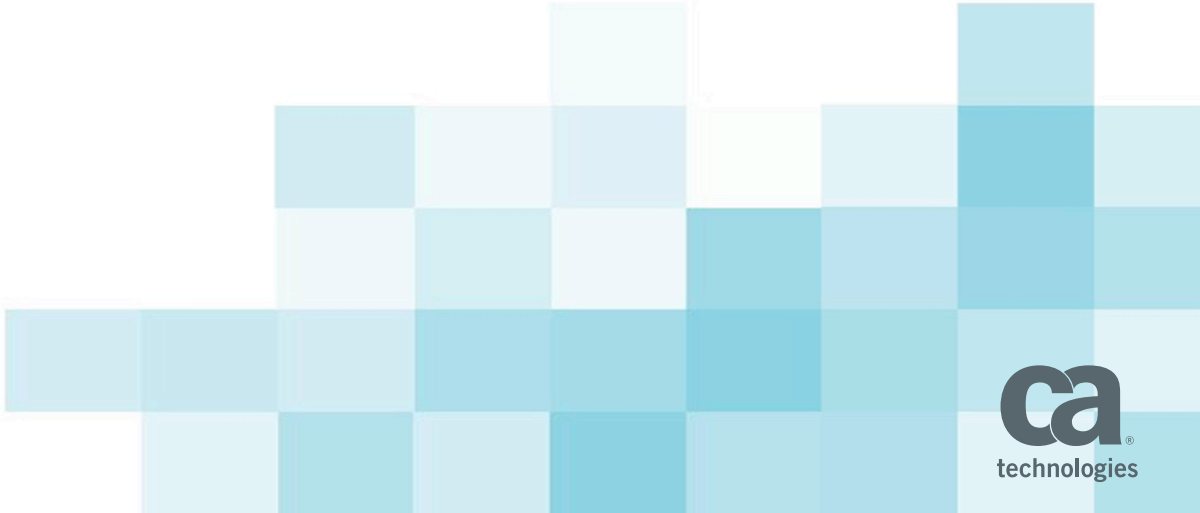
Do we need API Gateways when using Microservices?

API Days Zürich 2017

Sven Walther



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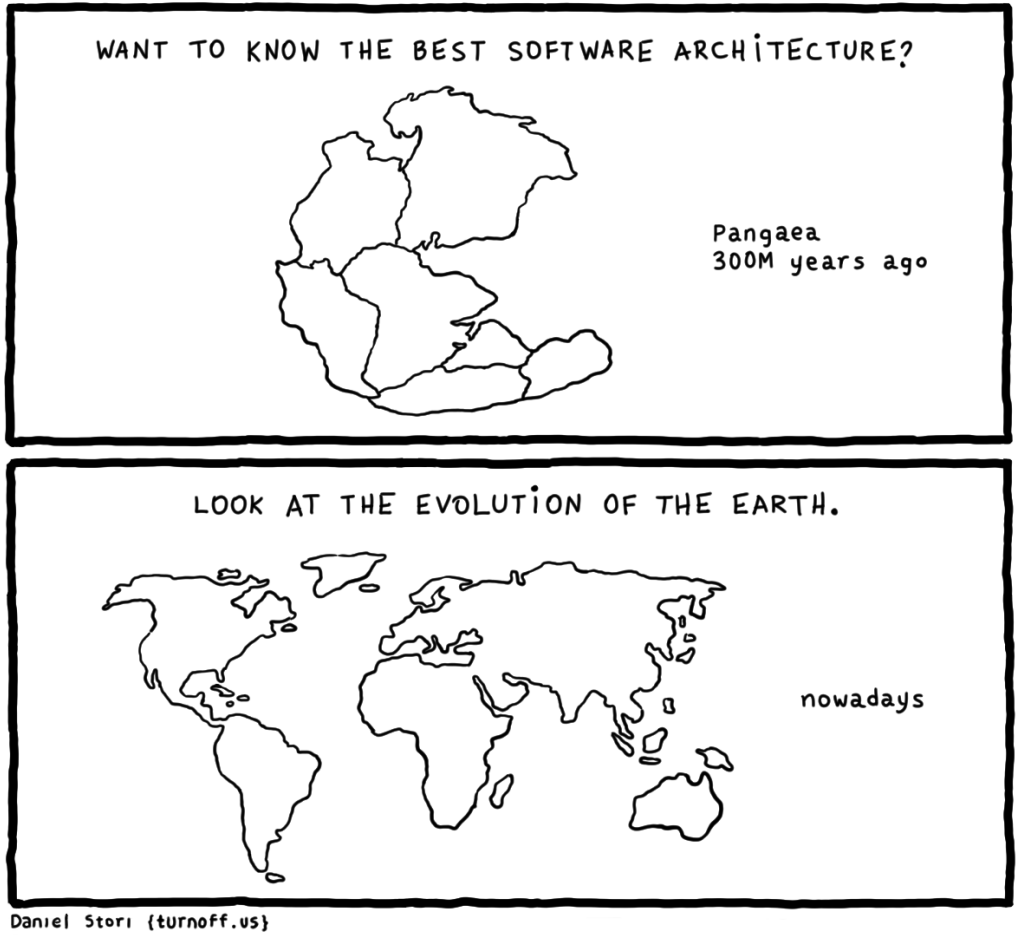
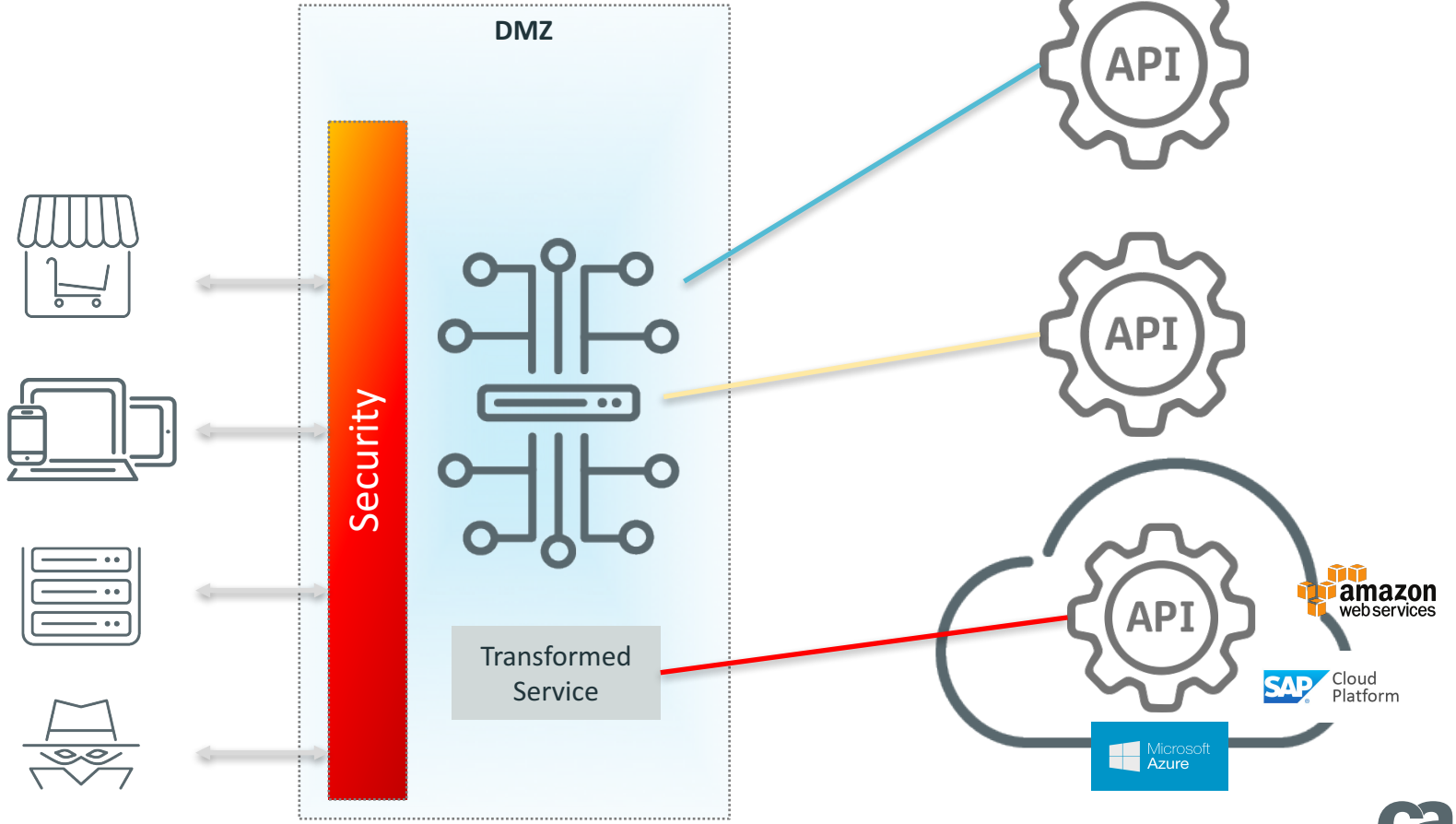


Do we need API Gateways when using Microservices?

YES!

API Gateway?

API Gateway at the edge



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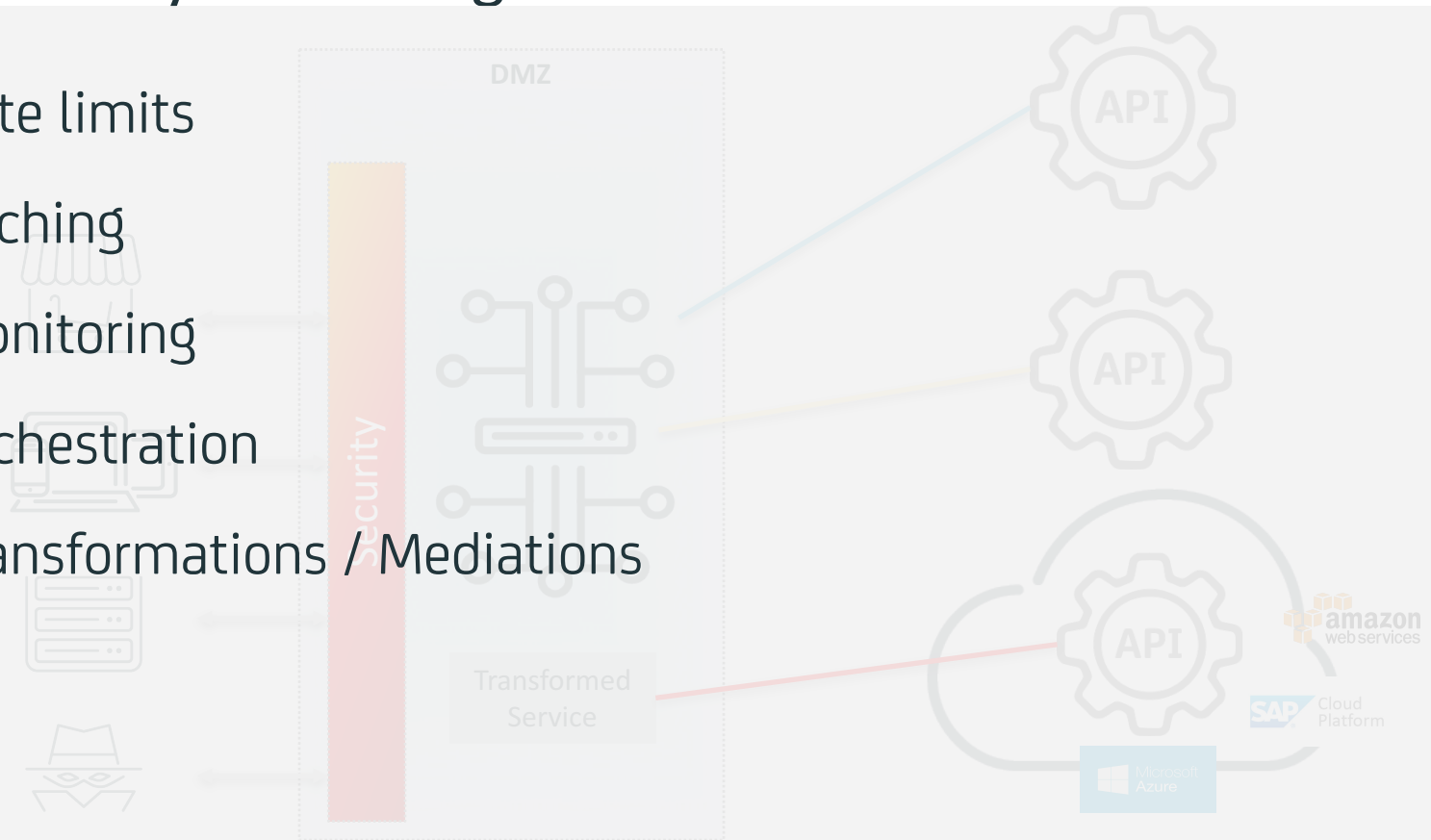
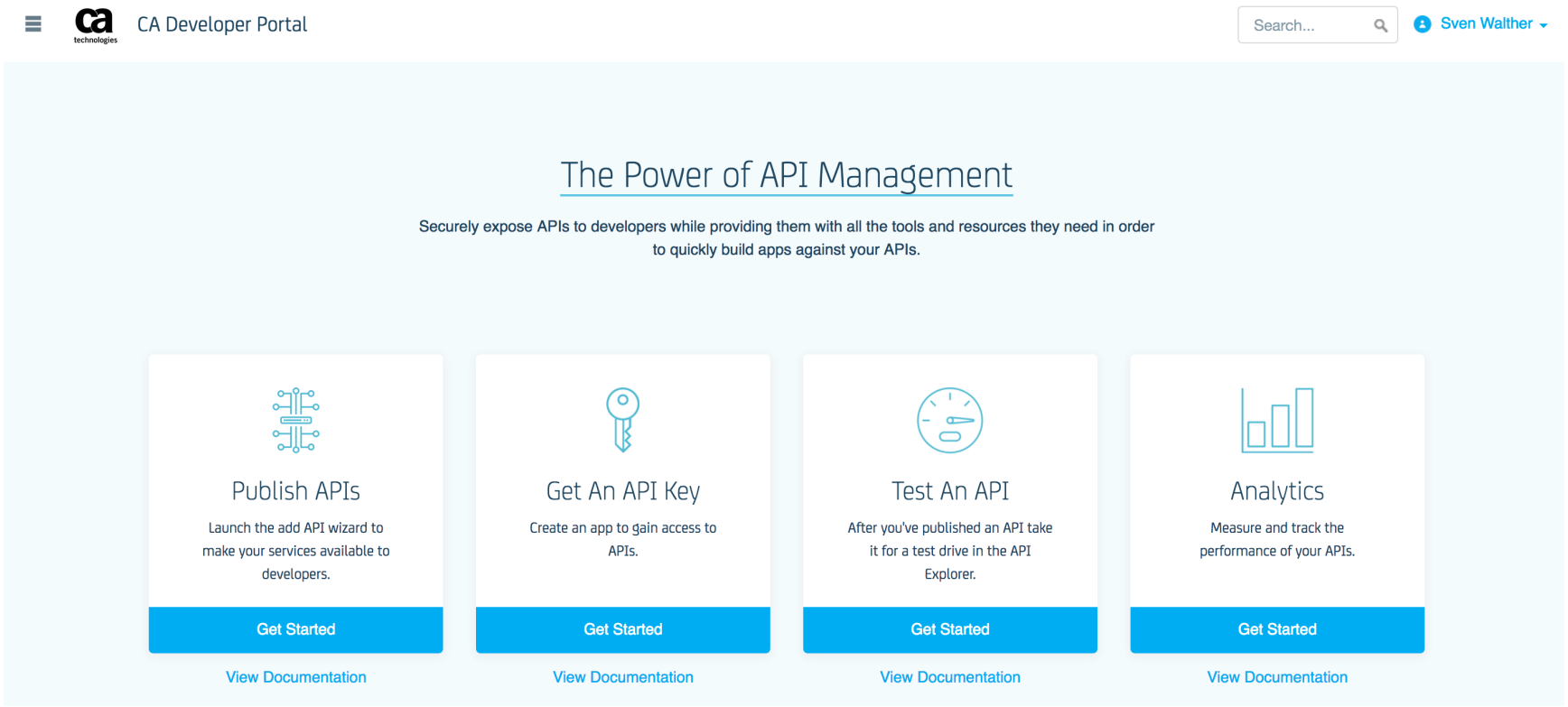
API Gateway at the edge

- Rate limits
- Caching
- Monitoring
- Orchestration
- Transformations / Mediations
- …



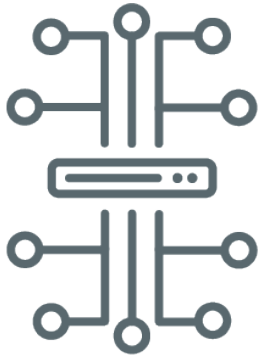
Developer Portal



But aren’t microservices somehow different?

What makes a microservice different?

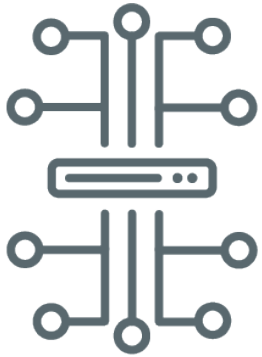
- It’s micro
- It’s not only micro – it’s lightweight
- It’s typically deployed in a containerized infrastructure
- DevOps will start up and shut down instances all the time
- It depends on a whole ecosystem



So what does a API Gateway add to it?

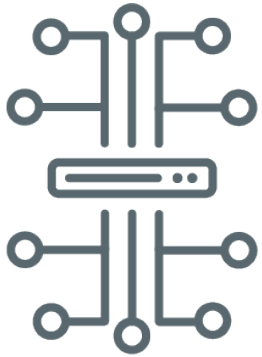
API Gateway functions for microservices

- It’s micro
  - Published services might need orchestration
- It’s not only micro – it’s lightweight
  - Security needs to be taken care of
- It’s typically deployed in a containerized infrastructure
  - Unified access at fixed hosts and URLs



API Gateway functions for microservices (cont.)

- DevOps will start up and shut down instances all the time
  - Routing to only active nodes
- It depends on a whole ecosystem
  - Central point of truth on infrastructure and documentation

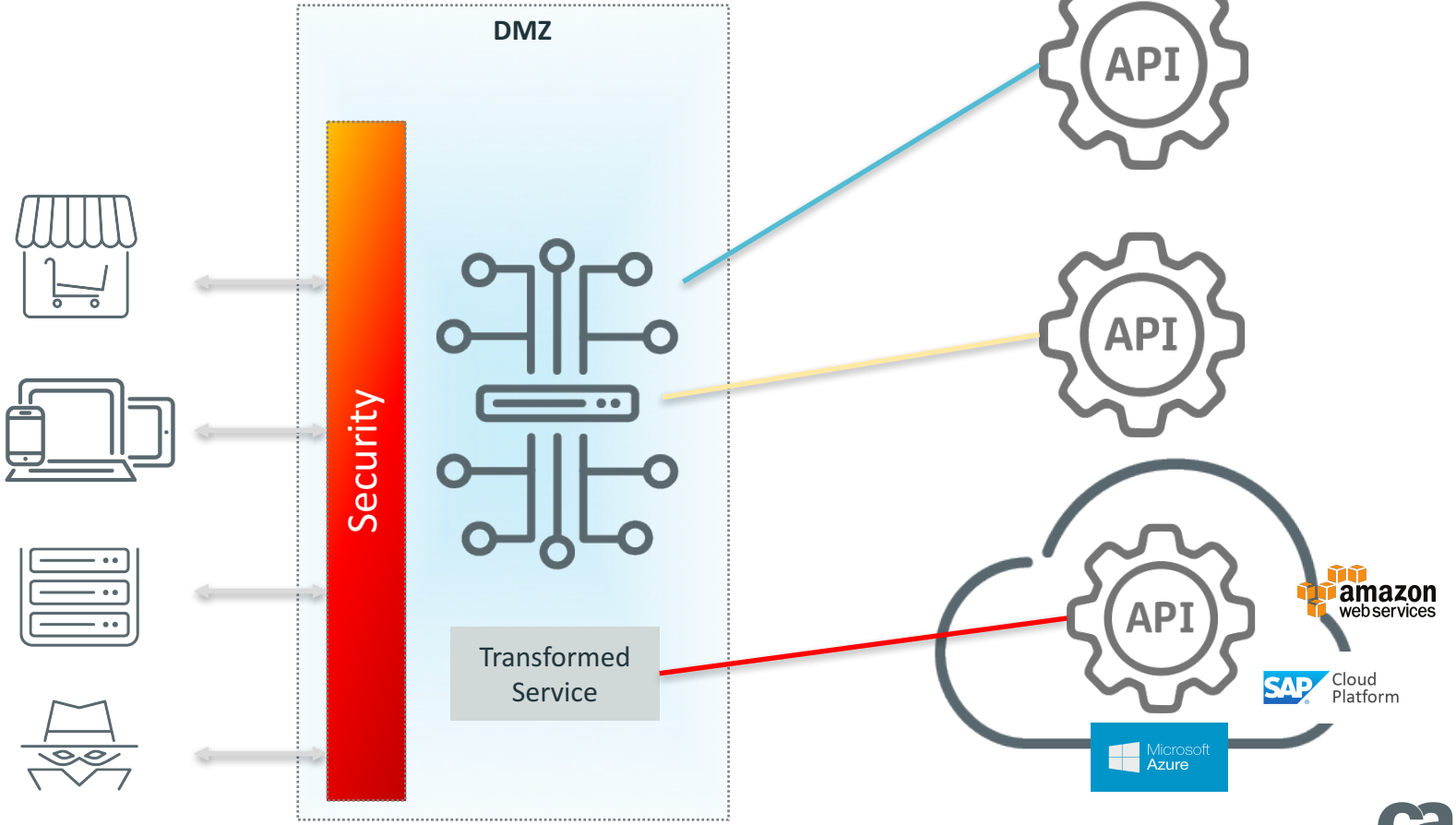


But aren’t gateways to heavy for microservices?

To heavy?

- Well, yes and no
- No: securing the edges of networks stays an important and big task

API Gateway at the edge



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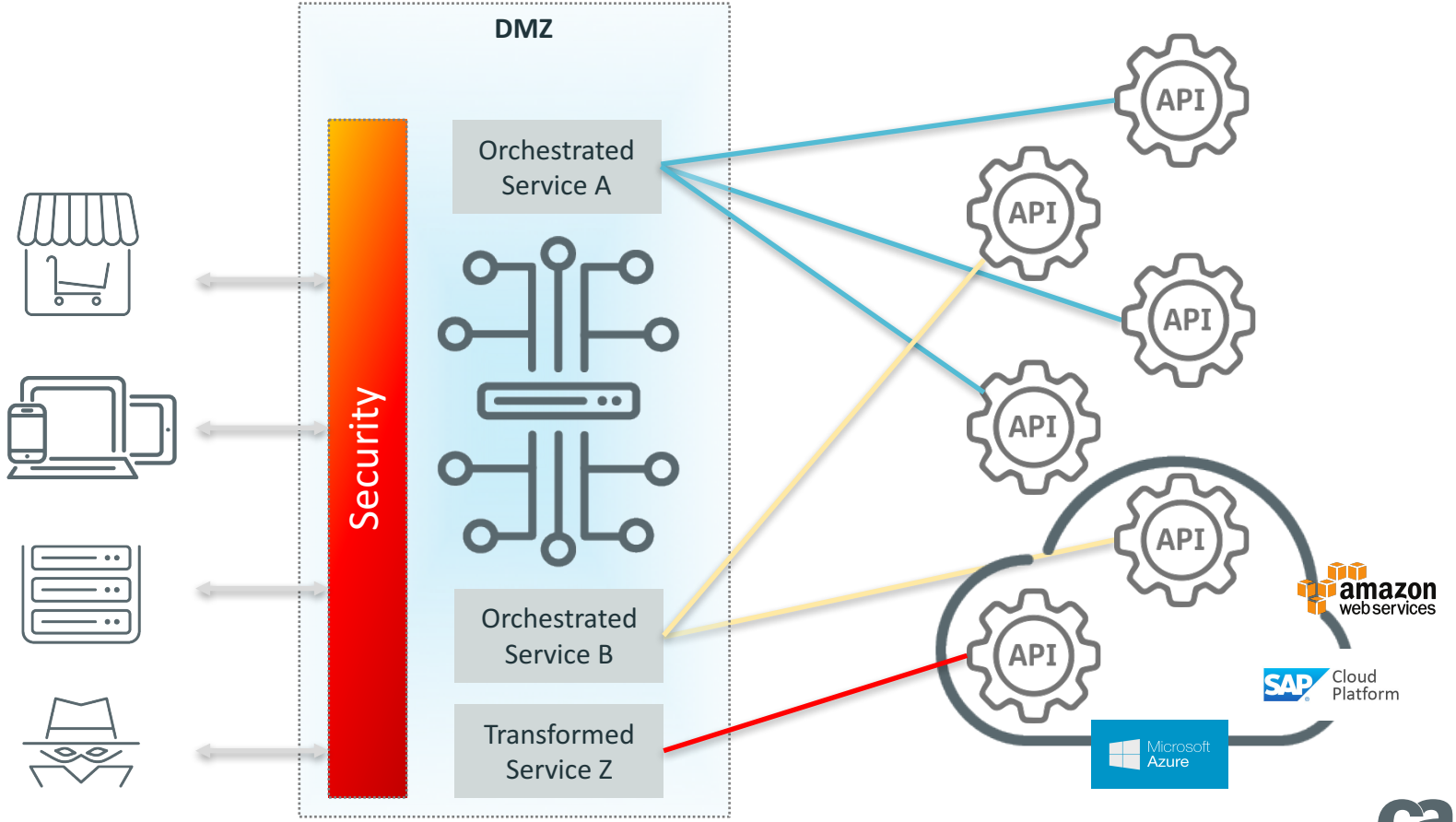
API Gateway at the edge for microservices



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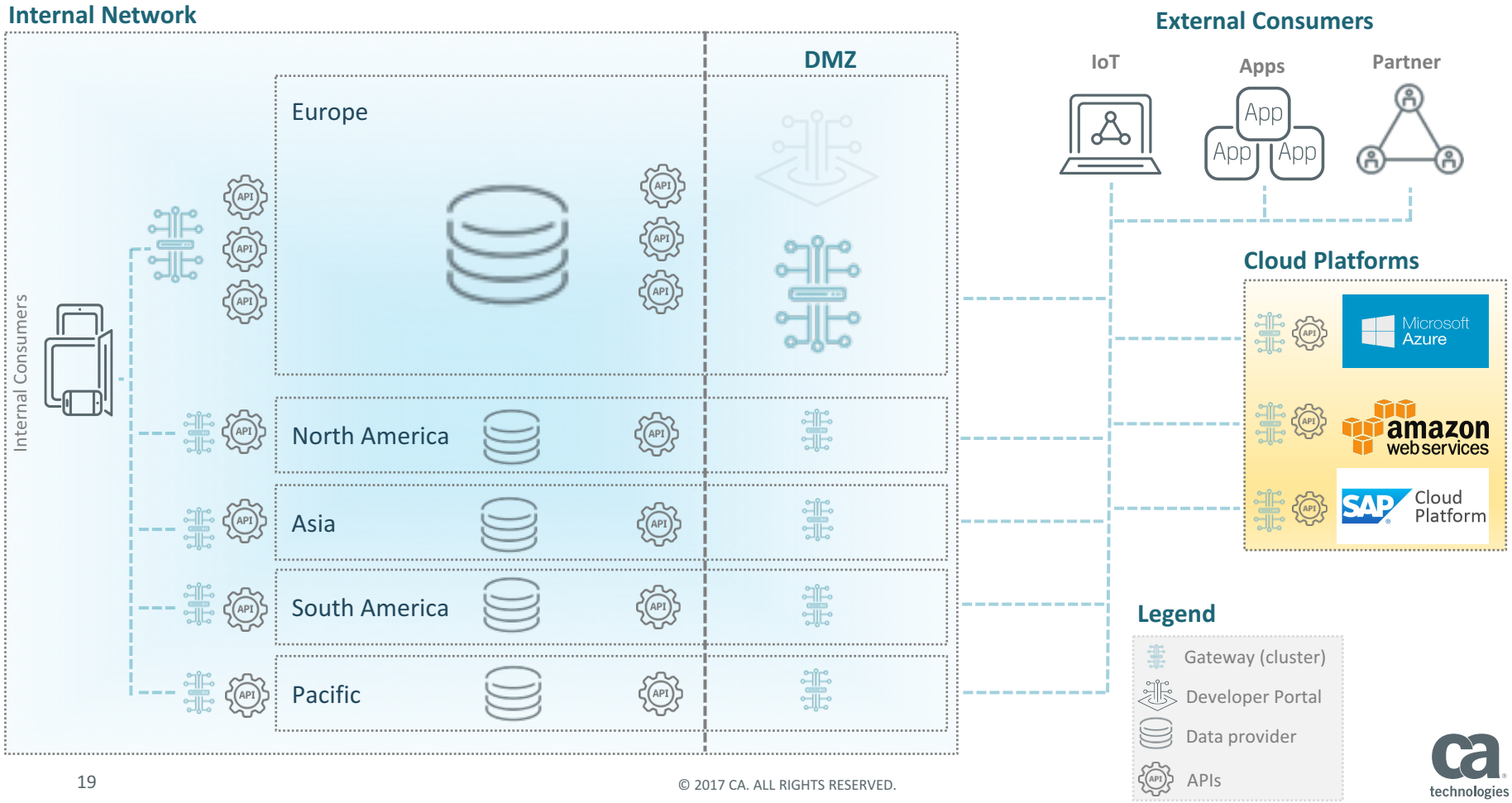
To heavy?

- Well, yes and no
- No: securing the edges of networks stays an important and big task
- Yes, a typical today's API Gateway might be to heavy to be flexible deployed on each container host

A real world example of a deployment



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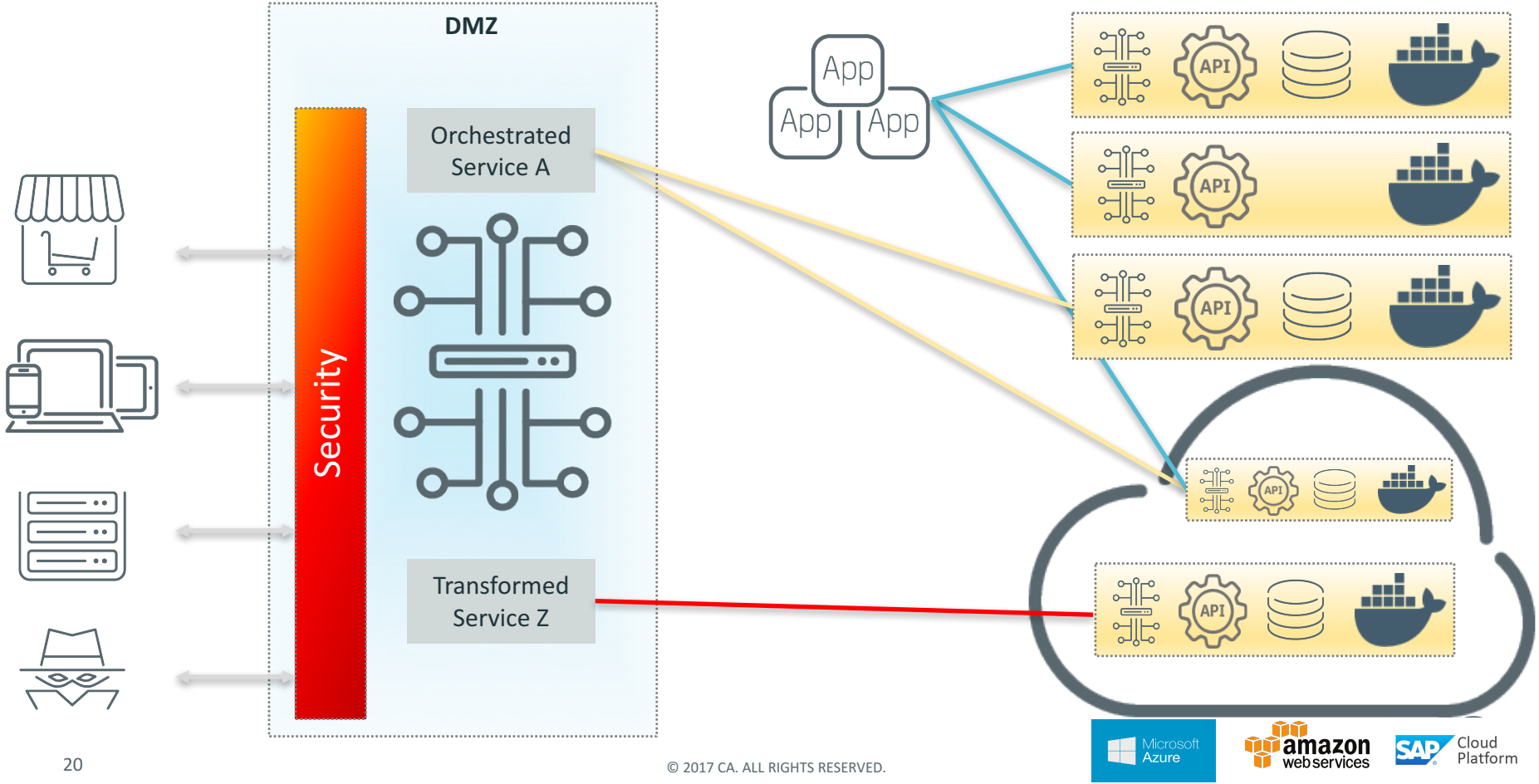
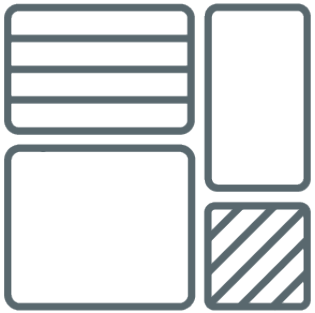
API Gateways managing microservices



Challenges for an API Gateway serving microservices

Internal services?



- Couldn’t we use a shrinked down version of the API Gateway for internal microservices use?

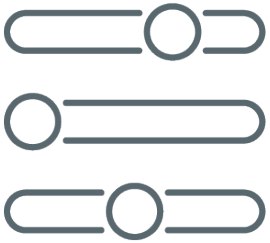
- Just reducing size und removing functionality won’t bring any real benefit – we have to rethink an API Gateway here!

A gateway for microservices: size

- An API gateway focused on microservices needs to have
  - A smaller download
  - Fewer components
  - A small footprint

- git clone https://github.com/CAAPIM/Microgateway.git

A gateway for microservices: usage



- The classical configuration with complex user interfaces cannot be adopted to microservices
- What we need is
  - Declarative config
  - Common tooling and methodologies
  - Manageable by different teams without the need of in detail knowledge of an API Gateway

Deploy a new service

Need some policies?

walsv01 — sven@docker: ~ — ssh docker

```
{
    "Service": {
    "name": "Employess",
    "gatewayUri": "/employees",
    "httpMethods": [ "get" ],
    "policy": [
      {
        "RouteHttp" : {
          "targetUrl": "http://myInternalHost/employees${request.url.query}",
          "httpMethod" : "Automatic",
          "useAuthenticationHeader" : true
        }
      }
      {
        "RateLimit" : {
          "maxRequestsPerSecond": 1,
          "hardLimit": true,
          "counterName": "RateLimit-${request.clientId}-b0938b7ad6ff"
        }
      }
    ]
  }
}
(END)
```

Template based policies

- Let central gateway administer your corporate standards
- Let DevOps apply those standards easily

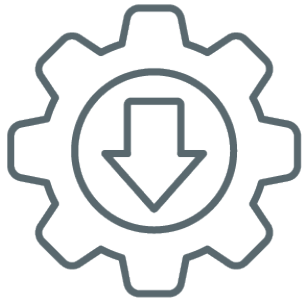
Available Encapsulated Assertions:

1. Encapsulated Assertion: CodeInjectionProtection
2. Encapsulated Assertion: Cors
3. Encapsulated Assertion: CredentialSourceHttpBasic
4. Encapsulated Assertion: RateLimit
5. Encapsulated Assertion: RequireOauth2Token
6. Encapsulated Assertion: RequireSsl
7. Encapsulated Assertion: RouteHttp
8. Encapsulated Assertion: RouteOrchestrator

Encapsulated Assertion: CodeInjectionProtection

Description: Immediately fail messages that contain injected code: HTML/JavaScript, PHP eval, shell, LDAP DN and search, and XPath.

A gateway for microservices: deployment

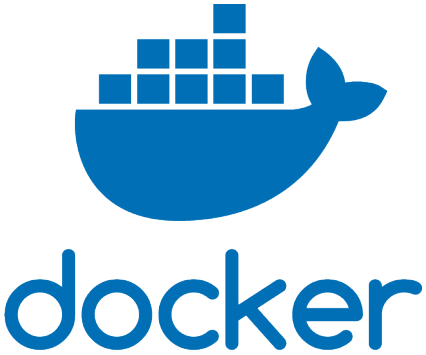


- Big containers and manual installation scripts are not fitting in the microservices space
  - Common container platforms
    - Docker
    - Openshift
    - …
  - It must be manageble by standard tools

All Docker based – one line to start your gateway

```
> docker-compose -f docker-compose.yml -f docker-compose.dockercloudproxy.yml up -d --build
```

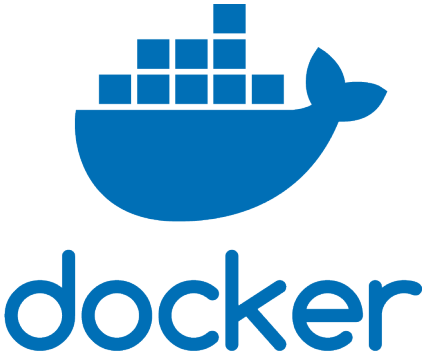
```
Creating network "dockercompose_public" with the
Building cadbhost
Step 1/2 : FROM postgres:9.6
 ---> 1227c4263c8c
Step 2/2 : ADD ./liquibase/scalerDbSchemaPostgreS
 ---> Using cache
 ---> 2f5884b4ab85
Successfully built 2f5884b4ab85
Creating dockercompose_cadbhost_1 ...
Creating dockercompose_cadbhost_1 ... done
Creating dockercompose_ssg_1 ...
Creating dockercompose_ssg_1 ... done
Creating dockercompose_proxy_1 ...
Creating dockercompose_proxy_1 ... done
>
```



Need to scale? Let's add 3 more nodes

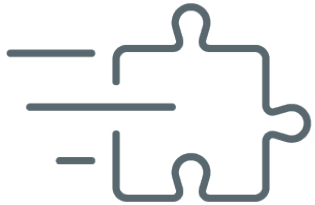
```
> docker-compose -f docker-compose.yml -f docker-compose.dockercloudproxy.yml scale ssg=4
```

```
Starting dockercompose_ssg_1 ... done
Creating dockercompose_ssg_2 ...
Creating dockercompose_ssg_3 ...
Creating dockercompose_ssg_4 ...
Creating dockercompose_ssg_2 ... done
Creating dockercompose_ssg_3 ... done
Creating dockercompose_ssg_4 ... done
>
```

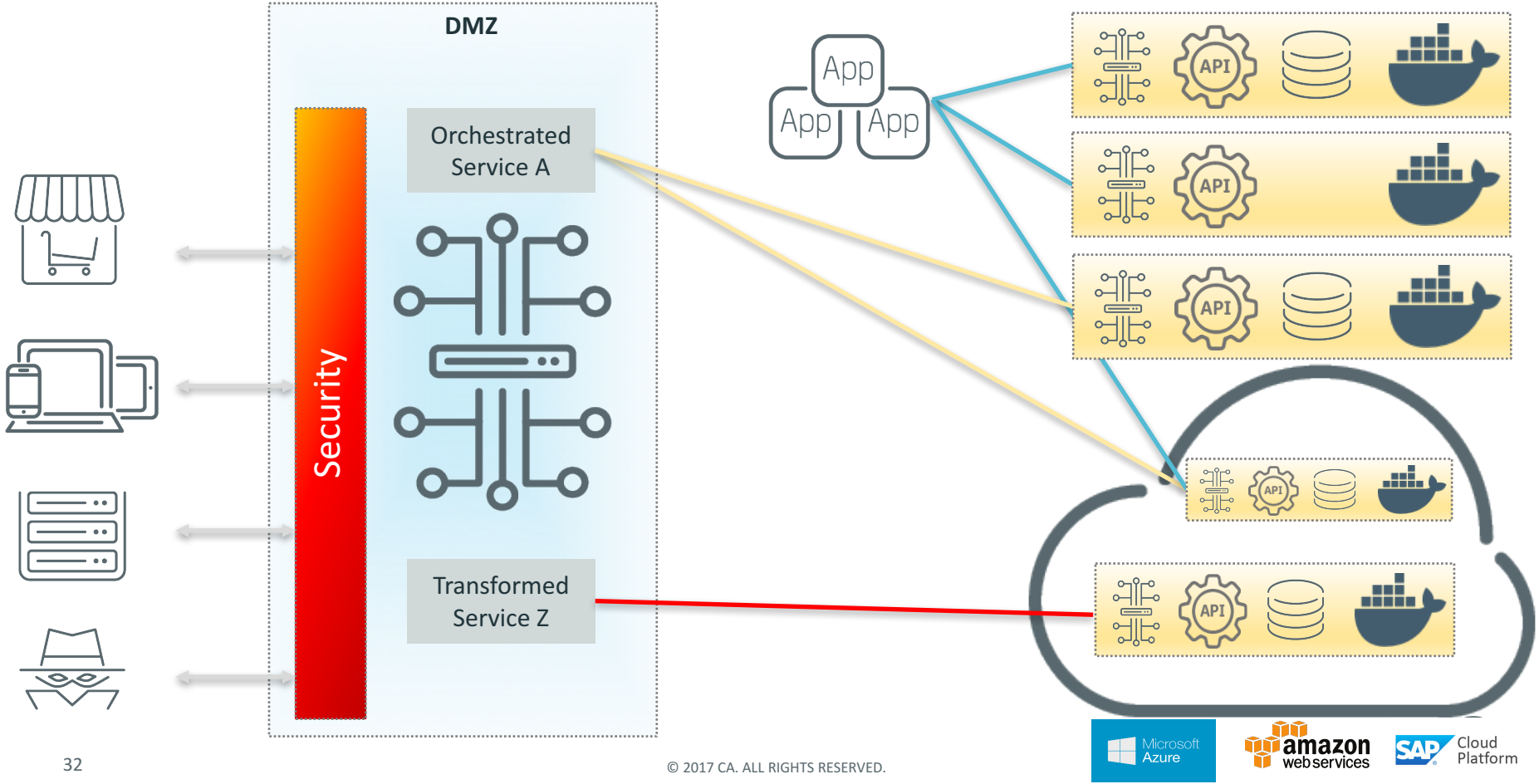


Speed and reliability

- The central goals of microservices
  - Fast provisioning
  - Fast implementation
  - Fast deployment



API Gateways managing microservices



YES!

But probably not “One Size Fits All”

Thank you

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@SvenWal (next to everywhere)

https://www.linkedin.com/in/svenwal/

CA API Microgateway: https://github.com/CAAPIM/Microgateway