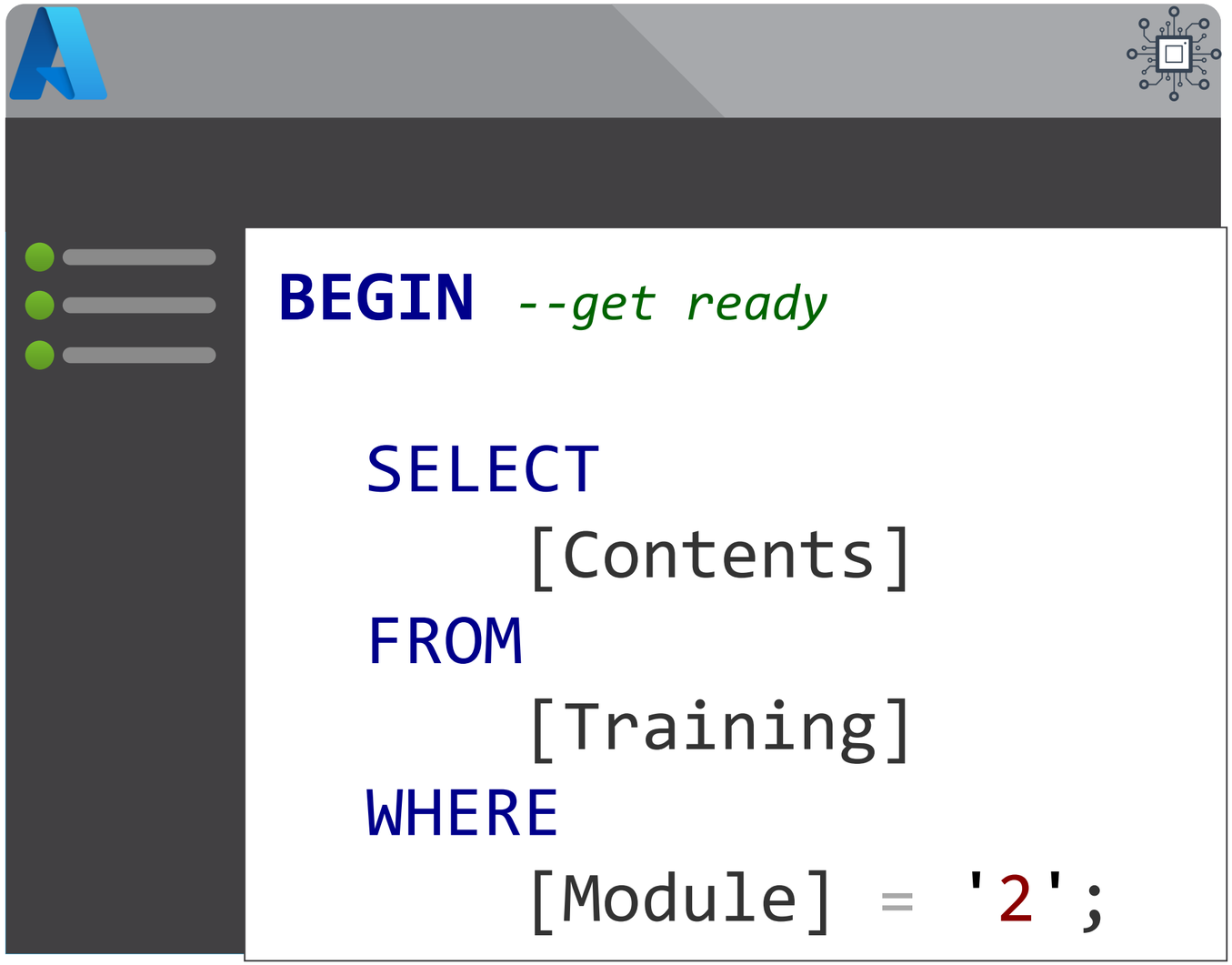
Module 2

Integration Runtime Design Patterns



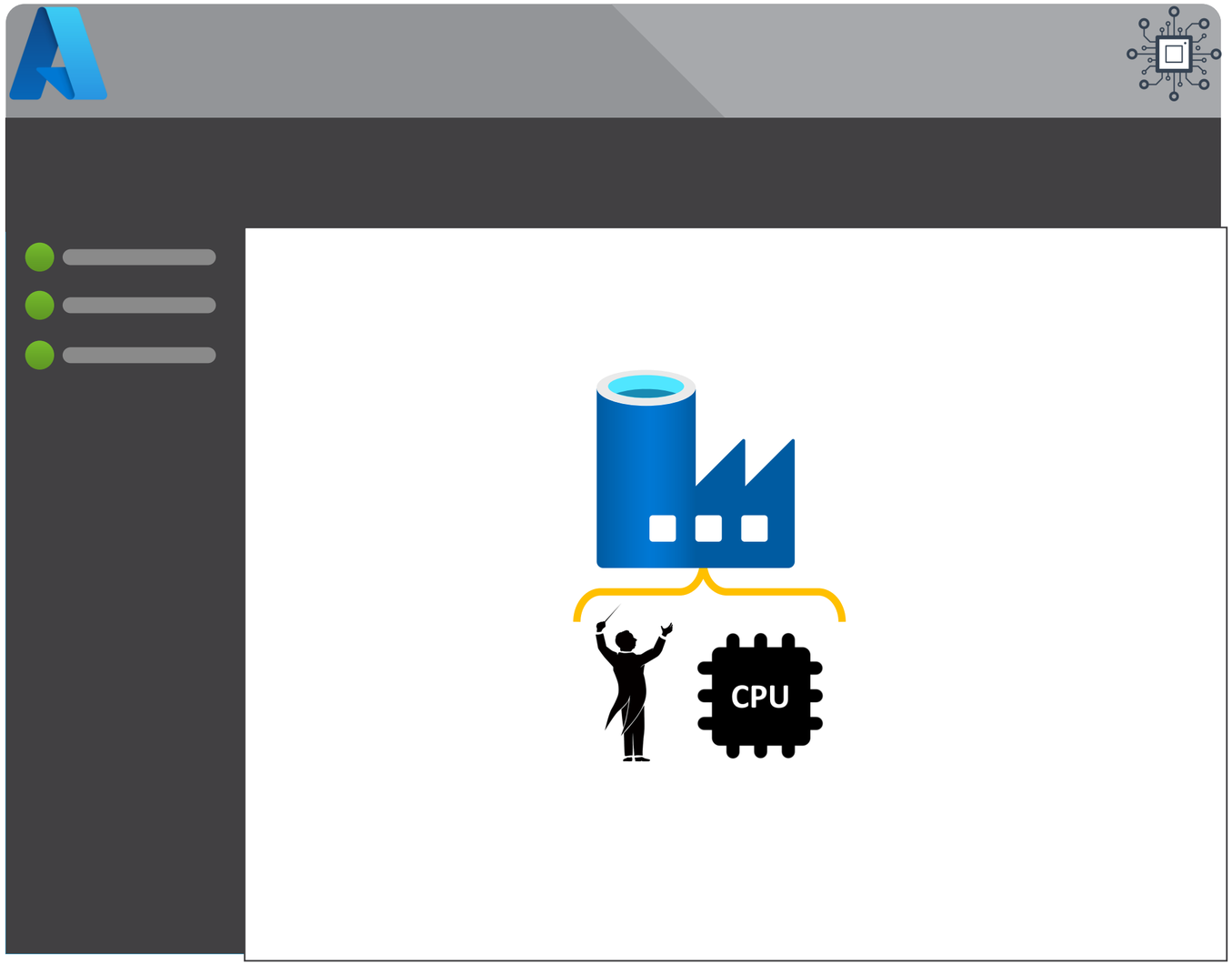
```
BEGIN --get ready

    SELECT
        [Contents]
    FROM
        [Training]
    WHERE
        [Module] = '2';
```

- Compute Types
  - Azure
  - Hosted
  - SSIS
- Patterns & Configuration

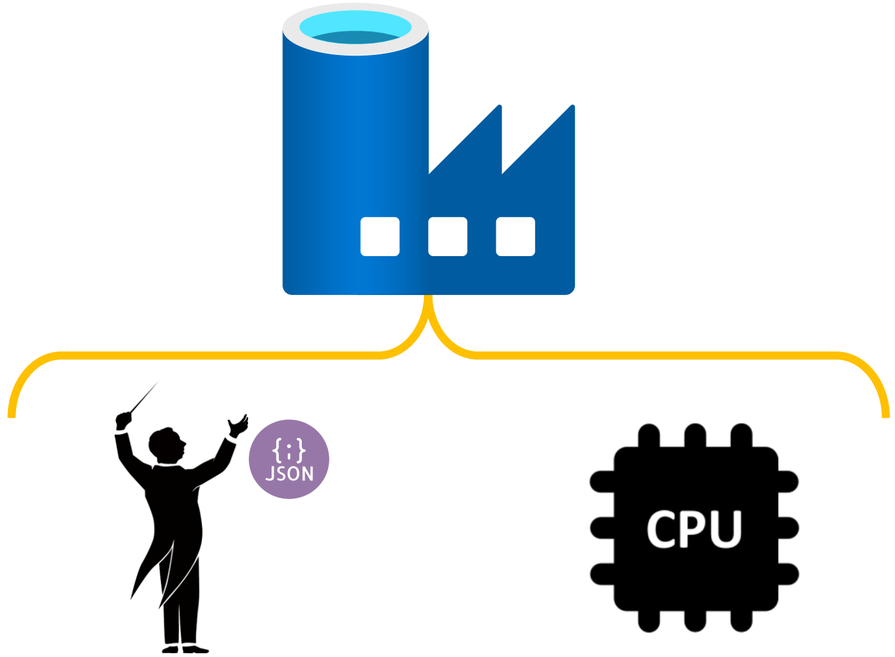
Module 2

Integration Runtime Design Patterns



- Compute Types
  - Azure
  - Hosted
  - SSIS
- Patterns & Configuration

What is an Integration Runtime?

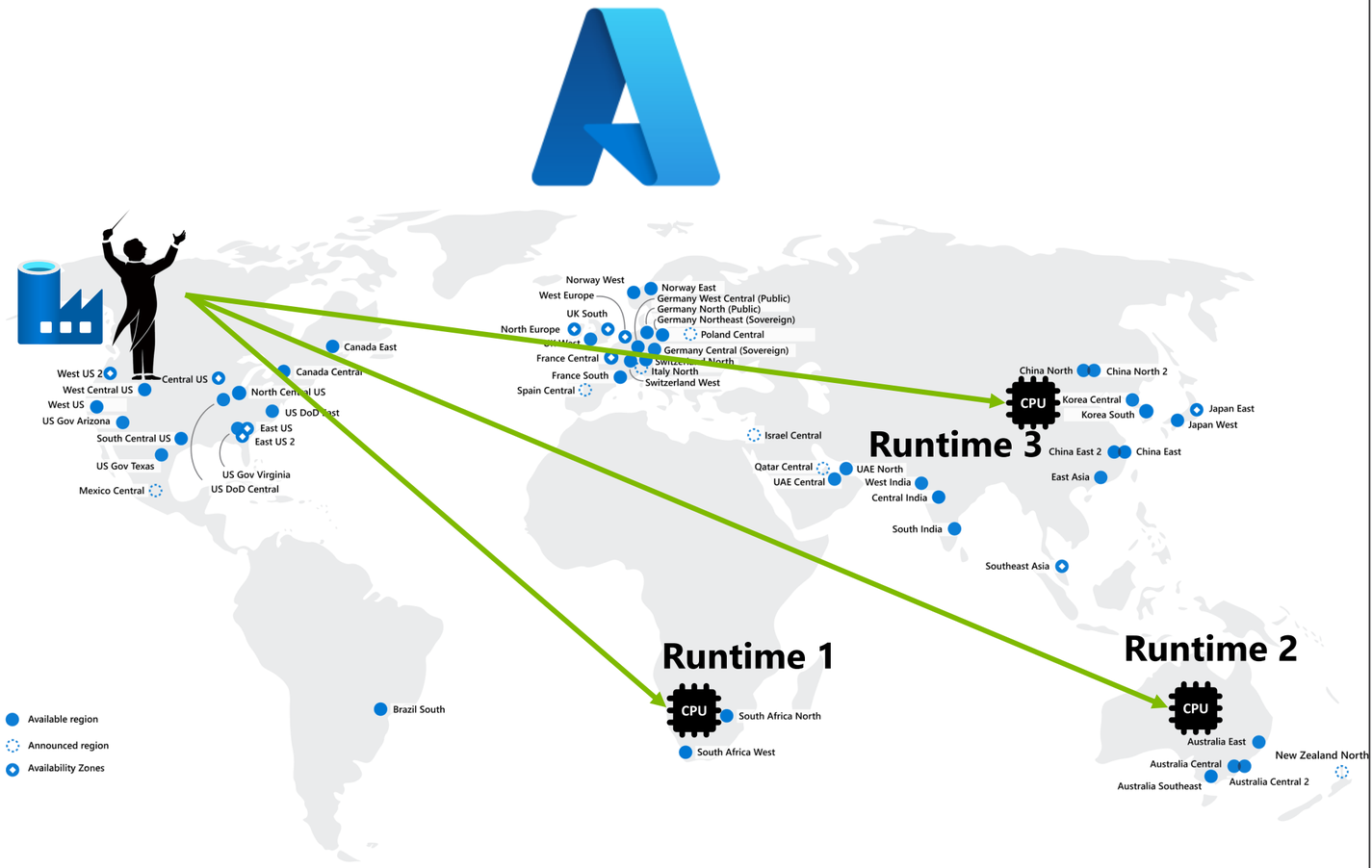


Orchestrator

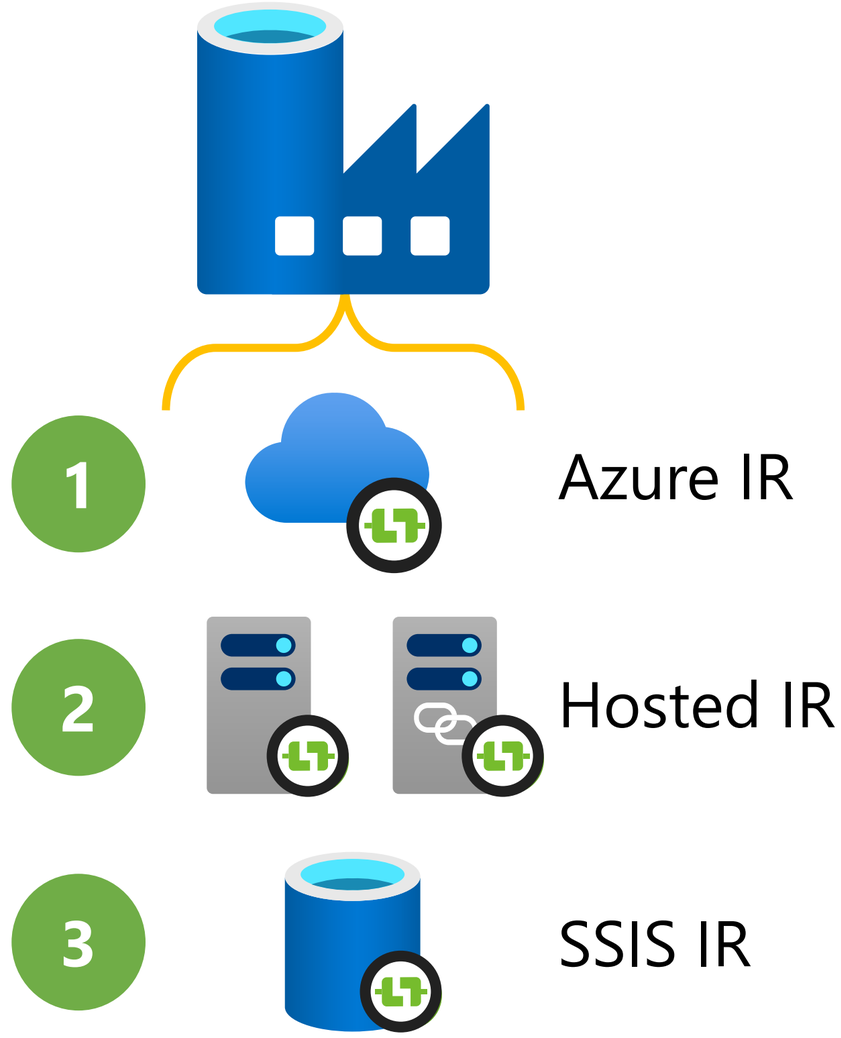
Runtime

Fixed Region

Flexible Location

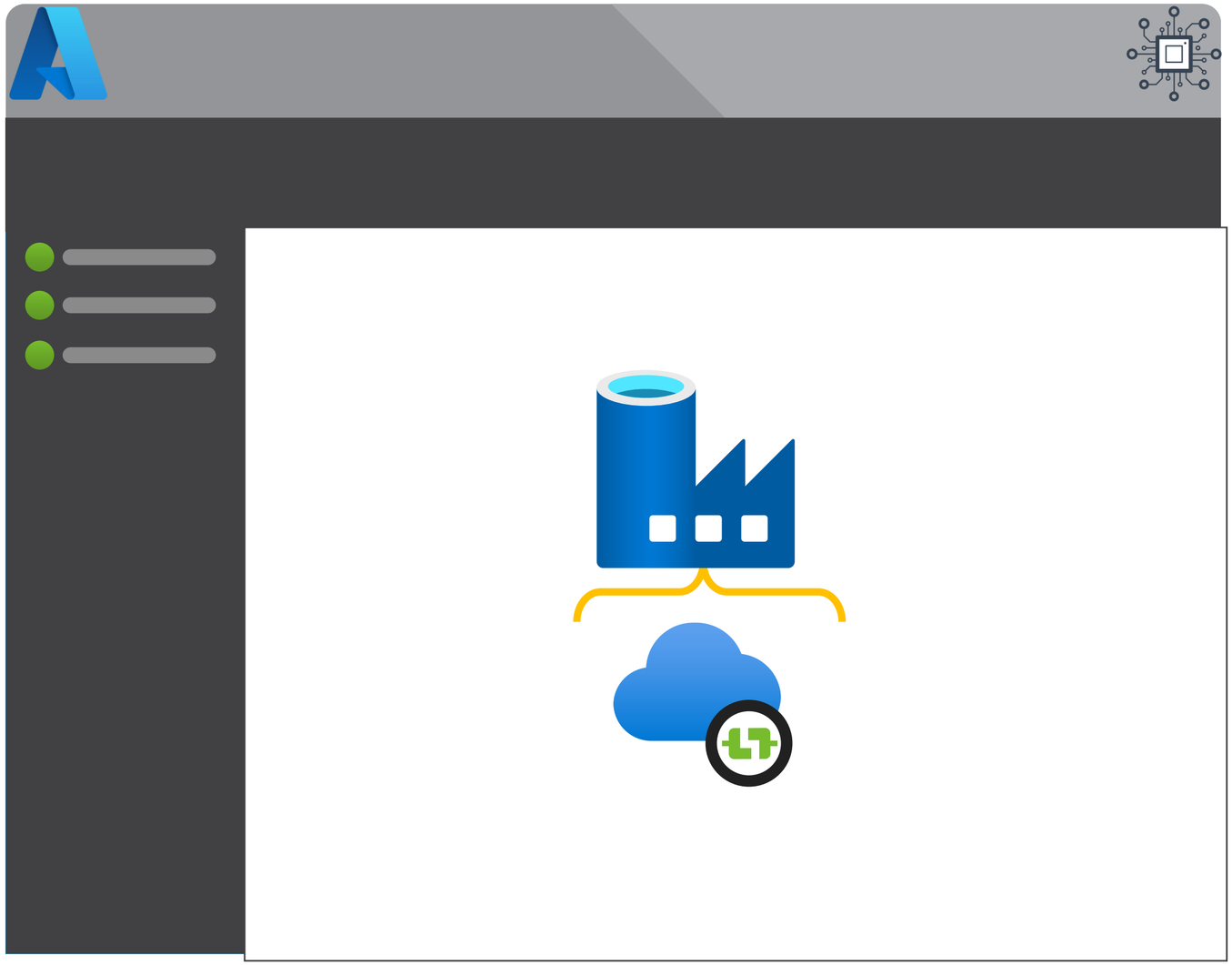


What can an Integration Runtime do?



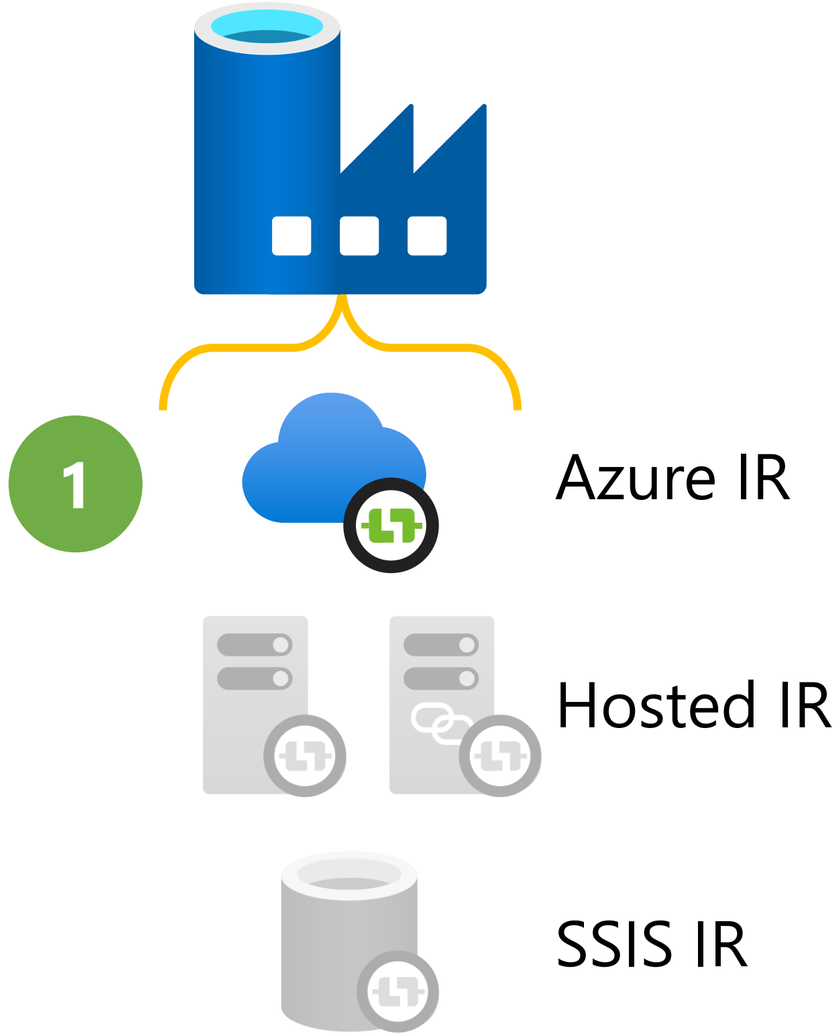
Module 2

Integration Runtime Design Patterns

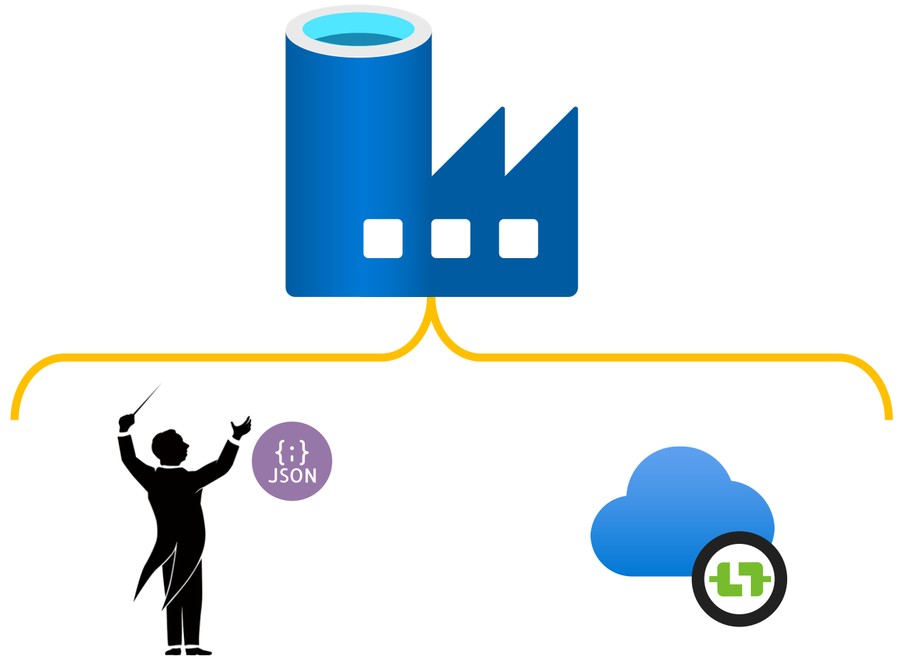


- Compute Types
  - Azure
  - Hosted
  - SSIS
- Patterns & Configuration

What can an Integration Runtime do?



What is an Integration Runtime?



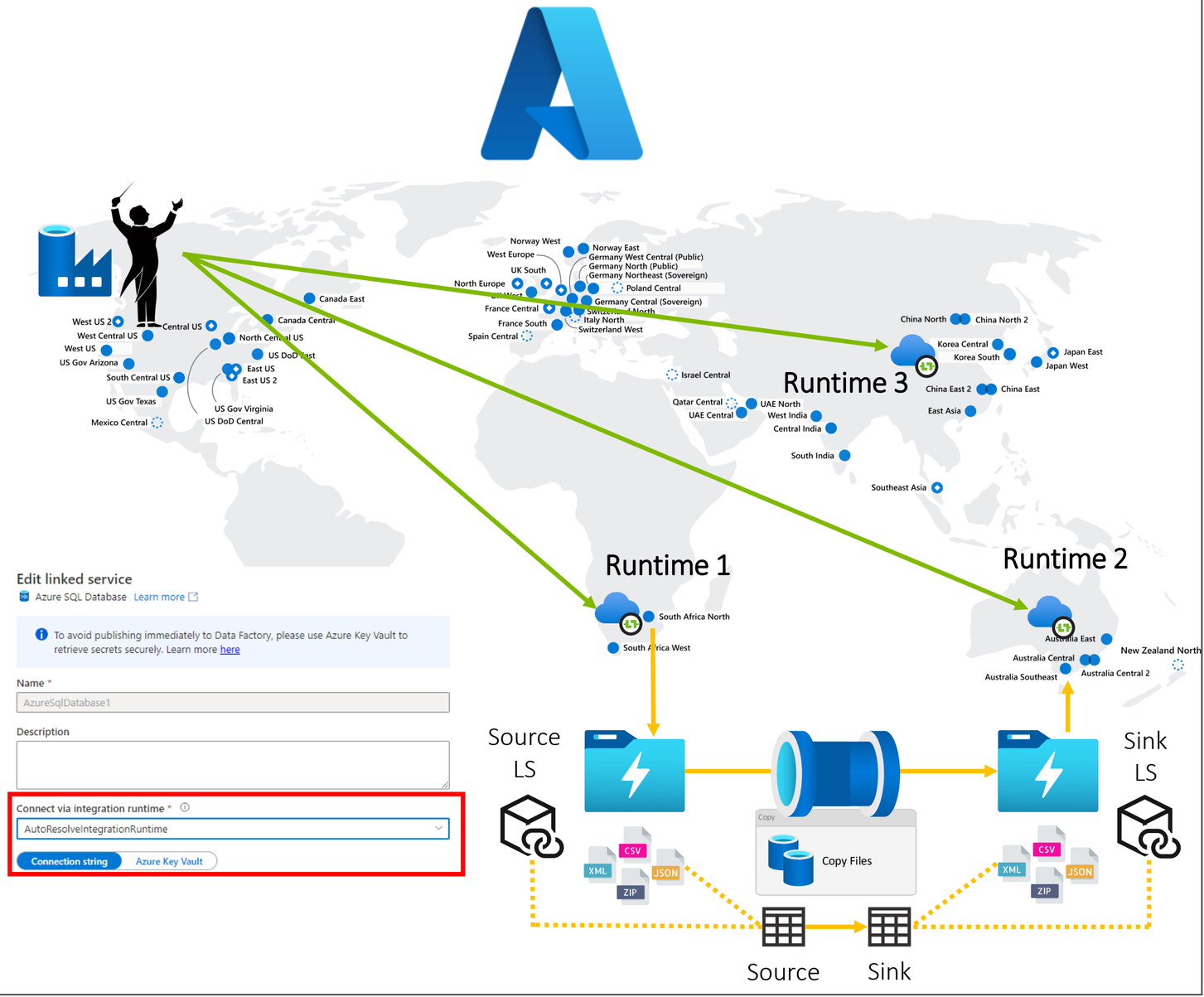
Orchestrator

Fixed Region

Runtime

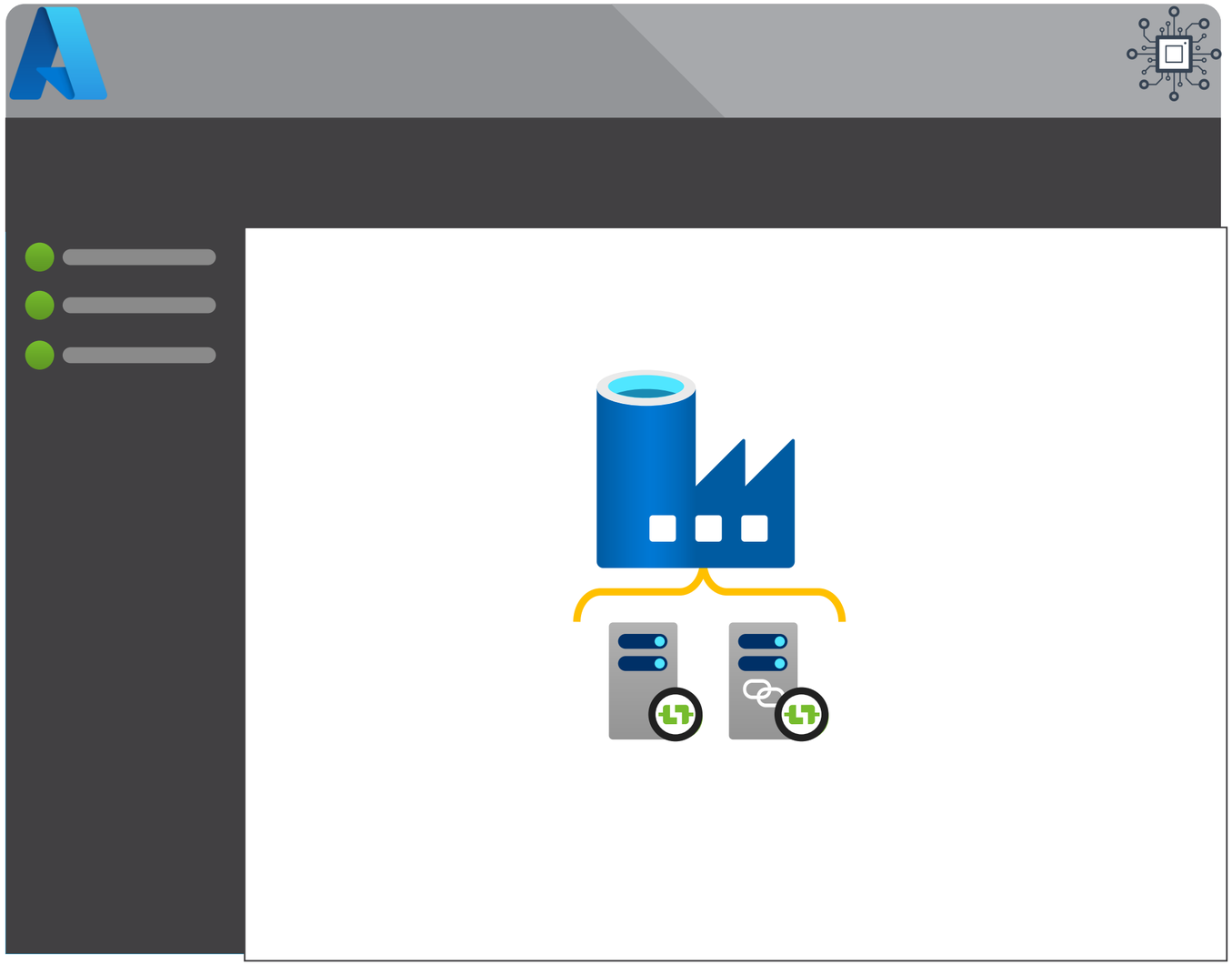
Flexible Location

AutoResolveIntegrationRuntime



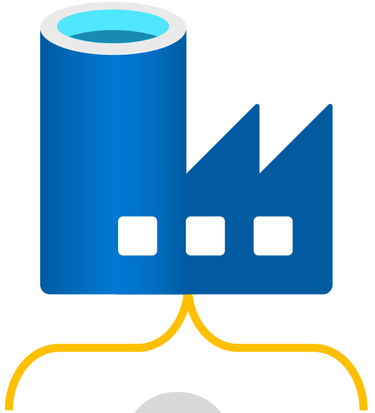
Module 2

Integration Runtime Design Patterns



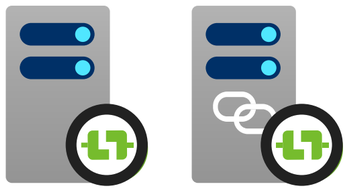
- Compute Types
  - Azure
  - Hosted
  - SSIS
- Patterns & Configuration

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

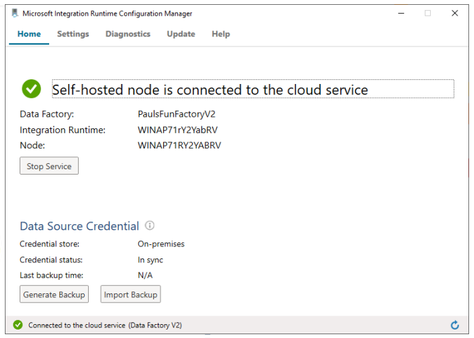
Settings | Nodes | Auto update | Sharing | Links

View Service URLs

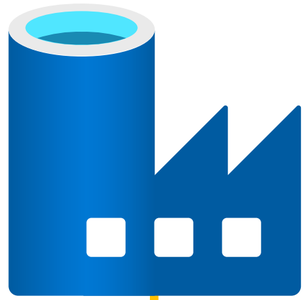
Name	Status	IP address	Limit concurrent jobs	Actions
WINAP71RY2YAB...	Running	Get IP address	112	

Data Sources

Windows OS
8GB RAM
4 CPU Cores
80GB Storage



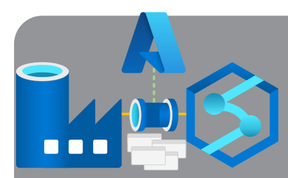
Runtime
Self Hosted

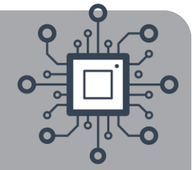


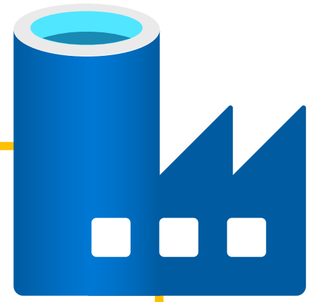
Orchestrator
Fixed Region

Runtime
Flexible Region

Hosted Integration Runtime



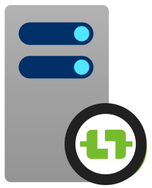




SAP

CSV XML JSON ZIP

Microsoft SQL Server



Runtime

Self Hosted

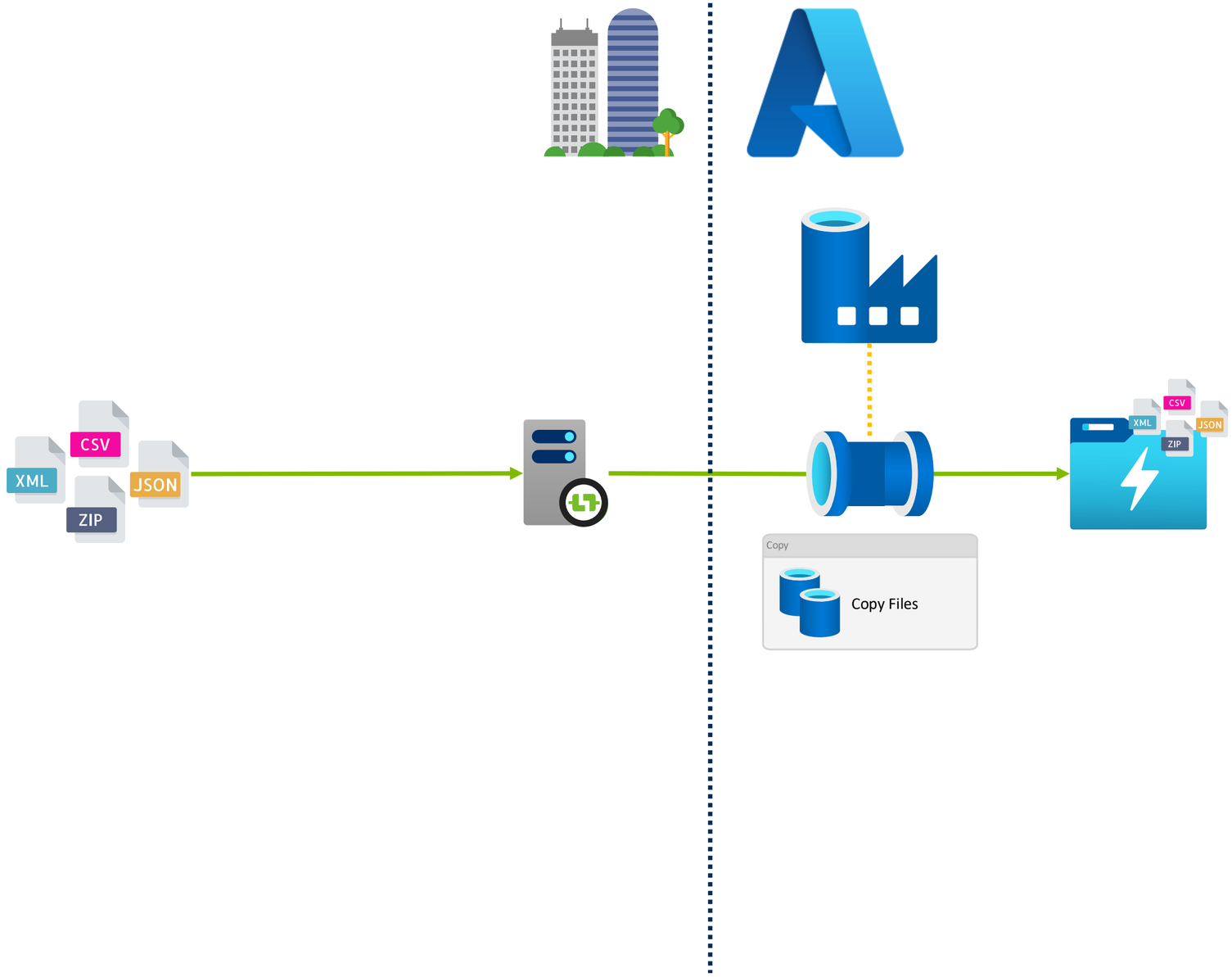
Orchestrator

Fixed Region

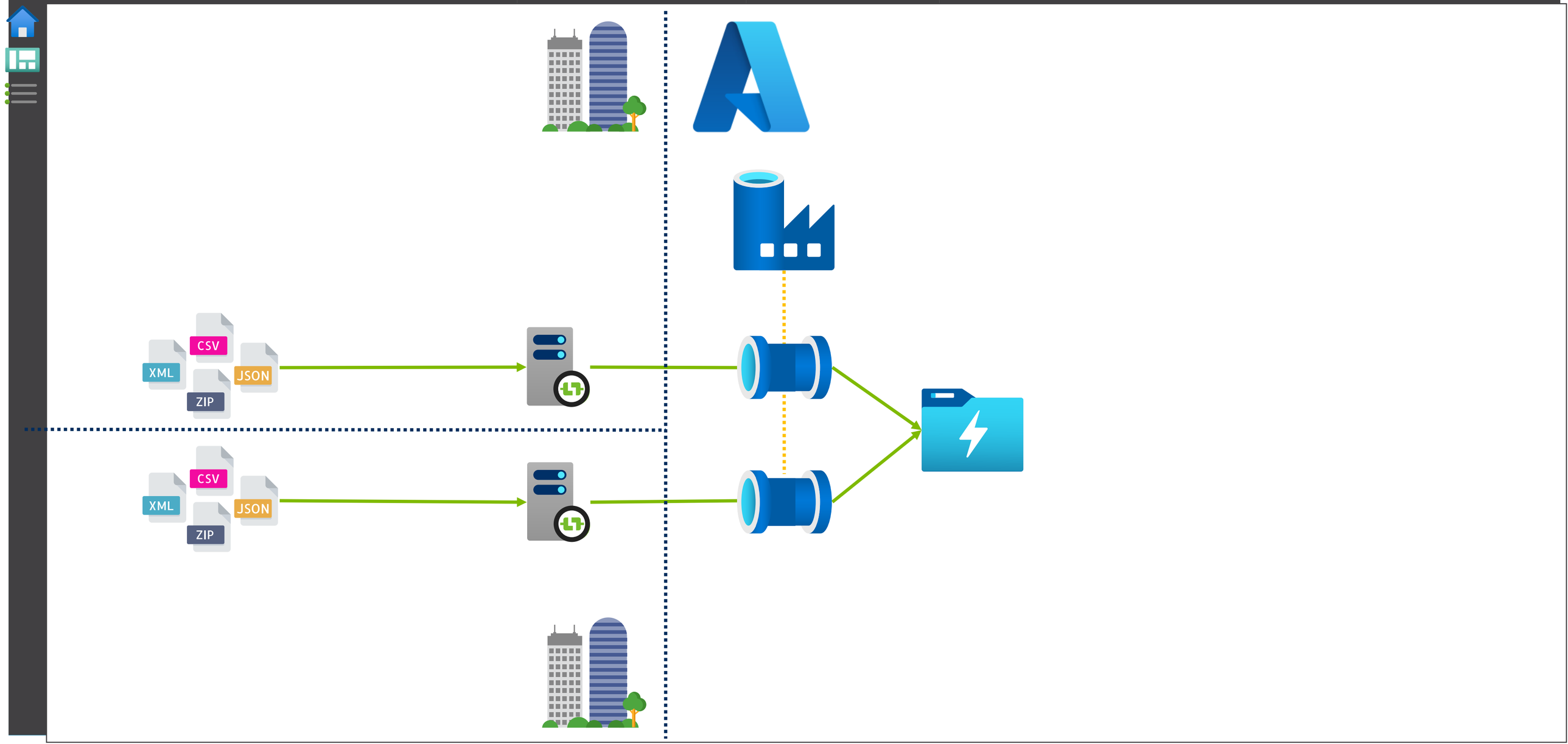
Runtime

Flexible Region

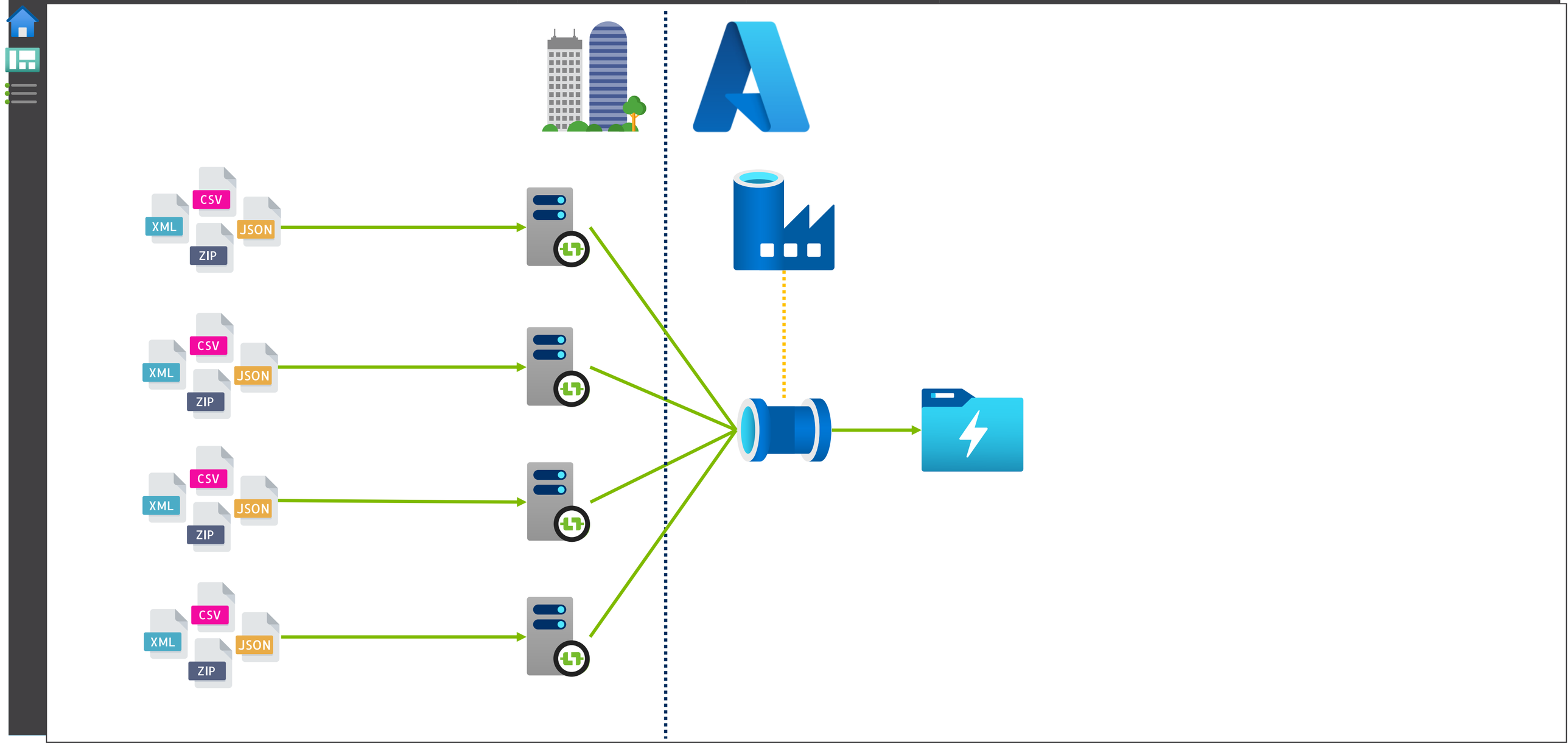
Single Hosted IR



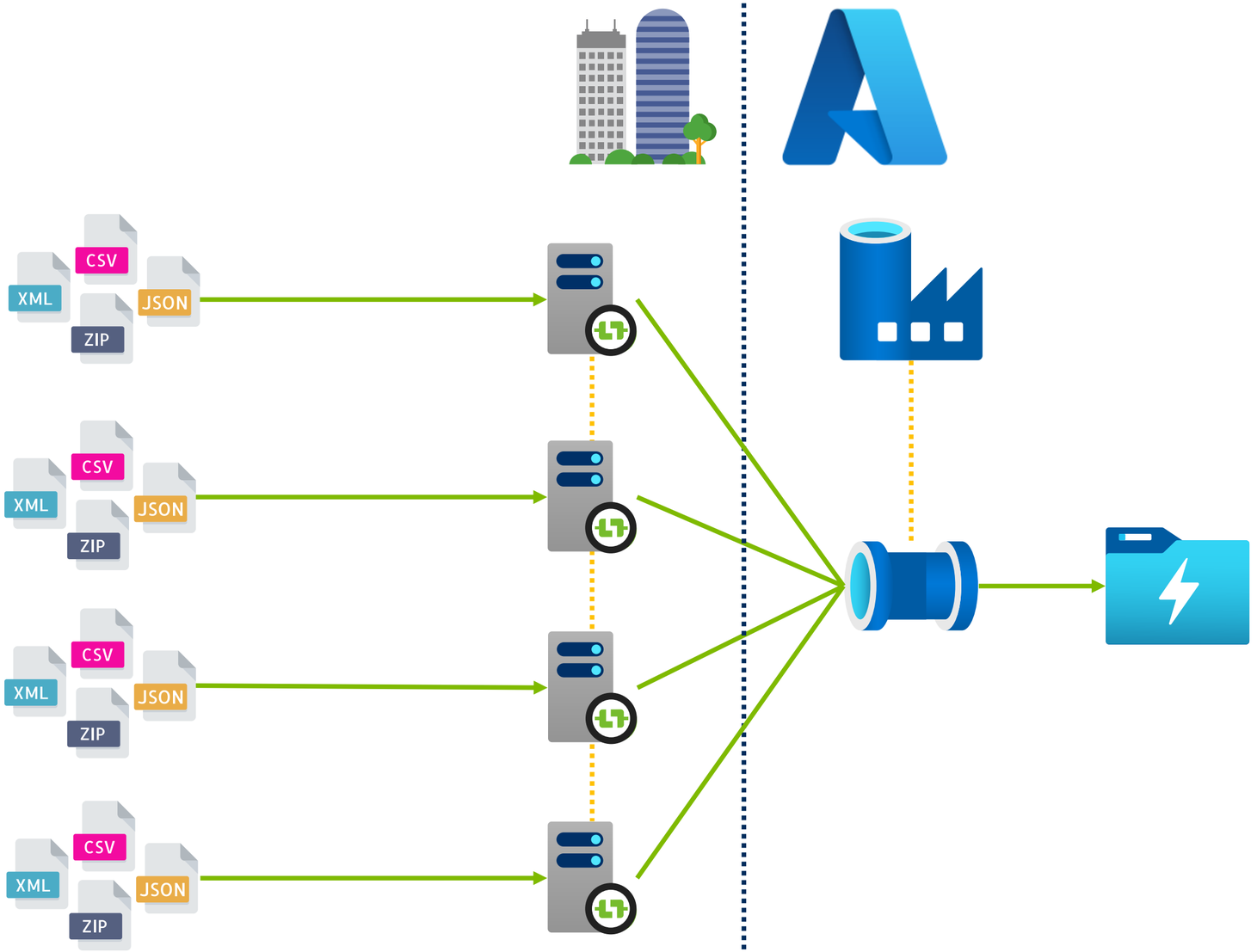
Multiple Hosted IR's at Different Sites



Multiple Hosted IR's as Separate Endpoints

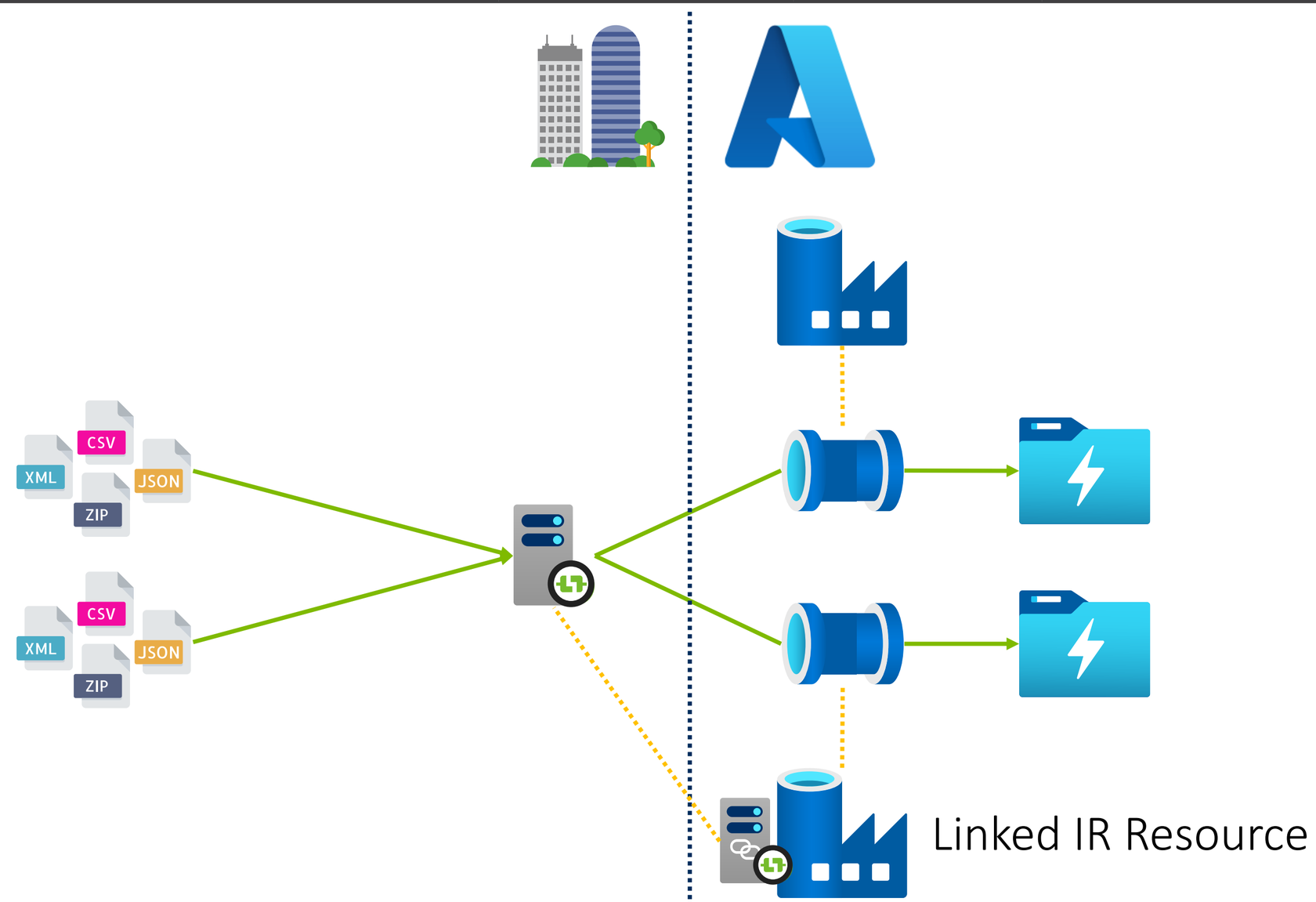


Single Hosted IR with Multiple Nodes

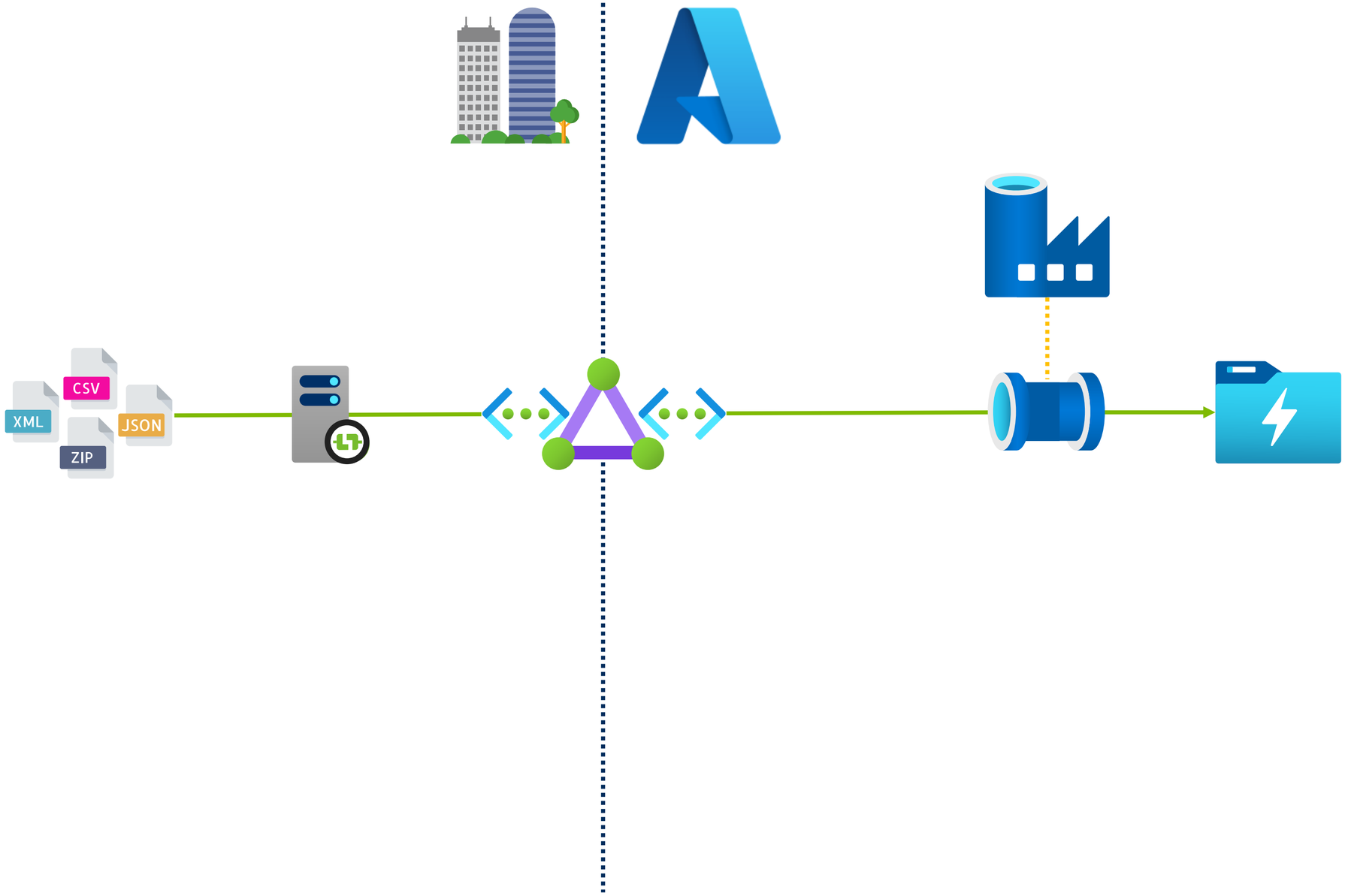


* Max of 4 Nodes per IR Endpoint

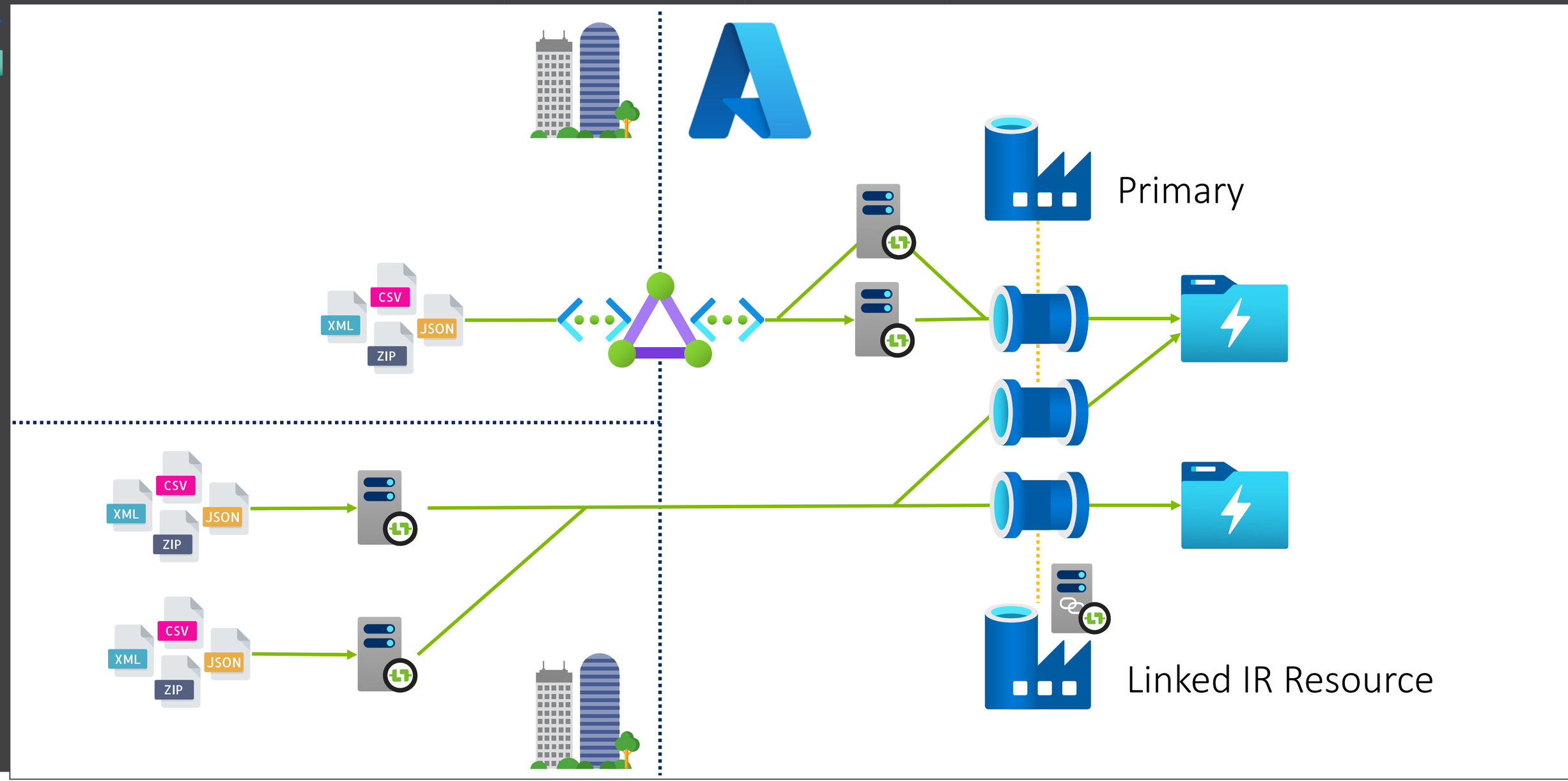
Single Hosted IR Linked to Multiple Data Factories



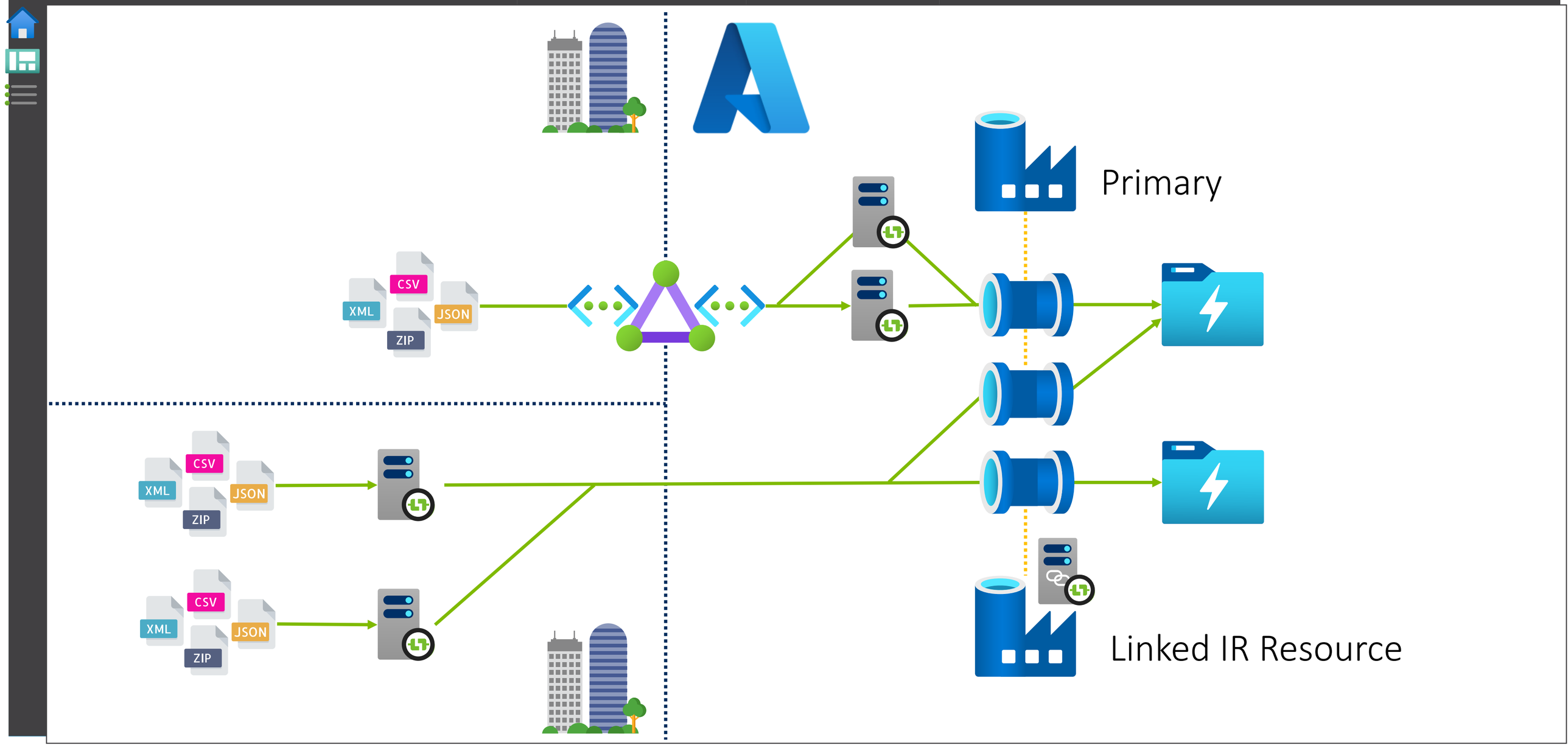
Hosted IR's with Express Route Connections



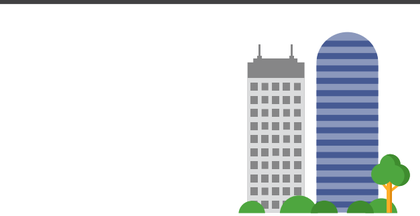
Hosted IR Combinations



Horizontal vs Vertical Environment Processing



Hosted IR's vs Environments



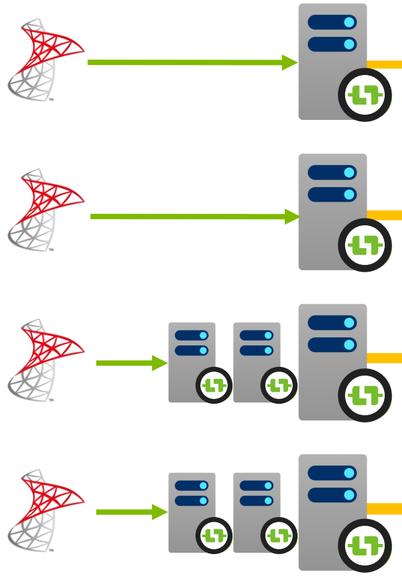
Dev

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

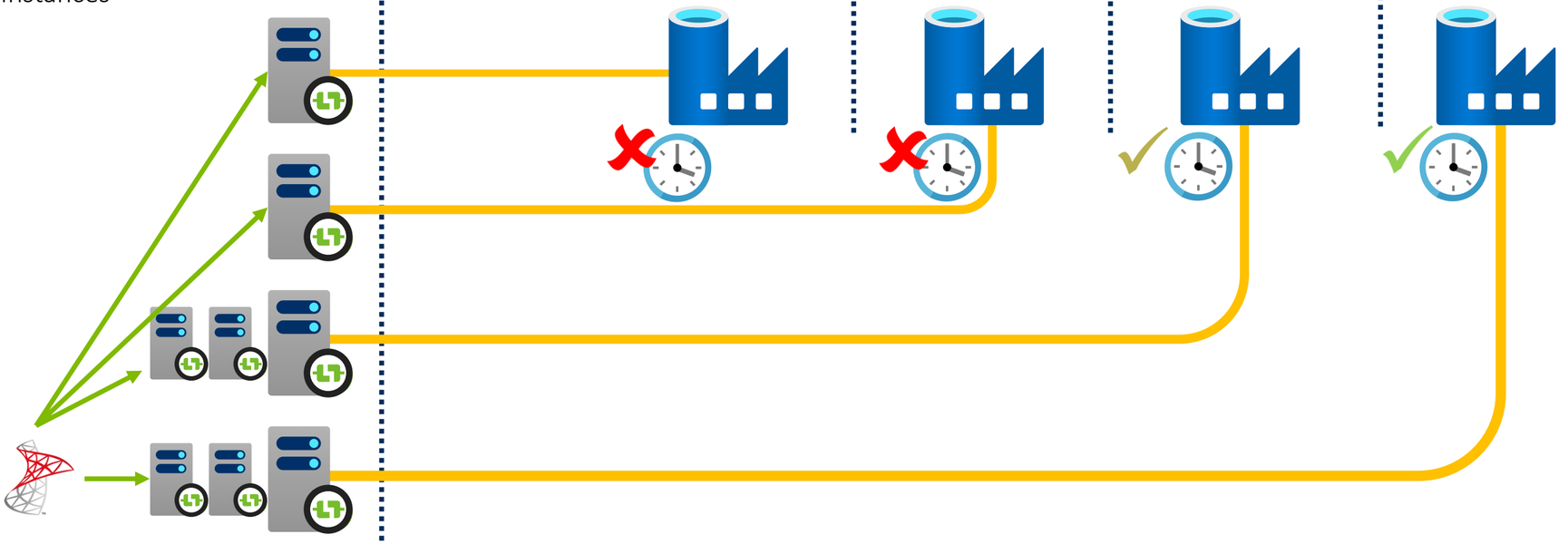
Dev

Test

PreProd

Prod

SQL Server Instances



25x Sites
4x Environments

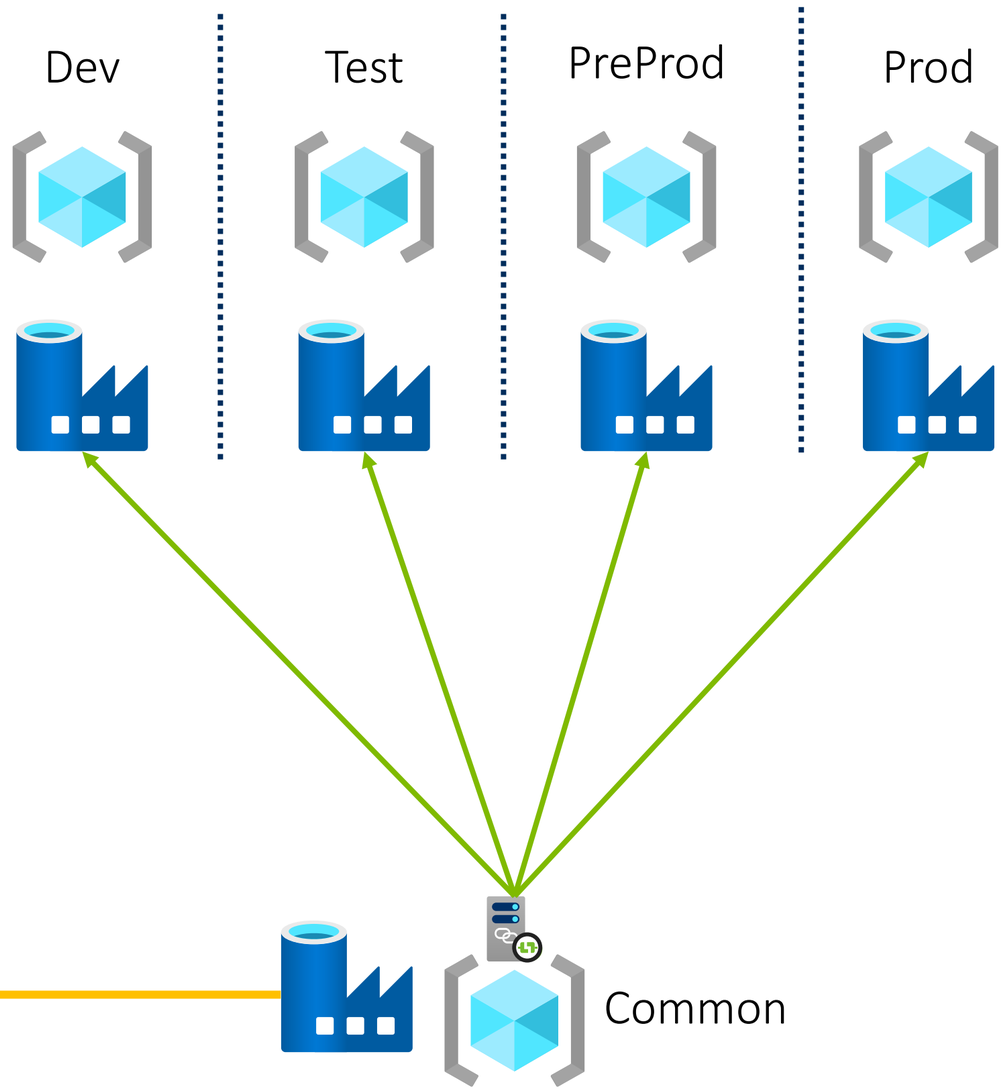
2x IR's for Dev
1x Linked IR for Test (from Dev)

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

8x Virtual Machines per Site
200x Virtual Machines Total

Hosted IR's vs Environments

SQL Server Instances



25x Sites
4x Environments

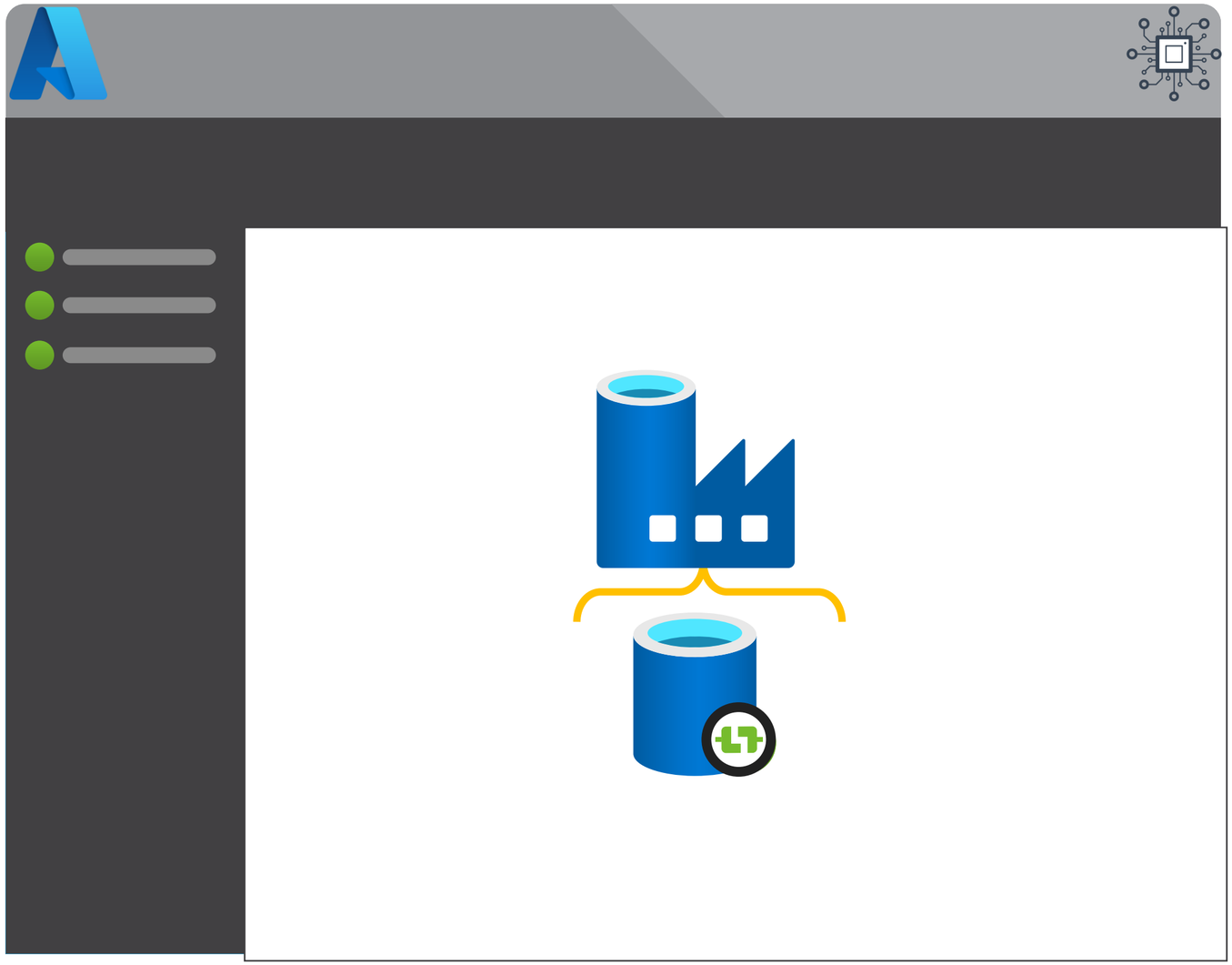
2x IR's for Dev
1x Linked IR for Test (from Dev)

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

8x Virtual Machines per Site
200x Virtual Machines Total

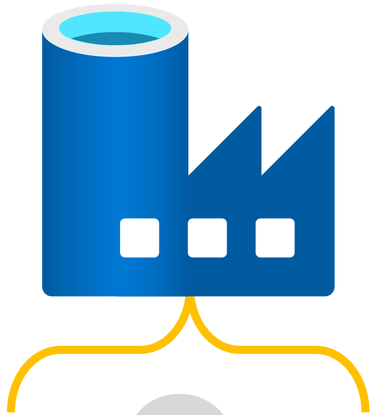
Module 2

Integration Runtime Design Patterns

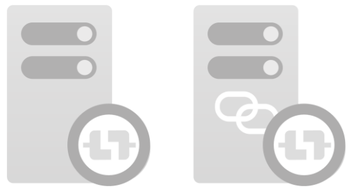


- Compute Types
  - Azure
  - Hosted
  - SSIS
- Patterns & Configuration

What can an Integration Runtime do?



Azure IR



Hosted IR

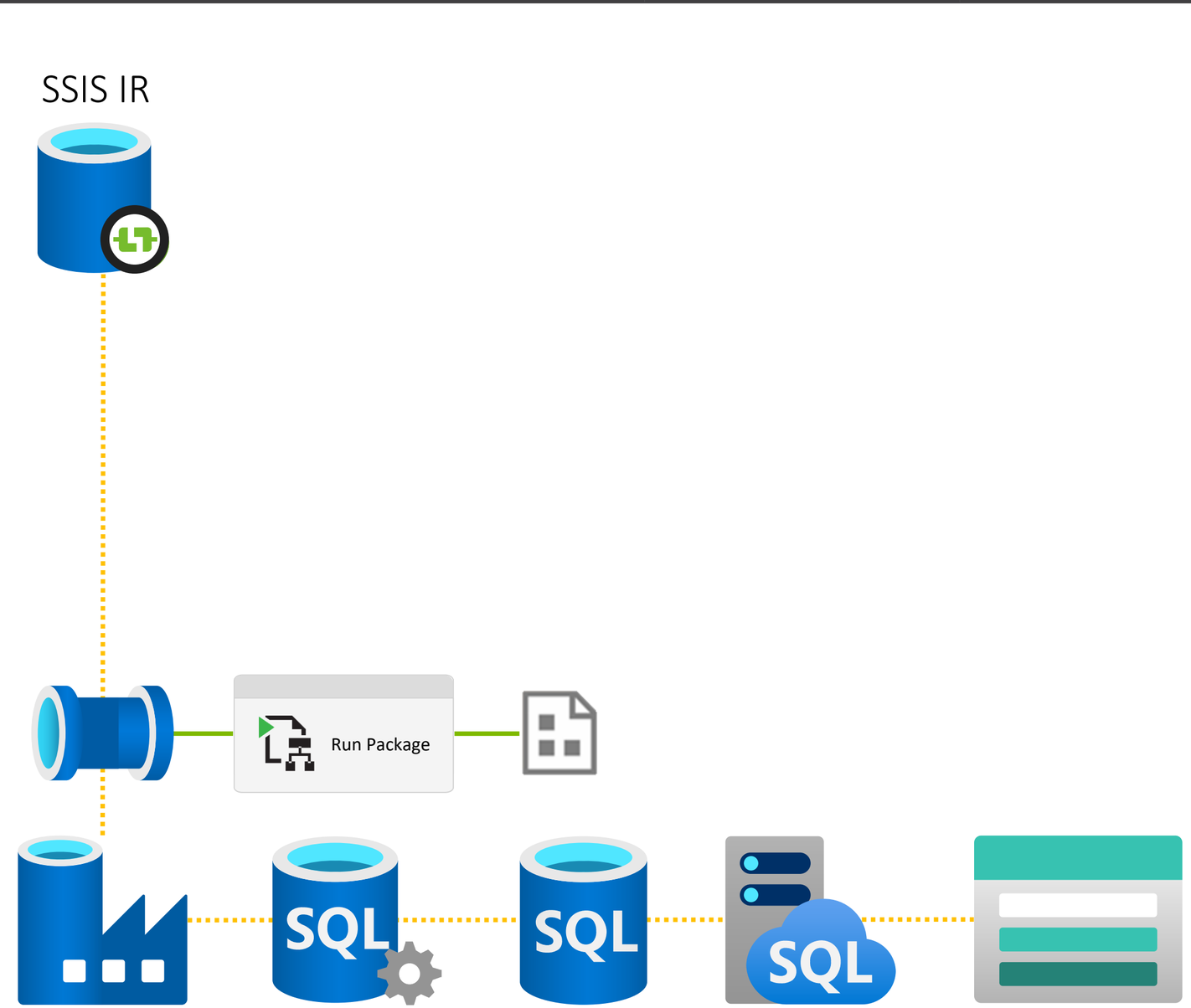
3

SSIS IR

Running an SSIS Package in Azure

SSIS IR

Running an SSIS Package in Azure

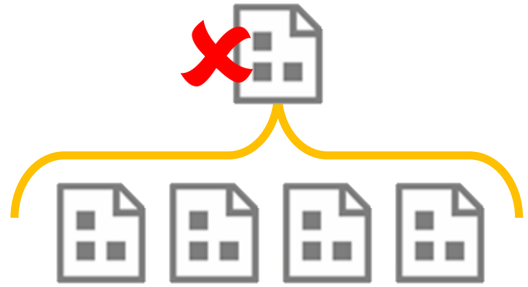


Problem: Using All Of The SSIS IR Compute

Supports 80 Concurrent Packages

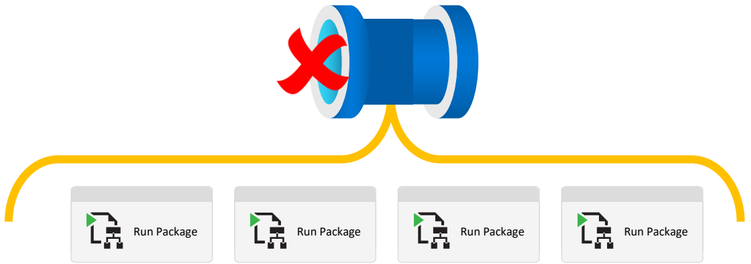
MAXDOP = 80

Runs 1 Package



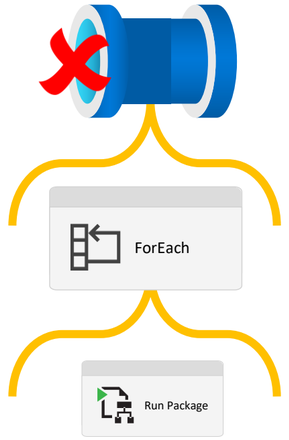
Parent Package

Child Packages x80



Pipeline x1

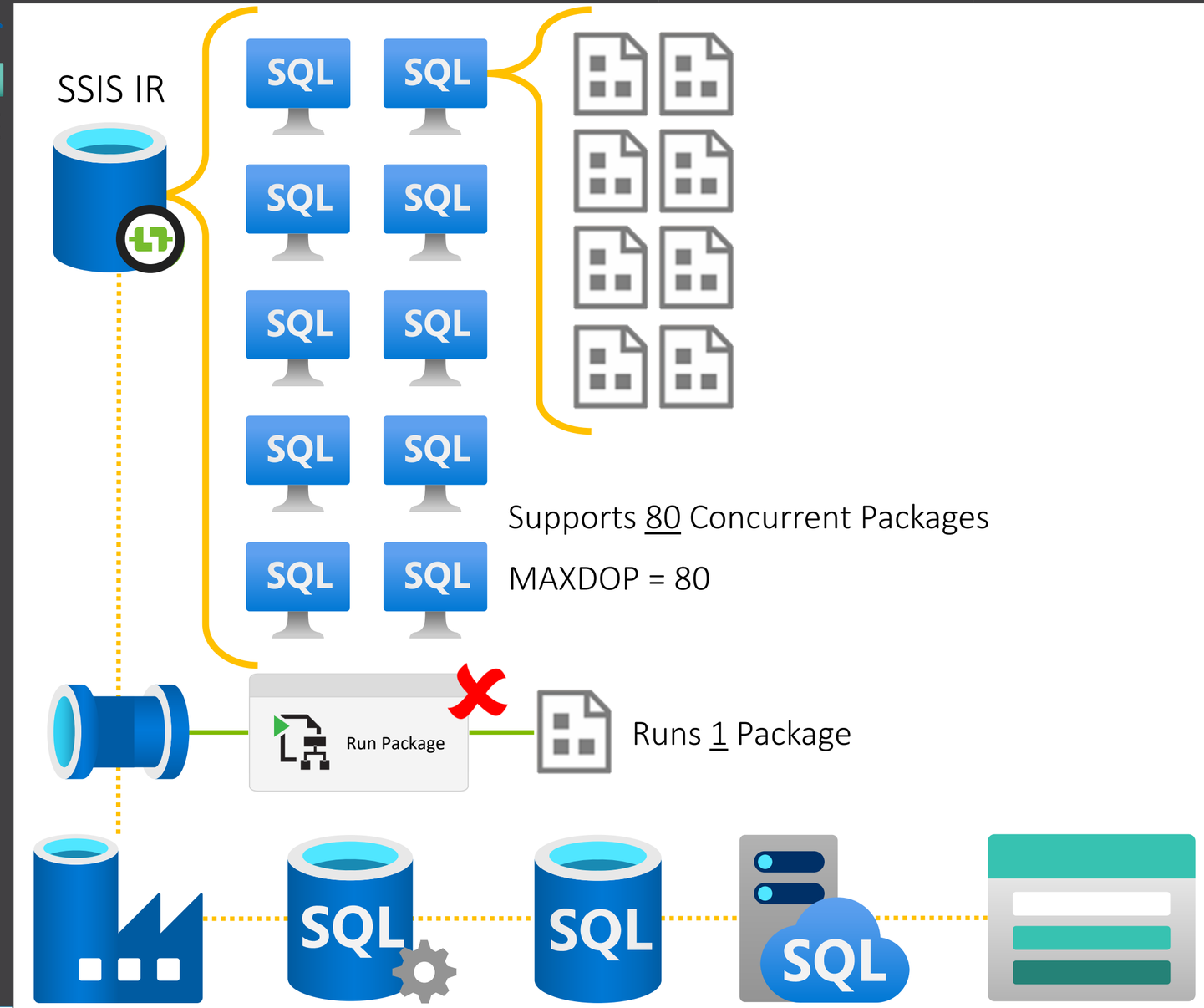
Activities x80

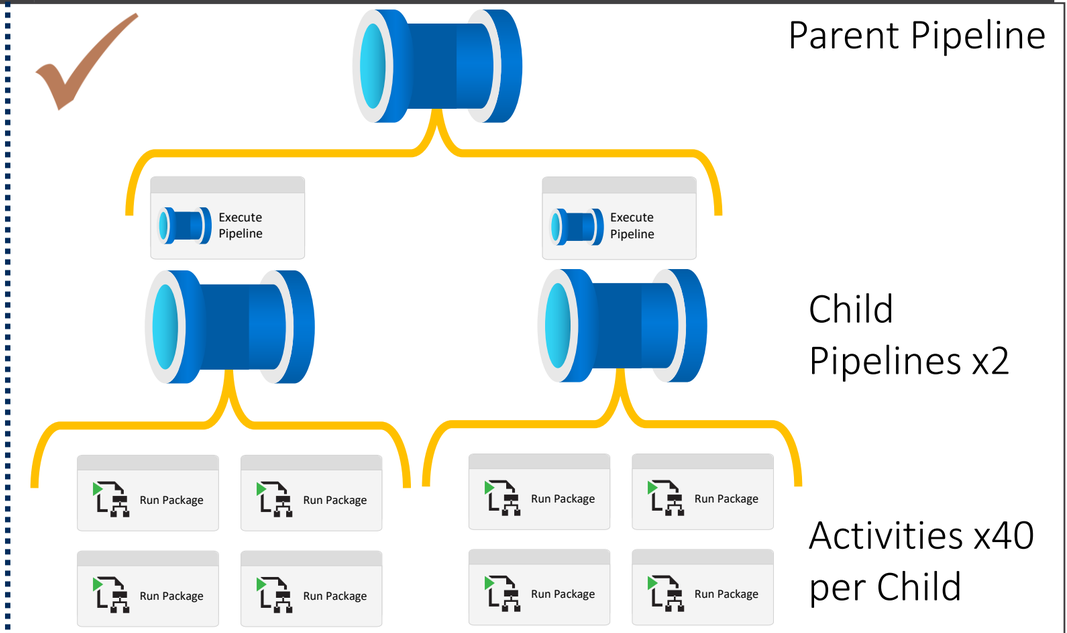


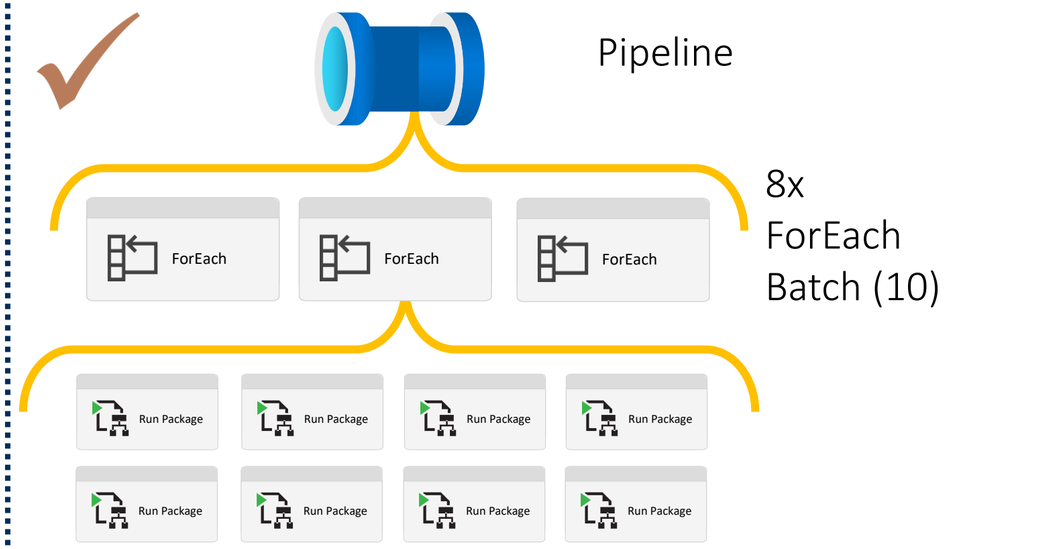
Pipeline x1

ForEach
Max Batch
(50)

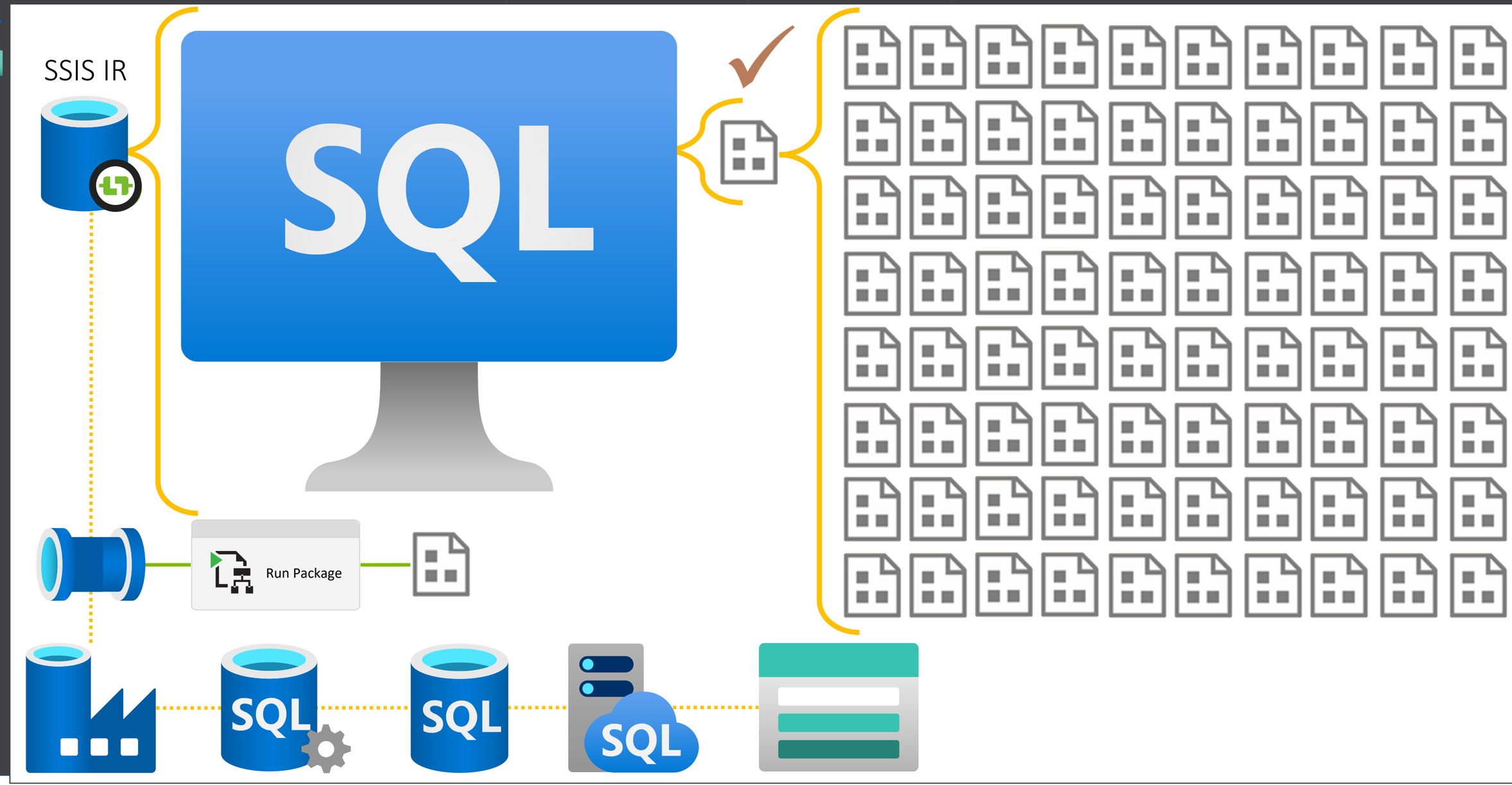
Solution 1 & 2: Static Pipelines





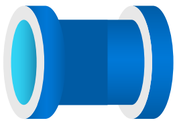


Solution 3: Packages Refactored on a Single Node IR



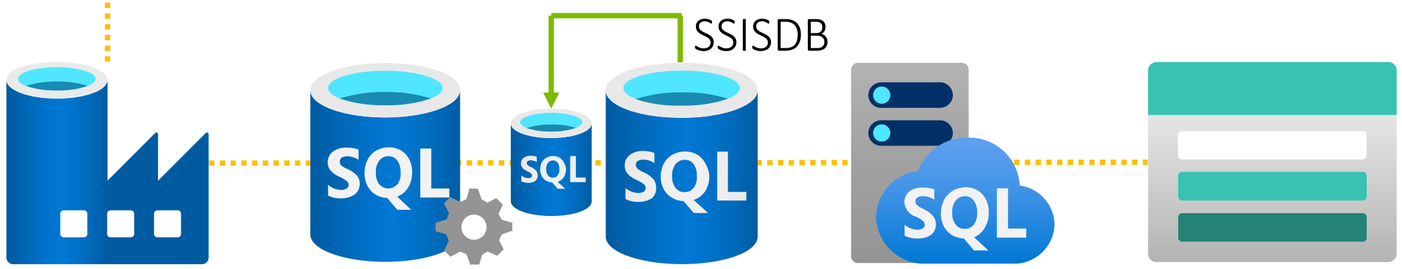
Solution 4: Nested ForEach Activities & Bucket Metadata

SSIS IR



Compute size	S4	S6	S7	S9	S12
Max DTUs	200	400	800	1600	3000
Included storage (GB) [1]	250	250	250	250	250
Max storage (GB)	1024	1024	1024	1024	1024
Max in-memory OLTP storage (GB)	N/A	N/A	N/A	N/A	N/A
Max concurrent workers (requests)	400	800	1600	3200	6000
Max concurrent sessions	4800	9600	19200	30000	30000

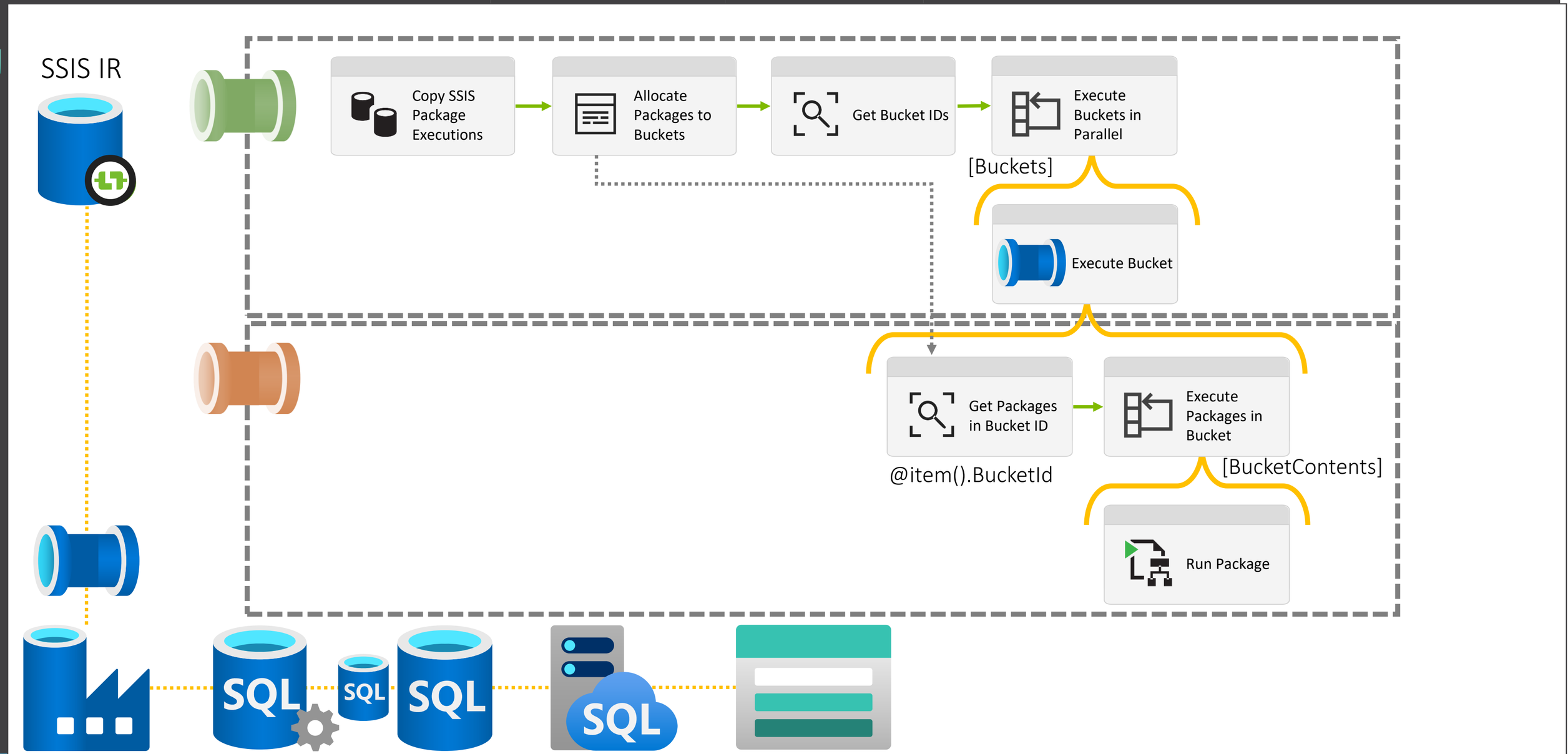
https://docs.microsoft.com/en-us/azure/azure-sql/database/resource-limits-dtu-single-databases



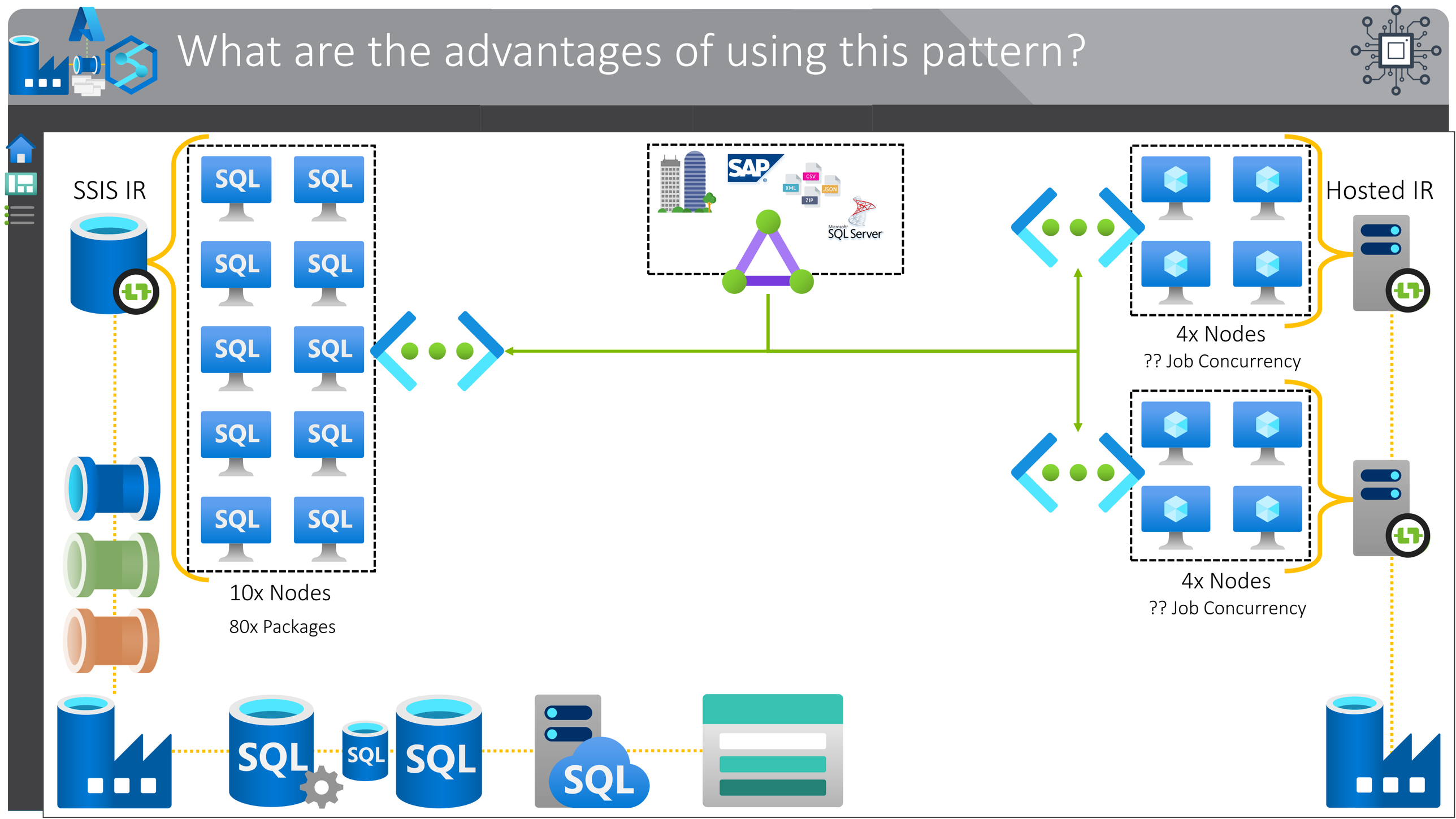
(FE L1) x (FE L2) = NEW MAXDOP

50 x 50 = 2500

Solution 4: Nested ForEach Activities & Bucket Metadata

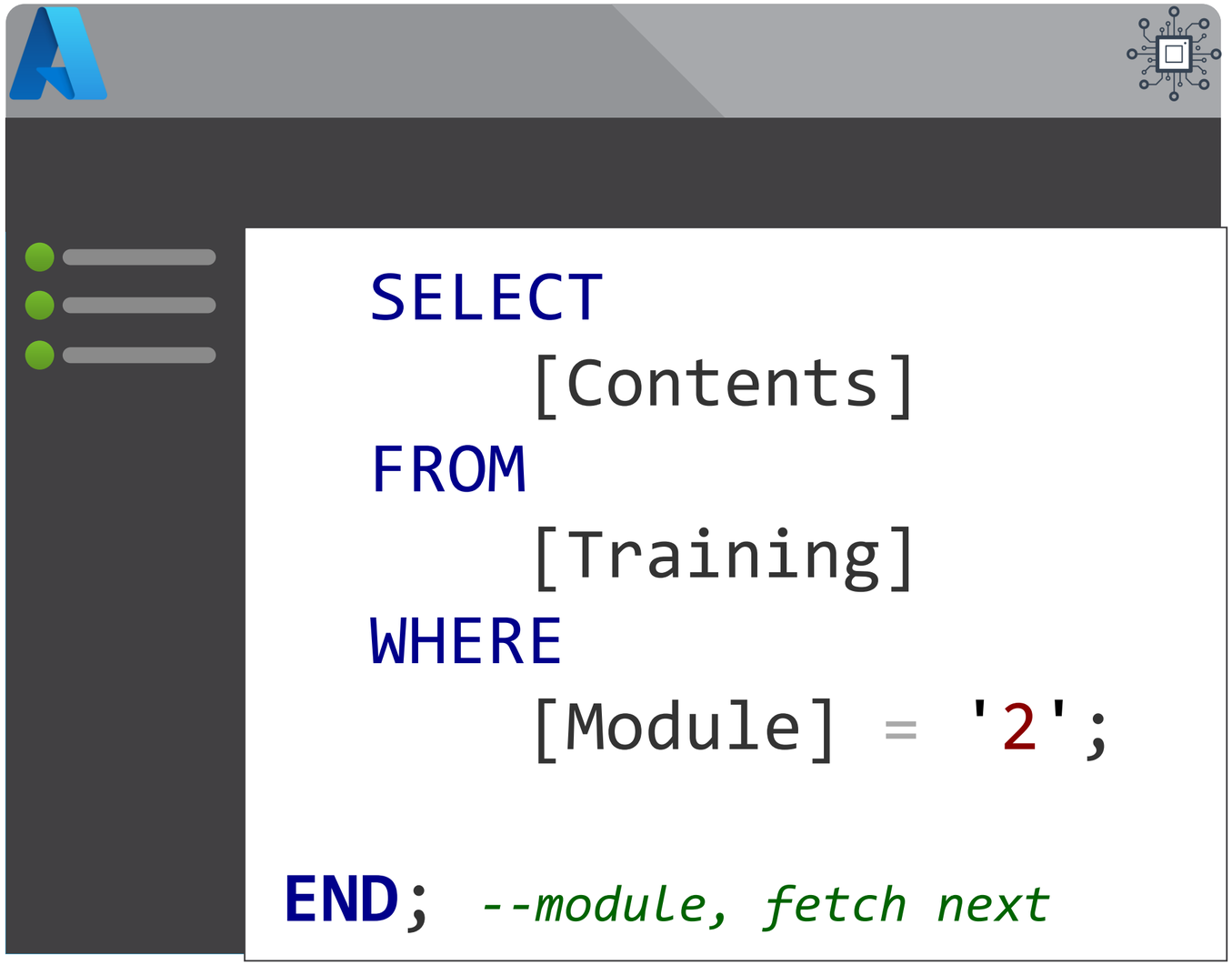


What are the advantages of using this pattern?



Module 2

Integration Runtime Design Patterns



```
    SELECT
        [Contents]
    FROM
        [Training]
    WHERE
        [Module] = '2';

END; --module, fetch next
```

- Compute Types
  - Azure
  - Hosted
  - SSIS
  - AirFlow
- Patterns & Configuration