The Future of Cloud

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About Me

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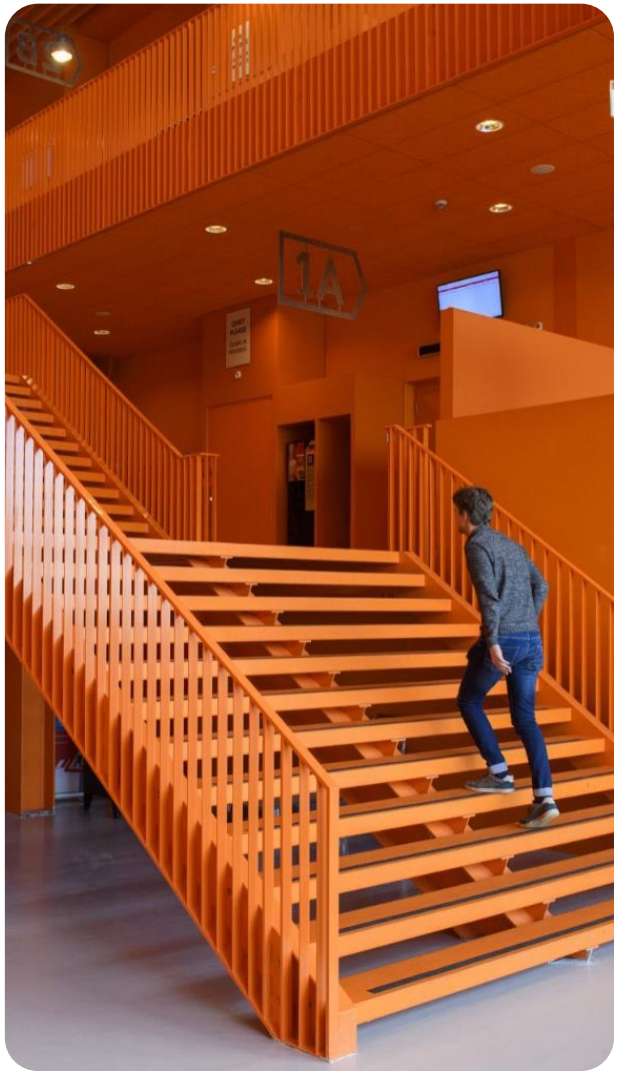
The Future of Cloud

Commoditised Intelligence



What is Cloud Technology?

It is a complex and multi-faceted question, just like “What is Electricity?”

- Is the flow of electrons through a conductor
- It's a form of energy resulting from the existence of charged particles
- Electricity is what connects and powers the modern world

Cloud is a ubiquitous Technology

Ubiquitous technology refers to tech that is everywhere at the same time, seamlessly integrated into our daily lives, and often invisible or unnoticed by users.

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Is this “*Electricity*”?

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Is this “*the Cloud*”?

Microsoft Azure aws GCP ORACLE

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What is the Cloud?

Cloud is what happens on a global multi-tier distributed infrastructure that for some mind-blowing reasons, seems to be always there!

What is the Cloud?

Hardware Layer (“the metal”)

Servers
Racks
Network Devices
Intercontinental Cables
Urban Fiber Optics
Edge Routers
Mobile Phones
Satellites
Data Centers
Laptops
TVs
Smart Home Devices
Industrial Sensors
Manufacturing Robots
Smart Fridges
Smart Thermostats
Security Cameras
Smart Locks
Smart Lighting Systems
Smart Watches
Fitness Trackers
Industrial Control Systems
SCADA Systems
Smart Meters (Electricity, Water, Gas)
Vehicle Telematics Systems
Smart Agriculture Equipment
Drones
Point of Sale Systems
Medical Devices (e.g., Smart Insulin Pumps)
Networking Hubs
Wi-FI equipment
Smart Speakers

What is the Cloud?

Non-Functional software Layer (“the enabler”)

Operating Systems
Virtualization Software
Containerization Platforms
Database Management Systems (DBMS)
Web Servers
Cloud Management Platforms
Development Tools and IDEs
CI/CD Tools
Monitoring and Analytics Tools
Network Management Software
Security and Compliance Software
Load Balancers
API Management Platforms
Storage Management Software
Data Backup and Recovery Solutions
Content Delivery Networks
AI and Machine Learning Platforms

Blockchain Platforms
IoT Platforms
Big Data Processing Frameworks
CRM Software
ERP Systems
Collaboration and Communication Tools
Cloud-native Application Frameworks
Identity and Access Management Solutions
Encryption and Data Protection Tools
Logging and Event Management Software
Queue Management Systems (e.g., RabbitMQ, Kafka)
Function-as-a-Service (FaaS) Platforms
(Disaster Recovery as a Service (DRaaS) Solutions

What is the Cloud?

Functional software Layer (“the tools”)

Learning Management Systems, Collaborative Research Platforms, Data Analysis and Visualization Tools, Cloud Storage and File Sharing Services, Project Management Tools, Video Conferencing Platforms, Educational Apps and Platforms, Scientific Simulation Software, Enterprise Resource Planning Systems, Customer Relationship Management Software, Content Management Systems, E-commerce Platforms, Digital Marketing Tools, Healthcare Management Systems, Financial Management and Accounting Software, Social Media Management Tools, Cybersecurity and Threat Detection Systems, Artificial Intelligence and Machine Learning Platforms, Blockchain Applications, Internet of Things Platforms, Remote Desktop and Access Tools, Cloud-Based Development Environments, Business Intelligence Tools, Virtual Event Platforms, Supply Chain Management Systems, …

What is the Cloud?

People Layer (“where value happens”)

Software Developers
Data Scientists
IT Administrators
Academic Researchers
Startups
Healthcare Professionals
Students and Educators
Media Professionals
Financial Analysts
Retailers
Government Agencies
Marketing Professionals
Non-Profit Organizations
Engineers and Architects
Transport and Logistics Companies
Manufacturers
Energy Sector Professionals
Urban Planners and Smart City Developers
Legal Professionals
Consumers

Maybe this is the Cloud?

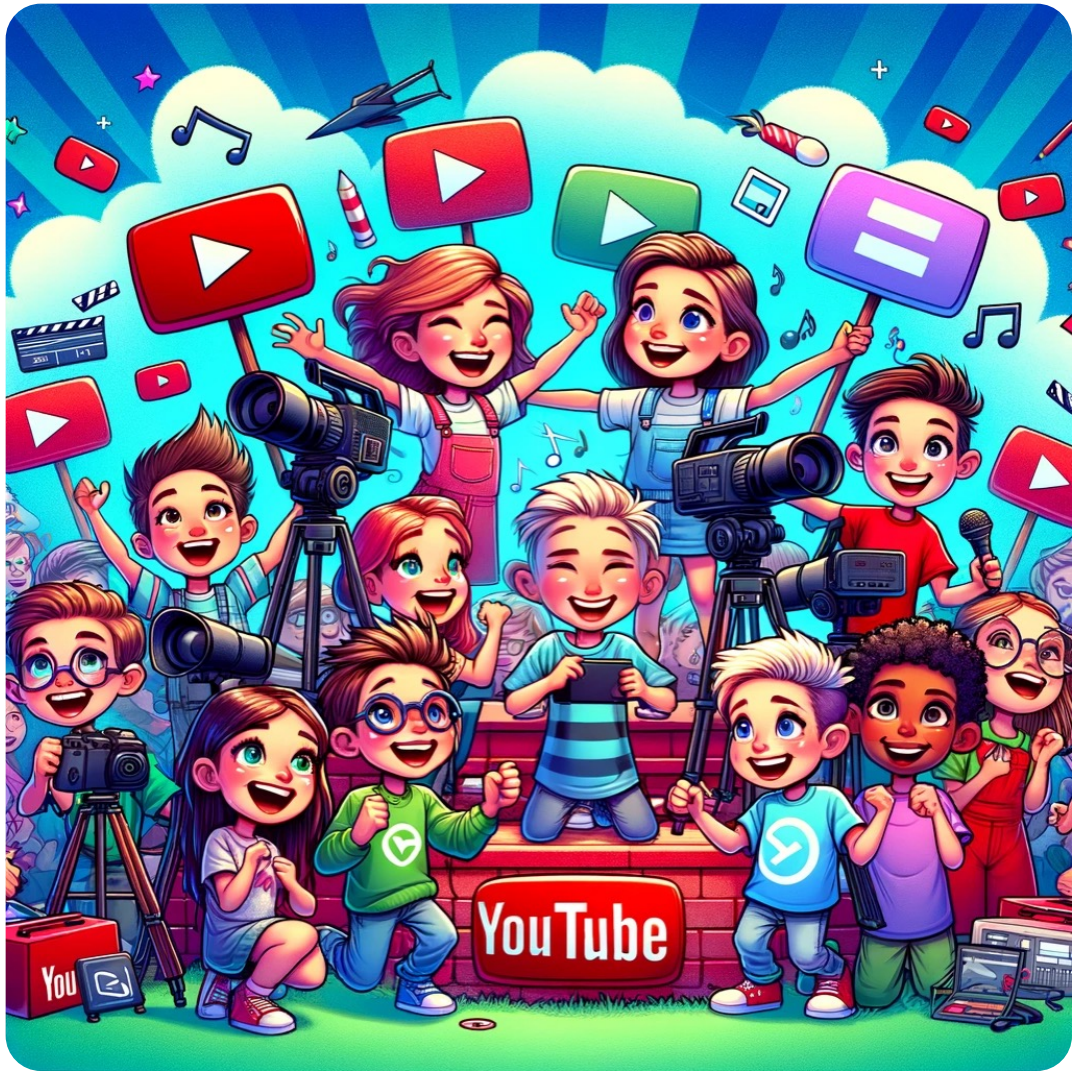
"State Surveillance”
"Profit vs Privacy”
"Antitrust Concerns”
"Digital Balkanization”
"Cloud Supremacy”
"Digital Geopolitics”

Challenge 1: Things are getting expensive (wallet and environment)

“Generating one image using AI can use almost as much energy as charging your smartphone”

Challenge 2: every kid wants to be a YouTuber

Foster a generation that “understands” and creates Cloud Technologies.



Challenge 3: Making the most of what we have

Efficient use of existing infrastructures:

- Local datacenters
- Supercomputers
- Private Clouds
- Public Clouds
- People

Countless angles, views and components – choose what cloud is for you.

What are the common denominators for a sustainable ecosystem?

On what can we bet to stay constant for the foreseeable future?

The Cloud Model (is not going anywhere) (yet)

Cloud Model: delivering computing services—like servers, storage, databases, networking, software, analytics, and *intelligence*—over the internet.

Cloud Native: How applications are created and deployed, not where. It focuses on building applications that exploit the flexibility, scalability, and resilience of cloud computing.

What is the Cloud Model?

Expectations:

I need it now!

I need more power!

I need to share with my colleagues!

… and more!

CLOUD MODEL

On-Demand Access

Global Availability

Self-Service Provisioning

Scalability and Elasticity

… and more!

Users expect a seamless, reliable, and efficient experience

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The Cloud Model works naturally with Cloud-Native primitives

Expectations:

I need it now!

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CLOUD MODEL

On-Demand Access

Global Availability

Self-Service Provisioning

Scalability and Elasticity

… and more!

CLOUD NATIVE PRIMITIVES

Object Storage

Microservices

Serverless Computing

Event Drive Architectures

Service Meshes

… and more!

Users expect a seamless, reliable, and efficient experience

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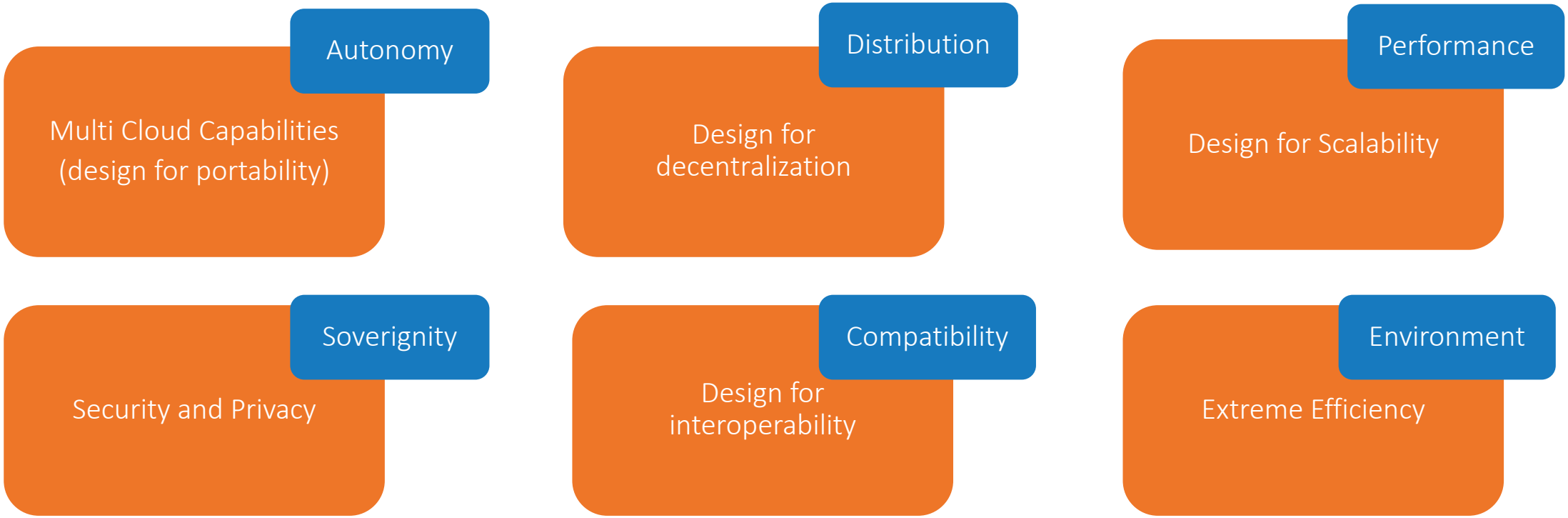
Sustainable Architectural Framework – the foundation for the Cloud Model



But Why? Or rather… wAI?

Edge Computing Demands Distribution, Performance, Soverignity	Real Time Processing	Campus Security: Facial recognition. Research Data Collection: Sensor analytics. Educational VR: Immersive learning.
Data Soverignity and Privacy Soverignity, Distribution, Autonomy	Data is processed and stored in specific geographical locations.	Student Information Systems: Privacy compliance. Research Data Repositories: Secure storage. Online Course Platforms: Data localization.
Scalability and Availability Performance, Distribution, Environment	AI workloads can be unpredictable and may require rapid scaling.	MOOC Platforms: Auto-scaling access. Research Computing Clusters: Elastic resources. Library Databases: High-traffic handling.
Bandwidth and Cost Efficiency Environment, Soverignity, Distribution	AI applications can generate vast amounts of data.	Remote Laboratories: Local computation. Field Study Analysis: On-site processing. Digital Archives: Bandwidth conservation.
Specialized Hardware Performance, Distribution	GPUs, TPUs are not always located when needed.	Genomic Research: Parallel processing. Machine Learning Courses: GPU usage. Simulation Models: Accelerated computing.

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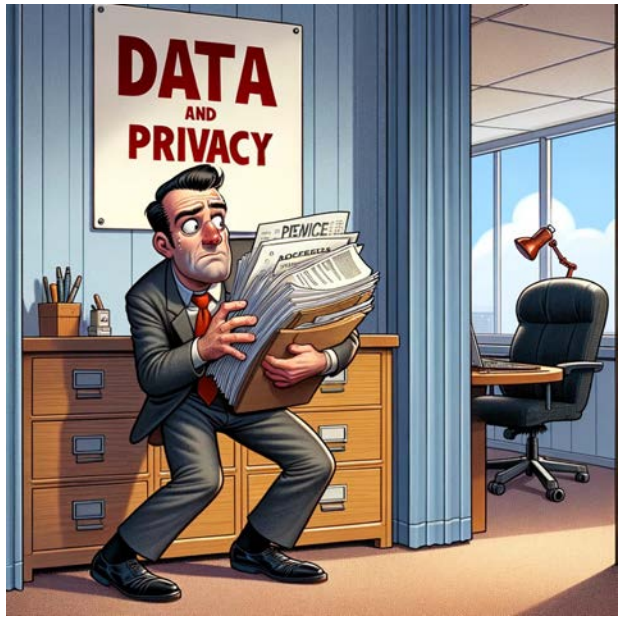
What will be driving “Distribution”



DATA and Computing at the Edge

Lurking at the Industry…

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Login Get

Serverless AI on GPUs

Run generative AI tasks on our global network of NVIDIA GPUs with no extra setup.

Models Included

Choose from a variety of popular models in our catalog including Llama-2, Whisper, and ResNet50.

Available everywhere

Run AI models from Workers, Pages, or anywhere via our REST API

Supercharge with Vectorize

Generate and store embeddings in a globally distributed vector database.

AI Gateway

Improve reliability and scalability with caching, rate limiting, and analytics.

Train with R2

Build multi-cloud training architectures with free egress.

How does a commercial global network looks like

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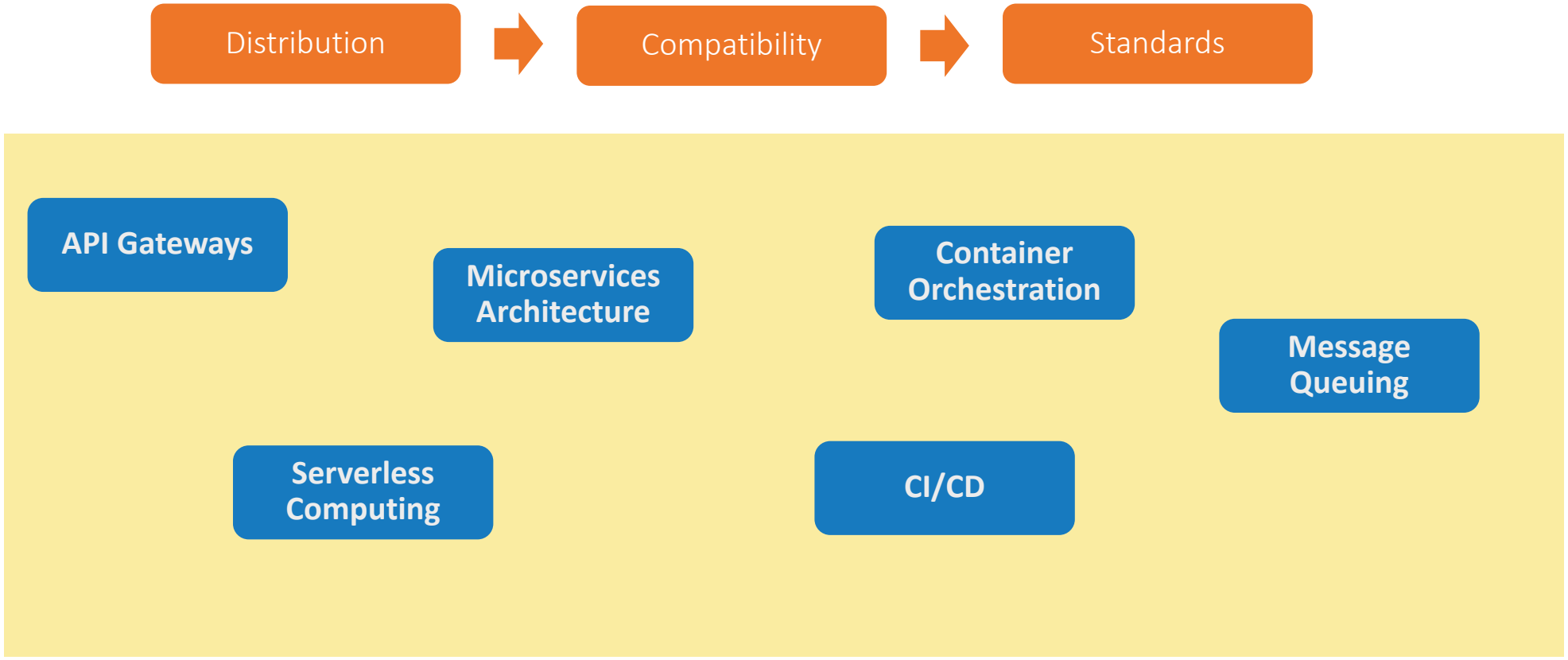
What can we learn from the Industry?



What is going on in EU

gaia-x

EuroHPC Joint Undertaking

Sovereign Cloud Stack

GÉANT

EURO

Soverignity

Innovation

Collaboration

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SURF is here with you, for you.

Let’s figure it out together

Thank you!