Open IX Update

Keith Mitchell

Board Member, Open-IX Association

Connect WG, RIPE70

13th May 2015

OPEN·IX

Founding Principles

OBSERVATION

Peering is easier in Europe where there are established, cooperative exchanges and this creates a healthy ecosystem to promote growth of new technology.

CHALLENGES

- The European exchanges evolved to where they are today over many years, with many adjustments in direction – they didn't start where they are today.

- Legal requirements, commercial interests and government regulation make it hard, if not impossible, to replicate the European model exactly in other locations.

- The world needs a new roadmap to guide creation of optimal exchange platforms.

OPEN·IX

Interconnection for Data Centers

- The Internet: a network of networks

- Peering and Interconnection
  - Agreements between networks to exchange data
  - A variety of motivations and business terms
  - Can occur over a private or public exchange fabric but Interconnection almost always happens within Data Centers

- Internet Exchanges offer a neutral local network where operators can exchange traffic.

OPEN·IX

Interconnection

- Network interconnection and exchange (peering) are critical to handle massive growth in traffic across enterprise, mobile and broadband networks

- Passing traffic at the edge improves service quality by reducing congestion or other possible network bottlenecks

- OIX seeks improve the environment for Interconnection

- Standards help create more resiliency and better reliability

Exabytes per Month

21% CAGR 2013-2018

| Year	Value
2013	51 EB
2014	62 EB
2015	76 EB
2016	91 EB
2017	110 EB
2018	132 EB

Source: Cisco VNI, 2014

OPEN·IX

Data Centers

Mega Data Centers
- Large footprint ~250,000 – 1,000,000 sq. ft.
- Low cost of power
- Favorable cooling options
- Remote locations tethered by long-haul fiber
- Data storage
- Non-latency sensitive / low bandwidth applications
- Delivery of last resort

Delivery Data Centers
- Typical footprint <10,000 sq. ft. to 100,000 sq. ft.+
- Located proximate to population centers
- Highly connected
- Content delivery networks
- Latency / jitter sensitive applications
- Reduce / manage backbone traffic

Core Data Centers
(Distant)

Internet
Backbone

End-Users
Delivery Data Centers

Organizational
nexion
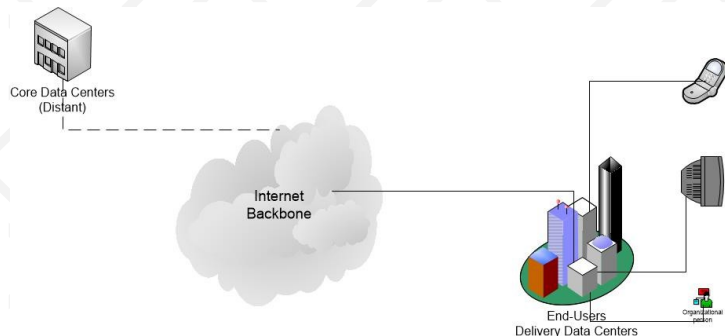
About Open-IX Association

MISSION

To build community and consensus that foster data center and Internet Exchange Point (IXP) standards, ultimately improving the landscape of Internet peering and interconnect.

OPEN·IX®

The Open-IX Association* is a self-regulated community that fosters the development of critical data center and IXP technical and operating standards to:

1. Promote uniform specifications for data transfer and physical connectivity.
2. Create resiliency to improve reliability.
3. Certify IXPs and data centers that meet the community-developed standards.

*Open-IX is a 501(c)(6) non-profit Trade Association

OPEN·IX

Why Open-IX?

➢ **Before Open-IX**
- Few choices in the IXP market.
- Significant concentration in single facilities in many markets.

➢ **With Open-IX**
- Multiple IXPs being certified, offering choice.
- Multiple data centers being certified, decreasing concentration.
- Competitive response from incumbent exchange / interconnect providers.

➢ **Benefits of Open-IX**
- Less density, more choice, increased resiliency and decreased cost.
- Better performance and uptime for all.

OPEN·IX

Membership

Open to anyone with an interest in IXPs, data center infrastructure, interconnect engineering or research, and who wishes to participate in shaping the operations and engineering of the future of Internet interconnect.

Members:
- Vote in all Open-IX elections.
- Nominate and elect the Board of Directors.
- Serve on volunteer standards committees.
- Provide input on Certification Applications.
- $50 per year

Application process:
- One class of membership for all.
- 12-month term

Certification

Any company can adopt Open-IX standards and apply for certification.

Certification signifies that your company will adopt the OIX standards, indicates that your operations comply with these standards and provides you the ability to use the certification marks publicly.

OIX-1 IXP Technical Requirements
For organizations that operate a physical network infrastructure with the purpose to facilitate the exchange of Internet traffic between Autonomous Systems (AS).

OIX-2 Data Center Technical Requirements
For building owners, Meet-Me-Room (MMR) operators, and data center providers.

Certification is $5,000 per market for ISPs or per data center, per year.

Open-IX is a standards organization, so companies may choose to be compliant without being certified.
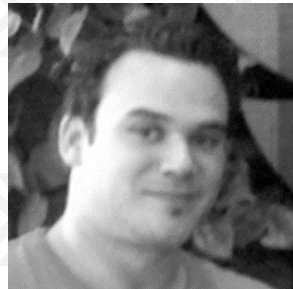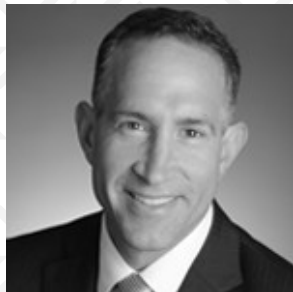
OIX Board of Directors

David Temkin
Co-Founder &
Chairman

Will Charnock
Vice Chair

Christian Koch
Secretary

Chris Malayter
Treasurer

Barry Tishgart
Member

Josh Snowhorn
Member

Keith Mitchell
Member

OPEN·IX

OIX Standing Committees

IXP STANDARDS COMMITTEE

Henk Steenman
Board Liaison and Chair

Development and maintenance of technical and operational standards for Internet Exchange Points (IXPs). **OIX-1 Standard**

DATA CENTER STANDARDS COMMITTEE

Gabe Cole
Board Liaison and Chair

Development and maintenance of technical and operational standards for data centers. **OIX-2 Standard**

MEMBERSHIP COMMITTEE

Christian Koch
Board Liaison and Chair

Recruiting Open-IX Association members, membership management and retaining Open-IX members.

MARKETING COMMITTEE

Vinay Nagpal
Board Liaison and Chair

Promoting OIX, external messaging and working with certified IXPs and data centers to increase peers on certified exchanges.

PROGRAM COMMITTEE

Anna Claiborne
Board Liaison and Chair

Soliciting talks in the industry and working with selected presenters to deliver top quality content to our membership.

OPEN·IX

OIX-1 & OIX-2 Standards

OIX-1 IXP

- Infrastructure: switching platform, IP space, route server

- Standard physical interface

- Best practices for traffic forwarding

- Clear customer interface demarcation points

- Operational: NOC, monitoring & statistical reports

- Current in peering contact and config. Directory

- Accessible information on public website

OIX-2 Data Center

- Infrastructure: utility feeds, transformers, water sources, network access, MMR, interconnection

- Operational: rules, licensing, commissioning, maintenance, operating procedures, change management

- Service levels for generator(s), UPS, cooling, interconnect delivery, electrical circuit

- Open, non-discriminatory access and pricing

- Accessible information on public website

OPEN-IX

OIX-1 Certification

- Completed: Five (5) IXPs
- Pending: One (1) IXP; three (3) MSAs

LINX NoVA
1. VA/MD/DC

DE·CIX New York
Deutscher Commercial Internet Exchange
1. New York (Completed)

amsix New York **amsix** Bay Area
amsix Chicago **amsix** amsterdam internet exchange

Amsterdam Internet Exchange
1. NY/NJ (Completed)
2. SF Bay Area (Completed)
3. Chicago (Announced)
4. Amsterdam (Completed)

FL-IX
Florida Internet Exchange
1. Miami (Pending)

Omaha IX
The Premiere Midwest Internet Exchange Location
1. Omaha (Announced)

phoenixNAP GLOBAL IT SERVICES
1. Phoenix (Announced)

Pending: Currently going through certifications process
Announced: Intend to certify

OPEN·IX

OIX-2 Certification

- Completed: 22 Data Centers, Ten (10) Companies
- Pending: Six (6) Data Centers, Five (5) Additional Companies

CyrusOne
1. Dallas, TX
2. Houston, TX
3. Austin, TX
4. Cincinnati, OH
5. Cincinnati, OH
6. Phoenix, AZ

DIGITAL REALTY Data Center Solutions
1. Los Angeles, CA
2. San Francisco, CA
3. Dallas, TX
4. New York, NY

QTS
1. Atlanta, GA
2. Suwanee, GA
3. Richmond, VA

DuPont Fabros Technology
1. Ashburn, VA
2. Piscataway, NJ

SENTINEL DATA CENTERS
1. Durham, NC
2. Somerset, NJ

VANTAGE DATA CENTERS
1. Santa Clara, CA

CONTINUUM DATA CENTERS
1. Chicago, IL

evoswitch NEXT GENERATION DATACENTERS
1. Manassas, VA

edgeconnex
1. Houston, TX

zayo
1. Atlanta, GA

Pending Data Centers:

zayo
1. Miami, FL

phoenixNAP GLOBAL IT SERVICES
1. Phoenix, AZ

DATA BANK
1. Richardson, TX

DATAGRYD DATA CENTERS | SIXTY HUDSON
1. New York, NY

experis DATA CENTERS
1. Middletown, VA

Jaguar network
1. Marseilles, France

OPEN·IX

OIX-1 & OIX-2 Certified Entities – Global View
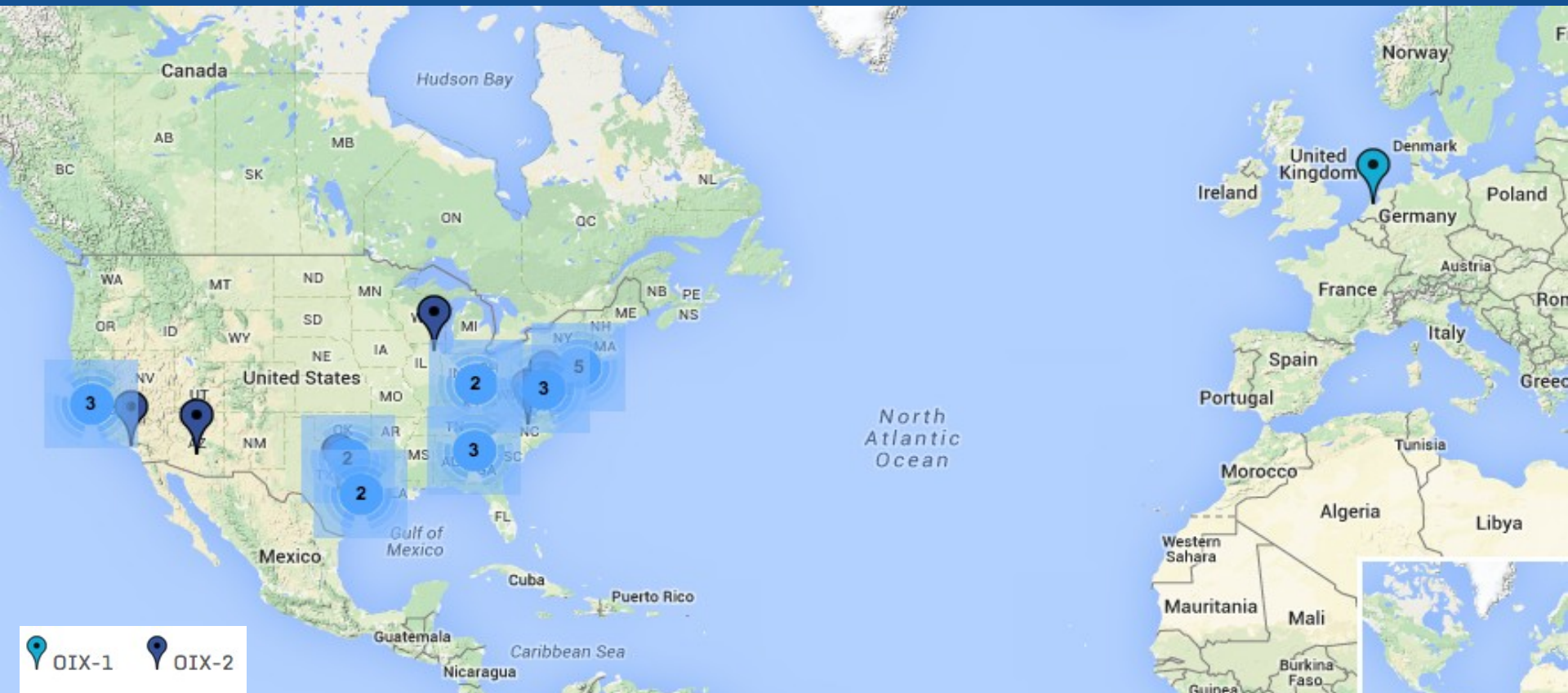
About Open-IX Association

The Open-IX Association (OIX) is a non-profit organization, tax-exempt under Section 501(c)(6), created to improve the landscape of Internet peering and massive-scale interconnection. OIX encourages the development of neutral and distributed Internet exchanges while promoting uniform standards of performance for interconnections backed by the Internet community. The Association aims to promote common and uniform specifications for data transfer and physical connectivity and improve overall Internet performance by developing criteria and methods of measurement to reduce the complexity that restricts massive scale interconnection in fragmented markets.

- ➢ **VISIT US:** **www.open-ix.org**
- ➢ **CONTACT US:** **info@open-ix.org**