

Building a Multi-cloud API Strategy with Microservice Architecture

Robert Thelen

IBM

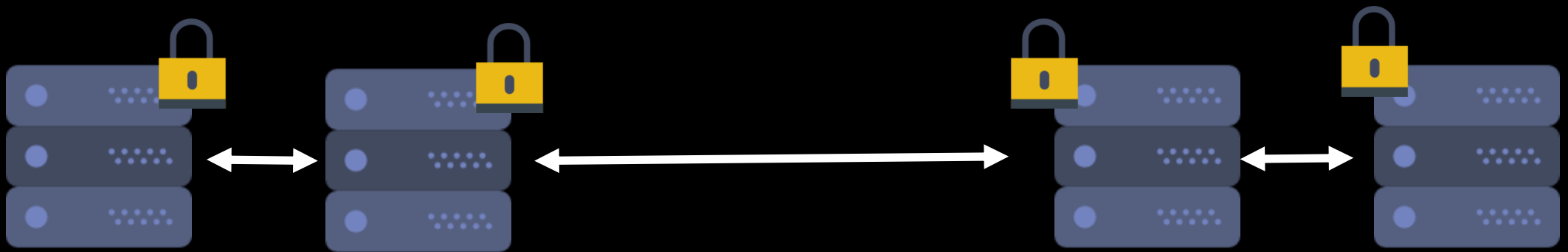
Content

- A brief History
- The Rules of Multi-cloud Management
- The Future

In the Beginning there were servers...



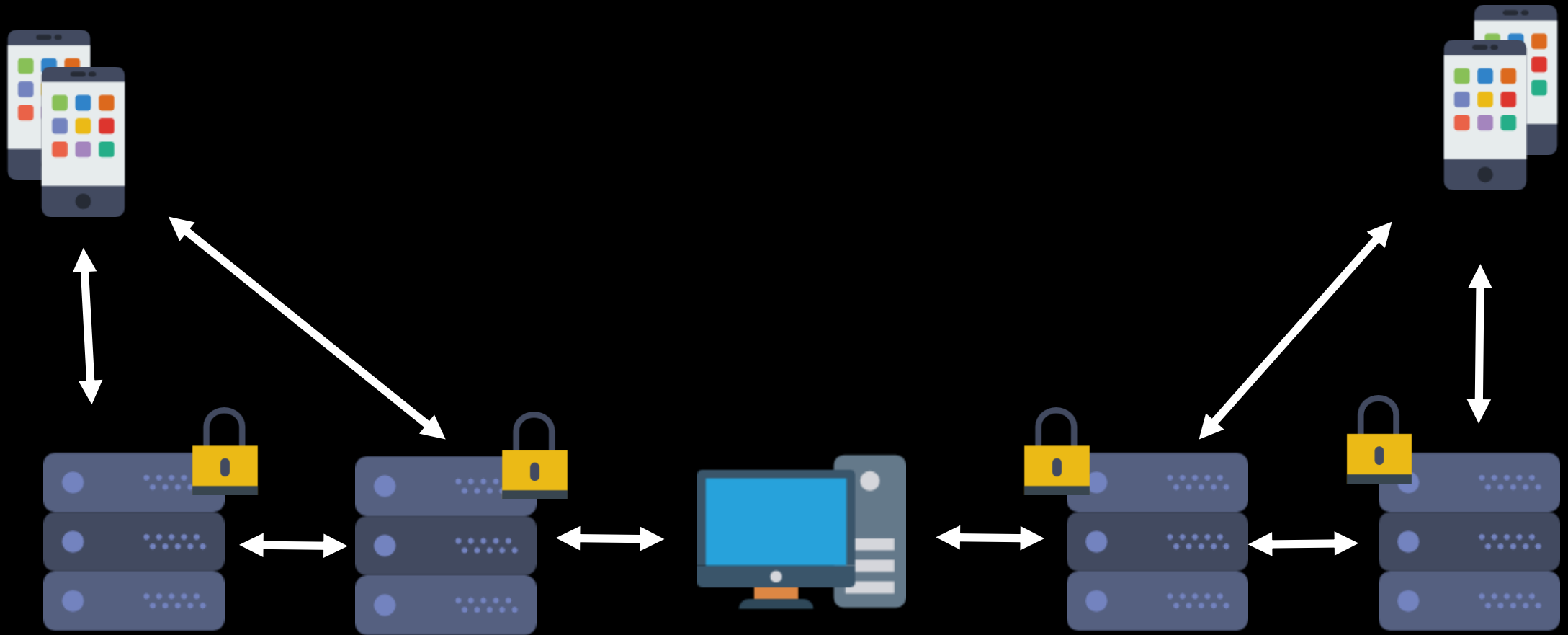
Then many servers



The on-premises Data Center was born...



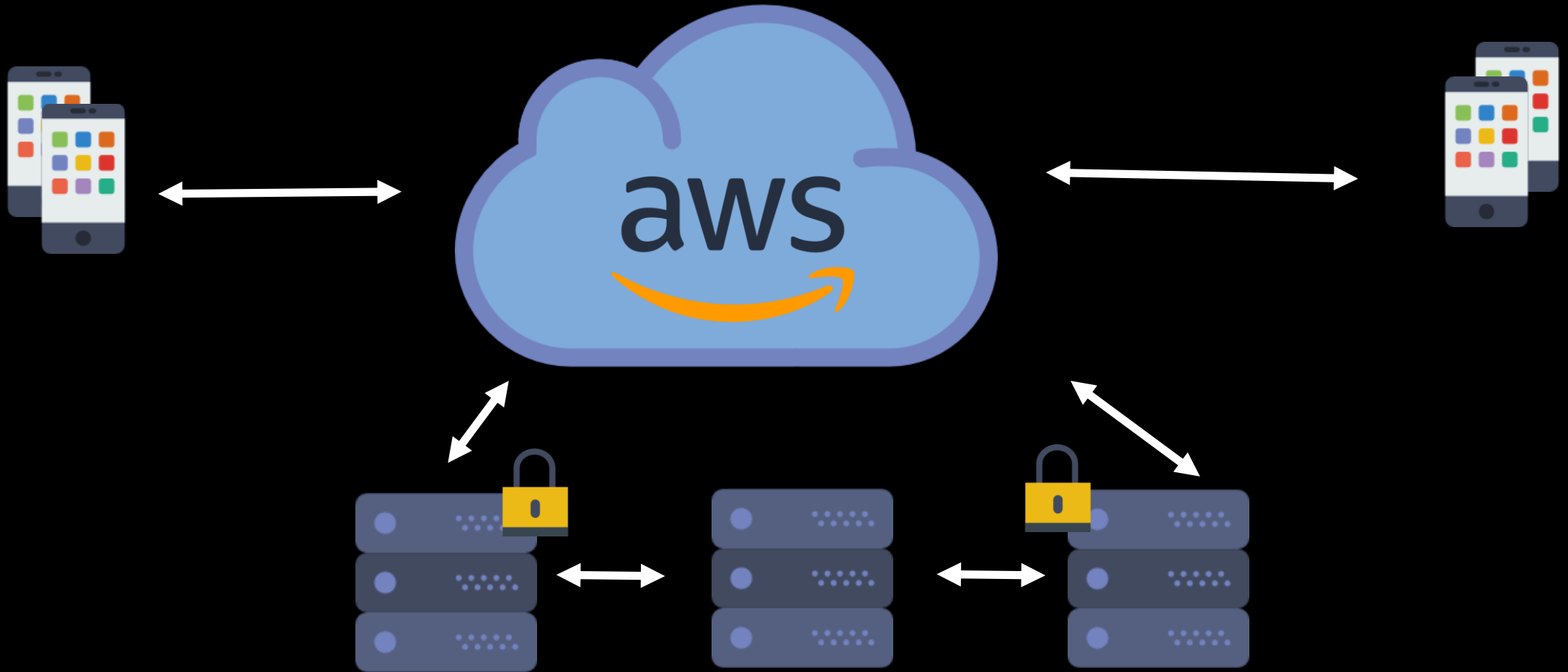
With Mobile, multi-geo became the game



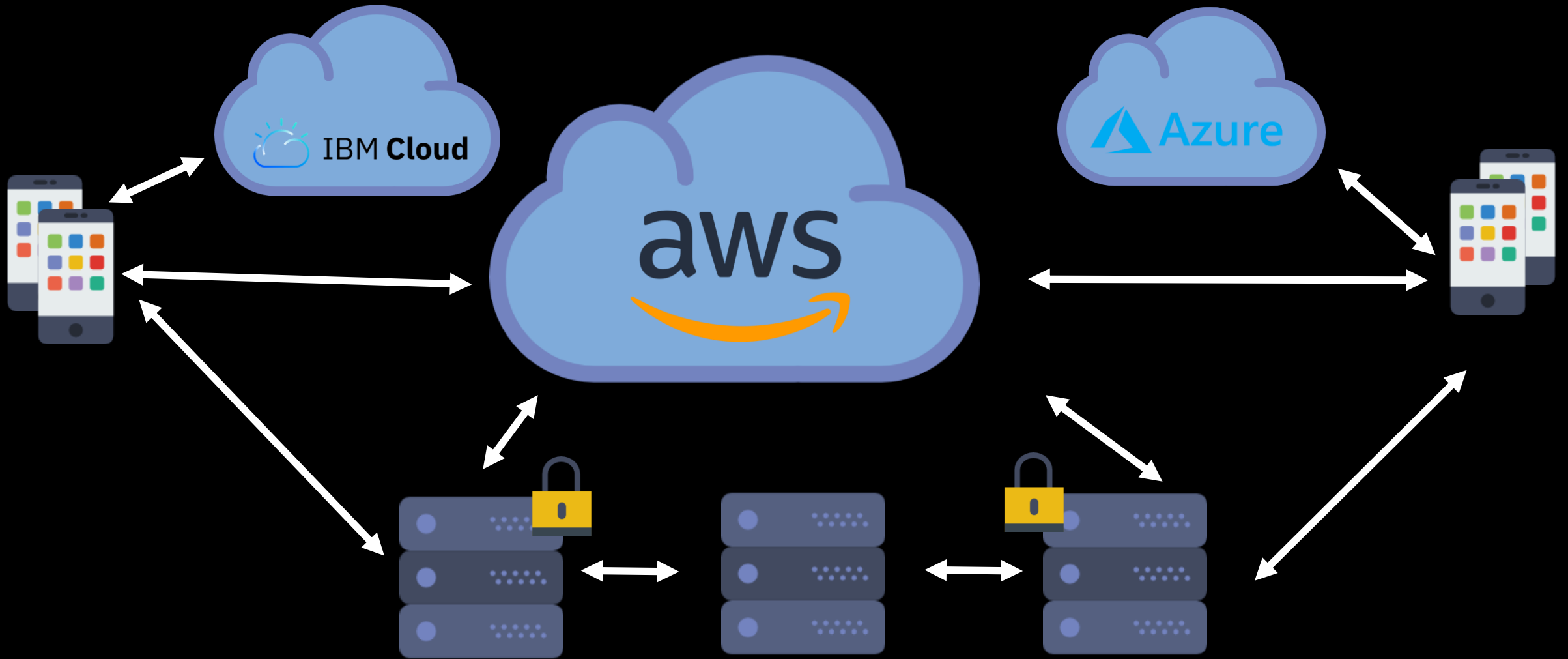
Reducing latency became expensive!



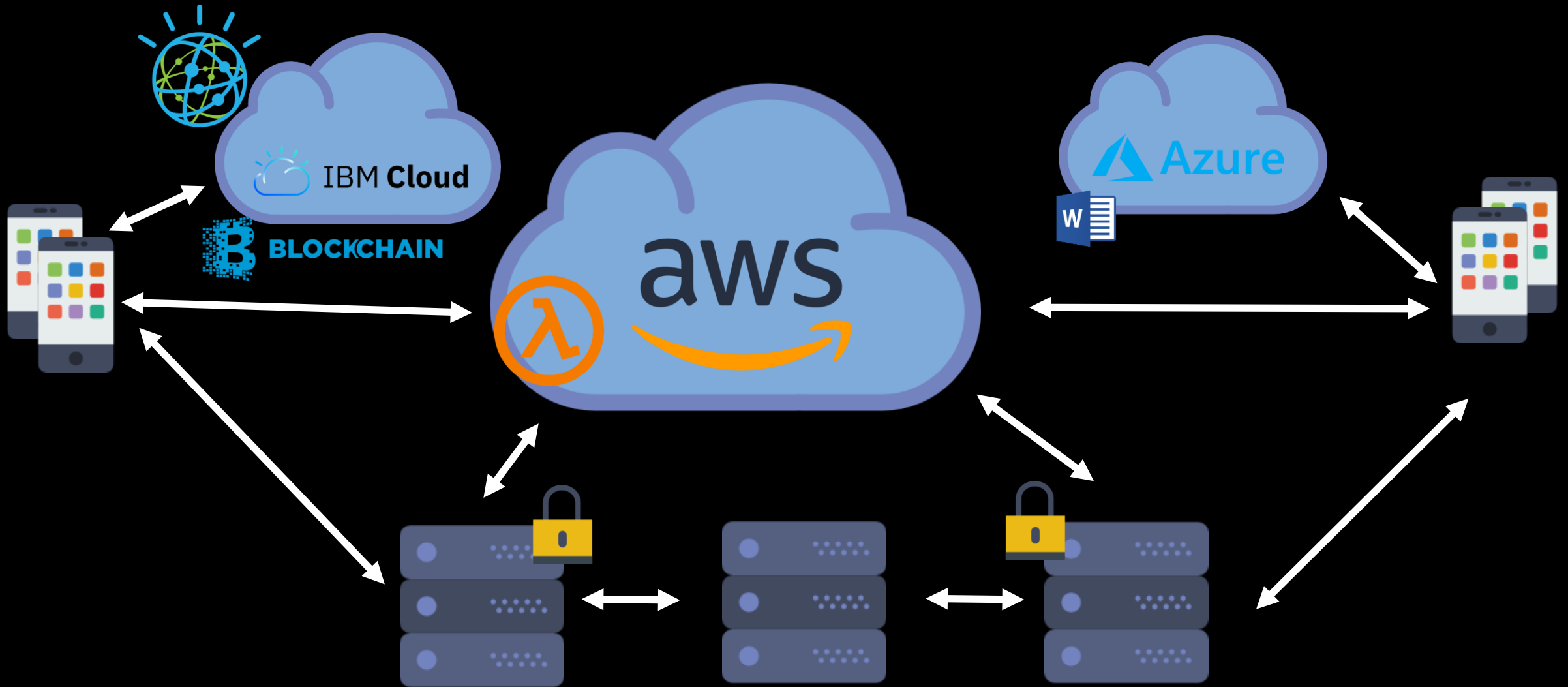
AWS to the rescue – Hybrid cloud is born



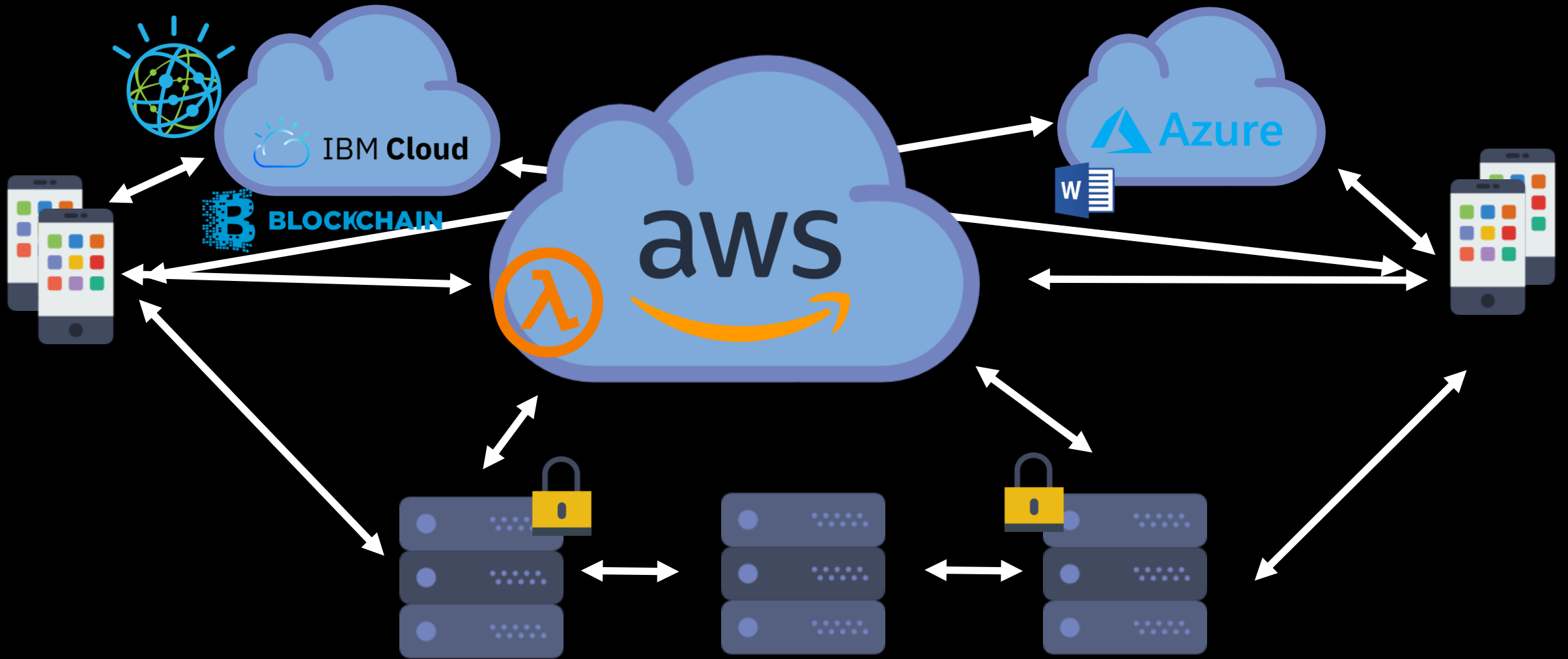
Then other clouds started to scale...



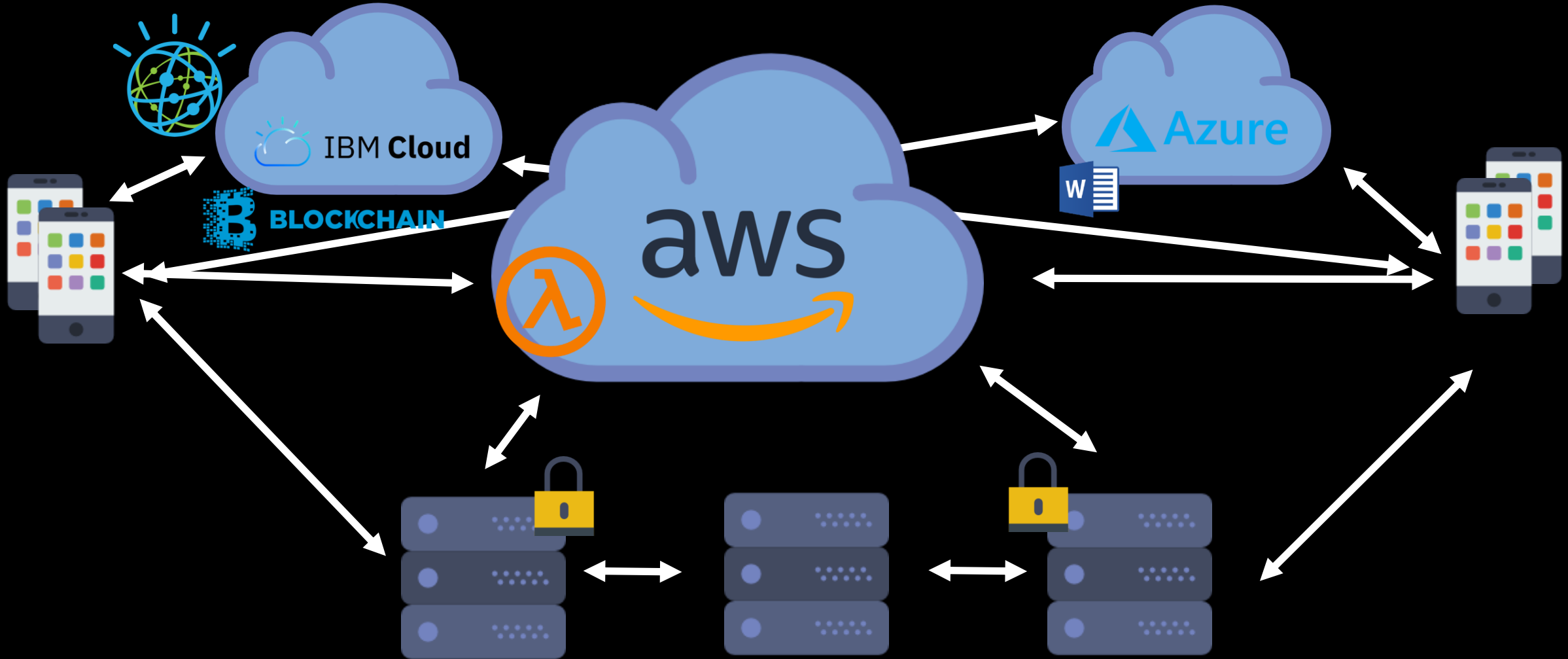
Each with their own advantages...



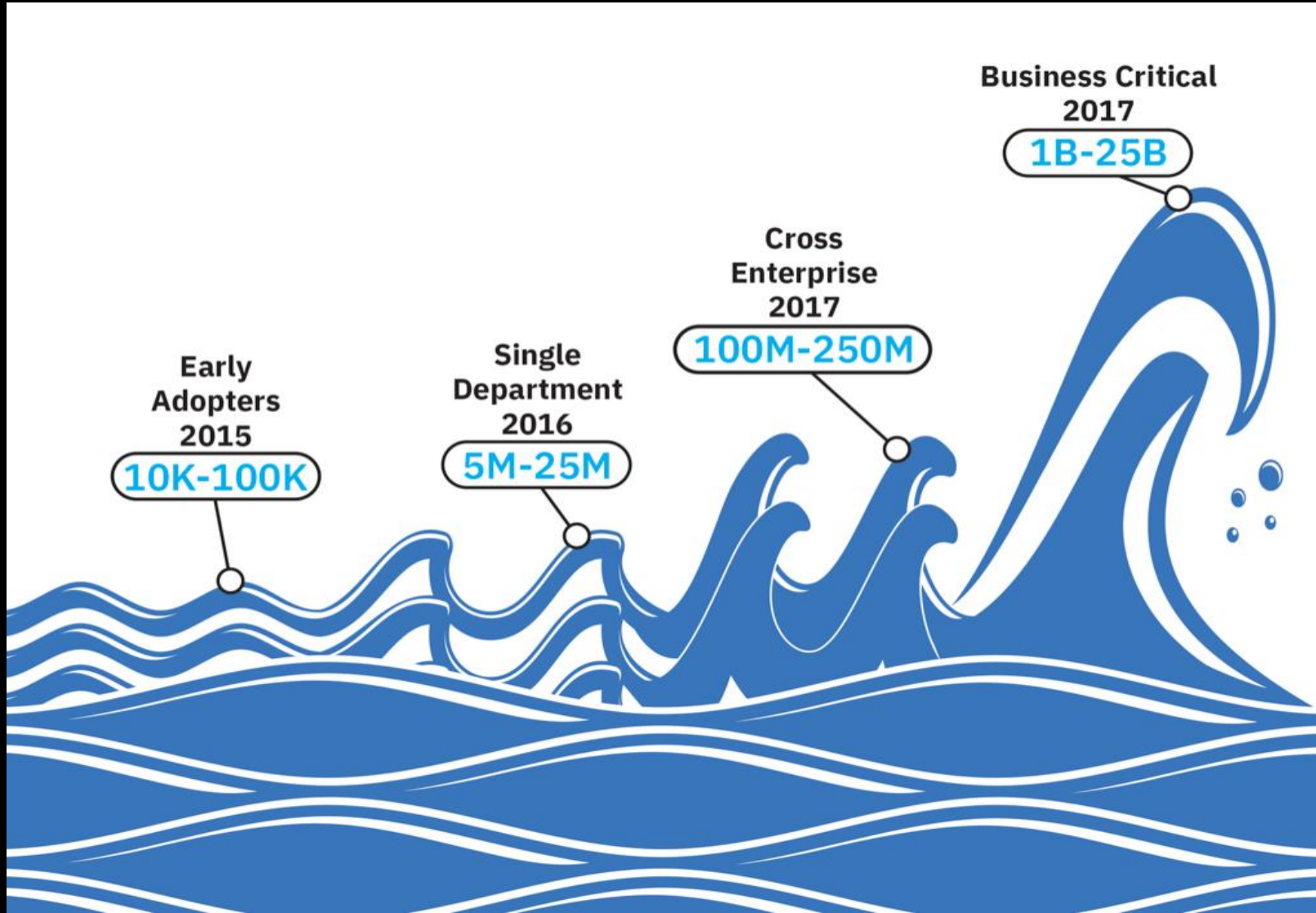
Multi-cloud is the norm (5+ clouds)



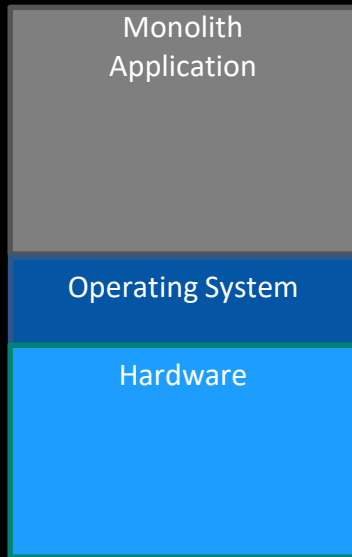
To survive this world, you need a multi-cloud API Strategy...



Multi-cloud + tsunami of API calls...

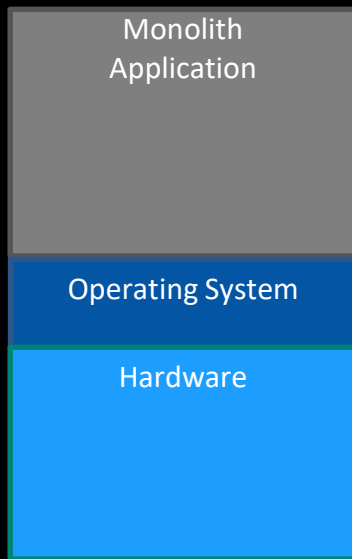


Evolution of Virtualization

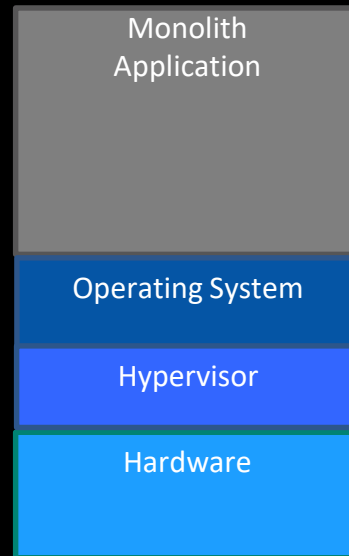


Bare Metal

Evolution of Virtualization

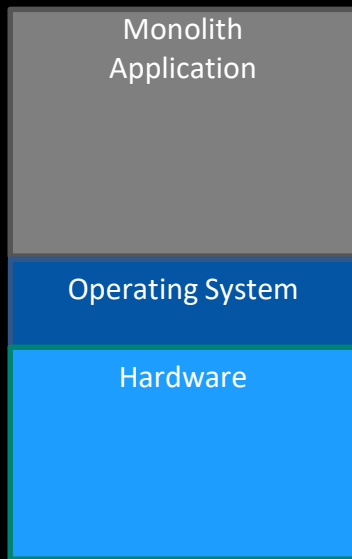


Bare Metal

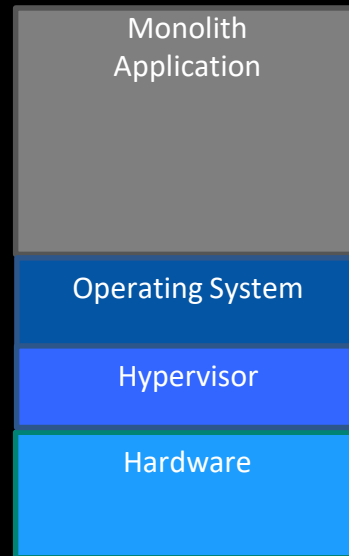


Virtual Machines

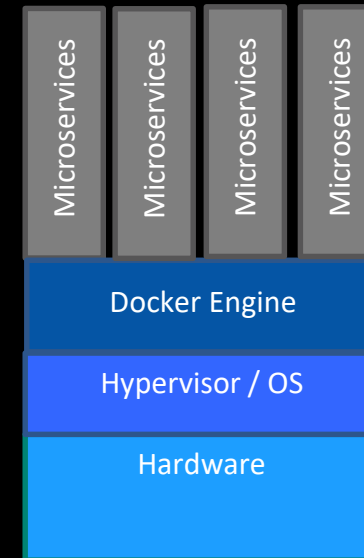
Evolution of Virtualization



Bare Metal

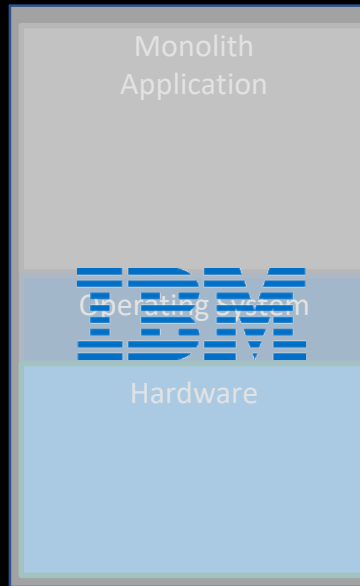


Virtual Machines



Containers

Evolution of Management at Scale



Bare Metal



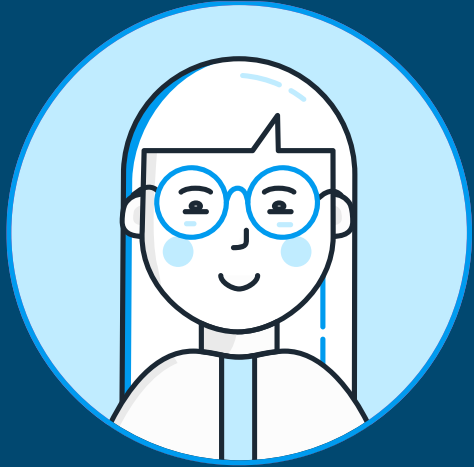
Virtual Machines



Containers

Meet the Players:

Four *Primary* Roles



Enterprise IT

- Responsible for traditional IT
- Very Security focused
- “Slow and steady”
- **Key Metrics: SLA, Security**



**API/Integration
Team Lead**

- Owner API “Products”
- Creates new APIs
- Creates integration flows
- “Between a rock and hard place”
- **Key Metrics: API calls # OF APIS**



App Developer

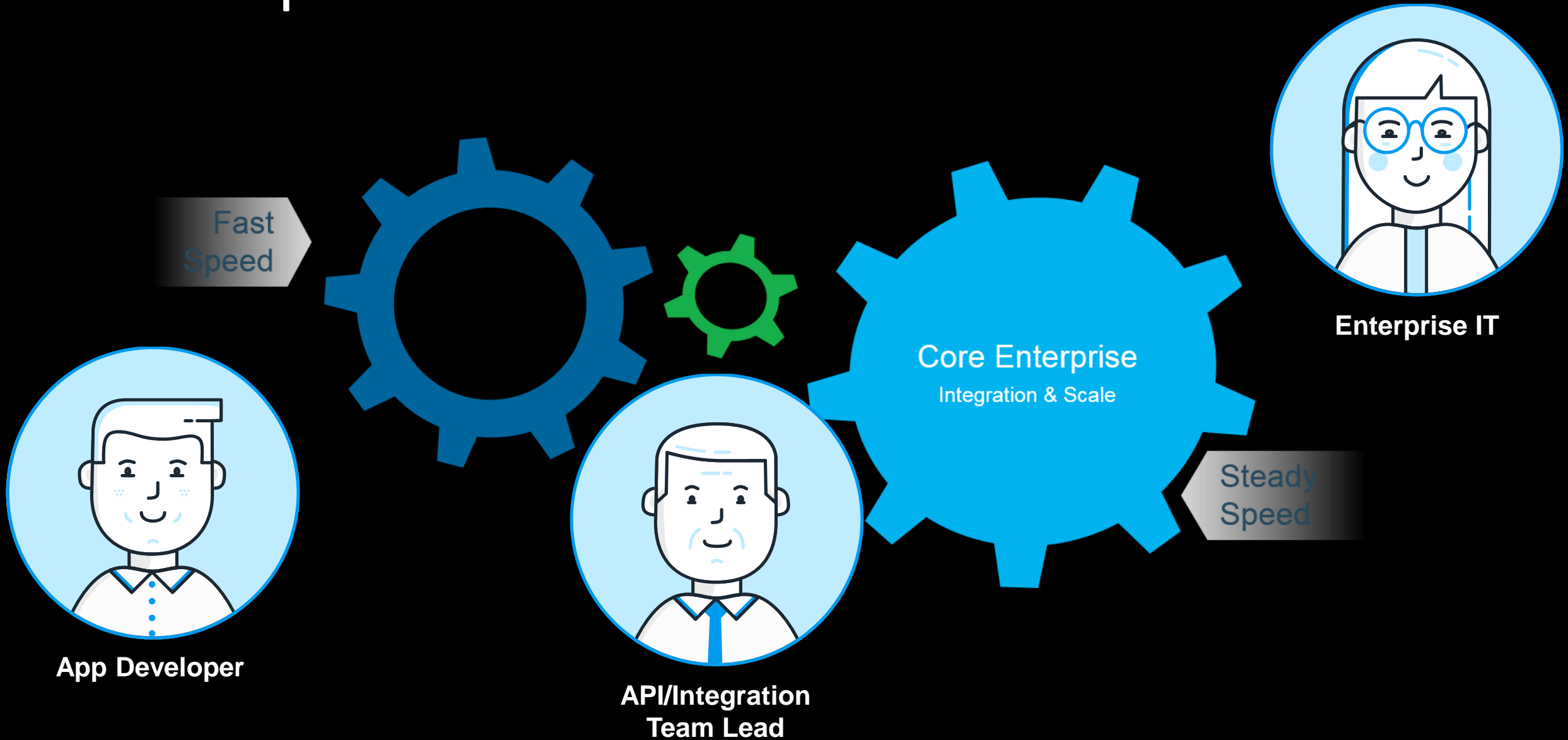
- Consumes APIs
- Creates Apps
- “Move fast and break things”
- **Key Metrics: MAU**



App User

- Uses the Apps
- “It’s gotta work every time and be fast”
- **Key Metric: Latency/Uptime**

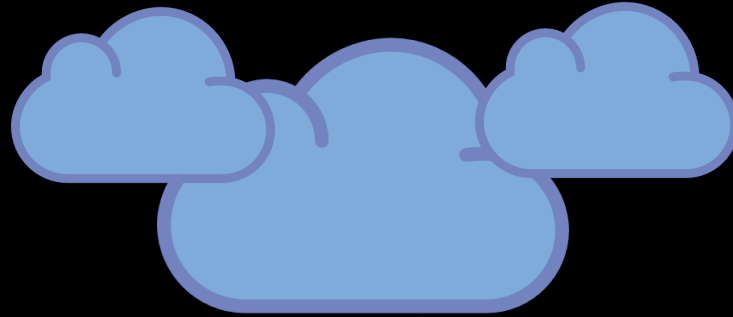
Two speed IT



The Rules of Multi-Cloud API Management



**Secure API Gateway
near target services**



**ANY Cloud
Flexibility**



**Microservice
Ready**

The Rules of Multi-Cloud API Management



**Secure API Gateway
near target services**



**ANY Cloud
Flexibility**



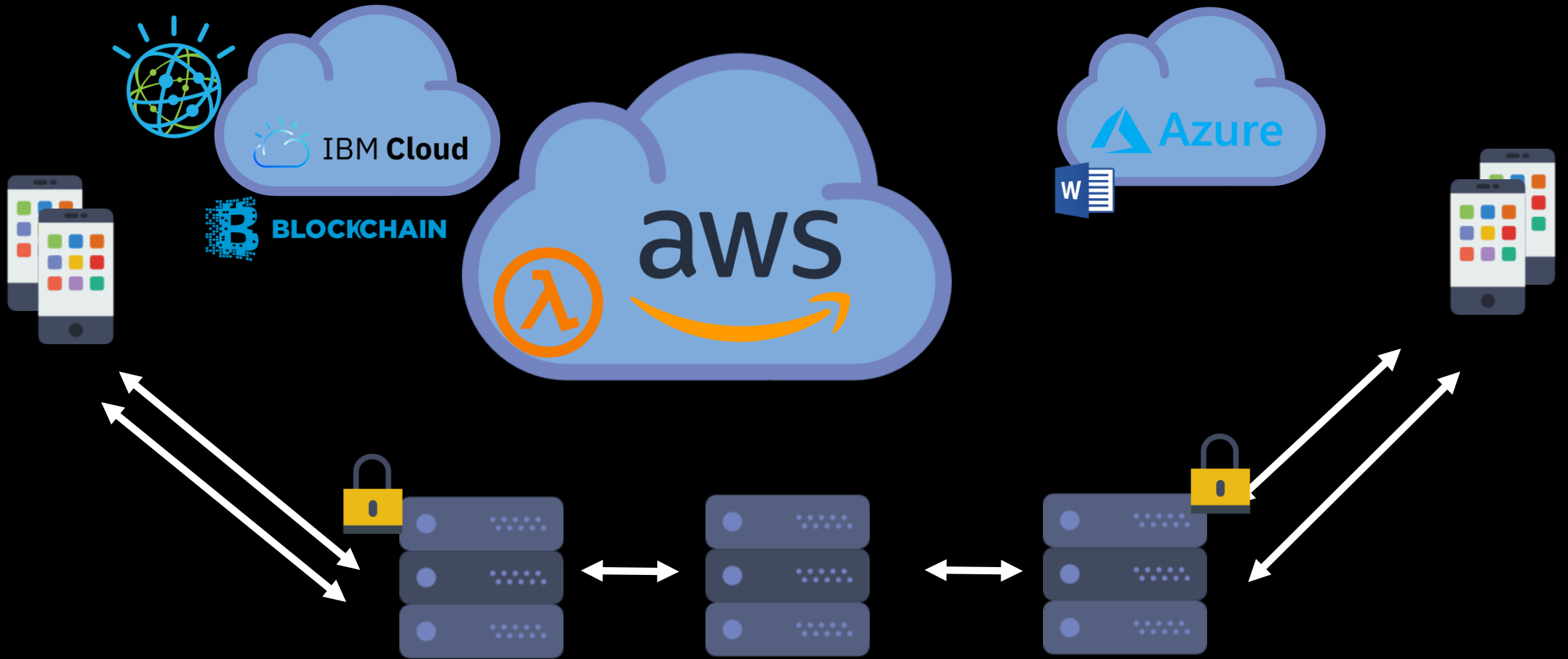
**Microservice
Ready**



Why do you want the API Gateway near a target service?

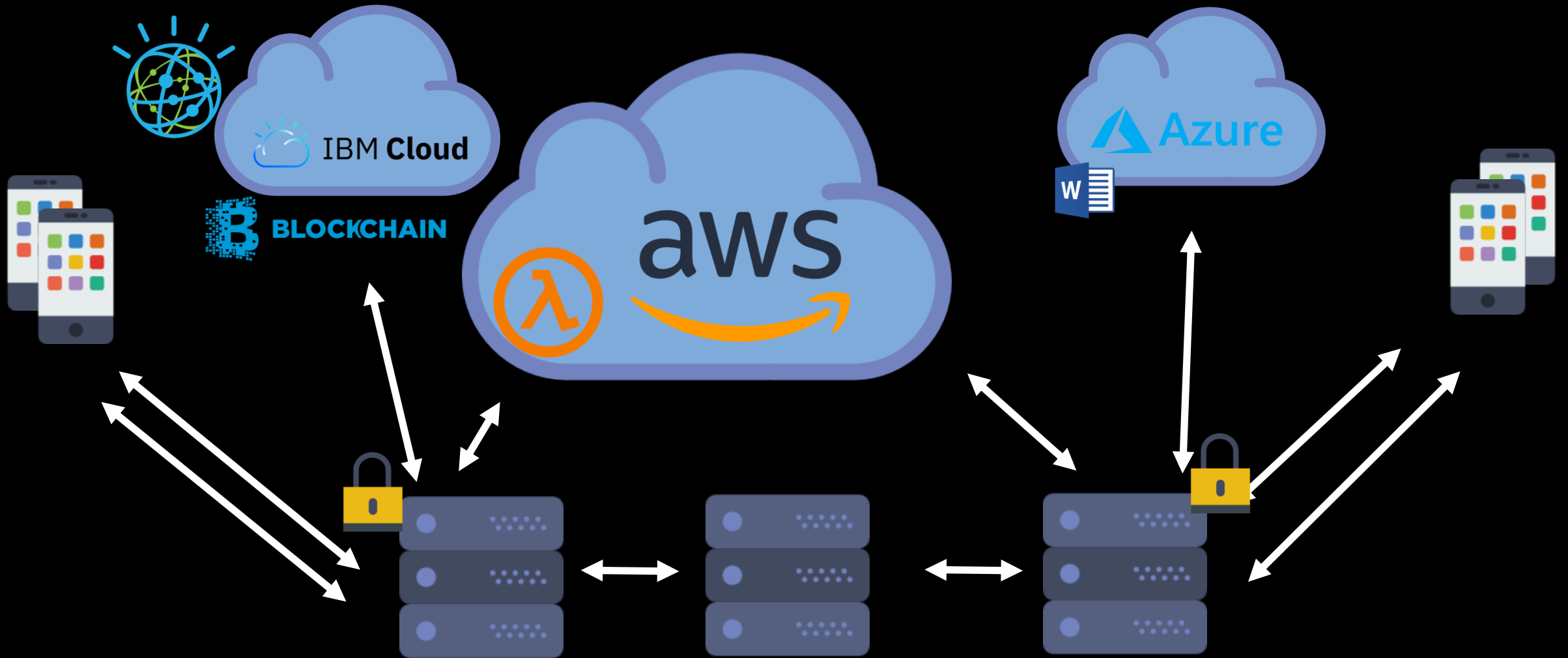


Added latency with calls to a “mother ship”

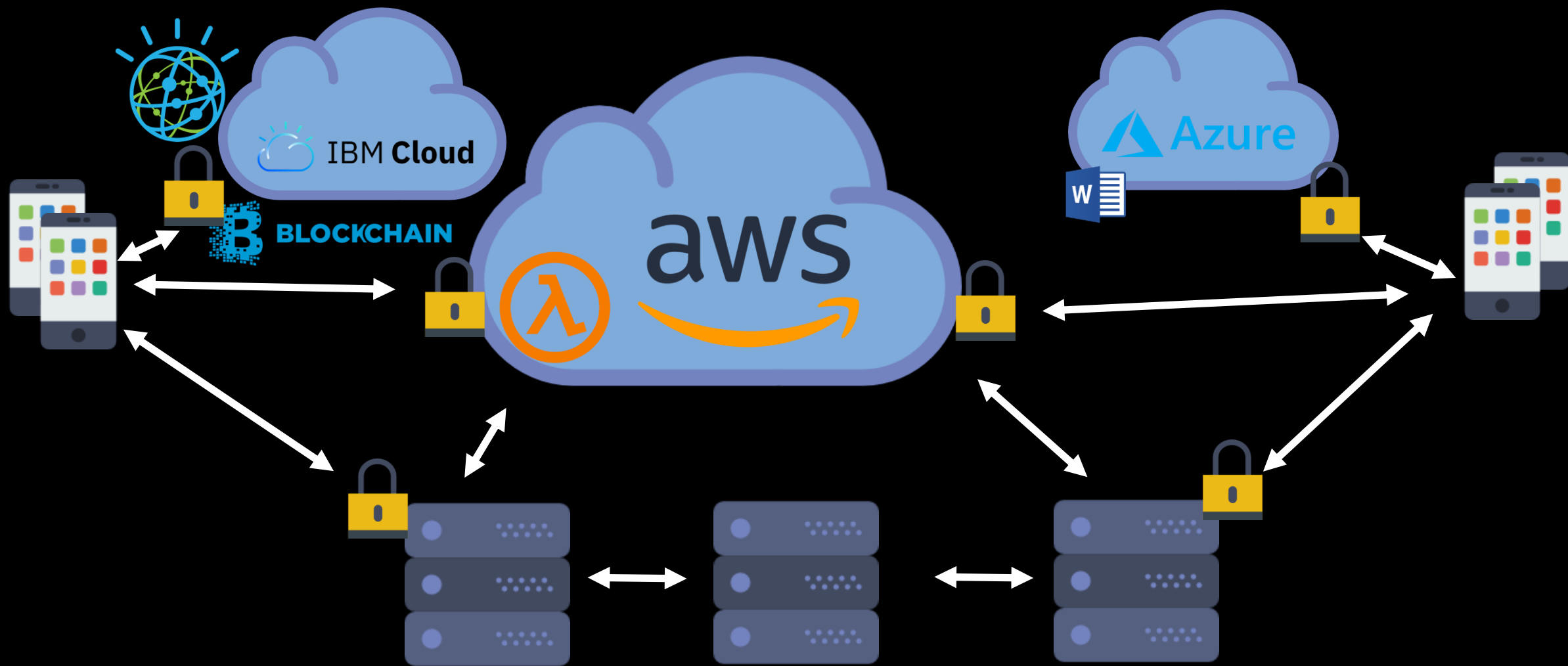




Added latency with calls to a “mother ship”



Put Gateways NEXT to your services





A distributed gateway strategy results in



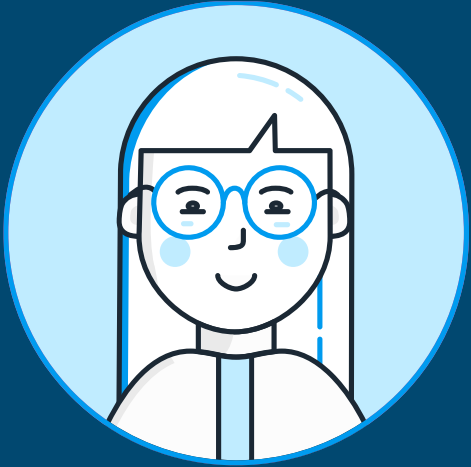
Reduced latency



Increased Security

Why the persona's need a distributed gateway

Four *Primary* Roles



Enterprise IT

- Same Gateway, everywhere
- Security
- Security
- Security



**API/Integration
Team Lead**

- Reach backends quicker
- Expose any services on any cloud



App Developer

- Reduce latency
- One set of APIs



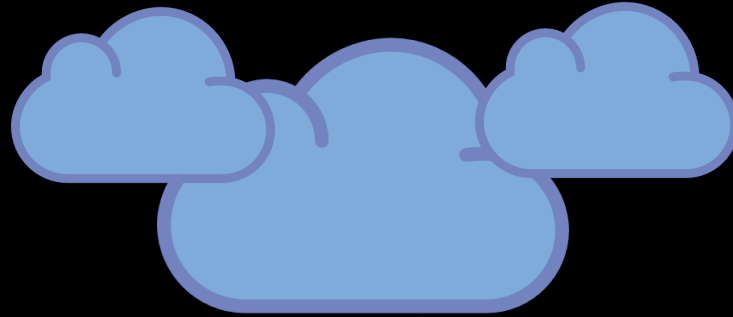
App User

- Reduces Latency!

The Rules of Multi-Cloud API Management



Secure API Gateway
near target service



ANY Cloud
Flexibility



Microservice
Ready

Any-cloud flexibility gives YOU more control

in a changing world



**Reduce Vendor
Lock in**

Any-cloud flexibility gives YOU more control in a changing world



**Reduce Vendor
Lock in**



**Use best of breed
services in
Each cloud**

Any-cloud flexibility gives YOU more control in a changing world



**Reduce Vendor
Lock in**



**Use best of breed
services in
Each cloud**



**Risk, Compliance
And Regulations**

Why the persona's need multi-cloud

Four *Primary* Roles



Enterprise IT

- GDPR
- Security! Same Gateway everywhere!



**API/Integration
Team Lead**

- Reduce vendor lock-in
- Expose any service on any cloud



App Developer

- Reduce latency
- One set of APIs
- GDPR



App User

- Reduces Latency!

The Rules of Multi-Cloud API Management



Secure API Gateway
near target service



ANY Cloud
Flexibility

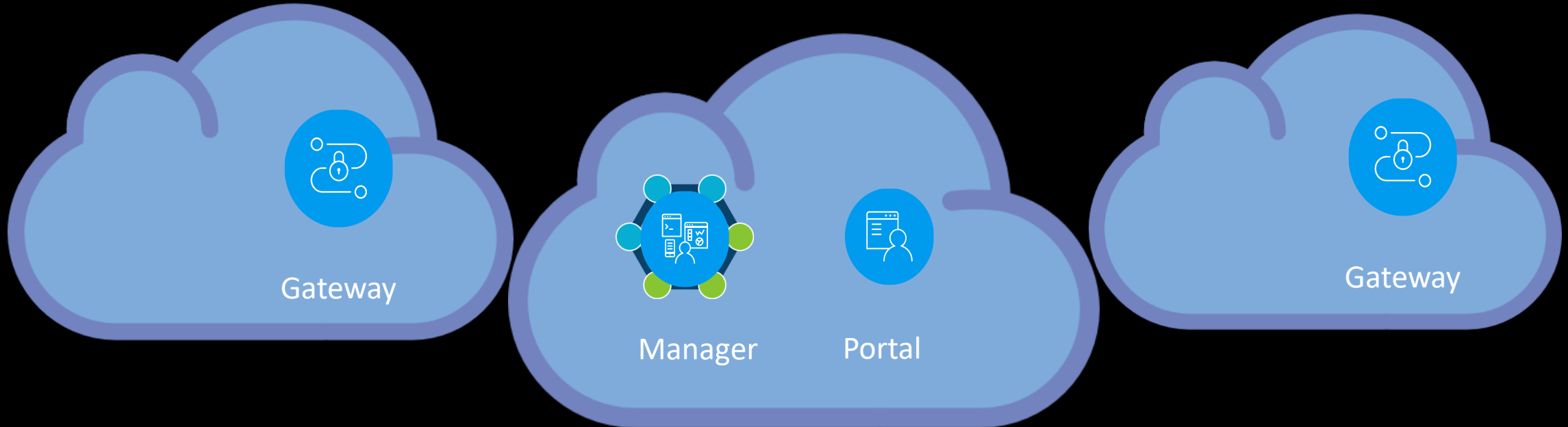


Microservice
Ready

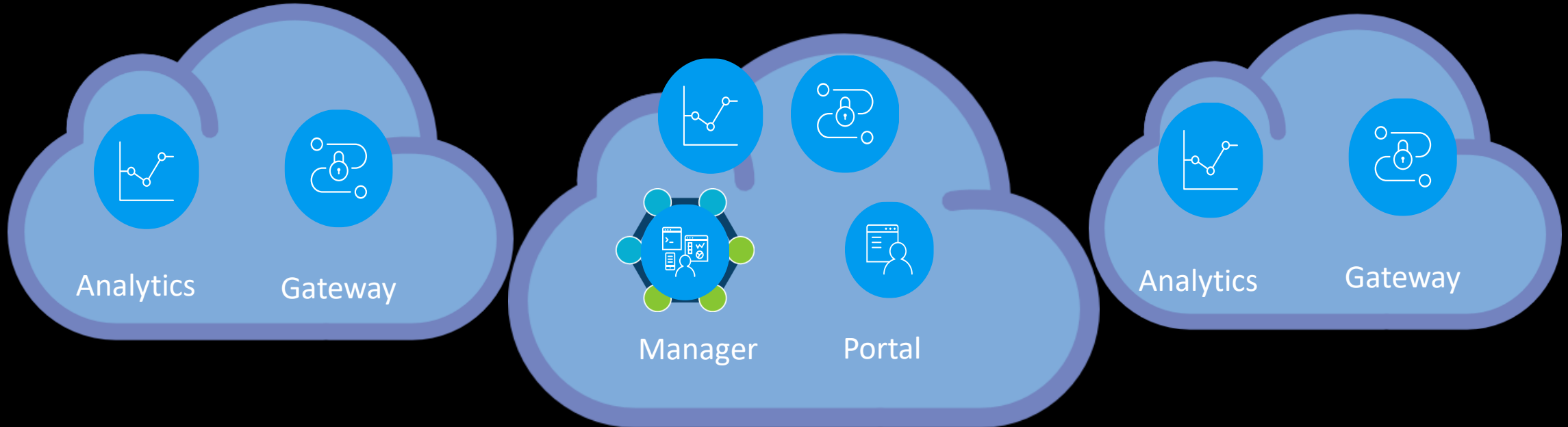


Your API Strategy needs to include a
microservice strategy

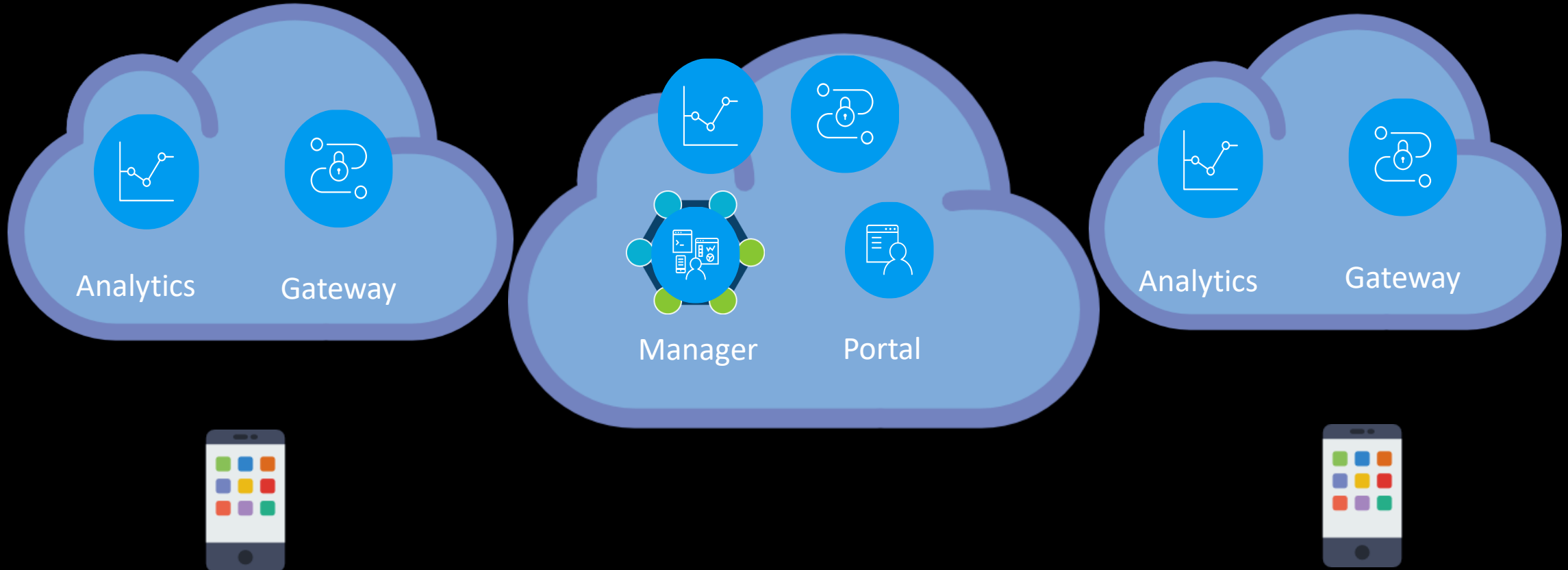
Meta: The API Management solution needs to be microservice ready



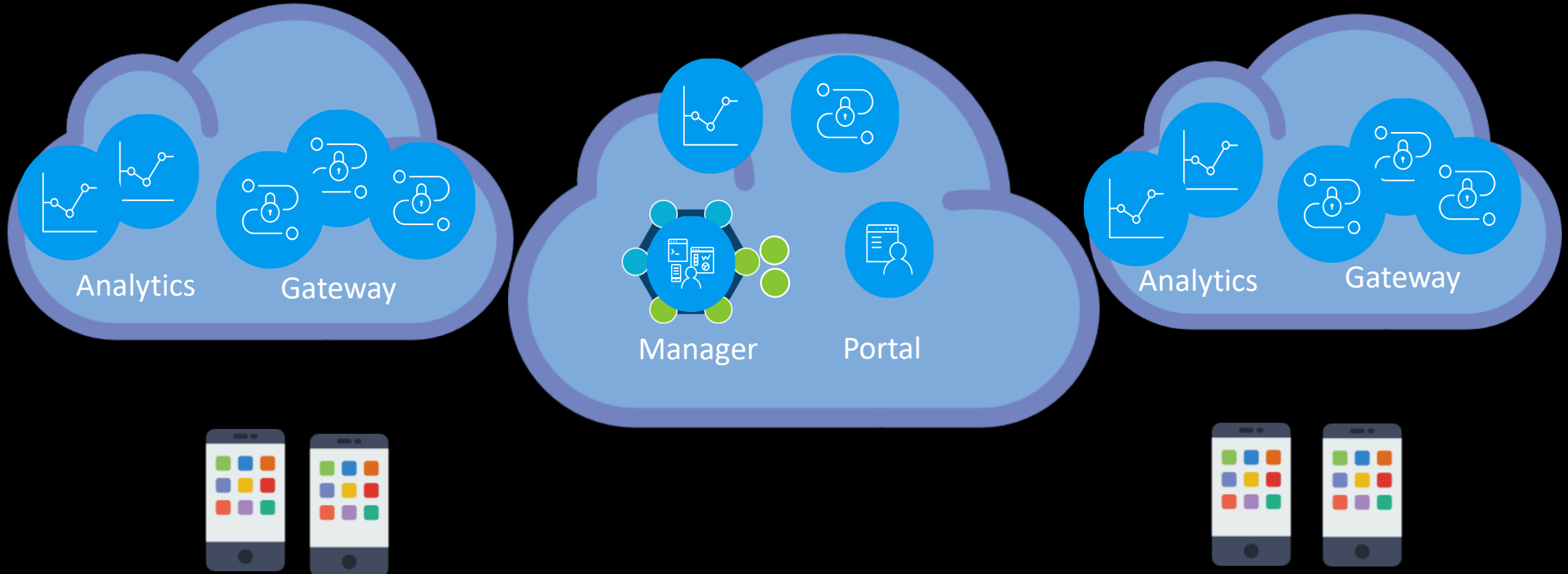
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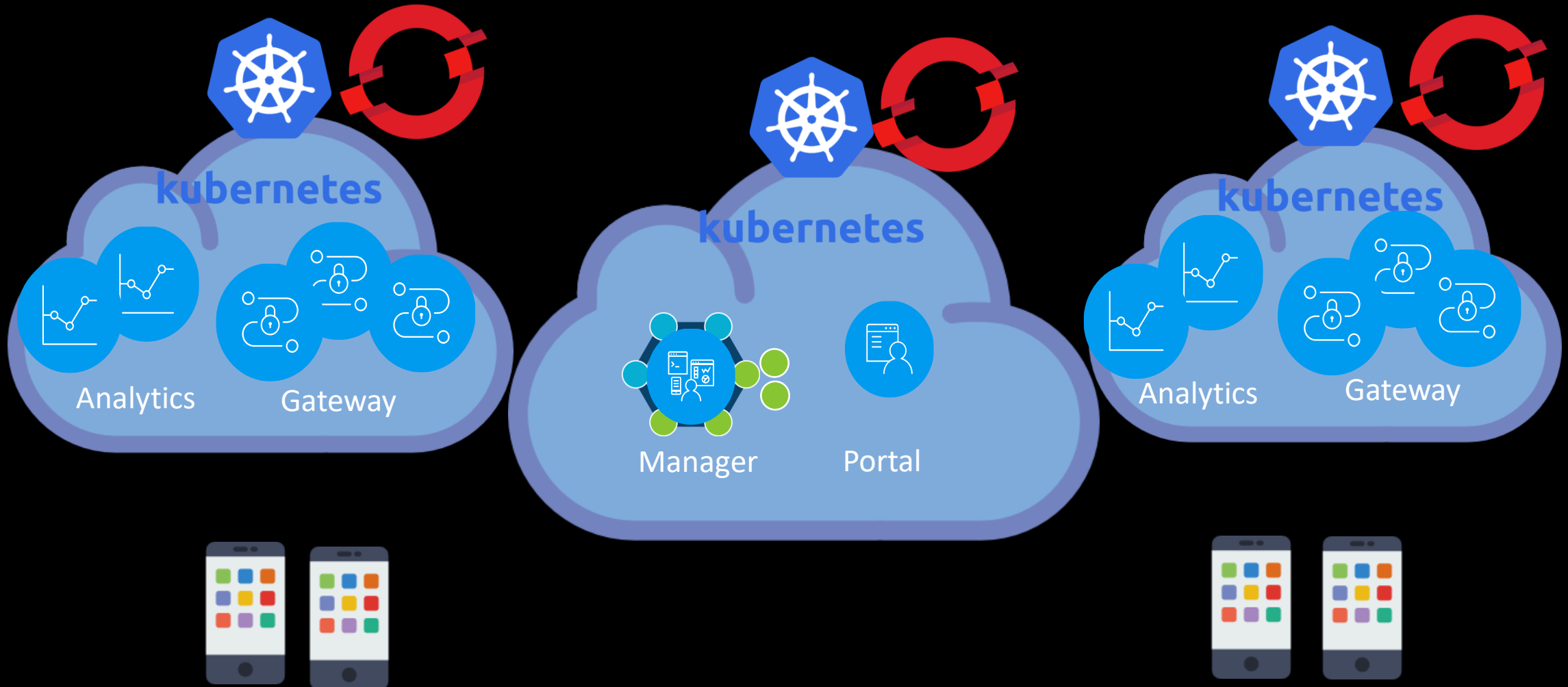
Meta: The API Management solution needs to be microservice ready



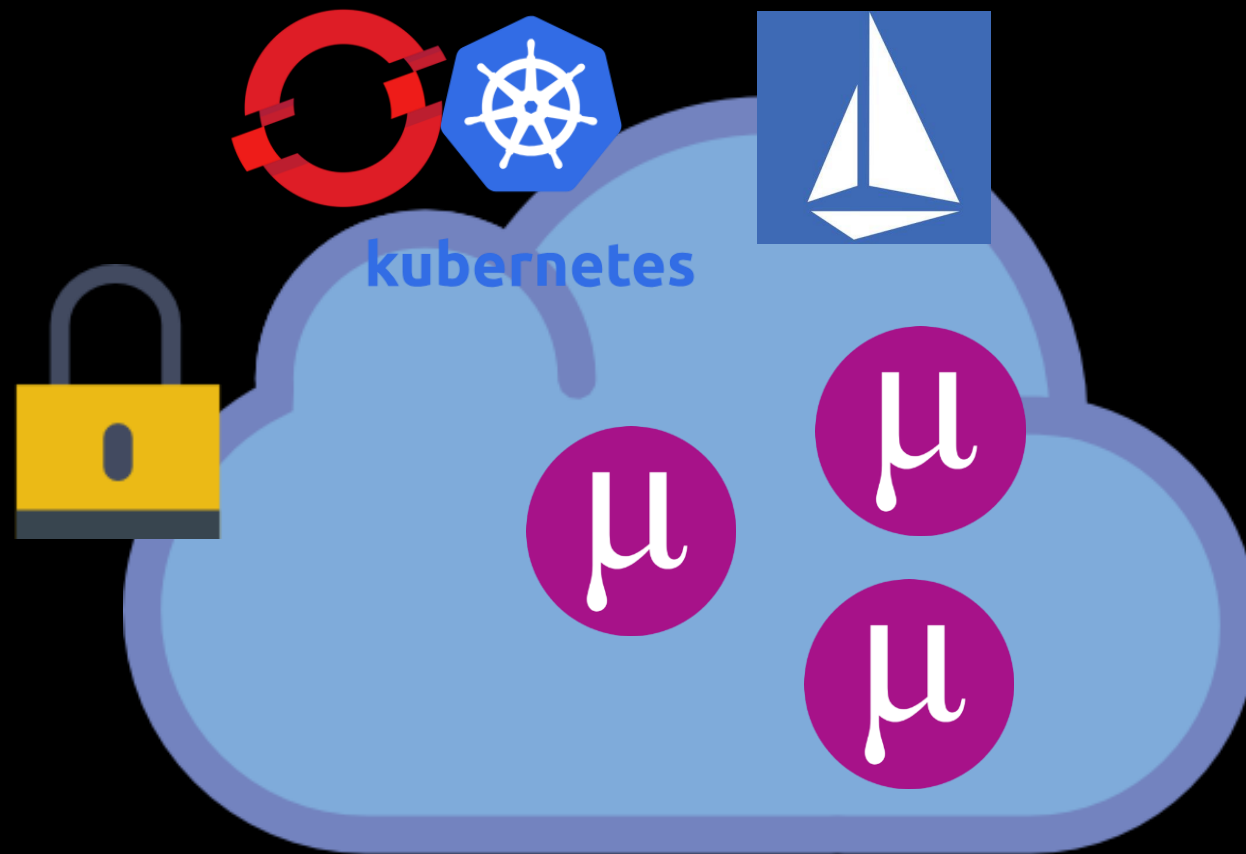
Meta: The API Management solution needs to be microservice ready



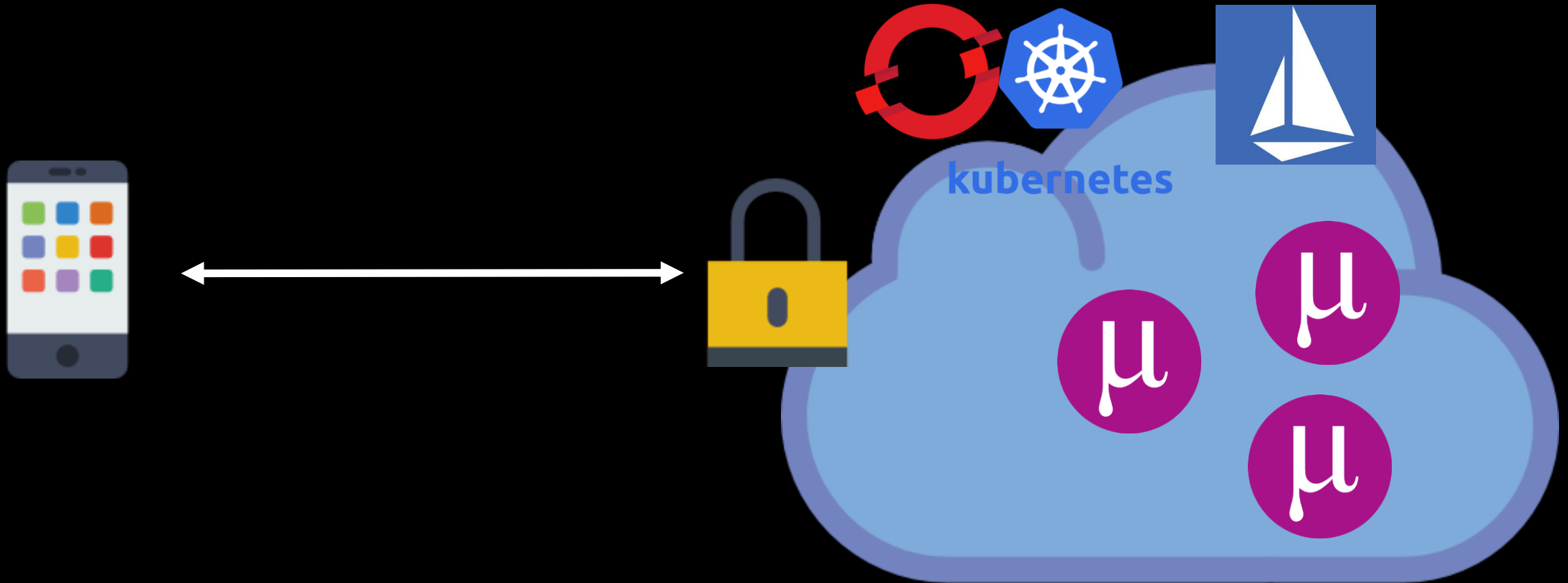
Meta: The API Management solution needs to be microservice ready



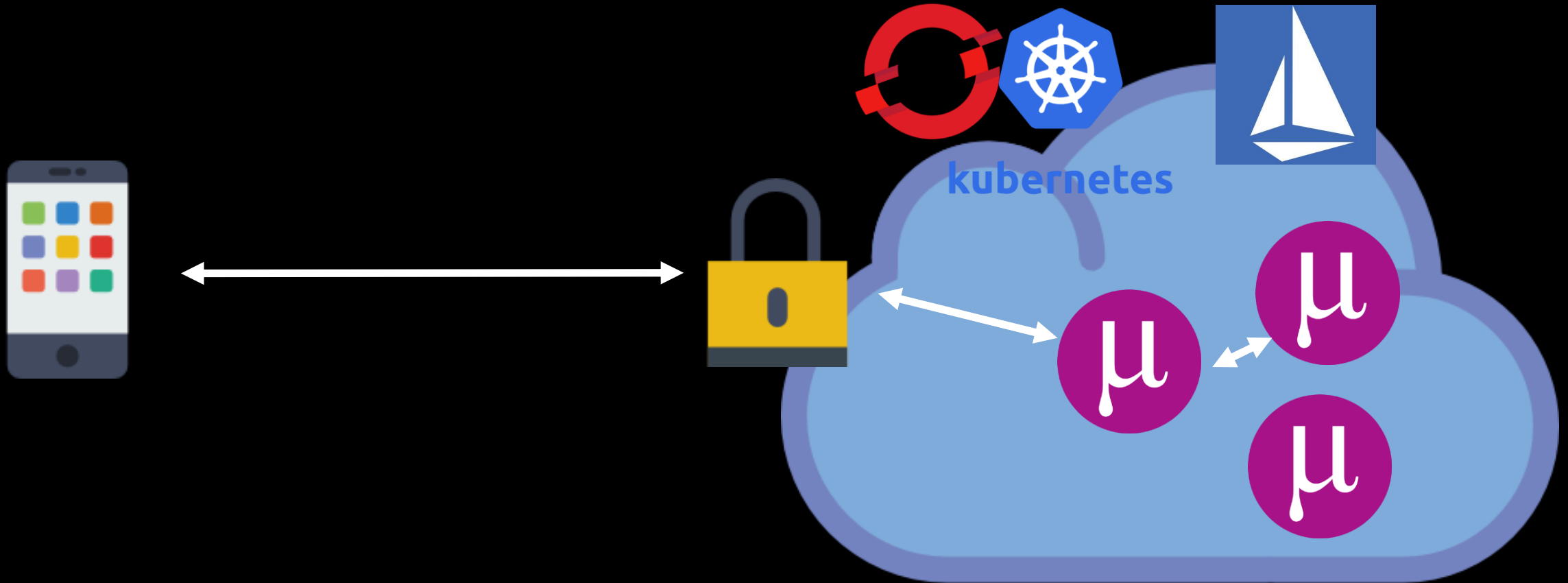
API Management needs to be ready for Istio (Microservice Meshes)



API Management needs to be ready for Istio (Microservice Meshes)

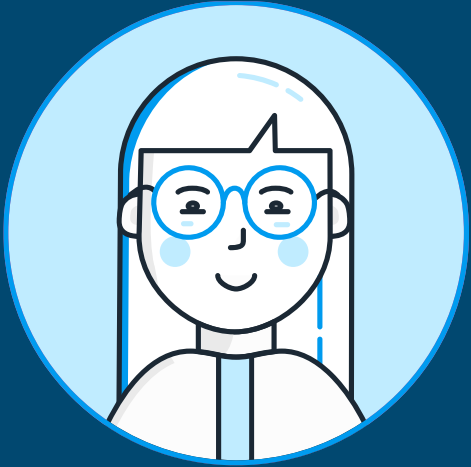


API Management needs to be ready for Istio (Microservice Meshes)



Why the persona's need a microservice ready solution

Four *Primary* Roles



Enterprise IT

- GDPR
- Increase security to the backend
- SLA!



**API/Integration
Team Lead**

- Add new optionality for plans
- Better experience for App Developers
- Costs Less!



App Developer

- Faster!



App User

- Reduces Latency!
- Increases SLA

The Rules of Multi-Cloud API Management



**API Gateway near to
target service**

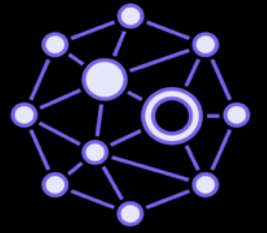


**ANY Cloud
Flexibility**



**Microservice
Ready**

IBM is a multi-cloud leader



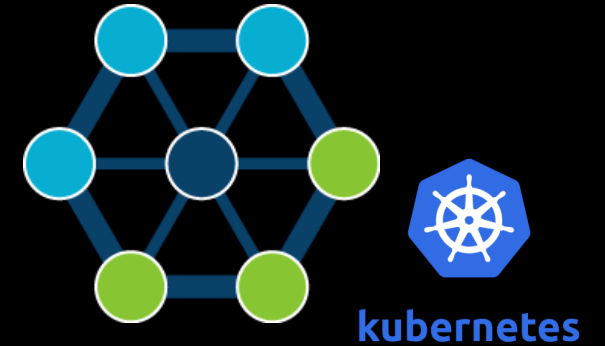
IBM API Connect



**IBM's market leading
API Gateway can be
deployed ANYWHERE**



**API Connect can be
deployed on ANY cloud
(including private clouds)**



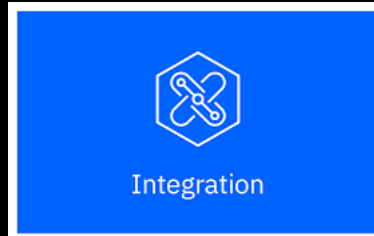
**API Connect was re-
engineered, from the
bottom up , with
microservices and
Managed by K8**

What's Next?

Cloud Paks that can run anywhere...



Red Hat



**IBM is ready for
Every cloud!**



Microservice Masters



**API Management built with
Microservices for maximum
scalability**



kubernetes



OPENSIFT

**API Connect uses Kubernetes
for container orchestration:
OOTB self-healing and auto-
scaling**

Codeless API testing and Monitoring

Test Now

+

✎

⌵

🗑

Save

Save & Exit

Environments

⌵

Run Test

Autosave

CODE

VISUAL

Data Sets

Vault Beta

HTTP Client

GET to \${endpointUrl}

GET REQUEST

Generated

Mode: json

Var: payload

Expect: Params: [server_token:server..longitude:longitude]

Edit

Aeq

payload_response.statusCode must be equal to

200

ASSERT EQUALS

Mode: Level: Execute only if item exists: Stop test if fails:

Aeq

payload_response.headers['Content-Type'] must be equal to

application/json

ASSERT EQUALS

Mode: Level: Execute only if item exists: Stop test if fails:

Ae

payload must exist

ASSERT EXISTS

Generated

Mode: Level: Stop test if fails:

AI

payload.products must be array

ASSERT IS

Generated

Mode: Type: array

Level: Execute only if item exists: Stop test if fails:

for each in

payload.products.pick(5)

the nested assertions will be executed

Generated

AI

_1.capacity must be integer

ASSERT IS

Generated

Mode: Type: integer

Level: Execute only if item exists: Stop test if fails:

AI

_1.cash_enabled must be boolean

ASSERT IS

Generated

Mode: Type: boolean

Level: Execute only if item exists: Stop test if fails:

Ae

_1.description must exist

ASSERT EXISTS

Generated

Mode: Level: Stop test if fails:

PUBLIC API / Endpoints

🔍

https://api.penguinrandom...US/titles/[isbn]/weblinks	50ms MIN	209ms AVG	380ms MAX	🟢
https://api.penguinrandom...PRH.US/titles/[isbn]/work	46ms MIN	211ms AVG	473ms MAX	🟢
https://api.penguinrandom...tle/domains/PRH.US/titles	49ms MIN	562ms AVG	10085ms MAX	🟢
/resources/v2/title/doma...H.US/titles/[isbn]/events	50ms MIN	226ms AVG	454ms MAX	🟢
https://api.penguinrandom...ouse.com/resources/titles	62ms MIN	434ms AVG	2941ms MAX	🟢
https://api.penguinrandom...authors/[authorid]/titles	49ms MIN	256ms AVG	487ms MAX	🟢
https://api.penguinrandom.../events/[eventid]/authors	49ms MIN	226ms AVG	386ms MAX	🟢
https://api.penguinrandom...tle/domains/PRH.US/events	53ms MIN	598ms AVG	1768ms MAX	🟢
https://api.penguinrandom...US/titles/[isbn]/domains	47ms MIN	245ms AVG	482ms MAX	🟢
https://api.penguinrandom...ains/PRH.US/titles/[isbn]	46ms MIN	210ms AVG	408ms MAX	🟢
https://api.penguinrandom...US/titles/[isbn]/content	47ms MIN	197ms AVG	383ms MAX	🟢

Tests

Endpoints

4k

2k

0

14:10

14:20

14:30

14:40

14:50

Download

Latency

🔴 Downtime: 0%

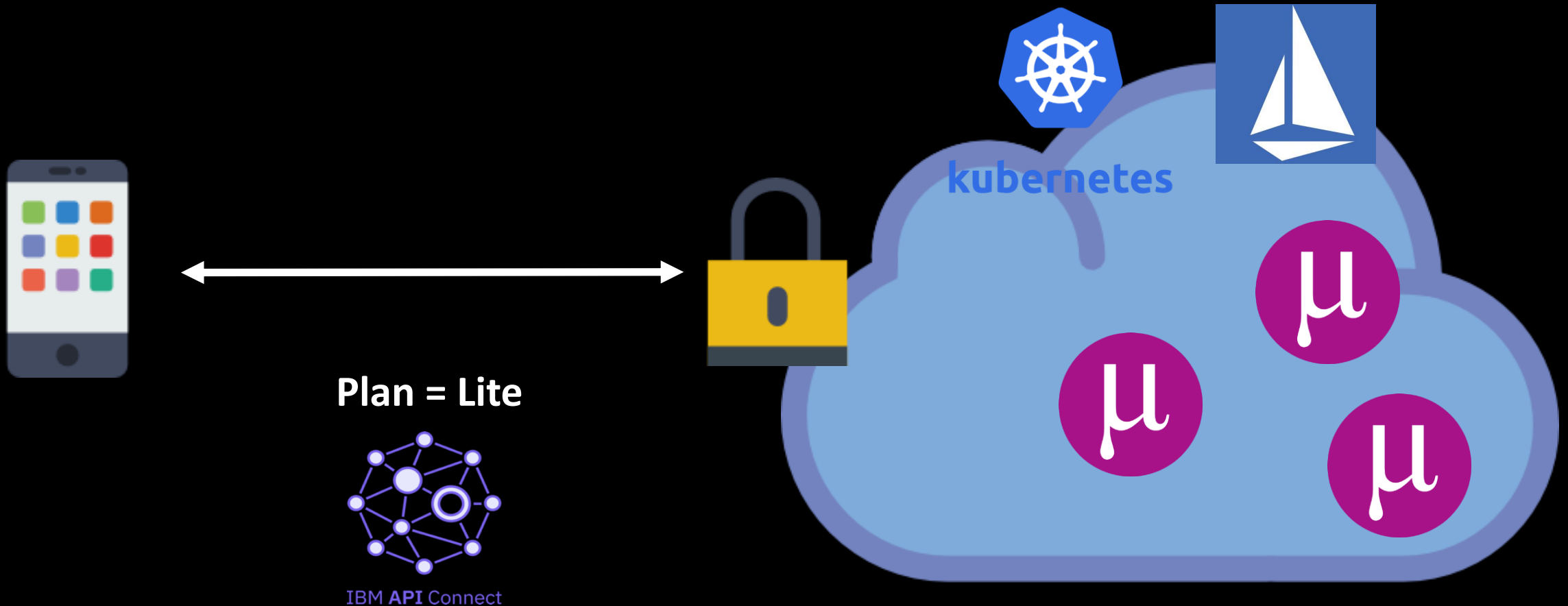
🟢 Uptime: 100%

Istio! Microservice + API Management

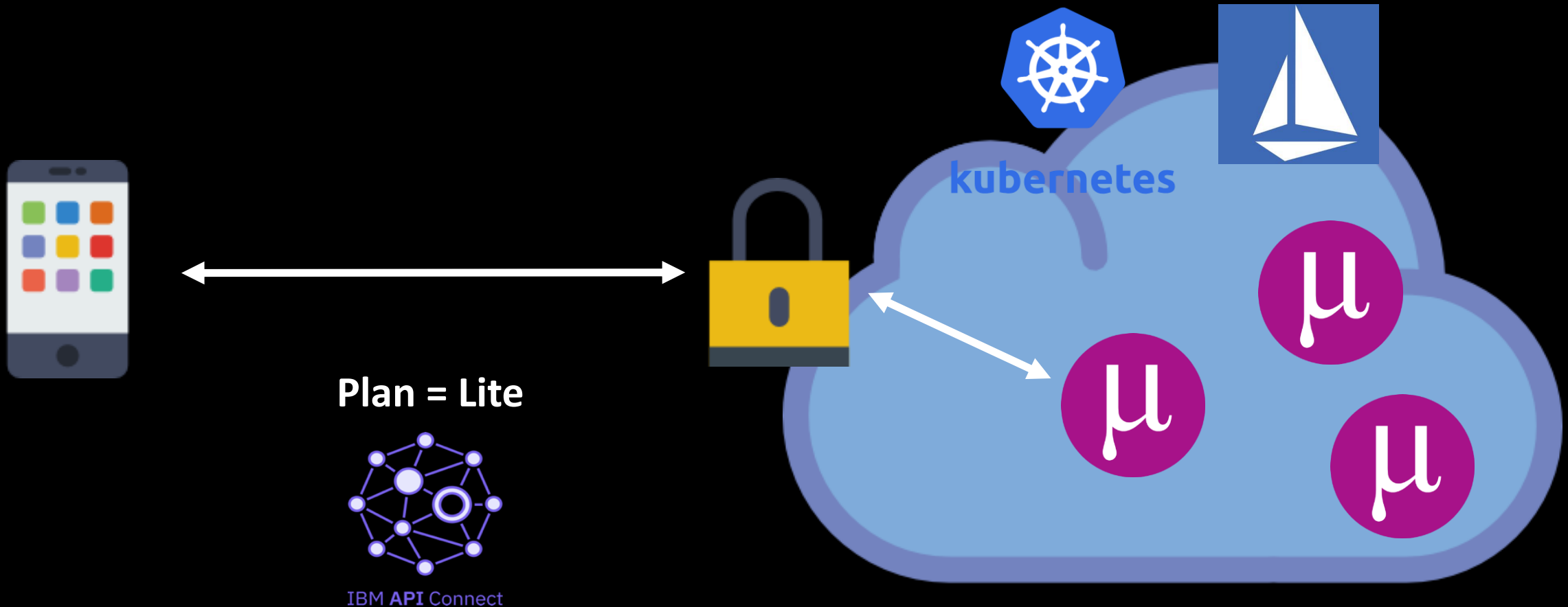


IBM partnered with Google and Lyft to launch Istio

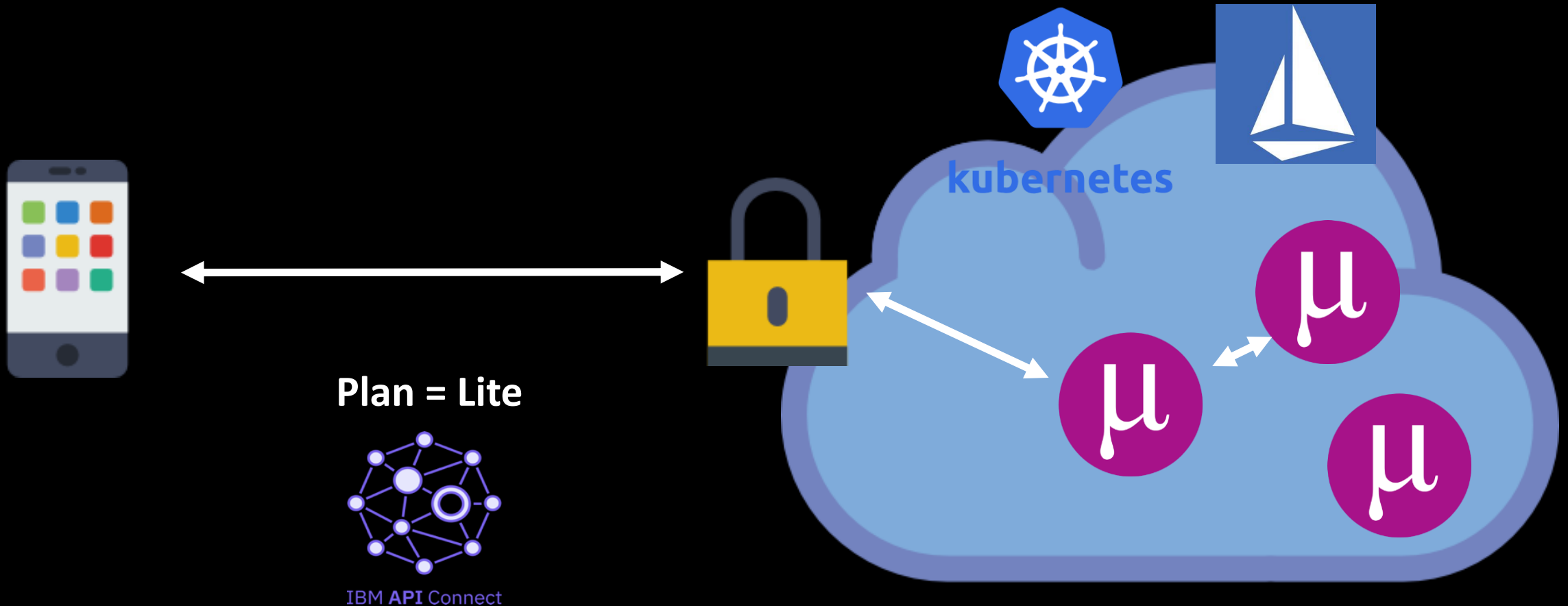
From the Labs: APIm Augmentation of the Istio Mesh



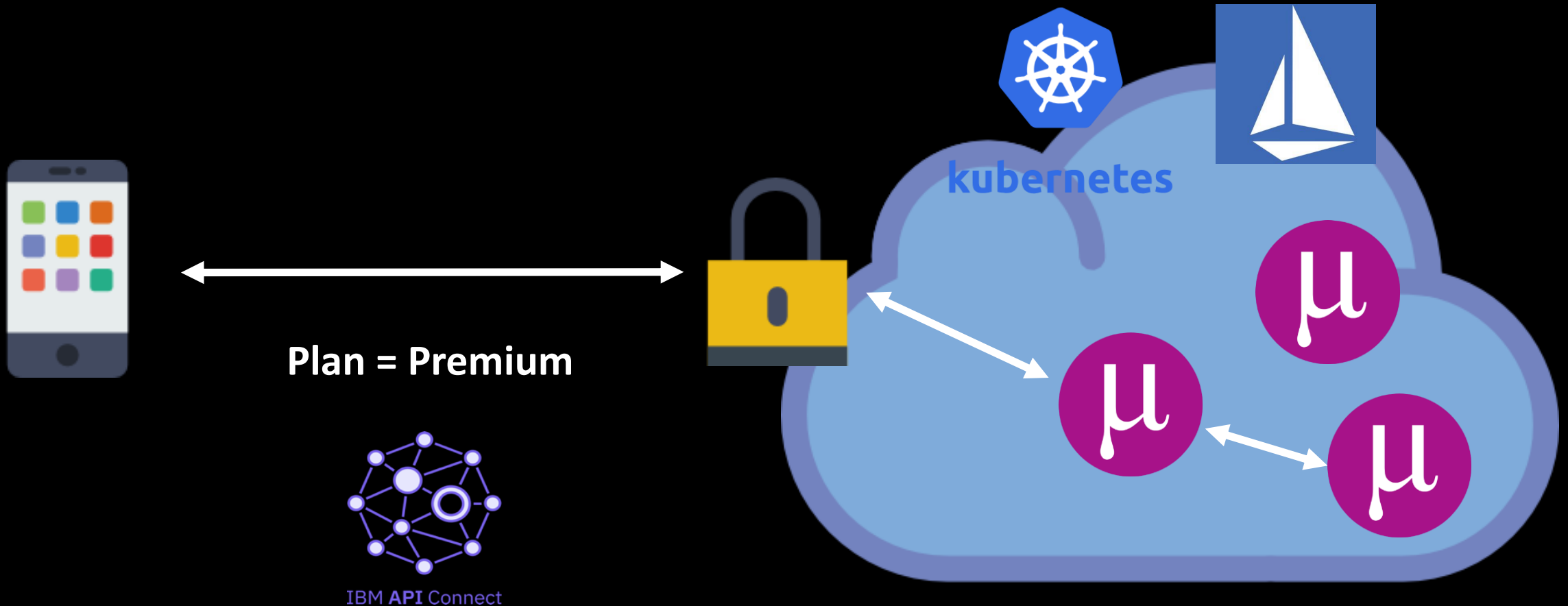
From the Labs: APIm Augmentation of the Istio Mesh



From the Labs: APIm Augmentation of the Istio Mesh



From the Labs: APIm Augmentation of the Istio Mesh



Managed multi-cloud



Multi-Cloud.next = Native support for managed
Kubernetes across clouds

API Strategy = Multi-cloud strategy

Thank you