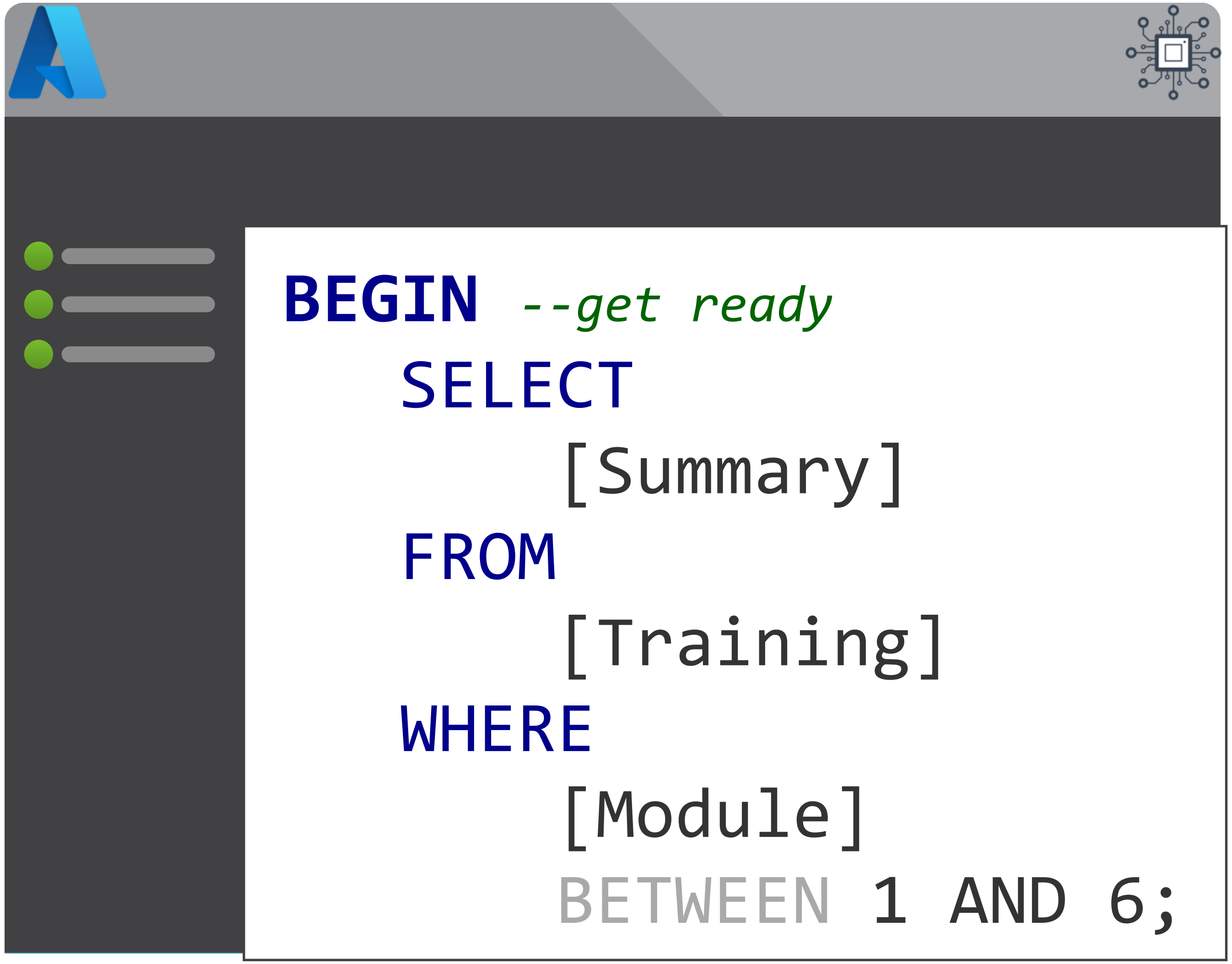
Module 1 - 6

An Architects Recap



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    FROM
         [Training]
    WHERE
         [Module]
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```

Module 1 to 6 Recap

1. Design
2. Extract
3. Transform
4. Load

Agenda

1. Design
2. Extract
3. Transform
4. Load

Question:

What is the answer to life, the universe and everything?

Answer:

42 ✗

Answer:

It depends! ✓

Question:

What is big data?

Answer:

It depends! ✓

Answer:

Any data that you cannot process
in the time that you have/want ✓
using the technology you have.

- Buck Woody

@BuckWoodyMSFT

Goal

Paul’s Magic Box -
From the Hogwarts School of Witches & Wizardry

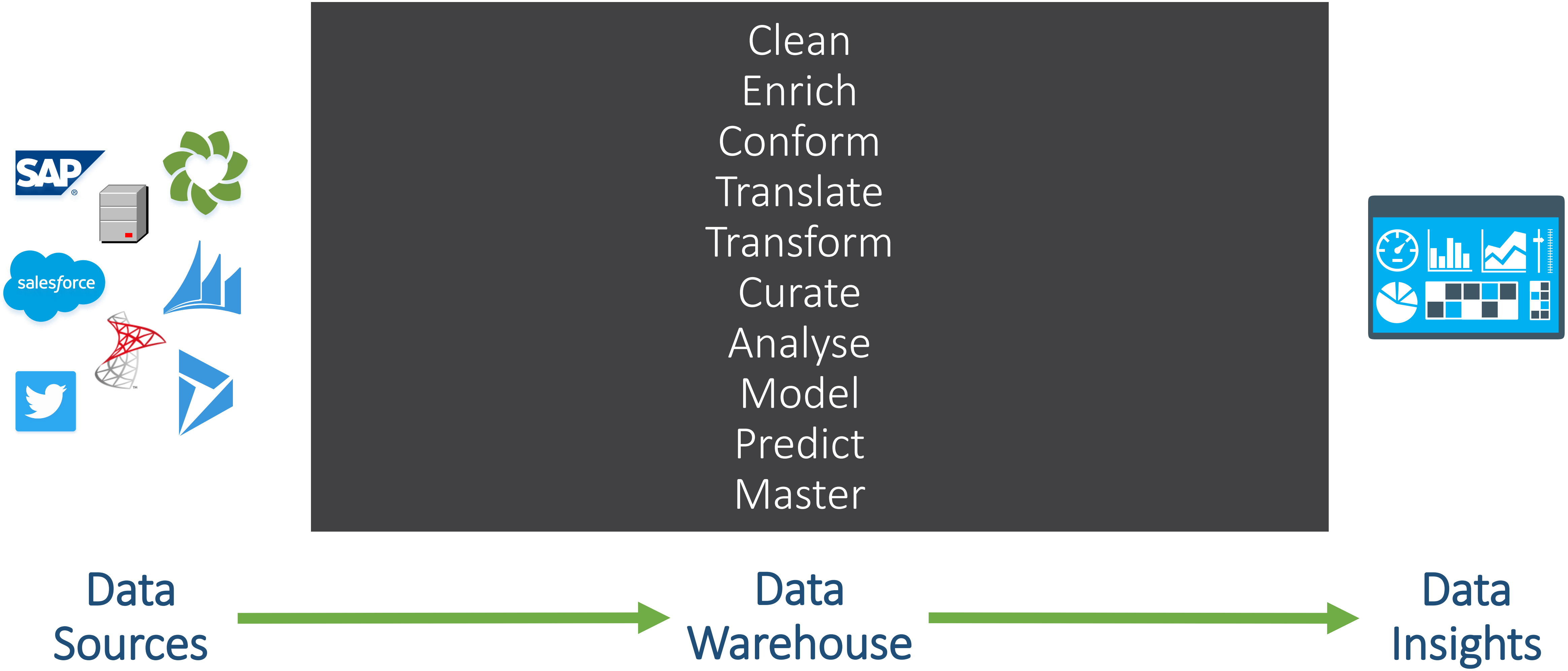
Data Sources

Data Warehouse

Data Insights

Data = Information = Knowledge = Power

Goal



Clean
Enrich
Conform
Translate
Transform
Curate
Analyse
Model
Predict
Master

Data Sources

Data Warehouse

Data Insights

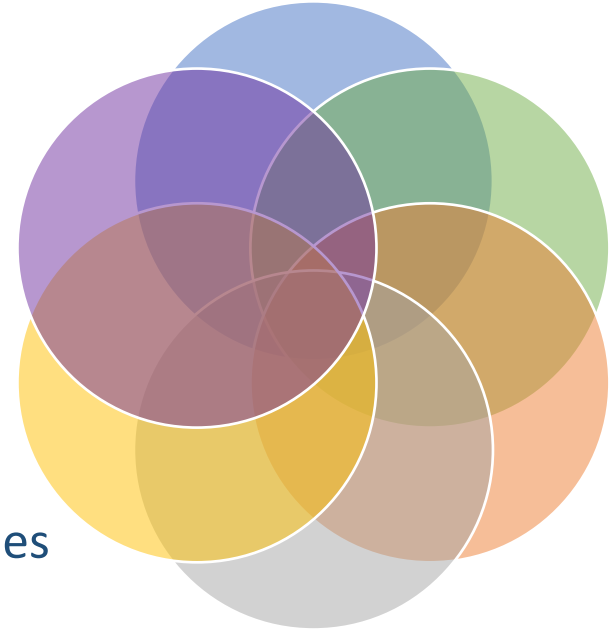
What is your primary design focus?

- Disaster recovery
- Transaction level restart ability

Resilience

Rapid Delivery

- Metadata driven
- Continuous deployments



Performance

- Complex partitioning
- Large compute clusters

(Re)Usability

- Generic code libraries
- Technical contracts

Scalability

- Auto scaling microservices
- Event driven discrete processes

Cost

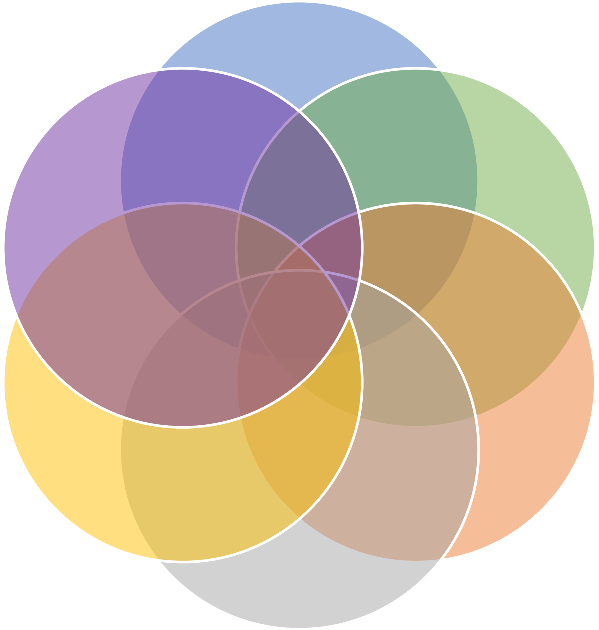
- Minimum resources used
- Dynamic resource management

What is your primary design focus?

Resilience

Rapid Delivery

Performance

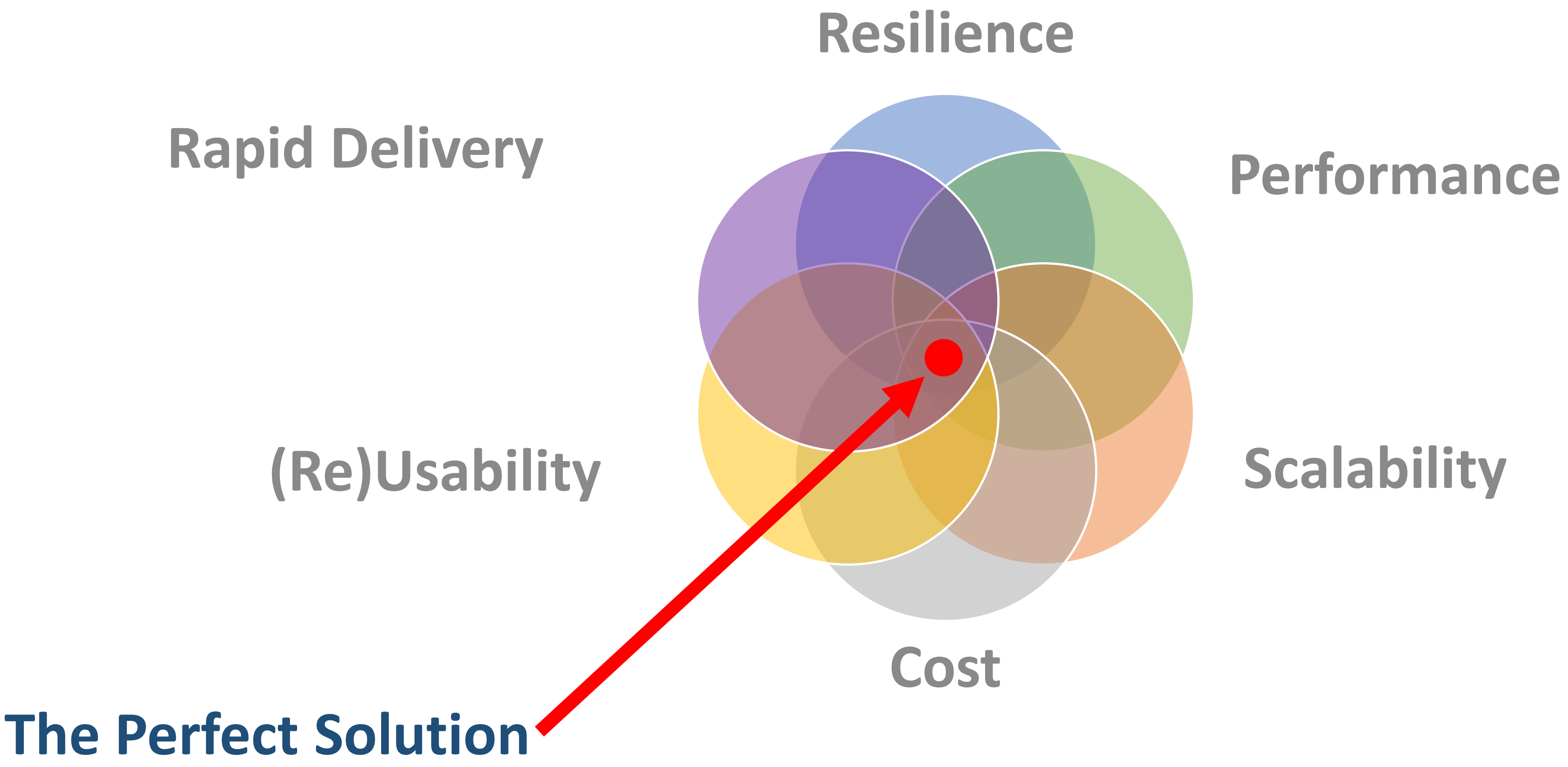


(Re)Usability

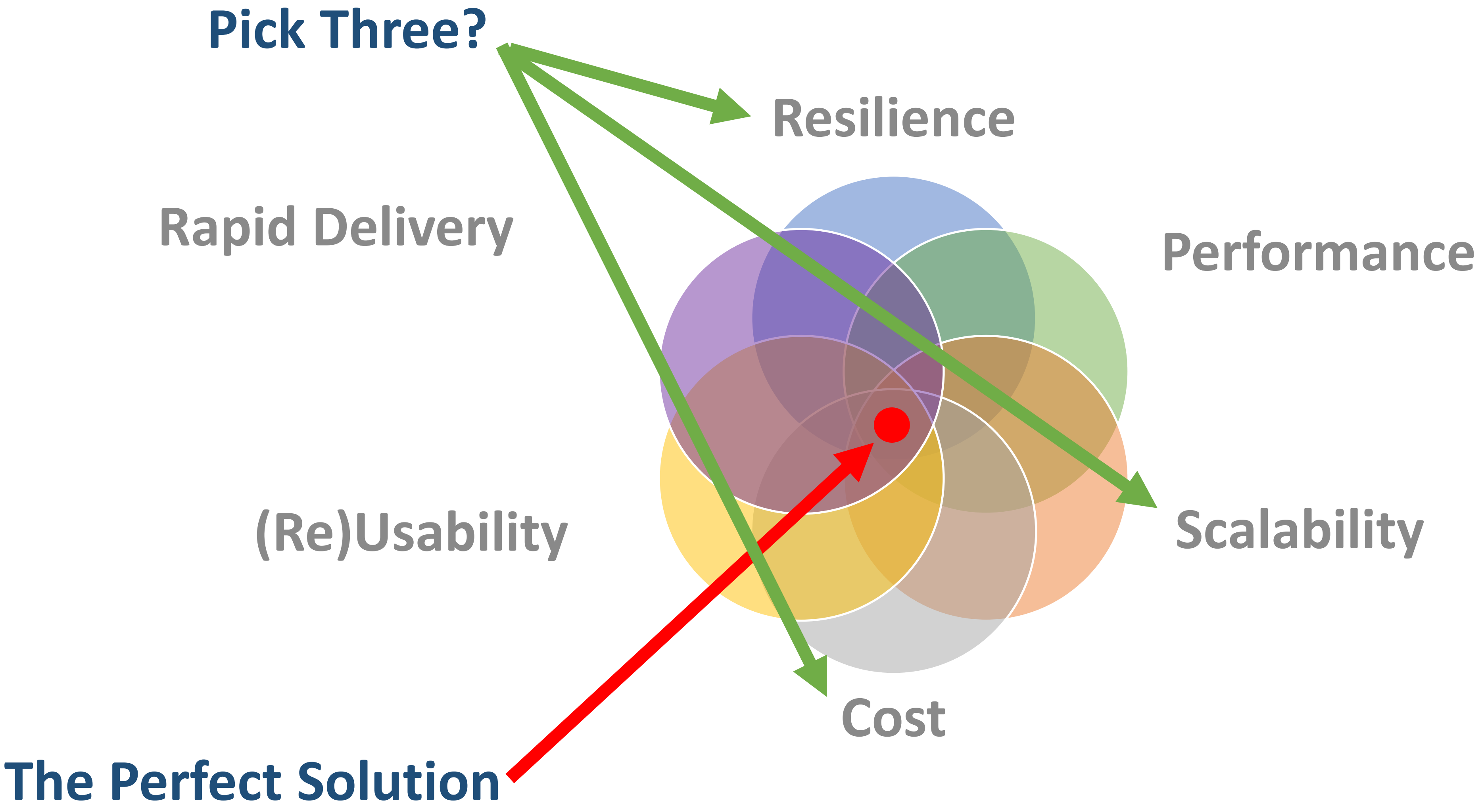
Scalability

Cost

What is your primary design focus?



What is your primary design focus?



Pick Three?

Resilience

Rapid Delivery

Performance

(Re)Usability

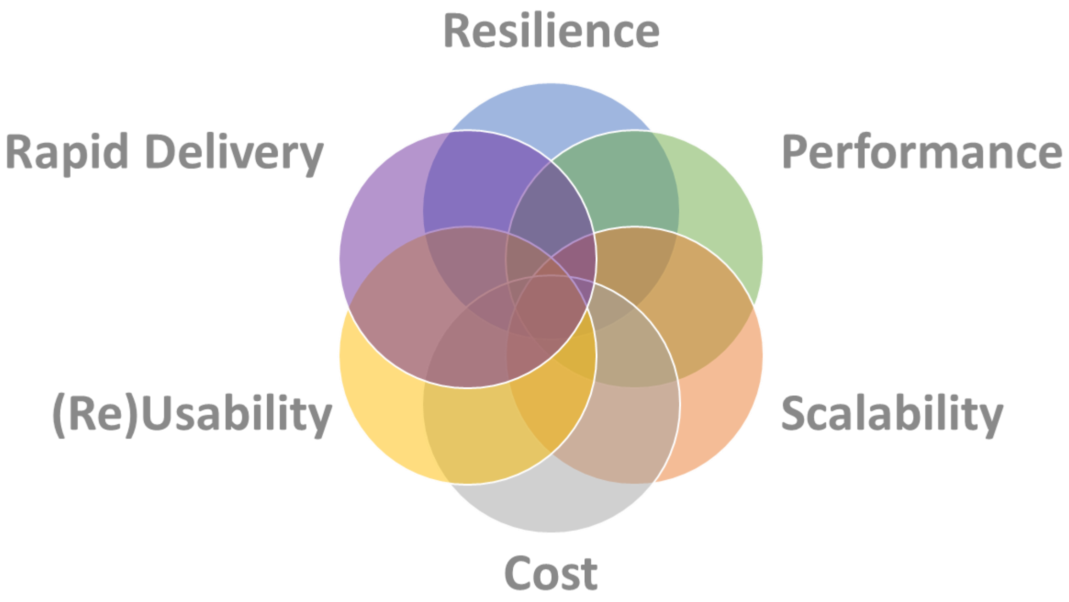
Scalability

Cost

The Perfect Solution

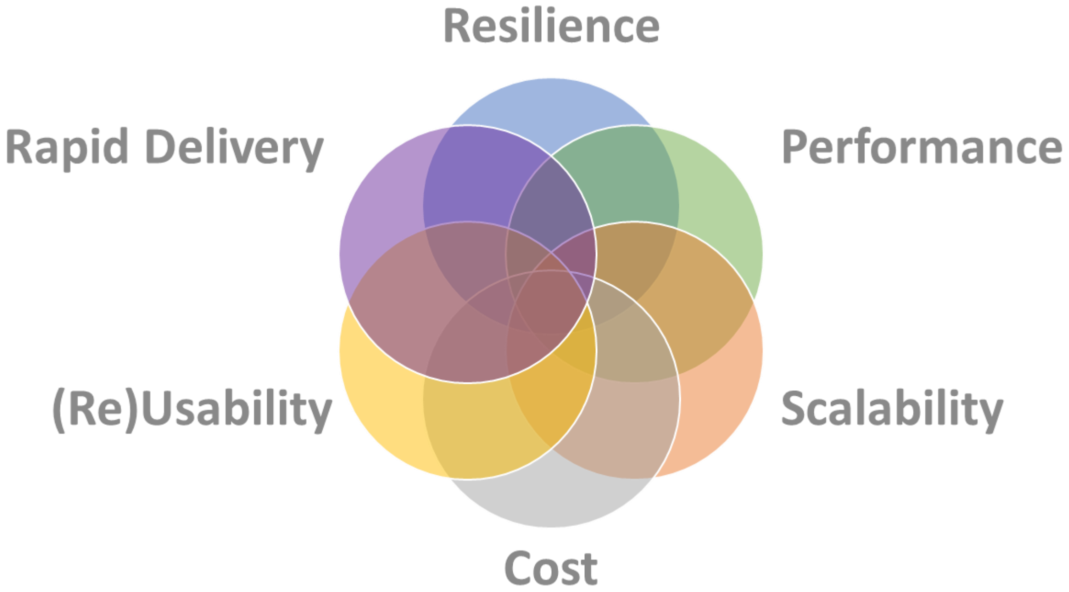
Agenda

1. Design ✓
2. Extract
3. Transform
4. Load

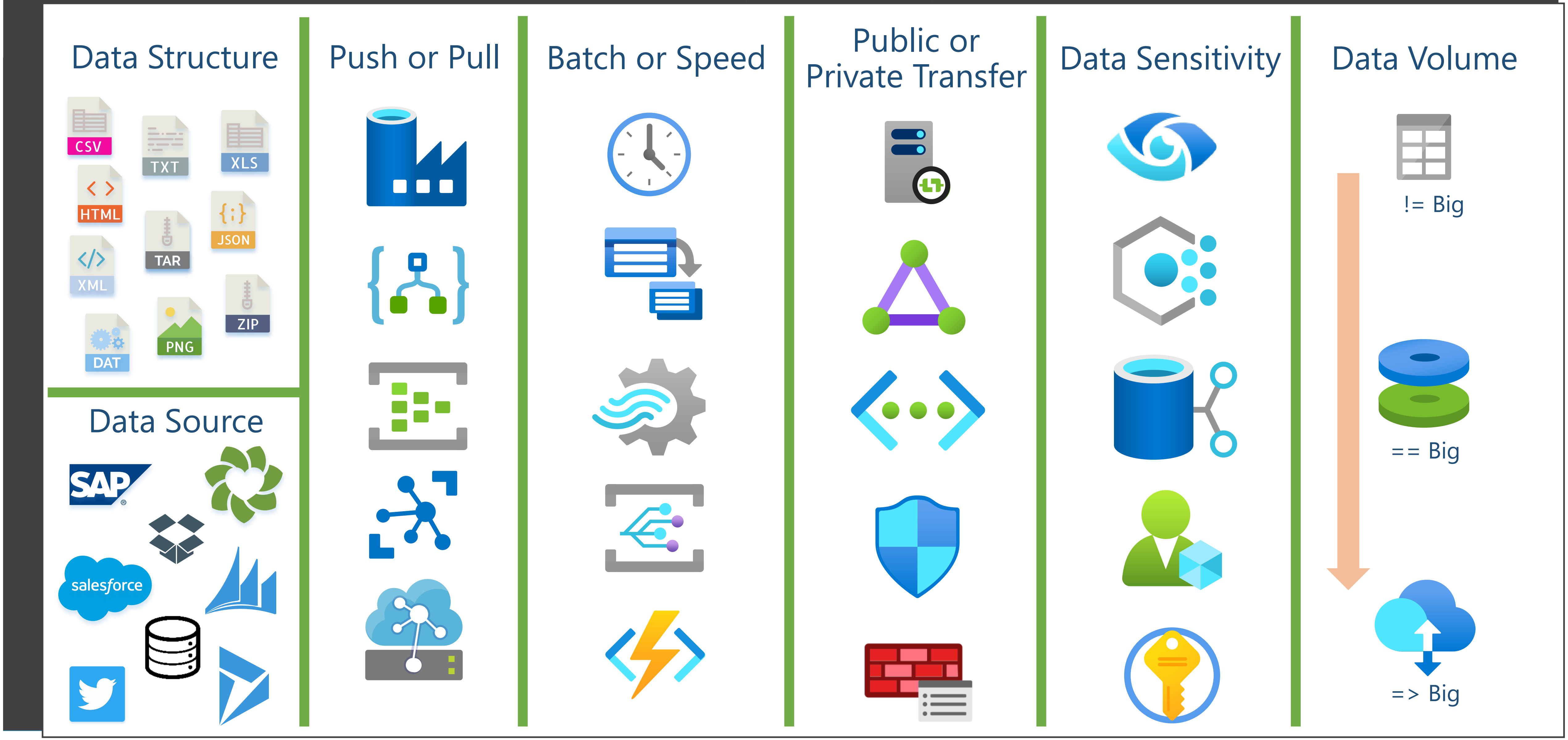


Agenda

1. Design ✓
2. **Extract**
3. Transform
4. Load



Data Extraction & Ingestion



Data Structure

Data Source

Push or Pull

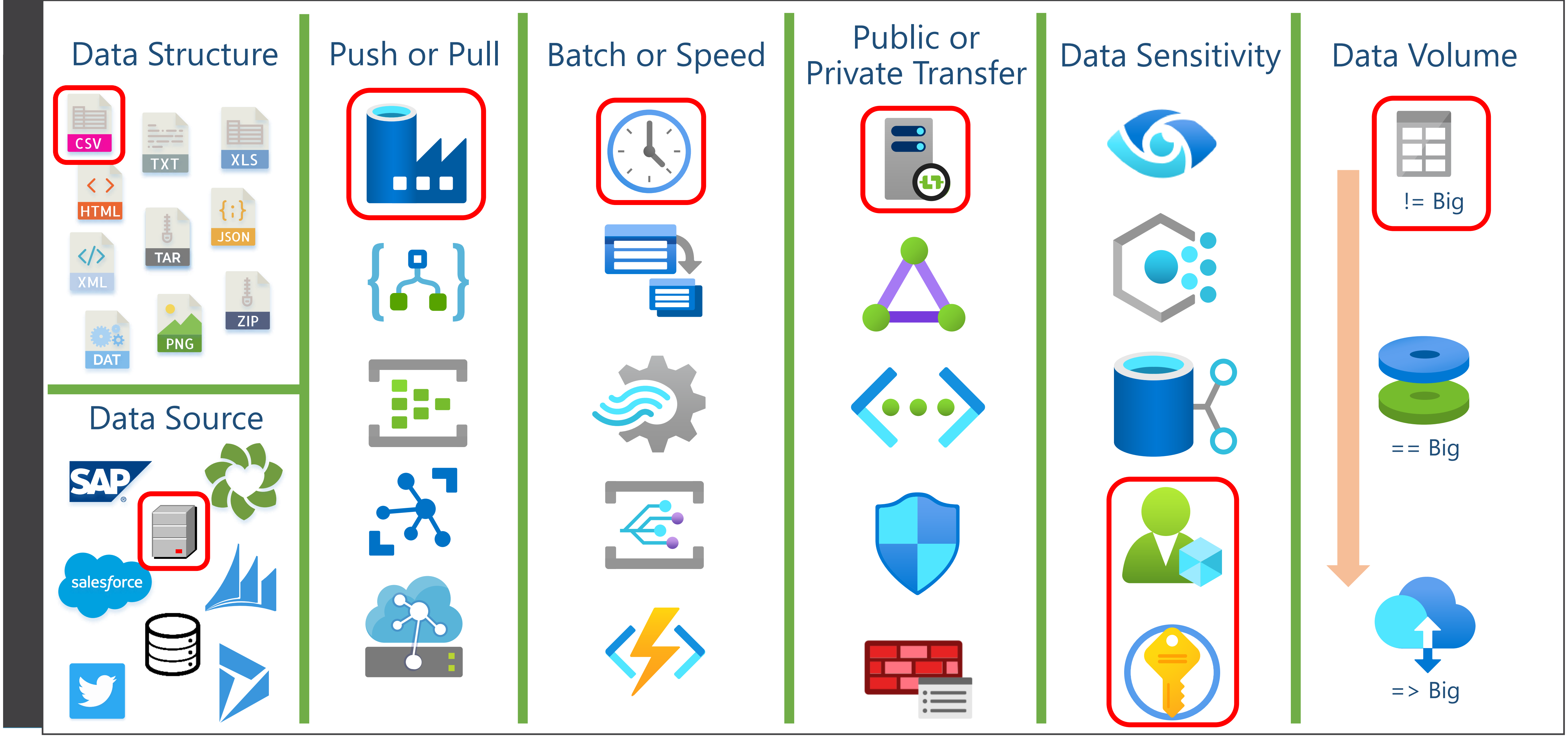
Batch or Speed

Public or Private Transfer

Data Sensitivity

Data Volume

Data Extraction & Ingestion – Spec v1



Data Structure

Data Source

Push or Pull

Batch or Speed

Public or Private Transfer

Data Sensitivity

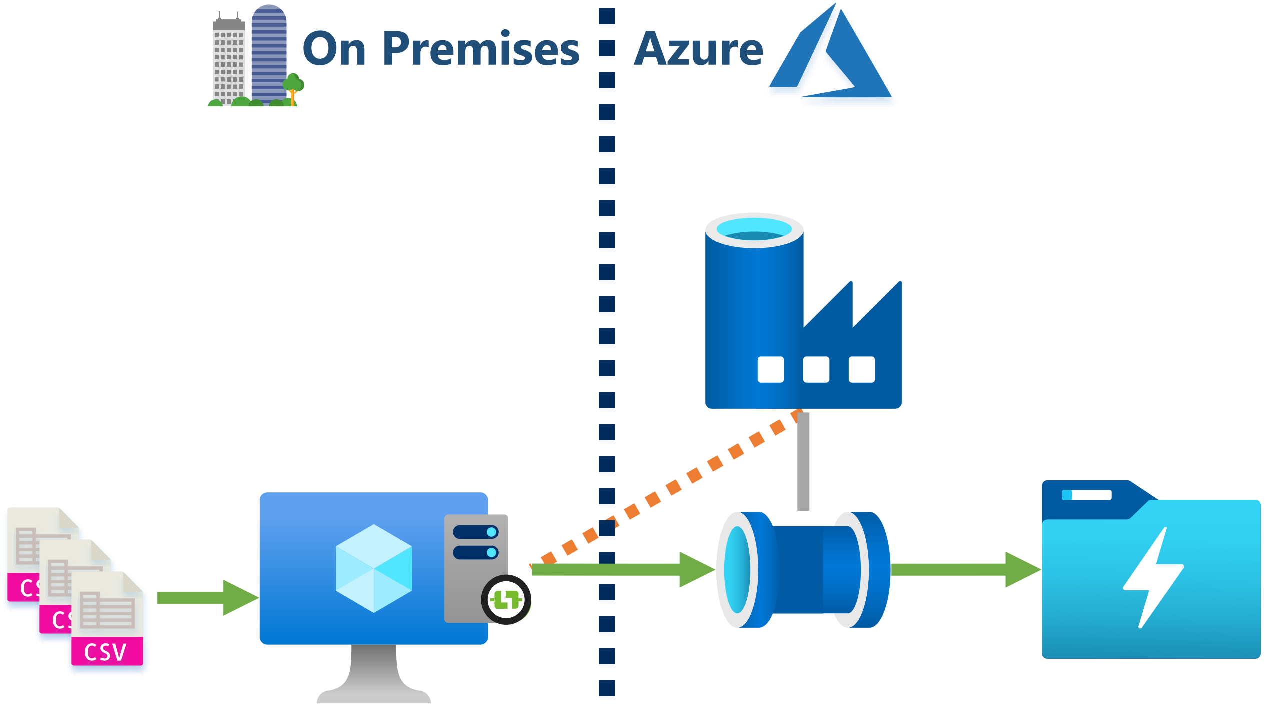
Data Volume

!= Big

== Big

=> Big

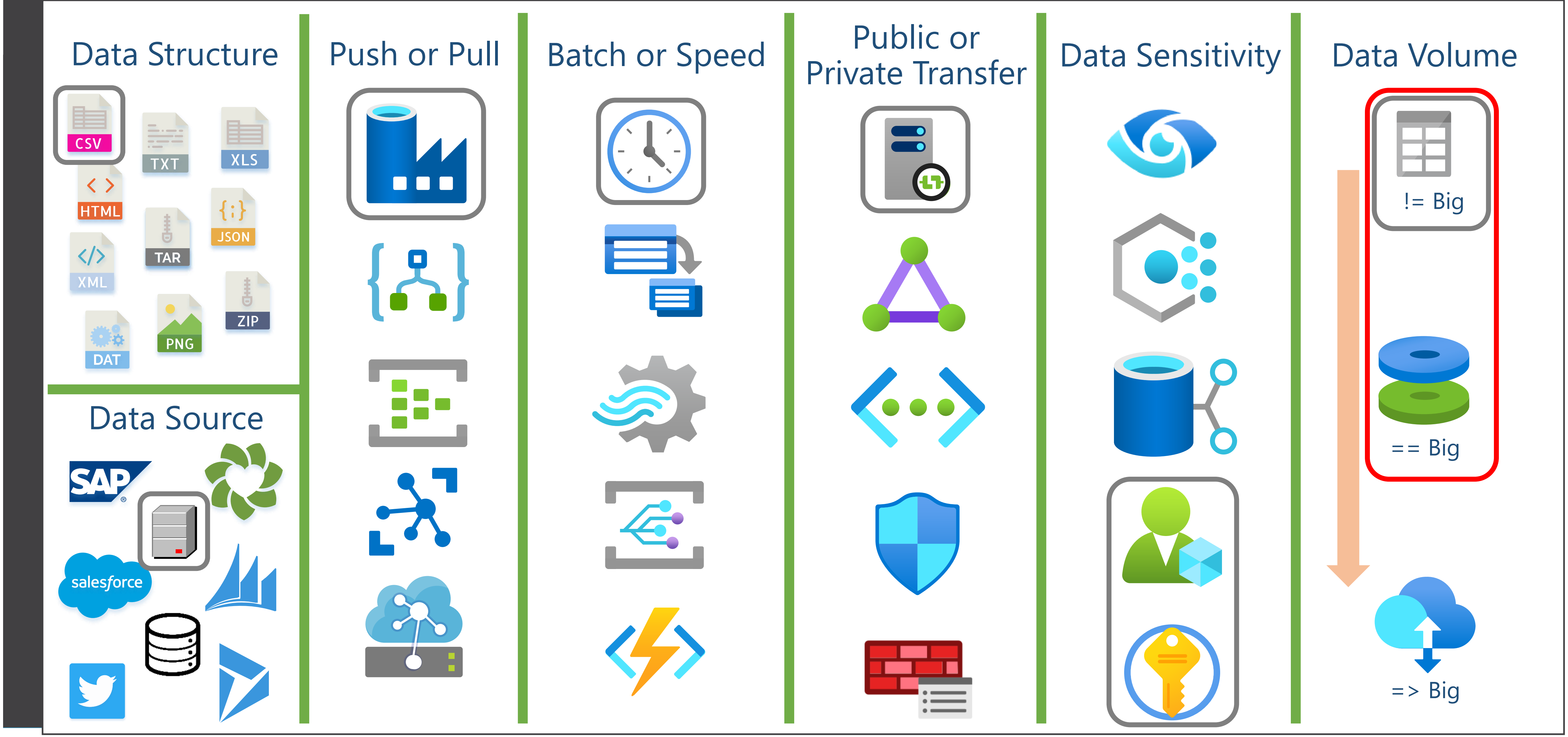
Data Extraction & Ingestion – Solution 1



Requirements:

- Flat files
- From local storage
- Pulled from source
- Batch load
- Public connections
- No PII data
- Small data volumes

Data Extraction & Ingestion – Spec v2



Data Structure

Data Source

Push or Pull

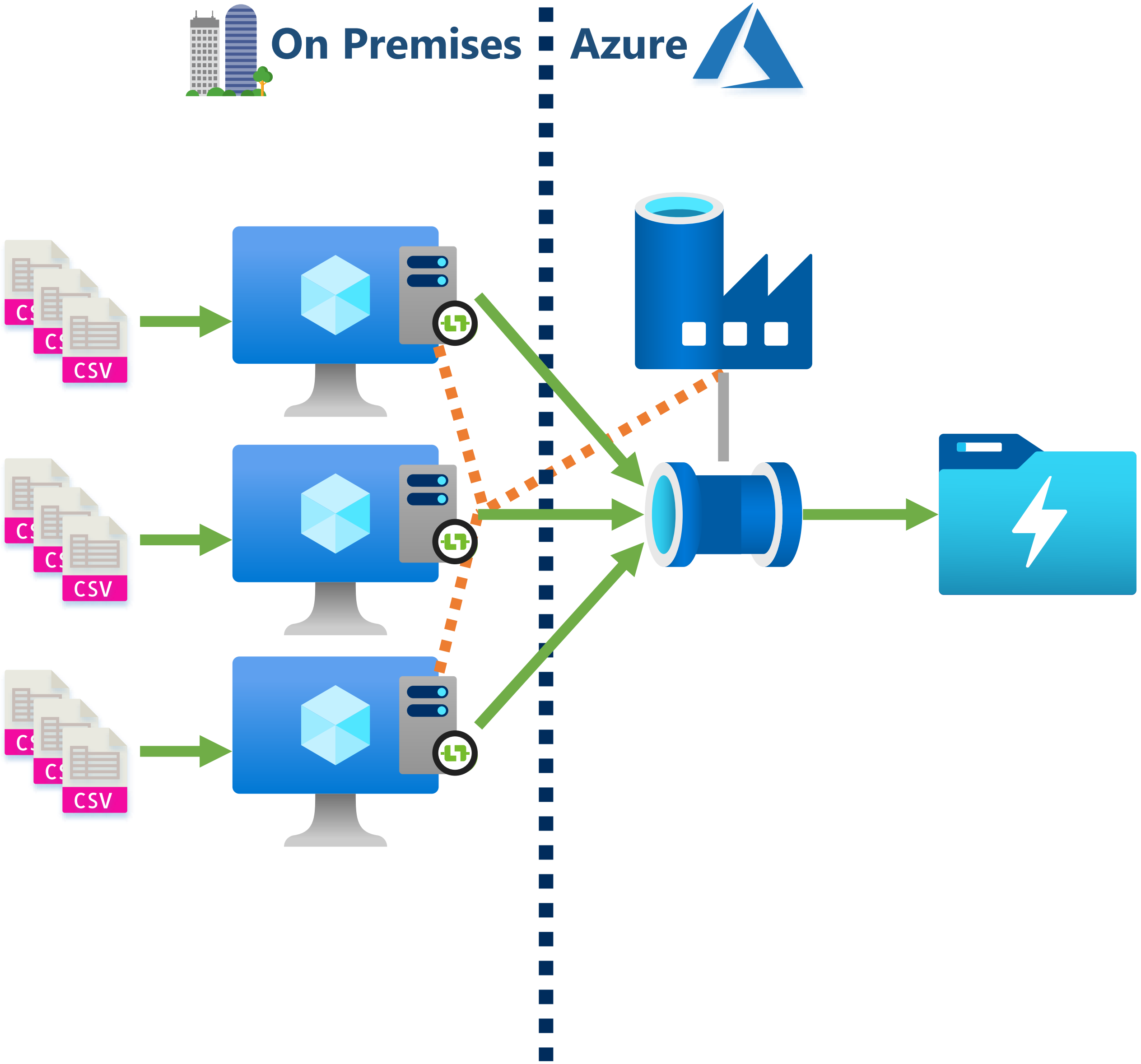
Batch or Speed

Public or Private Transfer

Data Sensitivity

Data Volume

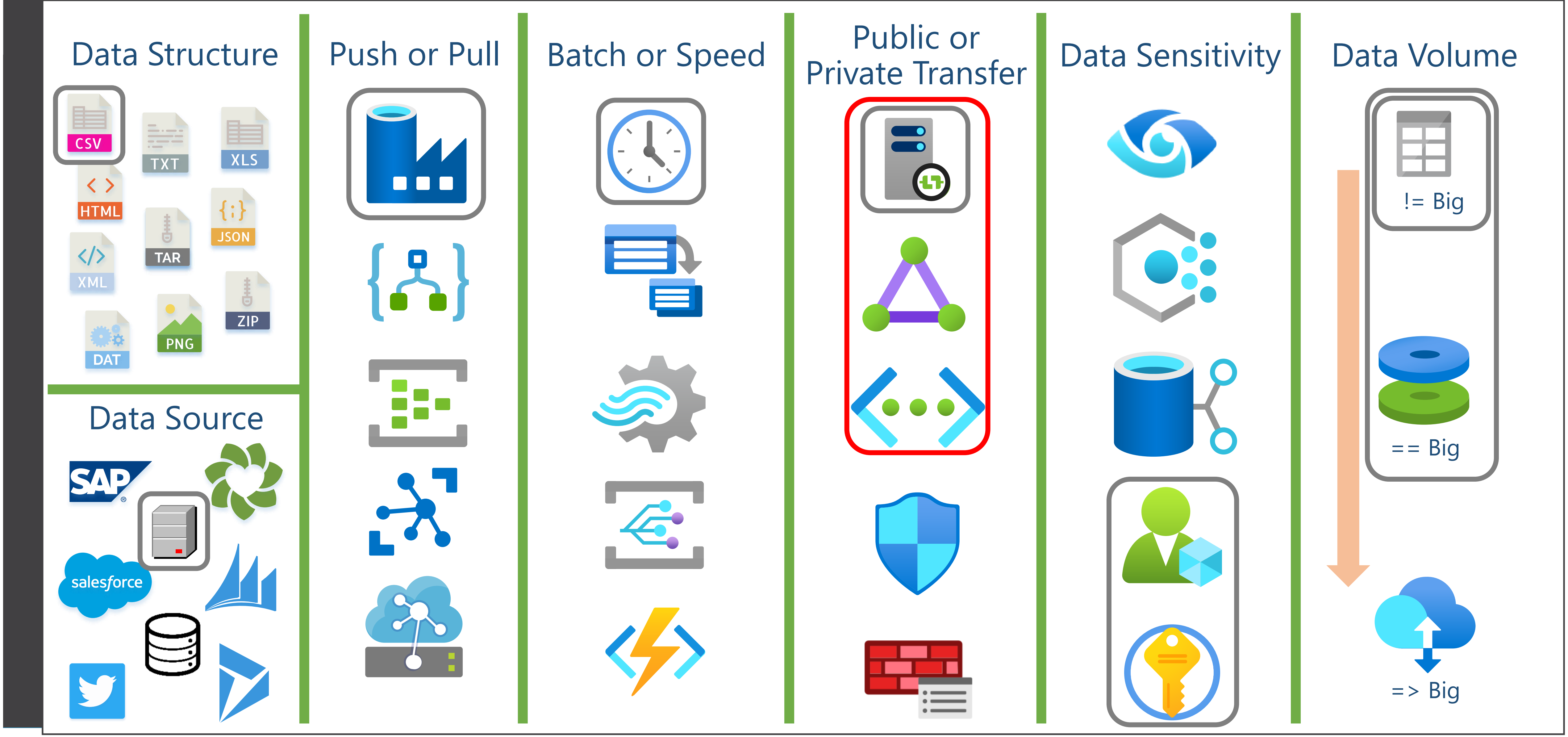
Data Extraction & Ingestion – Solution 2



Requirements:

- Flat files
- From local storage
- Pulled from source
- Batch load
- Public connections
- No PII data
- Large data volumes

Data Extraction & Ingestion – Spec v3



Data Structure

Push or Pull

Batch or Speed

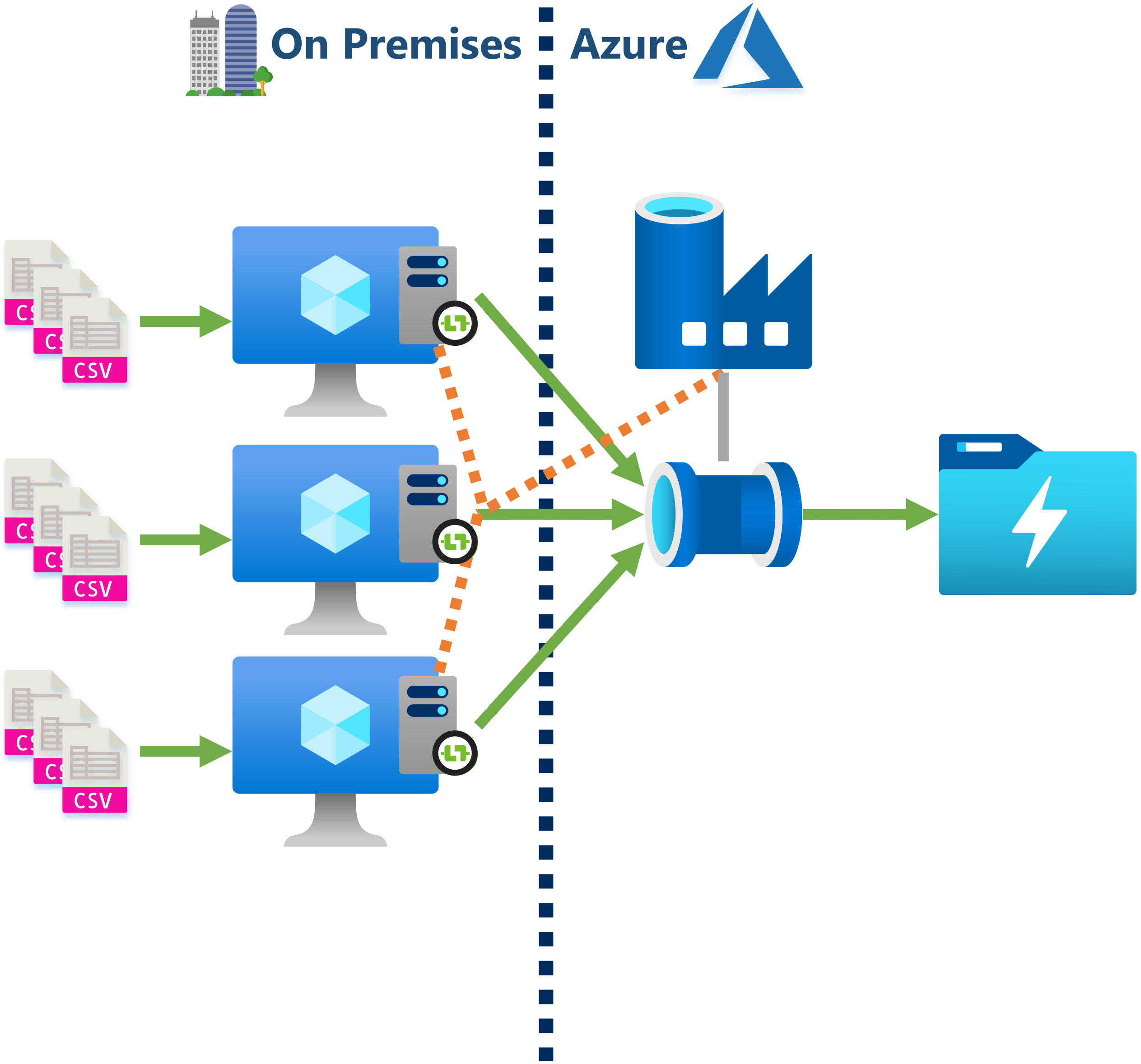
Public or Private Transfer

Data Sensitivity

Data Volume

Data Source

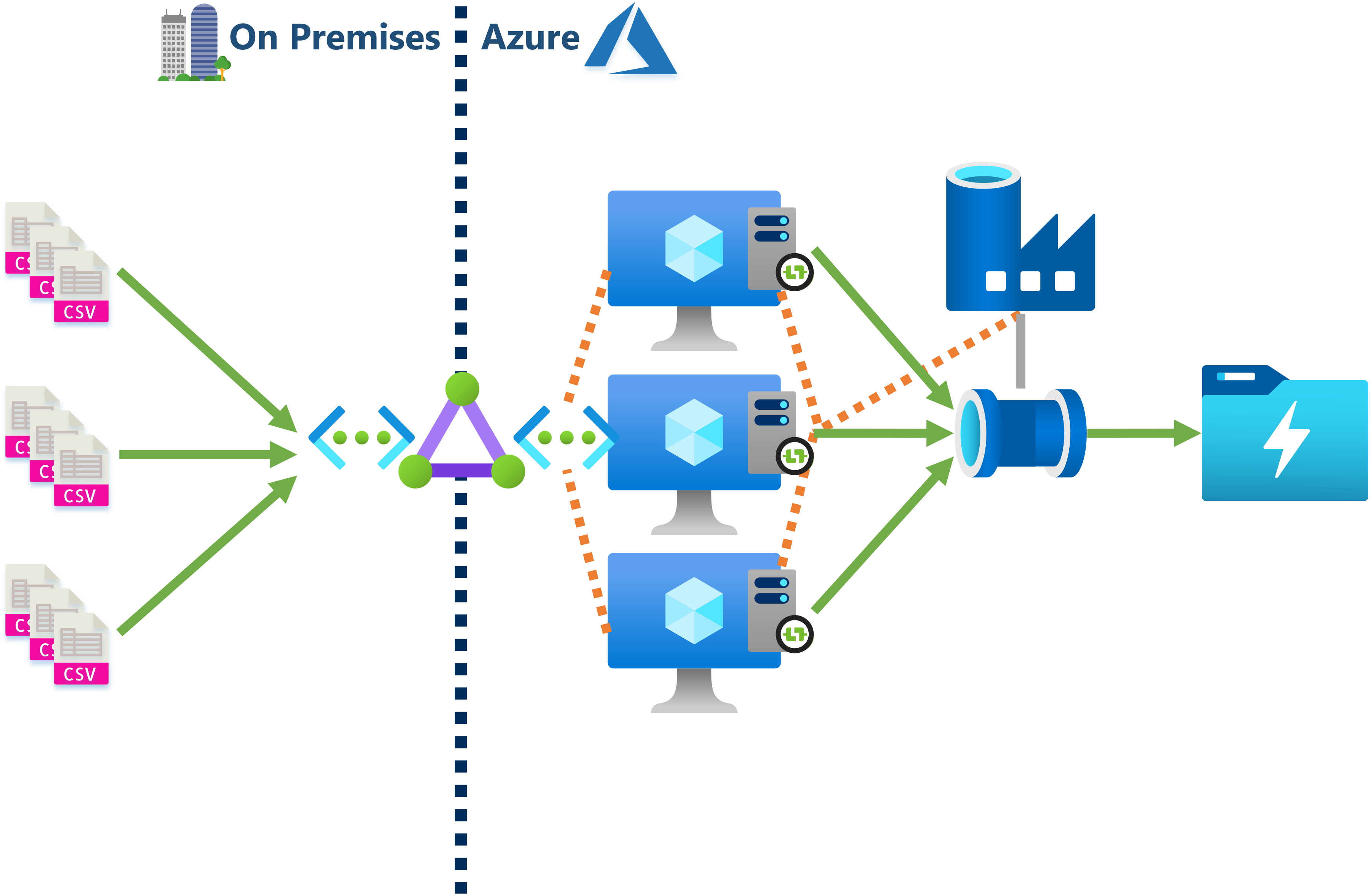
Data Extraction & Ingestion – Solution 3



Requirements:

- Flat files
- From local storage
- Pulled from source
- Batch load
- Private connections
- No PII data
- Large data volumes

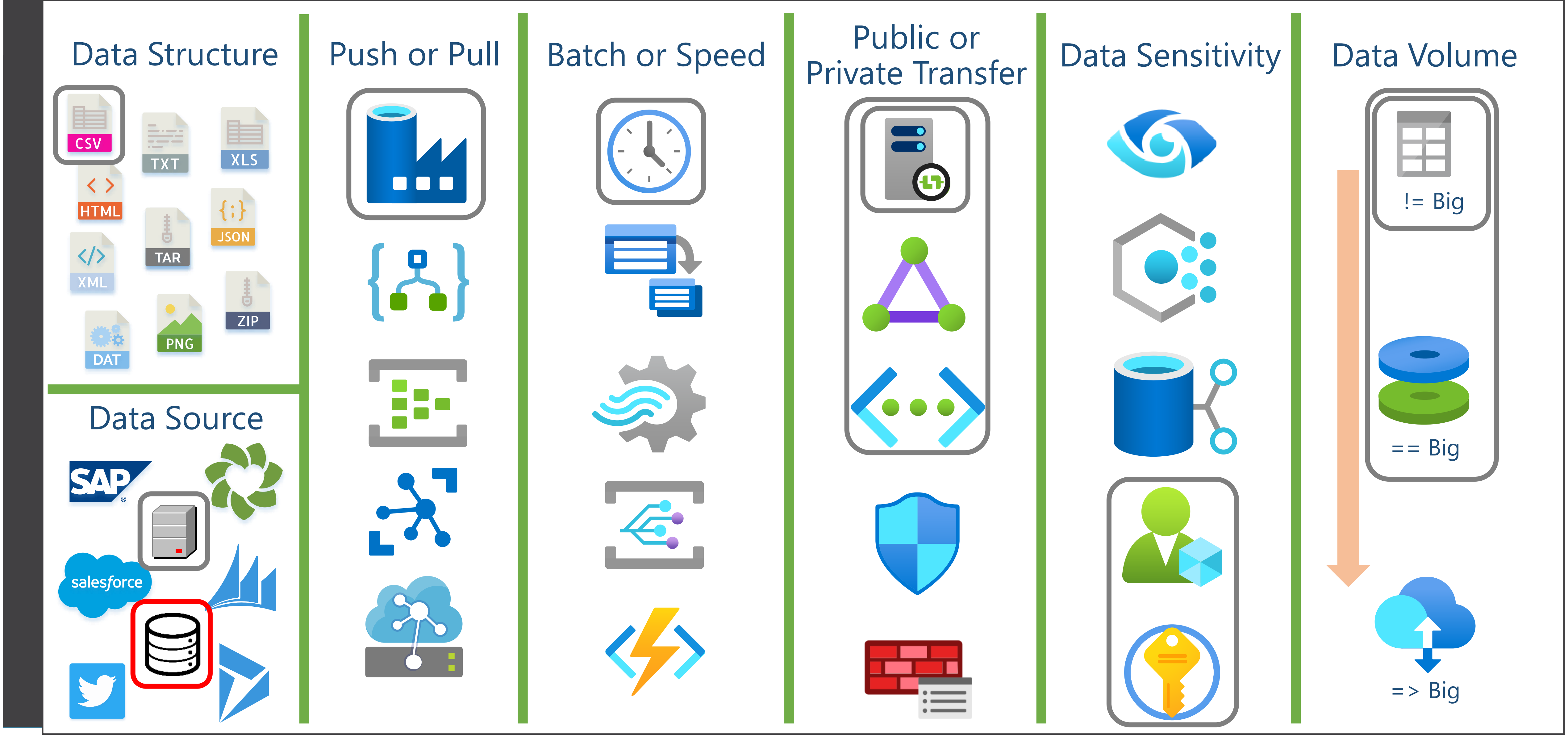
Data Extraction & Ingestion – Solution 3



Requirements:

- Flat files
- From local storage
- Pulled from source
- Batch load
- Private connections
- No PII data
- Large data volumes

Data Extraction & Ingestion – Spec v4



Data Structure

Data Source

Push or Pull

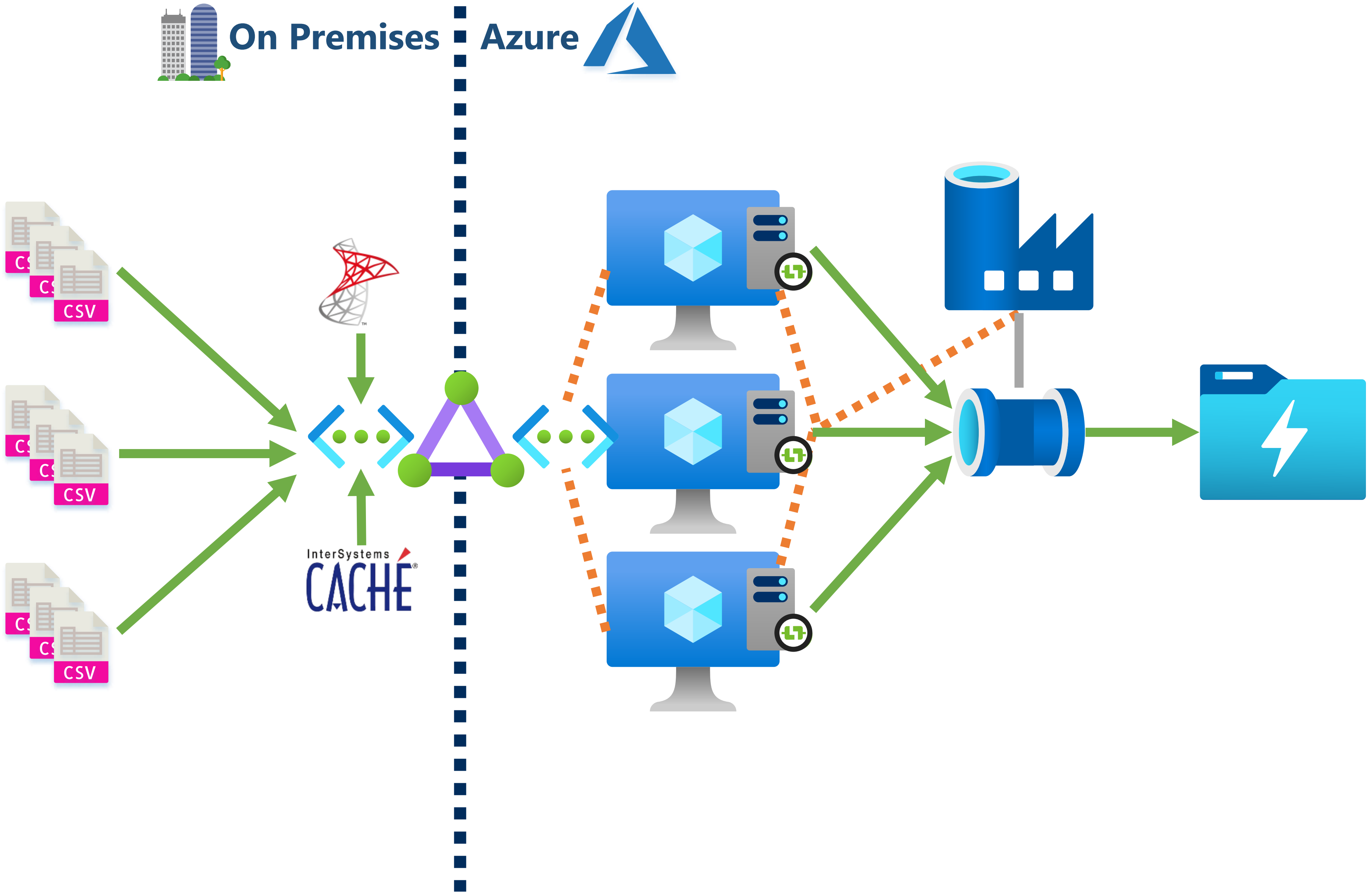
Batch or Speed

Public or Private Transfer

Data Sensitivity

Data Volume

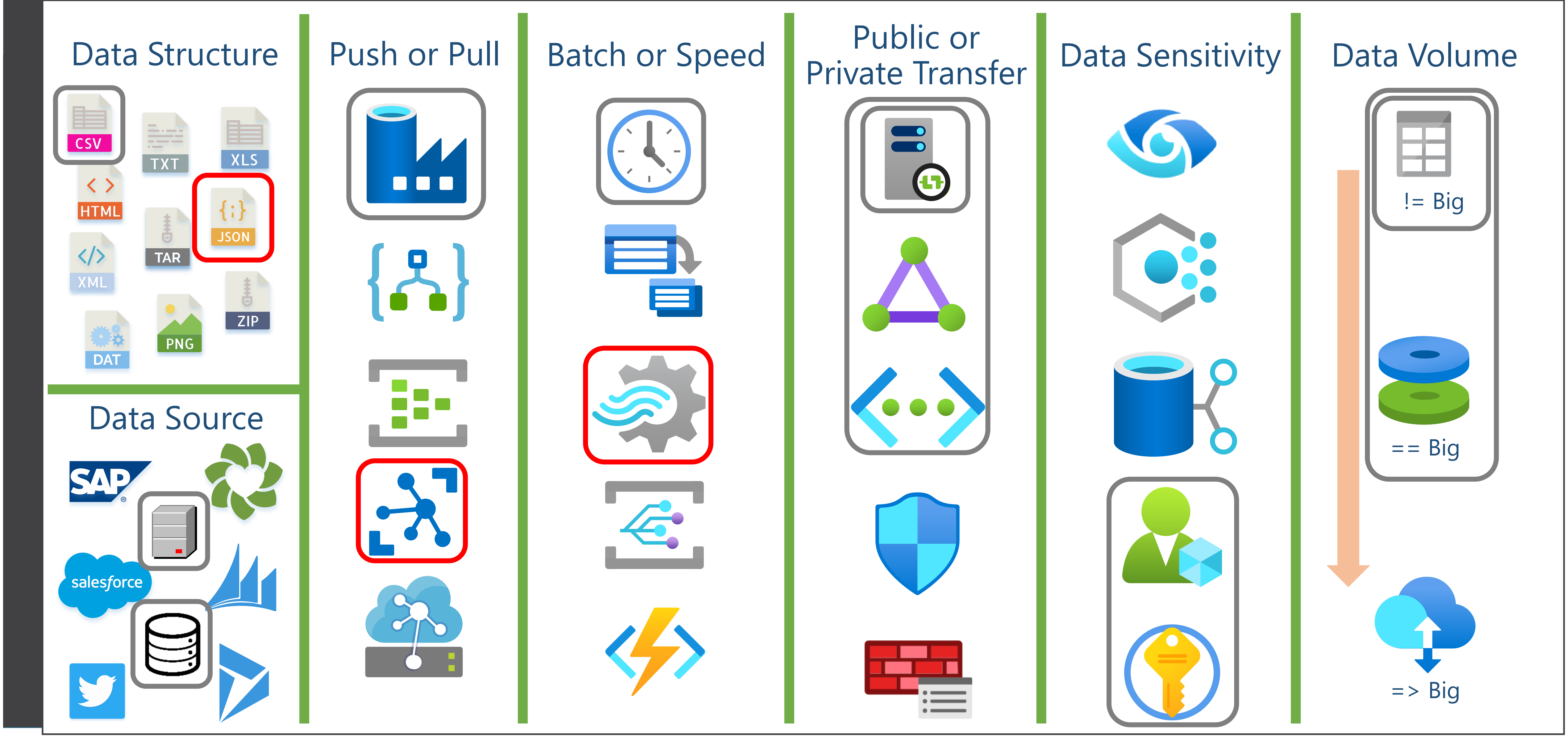
Data Extraction & Ingestion – Solution 4



Requirements:

- Flat files
- From local storage & database tables
- Pulled from source
- Batch load
- Private connections
- No PII data
- Large data volumes

Data Extraction & Ingestion – Spec v5



Data Structure

Data Source

Push or Pull

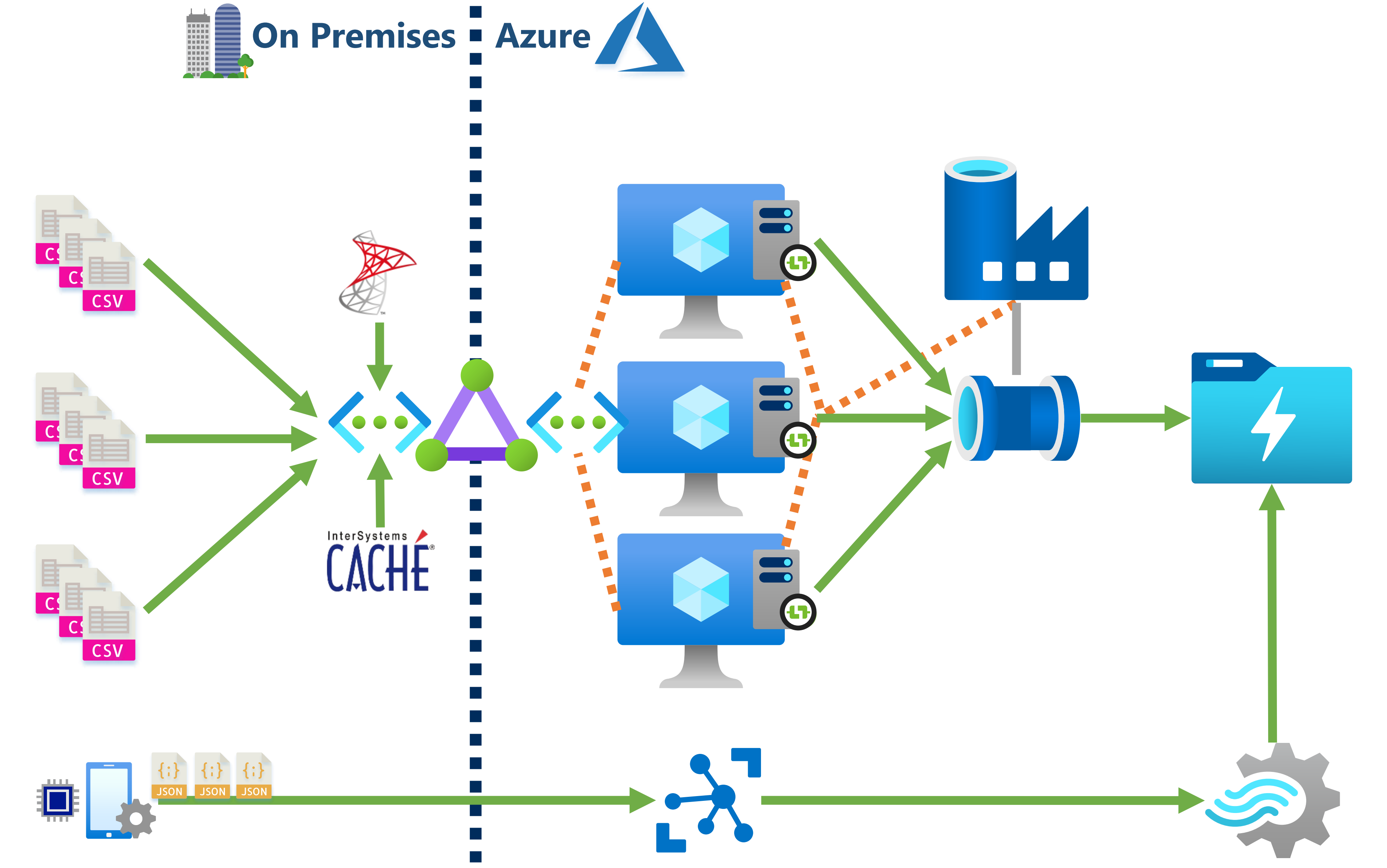
Batch or Speed

Public or Private Transfer

Data Sensitivity

Data Volume

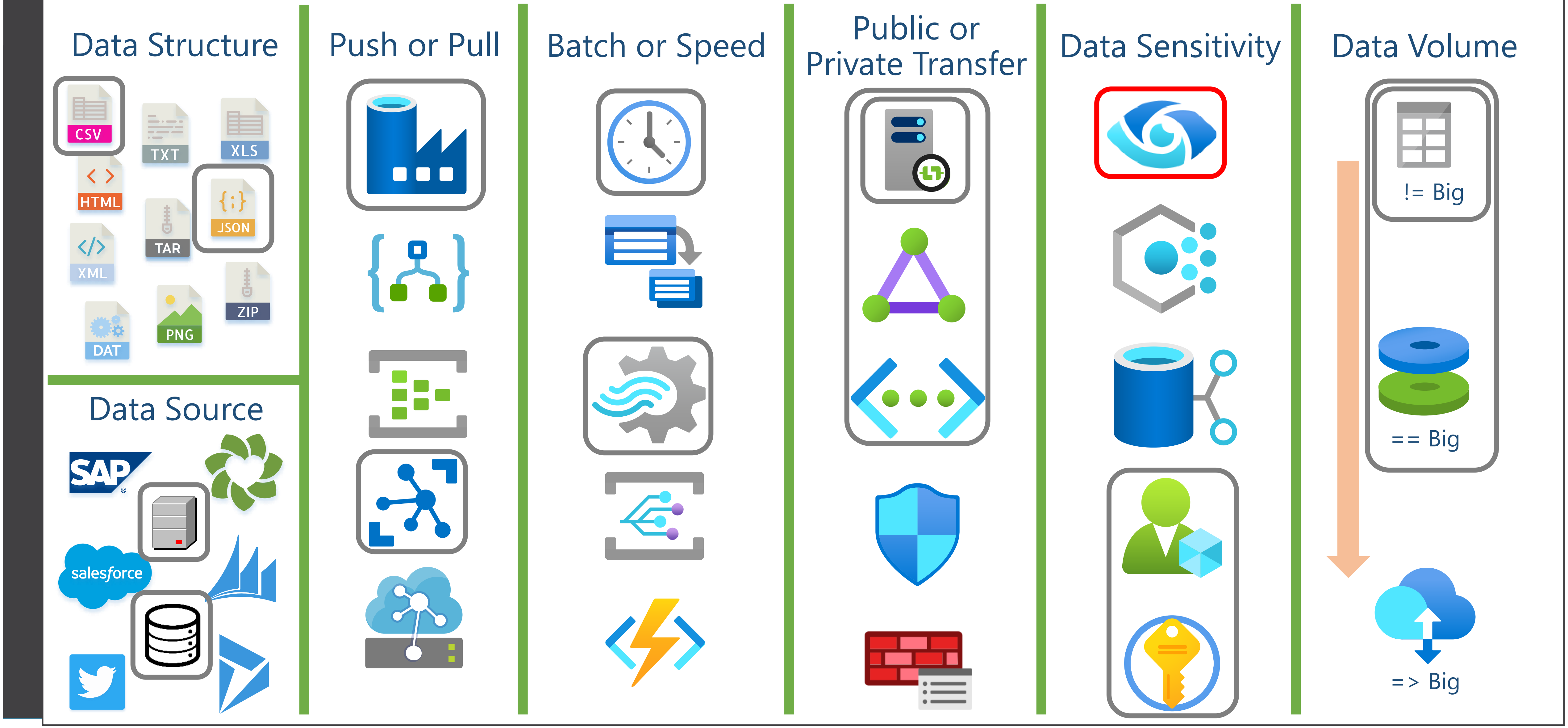
Data Extraction & Ingestion – Solution 5



Requirements:

- Flat files & JSON
- From local storage & database tables
- Pulled from source & pushed
- Batch load & streamed
- Private connections
- No PII data
- Large data volumes

Data Extraction & Ingestion – Spec v6



Data Structure

Push or Pull

Batch or Speed

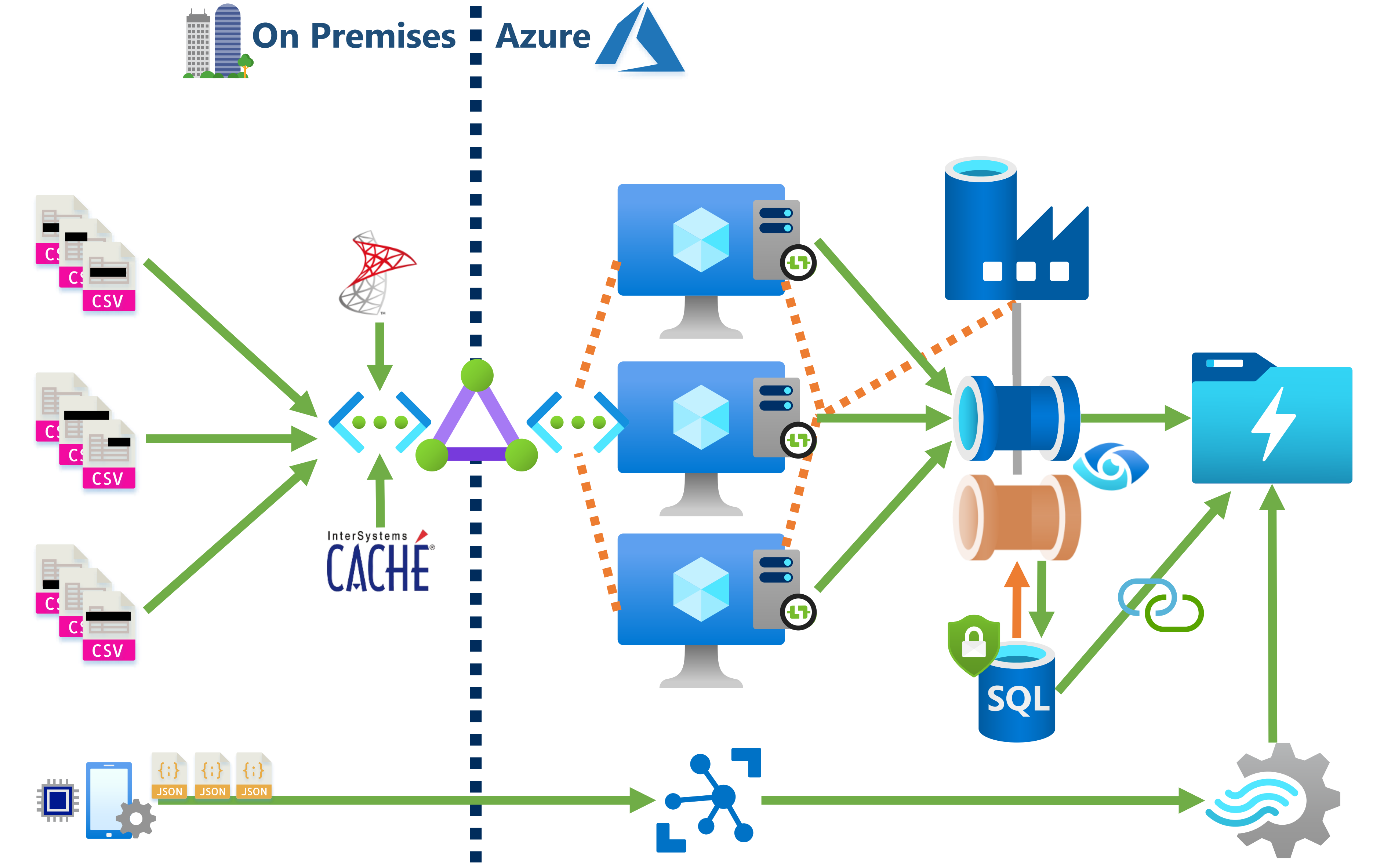
Public or Private Transfer

Data Sensitivity

Data Volume

Data Source

Data Extraction & Ingestion – Solution 6

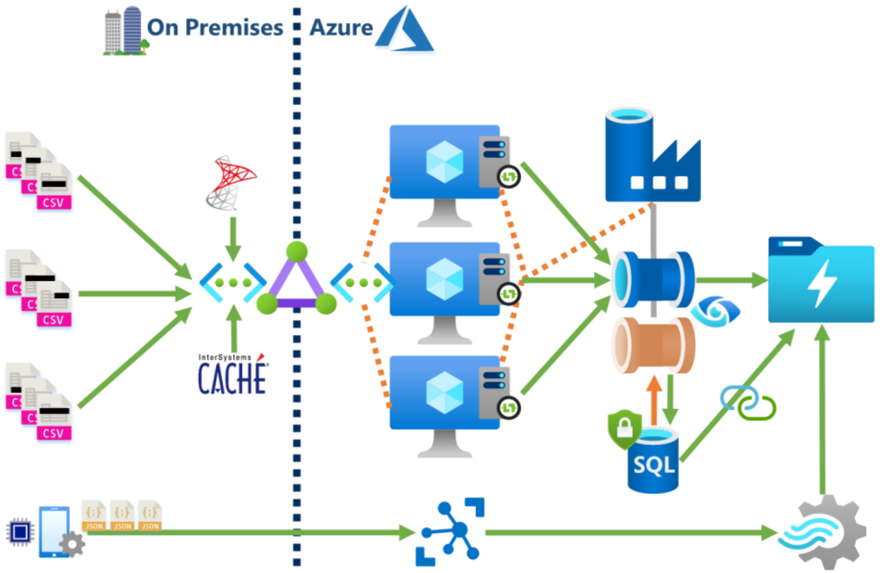


Requirements:

- Flat files & JSON
- From local storage & database tables
- Pulled from source & pushed
- Batch load & streamed
- Private connections
- Both PII & none PII data
- Large data volumes

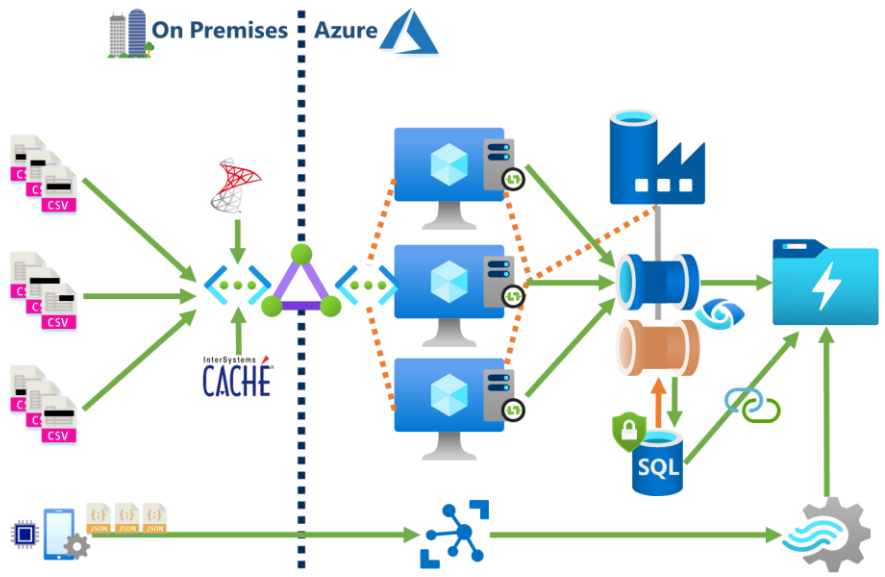
Overall Architecture

Extract | Transform | Load



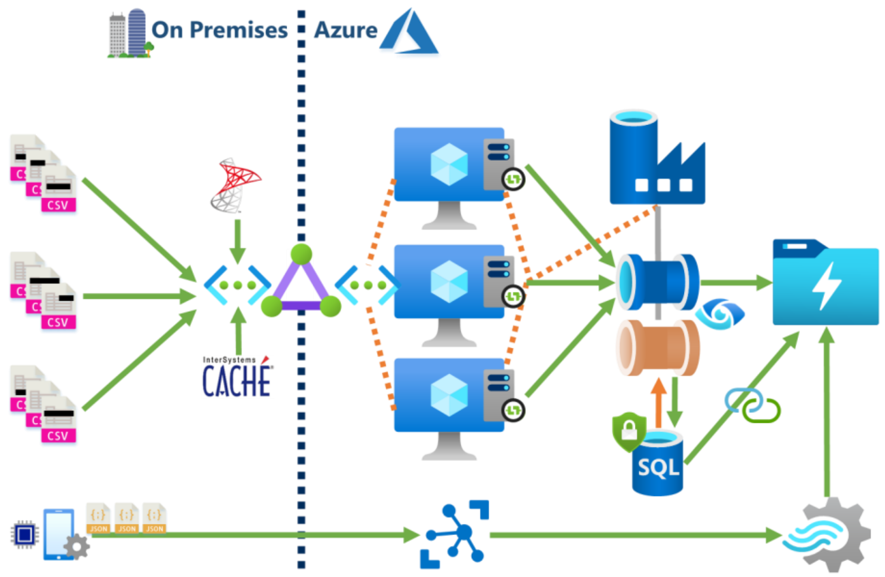
Agenda

1. Design ✓
2. Extract ✓
3. Transform
4. Load

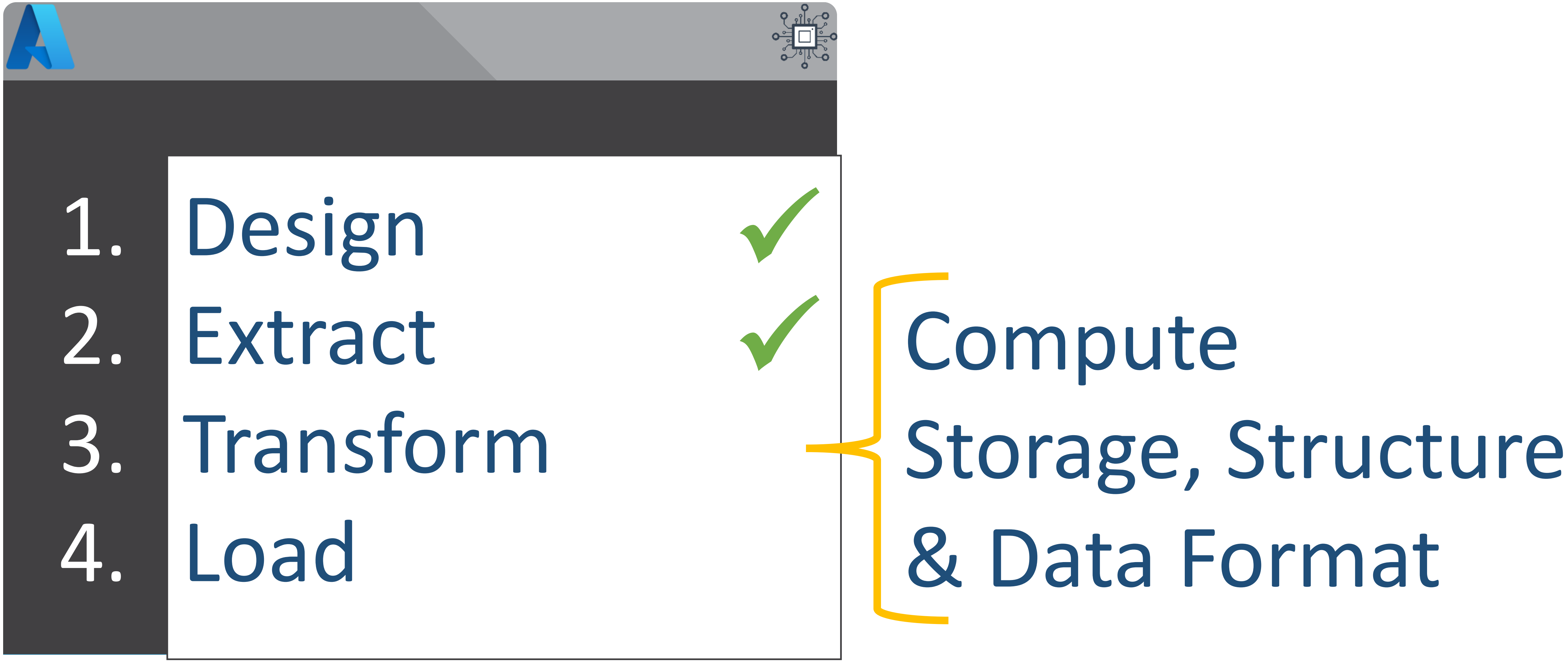


Agenda

1. Design ✓
2. Extract ✓
3. **Transform**
4. Load



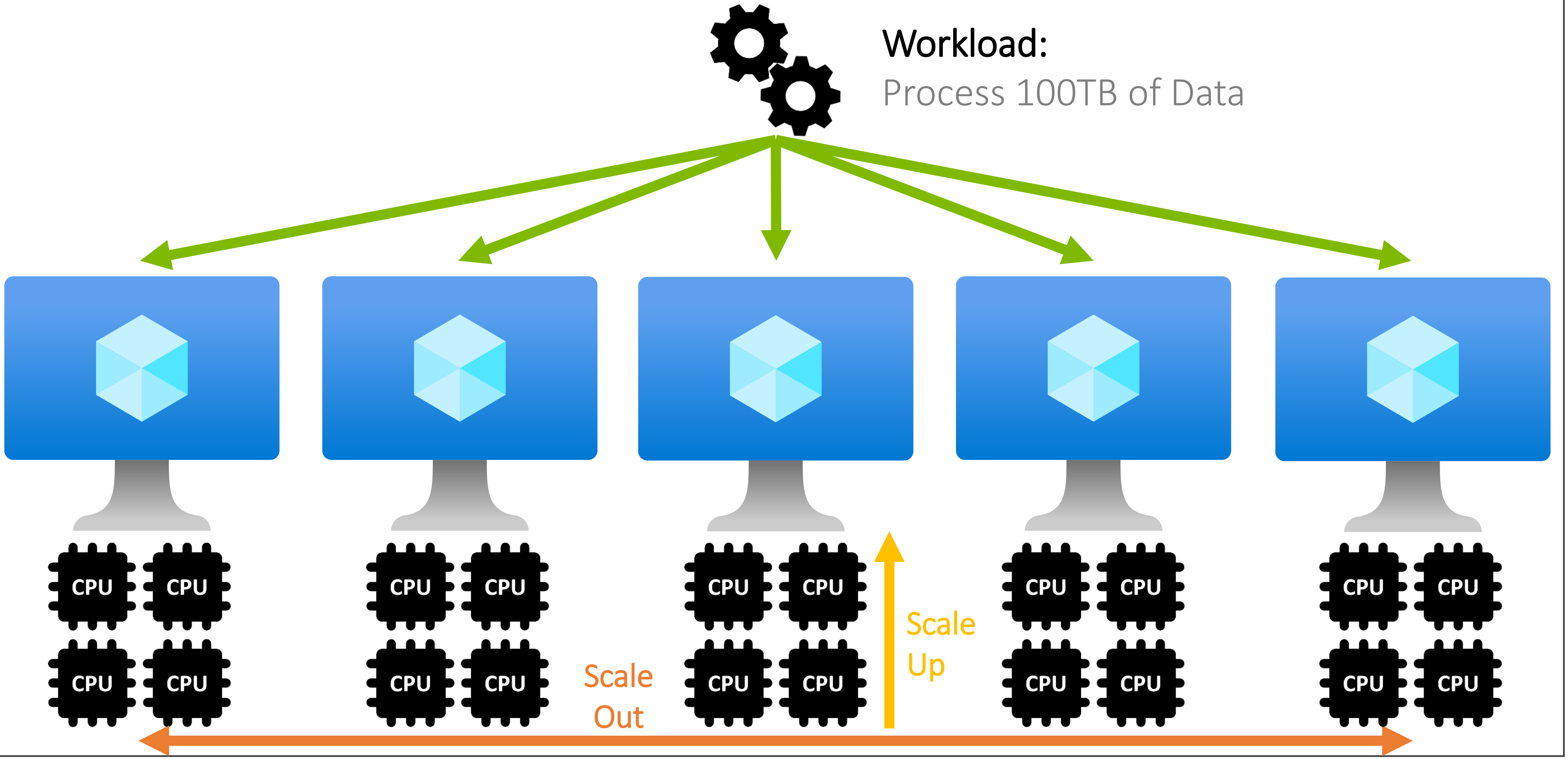
Agenda



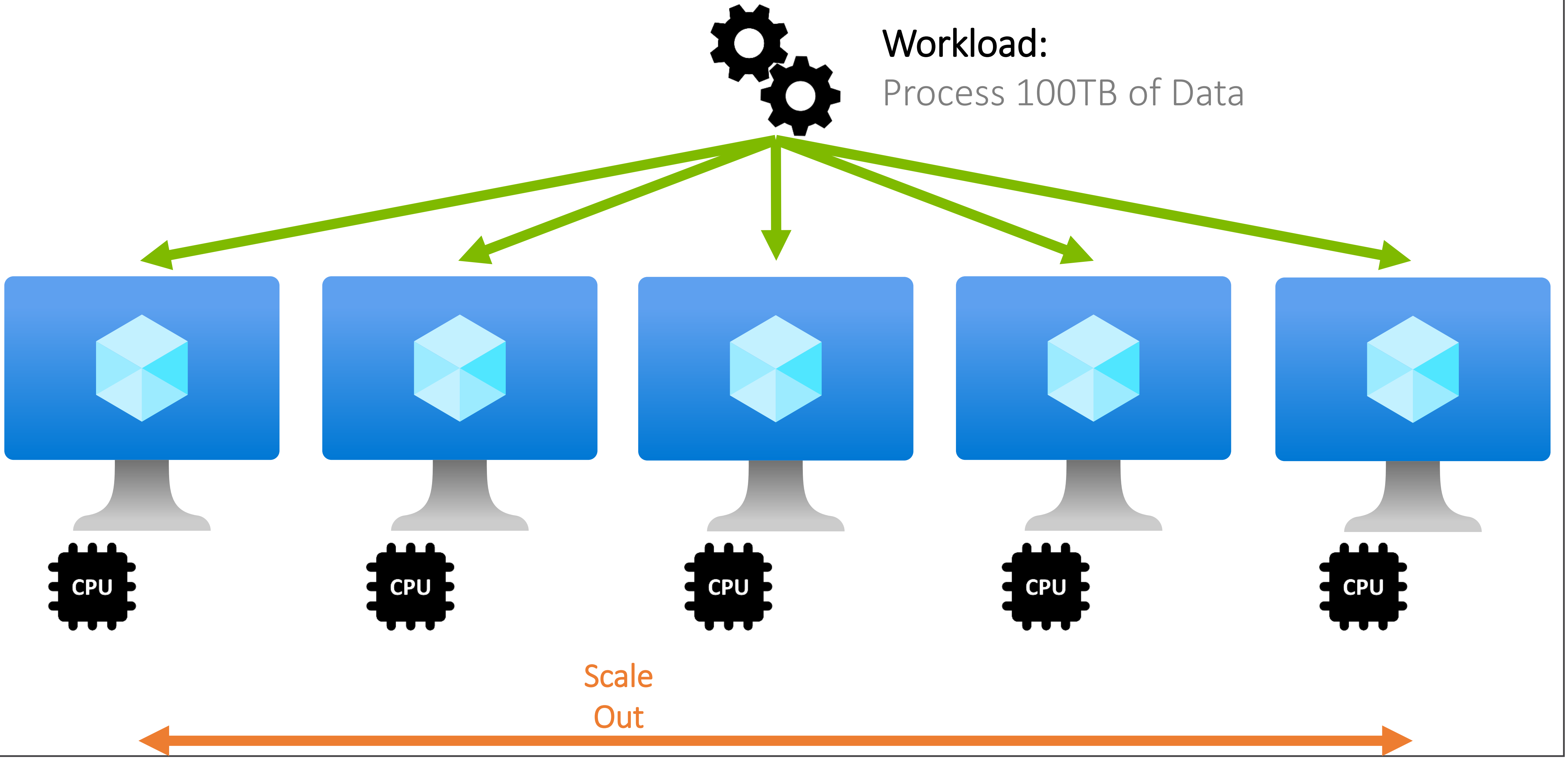
1. Design ✓
2. Extract ✓
3. Transform
4. Load

Compute
Storage, Structure
& Data Format

Scaling Up and/or Scaling Out



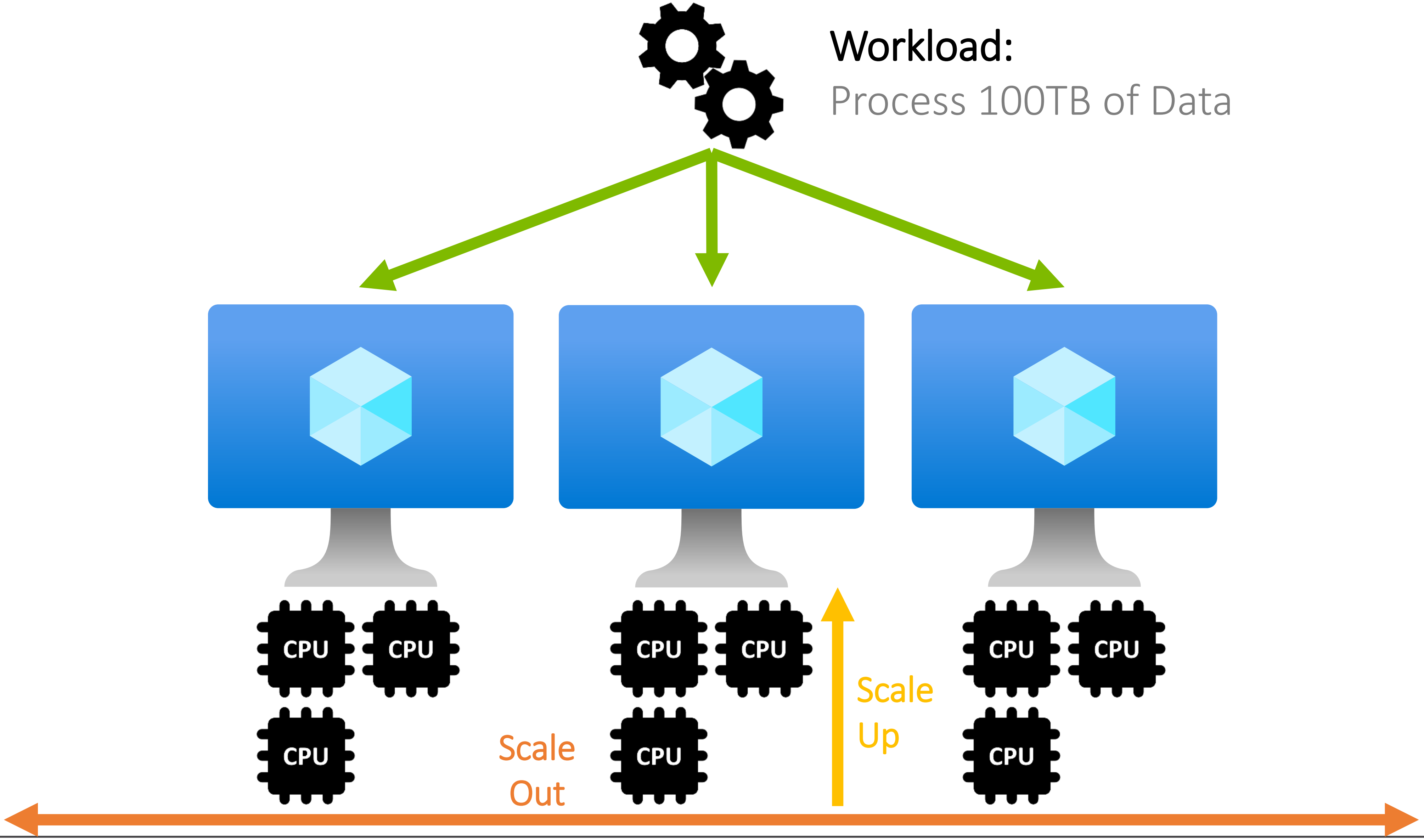
Scaling Up and/or Scaling Out



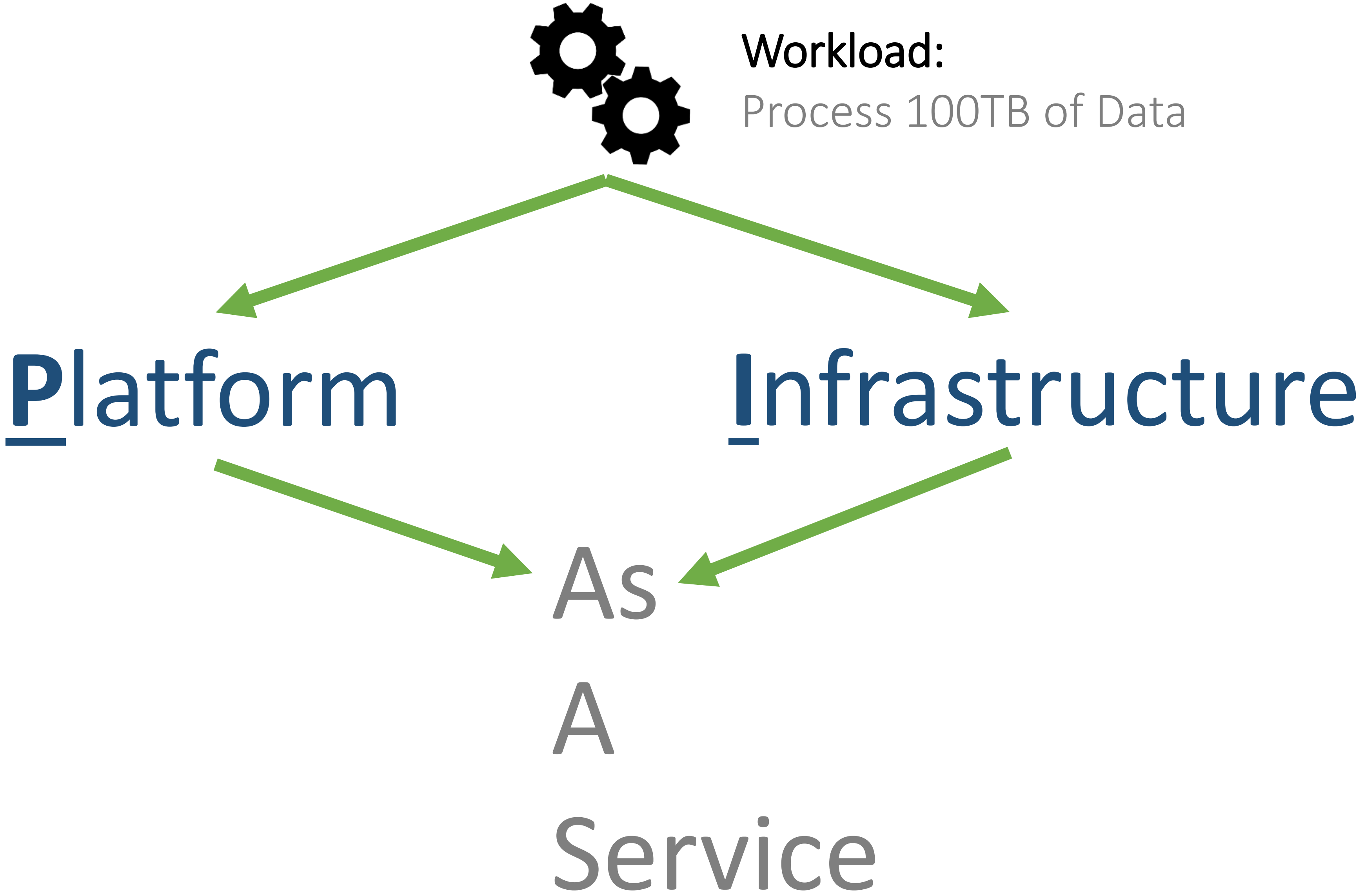
Workload:

Process 100TB of Data

Scaling Up and/or Scaling Out



What Compute Type of Compute?



Workload:

Process 100TB of Data

Platform

Infrastructure

As

A

Service

What Compute Type of Compute?

Workload:

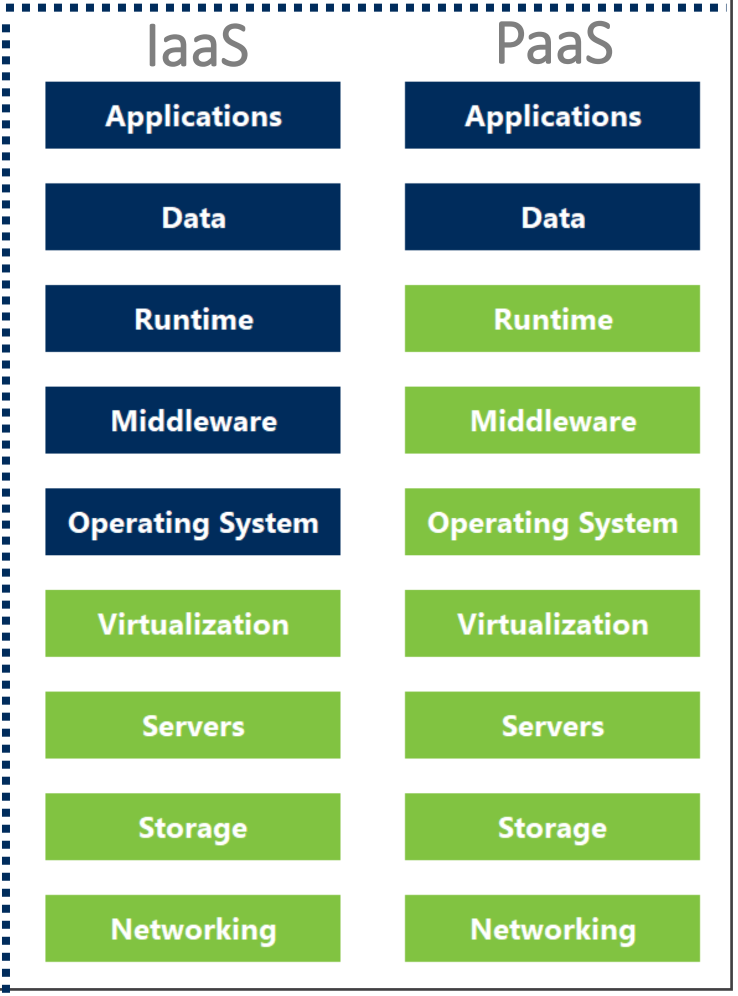
Process 100TB of Data

Platform

As

A

Service



IaaS	PaaS
Applications	Applications
Data	Data
Runtime	Runtime
Middleware	Middleware
Operating System	Operating System
Virtualization	Virtualization
Servers	Servers
Storage	Storage
Networking	Networking

Data Transformation – Compute

Data Lake Analytics

HDInsight

Relational Database

Synapse – SQL Pools or Spark Pools

Databricks

Batch Service

Data Explorer

Automation

Cosmos

Functions

Power BI Data Flows

Logic Apps

Data Factory Data Flows

Analysis Services

Data Transformation – Compute

Data Lake Analytics

HDInsight

Relational Database

Synapse – SQL Pools or Spark Pools

Databricks

Batch Service

Data Explorer

Automation

Cosmos

Functions

Power BI Data Flows

Logic Apps

Data Factory Data Flows

Analysis Services

Data Transformation – Compute

Data Lake Analytics

HDInsight

Relational Database

Batch Service

Data Explorer

Automation

Cosmos

Functions

Power BI Data Flows

Logic Apps

Data Factory Data Flows

Analysis Services

Agenda

1. Design ✓
2. Extract ✓
3. Transform
4. Load

Compute ✓
Storage, Structure
& Data Format

Data Transformation – Storage & Format

Azure Storage Account

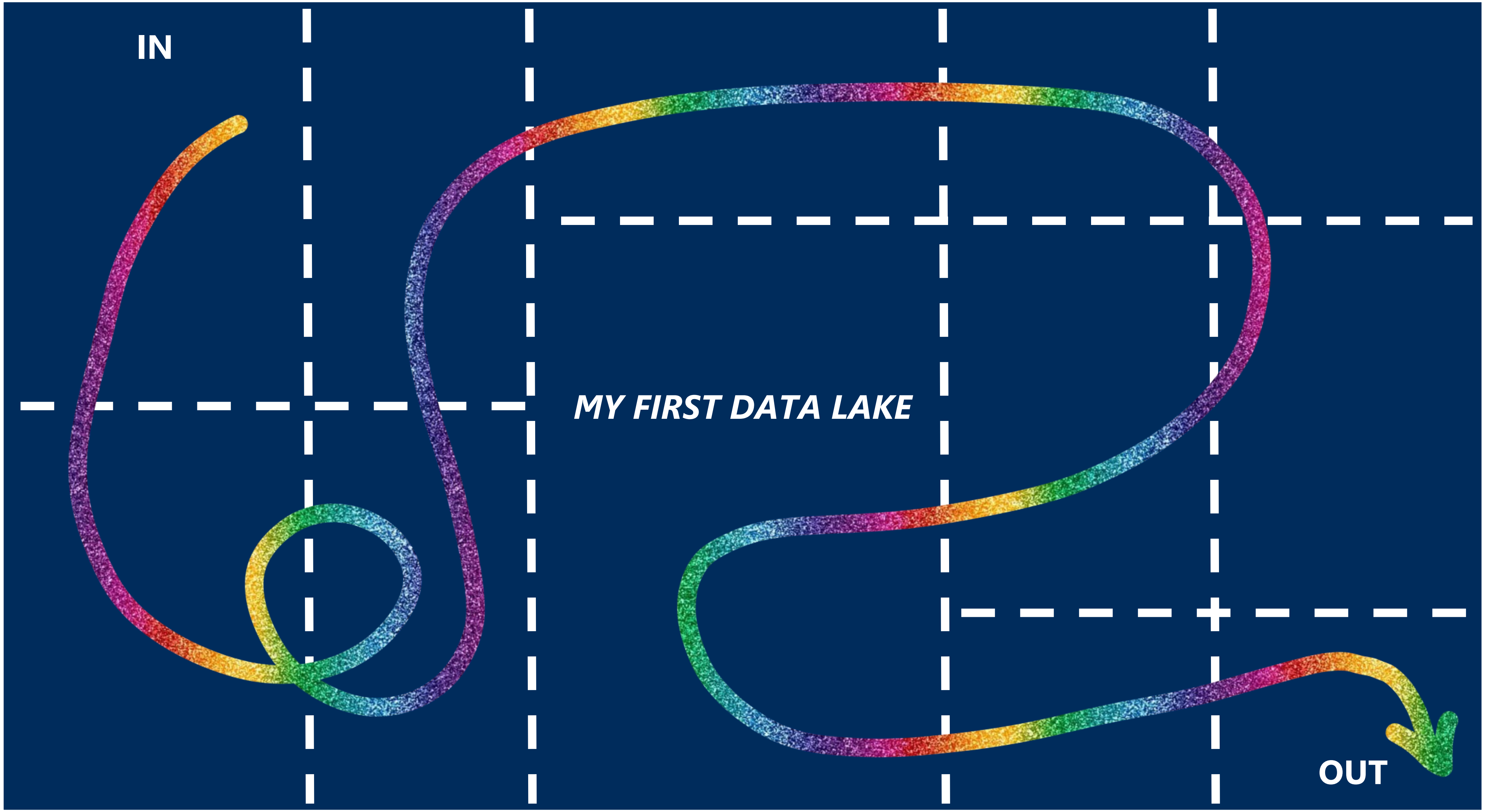
Azure Data Lake Gen2

Hadoop Distributed File System (HDFS)

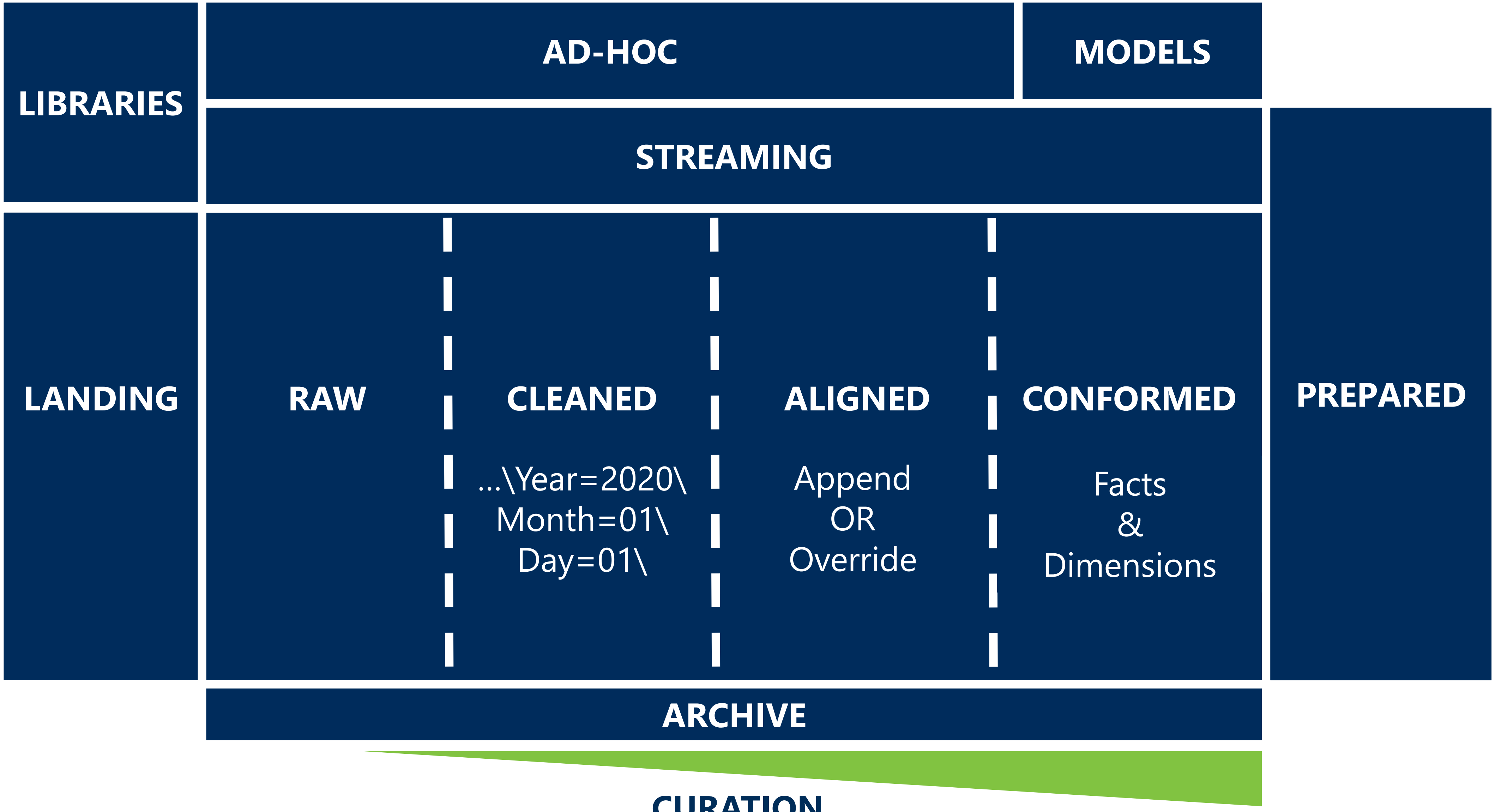
hadoop

Data Transformation – Storage & Format

Data Transformation – Storage & Format



Data Transformation – Storage & Format



LIBRARIES

AD-HOC

MODELS

STREAMING

LANDING

RAW

CLEANED

...\Year=2020\
Month=01\
Day=01\

ALIGNED

Append
OR
Override

CONFORMED

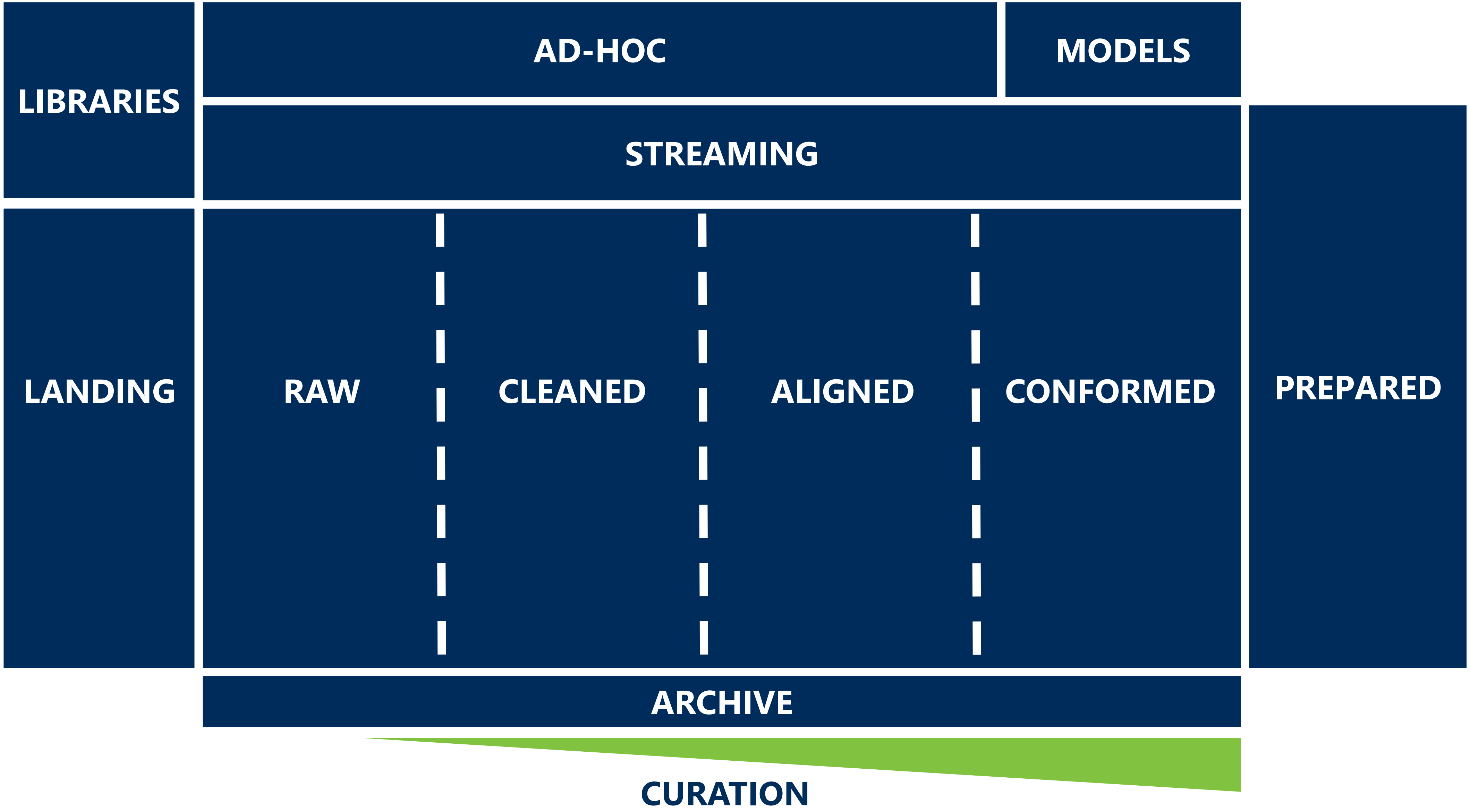
Facts
&
Dimensions

PREPARED

ARCHIVE

CURATION

Data Transformation – Storage & Format



LIBRARIES

AD-HOC

MODELS

STREAMING

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RAW

CLEANED

ALIGNED

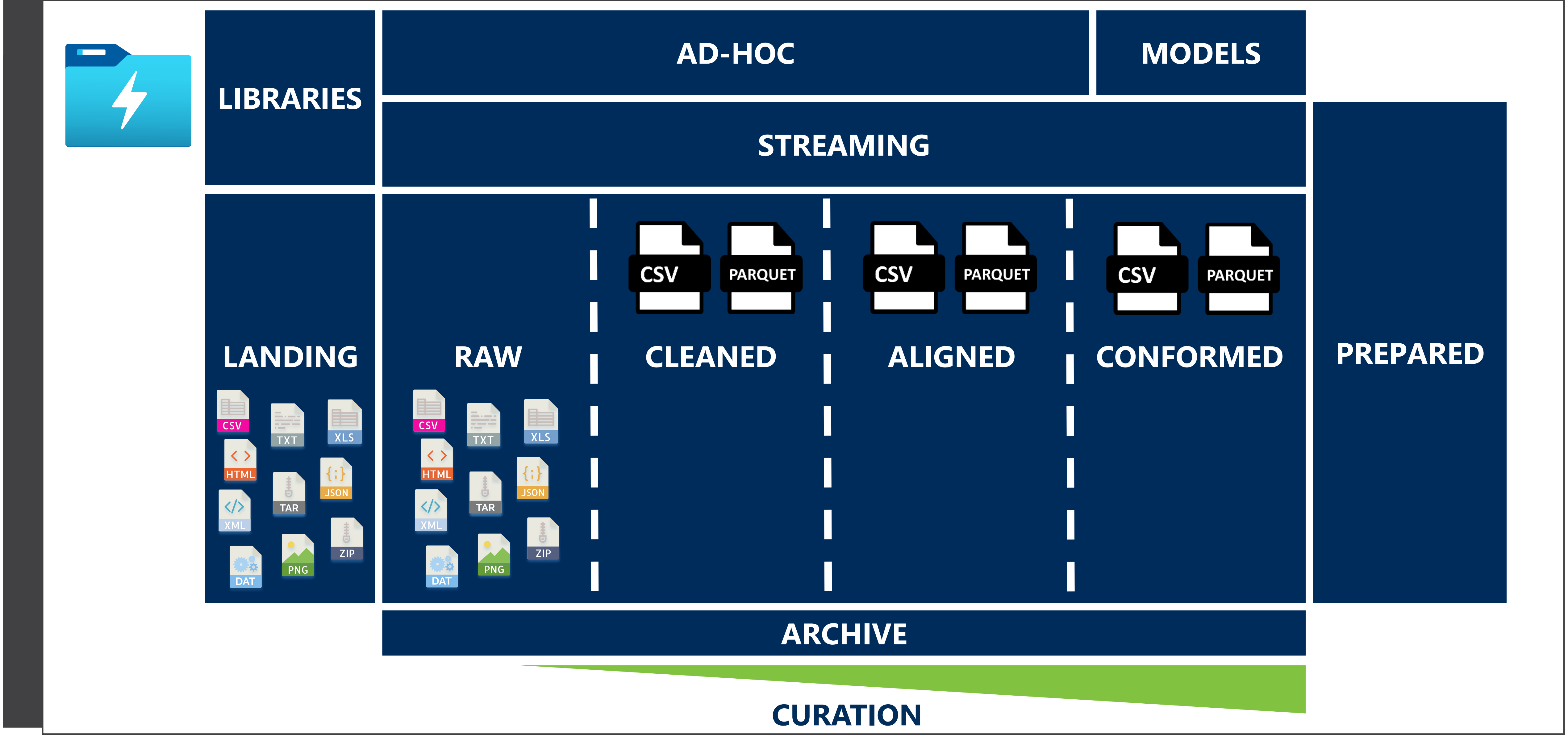
CONFORMED

PREPARED

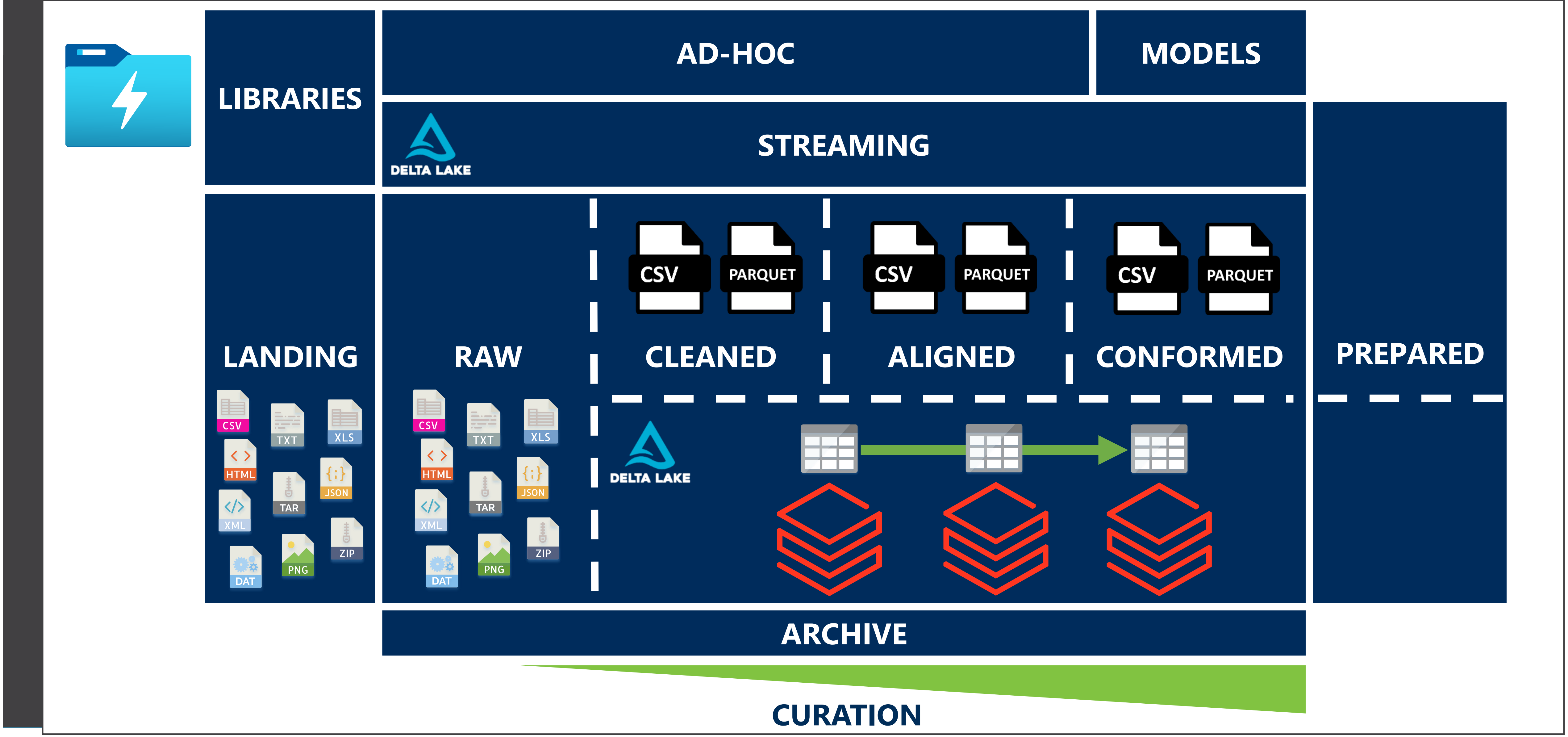
ARCHIVE

CURATION

Data Transformation – Storage & Format



Data Transformation – Storage & Format

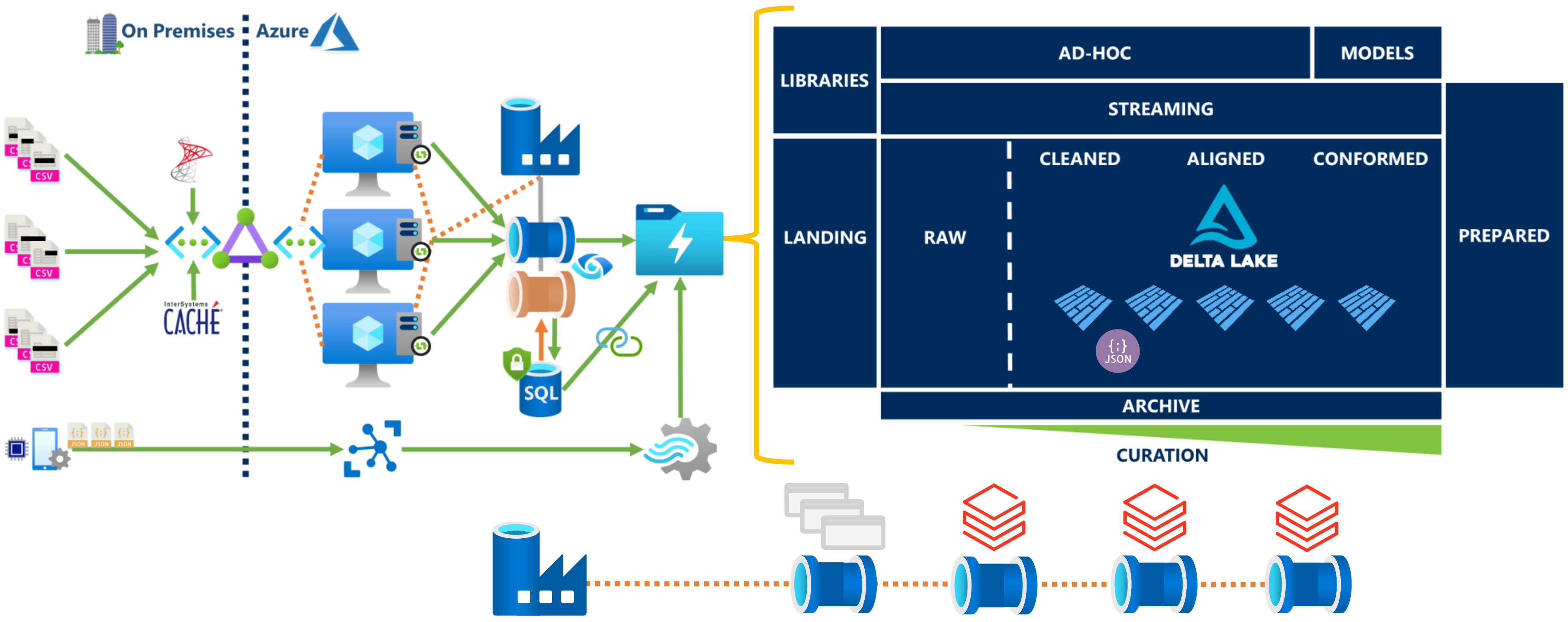


Agenda

1. Design ✓
2. Extract ✓
3. Transform
    - Compute ✓
    - Storage, Structure & Data Format ✓
4. Load

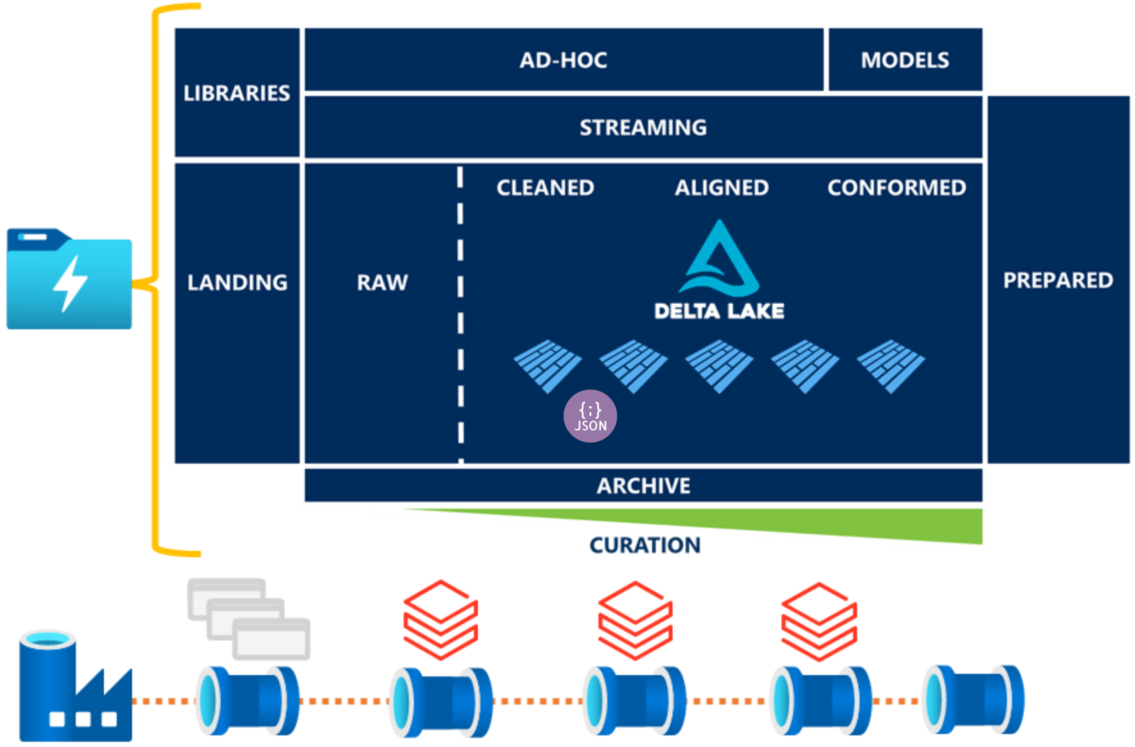
Overall Architecture

Extract | Transform | Load



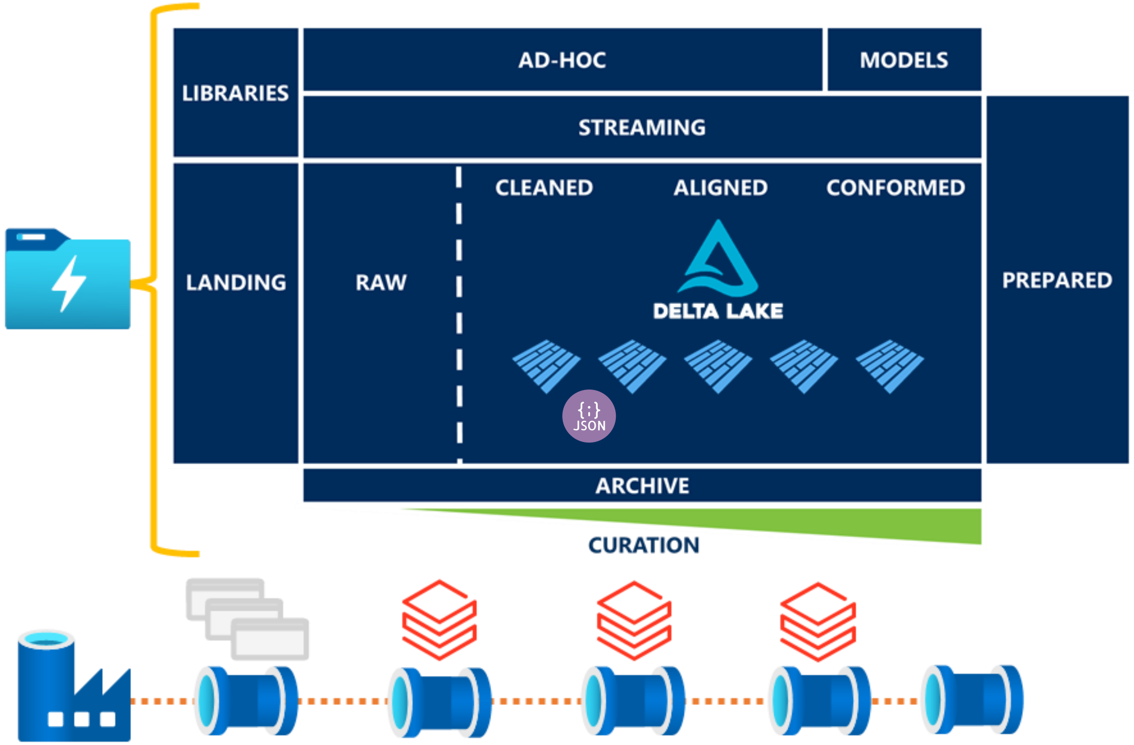
Agenda

1. Design ✓
2. Extract ✓
3. Transform ✓
4. Load

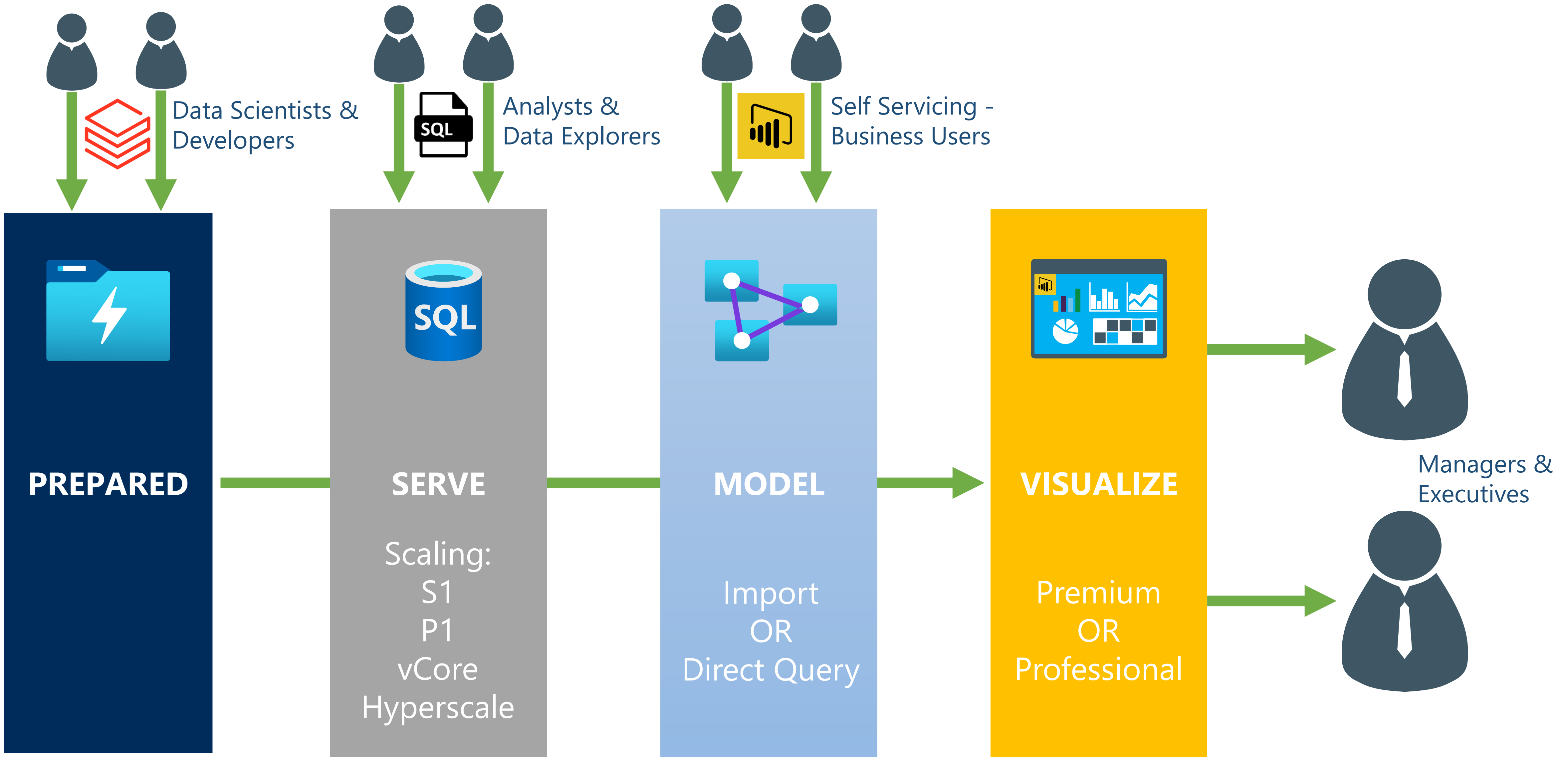


Agenda

1. Design ✓
2. Extract ✓
3. Transform ✓
4. Load



Loading & Consuming Data



Data Scientists & Developers

Analysts & Data Explorers

Self Servicing - Business Users

PREPARED

SERVE

Scaling:
S1
P1
vCore
Hyperscale

MODEL

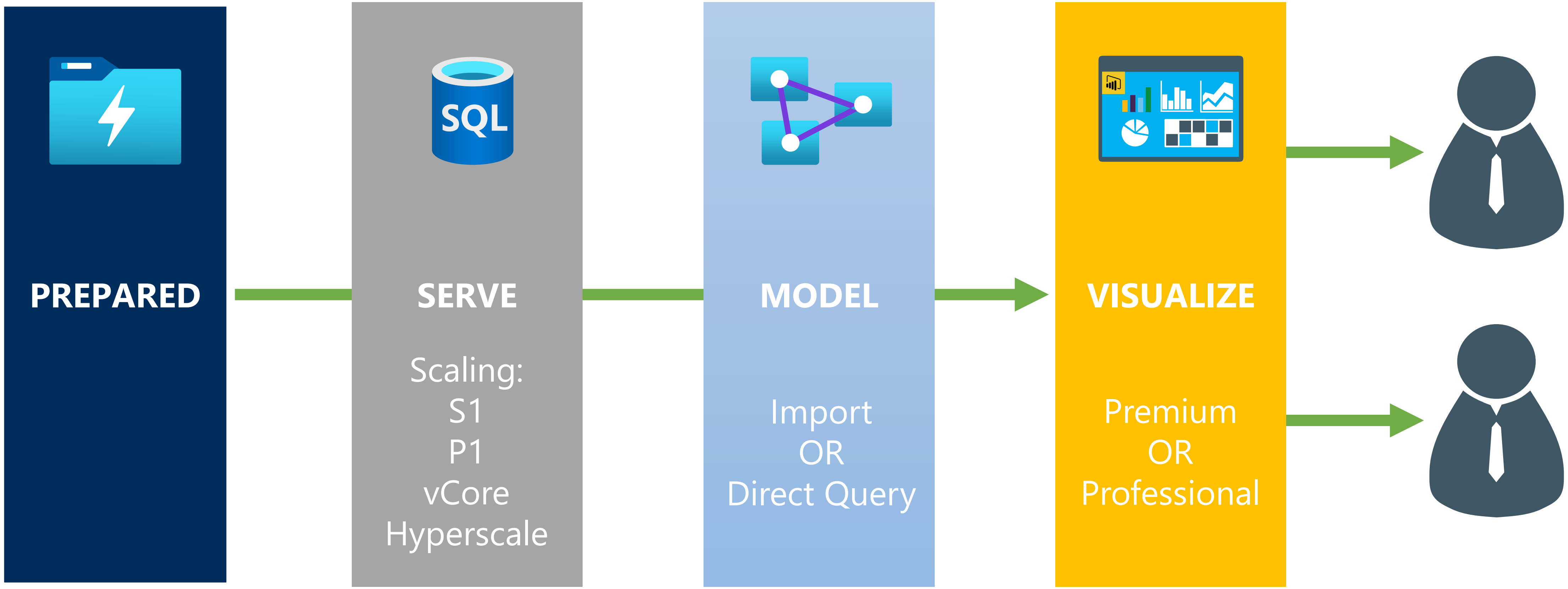
Import
OR
Direct Query

VISUALIZE

Premium
OR
Professional

Managers & Executives

Loading & Consuming Data



PREPARED

SERVE

Scaling:
S1
P1
vCore
Hyperscale

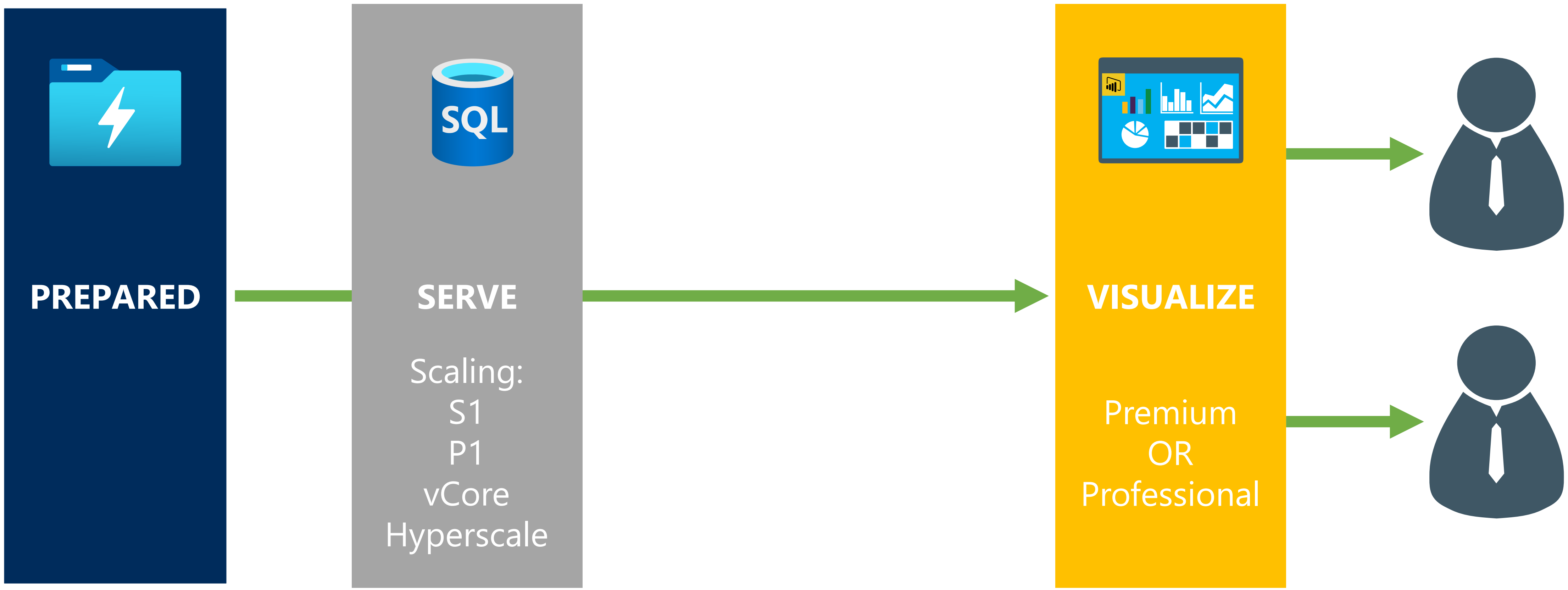
MODEL

Import
OR
Direct Query

VISUALIZE

Premium
OR
Professional

Loading & Consuming Data



PREPARED

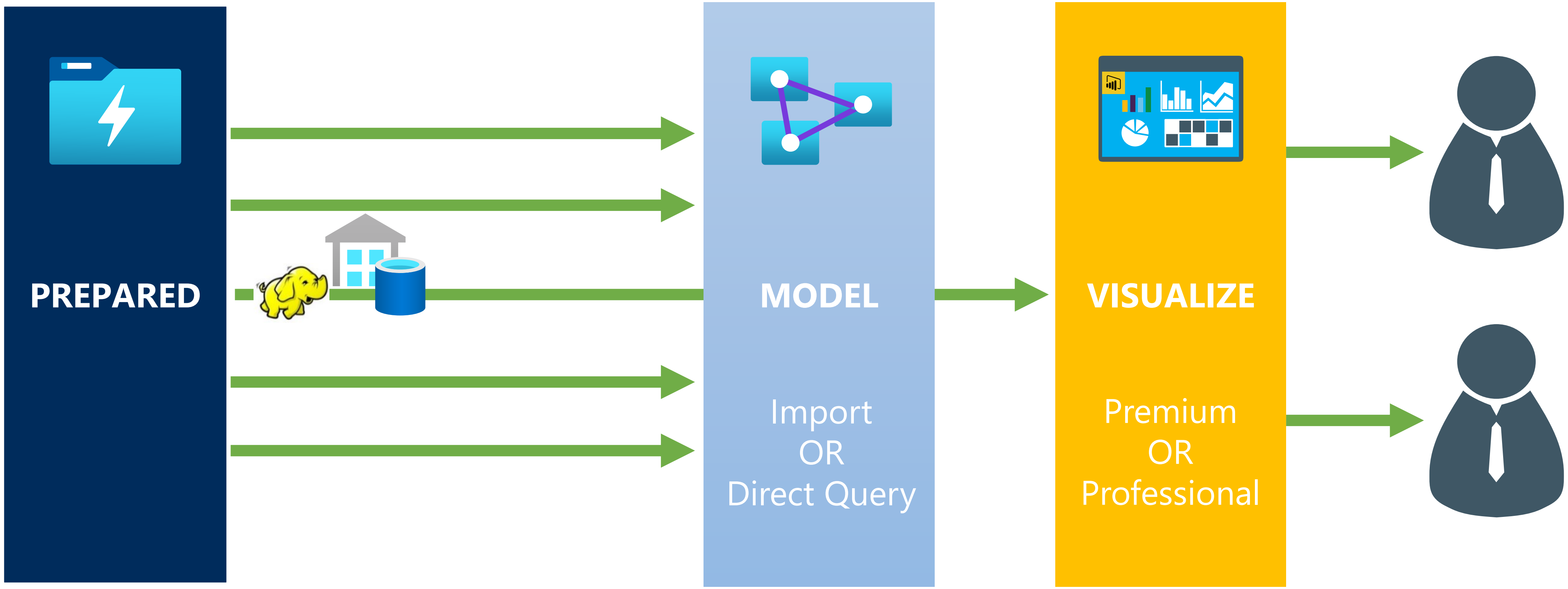
SERVE

Scaling:
S1
P1
vCore
Hyperscale

VISUALIZE

Premium
OR
Professional

Loading & Consuming Data



PREPARED

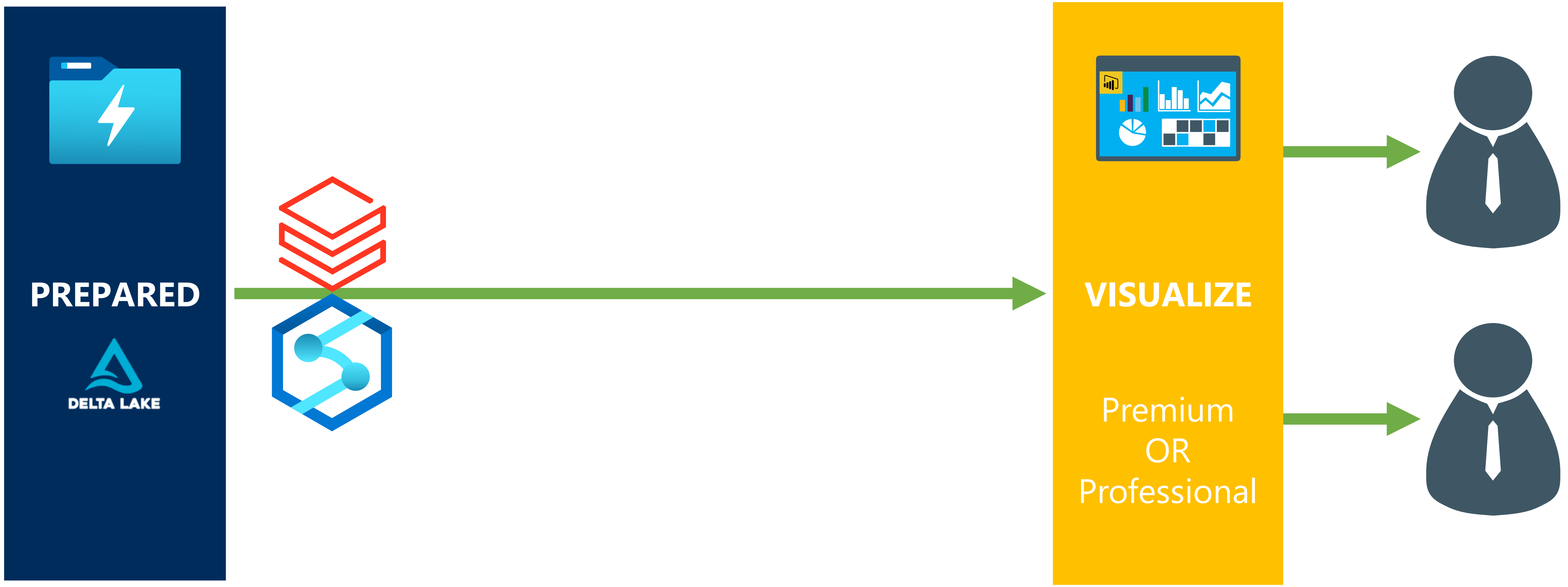
MODEL

Import
OR
Direct Query

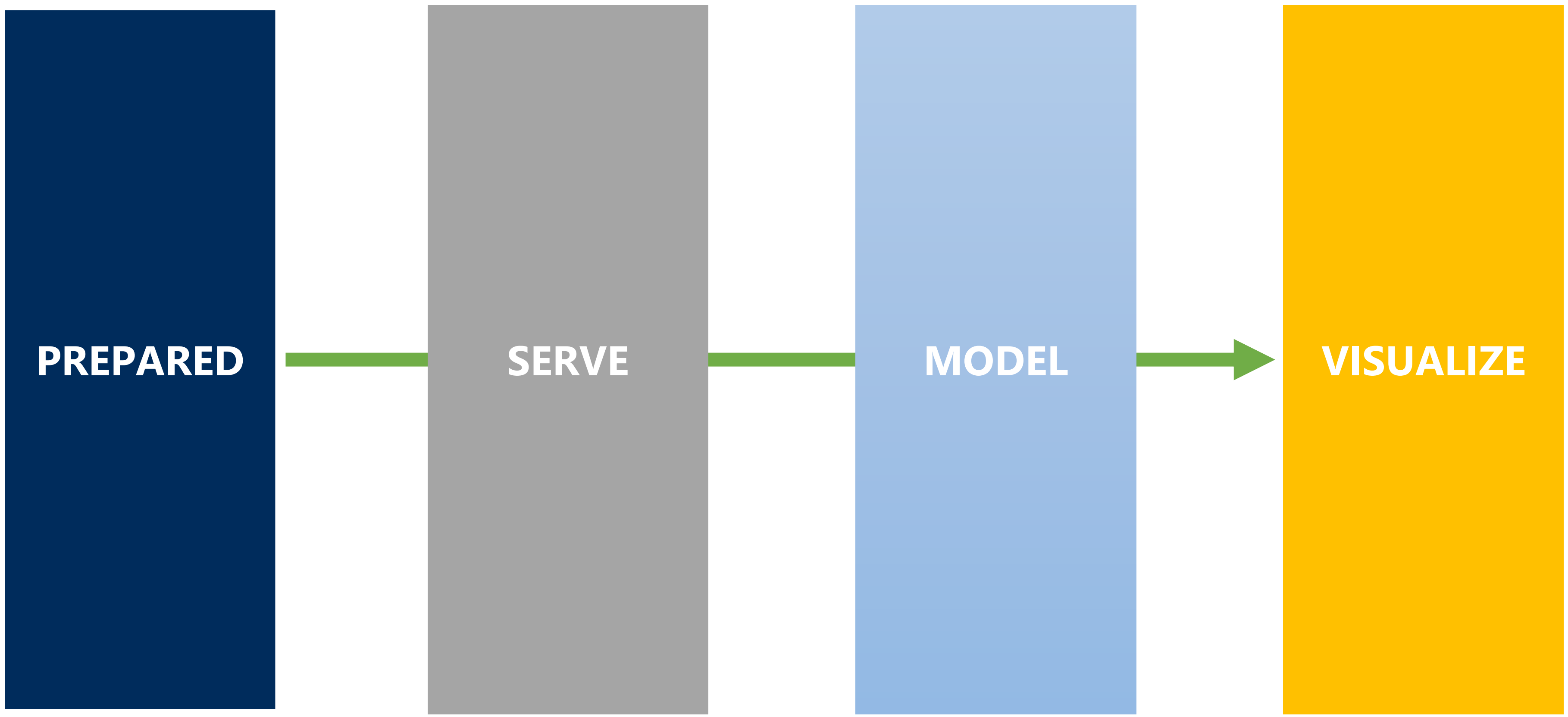
VISUALIZE

Premium
OR
Professional

Loading & Consuming Data



Consuming Our Lake House in Azure



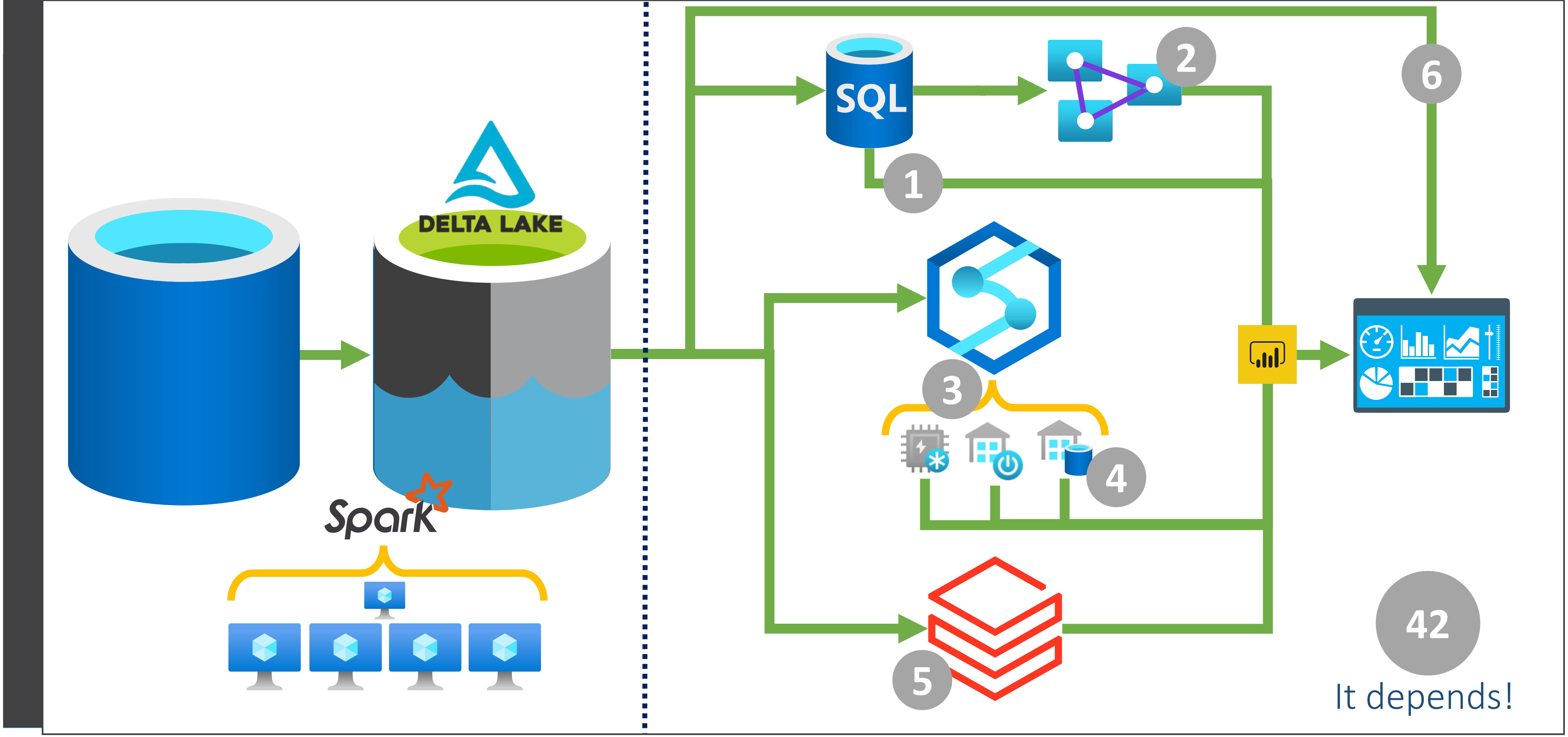
PREPARED

SERVE

MODEL

VISUALIZE

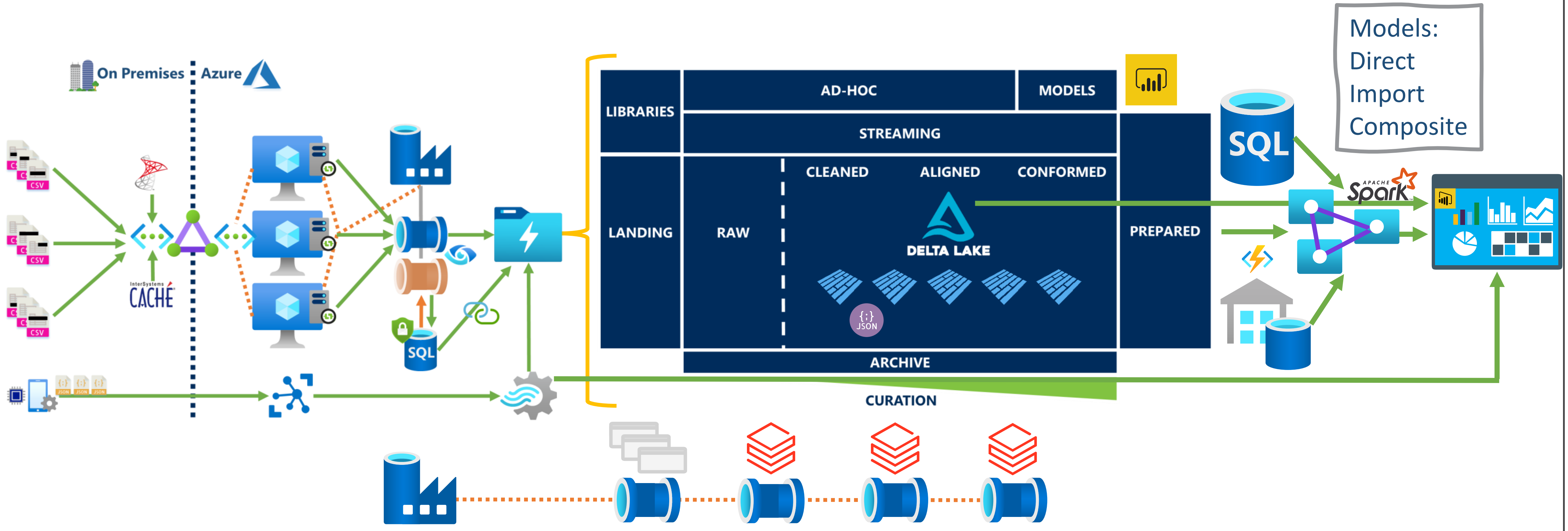
Consuming Our Lake House in Azure



It depends!

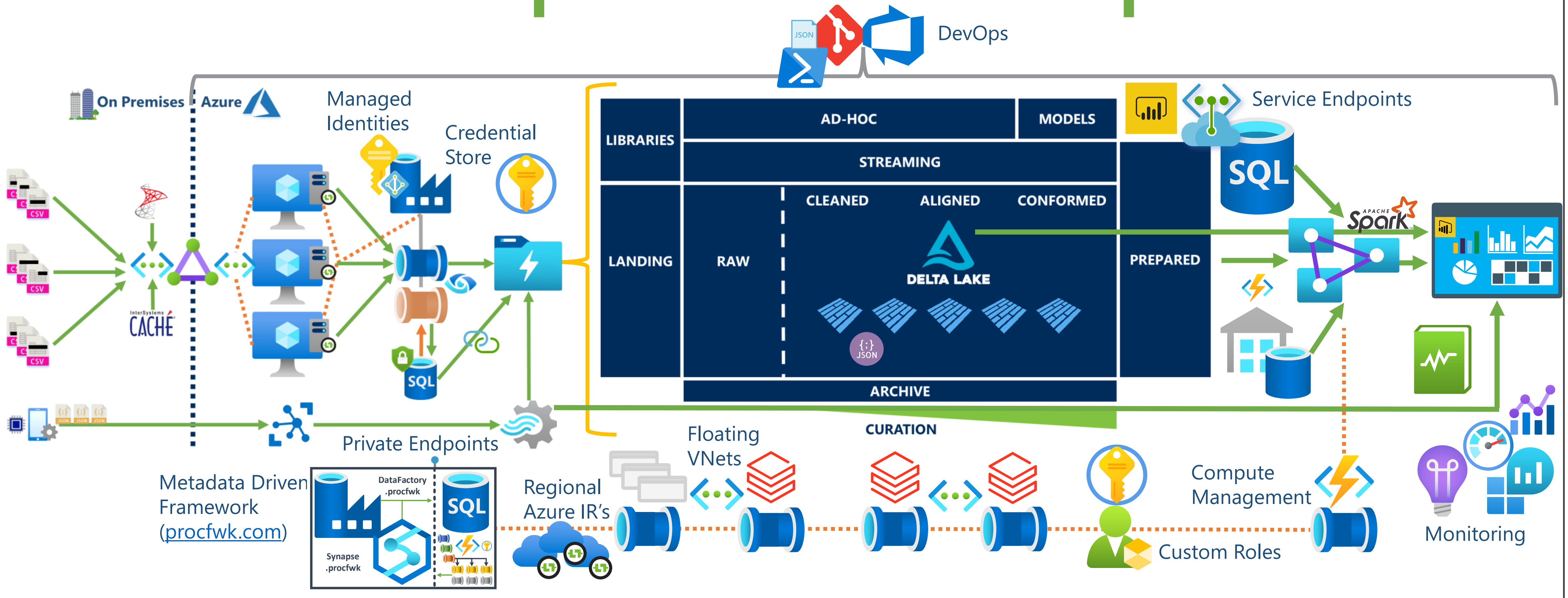
Overall Architecture

Extract | Transform | Load



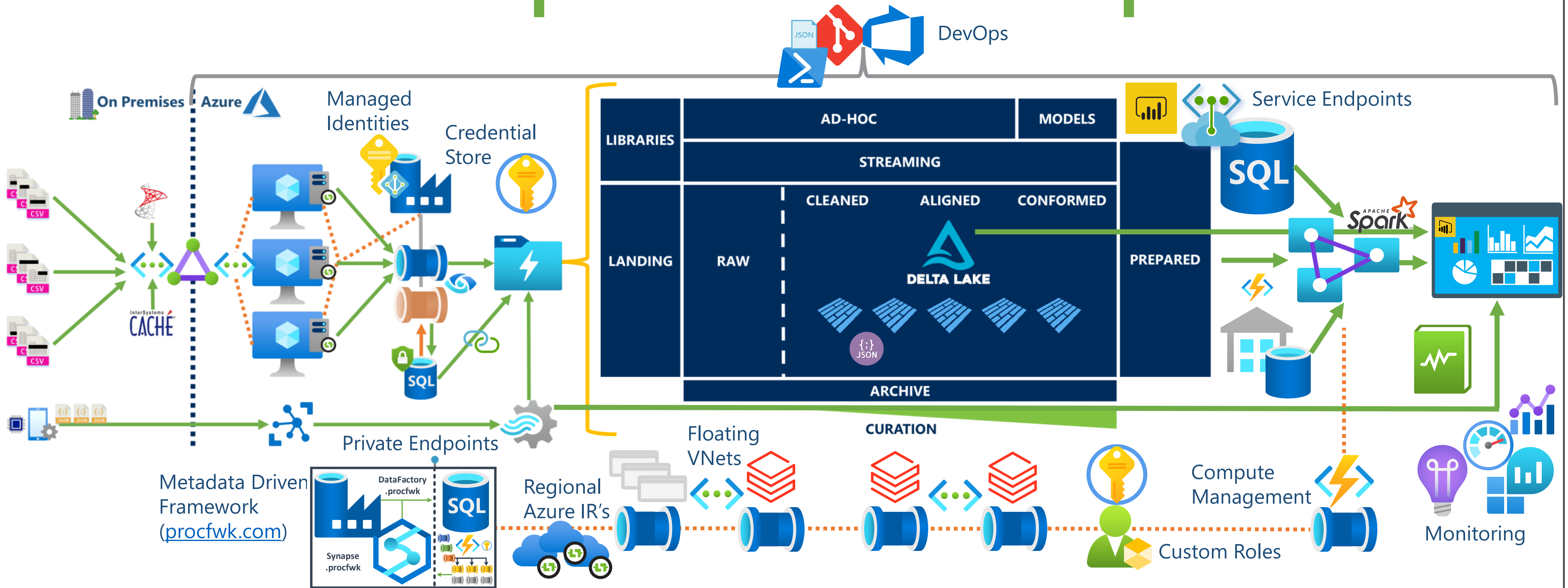
Overall Architecture

Extract | Transform | Load



Overall Architecture

Extract | Transform | Load



DevOps

On Premises

Azure

Managed Identities

Credential Store

LIBRARIES

AD-HOC

MODELS

STREAMING

LANDING

RAW

CLEANED

ALIGNED

CONFORMED

DELTA LAKE

PREPARED

ARCHIVE

CURATION

Service Endpoints

SQL

Spark

Private Endpoints

Metadata Driven Framework (procfwk.com)

DataFactory .procfwk

Synapse .procfwk

Regional Azure IR's

Floating VNets

Compute Management

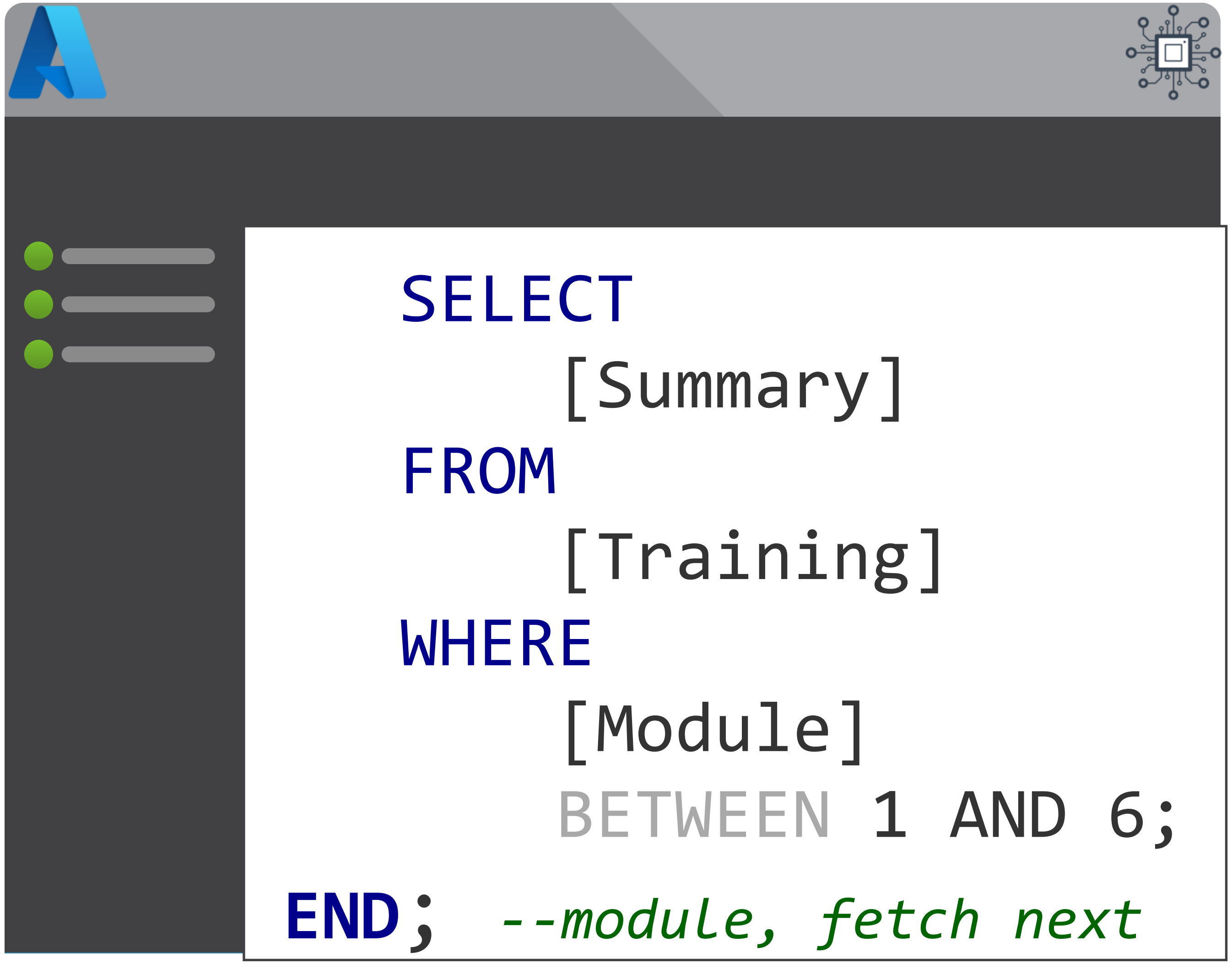
Custom Roles

Monitoring

Q: Should we build our data platform solution like this?...A: It depends!

Module 1 - 6

An Architects Recap



```
   SELECT
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   FROM
       [Training]
   WHERE
       [Module]
       BETWEEN 1 AND 6;
END;  --module, fetch next
```