ALL DAY DEVOPS

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DevSecOps Enabled Micro-Perimeter API Protection

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DevSecOps Enabled Micro-Perimeter API Protection

How to apply declarative configuration model for API Authorization, story about people, processes and tools...

System Owner	Date	Citation
Brazil Fed of Indus - ElasticSearch API exposed	11/23/18	https://www.zdnet.com/article/brazils-largest-professional-association-suffers-massive-data-leak/
Urban Massage - ElasticSearch API exposed	11/27/18	https://techcrunch.com/2018/11/27/urban-massage-data-exposed-customers-creepy-clients/
SKY Brasil - ElasticSearch API exposed	11/29/18	https://www.zdnet.com/article/sky-brasil-exposes-data-of-32-million-subscribers/
Atrium Health - ElasticSearch API exposed	11/29/18	https://www.securityinfowatch.com/healthcare/news/12438109/personal-data-of-more-than-2m-patients-compromised-in-atrium-health-data-breach
Data&Leads	11/29/18	https://www.bankinfosecurity.com/blogs/data-leads-site-disappears-after-data-exposure-alert-p-2687
LandMark White Limited	2/13/19	https://www.computerworld.com.au/article/657662/landmark-white-blames-exposed-api-data-breach/ https://www.programmableweb.com/news/landmark-white-api-breach-may-have-exposed-loan-details-100000-users/brief/2019/02/13
JustDial Leak	4/17/19	https://thehackernews.com/2019/04/justdial-hacked-data-breach.html
GateHub Cryptocurrency Wallet Hack	6/6/19	https://gatehub.net/blog/gatehub-preliminary-statement/
Venmo transactions Leaked	6/16/19	https://techcrunch.com/2019/06/16/millions-venmo-transactions-scraped/

Big scary slide

By 2022 API abuses will be the attack vector most responsible for data breaches within enterprise Web applications. - Gartner

Over half of the OWASP Top Ten API Security vulnerabilities related authentication and authorization. – OWASP https://www.owasp.org/index.php/OWASP_API_Security_Project

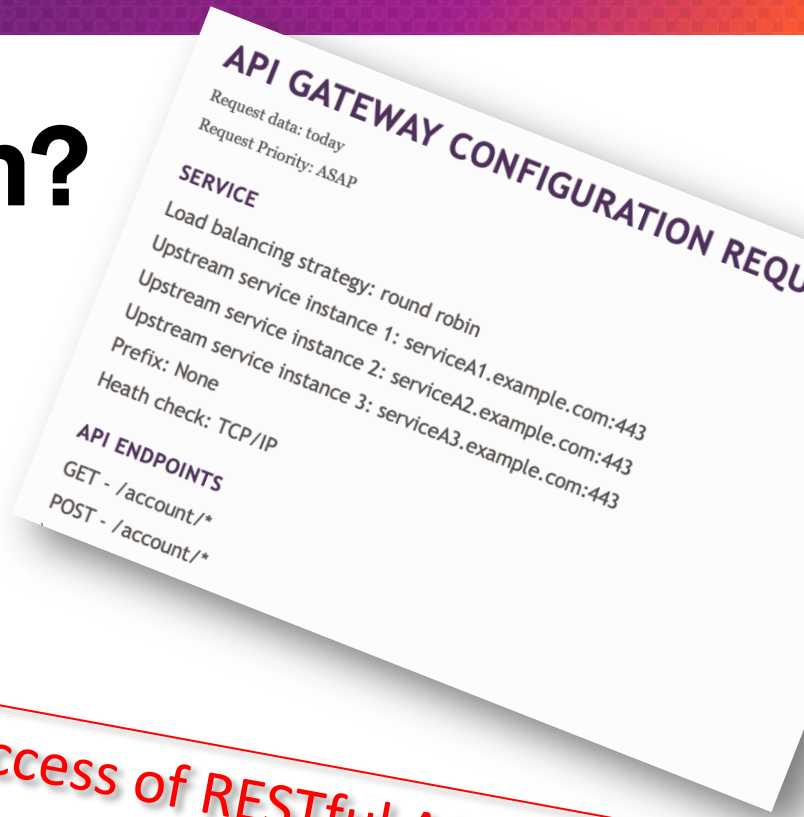
2/3rds of the companies are struggling with access control and authorization for the APIs. - Gartner

60% of the companies have insufficient API access controls in their production systems. - F5 Labs

3 patterns of API compromises: 1) large platforms with lots of third-party integrations, 2) mobile apps, 3) monolithic apps modernization process. During – F5 Labs

So why it's such a big problem?

- ❑Manual configurations
- ❑Complexity
- ❑Lack of tools
- ❑APIs Wild Wild West
- ❑Miscommunication between security and development team



Success of RESTful APIs is at fault here!

So how can we fix it?

Werner Vogels, AWS CTO 2017
AWS: ReInvent

"Security is all of our jobs now. It's no longer just the security team.

If you're doing continuous integration and continuous development, you have to make sure everyone is a security engineer"

To the rescue

Everyone Becoming A Security Engineer Is Not The Answer

Slowing the pace of developers will impact:

- ❑Business growth
- ❑Innovation
- ❑Technology adoption
- ❑Smaller Dev teams = Junior Devs with less oversight
- ❑And they will make more mistakes

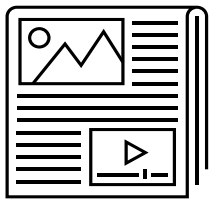
Guardrails instead of responsibility shift

Let’s start with people

Developers

Operations

Security & Governance



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Security & Governance

Regulation

Corporate Policies

Risk Acceptability

Privacy & Consent

Audit and visibility

Operations

Load balancing, routing, service discovery

Application Level Authorization

Data/Object Level Authorization

Workloads and API publishing

Monitoring

Developers

Code

Configure

Test

Build

Release

Continue to process and methodologies

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Security & Governance

- ✓ **Corporate global policies**
- ✓ **Policy Templates**
- ✓ **Best Practices**

- ✓ **Security peer review**

- ✓ **Generate API Security tests**

- ✓ Security testing
- ✓ **Access control testing**
- ✓ **Authorization testing**

- ✓ **Security and authorization configuration artifacts**

- ✓ **Security & authorization**

- ✓ **Monitor access, authorization, privacy**

Operations

- ✓ Infrastructure as code templates
- ✓ Networking as a code templates
- ✓ **API Publishing as a code templates**

- ✓ **Infrastructure peer review**

- ✓ **Generate API Infrastructure tests**

- ✓ Infrastructure testing
- ✓ Load testing
- ✓ **API Rate limiting testing**

- ✓ Infrastructure configuration artifacts

- ✓ Infrastructure & networking

- ✓ Monitor infrastructure

Developers

- ✓ Application Code
- ✓ **Authorization as a code**
- ✓ **API Publishing as a code**
- ✓ Infrastructure as a code

- ✓ Application artifacts
- ✓ **Configuration artifacts**

- ✓ Application testing
- ✓ Integration testing
- ✓ **API testing**

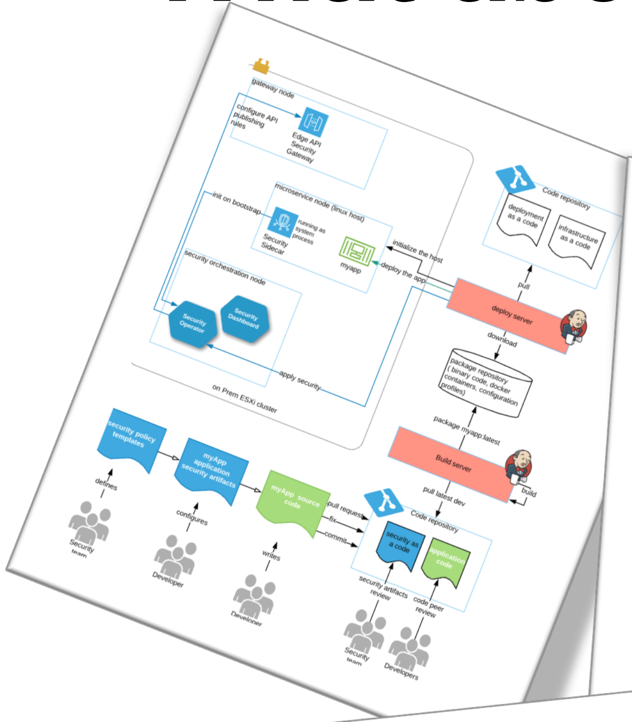
- ✓ Application artifacts

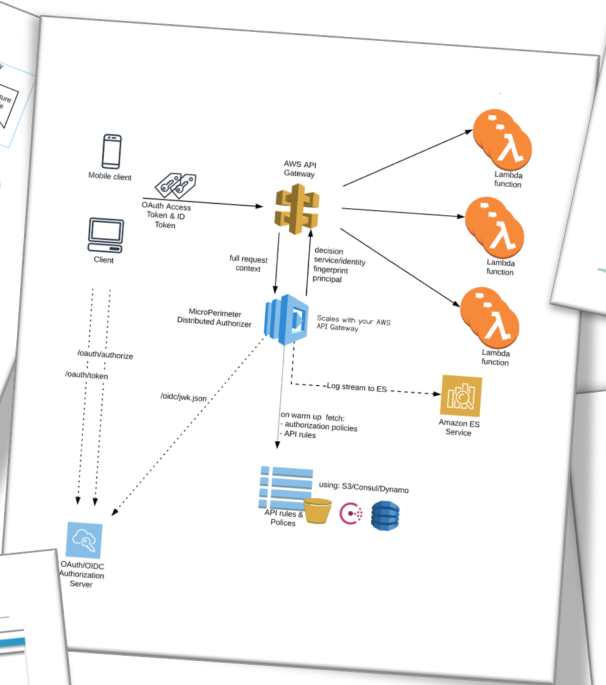
- ✓ Apps & services

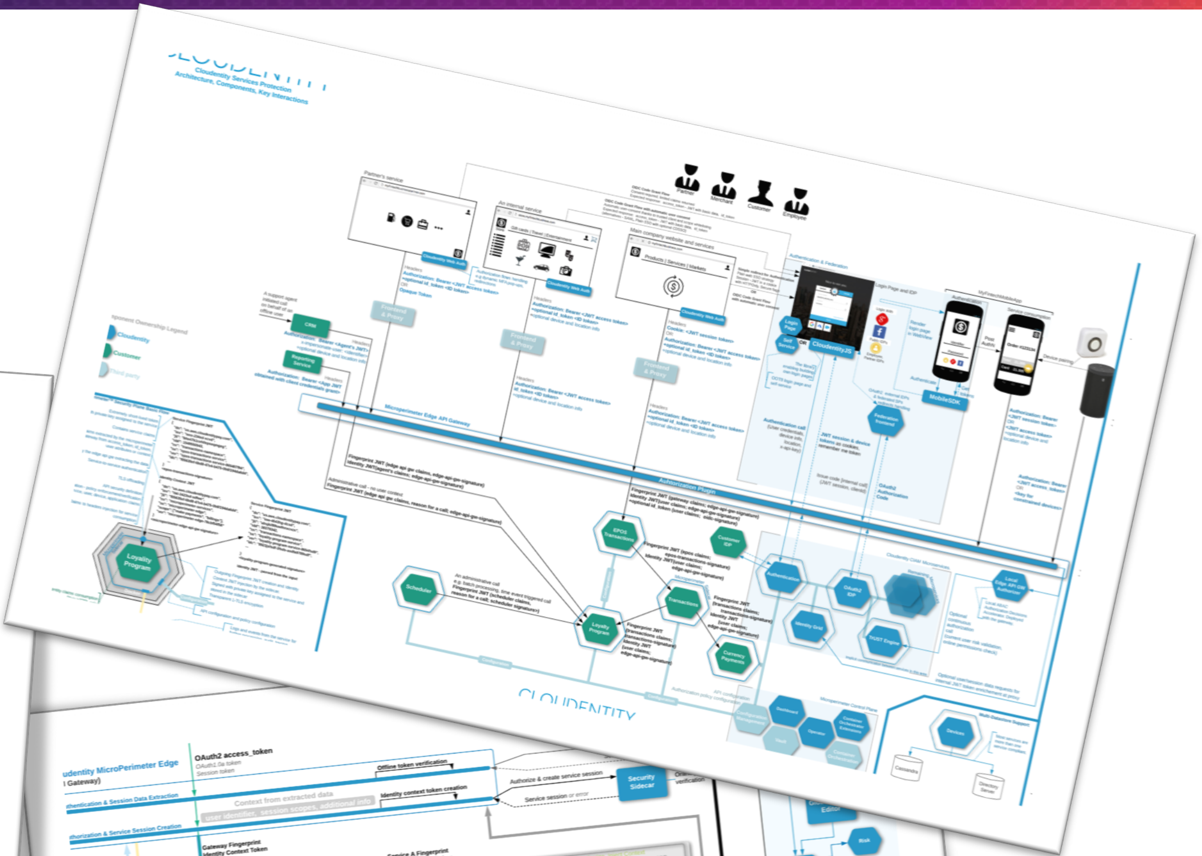
- ✓ Monitor application

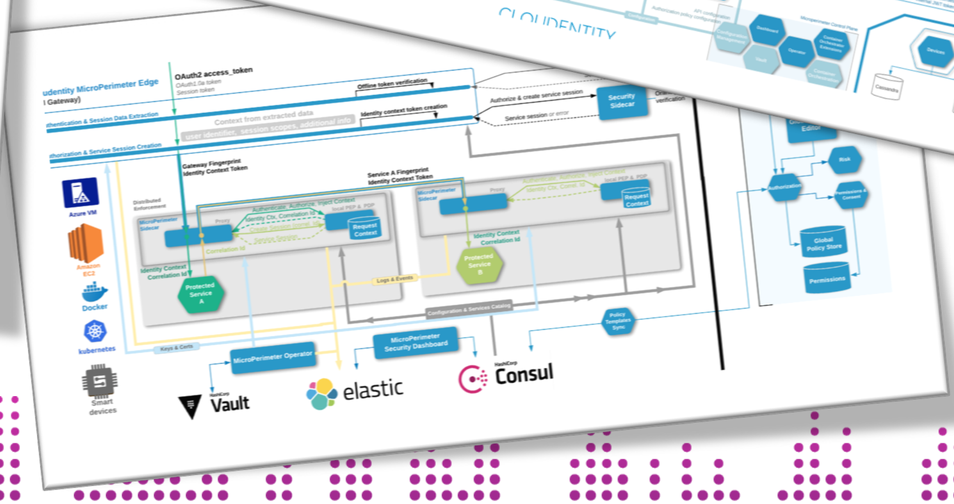
Plan | Code | Build | Test | Release | Deploy | Operate | Monitor

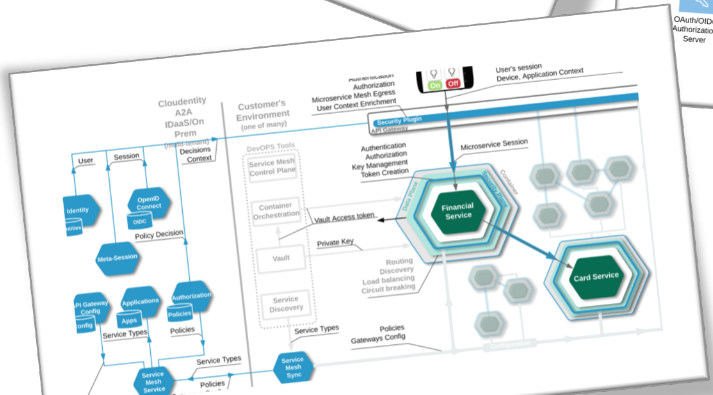
What about tools ?

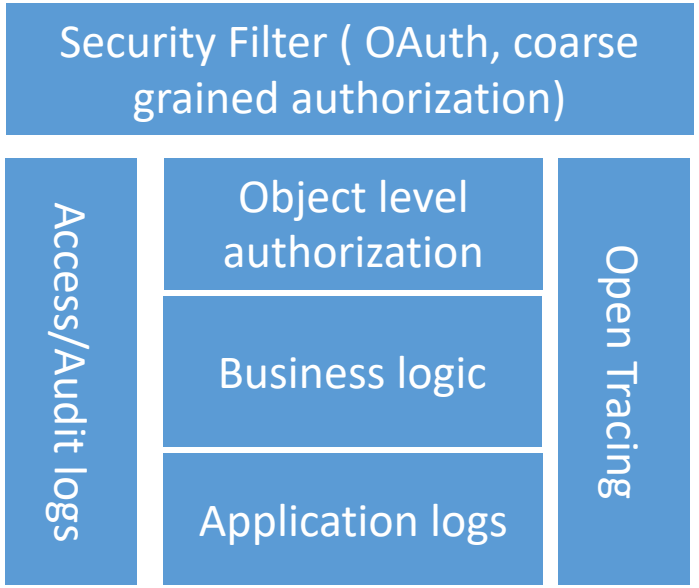










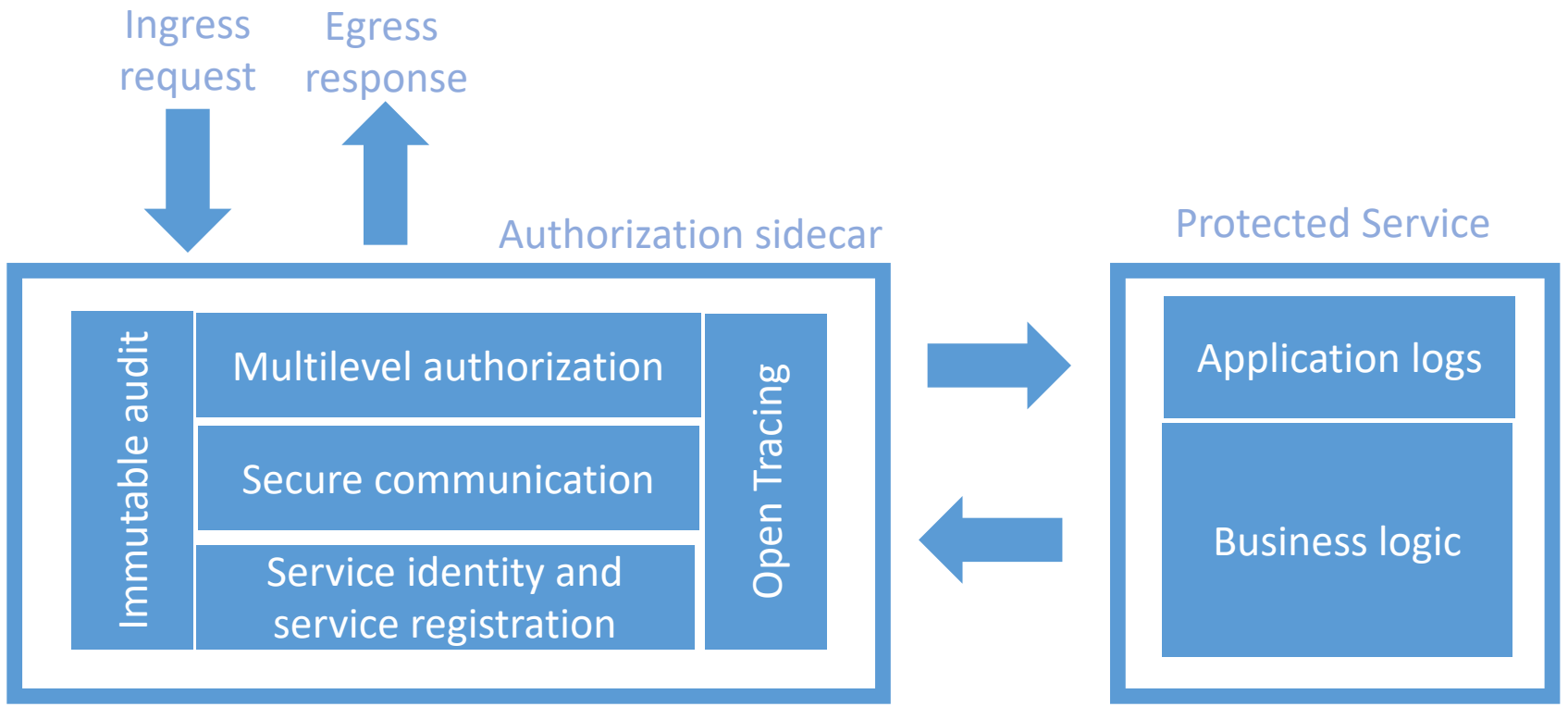


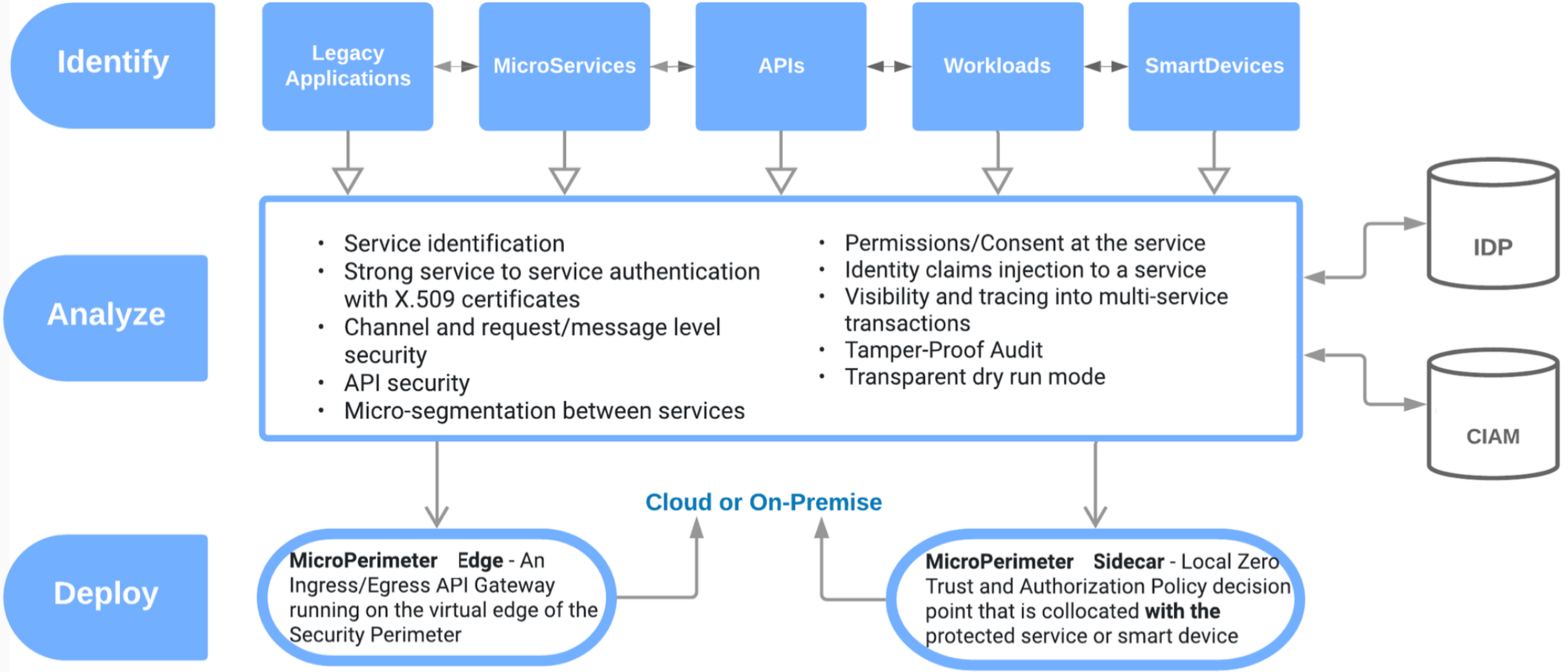
To secure each service one needs
(on top of a business function):

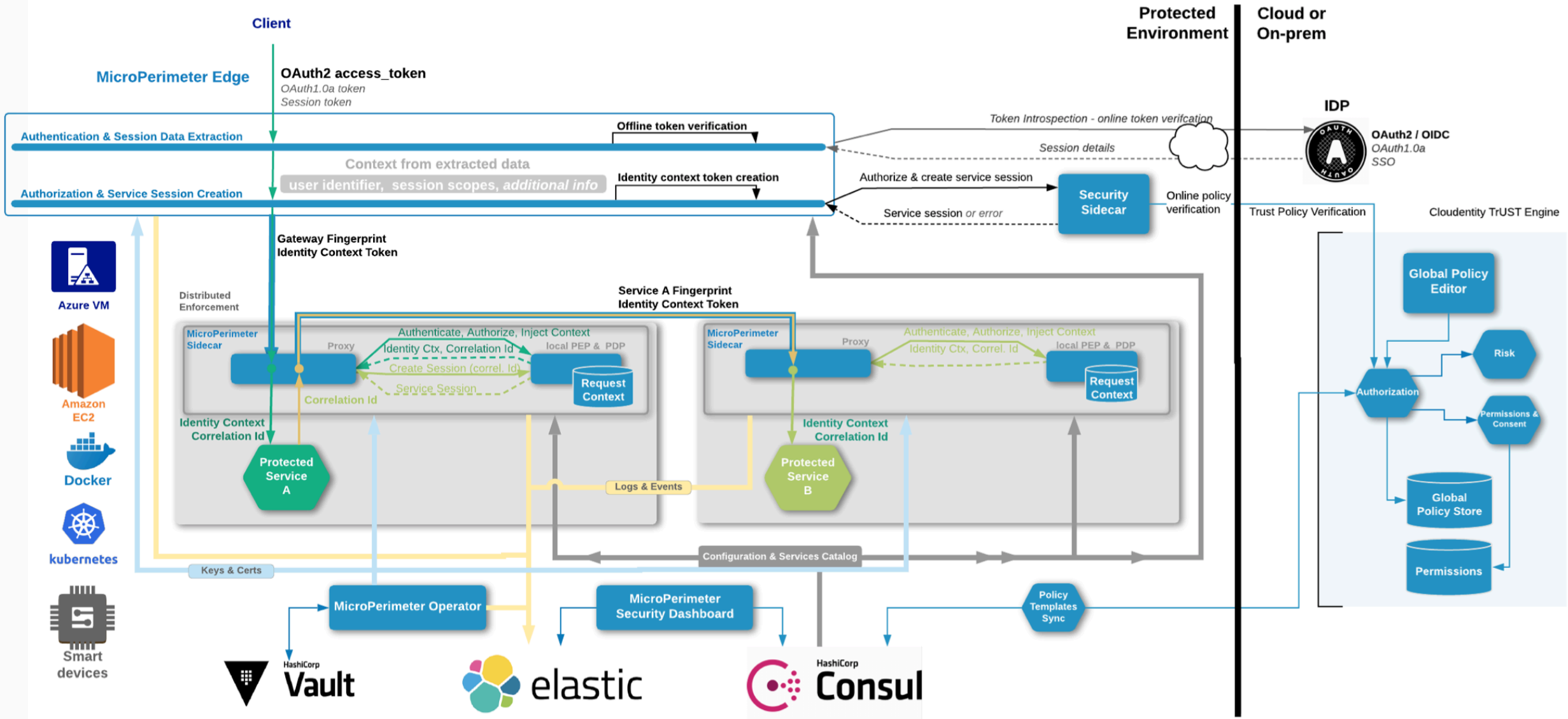
- ✓ Request authentication
- ✓ Request authorization
- ✓ Service registration and service identity
- ✓ API inspection
- ✓ Access/logs

Benefits of that approach

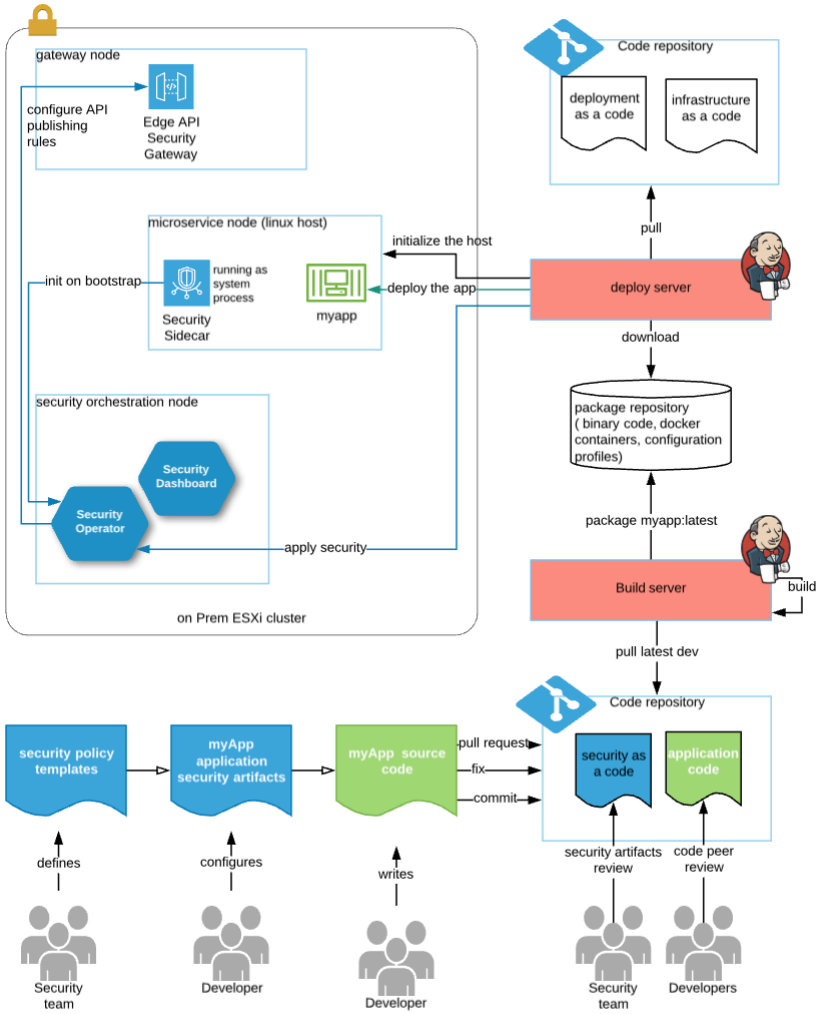
- ✓ Extensible APIs and Microservices
- ✓ Authorization as Code
- ✓ Code Reduction
- ✓ Security Guardrails




Identify
Legacy Applications
MicroServices
APIs
Workloads
SmartDevices
Analyze
Service identification
Strong service to service authentication with X.509 certificates
Channel and request/message level security
API security
Micro-segmentation between services
Permissions/Consent at the service
Identity claims injection to a service
Visibility and tracing into multi-service transactions
Tamper-Proof Audit
Transparent dry run mode
IDP
CIAM
Cloud or On-Premise
Deploy
MicroPerimeter Edge - An Ingress/Egress API Gateway running on the virtual edge of the Security Perimeter
MicroPerimeter Sidecar - Local Zero Trust and Authorization Policy decision point that is collocated with the protected service or smart device

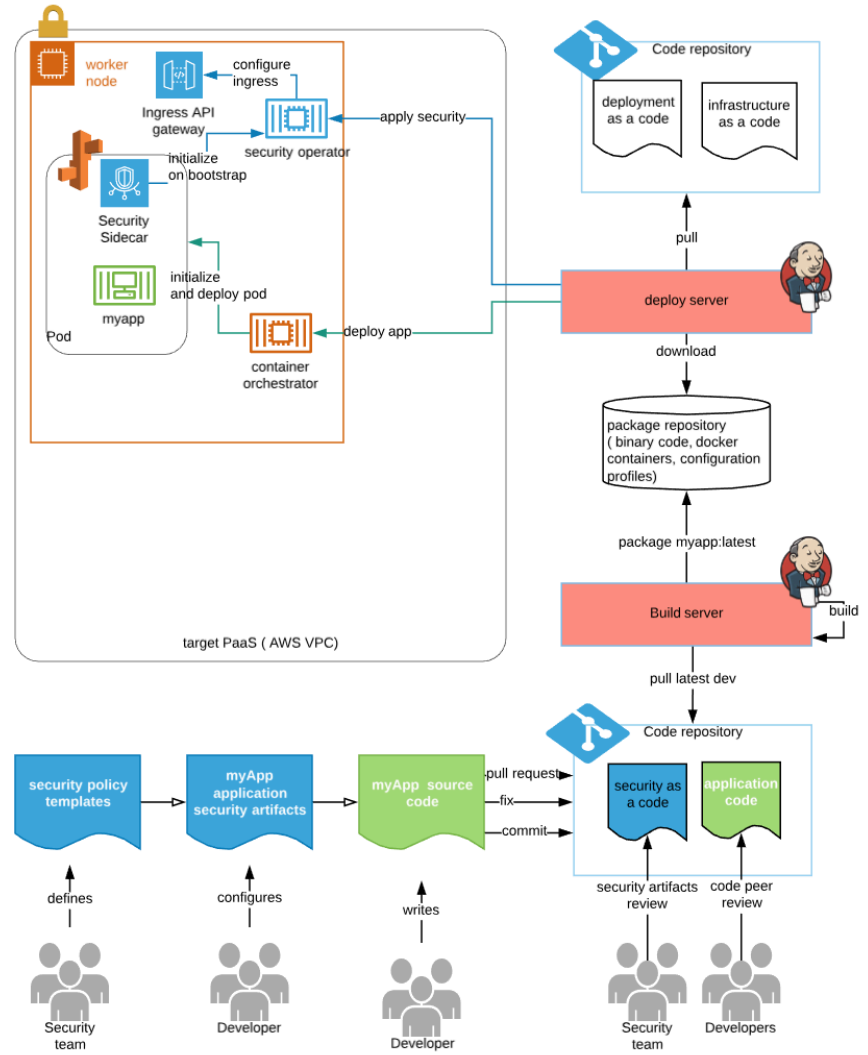

Client
MicroPerimeter Edge
OAuth2 access_token
OAuth1.0a token
Session token
Protected Environment
Cloud or On-prem
IDP
OAuth2 / OIDC
OAuth1.0a
SSO
Token Introspection - online token verifcation
Session details
Authentication & Session Data Extraction
Offline token verification
Context from extracted data
user identifier, session scopes, additional info
Identity context token creation
Authorization & Service Session Creation
Authorize & create service session
Service session or error
Security Sidecar
Online policy verification
Trust Policy Verification
Cloudentity TrUST Engine
Gateway Fingerprint
Identity Context Token
Service A Fingerprint
Identity Context Token
Distributed Enforcement
MicroPerimeter Sidecar
Proxy
Authenticate, Authorize, Inject Context
Identity Ctx, Correlation Id
local PEP & PDP
Create Session (correl. Id)
Service Session
Request Context
Correlation Id
Identity Context Correlation Id
Protected Service A
Protected Service B
Logs & Events
Configuration & Services Catalog
Keys & Certs
Azure VM
Amazon EC2
Docker
kubernetes
Smart devices
MicroPerimeter Operator
MicroPerimeter Security Dashboard
Policy Templates Sync
HashiCorp Vault
elastic
HashiCorp Consul
Global Policy Editor
Risk
Authorization
Permissions & Consent
Global Policy Store
Permissions

Traditional architecture



Not all of us are cloud native!

Microservices based architecture

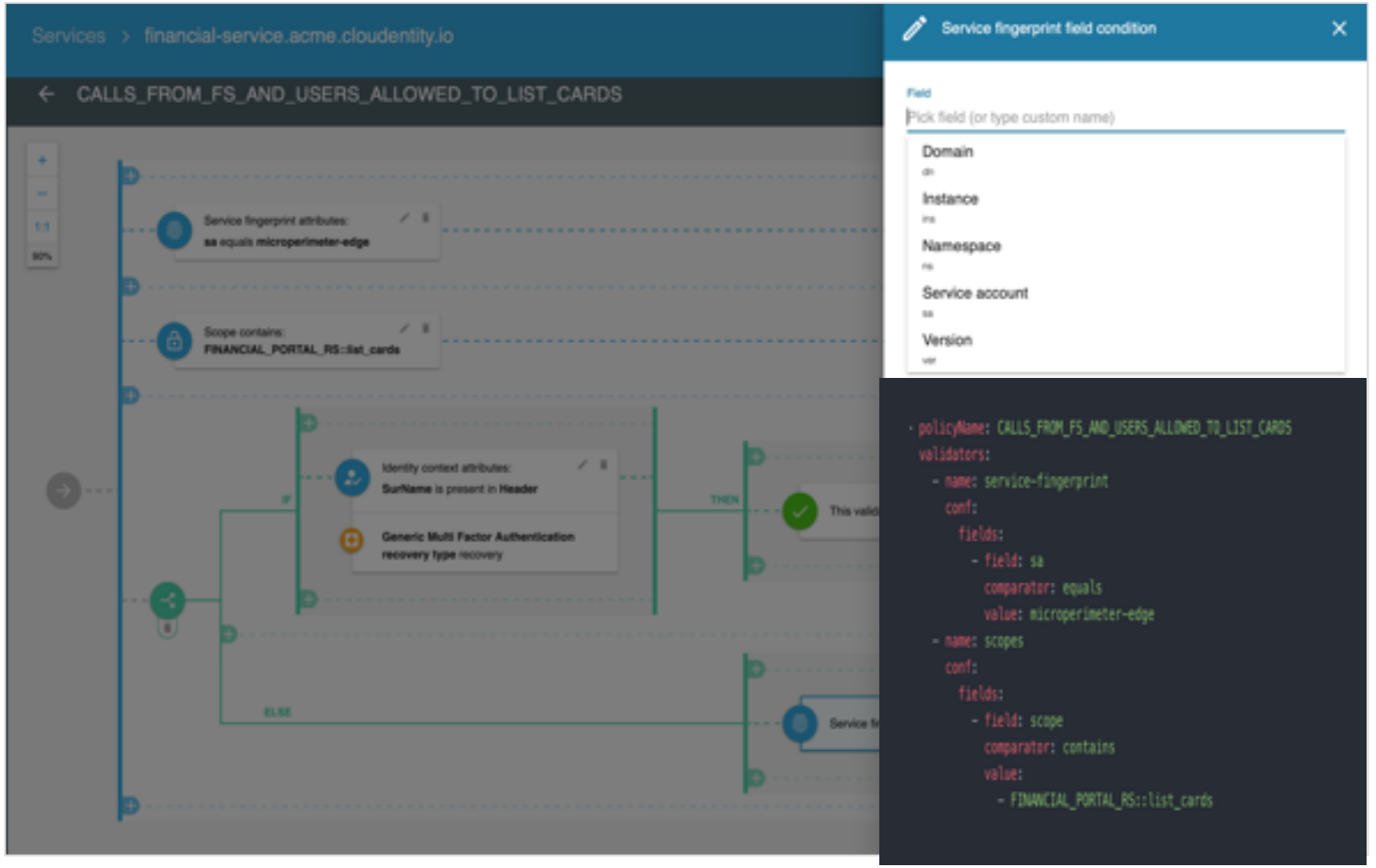


Policies as Code

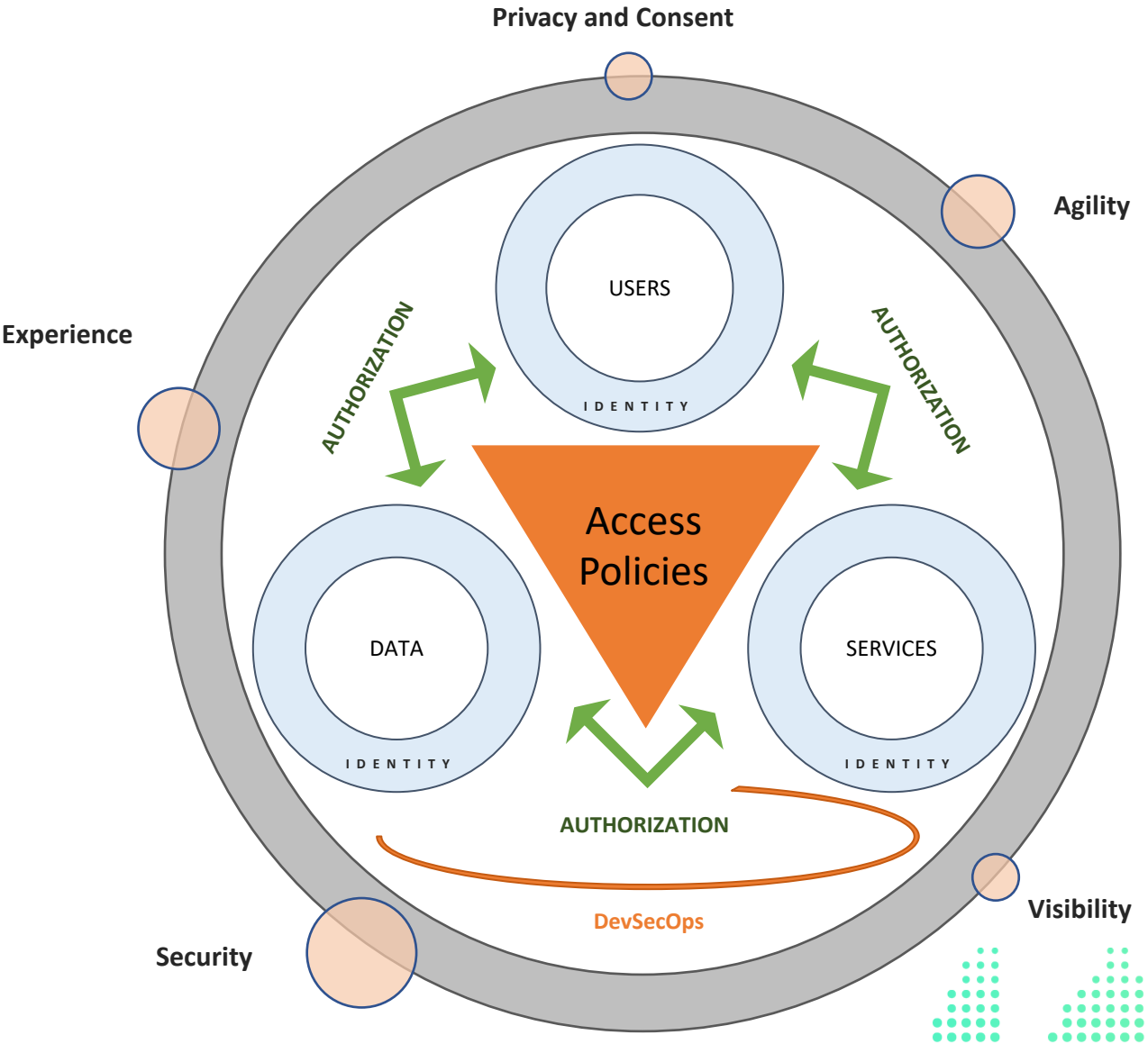
- ❑ JSON object
- ❑ Accessible via APIs
- ❑ Distributable
- ❑ Centrally Managed

Applicable

- ❑ Localhost
- ❑ Dev
- ❑ Pre-Prod
- ❑ Prod



Security is the same regardless of infrastructure & app architecture



Identity is at heart of security and enables you to deliver the modern services **your customers demand…**

All while

*Ensuring the **security** of the data you hold*

*Enhancing the **privacy** of the customers you serve; and*

*Meeting your regulatory and compliance **obligations**?*

Thank you!

About me:

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Learn more at:
www.cloudentity.com

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