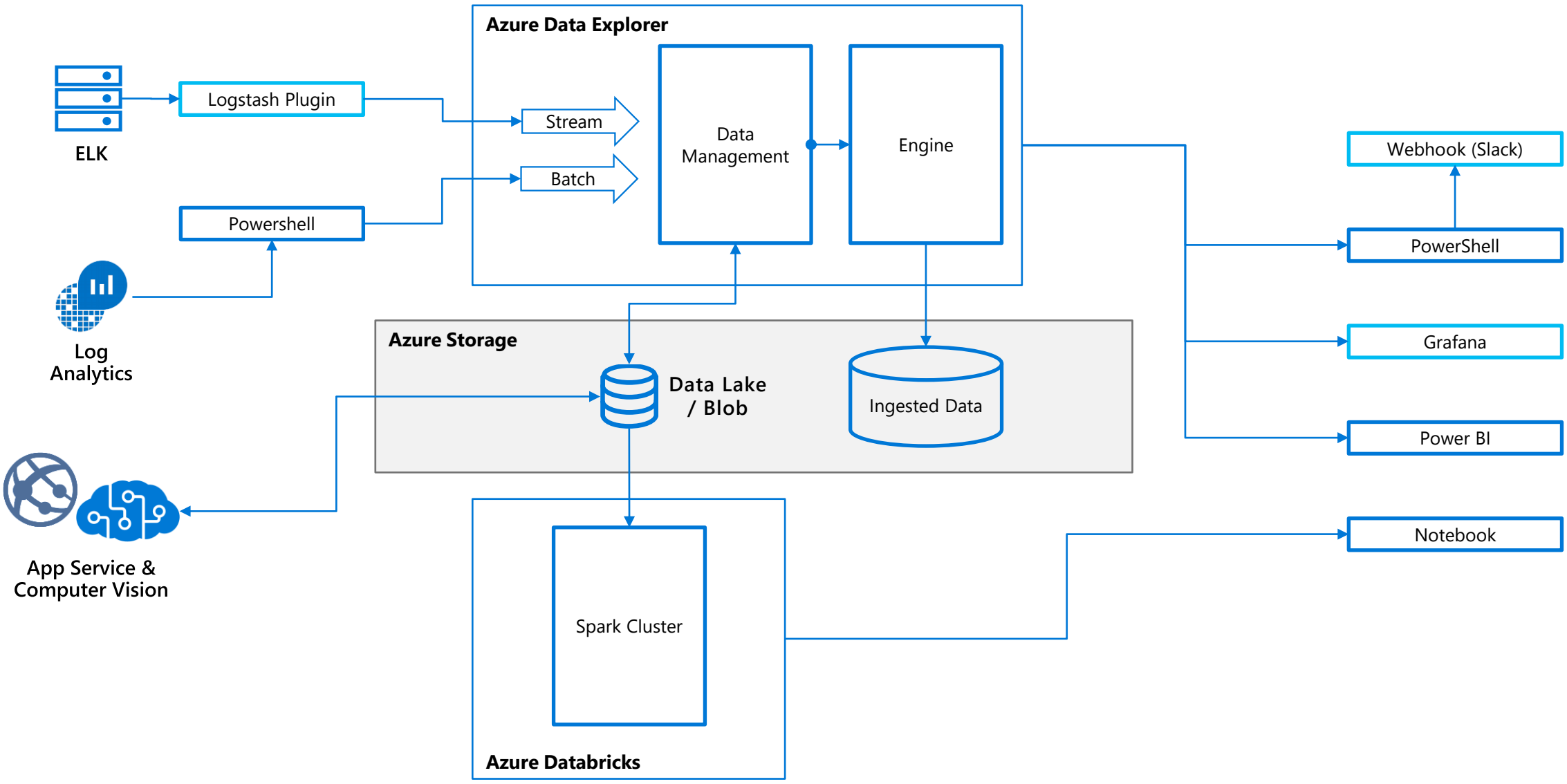
- Bing Entity Search
- Bing Autosuggest
- Bing Search
  - Web Search
  - Image Search
  - News Search
  - Video Search
- Bing Statistics add-in
- Bing Visual Search
- Bing Custom Search

Labs

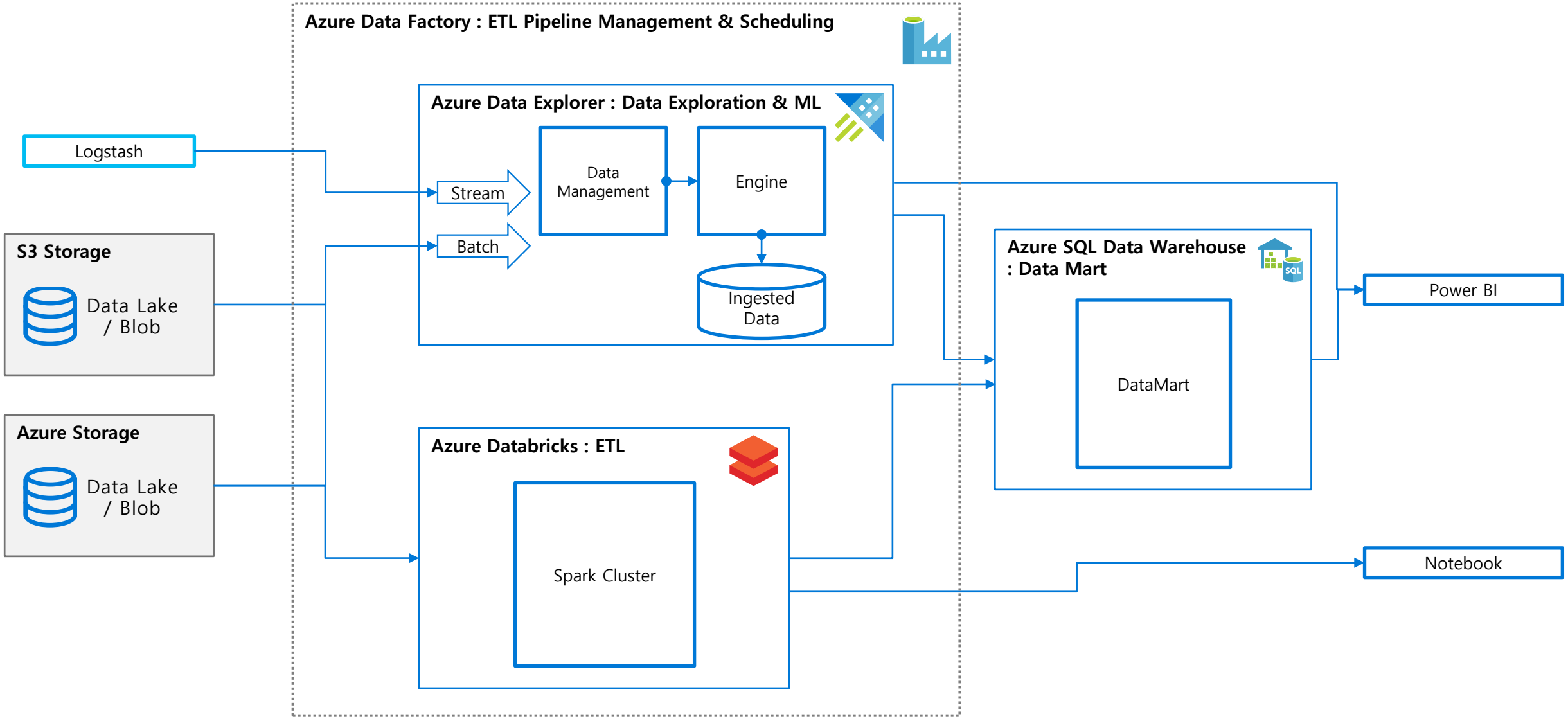
- Project Gesture
- Project Local Insights
- Project Academic Knowledge
- Project Entity Linking
- Project Knowledge Exploration
- Project Event Tracking
- Project Answer Search
- Project URL Preview
- Project Anomaly Finder
- Project Conversation Learner
- Project Personality Chat

Architectures

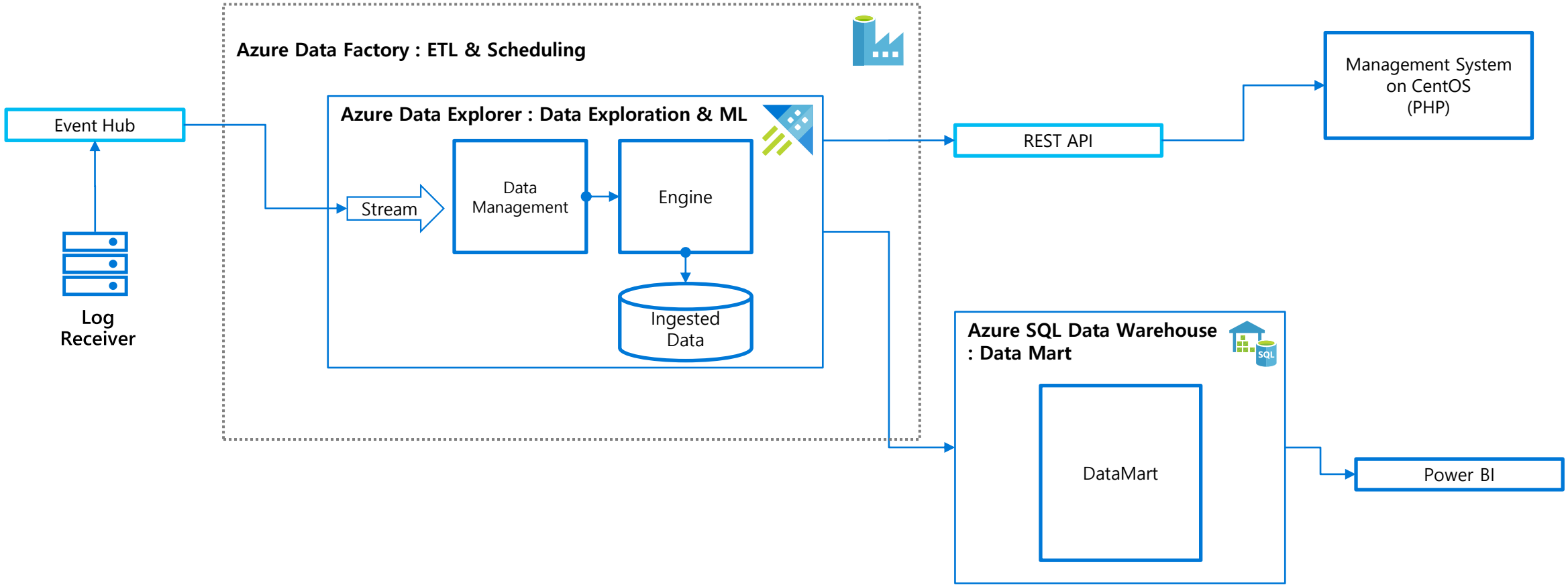
Case A: Korea gaming



Case B: Korea gaming

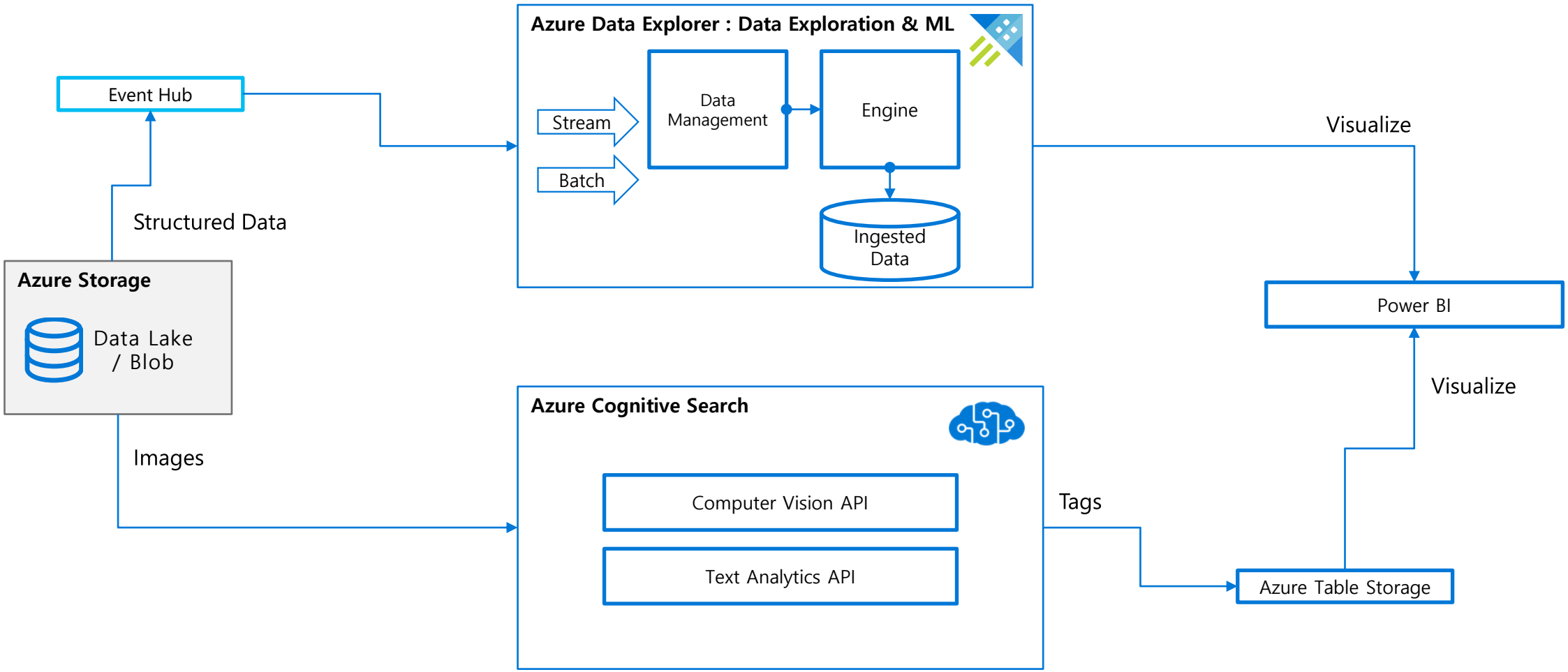


Case C: Korea gaming



Demo

Demo: Data analytics & Cognitive search



Appendix

Azure Data Explorer Cost (http://aka.ms/adx.cost)

Azure Data Explorer (Kusto) Cost Estimator

Data Set	Data ingestion (per day, one time)	Per Day
	Data collected (TB)	0.1
	Hot data (days)	10
	Total retention (cold and hot data available for query - days)	10
	Estimated Data Compression (x times)	7
	Machine SKU	Choose for me
	Azure Region	US West 2

Monthly Cost: **Cluster: 2 D11 Engine machines, and 2 D1 DM machines** **$639**

$7,670/year

Breakdown	**Year**	**Month**
Engine Machine Cores	$2,610	$218
Data Management Machine Cores	$999	$83
Total Machines	**$3,609**	**$301**
Storage: space + transactions	$198	$16
Network (bandwidth)	$9	$1
Kusto Markup ($0.11 per hour per engine core)	$3,854	$321
Total	**$7,670**	**$639**

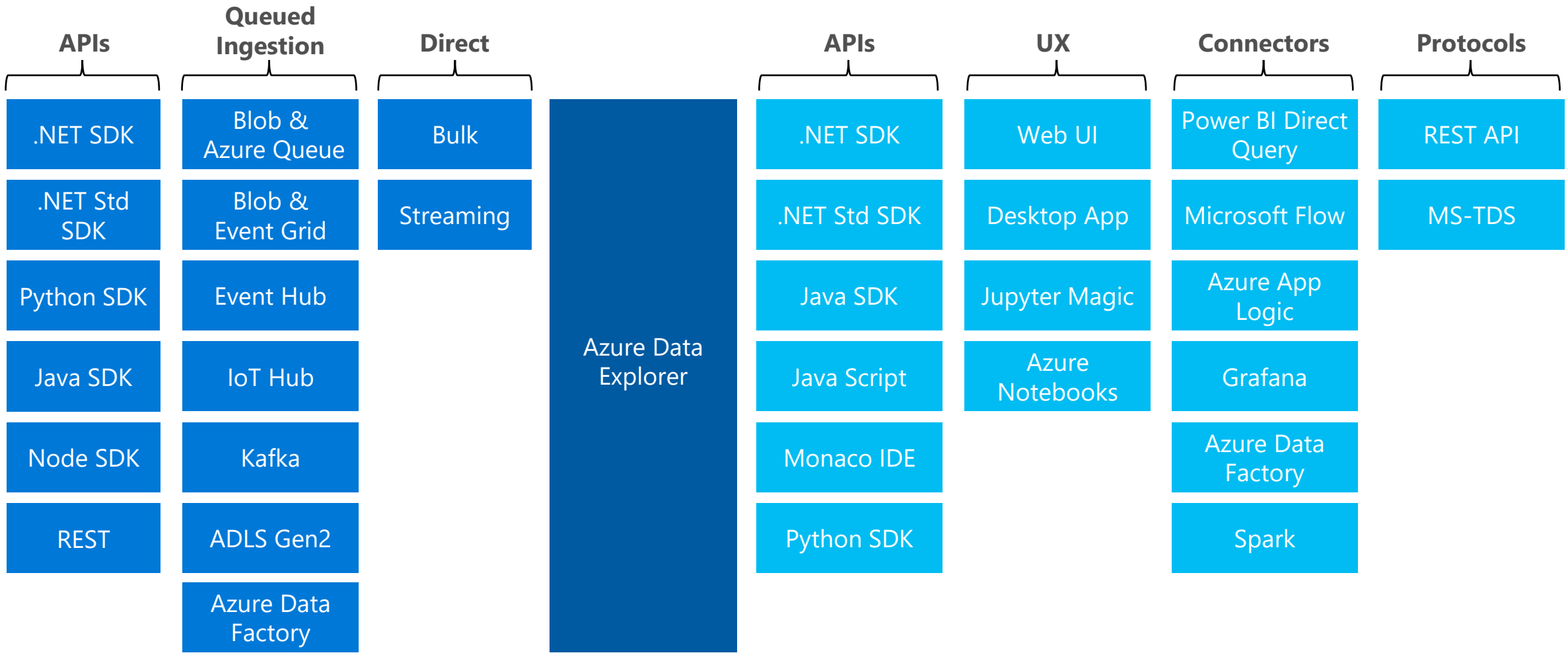
Notes (Updated on 2/9/2019):

The calculation is based on optimal capacity - actual cost may vary based on the actual capacity and compute needs

How to use:

1. Choose the ingestion pattern in cell D2
2. Enter amount of data ingested in TBs in cell D3
3. Enter the hot data period in days (i.e. the period that the data is cached in the cluster) in cell D4
4. Enter the total data retention period that includes the cold and hot data available for query in cell D5
5. Enter estimated compression ratio in cell D6
6. Choose machine type and Azure region cells D7, D8

How to get the data in and how to access the data



Cognitive Services capabilities

Infuse your apps, websites, and bots with human-like intelligence

Vision

Object, scene, and activity detection

Face recognition and identification

Celebrity and landmark recognition

Emotion recognition

Text and handwriting recognition (OCR)

Video metadata, audio, and keyframe extraction and analysis

Explicit or offensive content moderation

Custom image recognition

Speech

Speech transcription (Speech-to-text)

Speech Synthesis (Text-to-speech)

Real-time speech translation

Speaker identification and verification

Custom Speech models for transcription and translation

Custom voice

Language

Language detection

Text sentiment analysis

Key phrase extraction

Entity recognition

Spell checking

Explicit or offensive text content moderation, PII detection

Text translation

Customizable text translation

Contextual language understanding

Knowledge

Q&A extraction from unstructured text

Knowledge base creation from collections of Q&As

Semantic matching for knowledge bases

Customizable content personalization learning

Search

Ad-free web, news, image, and video search results

Trends for video, news

Image identification, classification and knowledge extraction

Identification of similar images and products

Named entity recognition and classification

Knowledge acquisition for named entities

Search query autosuggest

Ad-free custom search engine creation

Thank you