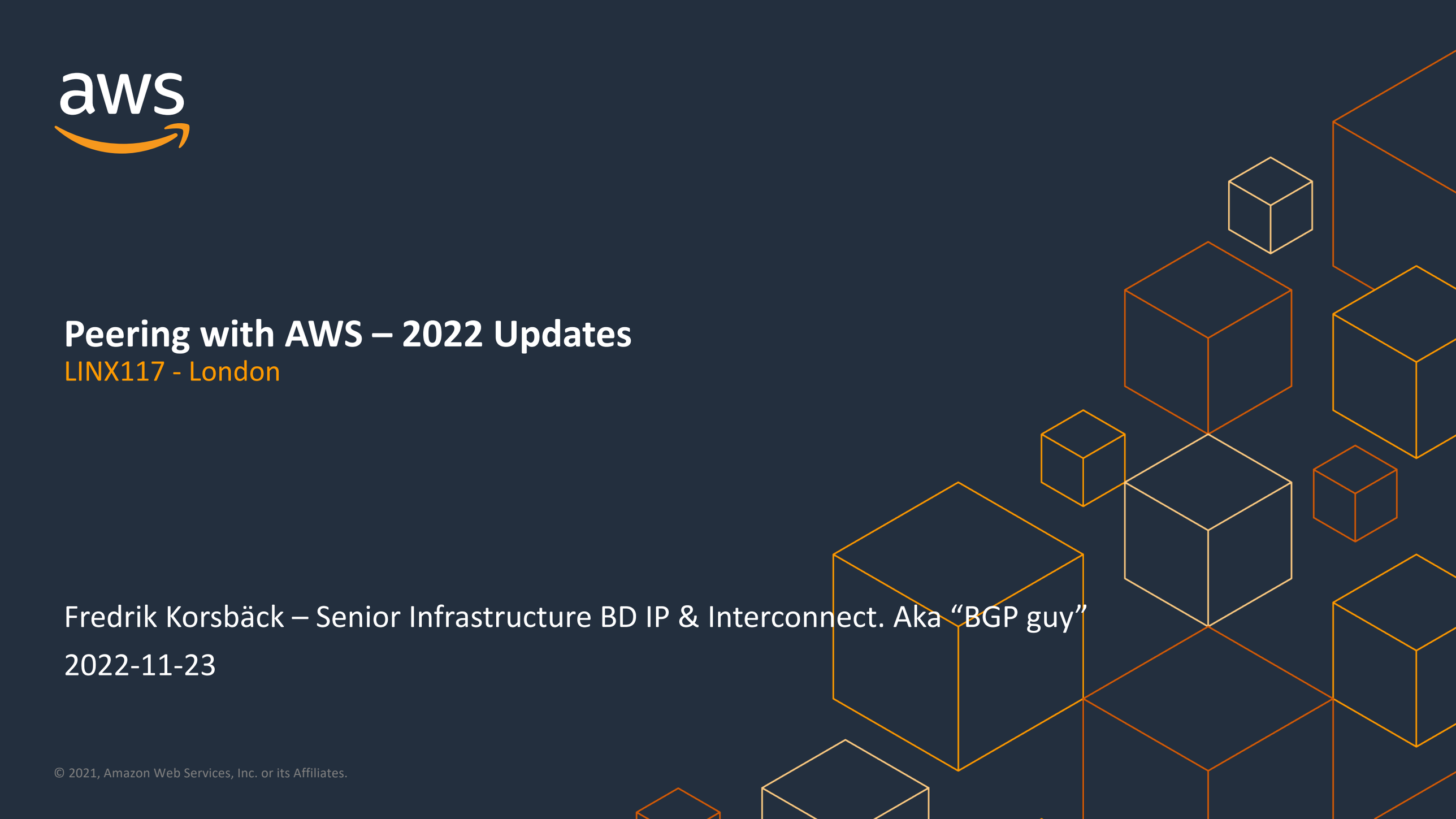

# Peering with AWS – 2022 Updates

LINX117 - London

Fredrik Korsbäck – Senior Infrastructure BD IP & Interconnect. Aka “BGP guy”

2022-11-23

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# Amazon at a glance

- Amazon is an American technology company
- Amazon.com; online shopping
- Amazon Web Services; cloud computing
- Prime Video; video streaming and content.
- Amazon Music
- Fire Tablets; Fire TV
- Echo and Alexa
- Kindle E-readers
- …and much more

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# What does the AS16509 Network Serve?

AWS Cloud regions. The AWS Cloud spans 87 Availability Zones within 27 geographic regions around the world, with announced plans for 21 more Availability Zones and 7 more AWS Regions in Australia, Canada, India, Israel, New Zealand, ~~Spain~~ and ~~Switzerland~~

Just Launched!

Home to EC2, S3 and DynamoDB ~~but the service catalogue~~ now has over **200** fully featured services for a multitude of IT Workloads

IoT

AI/ML

Game Tech

End-User Compute

Developer Tools

Databases

Containers

Media Services

Quantum Technologies

Compute

Business Applications

Blockchain

App integration

Networking & Content Delivery

Storage

Security, Identity & Compliance

Management & Governance

Analytics

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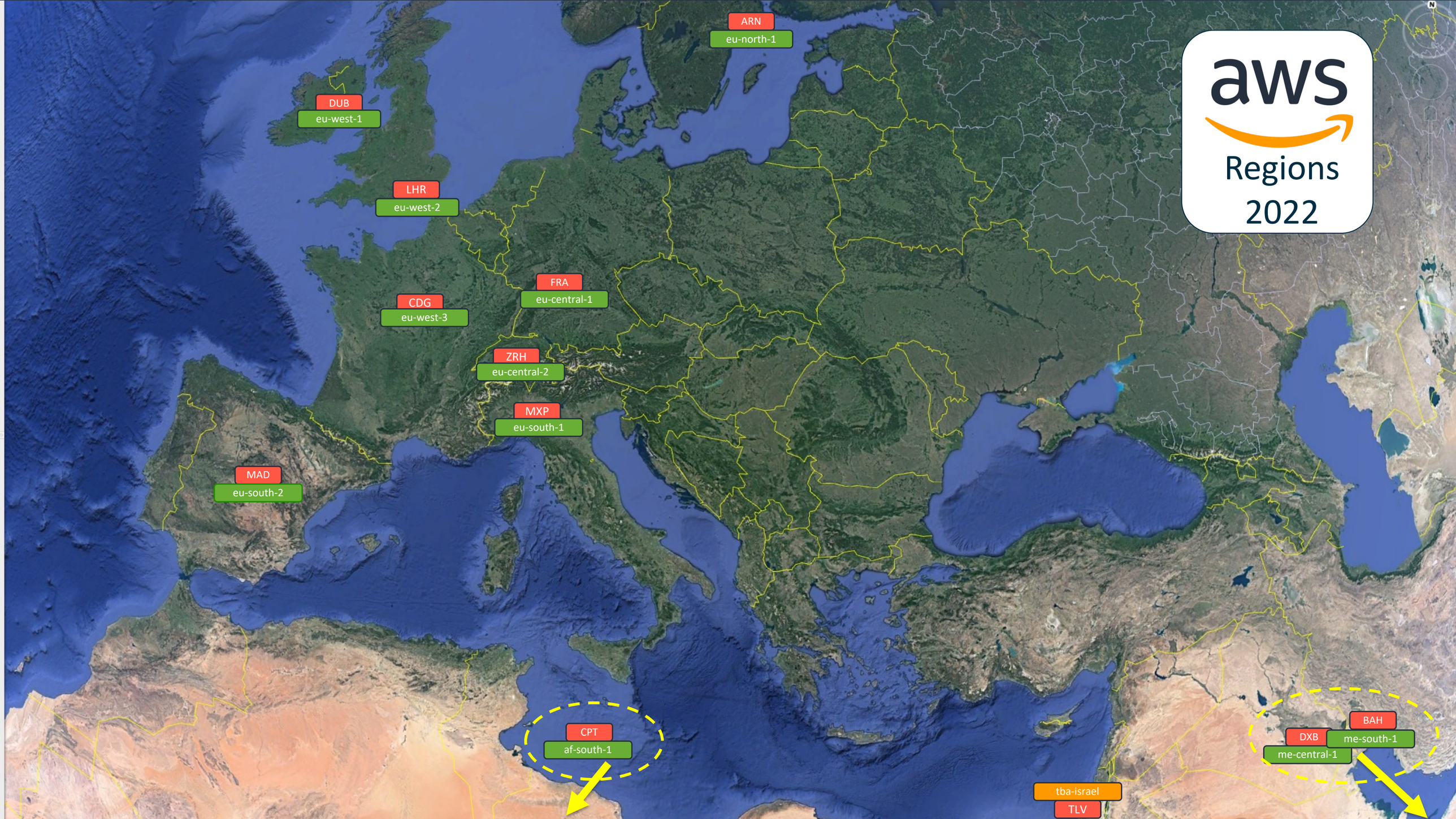
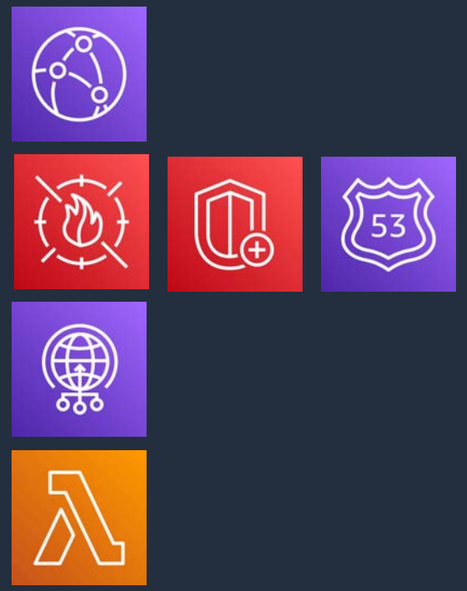

ARN
eu-north-1
DUB
eu-west-1
LHR
eu-west-2
FRA
eu-central-1
CDG
eu-west-3
ZRH
eu-central-2
MXP
eu-south-1
MAD
eu-south-2
CPT
af-south-1
tba-israel
TLV
BAH
DXB
me-south-1
me-central-1
aws
Regions
2022

# What does the AS16509 Network Serve?

- **AWS Edge Services. 400+ Global PoPs**
  - Cloudfront CDN: Multi-Petabit-scale feature rich CDN used by thousands of customers, everything from Slack to PrimeVideo
  - Security: WAF, Shield (DDOS), Route53 DNS
  - Acceleration: Global Accelerator, Anycast all the things!
  - Computing: Cloudfront Functions, Lambda@Edge (Serverless)




- **AWS Direct Connect**
  - Available in select PoPs for direct connectivty to the cloud-regions.
  - Can be consumed direct, or through a connectivity partner.
  - Comes with MACSEC
  - Comes with SLA's and QoS.
  - Is not the same as "regular" peering

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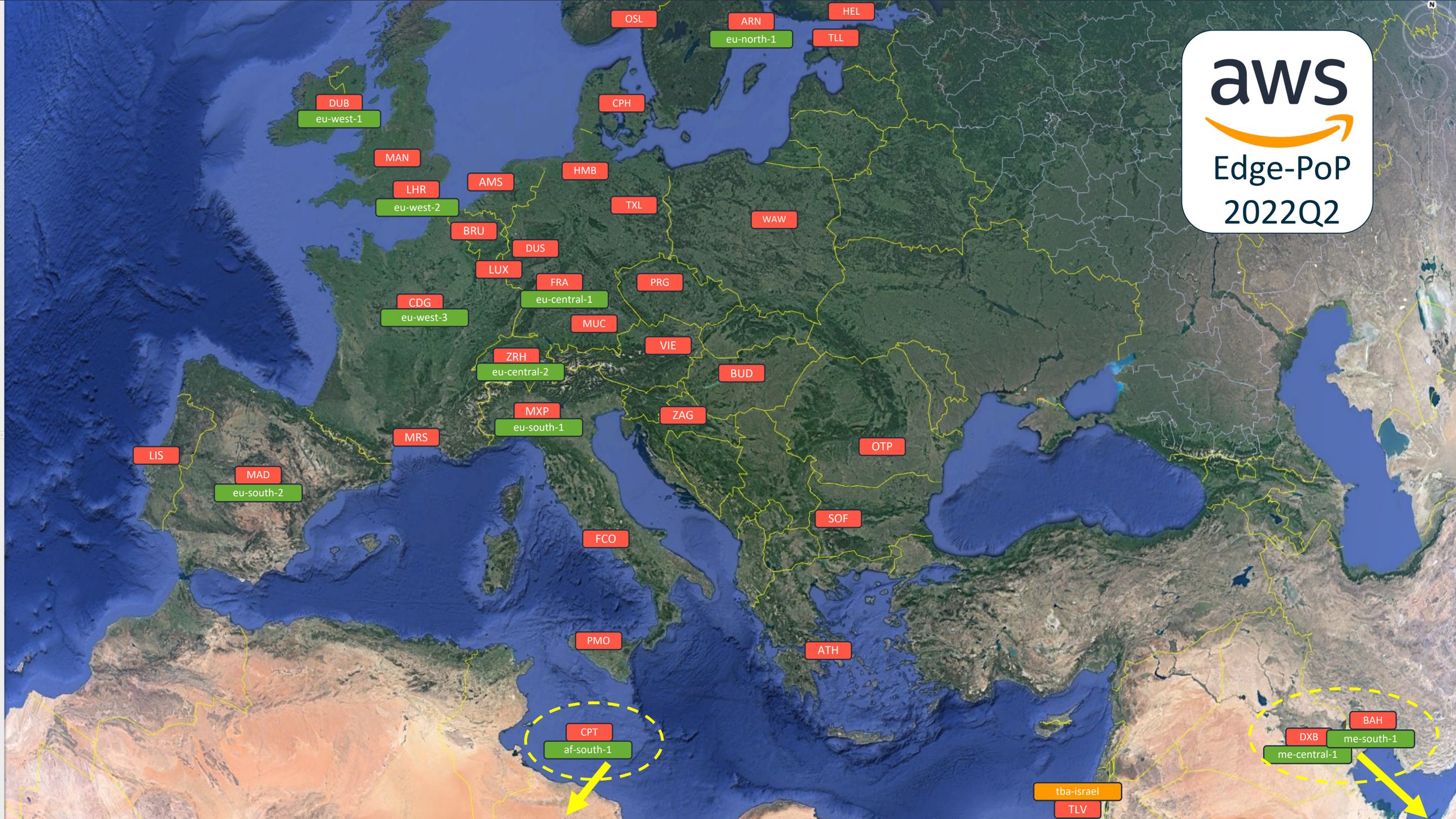
aws
Edge-PoP
2022Q2
OSL
ARN
eu-north-1
HEL
TLL
DUB
eu-west-1
CPH
MAN
HMB
AMS
LHR
eu-west-2
TXL
WAW
BRU
DUS
LUX
FRA
eu-central-1
PRG
CDG
eu-west-3
MUC
VIE
ZRH
eu-central-2
BUD
MXP
eu-south-1
ZAG
MRS
OTP
LIS
MAD
eu-south-2
SOF
FCO
PMO
ATH
CPT
af-south-1
BAH
DXB
me-south-1
me-central-1
tba-israel
TLV

# New things for AS16509

- **Local zones**
  - Select core-features moved into smaller single-AZ cloud-deployment in Edge-locations closer to the end-user to lower latency
  - Supports services such as EC2, EBS, ECS, EKS and VPC
  - Ties back to a parent-region for certain services
  - Uses existing connectivity

- **Wavelength-Zone** *(The product, not the DWDM-wave…)*
  - Similar model to Local zone but for 5G MEC
  - Installed into ISP-locations connected into 5G aggregator nodes for ultra-low-latency access to 5G Customers
  - Day1 Partners are Verizon, Vodafone, KDDI, Bell and SK-Telecom

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aws
Edge-PoP
2022Q2
OSL
LZ-OSL
ARN
eu-north-1
HEL
LZ-HEL
TLL
DUB
eu-west-1
CPH
LZ-CPH
MAN
LZ-AMS
AMS
HMB
LHR
eu-west-2
TXL
LZ-BER
WAW
LZ-WAW
BRU
LZ-BRU
DUS
LUX
FRA
eu-central-1
PRG
LZ-PRG
CDG
eu-west-3
MUC
LZ-MUC
VIE
LZ-VIE
ZRH
eu-central-2
BUD
MXP
eu-south-1
ZAG
MRS
OTP
LIS
LZ-LIS
MAD
eu-south-1
SOF
FCO
PMO
ATH
LZ-ATH
CPT
af-south-1
BAH
DXB
me-south-1
me-central-1
tba-israel
TLV

# General updates

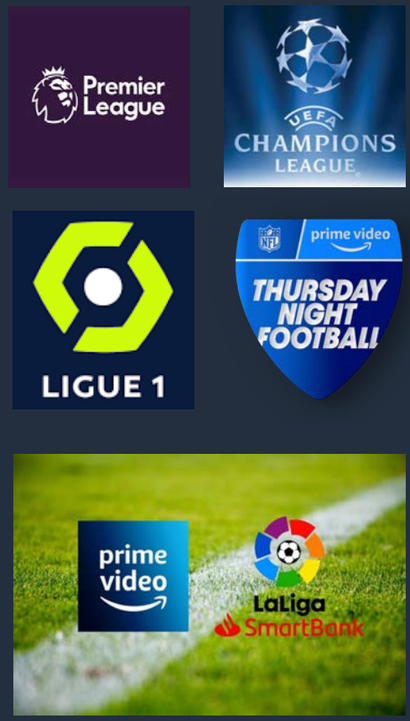
- **Peering concentration:** Especially for IX-based peers. Potential disconnect of IX:es with low local growth and low local coverage. Our smallest capacity-type but one of the largest cost-wise, specifically adjusted for the low growth.

  Still not remote-peering, still not using routeservers.

- **Event-focus:** Amazon PrimeVideo is continuing its venture into live-event broadcasting, content acqusition and licensing. Ligue 1 in France, Premier Leauge in UK, Thursday Night Fotball in the US, UEFA Champion Leauge in the UK/DE, LaLiga in Spain and many more.  Ongoing forecasting and planning with all ISPs in respective markets.

  Ontop of this we have customers such as DAZN, Hulu  (and tons more) using AWS CDN for similar event with live-streaming.

  4K UHD HDR is the new norm for both our own and our customers events

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# UK&IE Updates

- **London**
  - **Equinix Slough:** 400G enabled,  primary scaleout-site
  - **Telehouse North:** 400G enabled, primary scaleout-site. Linx PI
  - **Interxion City Campus:** Optical extension, 100G only, not preffered
  - **Interxion Sov House**: Small IP PoP, not a preffered site, sunset tba
  - **Equinix Harbour Exchange:** Optical extension, 100G only, not preffered

  - **LINX LON1** = Nx400G upgrades underway,
  - **LINX LON2** = Nx400G upgrades as soon as LINX is ready ;)

- **Manchester**
  - **Equinix MA3:** Not a great site…
  - **Equinix MA5:** To be launched H1-2023, much more coverage within <10km Darkfibre

- **Dublin**
  - We will try to come pick you up anywhere on darkfibre…
  - **INEX:** Or peer with us over INEX

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  - We will try to come pick you up anywhere on darkfibre…
  - **INEX:** Or peer with us over INEX
- **Rest**
  - Lets talk about embedded caches today or tomorrow.

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# Network Edge Technologies

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Cloud Stuff

Peers

Cloud stuff

1RU 32x400G | 1RU 32x400G | 1RU 32x400G | 1RU 32x400G

1RU 32x400G | 1RU 32x400G | 1RU 32x400G | 1RU 32x400G

Peers

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# 400G

- AWS has been a big user and supporter for 400G for a long time. We even had 400G Instances since 2020! (Based on Nvidia A100 ML/HPC)

- Migrations to 400G goes Datacenter -> Backbone -> Edge. Since im here talking with you, we are already in the Edge-readiness stage.

- In 2022 and onwards more and more sites will have 400G support at the AWS Edge-locations available for peering. We are happy to put in orders for 400G augments anywhere in the world from today and prioritize our supplychain to make it happen.

- We will use 400G-LR4 in the Edge for external interconnect. Longer distance-optics is being evaluated. 8-lane options is not going to happen, 2km options is not going to happen either.

- Speak with your fellow AWS-representative about YOUR plans for 400G enablement in the edge and our timeline for enablement. (most likely me)

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# 10G/100G

- 10G peering will be of less interest going forward and will not be offered anymore. In our 400G edge-platform, producing a 10G port means sacrificing 390G to 360G of potential capacity on the port

- 100G continues to be the de-facto standard interconnect-method for us going forward for the forseeable future. Happy to hear and take note if anyone would be interested in 100G-LR1 (Single Lambda) instead of 100G-LR4 to optimize for cost and simplification in 400G native networks.

  We are not fully convinced its a ”thing” yet due to lacking HW-support in 100G Native platforms.

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# AWS and RPKI, where we are today

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# AWS and RPKI, where we are today.

Blogpost for full context: https://aws.amazon.com/blogs/networking-and-content-delivery/how-aws-is-helping-to-secure-internet-routing/

- We are dropping RPKI invalids in 100% of our Internet Edge Border, in over 400+ global PoPs on all eBGP-peering sessions of all kinds (Transit, IX, PNI)
- We have signed more then 99% of our announced IP-space.
- We have fully automatic ROA-renewal, creation and maintenance in our “IP-vending machine”.
- Bring-Your-Own-IP (BYOIP) Relies on RPKI for Correctness
- RPKI-OV and RPKI-ROA-Creation is a ‘Severity 1’ service with oncall-teams on rotation.

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# AWS and RPKI, where we are going

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# AWS and RPKI, where we are going

1. Investing and looking more into Delegated RPKI solutions, with our own publication points. (Already live under APNIC and RIPE!)

2. Improve the BYOIP-process for customers. Specifically lookint at upcoming RSC IETF Standards.

3. Work with and reach out to networks that has RPKI invalids to have them fixed.

4. Continue the work on community-projects such as MANRS to launch new initiatives and frameworks to foster the use of RPKI.

5. Bring RPKI into RFPs and RFQs as if it would be a standard feature in all connectivity-business going forward.

Questions to fkback@amazon.com

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# Get in touch!

- Find me, or any of my colleagues in the hallways or in the AWS meeting room if you want to discuss any of these topics

- Use regional aliases when requesting peering! Regular peering@ will not answer
  peering-emea@amazon.com
  peering-amer@amazon.com
  peering-apac@amazon.com
  peering-india@amazon.com

- Use our excellent peering tech-ops for all technical inquries around peering, maintenance or smaller changes. peering-to@amazon.com.

- Self-service some troubleshooting using our NLNOG-ring trace-nodes and our EC2 reachability matrix linked at our PeeringDB-page.

- External peering-portal has been launched in a limited trial to select peers. Global launch to follow shortly!

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