Peering Trend and Challenge

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TWNIC Community Engagement 2025

TWNIC Peering Forum 2

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Agenda

Akamai Introduction

- Who’s Akamai?
- Akamai Connected Cloud
- Akamai network deployment in Taiwan

Peering Trends

- Port speed
- Optics
- IX Route servers
- Automation
- New IXes
- Interconnection between IXes

Peering Challenges

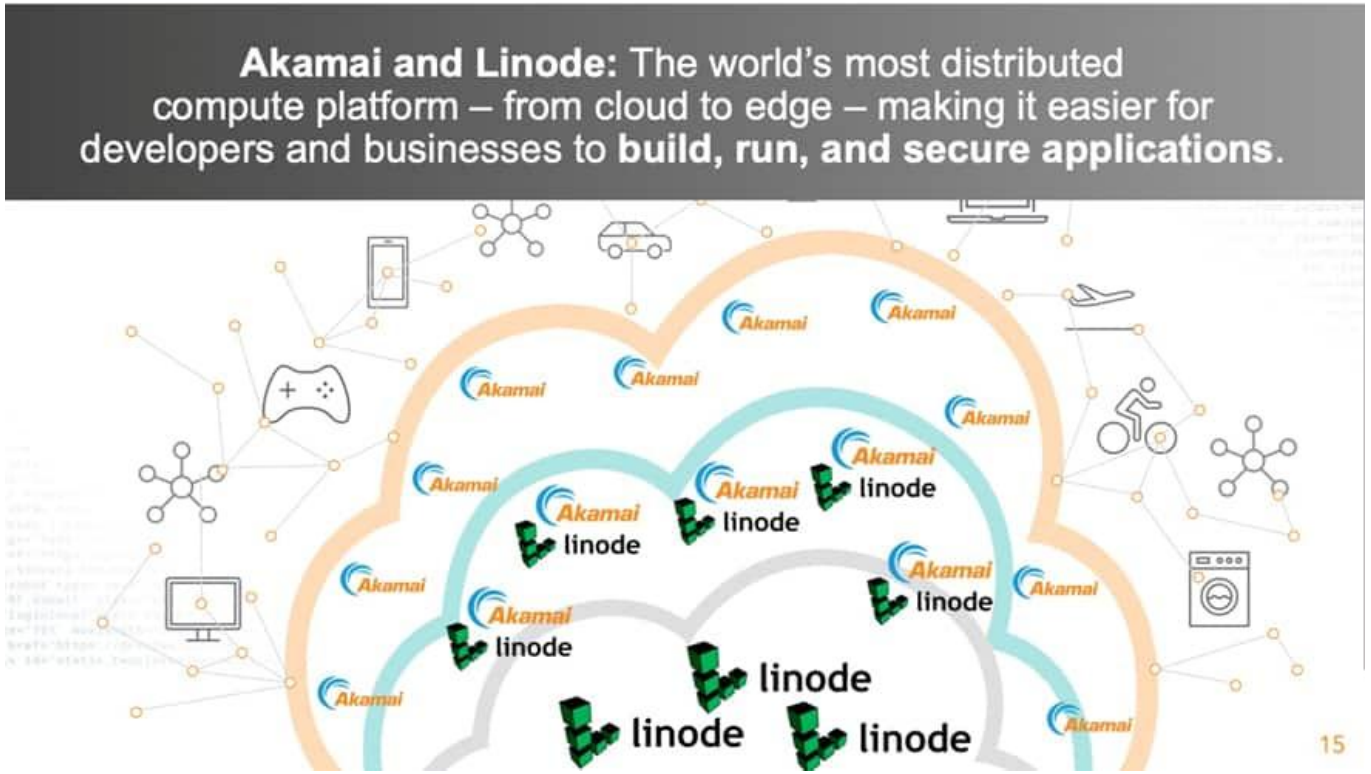
- Peering with incumbents
- Lack of neutral Data Centers and IXes

Akamai Introduction

25 YEARS
ONE AKAMAI

Who is Akamai?

Akamai Connected Cloud is a massively distributed edge and cloud platform that keeps experience close to users – and threats farther aways



The Akamai Connected Cloud

The world's largest on-demand, distributed computing platform delivers all forms of web content and applications

Akamai Global Cloud Infrastructure

1+ Pbps	4,200+	1,200+	130+	2450+
Edge Capacity	Locations	Networks	Countries	Service Experts

Typical daily traffic:

- More than **3 trillion** requests served
- Delivering over **250 Terabits/second**

Akamai Connected Cloud deployment in Taiwan

- Inside major ISP networks
- Located in 3 cities
  - Taipei
  - Taichung
  - Kaohsiung
- 2 infrastructure clusters
  - Chief LY Building Taipei
  - CHT Taipei Banqiao IDC
- Connected to 2 Internet Exchanges
  - TPIX
  - TWIX

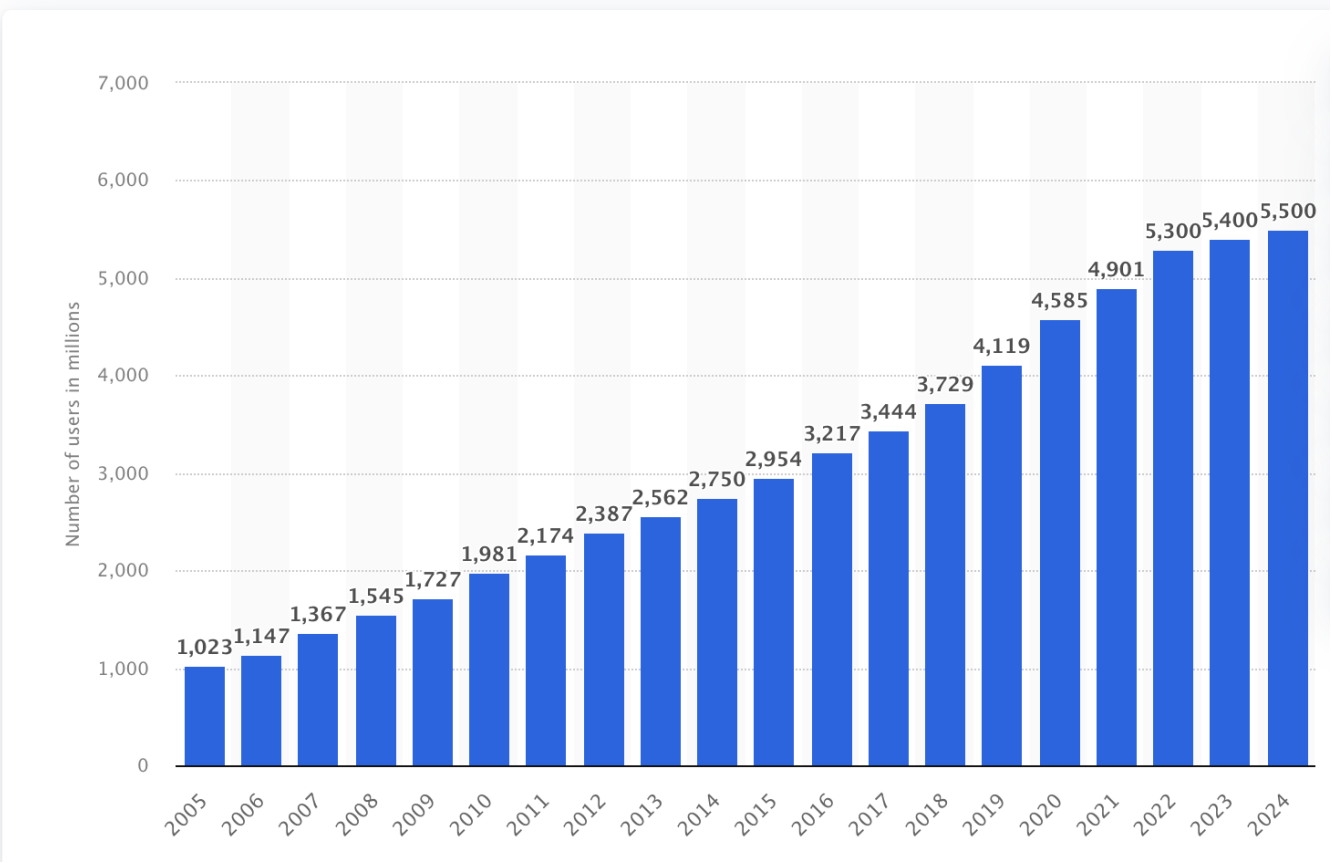
Peering Trends

- Port Speed
- Optics
- IX Route Servers
- Automation
- New IXes
- Interconnections between IXes

Port Speed

Internet traffic is keep growing, peering port speed would have to keep increasing IX and PNI interfaces:

1. Fading out 10G ports
2. 100G as minimum
3. Trend: 400G
    1. Large IXes
        - HKIX, JPNAP, EdgeIX, etc.
    2. Large Hyperscalers
        - Google, AWS, etc
    3. Large transit providers
        - Arelion, Lumen, Colt, Zayo, etc



Number of internet users worldwide from 2005 to 2024 *(in millions)*

Hyperscalers Peering Policy on Port Speed

Google

- Google only supports 100G Ethernet LR4, and 400GBASE-LR4

Microsoft

- Interconnection must be over 100-Gbps single-mode fiber

AWS

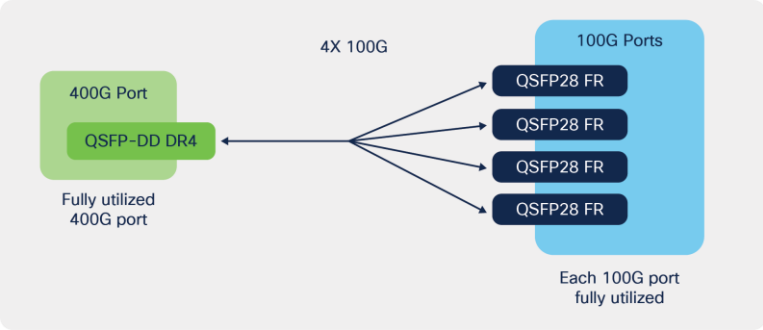
- PNI peering is only supported using 100 Gbps port speed or greater over single-mode fiber

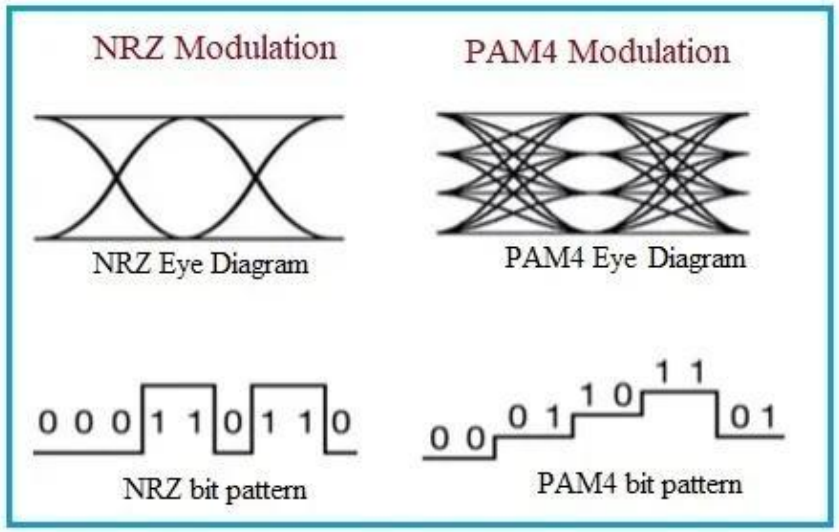
Optics

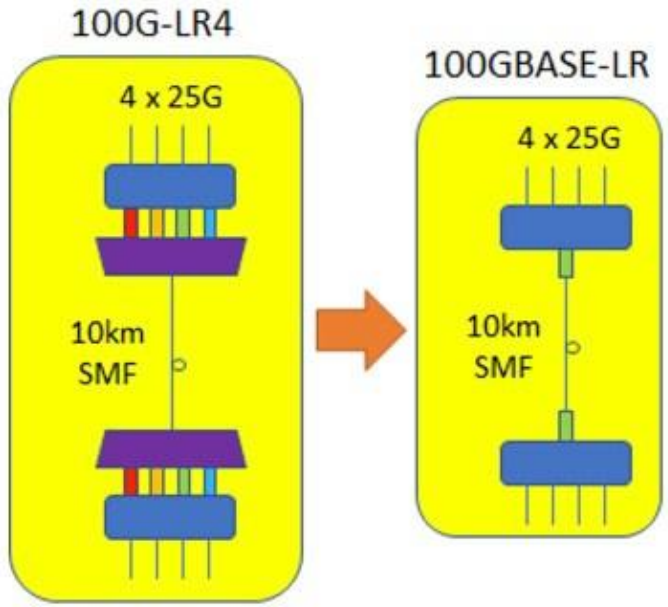
100G interface optics

1. Common: 100G-LR4
    1. Non-return-to-Zero (NRZ) modulation
    2. Four 25G wavelength transmission

2. Trend: 100G-LR/LR1
    1. Pulse Amplitude Modulation with 4 levels (PAM4)
    2. Single-wavelength transmission
    3. Lower cost (less optical components)
    4. Higher port density for 400G breakout
        - 2 x 100G-LR4 vs. 4 x 100G-LR1







IX Route Servers

Akamai peering policy towards route servers

1. Selective peering with route servers
2. Peers with most of the route servers, do not announce anycast prefixes
3. Pros and Cons
    1. Simple operations, single BGP sessions
    2. Route security and management
4. Trend: Restrictive / Not to peer with route servers

Google:
“As part of Google’s effort to simplify peering operations and increase routing security, we have decided to stop advertising and receiving prefix information from Route-Servers in Internet Exchanges. We invite other networks that rely on Route Servers to request a bilateral session. Bilateral session requests can be done at: https://isp.google.com/iwantpeering.”

Automation

Automate peering request and provisioning

1. Requests via online form
2. Integrate with PeeringDB
3. Simplify operations
4. Trend: Automate peering process

Peering automation examples:

Facebook: https://engineering.fb.com/2021/05/20/networking-traffic/peering-automation/

Gcore: https://gcore.com/blog/how-we-improve-network-connectivity-with-peering-automation

Tencent: https://peering.tencent.com/request

Cloudflare: https://www.cloudflare.com/partners/peering-portal/

New Internet Exchanges

New IXes in Asia Pacific regions

1. Emerging markets / developing countries
2. Tier-2 cities
3. Offer more choices
4. Examples:
    1. Taiwan: STUIX, FOX
    2. Philippines: BBIX Manila, AMS-IX Manila, MHK-IX, EPIX
    3. Thailand: BBIX Thailand, AMS-IX Bangkok
    4. Vietnam: BBIX Vietnam
    5. Indonesia: EIE Jakarta, AIX, EPIX, EdgeNXT, DE-CIX Jakarta
    6. Malaysia: EIE Kuala Lumpur, Penang IX

Interconnection between IXes

Interconnection between IXes

1. Enable remote peering
    1. Simple connection: VLAN
    2. Lower Setup Cost
    3. Evaluate traffic
    4. Simple process: legal, language, currency
2. Examples:
    1. TPIX and JPIX, DE-CIX and AMS-IX
    2. JPIX and CoreSite Any2West, NYIIX LA, HKIX, LINX, KINX, BKNIX, TPIX
    3. HKIX and JPIX
    4. BBIX and KINX

Peering Challenges

- Peering with incumbents
- Lack of neutral Data Centers and IXes

Peering with incumbents

Incumbents peering policy:

1. Restrictive peering policy
2. Do not peer in-country

Change in peering policy:

1. ISP change from free to paid peering
2. Change from local to out-of-country peering

Expensive:

1. High cost for paid peering

Lack of neutral Data Centers and IXes

Data Centers selection:

1. Lack of choices for neutral Data Centers
    1. e.g. Taiwan has only Chief LY and CHT Banqiao Data Centers
2. Success case: Telehouse Bangkok

IXes selection:

1. Lack of choices for neutral Internet Exchanges
    1. e.g. Taiwan is mainly TWIX and TPIX, but both are under Chunghwa group
2. Support new IXes
    1. Connect to new IXes as initial members
    2. Improve the market competitiveness

Summary

Akamai Connected Cloud

- Highly distributed edge servers
- Akamai Network Deployment in Taiwan

Peering Trend

- Port Speed, Optics
- IX route servers, automation
- New IXes, interconnection between IXes

Peering Challenges

- Peering with incumbents
- Lack of neutral Data Centers and IXes choices

Questions?

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More Peering Information:

- CDN Peering: https://as20940.peeringdb.com
- Prolexic DDoS Mitigation: https://as32787.peeringdb.com
- Linode: https://as63949.peeringdb.com

謝謝!

(Thank You!)