



TOWARDS GLOBAL MULTI-CLOUD STRATEGIES: INSIGHTS INTO AWS AND ALIBABA CLOUD SYNERGY

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- **Martin Zizler** received his Bachelor of Engineering in Media Informatics and a Master of Science in Artificial Intelligence from OTH Amberg-Weiden, Germany. His master's thesis explored global multi-cloud architectures, with a specific focus on the synergies between AWS and Alibaba Cloud.
- He currently works as an IT Application Specialist at the IT-Servicezentrum der bayerischen Justiz (IT Service Center of the Bavarian Judiciary).

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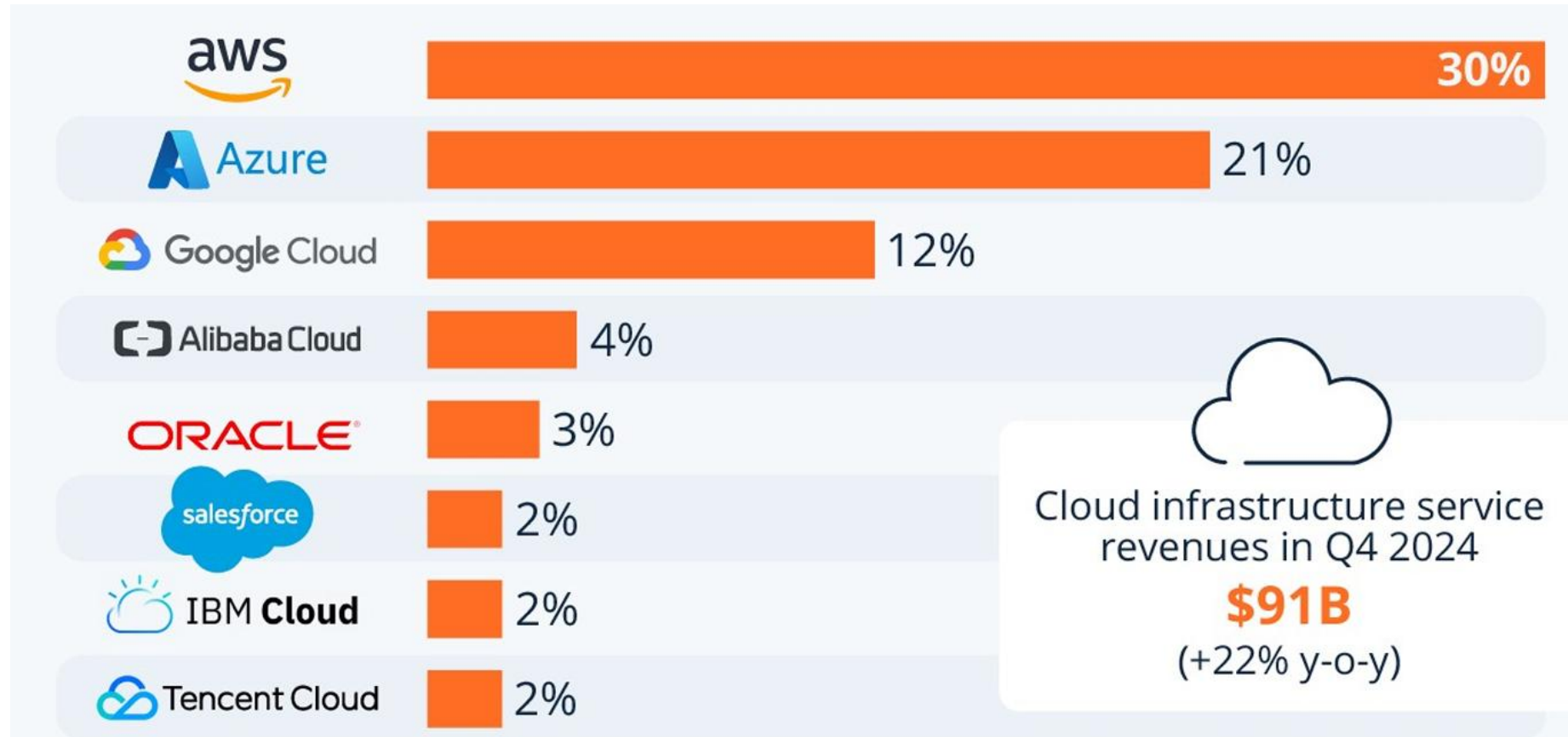
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Motivation



Source: Synergy Research Group <https://www.statista.com/chart/18819/worldwide-market-share-of-leading-cloud-infrastructure-service-providers/>

Multi-Cloud Definition



CLOUD

Basic cloud use, using SaaS application, public cloud for test-dev or a specific use case.



HYBRID-CLOUD

Run the same application seamlessly on premises and in a public cloud.

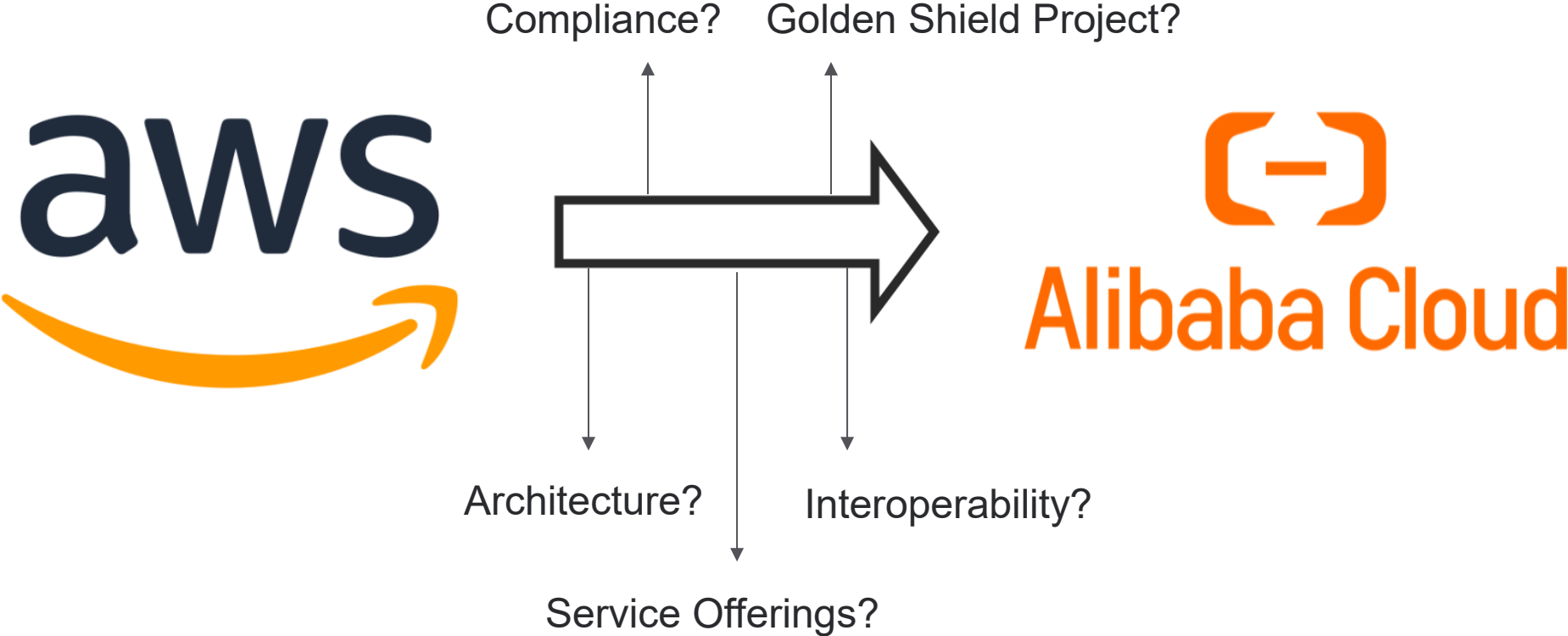


MULTI-CLOUD

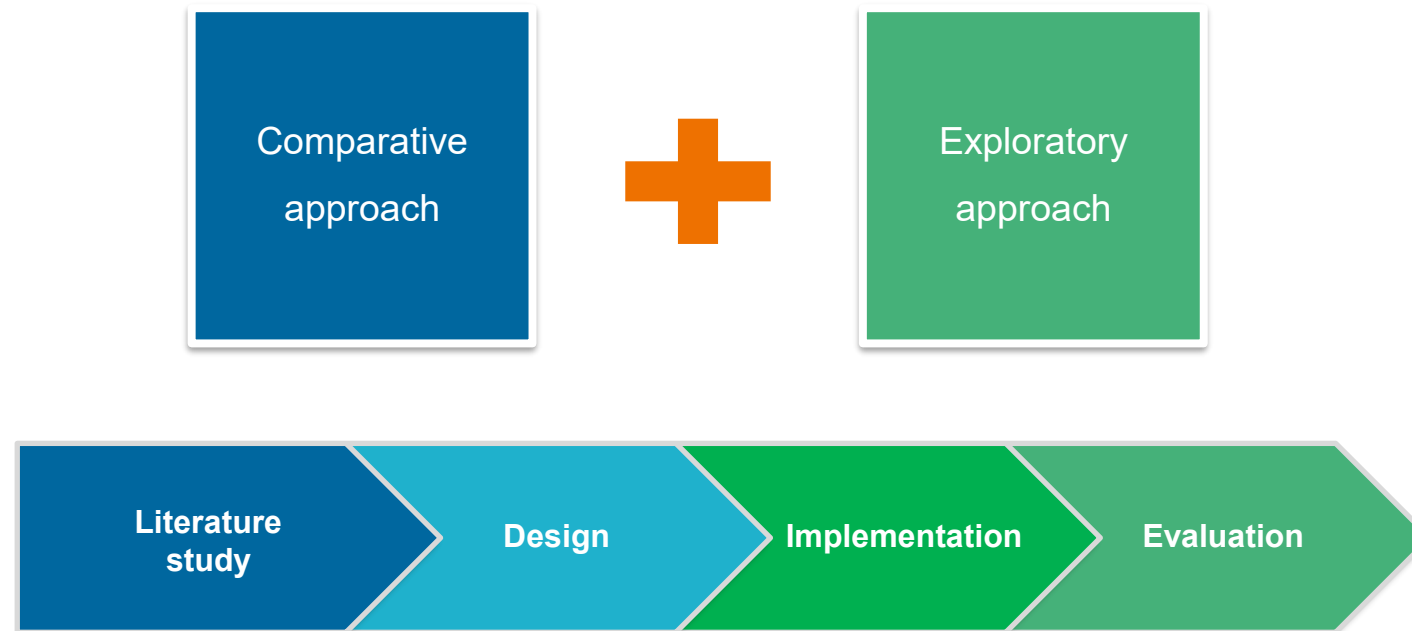
Ability to use the most appropriate cloud, whether on-premises or public, for each application.

Source: <https://www.xorlogics.com/2019/11/25/pros-of-a-multi-cloud-strategy/>

Problem Statement



Methodology Overview



AWS vs Alibaba Cloud

Global Infrastructure

Characteristic	AWS	Alibaba Cloud
Regions	36	29
Availability Zones	114	87
Strongest Presence	North America, Europe	China, Southeast Asia
Specialized Partitions	AWS GovCloud, AWS China	China Mainland, Outside Mainland

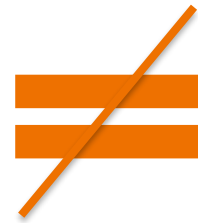
Sources: Amazon & Alibaba from mid 2025

The Mainland China Isolation

AlibabaCloud.com vs. Aliyun.com



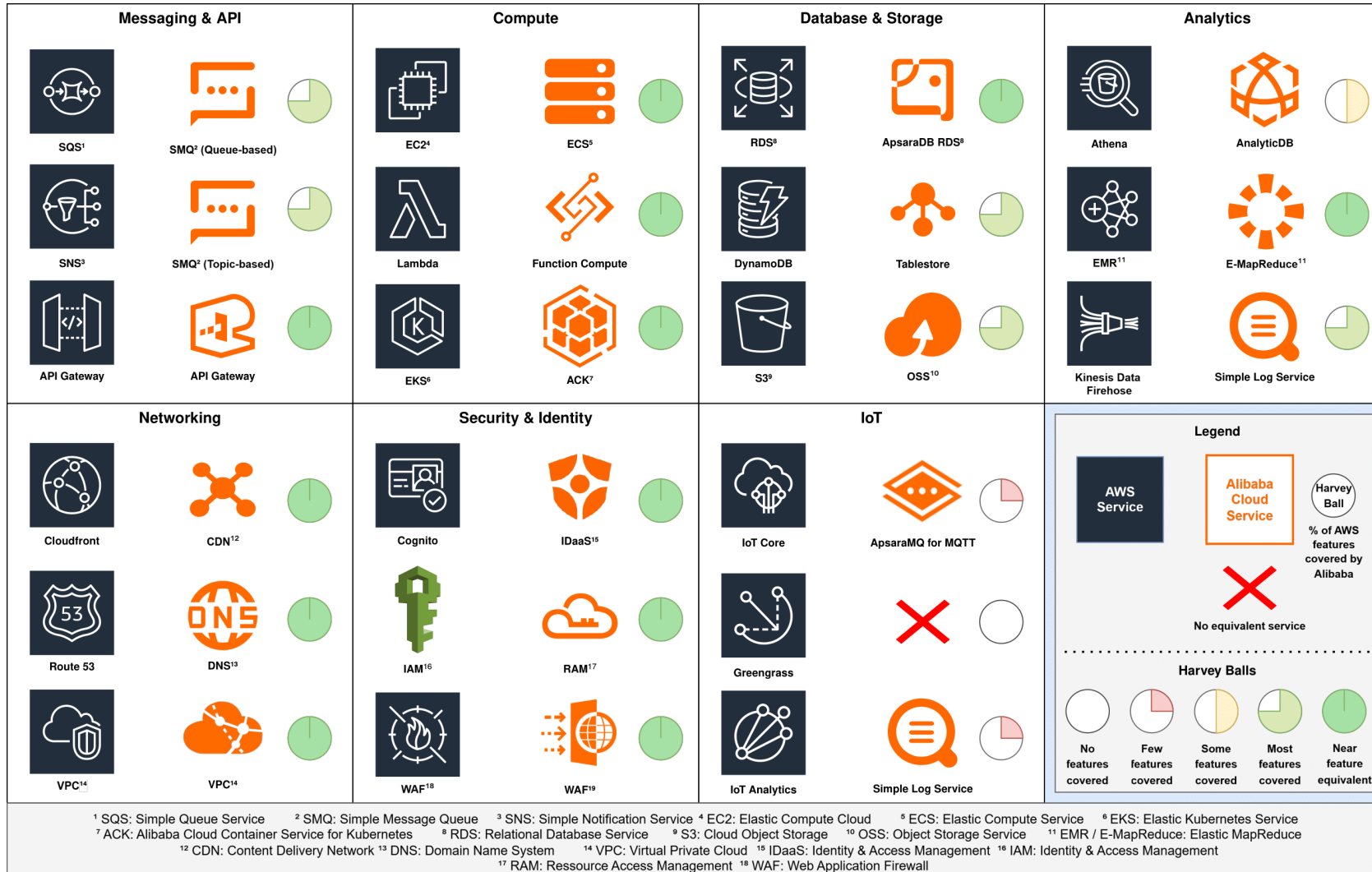
for international users



for Chinese users

AWS vs Alibaba Cloud

Core Service Portfolio Comparison



AWS vs Alibaba Cloud

Infrastructure as Code Tooling Comparison



AWS CDK



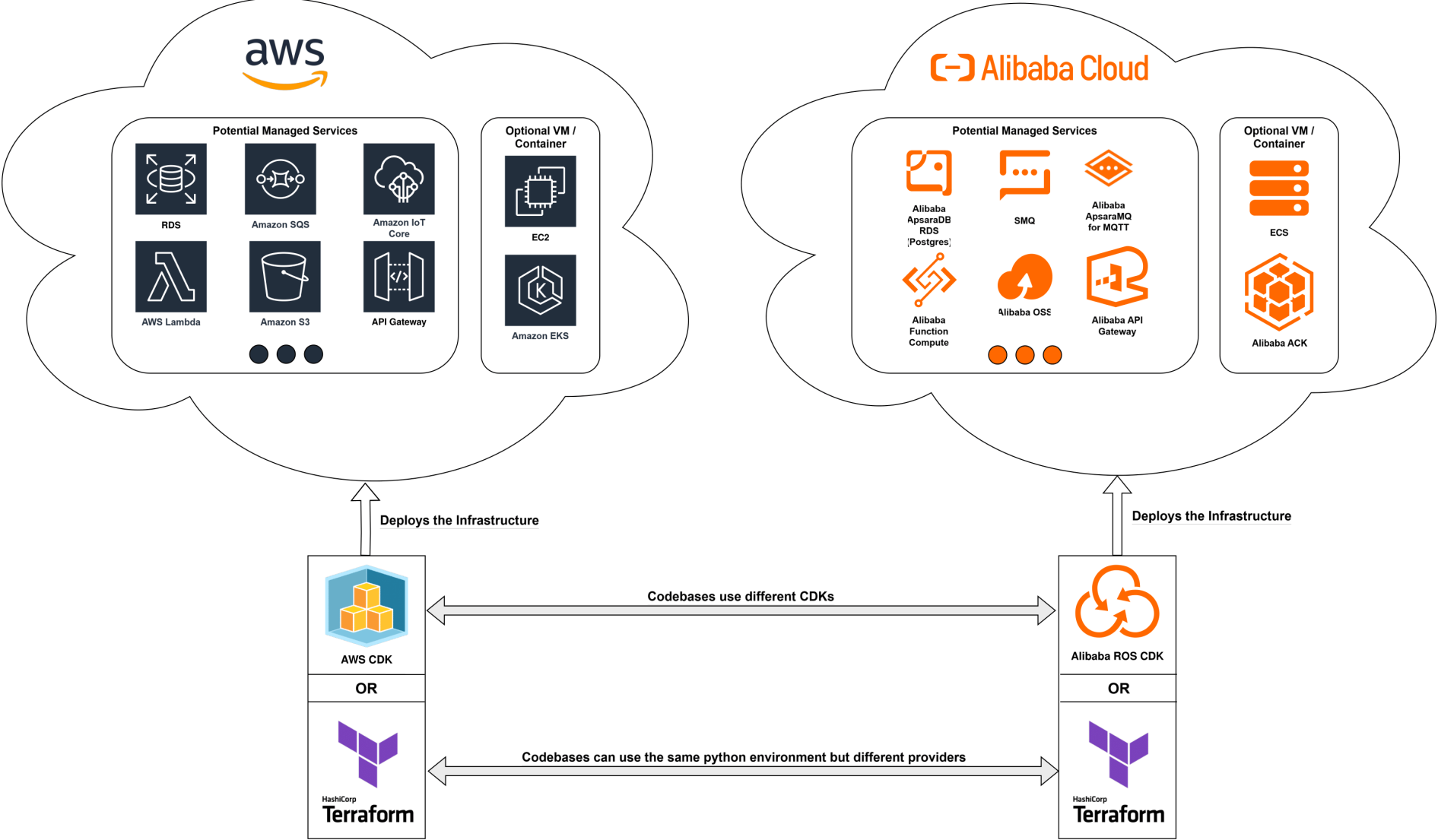
Alibaba ROS CDK



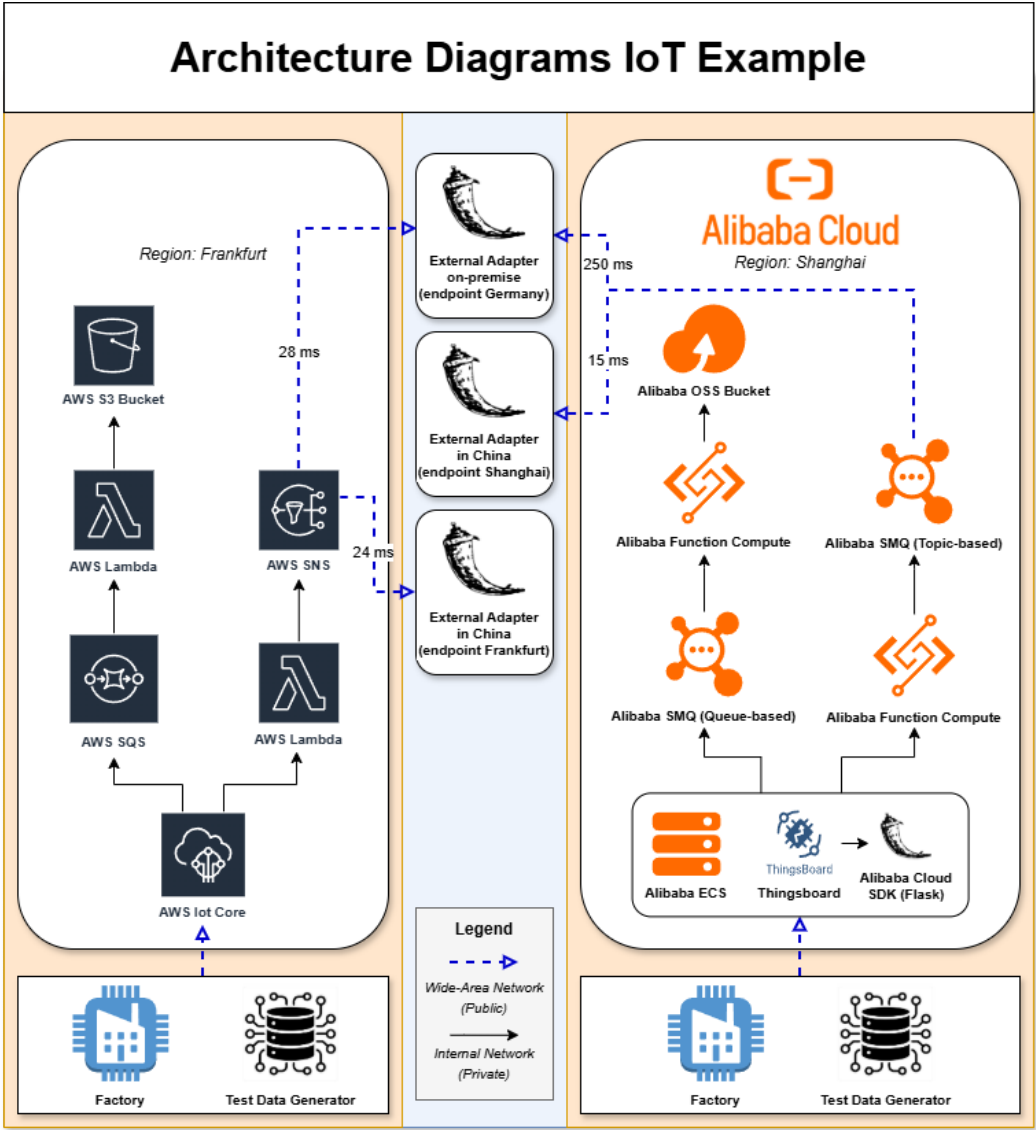
HashiCorp
Terraform

Multi-Cloud Strategy Design

Architecture Overview



Proof-of-Concept Architecture



Evaluation Results

- Functional parity achieved across clouds
- AWS CDK very concise
- Comparable performance and cost between providers (limited testing)
- Higher complexity on Alibaba due to ingestion layer

Latency measurements:

- Alibaba→ECS (cn-shanghai): **15 ms**
- Alibaba→on-prem (Germany): **250 ms**
- AWS→EC2 (eu-central-1): **24 ms**
- AWS→on-prem (Germany): **28 ms**

Platform	Tool	Deploy	Destroy	Lines
AWS	CloudFormation	1m 15s	56s	75
AWS	CDKTF	1m 11s	30s	184
Alibaba Cloud	ROS	24s	26s	146
Alibaba Cloud	CDKTF	19s	26s	143

Table 7.3: Deployment / Teardown Times and IaC Line Counts of IoT Stack

Laws that dictate:

- Cross-border data transfers
- Data residency
- Data minimization
- Auditability



Lessons Learned & Best Practices

Native CDK recommended

Use native security
and logging tools

Design for Compliance
from the Start

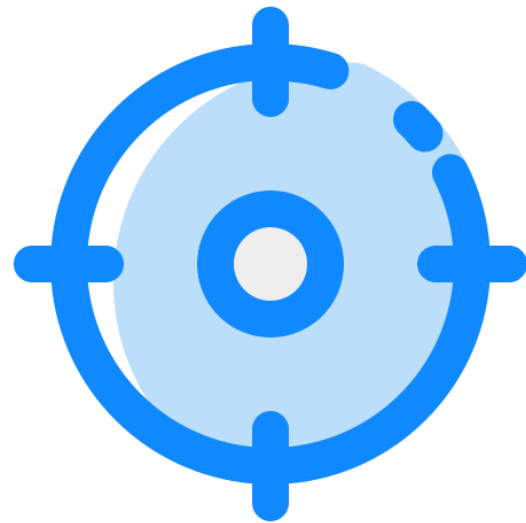
Evaluate Long-Term
Maintainability

Utilize a service mapping matrix
to track equivalences.



Source: [Light Bulb or Idea Flat Icon Vector.svg](#) from [Wikimedia Commons](#) by [Videoplasty.com](#), [CC-BY-SA 4.0](#)

Threats to Validity



Scope



Bias



Evolution

Conclusions & Future Work

Contributions

1. First structured comparative analysis of AWS and Alibaba Cloud
2. Developed a multi-cloud strategy framework
3. Delivered a proof-of-concept to test portability

Future Work

- Comprehensive Benchmarking Studies
- AI-Driven Optimization of Multi-Cloud
- Security and Compliance Automation (policy-as-code)



THANK YOU!

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