

Bringing Integration Anywhere

with Azure Logic Apps v2

Thank you!



codit|



team 4 talent

involved



AXXES





Massimo Crippa

Hi, nice to meet you!

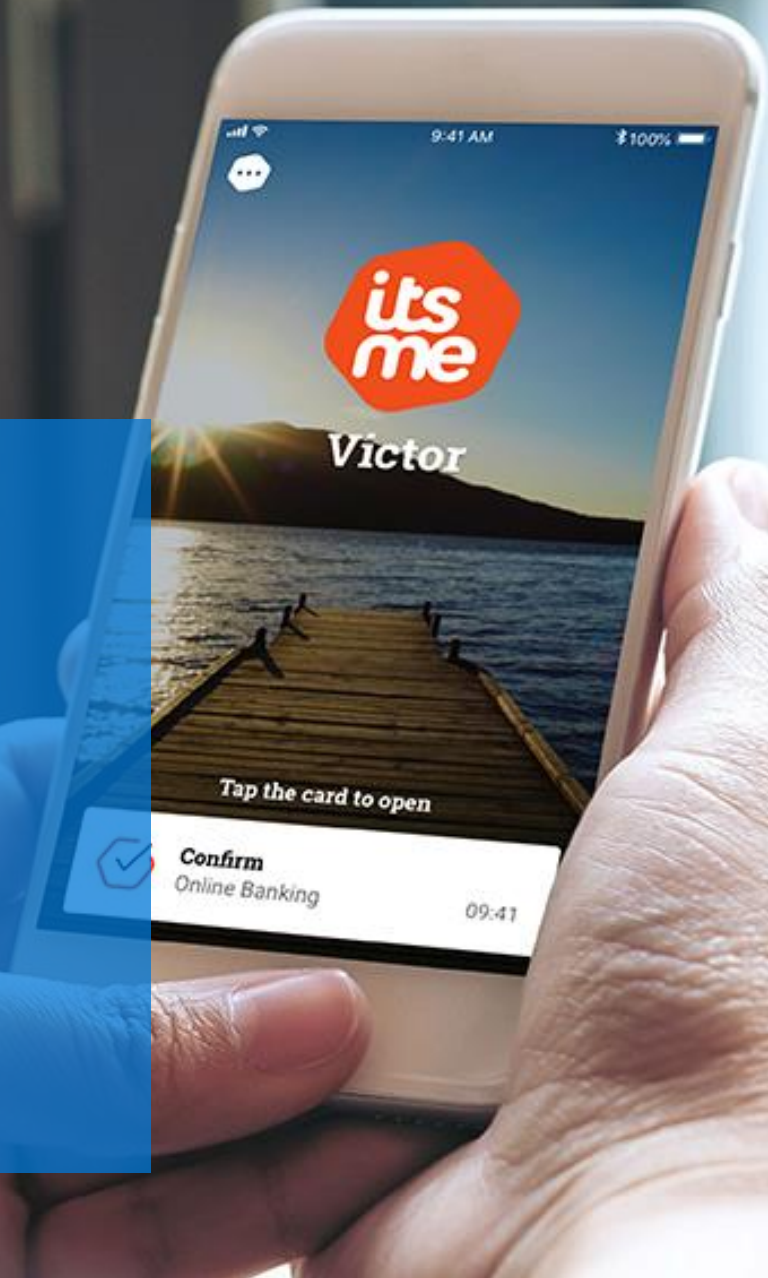
An aerial photograph of a large cargo ship, the EDISON NAV, sailing on the ocean. The ship is dark blue with white lettering. Overlaid on the ship and the surrounding water are various digital, semi-transparent graphics in shades of blue and green. These include a grid pattern, circular radar-like lines, and abstract data points, suggesting a digital or IoT theme. A large, solid blue rectangular area covers the lower-left portion of the image, serving as a background for the text.

IoT solutions

Building intelligent vessels

Cloud platforms

Identity at your fingertips





Advanced Analytics

Securing European waters

Enterprise Integration

Connecting systems and people



Enterprise Integration

Applications rarely live in isolation

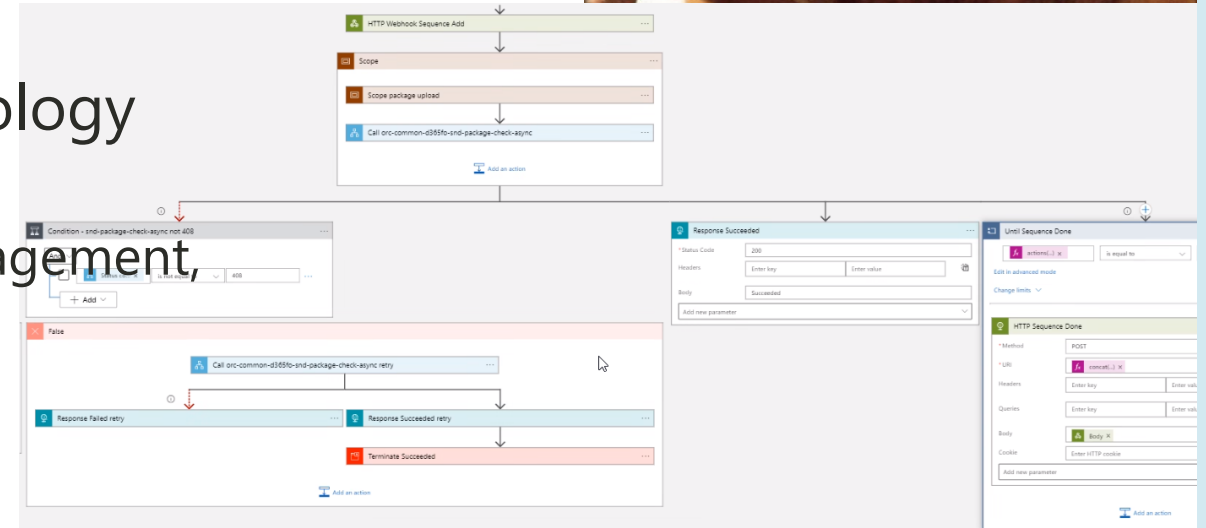
- Procurement needs to connect with suppliers
- Shipment needs to sync with the Logistic partner
- ...

It's all about using messaging to connect applications

- Message construction, transformation, routing, channel, ...

Azure Integration Services is our technology stack

- LogicApps, Service Bus, Functions, API Management, Event Grid, Data Factory



Agenda

- | Overview + Terminology
- | Logic Apps Standard (Runtime)
 - | General Overview
 - | Runtime
 - | Scaling & Pricing
 - | ...
 - | Connectors: Built-in vs. Cloud
 - | Stateful vs. Stateless
 - | Local Development & Debugging
 - | Networking
 - | Monitoring
- | Conclusion

Overview + Terminology

Logic Apps Offerings

- | Logic Apps Consumption (~multi-tenant)
 - | Serverless offer
- | Logic Apps ISE
 - | Dedicated environment
- | Logic Apps Standard (~single-tenant, v2, new runtime)
 - | The new offering

Logic Apps Consumption

- | Deployment unit: Single Logic App
- | Scaling: Serverless handled by MS
- | Cost: Pay per action
- | Easiest to get started
- | API Connections hosted in Azure to connect to other services.

Logic Apps ISE

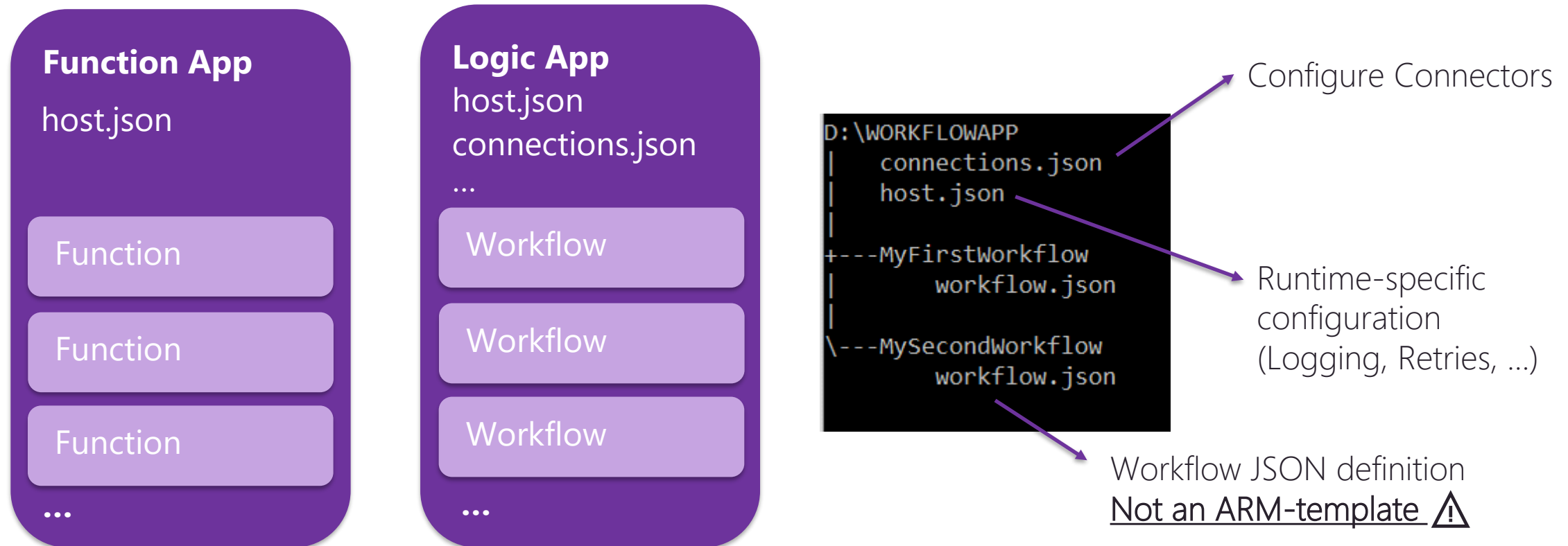
- | Deployment unit: Single Logic App
- | Deployed inside the (dedicated) ISE environment
- | (Optional) Network Integration
- | 💰 Costly! (Premium starts at ~4750 euros per month)
- | 'Free' Integration account
- | Scale-Out only

Logic Apps Standard

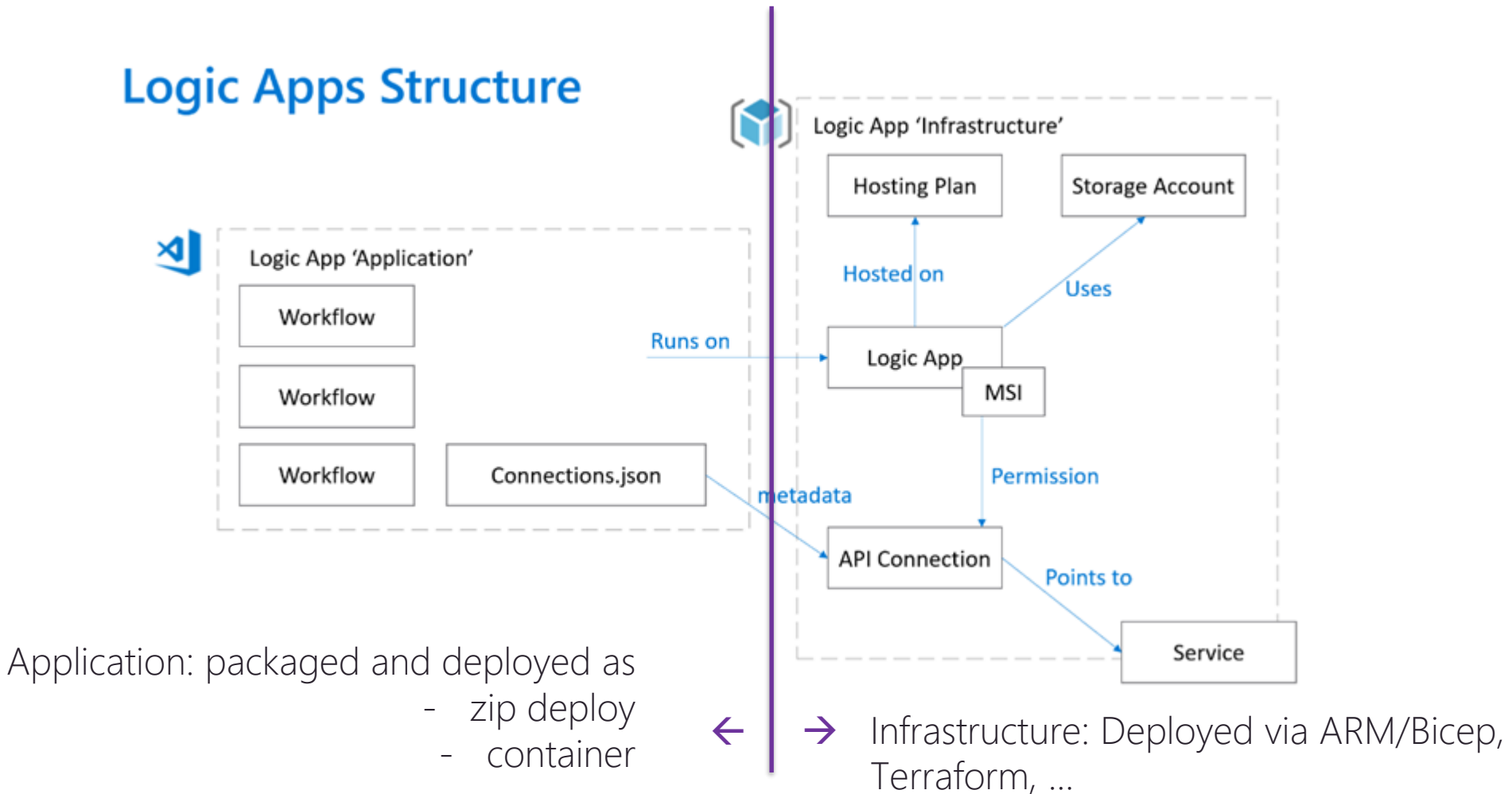
- | Deployment unit: Single Logic App with workflow(s)!
- | Based on Azure Functions ⚡ runtime
- | Run anywhere (Azure, Docker, Kubernetes, ...)
- | Built-in connectors vs. Cloud connectors

Logic Apps Standard: deployment unit

- | In LA Standard: Logic App (~infra) can have multiple workflows (~logic)
 - | Similar to Function App having multiple Functions



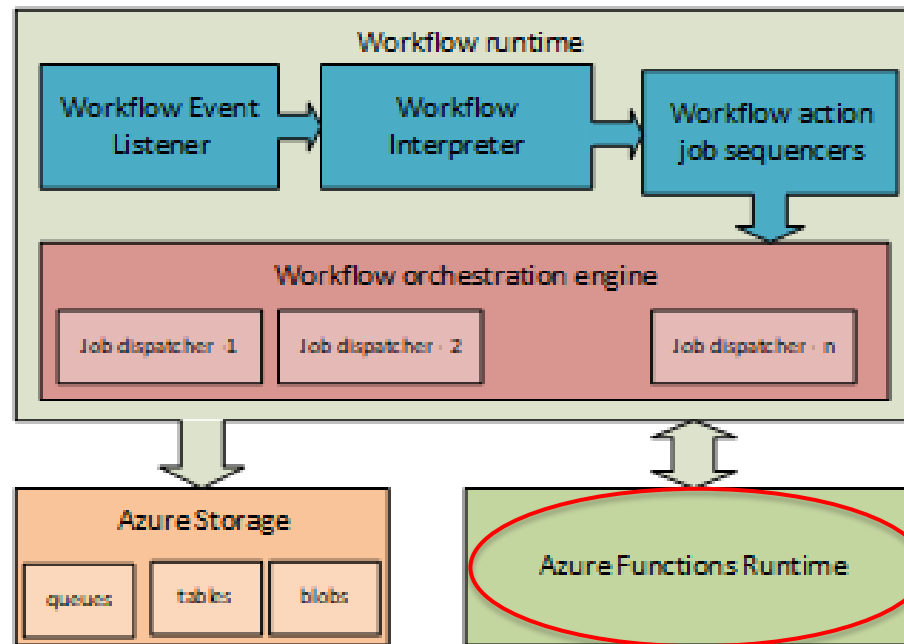
Logic Apps Standard: deployment unit



Separation of concerns

Logic Apps Standard: workflow runtime

Trigger = Event listener

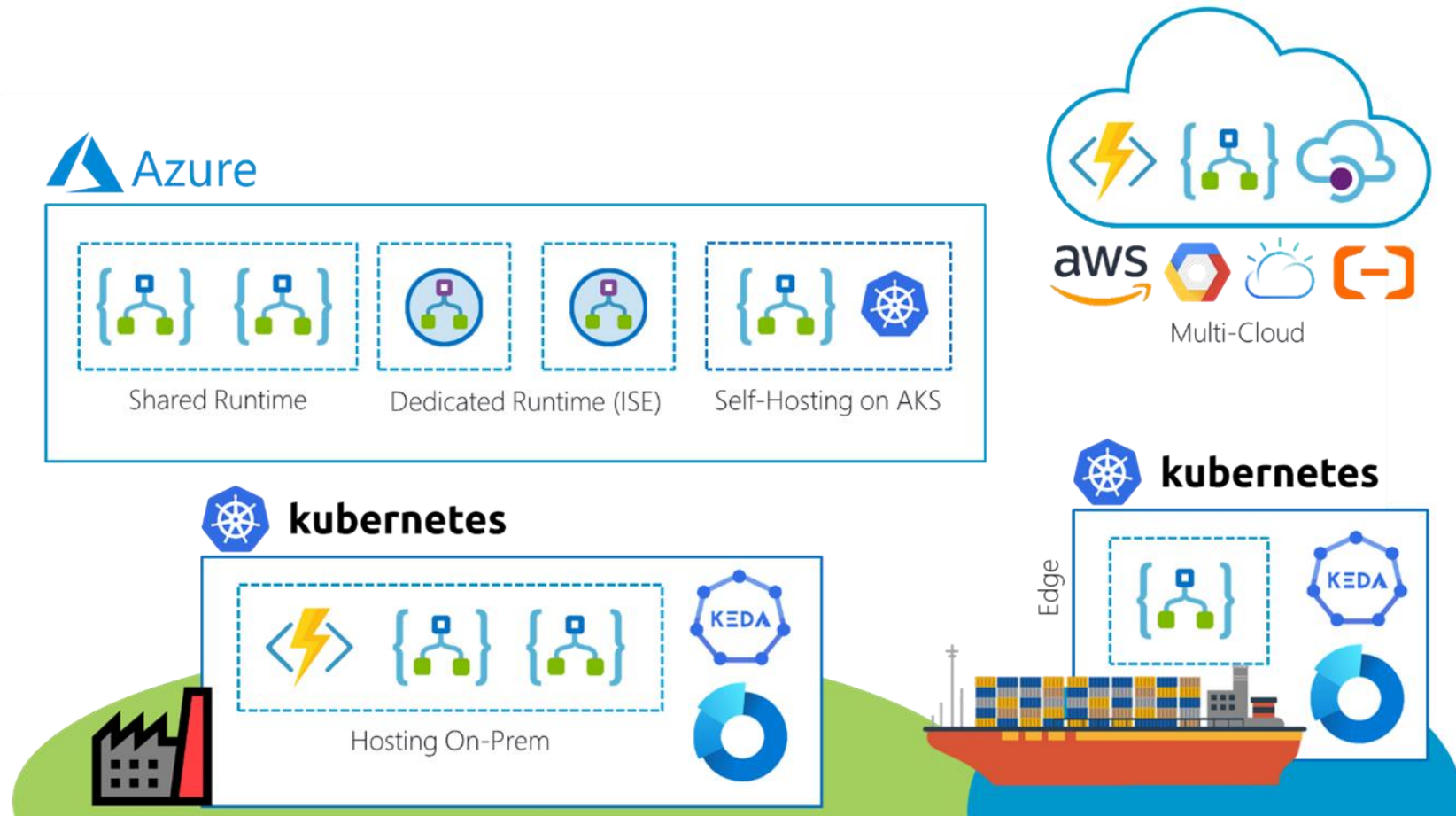


Used for persistence / state

SQL-support in public preview

- Each action is a job, job handles input/output/requests/error handling/...
- Job dependencies are mapped via Direct Acyclic Graph. Handled by Job sequencer
- Job dispatcher executes a job

Logic Apps Standard : run anywhere



Scaling & Pricing

Microsoft (currently) offers 3 “Workflow Standard” plans


- Supposedly more predictable (stable) costs
- Quite expensive ⚠️
- No Dev/Test plans ⚠️


Scale up and Scale out


- Min and Max instances (plan scale)
- Min and Max warm instances (app scale)

Possible to configure other plans via ARM/Bicep.

Spec Picker



Dev / Test
For less demanding workloads



Production
For most production workloads



Isolated
Advanced networking and scale

Dev / Test pricing tiers are not available for your configuration and are only available to plans that are not hosted within an App Service environment.
[Click to learn more.](#)

Spec Picker


Dev / Test
For less demanding workloads


Production
For most production workloads


Isolated
Advanced networking and scale

Recommended pricing tiers

WS1 210 total ACU 3.5 GB memory Dv2-Series compute equivalent 142.66 EUR/Month Baseline (Estimated)	WS2 420 total ACU 7 GB memory Dv2-Series compute equivalent 285.31 EUR/Month Baseline (Estimated)	WS3 840 total ACU 14 GB memory Dv2-Series compute equivalent 570.62 EUR/Month Baseline (Estimated)
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Cost Prediction

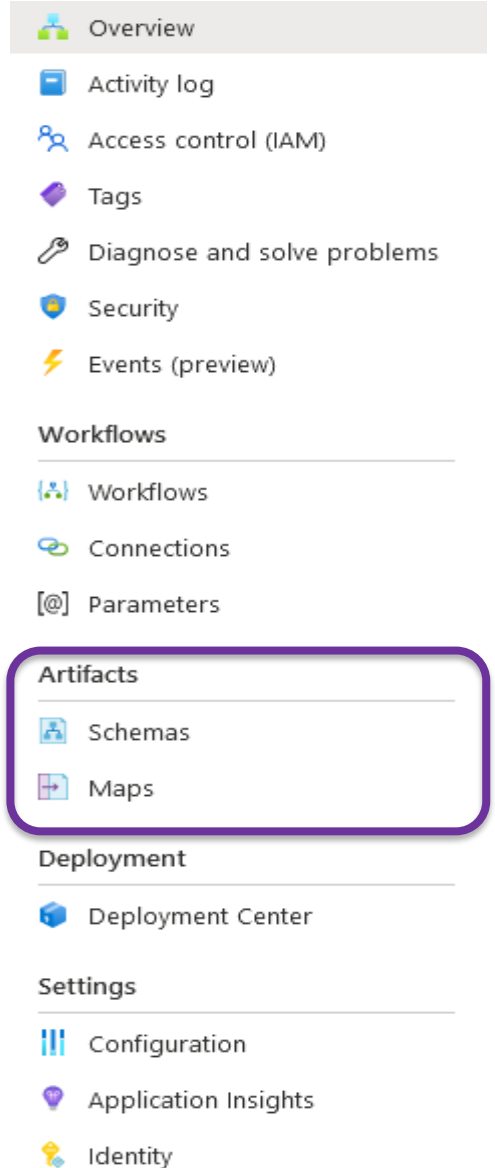
- | ~ Fixed costs = easier to predict?
- | Typically: workload is known (# runs per day)
 - | LA Consumption: # actions known → Predict cost
 - | LA Standard: Pricing plan known → Predict cost?
 - | What load can app plan run?
 - | What is the optimal app plan?
 - | Autoscaling: when triggered? For how long?
 - | Extra hidden costs (Storage account transactions, API connections)?

⚠ Costs are harder to predict on LA standard

⚠ Dev/Test environments (less activity) will probably end up costing more.

Artifacts

- | Schemas & mappings used by workflows. No support for:
 - | FF schema/mapping
 - | EDI
- | Mappings / Schema validations
 - | executed locally, no need for Integration Account
- | Integration Account
 - | ⚠ No possibility to associate Integration Account With Logic App Standard!
 - | ⚠ No actions for Integration Account available!
- | EDI, FF en-/decoding
 - | Call Logic App Consumption to handle this task 🙅



Parameters vs. App settings

Parameters:

- Key-value pairs
- Value can be: string, int, float, bool, object, array
- ⚠️ No support for "SecureString" and "SecureObject"!
- Accessible via all workflows

```
"inputs": {
  "method": "GET",
  "uri": "@{concat(parameters('hostName'), '/path' )}"
},
```

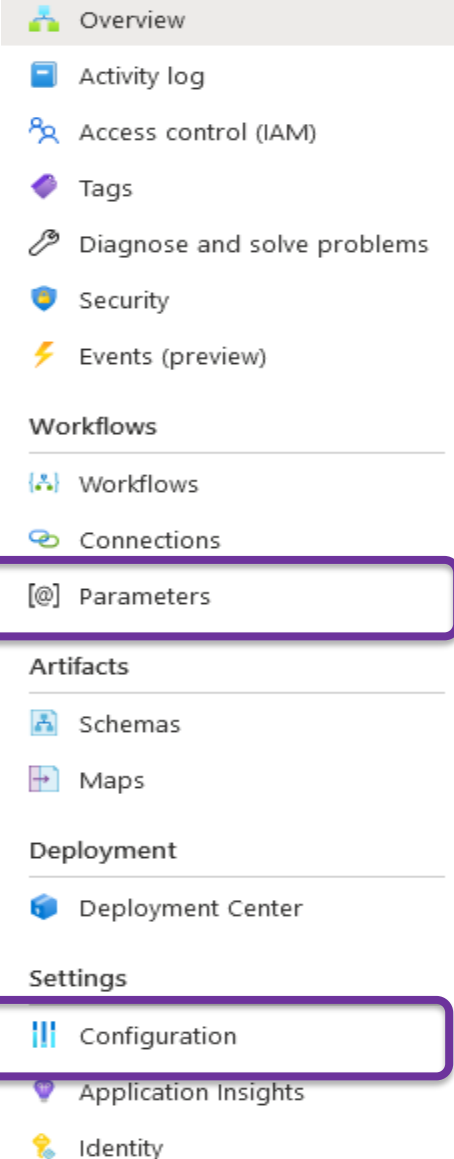
- No KeyVault integration
- Defined in 'parameters.json' file
- Deployed via zip deploy (part of application)

App Settings:

- Key-value pairs
- Value can only be string
- Accessible via all workflows

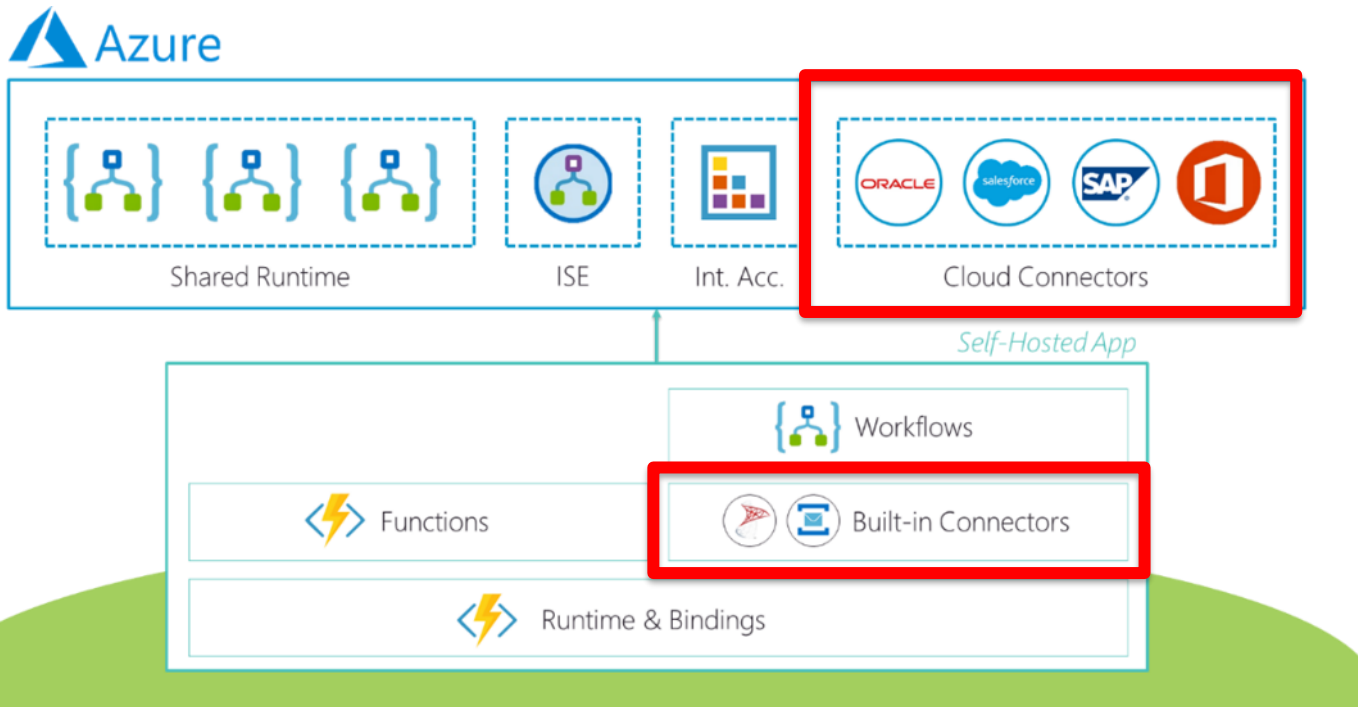
```
"inputs": {
  "method": "GET",
  "uri": "@{concat(appsetting('hostName'), '/path' )}"
},
```

- KeyVault integration 🔑
- Defined in ARM/Bicep
- Deployed via ARM/Bicep (part of infra)



Logic Apps Standard Connectors: Built-in vs. Cloud

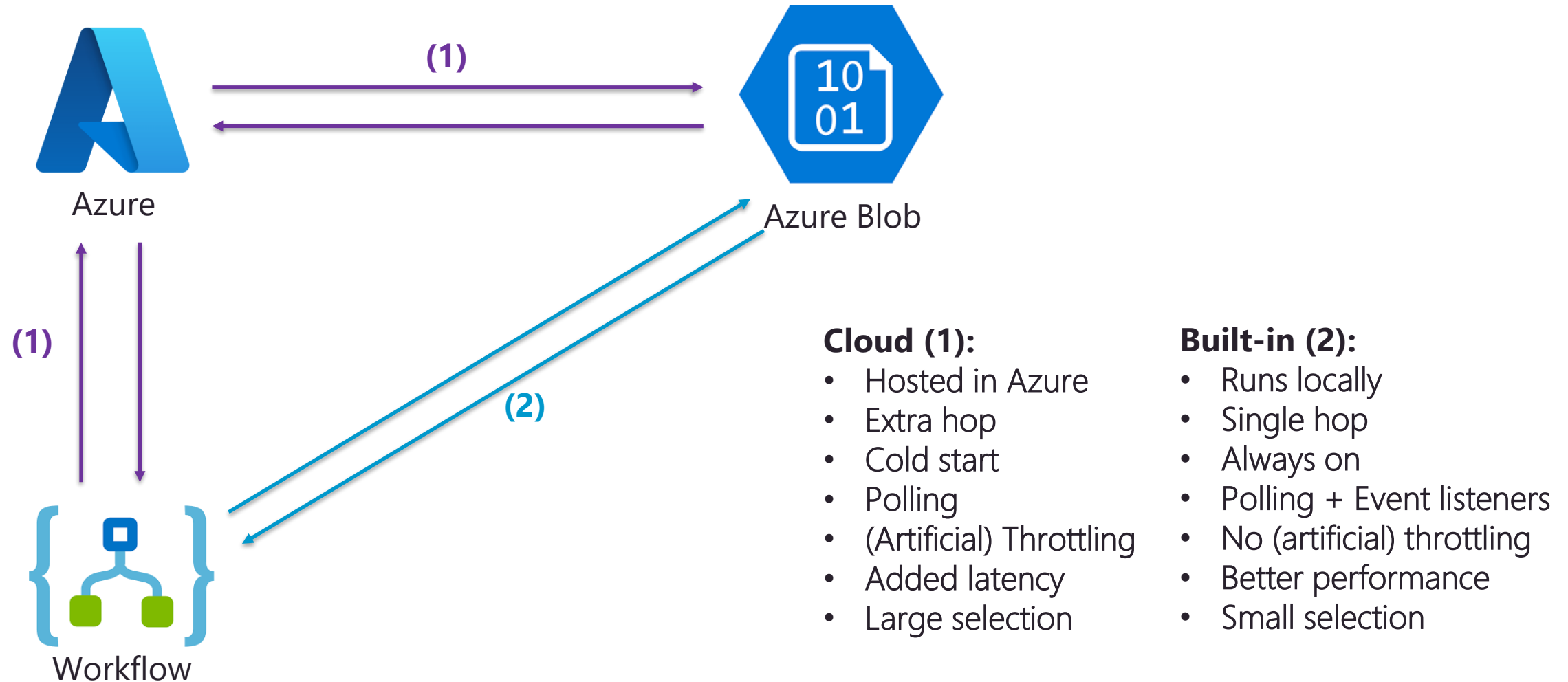
Built-in vs. Cloud connectors



Built-in connectors “execute locally”

Cloud connectors require extra hop to the Cloud (performance!)

Built-in vs. Cloud connectors



Logic Apps Standard Stateful vs. Stateless

Stateful vs. Stateless workflows

Workflow Name *

CoditTestWorkflow ✓

State type *

- ☐ Stateful: Optimized for high reliability, ideal for process business transitional data.
- ☐ Stateless: Optimized for low latency, ideal for request-response and processing IoT events.

Stateful:

- Persistence (StorAcc)
- Resubmits
- Resilience
- Run History
- All triggers
- Lower throughput
- Higher latency

→ Use in most scenarios.

Stateless:

- In-memory
- No Resubmits
- Volatile
- Run History off by default
- Only built-in triggers
- Higher throughput
- Lower Latency

→ Use in specific (high-throughput) scenarios.
(e.g. high volumes of non-critical IoT data)

Add/Edit application setting

Name

Workflows.CoditTestWorkflow.OperationOptions

Value

WithStatelessRunHistory

Workflow Name

Debug purposes only
(not stable)

Stateless workflows

- | Only use **stateless** when:
 - | Small messages (<64kb)
 - | Non-critical data
 - | Need for high performance/throughput
 - | Trigger is built-in connector (not cloud)

❗ Important

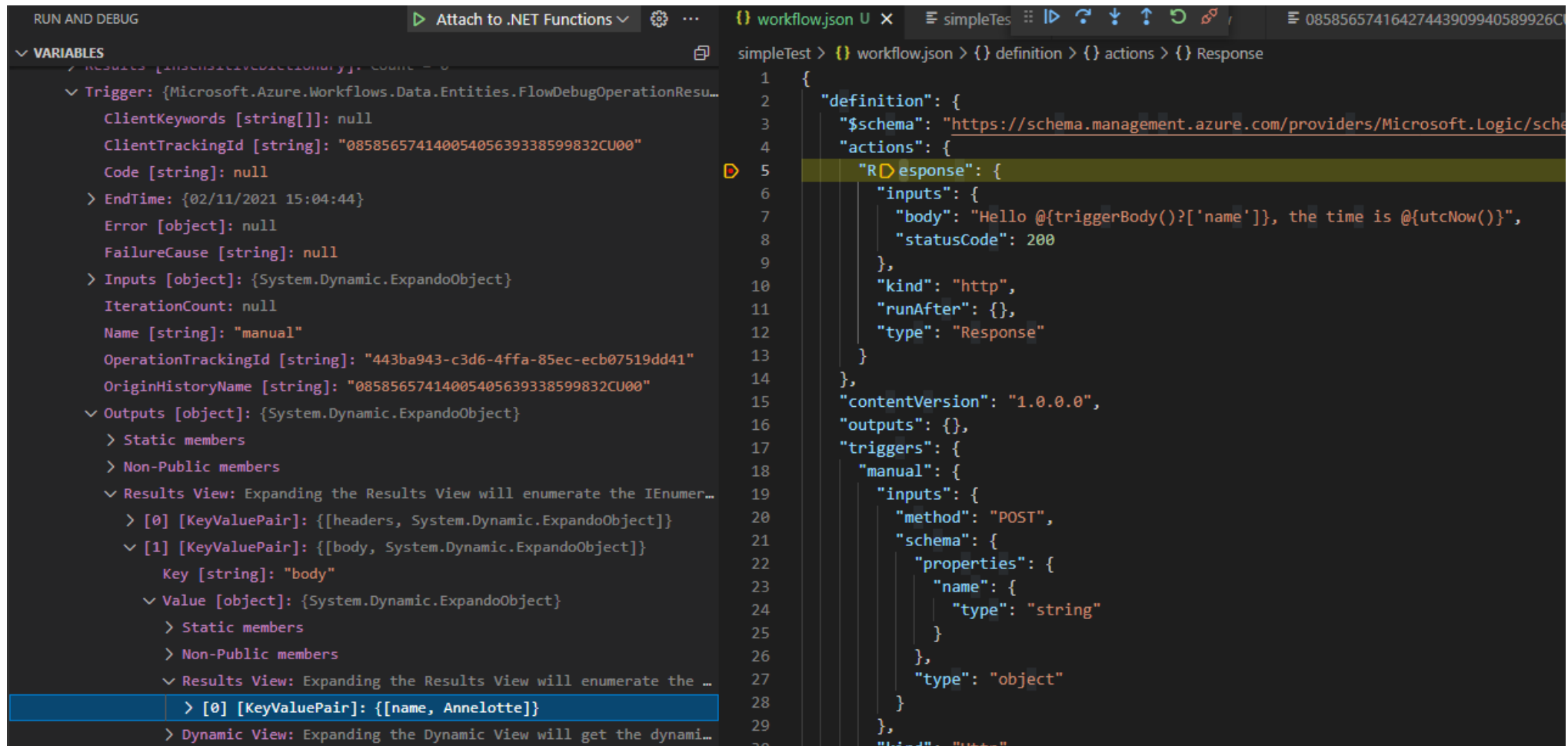
A stateless workflow provides the best performance when handling data or content, such as a file, that **doesn't exceed 64 KB in total size**. Larger content sizes, such as multiple large attachments, might significantly slow your workflow's performance or even cause your workflow to crash due to out-of-memory exceptions. If your workflow might have to handle larger content sizes, use a stateful workflow instead.

⚠ Usage of Cloud connectors → Latency & Throttling!

Logic Apps Standard Local Development & Debugging

Local Debugging

| Ability to set break points



```
simpleTest > {} workflow.json > {} definition > {} actions > {} Response
1  {
2    "definition": {
3      "$schema": "https://schema.management.azure.com/providers/Microsoft.Logic/sche
4      "actions": {
5        "Response": {
6          "inputs": {
7            "body": "Hello @{triggerBody()?['name']}, the time is @{utcNow()}",
8            "statusCode": 200
9          },
10         "kind": "http",
11         "runAfter": {},
12         "type": "Response"
13       }
14     },
15     "contentVersion": "1.0.0.0",
16     "outputs": {},
17     "triggers": {
18       "manual": {
19         "inputs": {
20           "method": "POST",
21           "schema": {
22             "properties": {
23               "name": {
24                 "type": "string"
25               }
26             },
27             "type": "object"
28           }
29         },
30         "kind": "http"
```

VARIABLES

- Trigger: {Microsoft.Azure.Workflows.Data.Entities.FlowDebugOperationResu...
 - ClientKeywords [string[]]: null
 - ClientTrackingId [string]: "08585657414005405639338599832CU00"
 - Code [string]: null
 - EndTime: {02/11/2021 15:04:44}
 - Error [object]: null
 - FailureCause [string]: null
 - Inputs [object]: {System.Dynamic.ExpandoObject}
 - IterationCount: null
 - Name [string]: "manual"
 - OperationTrackingId [string]: "443ba943-c3d6-4ffa-85ec-ecb07519dd41"
 - OriginHistoryName [string]: "08585657414005405639338599832CU00"
- Outputs [object]: {System.Dynamic.ExpandoObject}
- Static members
- Non-Public members
- Results View: Expanding the Results View will enumerate the IEnumer...
 - [0] [KeyValuePair]: {[headers, System.Dynamic.ExpandoObject]}
 - [1] [KeyValuePair]: {[body, System.Dynamic.ExpandoObject]}
 - Key [string]: "body"
 - Value [object]: {System.Dynamic.ExpandoObject}
 - Static members
 - Non-Public members
 - Results View: Expanding the Results View will enumerate the ...
 - [0] [KeyValuePair]: {[name, Annelotte]}
 - Dynamic View: Expanding the Dynamic View will get the dynami...



Local development (vscode and docker)

Logic Apps Standard Network integration
















Network integration

| Inbound

- | IP restriction (IPs, Service Tags, VNET / Service Endpoint)
- | Private endpoint / Private Link
- | Triggered by VNET resources

| Outbound

- | VNET integration (Regional, Gateway)
- | Hybrid connections (Relay)
- | IP restrictions (force all the traffic to be sent into your virtual network)

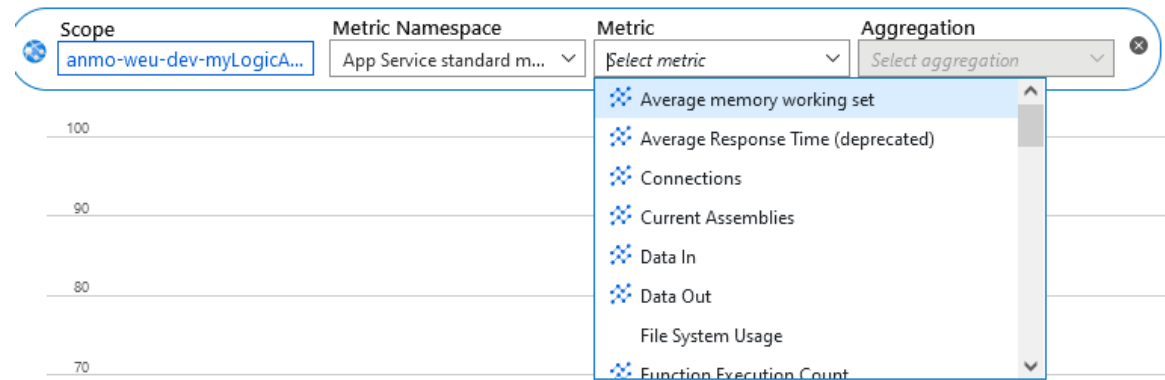
Feature	Workflow plan	ASE	Kubernetes
Inbound IP restrictions and private site access	 Yes	 Yes	 Yes
Virtual network integration	 Yes (Regional)	 Yes	 Yes
Virtual network triggers (non-HTTP)	 Yes	 Yes	 Yes
Hybrid connections (Windows only)	 Yes	 Yes	 Yes
Outbound IP restrictions	 Yes	 Yes	 Yes

Logic Apps Standard Monitoring

Logic App standard: Metrics

| Only “App service like” metrics

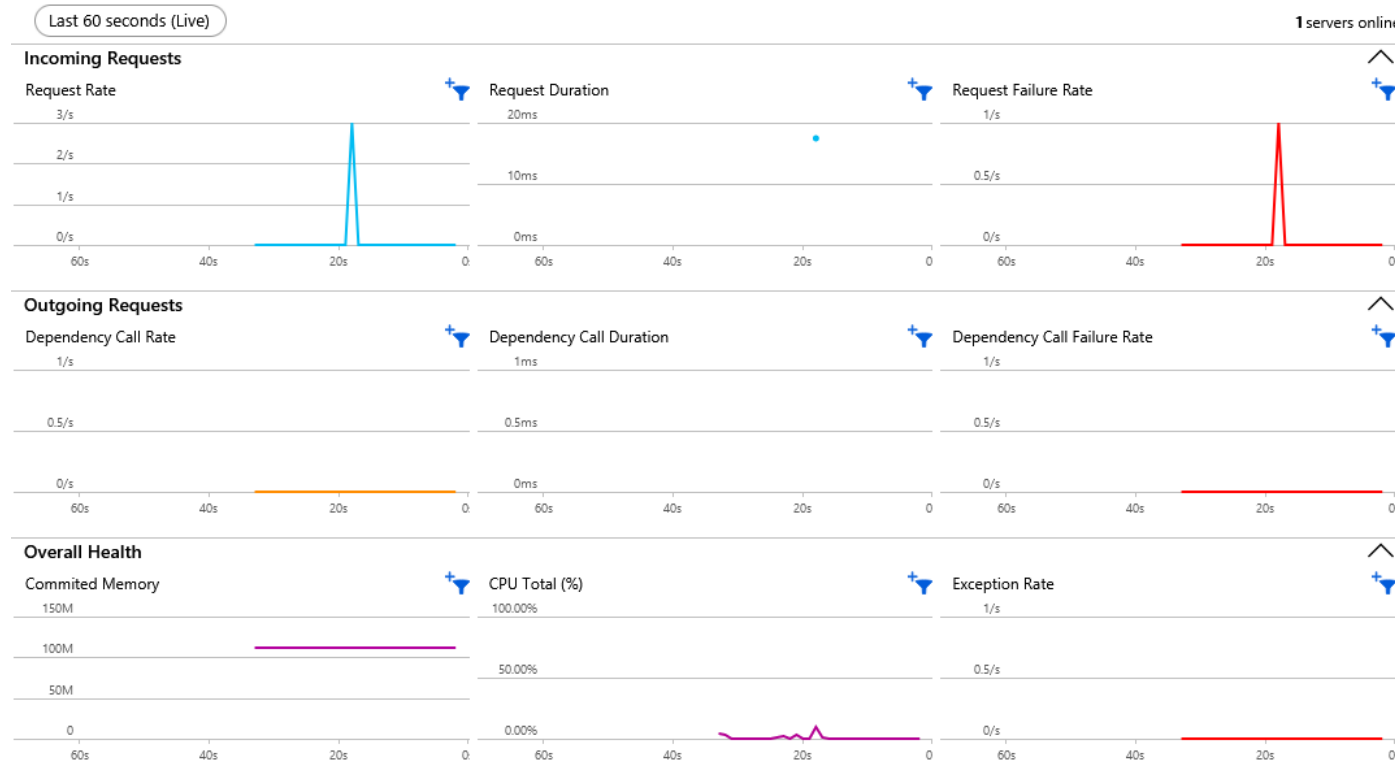
- | CPU/Memory
- | HTTP xxx
- | Response times
- | ...



⚠ No specific metrics (yet) for runs/actions/triggers
(started/completed/failed), ...

➔ Major issue for Production workloads! (Metrics, Alerts, ...)

Application insights – live metrics



Sample telemetry

```
13:18:26 | Request | 0 | 1 ms | @c4e34dc9b85e418...1502e04a4664c15
rcv-customerOrder.Send_message.ActionInvocation | InvocationId=ca7bf644-fc2a-471a-8904
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Workflow trigger starts. flowName='rcv-cus...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Workflow run starts. flowName='rcv-custome...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Storage operation completed: correlationId...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Storage operation completed: correlationId...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Storage operation completed: correlationId...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Storage operation completed: correlationId...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Storage operation completed: correlationId...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Storage operation completed: correlationId...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Storage operation completed: correlationId...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256
13:18:26 | Trace | @c4e34dc9b85e418...1502e04a4664c15
Incoming HTTP request starts: correlation...yld='2eabbde1-9dee-4714-a2c7-d28aa3381256'.
```

Time 13:18:26

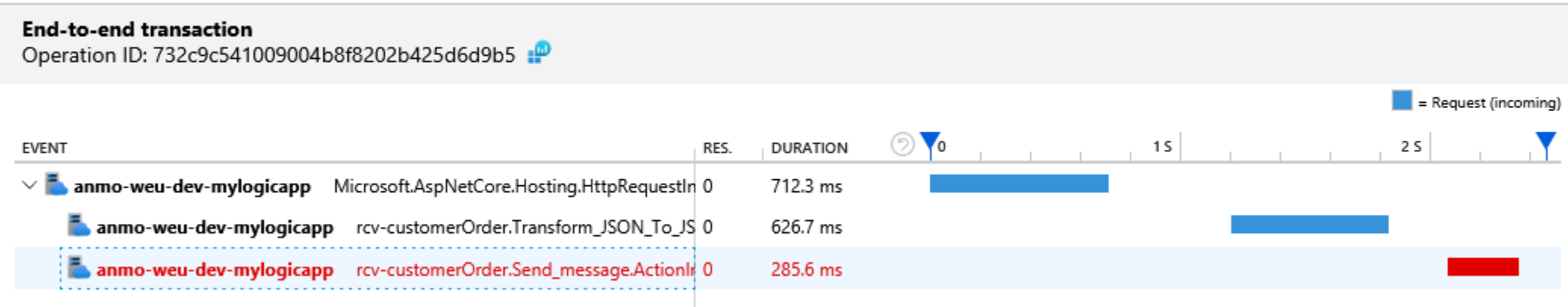
Workflow run starts. flowName='rcv-customerOrder', flowId='08585718772718346455', flowRunSequenceId='08585718772718346455', correlationId='2eabbde1-9dee-4714-a2c7-d28aa3381256', slotName='Production', status='', statusCode='', error='', diagnosticId='08585718772718346455', clientTrackingId='08585718772718346455', properties={'\$schema':'2016-06-01','startTime':'2021-10-10T13:18:26.754Z','workflowId':'754ca383c9ec41f2b55e6be786dd9be2','workflowName':'rcv-customerOrder','runId':'0858566878179321435385037843'}

Application insights – Performance / Failures

| Split per action (job)

OPERATION NAME	DURATION (AVG)	↑↓	COUNT	↑↓	🕒	PIN
Overall	280 ms		6			
rcv-customerOrder.manual.TriggerInvocation	379 ms		2			
rcv-customerOrder.Transform_JSON_To_JSON.ActionInvocation	317 ms		2			
rcv-customerOrder.Send_message.ActionInvocation	143 ms		2			
OPERATION NAME	COUNT (FAILED)	↑↓	COUNT	↑↓	🕒	PIN
Overall	2		6			
rcv-customerOrder.Send_message.ActionInvocation	2		2			

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Application insights – Tracked properties

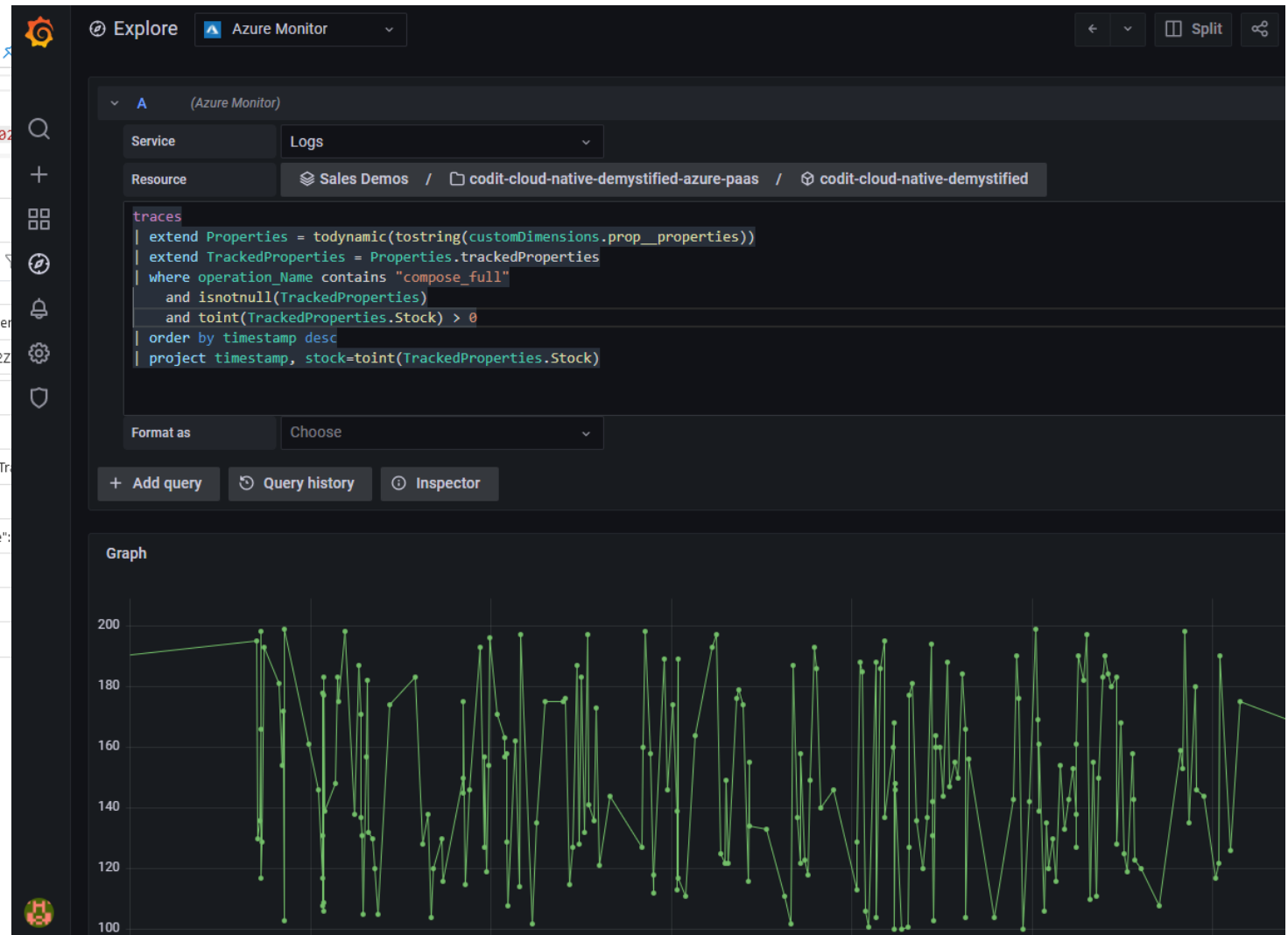
Run Time range: Set in query Save Share + New alert rule Export

```
1 // All telemetry for Operation ID: df2169161184f742b32fdafc259be0df
2 union *
3 // Apply filters
4 | where timestamp > datetime("2021-10-19T13:39:57.098Z") and timestamp < datetime("2021-10-20T13:39:57.098Z")
5 | where operation_Id == "df2169161184f742b32fdafc259be0df"
```

Results Chart Columns Display time (UTC+00:00) Group columns

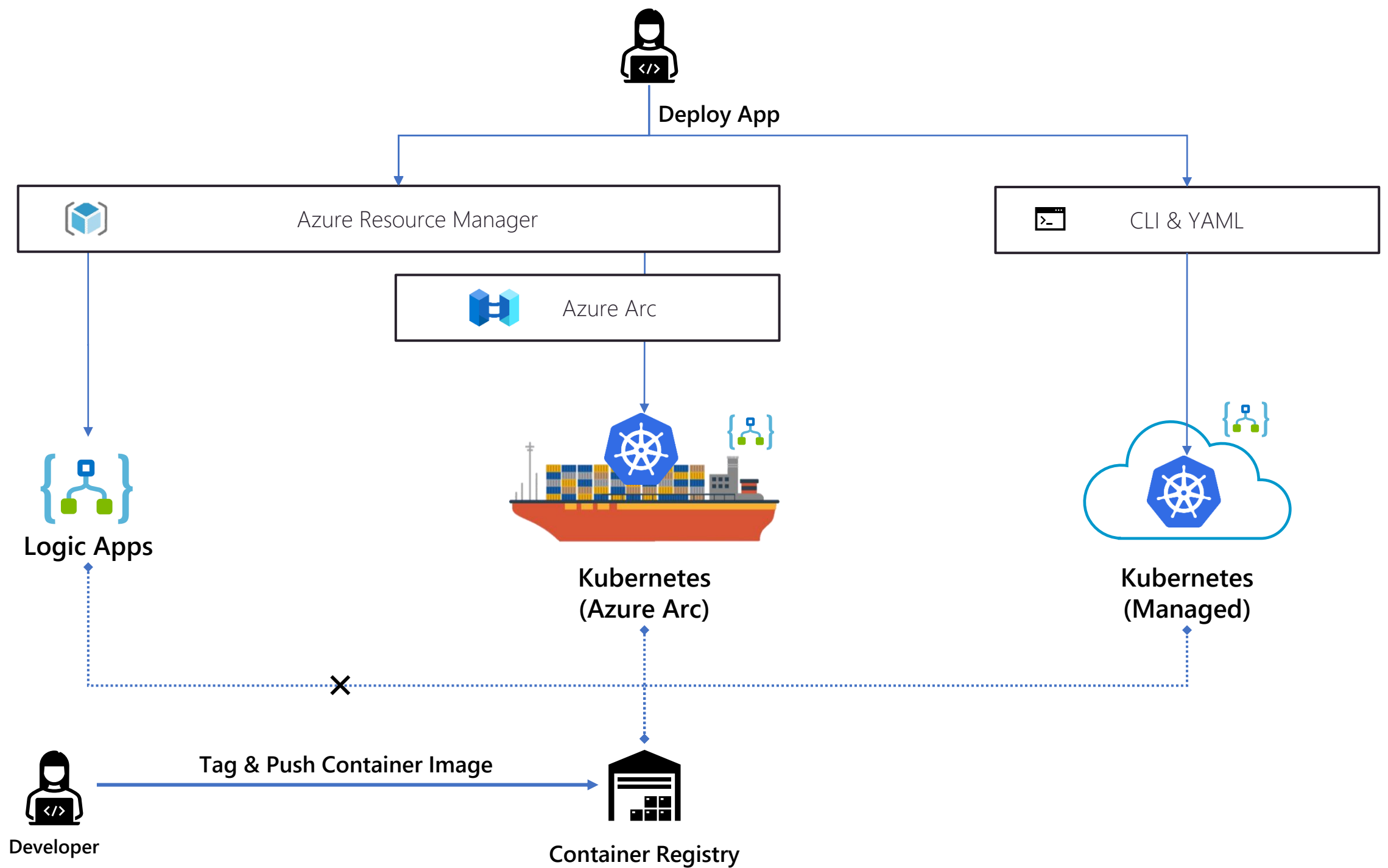
Completed

timestamp [UTC]	message	severityLevel
prop_outputsContentSize	182	
prop_platformOptions	RunDistributionAcrossPartitions, RepetitionsDistributionAcrossSequ	
prop_properties	{'\$schema':'2016-06-01','startTime':'2021-10-20T13:39:57.0966502Z'	
\$schema	2016-06-01	
code	OK	
correlation	{'actionTrackingId':'daa3d570-4fe3-4a48-8761-d8c5d61aa8b9','clientTr	
endTime	2021-10-20T13:39:57.107274Z	
resource	{'workflowId':'754ca383c9ec41f2b55e6be786dd9be2','workflowName':	
startTime	2021-10-20T13:39:57.0966502Z	
status	Succeeded	
trackedProperties	{'TableNumber':5,'TestTrackedProperty':'Test'}	
TableNumber	5	
TestTrackedProperty	Test	



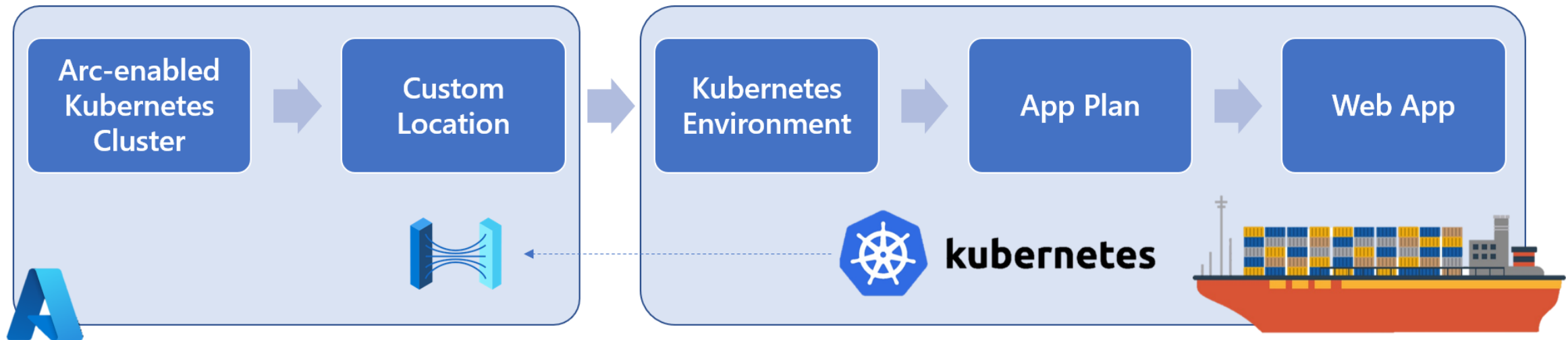


Deploy containerized integration on to Azure PaaS, Kubernetes or anywhere



Enterprise Integration on Azure ARC

- | Same deployment model
- | Target a custom location



Conclusions

Logic Apps Standard: yay or nay?



- | Flexibility and Control
- | Run Anywhere
- | Network Integration
- | Performances
 - | built-in connectors
 - | stateless
- | Local debugging
- | KeyVault integration



- | Unstable behavior in some cases
- | Cost harder to predict
- | No offer (yet) for Dev/Test
- | Limited options for built-in connectors
- | Limited metrics
- | Local debugging can be hassle to setup

Thank you