

ANGA COM 2025 | Axians In-Booth Theater

# Networking the cloud with Nokia - reliable, secure, and automated

Nils Kleemann, Nokia



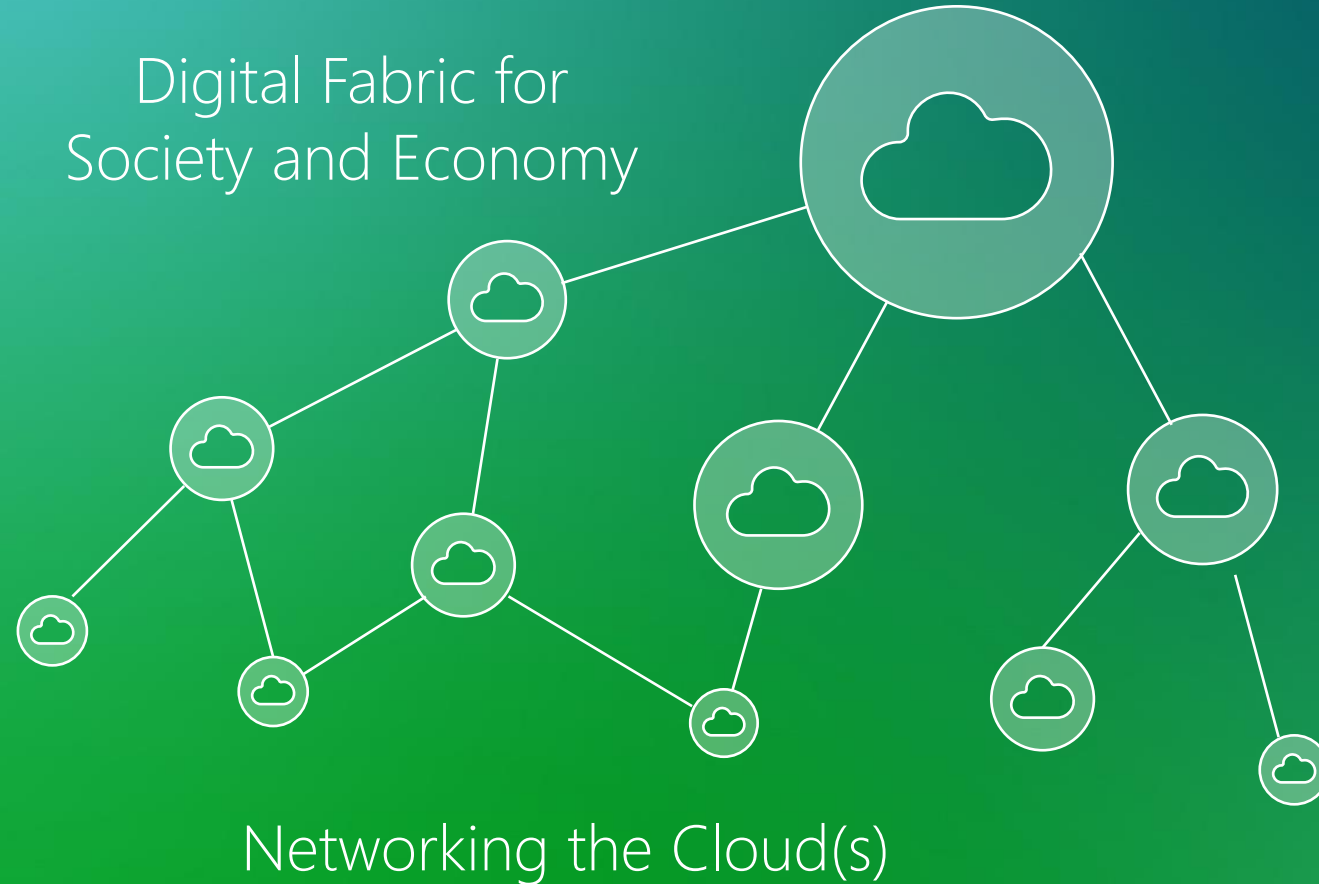
# Networking the Cloud with Nokia

Seamlessly distributing AI workloads

Nils Kleemann, Nokia

June 2025

# The Cloud imperative

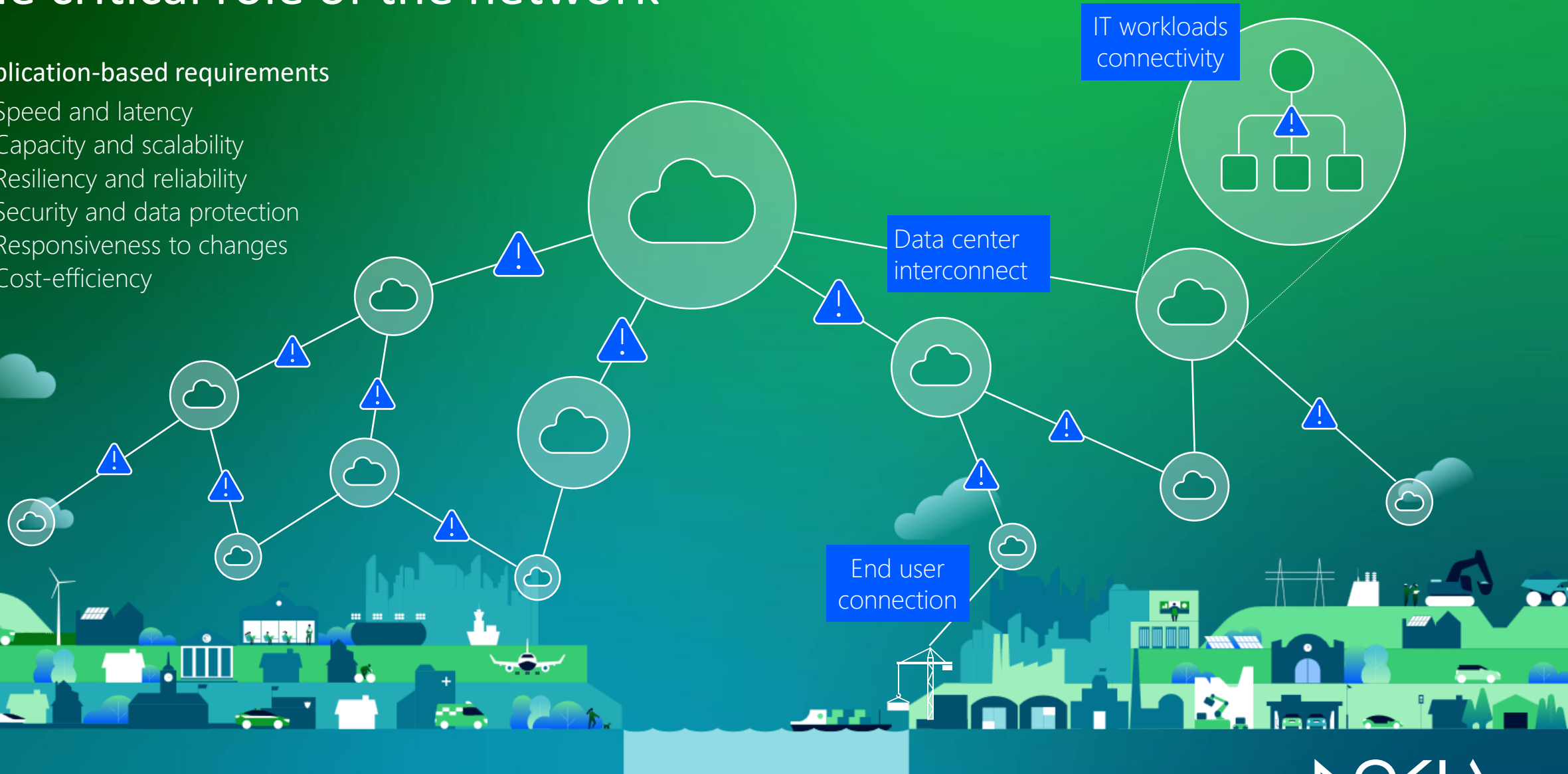


- **Cloud services** on the rise
  - Streaming
  - Enterprise services
  - AI
- **Network functions**  
either Cloud, SoC or appliance
- **Cloud Repatriation**
- **Digital & Cloud Sovereignty**
- **Types of Clouds**  
(on-prem, regional, public)
- **Artificial Intelligence**
  - Training and inference
  - AI Services
  - AI for networks
  - from very small to very large LLMs

# The critical role of the network

## Application-based requirements

- Speed and latency
- Capacity and scalability
- Resiliency and reliability
- Security and data protection
- Responsiveness to changes
- Cost-efficiency



# Artificial Intelligence– driving growth in networking traffic

## Ecosystem Built-up

### Technology Advancements

- Computing/Storage
- Deep learning & neural networks
- Chipsets

### Big Data

- Explosion of Data (= sources)
- Social media, IoT, digital media
- Continuous learning

### Practical Applications

- Wide range of industries
- Addressing QoE, operations, ...
- GenAI for generating content

### Investment & Research

- Substantial investments
- Private and governments
- Accelerating innovation

## Global WAN AI traffic\* by 2033

1088 EB/month, growing at 24% CAGR  
(33% of Global WAN traffic)

### Consumer

1006 EB/month, 23% CAGR  
(38% of Global consumer traffic)

#### Direct AI traffic

174 EB/month, 51% CAGR

#### Indirect AI traffic

832 EB/month, 21% CAGR

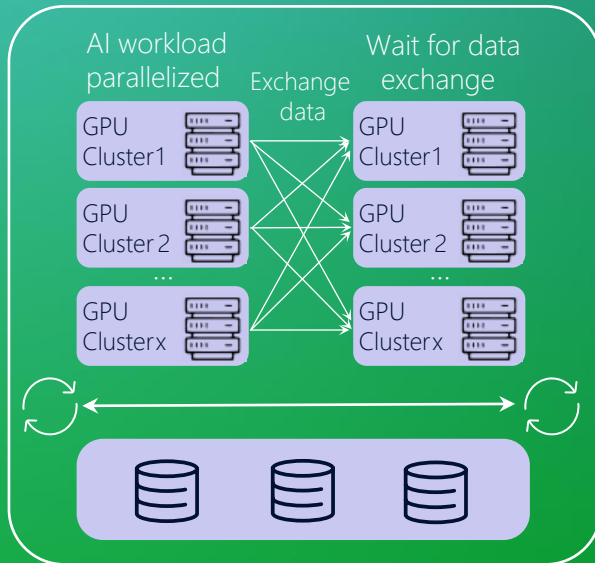
### Enterprise

81 EB/month, 57% CAGR

Source: Bell Labs, Global network traffic report

# Networking for Artificial intelligence services

AI workloads across many GPU clusters



- High-perf. Backend (400G/800G)
- Low latency (Ultra-Ethernet)
- Automation (intent based)
- Security (DDoS mitig. for DC-GW)

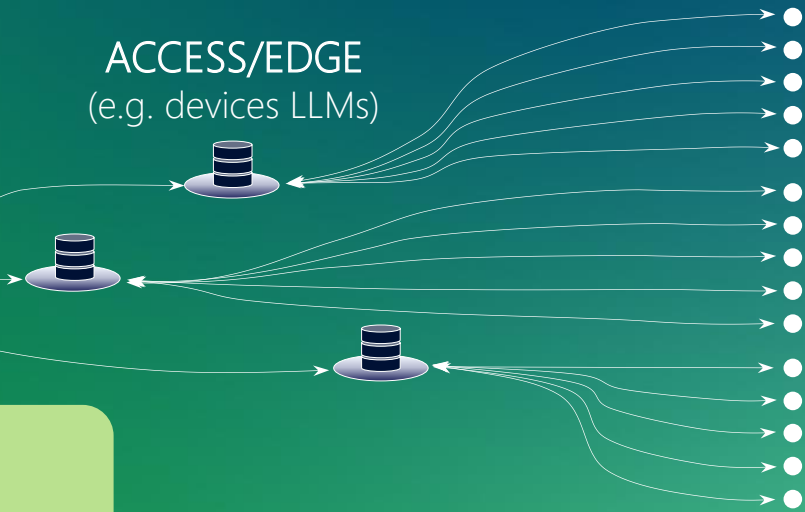
CENTRAL CLOUD  
(e.g. Very LLMs)



- Capacity (fibre)
- East – West traffic
- Symmetrical traffic
- Security (e.g. Quantum safe)

END-POINT  
Data collection

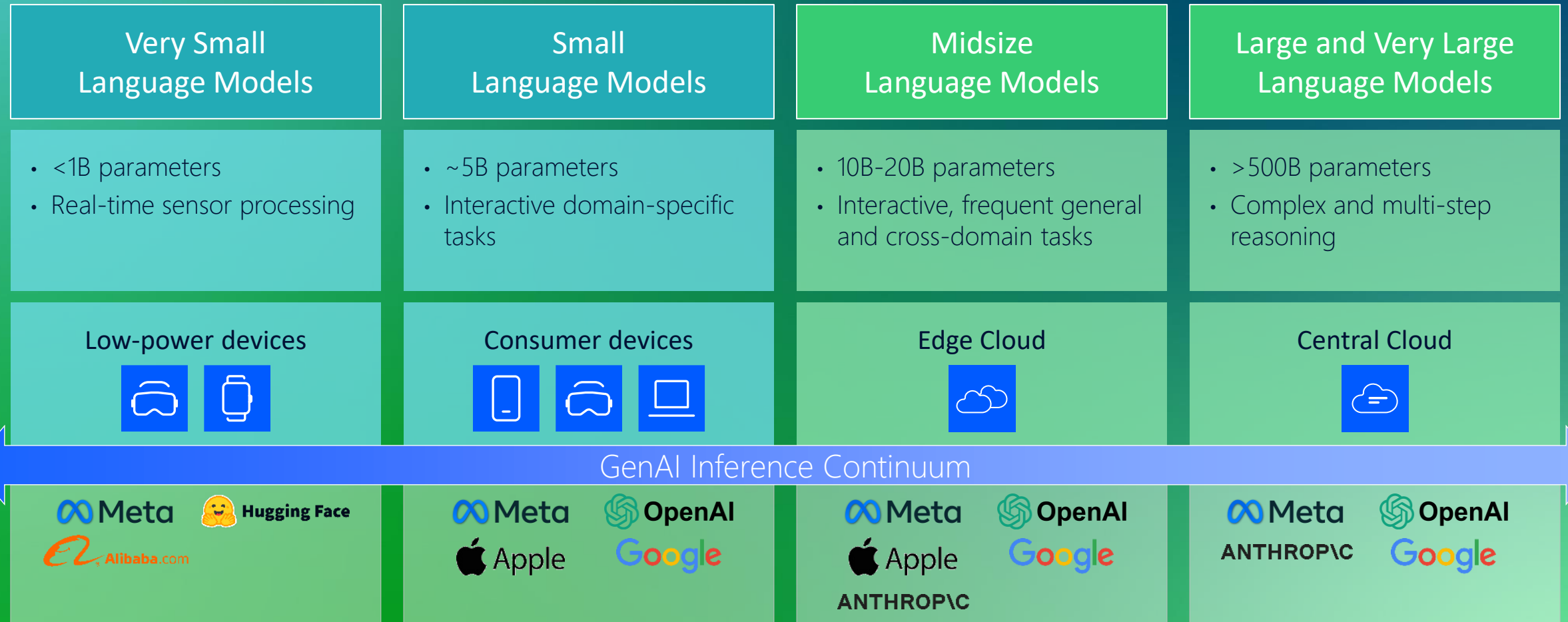
ACCESS/EDGE  
(e.g. devices LLMs)



- AI on and for devices

# The emergence of the GenAI inference continuum

Very small to very large language models



GenAI Inference Continuum

# Apple and AI



## Apple Intelligence

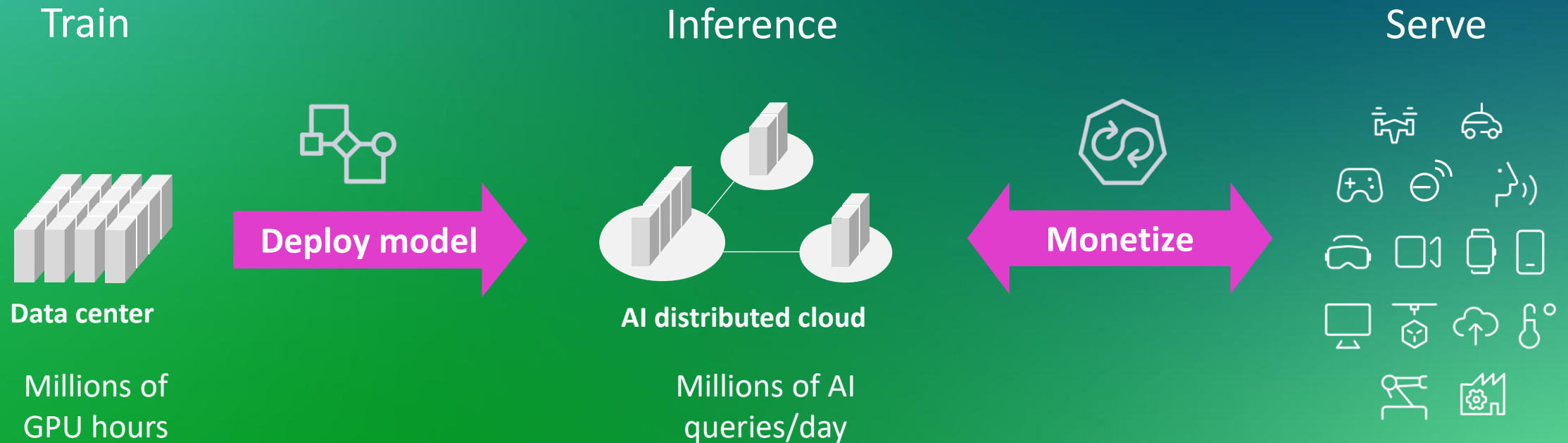
- a. On-device LLM (in house)
- b. Cloud-powered LLM (in house)
- c. Chatbot (OpenAI, Google maybe).

Securing our data, using a combination of 'on-device' working and secure server links.

Supported only on iPhone 15 & 16 models due to the advanced HW requirements needed to run these features efficiently.

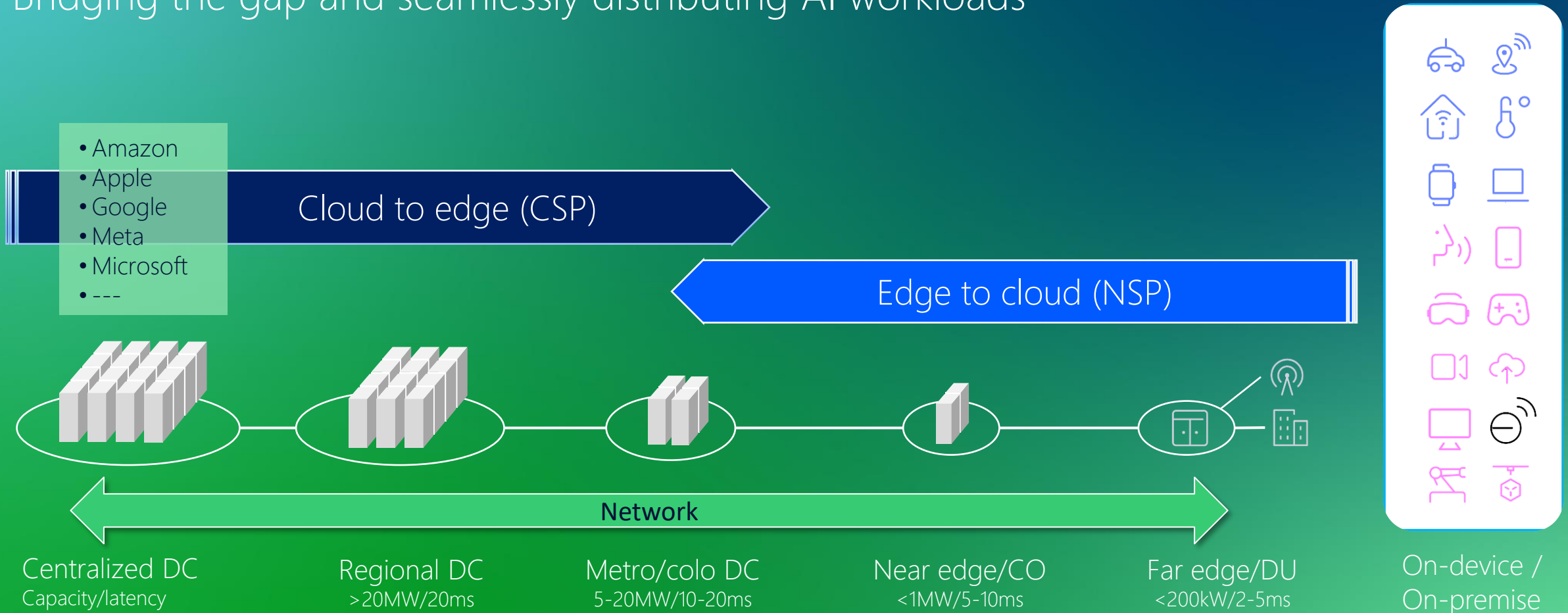
# Cloud services spanning across multiple cloud locations

## The role and value of AI inferencing in the application lifecycle



# Establishing a network-cloud continuum

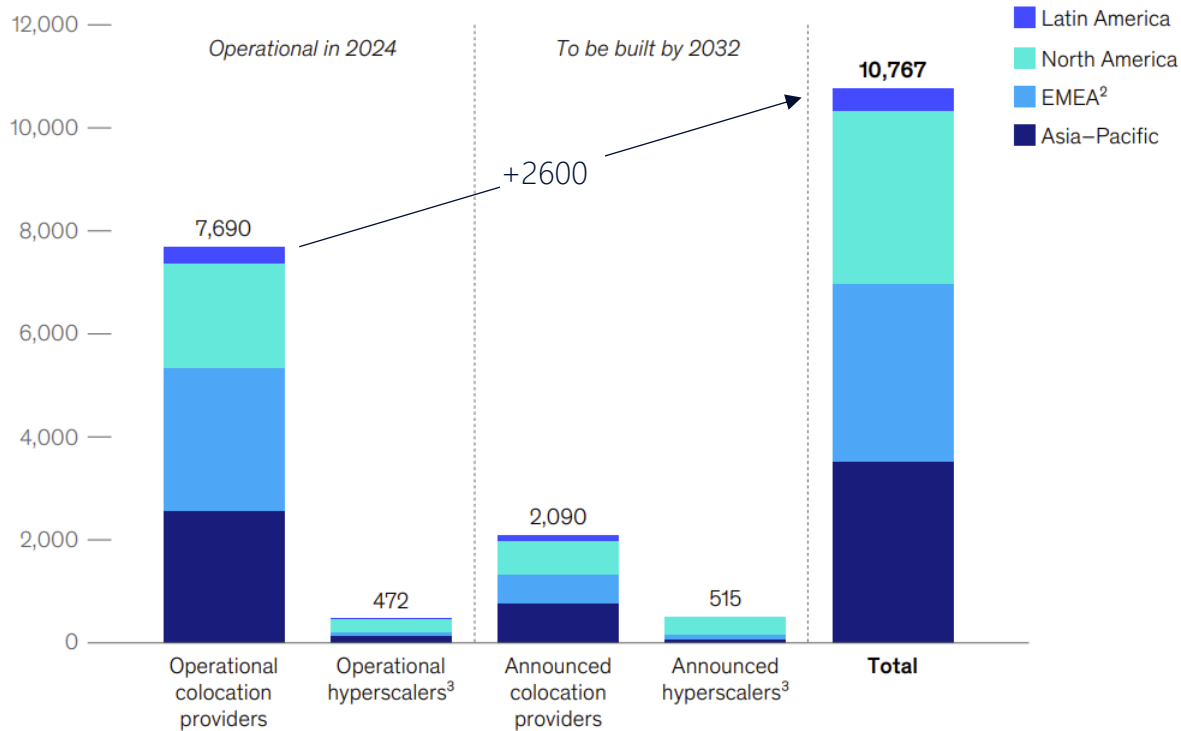
## Bridging the gap and seamlessly distributing AI workloads



# Treating Cloud networking as a new segment

## Opportunities and challenges in Europe

Data centers across colocation providers and hyperscalers,<sup>1</sup> number of facilities



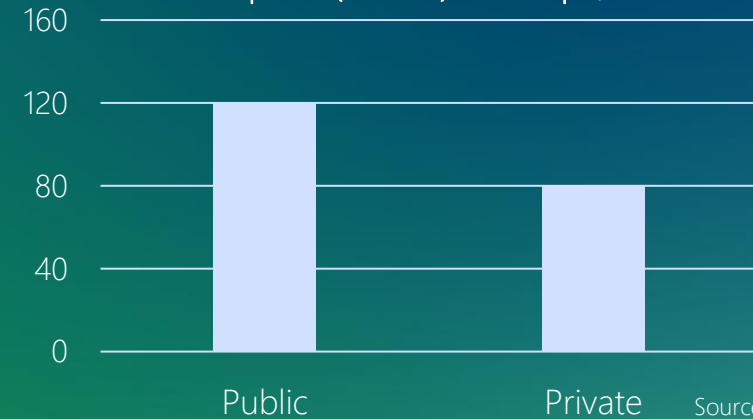
<sup>1</sup>84 announced facilities excluded as data on city location unavailable.

<sup>2</sup>Europe, Middle East, and Africa.

<sup>3</sup>Latin America has 2 operational hyperscaler facilities in 2024 and 15 announced to be built by 2032.

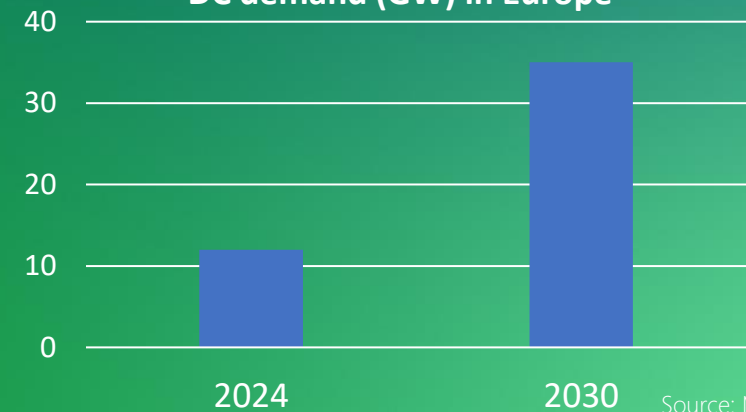
Source: 451 Research, part of S&P Global Market Intelligence (data as of Dec 2024)

Cloud Spend (bnEUR) in Europe, 2024



Source: GrandView Research

DC demand (GW) in Europe

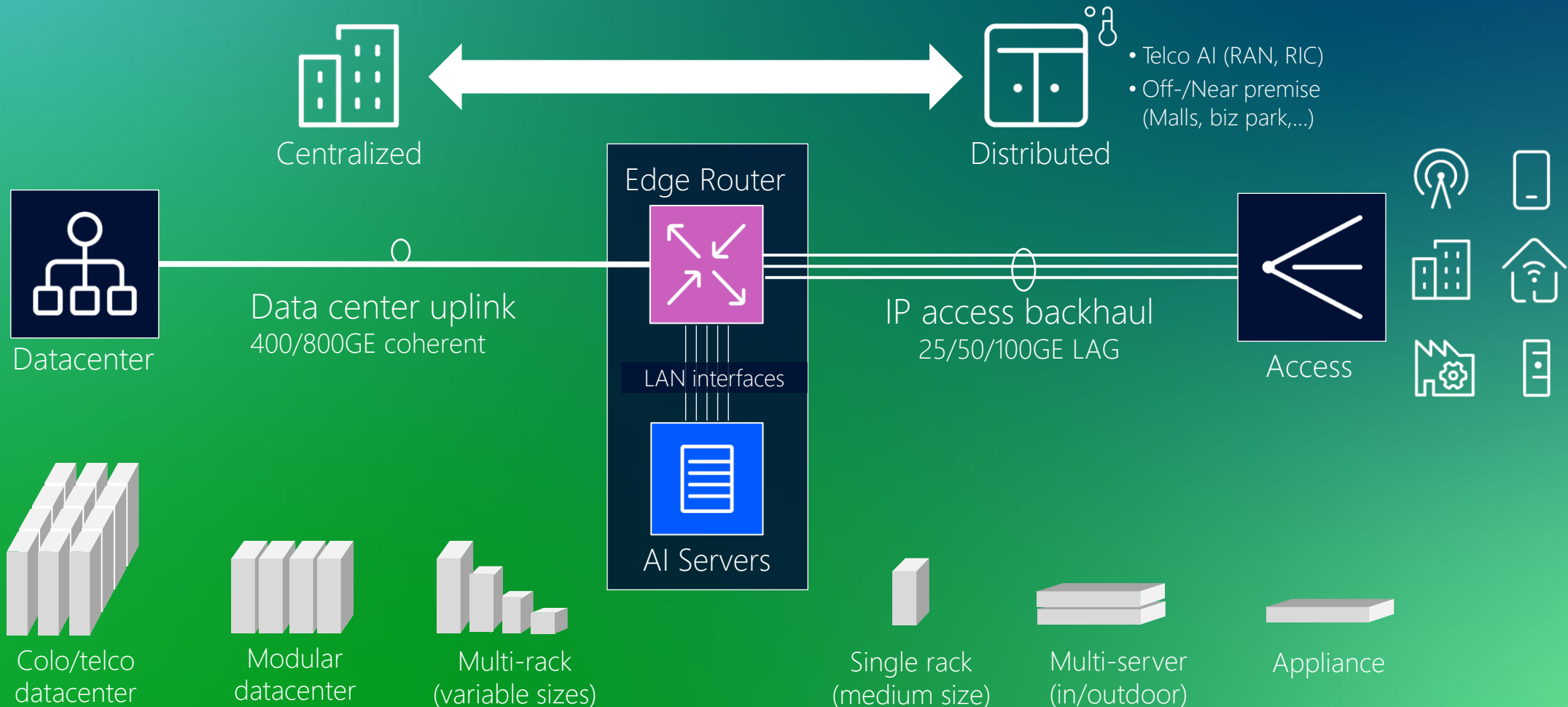


Source: McKinsey

Source: McKinsey, AI infrastructure: A new growth avenue for telco operators (Feb'25)

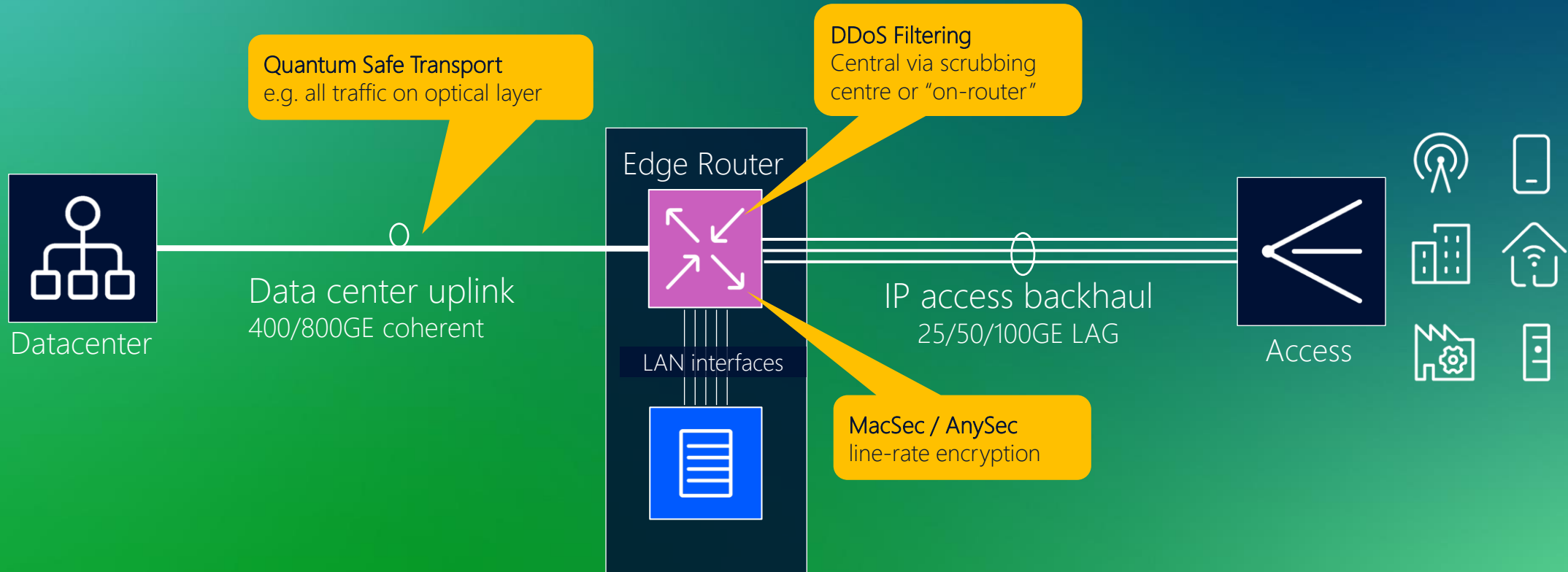
# Multi-access Edge Compute for AI inferencing

Distributed AI compute infra tightly and seamlessly integrated in networking services



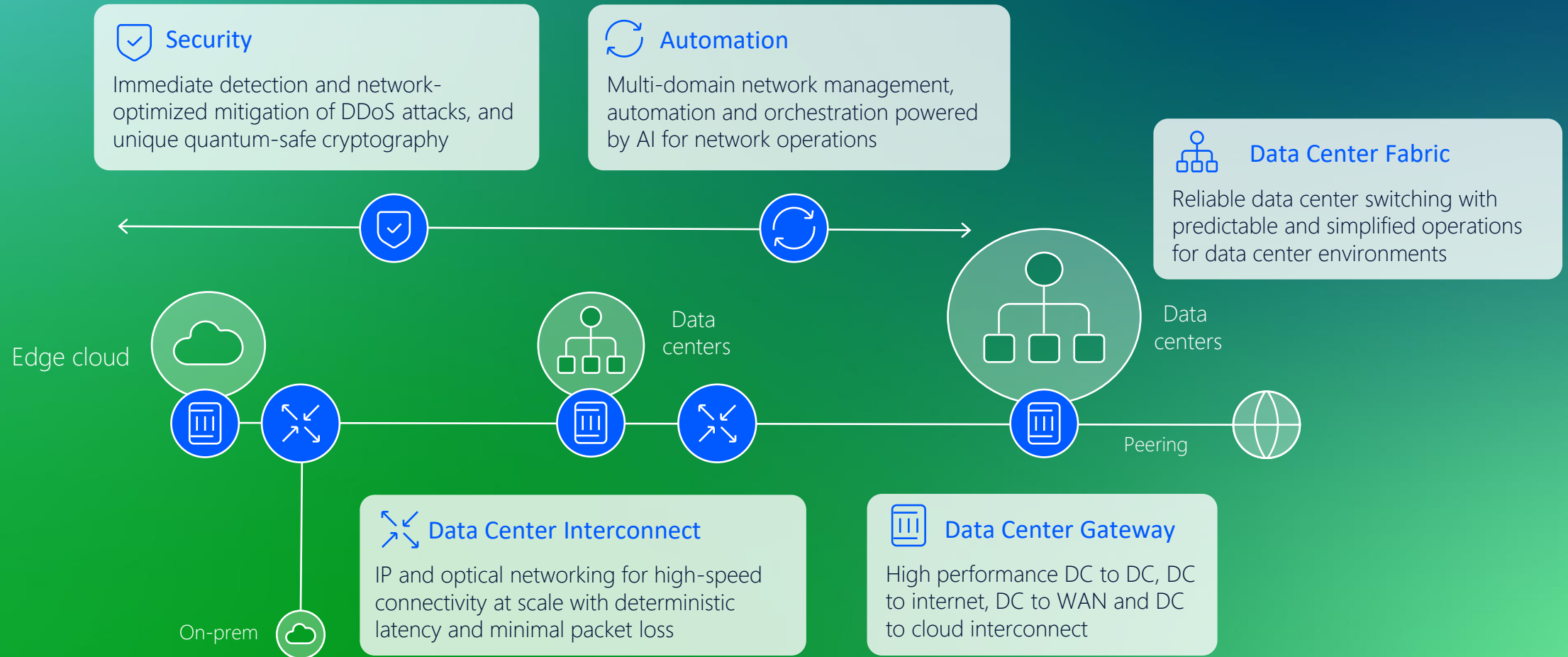
# No Cloud and Networking without Security

## Multi-layer embedded approach to network security



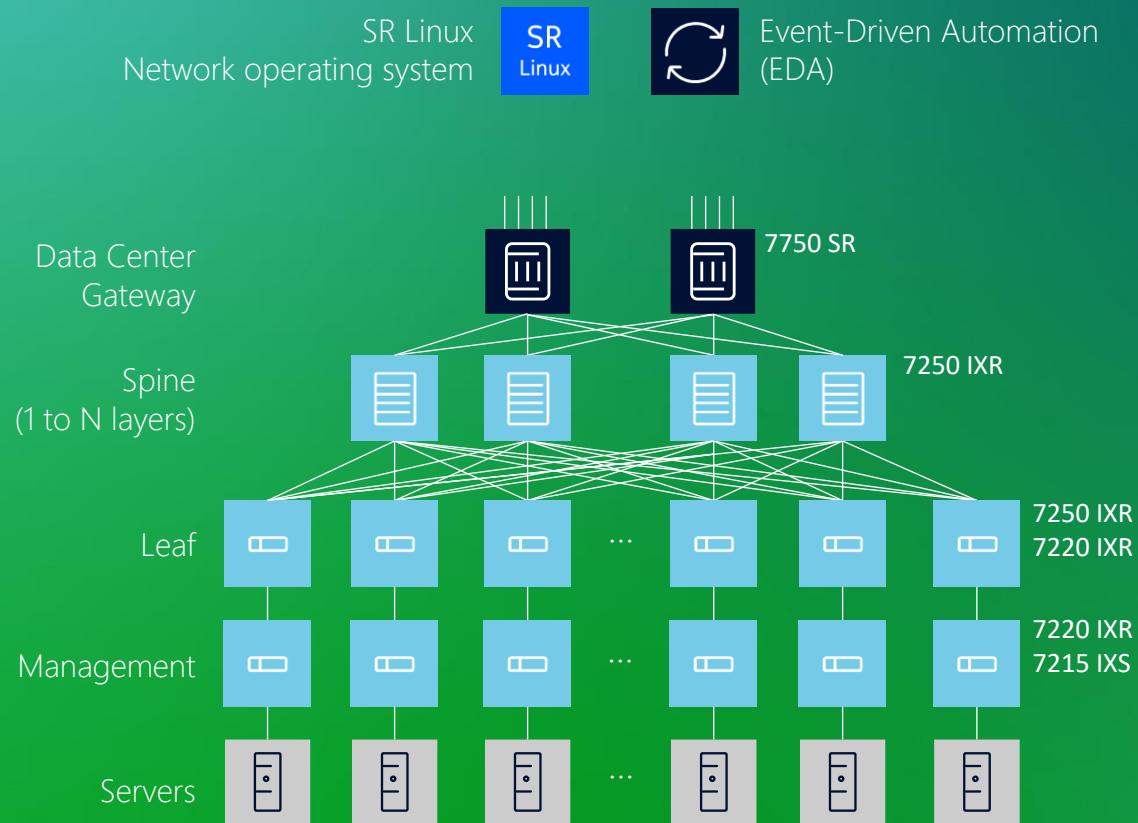
# Networking the cloud with Nokia

## Reliable, secure and automated networks



# Nokia Data Center Fabric solution

Network connectivity for all workloads



## A. Human Error Zero

Mitigating the influence of the human factor

- **Software quality** (avoid system instability)
  - SW 100% developed in house for total control
  - Balanced team developer vs test engineers
  - Lowest CVE in the industry
- **Event Driven Automation (EDA)** roll-out fabrics and changes as intended, and to avoid **fat-fingers**
  - Intent based, **reconciliation** and multi-vendor
  - Integrated Git, Digital Twin and AppStore
  - Kubernetes based

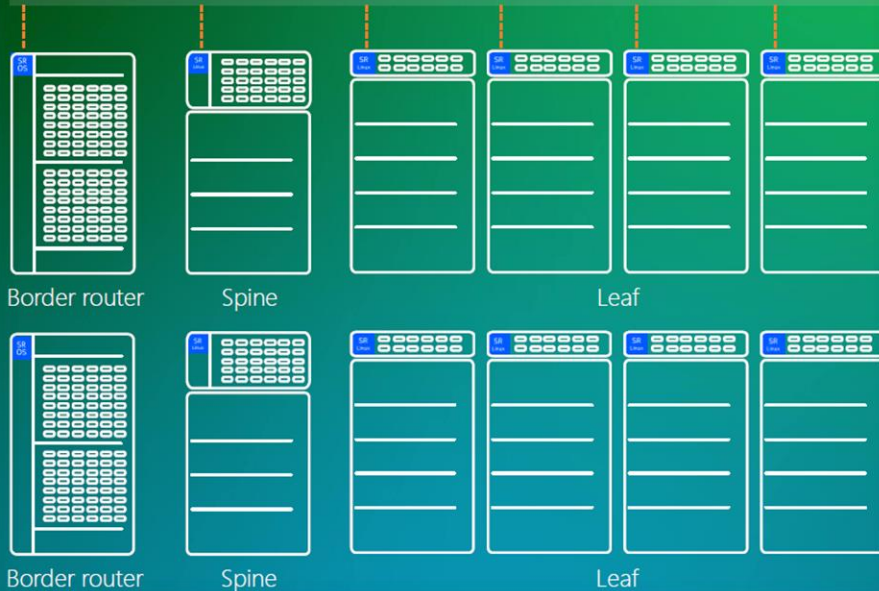
## B. Networking for AI era

- Part of UltraEthernet Consortium
- Future safe: 400G or 800G, scale-out or chassis-integrated

# Nokia EDA: Revolutionizing Data Center Automation



Nokia Event Driven Automation (EDA)



- 1. Intent-Based Automation** - simplifying network mgmt with high-level intents. Reducing configuration errors and operational complexity.
- 2. Digital Twin** - validating changes in a fully integrated emulated environment. Ensuring reliability and predictability before production deployment.
- 3. Git Integration** - centralized version control for configuration files. Easy rollback and historical tracking of changes.
- 4. Natural Language Processing (NLP)** – queries using common language. Enhancing user accessibility and ease of use.
- 5. Vendor-Agnostic** - integrating with equipment from multiple vendors. Provides flexibility and interoperability in diverse environments.
- 6. Kubernetes-Based** - leveraging the open-source Kubernetes ecosystem. Adaptable and scalable for modern data center needs.
- 7. Comprehensive Lifecycle Management**  
Automates the entire network lifecycle from design to daily operations.

# Data Center Gateway and Interconnect

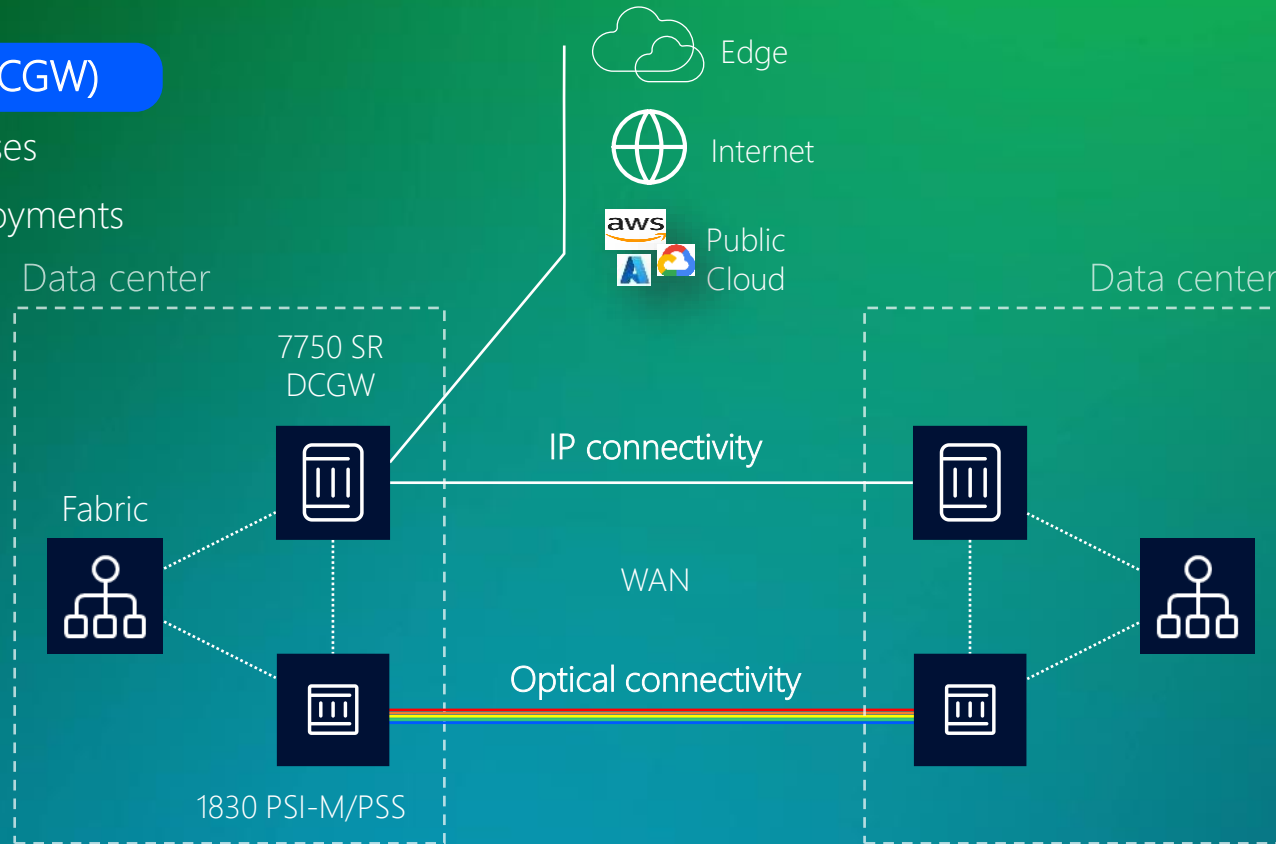
## Data Center Gateway (DCGW)

for a wide range of use cases

- small to large-scale deployments
- multi-services
- DDoS detection and mitigation.

FP4

FP5



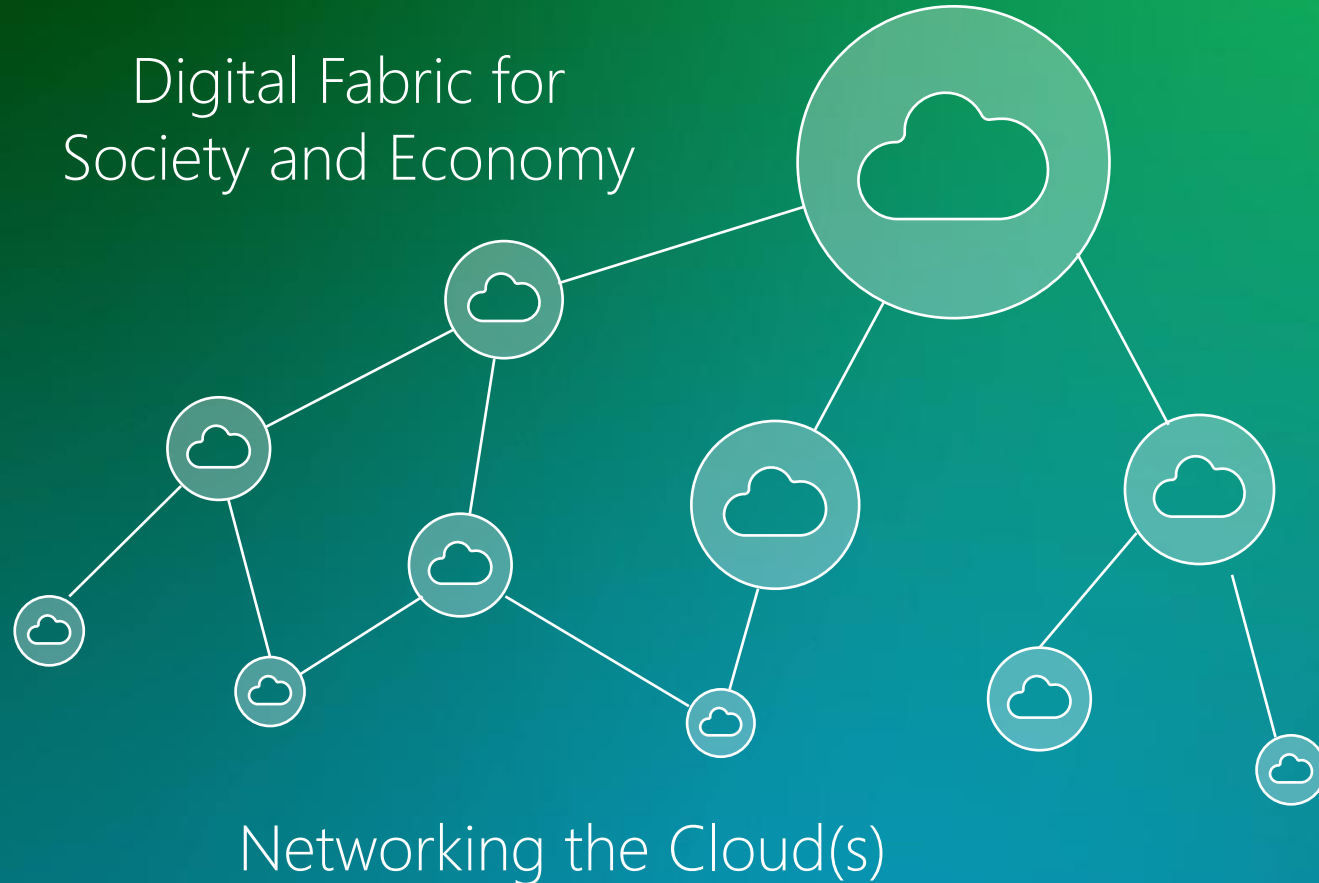
## Data Center Interconnect

for optical and IP data transmission between data centers

- various distance, speed and capacity
- WDM systems for high capacity and long reach
- Pluggables for high speeds over moderate link lengths

# Networking the cloud

... for seamlessly distributing AI workloads



- No cloud without Networking
- AI driving ...
  - network data traffic
  - network transformation
  - distribution of loads across multiple cloud locations
- Network Cloud Continuum  
Opportunity for CSPs to enter into this new market segment

NOKIA

*from Europe*

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für Ihren Besuch!**

**Wie hat Ihnen der  
Vortrag gefallen?**

Titel: Networking the cloud with  
Nokia Referent: Nils Kleemann,  
Nokia



**Jetzt abstimmen**