Seattle’s Community IXP: 20 Years Strong
WHO WE ARE

The SIX is a non-profit IXP in Seattle, WA.

We provide reliable, low-cost interconnections between member networks in the Northwest United States and beyond.
1997

A 111ms RTT between two companies on the 19th floor of the Westin Building carrier hotel caused them to peer directly. Inspired by a Bill Manning NANOG presentation, a hub was added along with a third org in June 1997, thus launching the Seattle Internet Exchange.
The SIX is now believed to be the among the largest non-MRC Internet Exchange Points (IXP) on the planet, serving hundreds of peers and moving upwards of 0.75 terabits per second.

*We do all of this with one part-time paid engineer and a team of volunteers.*
1997 Simple 10 megabit ethernet hub
1998 Cisco 1900 XL 10/100
2001 Added Cisco 4912G - First GigE ports
2004 5 core switches, plus 6 extension switches are listed.
2006 First 10G
2007 Cisco 6509
2009 Cisco 6509 <> Cisco Nexus 5020
2011 Cisco 6509 <> Arista 7508/7508E
2015 First 100G
2017 Arista 7512R <> Arista 7508E
2020 Fantasy 400G Switch <> Arista 7512R <> Arista 7508E
SIX AGGREGATE TRAFFIC: The Road to 1 Tbps

SIX Aggregate Traffic - 5 minute sampling

- Peak traffic
- Average traffic

Max In: 748.33 Gbps  Cur In: 534.35 Gbps
Max Out:748.57 Gbps  Cur Out:534.46 Gbps

Thu Jun 01 12:11:01 -0700 PDT 2017
SIX FINANCE
SIX MEMBERSHIP
This is how we publicly share everything we do and decide to do.
L2 SIX fabric extensions within the Westin Building

- Implicit assumption is always to put low-cost, flexible, convenient peering first

- Minimal debate, planning, or engineering up front; organic growth
  - There were two separate hubs in the very beginning; has been woven into SIX DNA
  - Distributed -> Consolidated -> Distributed (with a well-defined core)

- Seemed like a good idea at the time, and overall, has proven to be positive
  - Some operational issues; some extension operators better than others
  - Very large blast radius and uplink capacity are major concerns

- PAIX-SEA (now Equinix) was one of the earliest “extensions”
L2 SIX fabric extensions outside the Westin building

- Considerably more controversial / risky to expand beyond building walls
  - Simplicity sometimes at odds with mission of promoting peering adoption
  - Some risk-taking acceptable, as long as it is done thoughtfully
  - Extensions know they will be disconnected without notice if negatively impacting core IXP

- Started with Fisher Plaza as a relatively low-risk use case
  - Solid dark-fiber interconnect over short metro distance
  - Experienced operational personnel
  - Real demand from real customers/peers

- Expanded to other select metro Seattle and even distant locations
Monitoring, Alerting, Operations, and Remote Hands

● How does SIX handle monitoring & alerting?
  ○ NAGIOS and noc@ go to admins, with paid admin as primary responder.
  ○ Continuous sniff of broadcasts is performed and daily reports are emailed. Broadcast issues are jumped on to make it so new issues are more easily visible.

● On call / incident response?
  ○ 4-hour and NBD support. When NBD, we make sure to have linecard spares.

● Badly-behaving peers/members/extensions?
  ○ Always reserve the right to protect the fabric, regardless of what that means cutting off
WHAT ARE THE KEY LESSONS LEARNED?

K.I.S.S. - Focus on moving packets inexpensively

Volunteers + Staff = Winning Combination

Community presence, evangelism

One-time port fees vs. monthly recurring costs

Transparency

Autonomy & Avoiding Political Distraction

Distributed Switching Fabric (pros/cons)

Vendor Engineering Support / Engagement / Risk
Thank you for your time and interest.

Feedback, Questions, and Rotten Vegetables always welcomed and appreciated.