DIGITAL REALTY™

The Moving Edge

Impact on your Interconnection Strategy

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The Hyper-Connected Era

Billions of devices are being connected to the Internet

- Mobile devices, IoT devices (Home automation, Industry automation)
- Nearly every object can have computing and connectivity build in

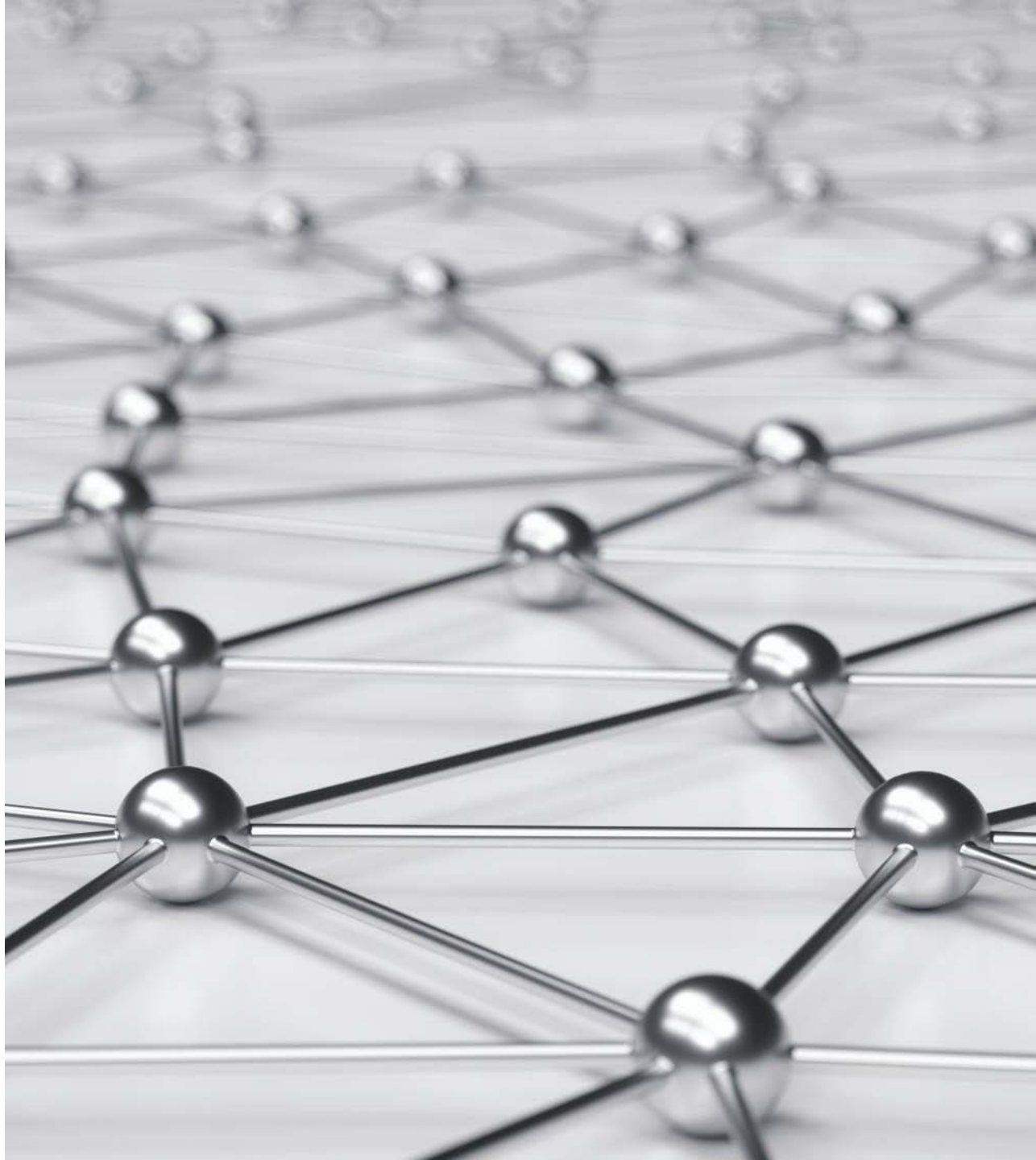
Users increasingly expect more immersive experiences

- Multi-device and virtual experiences (VR/AR)
- Personalization through intelligent systems (AI/ML)

Location and network availability are the most critical determinants of latency

- End-to-end applications are becoming more latency sensitive and adaptive to run on increasingly distributed platform

Need to deploy applications and data closer to the Edge!



Where is the Edge?

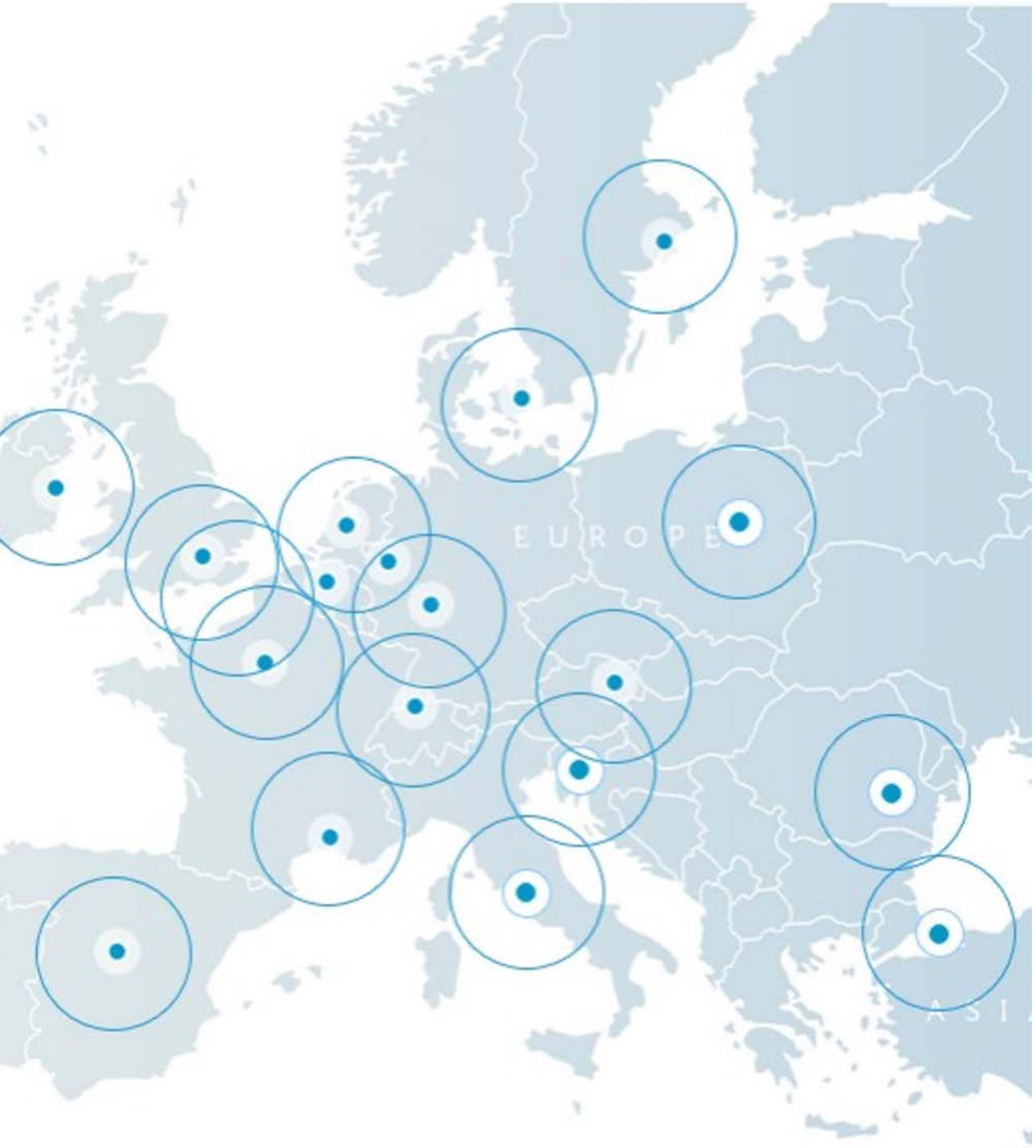
EDGE LAYERS

- CORE: Main colocation site for Storage and Compute (Central Cloud location)
- INFRASTRUCTURE: Smaller scale sites pushed into the Region to connect to local ISPs and Telco's
- AGGREGATION: Centralized location towards multiple Access sites, either inside or outside a Telco network, one hop away from the Access layer
- ACCESS: Locations closest to the last mile network, towards the RAN or cable headend
- DEVICE: Actual end-user Device or another device with compute (IoT or gateway)

Core Sites

Regional Sites

Edge Sites



Latency Impact on Application Deployment

Current generation application deployments

10 msec will do

- The current generation of XaaS deployments are delivering near real-time services to end users
- Latency tolerance is average 10ms leading to the need for infrastructure deployments on a more granular scale – at least 1 deployment per country served. For countries with denser end user populations then at least 2 deployments are common

Latency Impact on Application Deployment – Tomorrow

Future application deployments

Sub 5 msec

- The future generation of applications and services will provide realtime services to end users, regardless of geographic location
- Latency demand will lead to the need for deployments in multiple locations within a city
- Realtime applications will be a small subset but will provide mission critical services

The Moving Edge

Market Evolution

Yesterday

- Today, no largely deployed B2B or B2C application requiring less than 10ms latency – easily served from traditional colocated data centres
- Current Enterprise Edge applications deployed on-premise

Today

- CDN goes deeper – more cities, private deployments
- Cloud Compute - regional deployment
- Edge compute at caching level
- Fixed line networks with NFV
- 5G – private and large cities

Tomorrow

- Real time AI learning
- AR
- True autonomous vehicles

Moving from Core – to Regional – to Edge datacenters. But strong need for low latency connectivity between them!

Changing Interconnection Strategy

From Edge to the Backbone and the Core

- Backhaul will be latency sensitive, requires direct connections to the core
- Should the IXP move to the Edge?

From Edge to the Eyeball and Enterprise

- “Peering is local!” Avoid “tromboning” of local traffic
- Should the IXP move to the Edge?

Dynamic Approach

- Workload moves demand scalable and dynamic interconnections
- Need for automated provision and flexible agreements
- Clear role for the IXP?

Looking into the future

- Regardless of IXP location, the Edge is moving towards the eyeball/enterprise
- Application performance and latency will remain main drivers for IPX location, but justification of smaller IXPs closer to the eyeball/enterprise might be complicated
- The Moving Edge will drive a combination of local direct peering interconnections and dynamic “backbone” interconnections direct or via an IXP
- IXPs have an opportunity to provide flexible and automated interconnections...and maybe close to the Edge.

Thank you
Questions?

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