Module 2 –
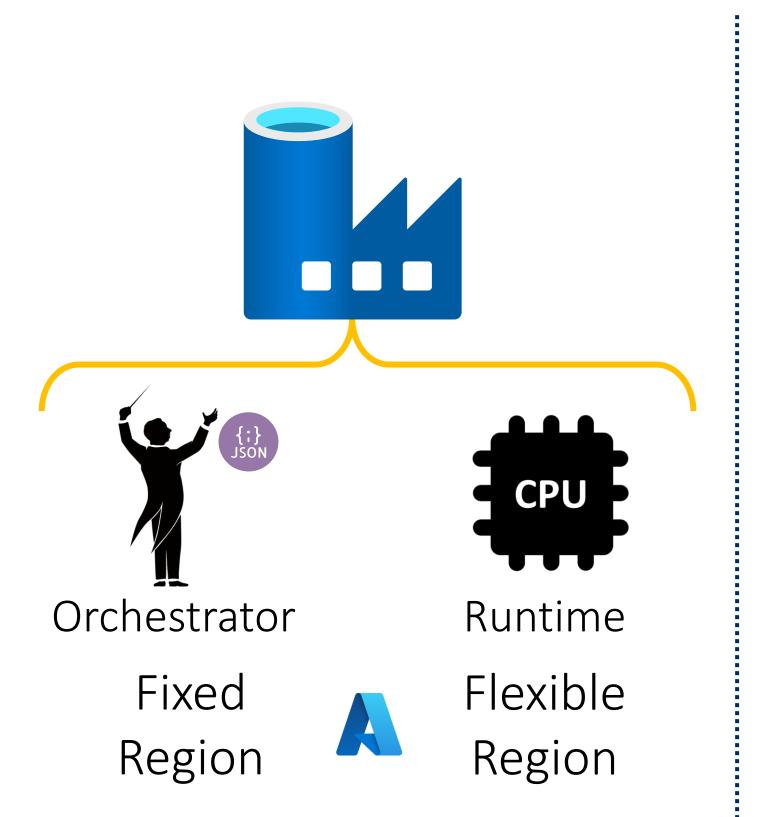## Integration Runtimes & Gateways
Orchestration Compute
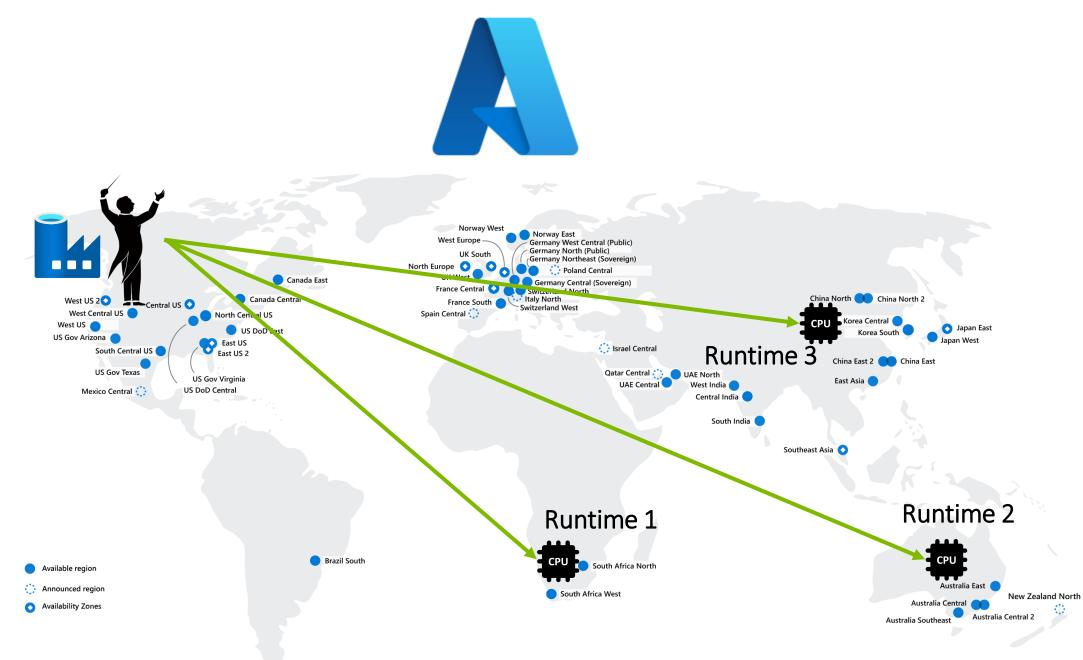
Cloud Formations

What is an Integration Runtime?

Orchestrator

Runtime

Fixed Region

Flexible Region

Runtime 1

Runtime 2

Runtime 3

- Available region
- Announced region
- Availability Zones

What can an Integration Runtime do?

1. Azure IR

2. Hosted IR

3. SSIS IR
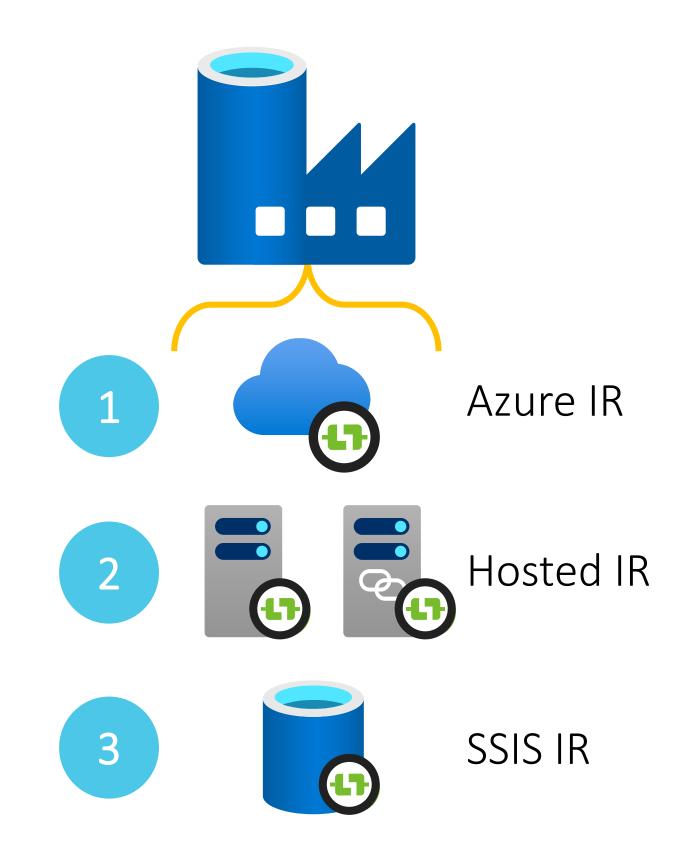
Module 2 –
Integration Runtimes & Gateways
Azure + Design Patterns

Cloud Formations

What can an Integration Runtime do?
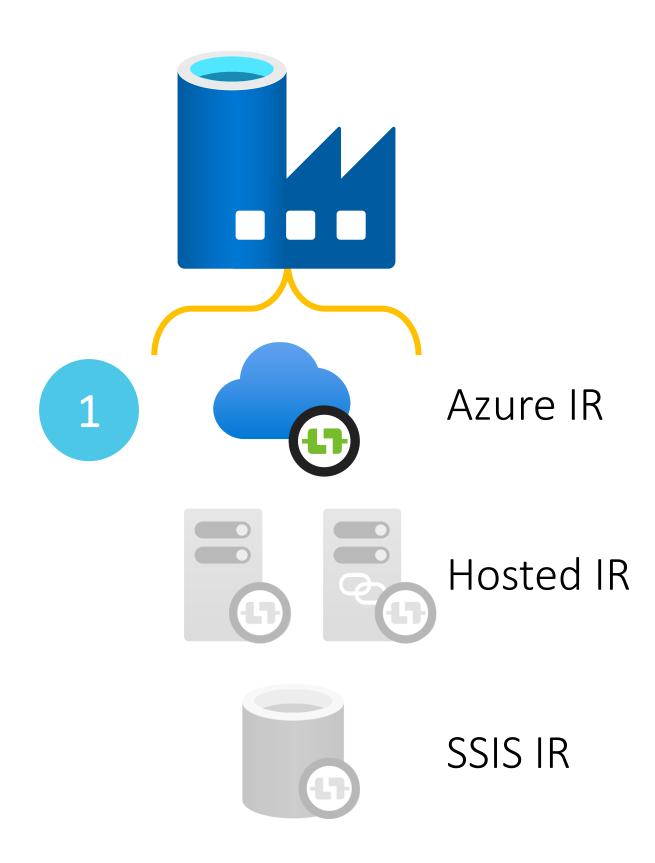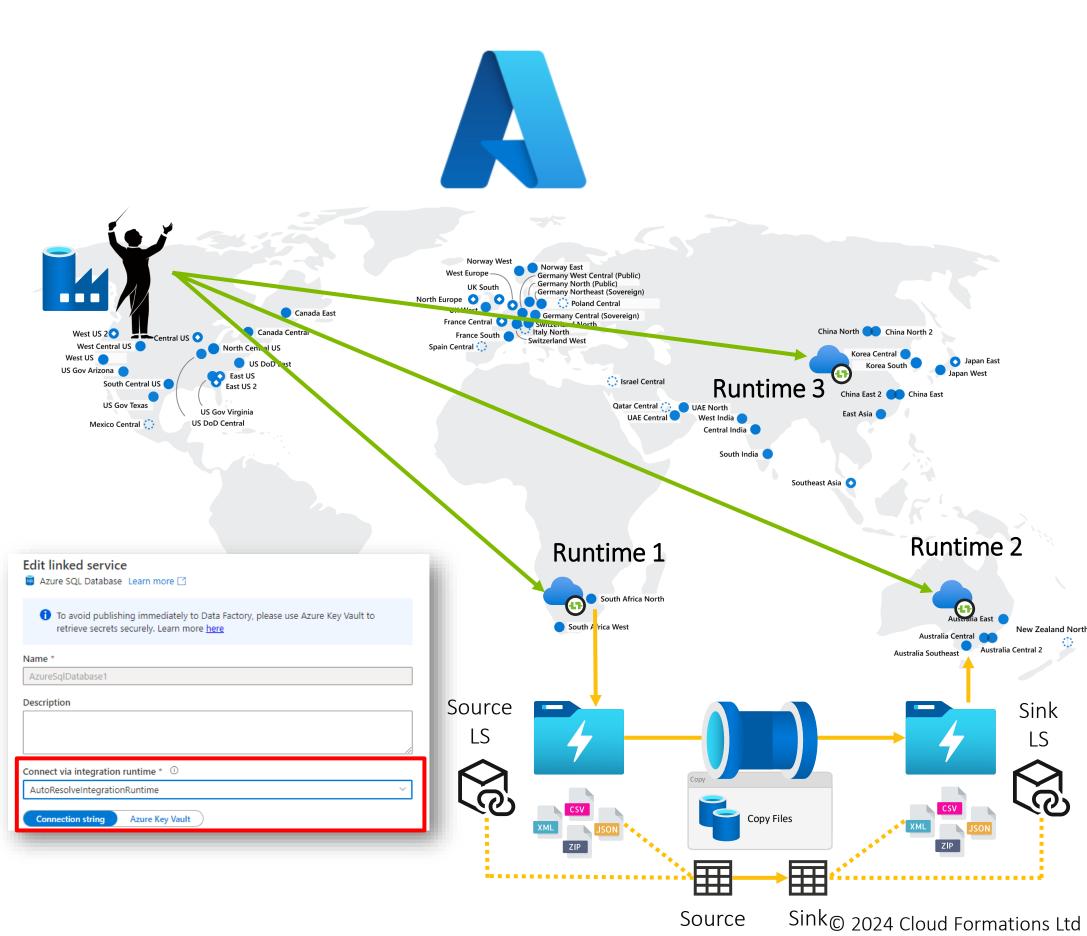
1

Azure IR

Hosted IR

SSIS IR

What is an Integration Runtime?

Orchestrator

Fixed Region

Runtime

Flexible Region

AutoResolveIntegrationRuntime

Edit linked service

Azure SQL Database   Learn more

To avoid publishing immediately to Data Factory, please use Azure Key Vault to retrieve secrets securely. Learn more here

Name *

AzureSqlDatabase1

Description

Connect via integration runtime *

AutoResolveIntegrationRuntime

Connection string   Azure Key Vault

Runtime 1

Runtime 2

Runtime 3

Source
LS

Sink
LS

Copy

Copy Files

Source

Sink

Module 2 –
Integration Runtimes & Gateways
Hosted + Design Patterns

Cloud Formations

What can an Integration Runtime do?

Azure IR
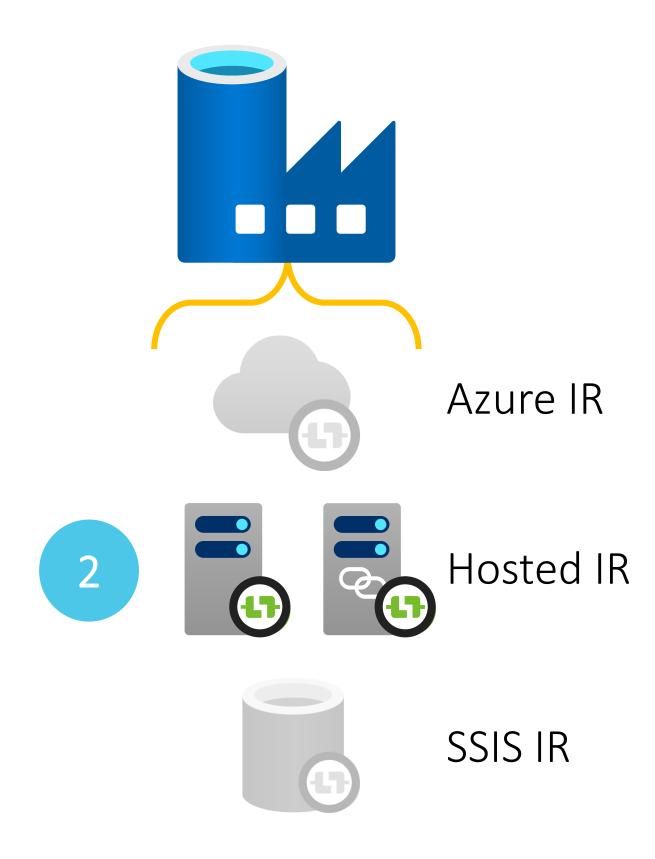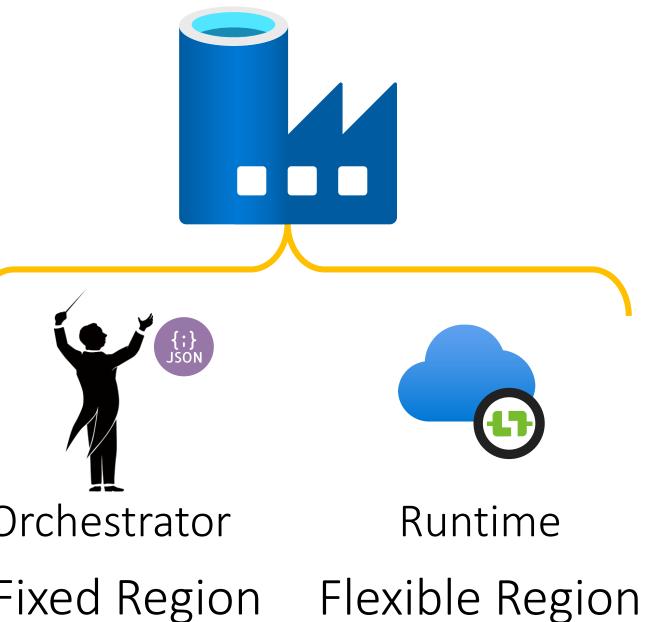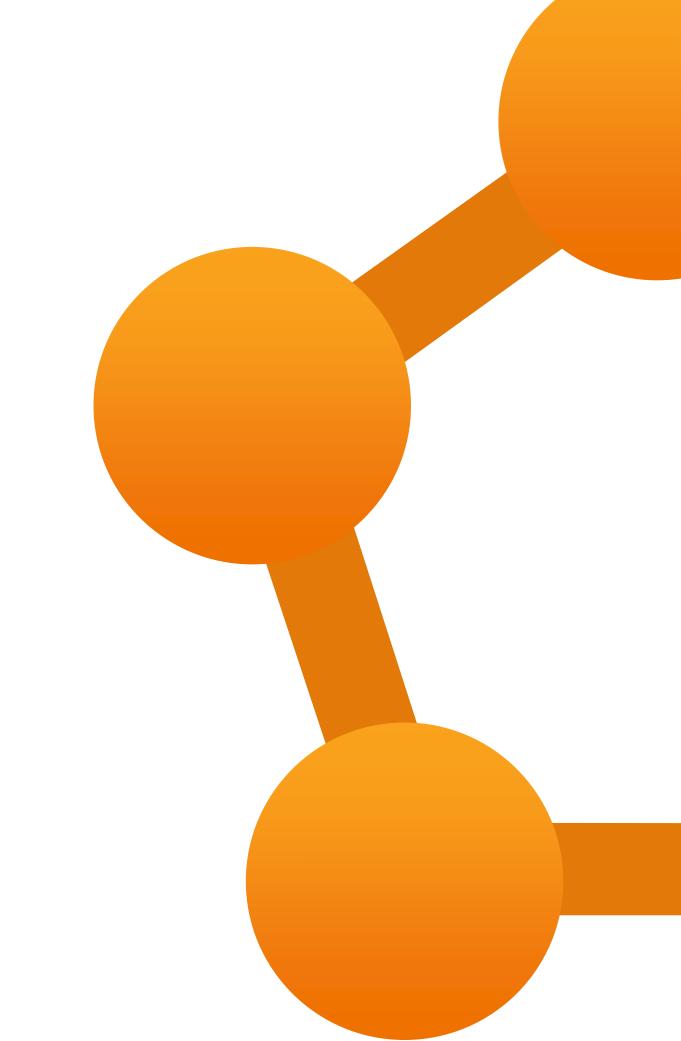
2 Hosted IR

SSIS IR

Hosted Integration Runtime

Windows OS
32GB RAM
6 CPU Cores
(12 Logical Cores)
80GB Storage

Edit integration runtime

Settings   **Nodes**   Auto update   Sharing   Links

60 View Service URLs ⓘ

Name	Status	IP address ⓘ	Limit concurrent jobs	Actions
WINAP71RY2YAB...	Running	Get IP address	112 ✓ ✕	⊘ 🗑

Data
Sources

Windows OS
8GB RAM
4 CPU Cores
80GB Storage

Runtime

Self Hosted

Microsoft Integration Runtime Configuration Manager

Home   Settings   Diagnostics   Update   Help

✓ Self-hosted node is connected to the cloud service

Data Factory: PaulsFunFactoryV2
Integration Runtime: WINAP71rY2YabRV
Node: WINAP71RY2YABRV

Stop Service

Data Source Credential ⓘ
Credential store: On-premises
Credential status: In sync
Last backup time: N/A

Generate Backup   Import Backup

✓ Connected to the cloud service (Data Factory V2)

Orchestrator

Fixed Region

Runtime

Flexible Region

cd "C:\Program Files\Microsoft Integration Runtime\5.0\Shared\"

.\dmgcmd.exe -DisableLocalFolderPathValidation

Hosted Integration Runtime

SAP

CSV
XML
JSON
ZIP

Microsoft
SQL Server

Runtime

Self Hosted

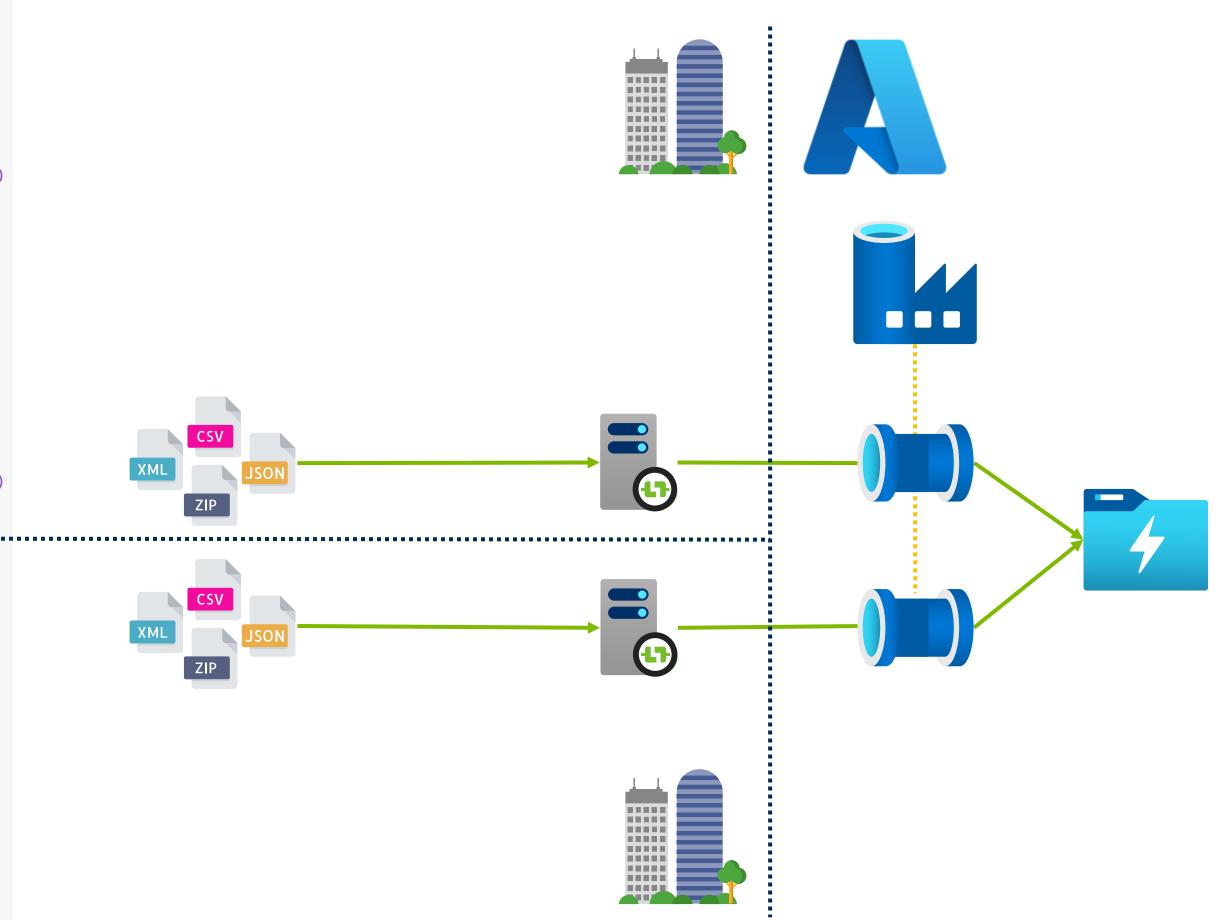**Orchestrator**

Fixed Region

Runtime

Flexible Region

Single Hosted IR

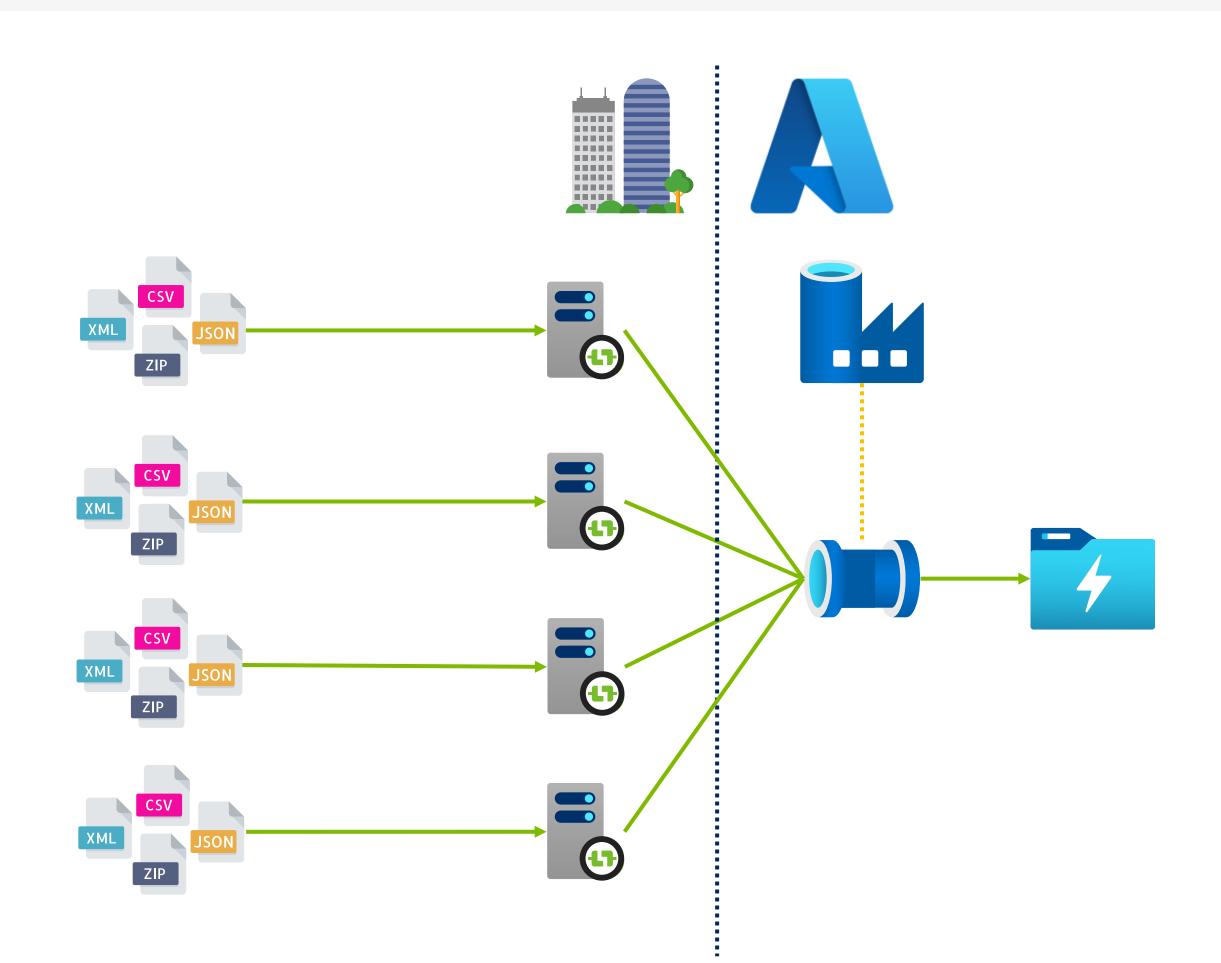# Multiple Hosted IR's at Different Sites
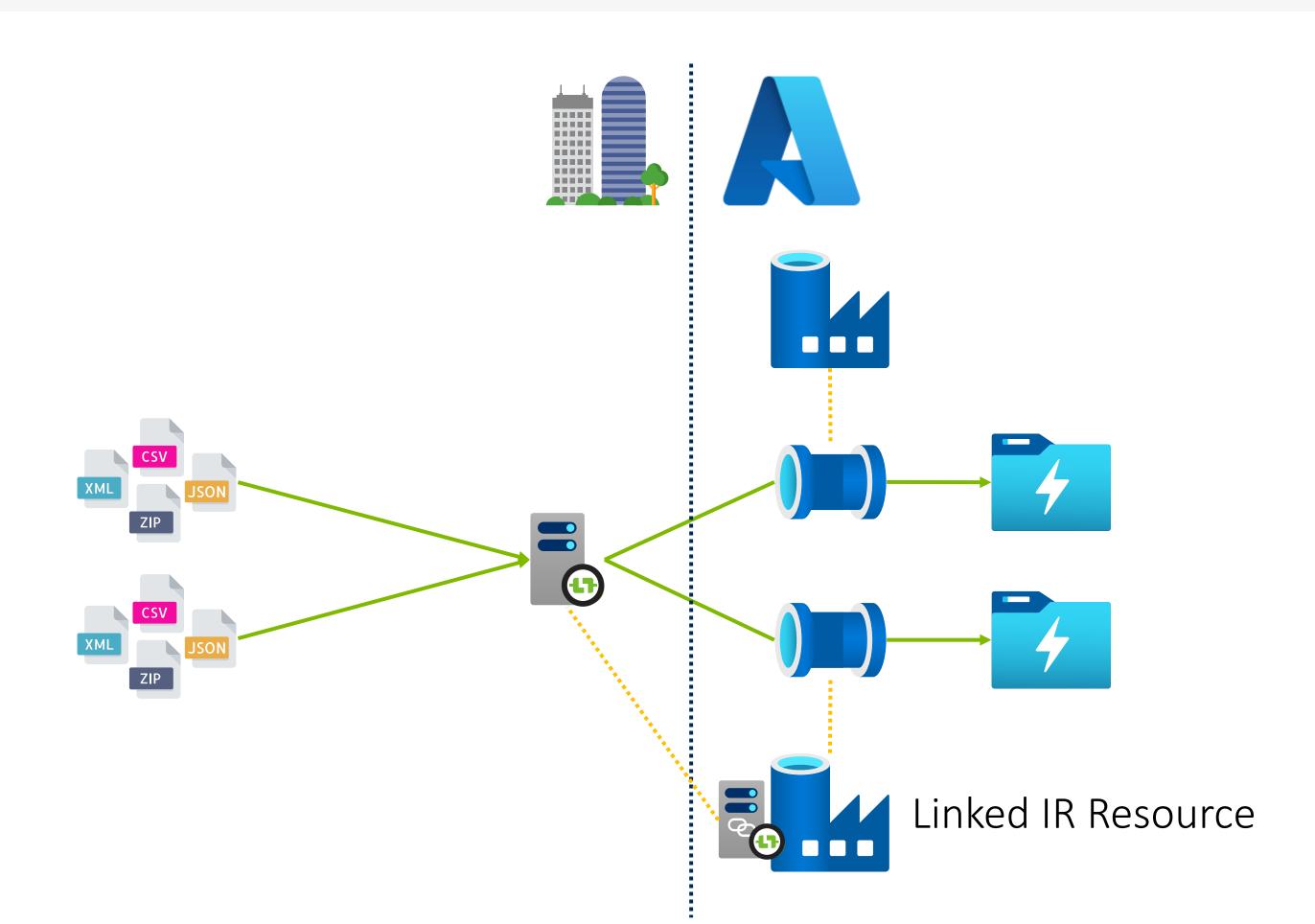
Multiple Hosted IR's as Separate Endpoints

Single Hosted IR with Multiple Nodes

CSV
XML
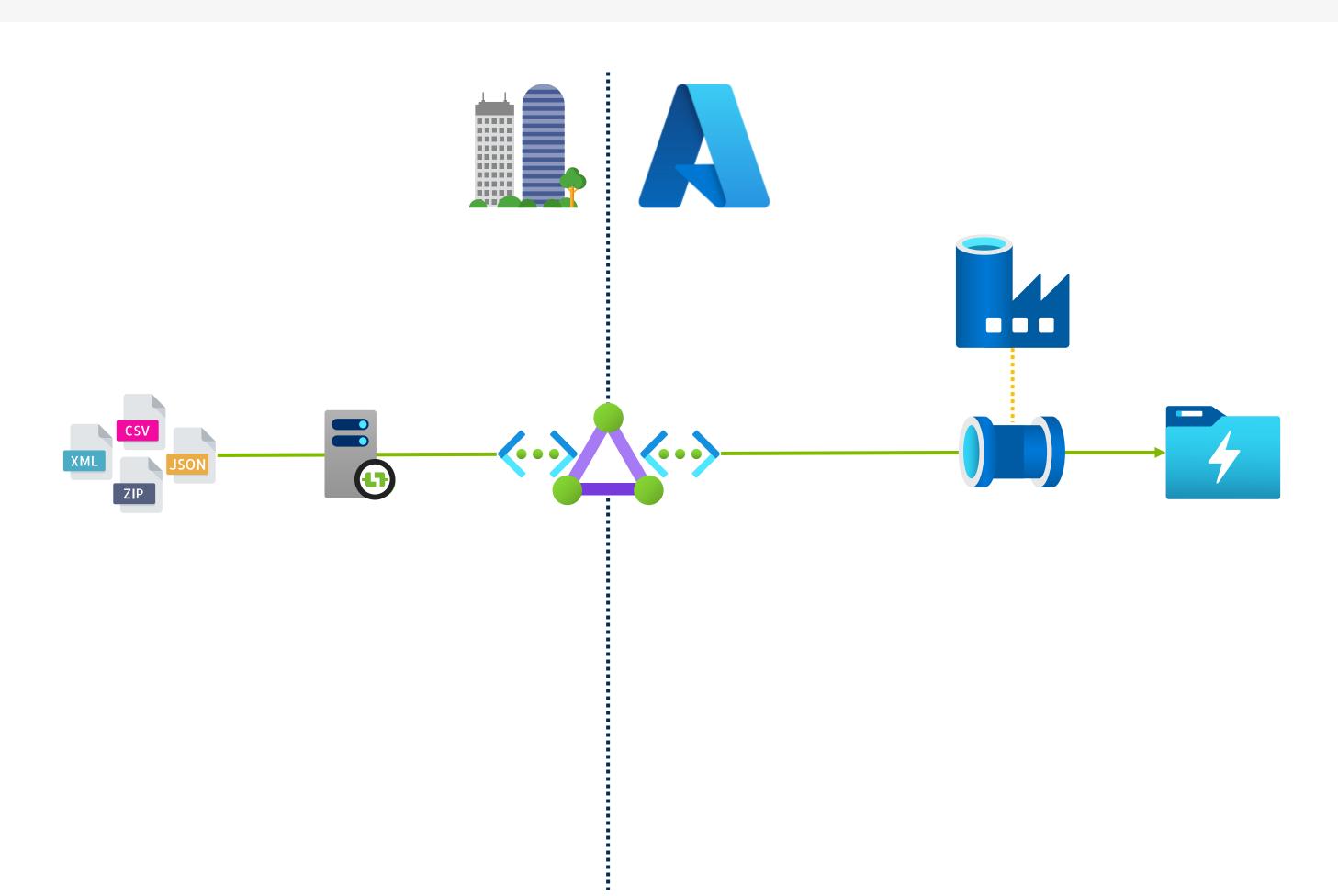JSON
ZIP

CSV
XML
JSON
ZIP

CSV
XML
JSON
ZIP

CSV
XML
JSON
ZIP

* Max of 4 Nodes per IR Endpoint

Single Hosted IR Linked to Multiple Data Factories

Linked IR Resource
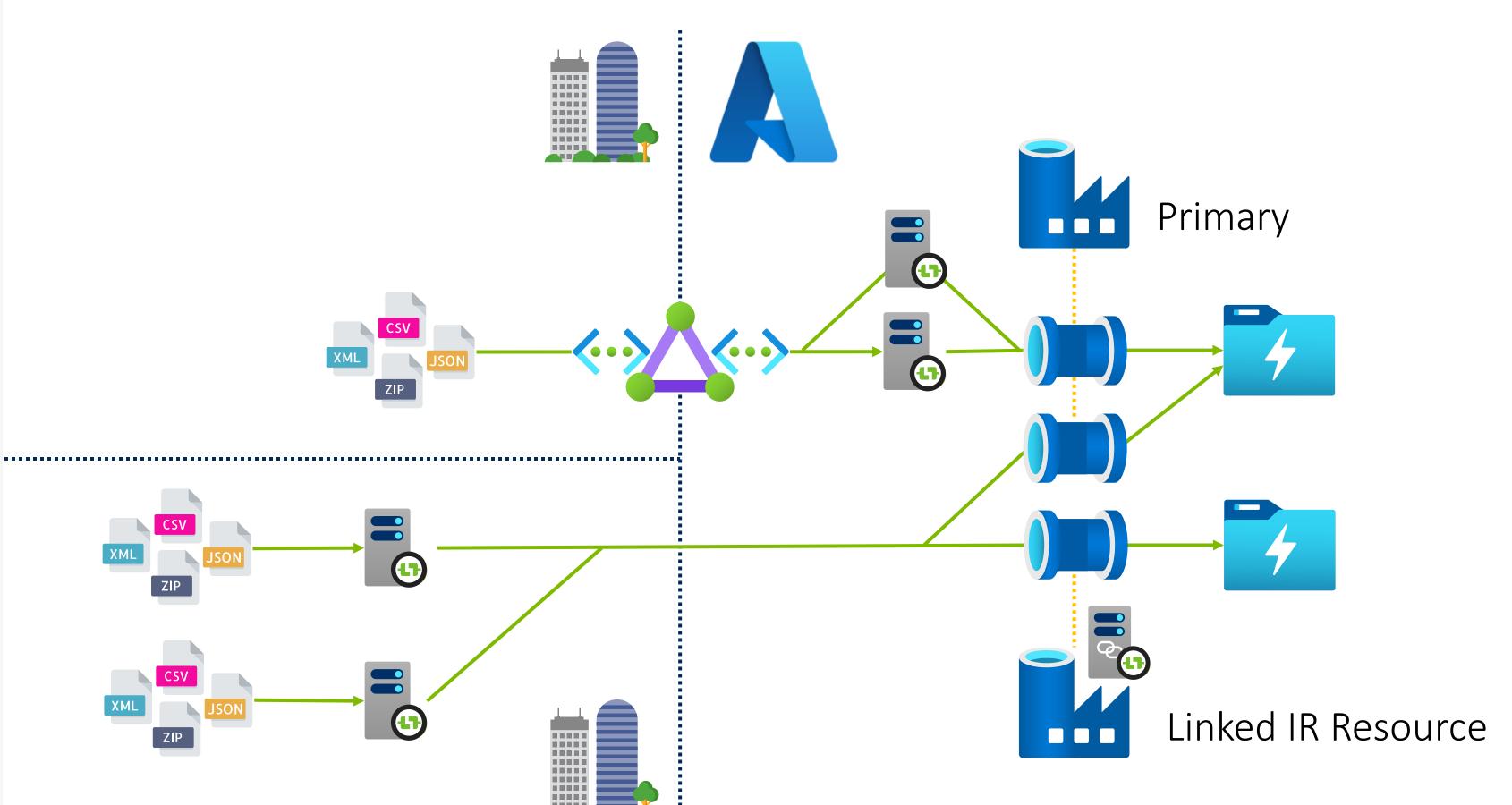
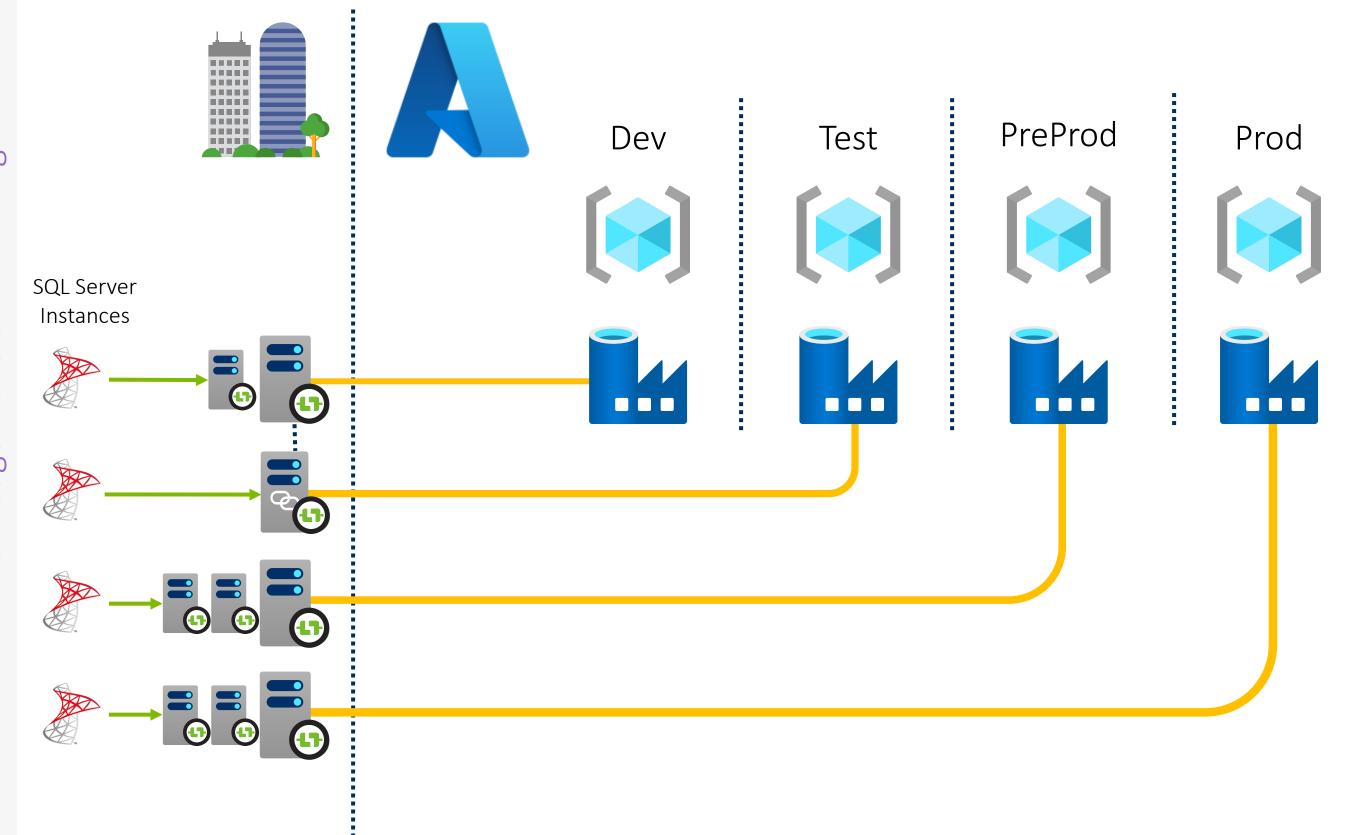# Hosted IR's with Express Route Connections

Hosted IR Combinations

Primary

Linked IR Resource
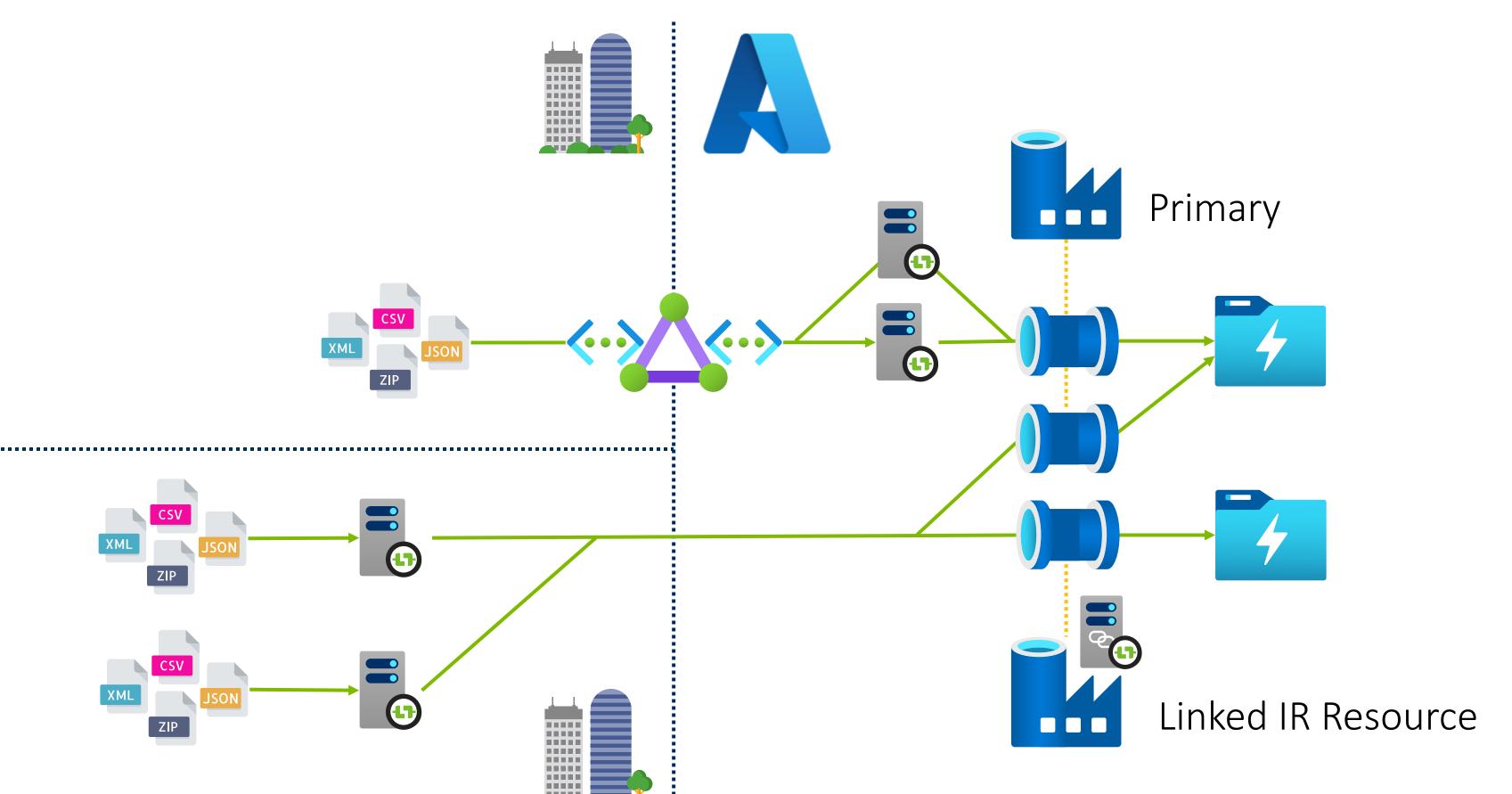
Horizontal vs Vertical Environment Processing
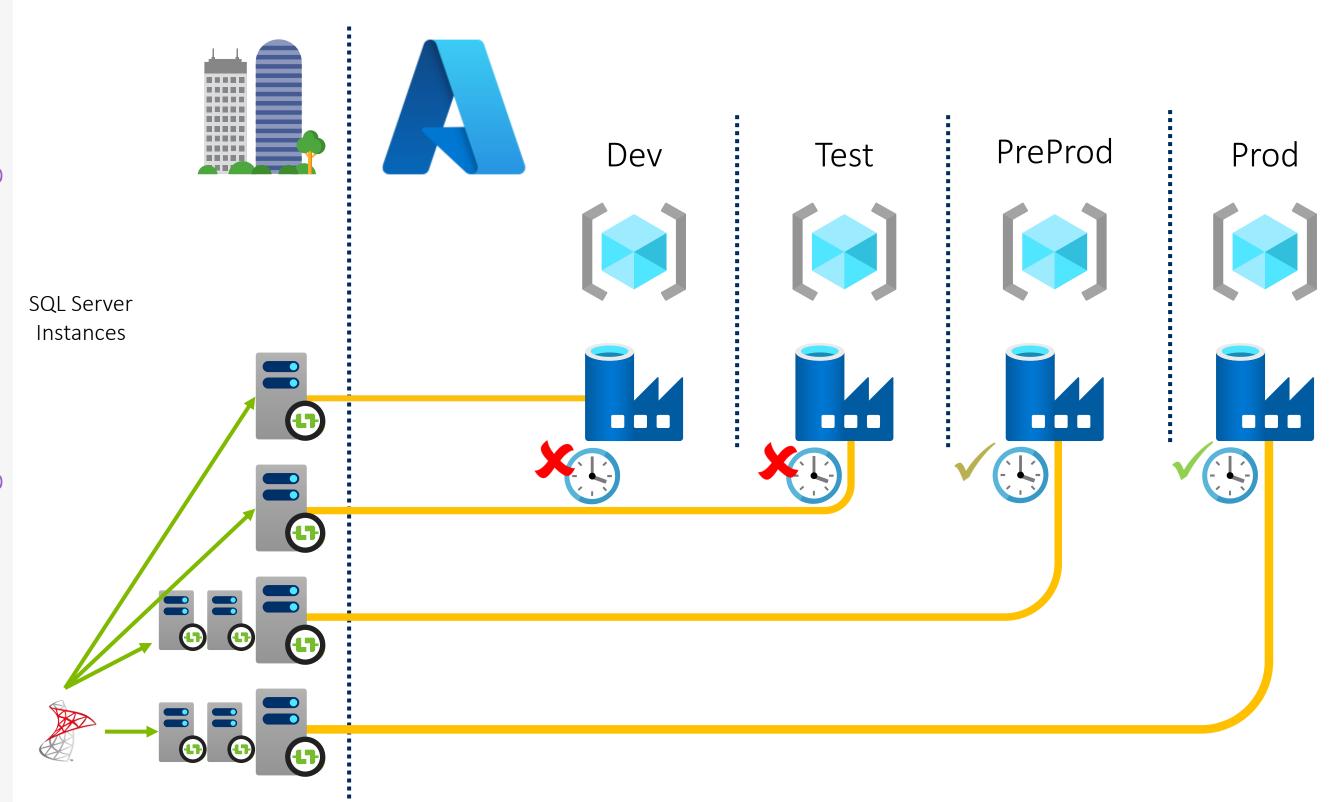
Primary

Linked IR Resource

Hosted IR's vs Environments

Cloud Formations - Knowledge Transfer & Training

Dev   Test   PreProd   Prod

SQL Server
Instances

25x Sites
4x Environments

2x IR's for Dev
1x Linked IR for Test (from Dev)

3x IR's for PreProd
3x IR's for Prod

8x Virtual Machines per Site
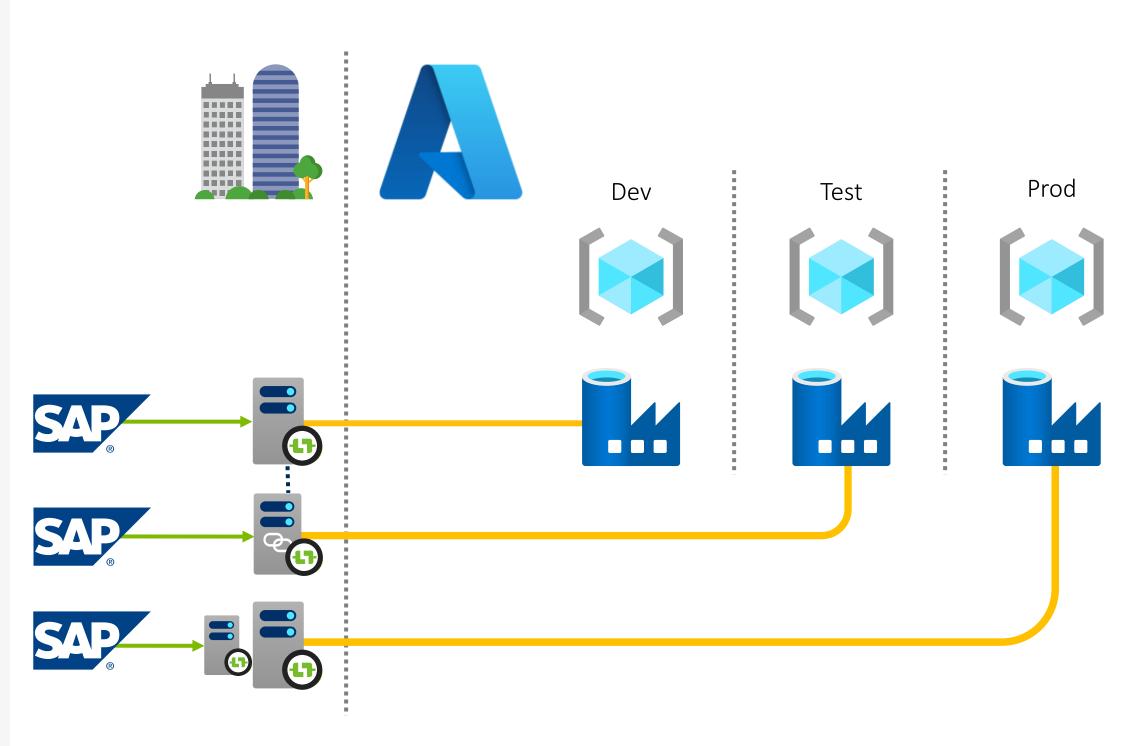200x Virtual Machines Total

Hosted IR's vs Environments

Dev Test PreProd Prod

SQL Server Instances

25x Sites
4x Environments

2x IR's for Dev
1x Linked IR for Test (from Dev)

3x IR's for PreProd
3x IR's for Prod

8x Virtual Machines per Site
200x Virtual Machines Total

Hosted IR's vs Environments

Dev

Test

PreProd

Prod

SQL Server
Instances

Common
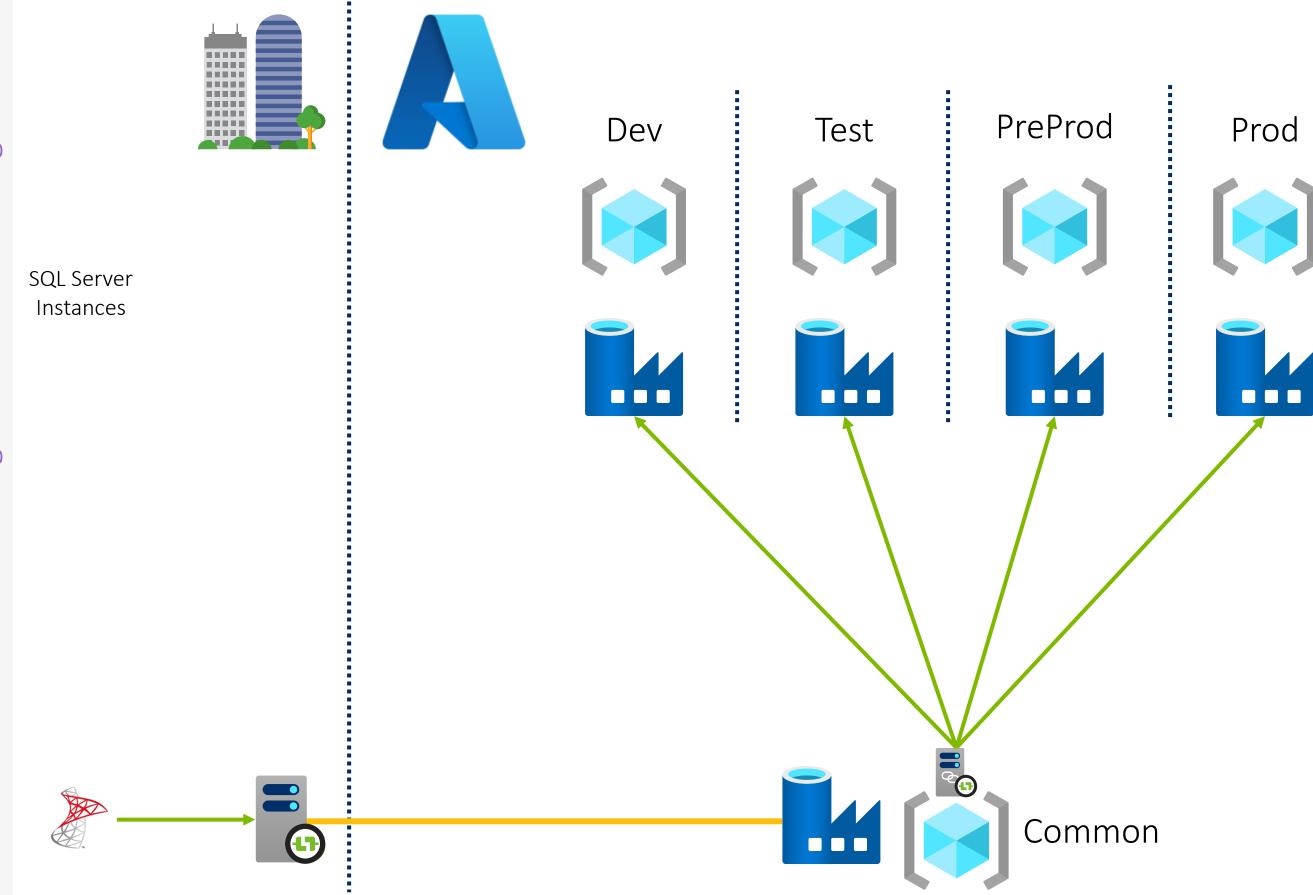
What does a typical setup involve?

Dev

Test

Prod

1x Location
3x Environments

1x IR's for Dev
1x Linked IR for Test (from Dev)
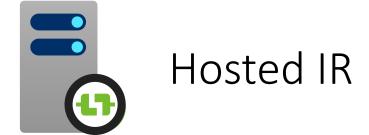
2x IR's for Prod

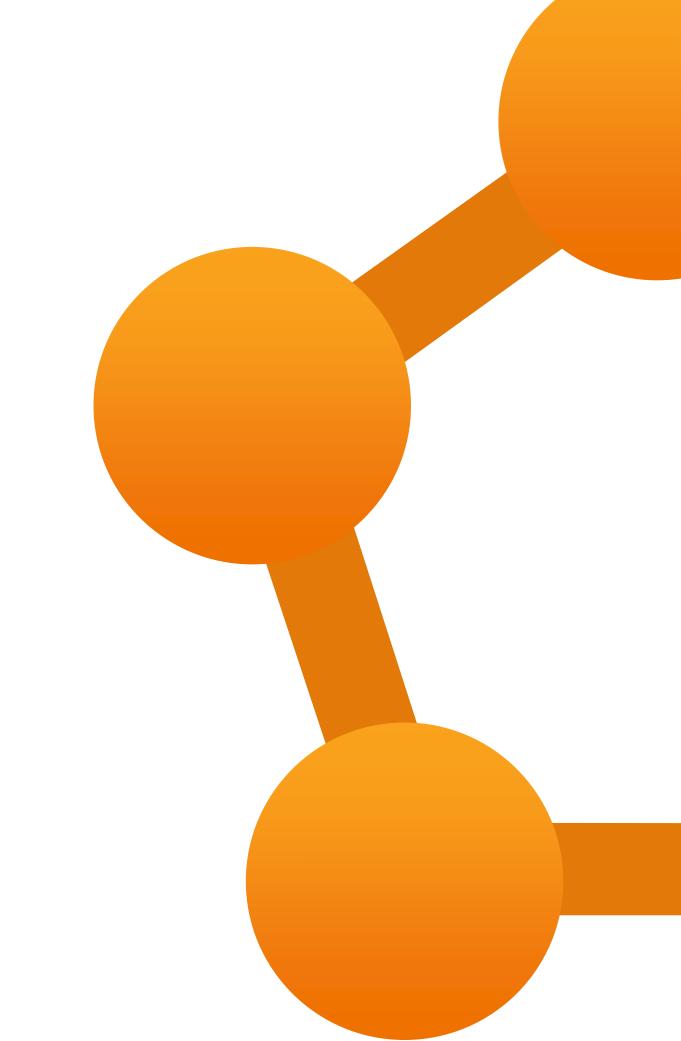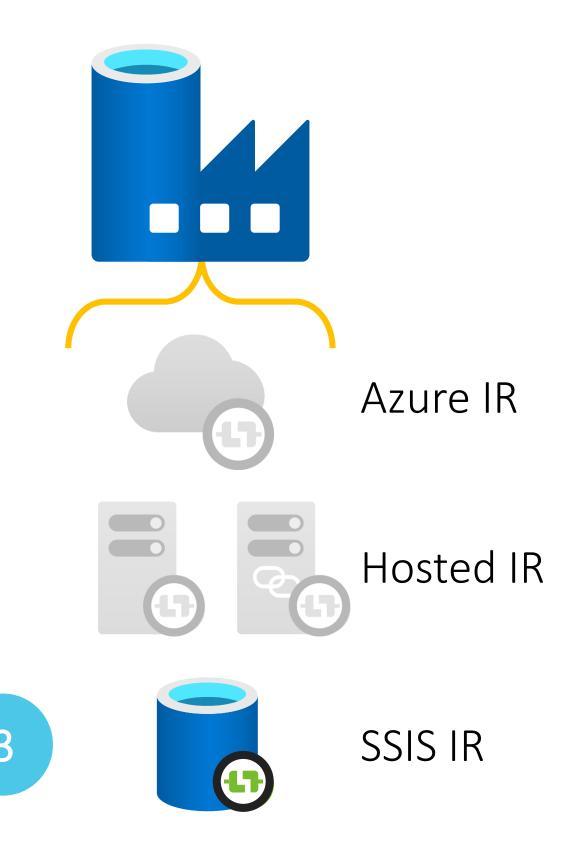# Synapse vs Data Factory
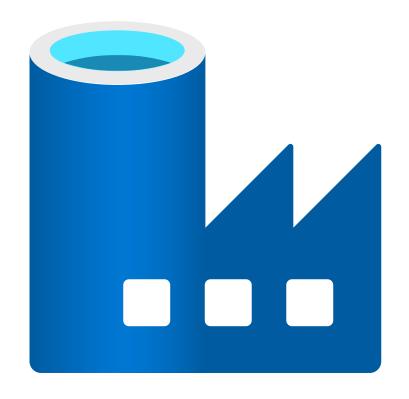
Integration Runtimes Differences

Hosted IR

SSIS IR (Preview)

Hosted IR

SSIS IR

Module 2 –
Integration Runtimes & Gateways
SSIS + Design Patterns

Cloud Formations

What can an Integration Runtime do?

Azure IR

Hosted IR

3 SSIS IR

SSIS IR

Running an SSIS Package in Azure

SSIS IR

Run Package
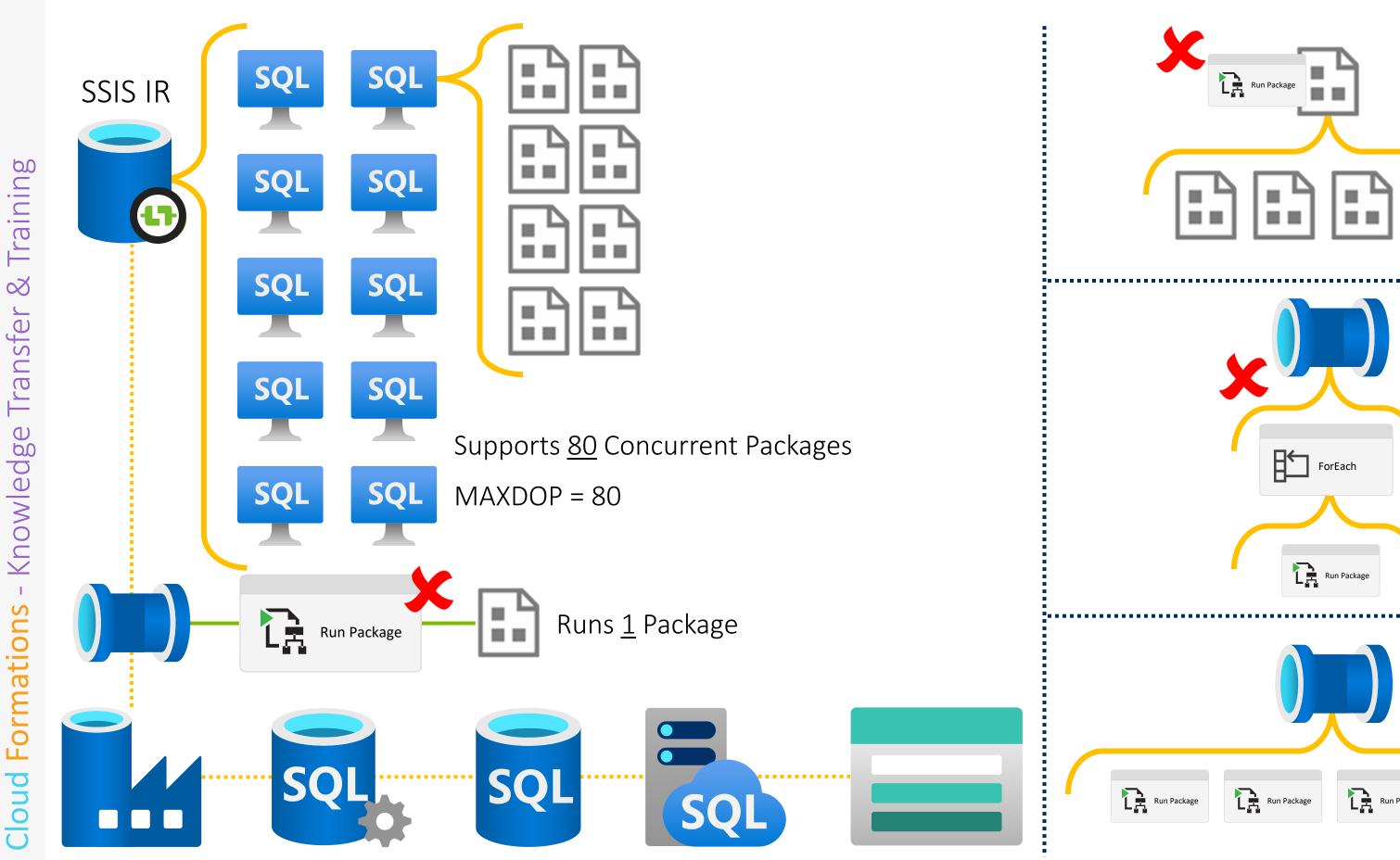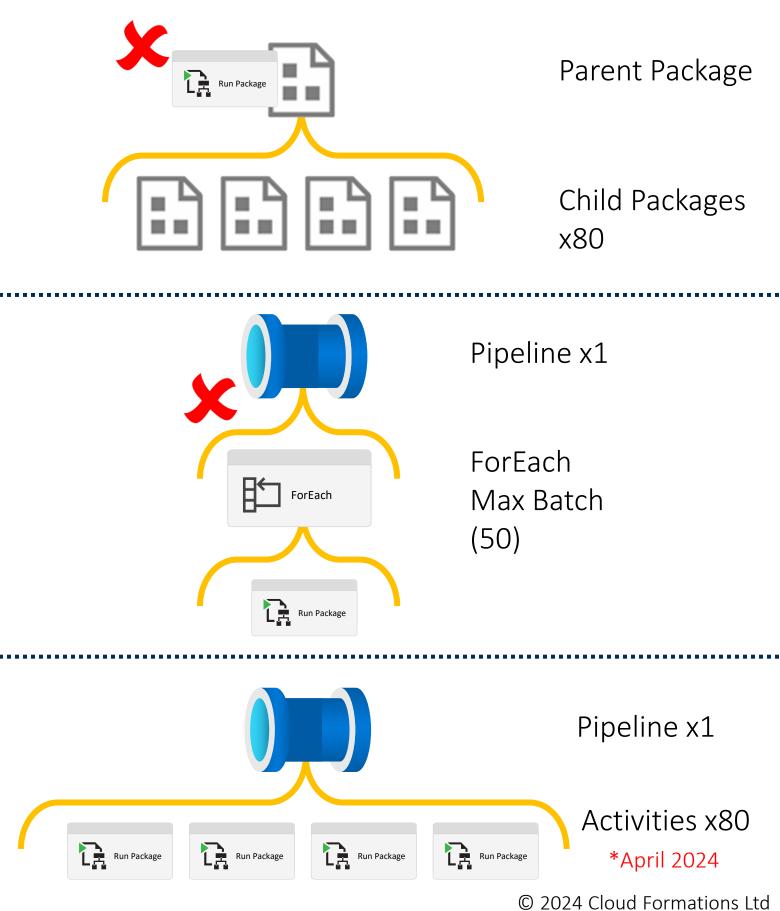
Problem: Using All Of The SSIS IR Compute

SSIS IR

Supports <u>80</u> Concurrent Packages

MAXDOP = 80

Run Package ❌

Runs <u>1</u> Package

Parent Package ❌

Child Packages x80

Pipeline x1

ForEach ❌

ForEach Max Batch (50)

Run Package

Pipeline x1

Activities x80

Run Package | Run Package | Run Package | Run Package

*April 2024
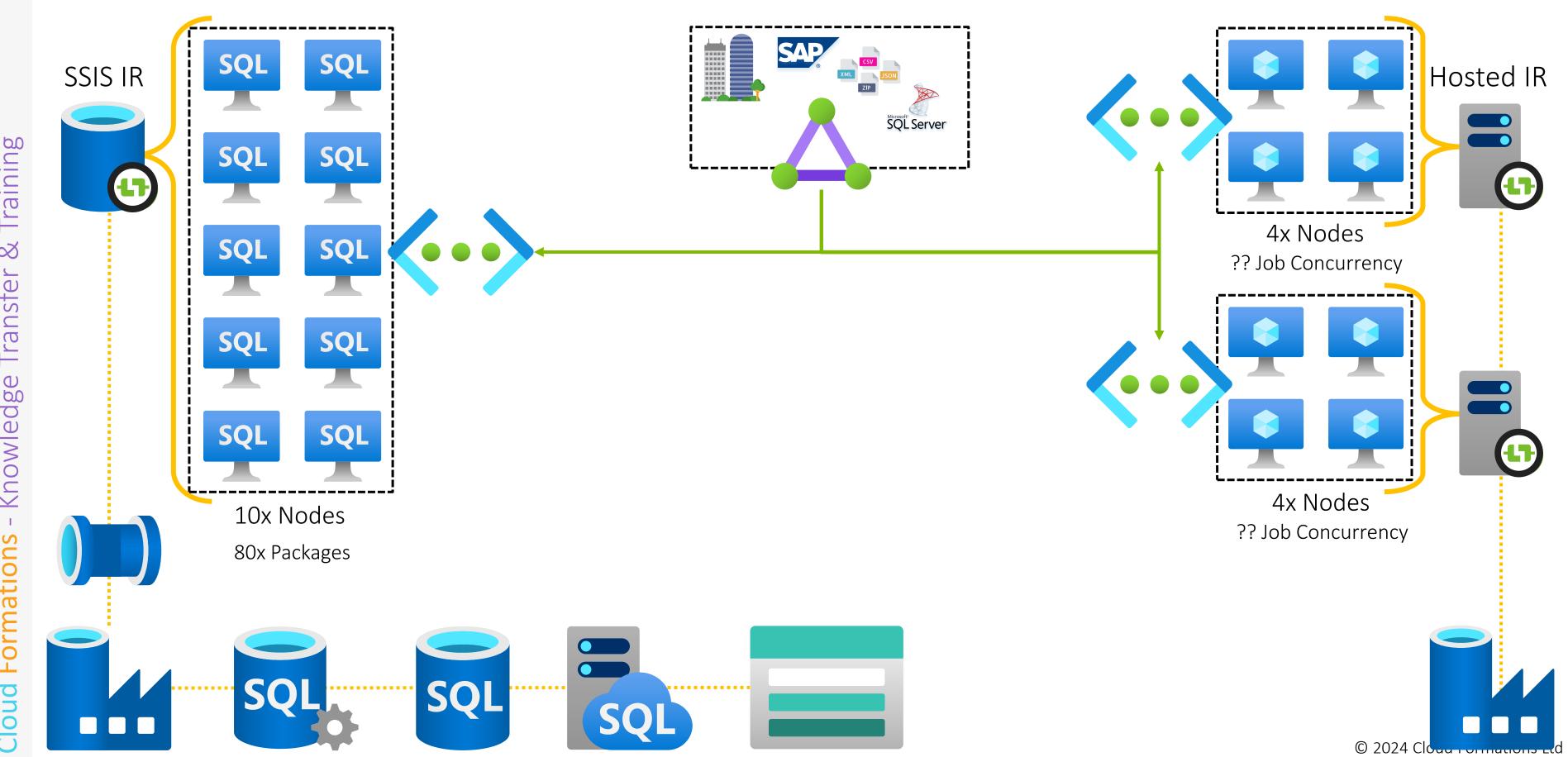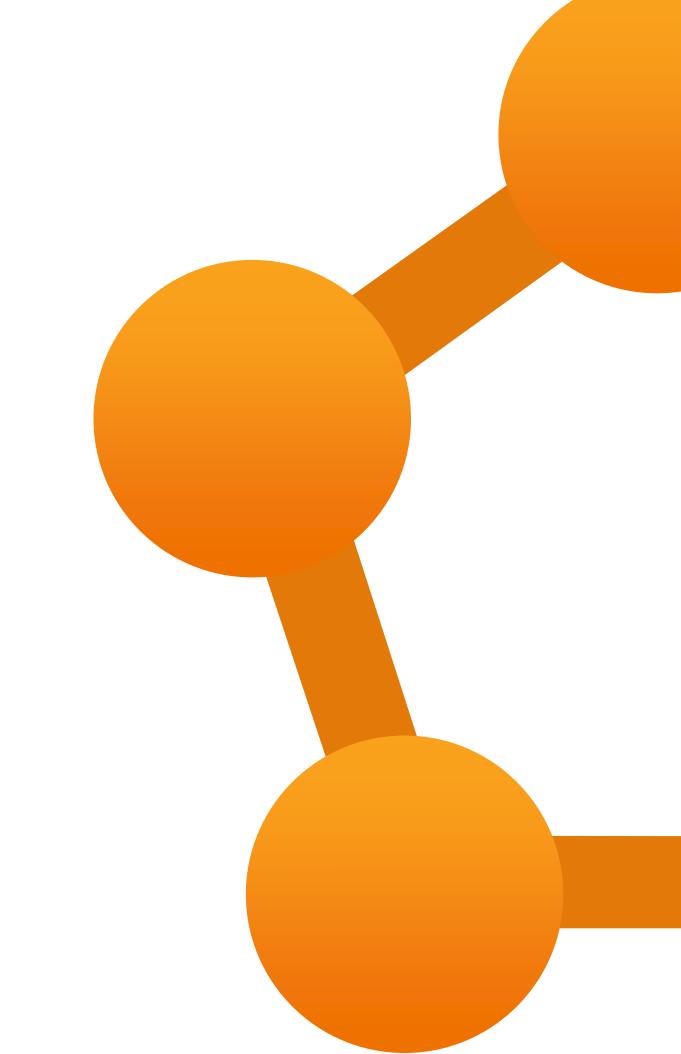
What are the advantages of using this pattern?

SSIS IR

10x Nodes
80x Packages

Hosted IR

4x Nodes
?? Job Concurrency

4x Nodes
?? Job Concurrency

Cloud Formations - Knowledge Transfer & Training

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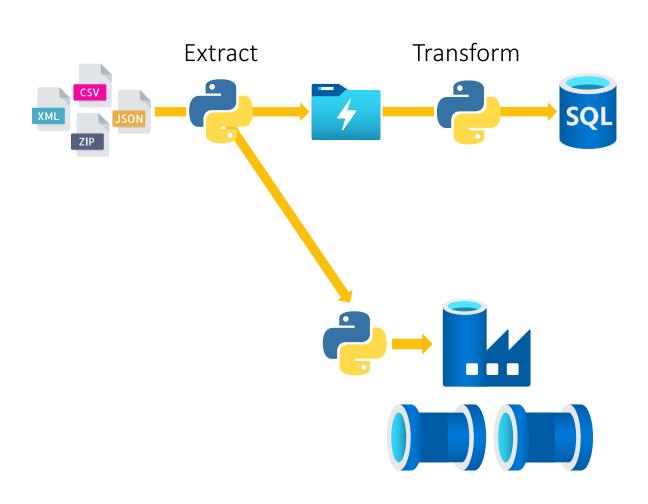
Module 2 –
Integration Runtimes & Gateways
Airflow

Cloud Formations

What is Apache Airflow?

Apache Airflow is an open-source platform designed for orchestrating complex workflows and data pipelines. Here are some key points about it:

Workflow Management: Airflow allows you to programmatically author, schedule, and monitor workflows. These workflows are defined as Directed Acyclic Graphs (DAGs) of tasks, where each task represents a unit of work.

Extensible and Dynamic: Written in Python, Airflow is highly extensible. You can create custom operators, sensors, and hooks to interact with various technologies and services.

Scalable: Airflow's architecture supports scaling from a single machine to a large distributed system, making it suitable for both small and large-scale workflows.

User Interface: It provides a robust web interface to manage and monitor workflows, view logs, and track the status of tasks.

Community and Open Source: As an open-source project, Airflow has a vibrant community that contributes to its development and provides support through various channels.
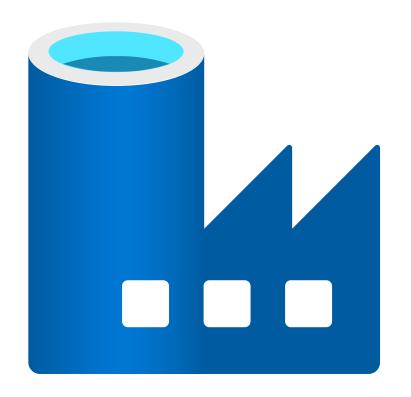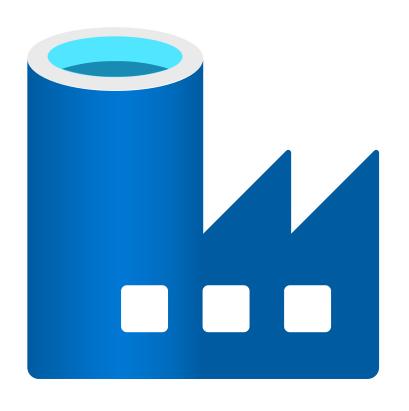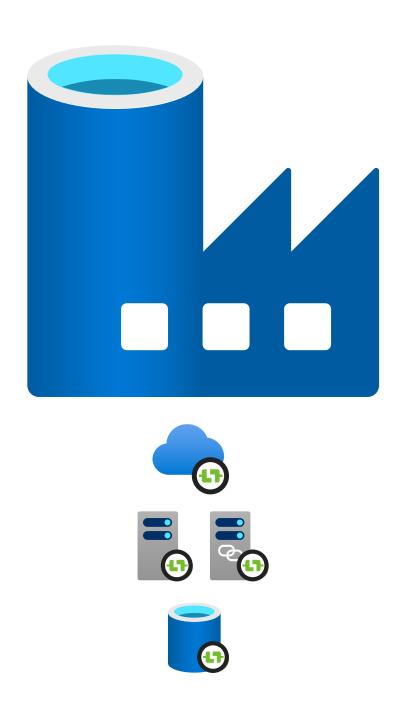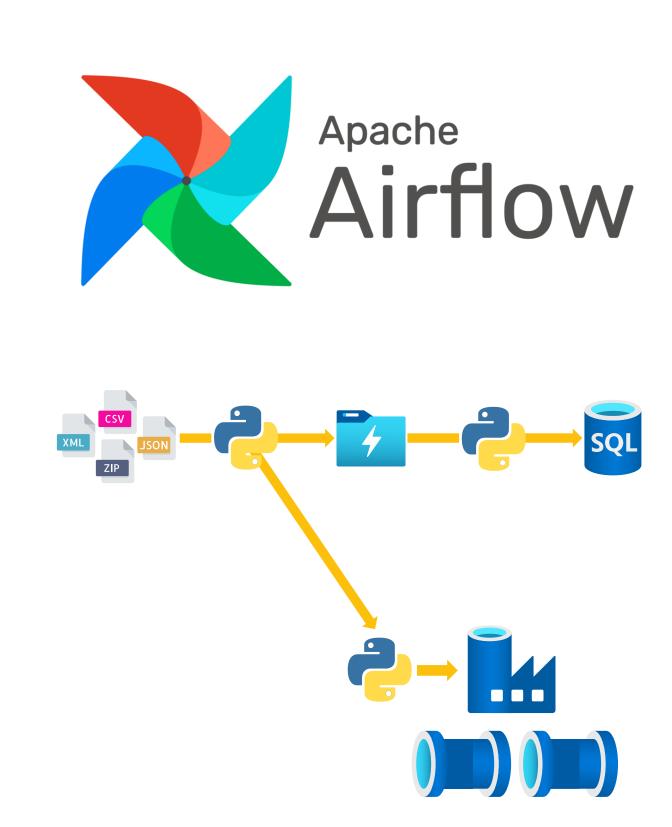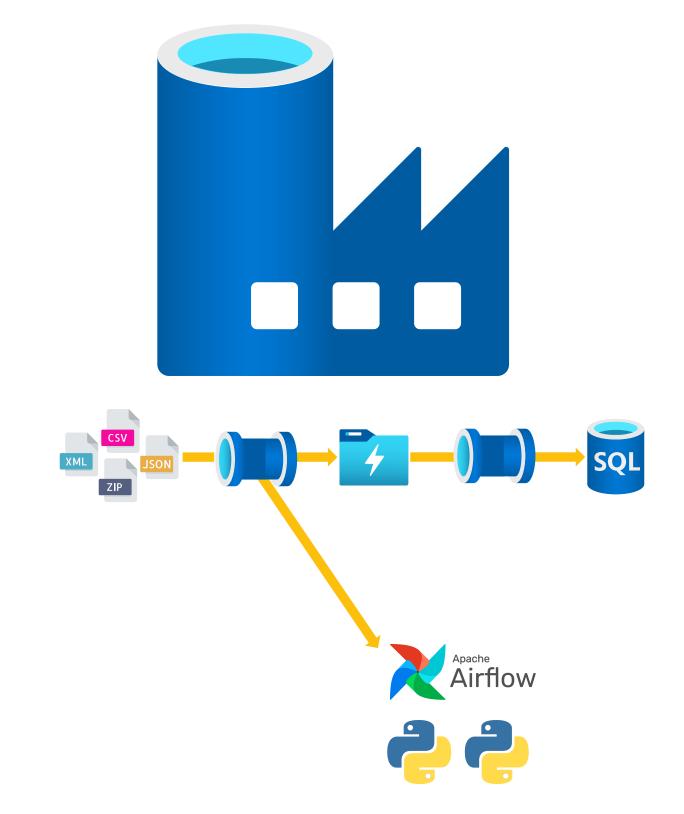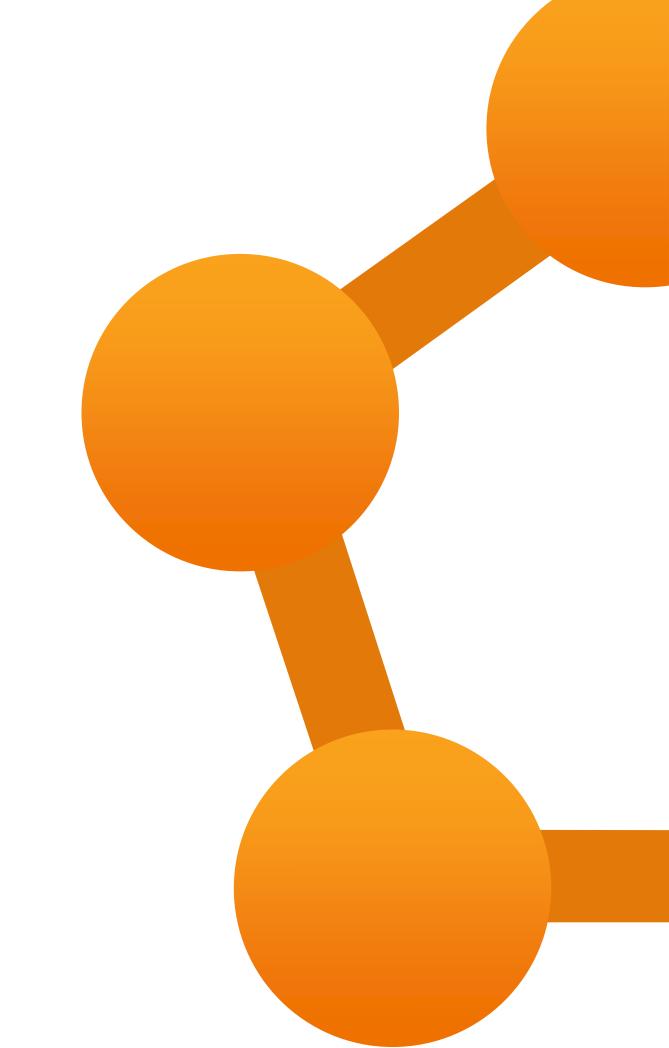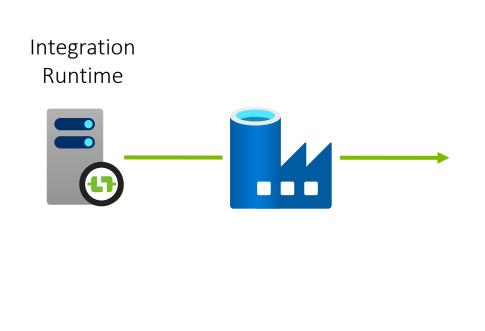
Module 2 –
Integration Runtimes & Gateways
Using Gateways vs IRs

Cloud Formations

Considering Other Products and Patterns
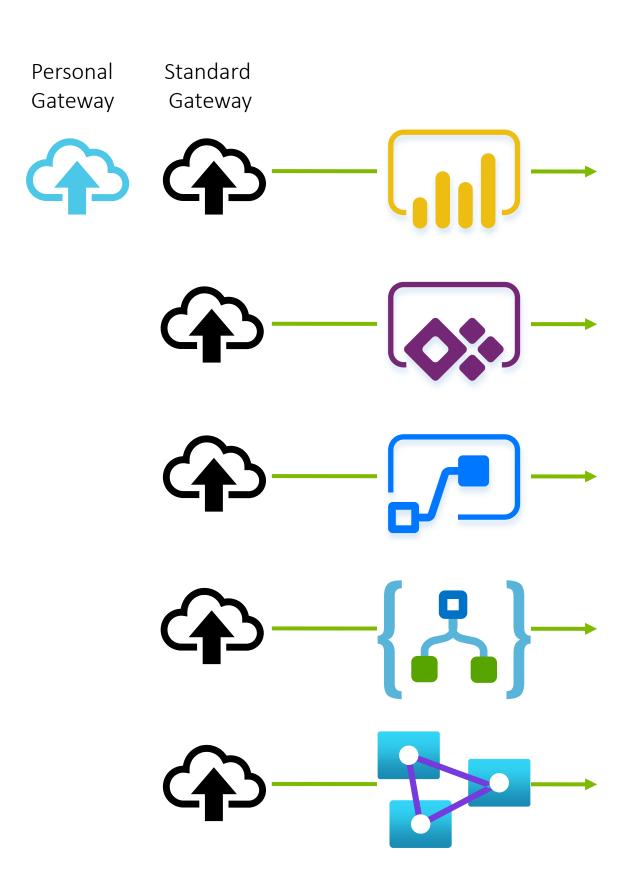
Integration
Runtime

Personal
Gateway

Standard
Gateway

Can only be used in isolation:
1 Windows Virtual Machine
1 Integration Runtime Client
1 Cloud Resource Registration

Can be used simultaneously.
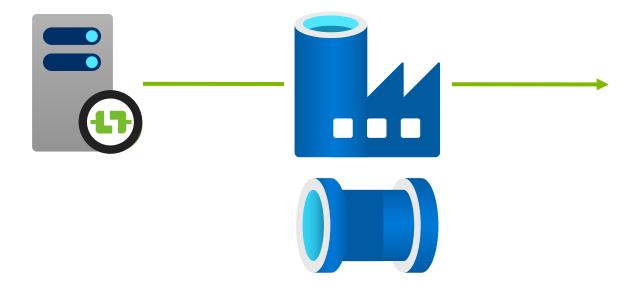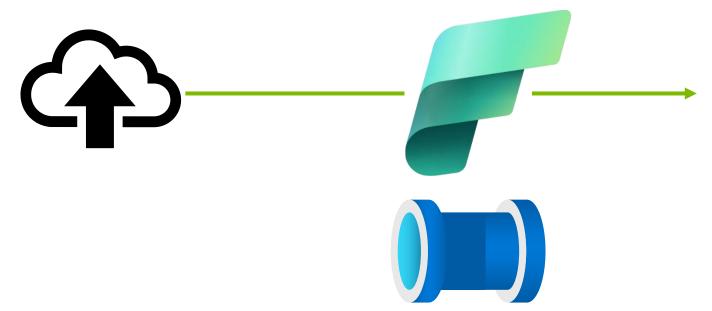
In Summary

Integration
Runtime

Integration
Runtime

Standard
Gateway

Module 2

Integration Runtimes & Gateways ✔

Any questions?

Cloud Formations