Open-IX: Beyond Year One

Keith Mitchell
Board Member, Open-IX Association

UKNOF30

January 22, 2015

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About the Speaker

Keith Mitchell

Board Member, Open-IX Association

Keith has 25 years' experience specializing in Internet engineering and governance. In 1994, he founded the London Internet Exchange (LINX) and was the company's Executive Chairman until 2000, when he went on to found Xchange Point. More recently, Keith worked at Internet Systems Consortium (ISC), where he managed the OARC programme for DNS operators. He then served as Vice President of Systems Engineering at ISC from 2008-2012. Since 2012, Keith has served as President of the now-autonomous nonprofit OARC, Inc. He also conceived the UK Network Operators' Forum (UKNOF) in 2005, and has been leading the group for its past 25 successful meetings.

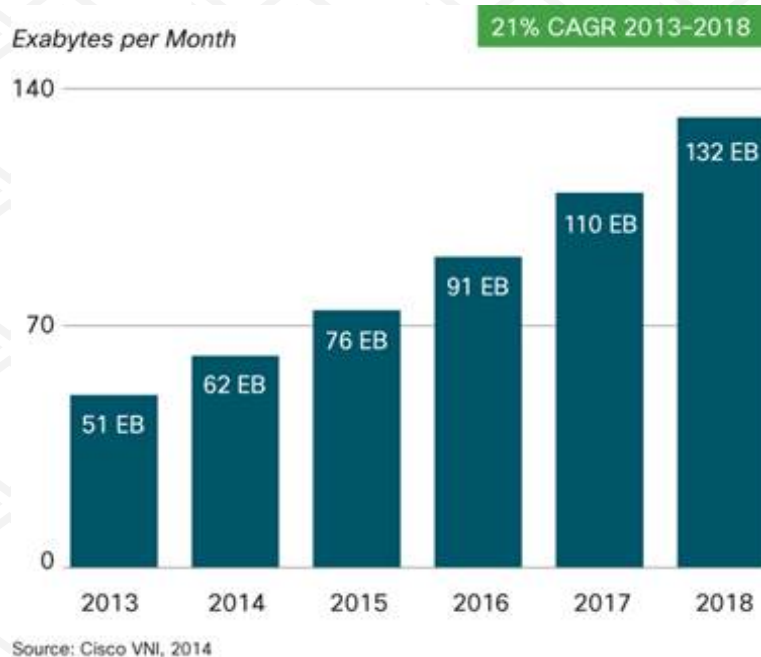OPEN-IX

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.

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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

140

70

0

51 EB   62 EB   76 EB   91 EB   110 EB   132 EB

2013   2014   2015   2016   2017   2018

Source: Cisco VNI, 2014

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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.

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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

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.

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How Does It Work?

INDIVIDUAL MEMBERS	CERTIFICATION PROGRAMS
Individual members help shape data center and IXP standards to create a level playing field for all.	Data centers and IXPs adopt community-created professional standards and then become certified.
$50.00 per member	$5,000.00 per facility/IXP MSA

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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.

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

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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

Smaller 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

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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.

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

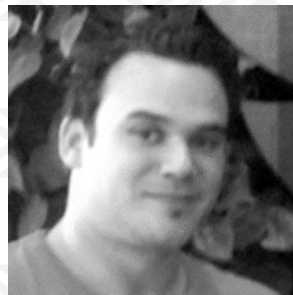- Accessible information on public website

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OIX Board of Directors

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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

Martin Hannigan
Board Liaison and Chair

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

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OIX-1 Certification

- Completed: Two (2) MSAs, Two (2) IXPs
- Pending: Four (4) MSAs, Two (2) IXPs

1. NY/NJ
2. SF Bay Area (Pending)
3. Chicago (Announced)

1. VA/MD/DC

1. Phoenix (Announced)

1. Omaha (Announced)

OIX-2 Certification

- Completed: 21 Data Centers, Nine (9) 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

CONTINUUM DATA CENTERS

1. Chicago, IL

evoswitch NEXT GENERATION DATACENTERS

1. Manassas, VA

edgeconnex

1. Houston, TX

VANTAGE DATA CENTERS

1. Santa Clara, CA

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Americas Interconnection Summit

When: April 7-9, 2015

Where: The Westin San Diego Gaslamp Quarter, San Diego, CA

Open-IX's inaugural **Americas Interconnection Summit** is an open and neutral event that will assemble decision-makers for interconnection and related services aimed at networks around the globe. The event program will feature one-on-one and small group meeting time, networking events, and panels and presentations covering current, relevant topics in peering and interconnection.

Open to all Internet participants interested in interconnection, including:

- Internet Service Providers
- Content Providers
- Content Delivery Networks (CDNs)
- Data Center and Internet Exchange Operators
- Network Hardware and Software Suppliers

For more details and sponsorship information, contact **ixs@open-ix.org**

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Information – Become a Member

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**

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