# SFMIX

## Members Meeting

April 6th, 2015

# Agenda

- Introductions
- Architecture
- Services available
- History (est. 9 years ago!)
- Expenditures
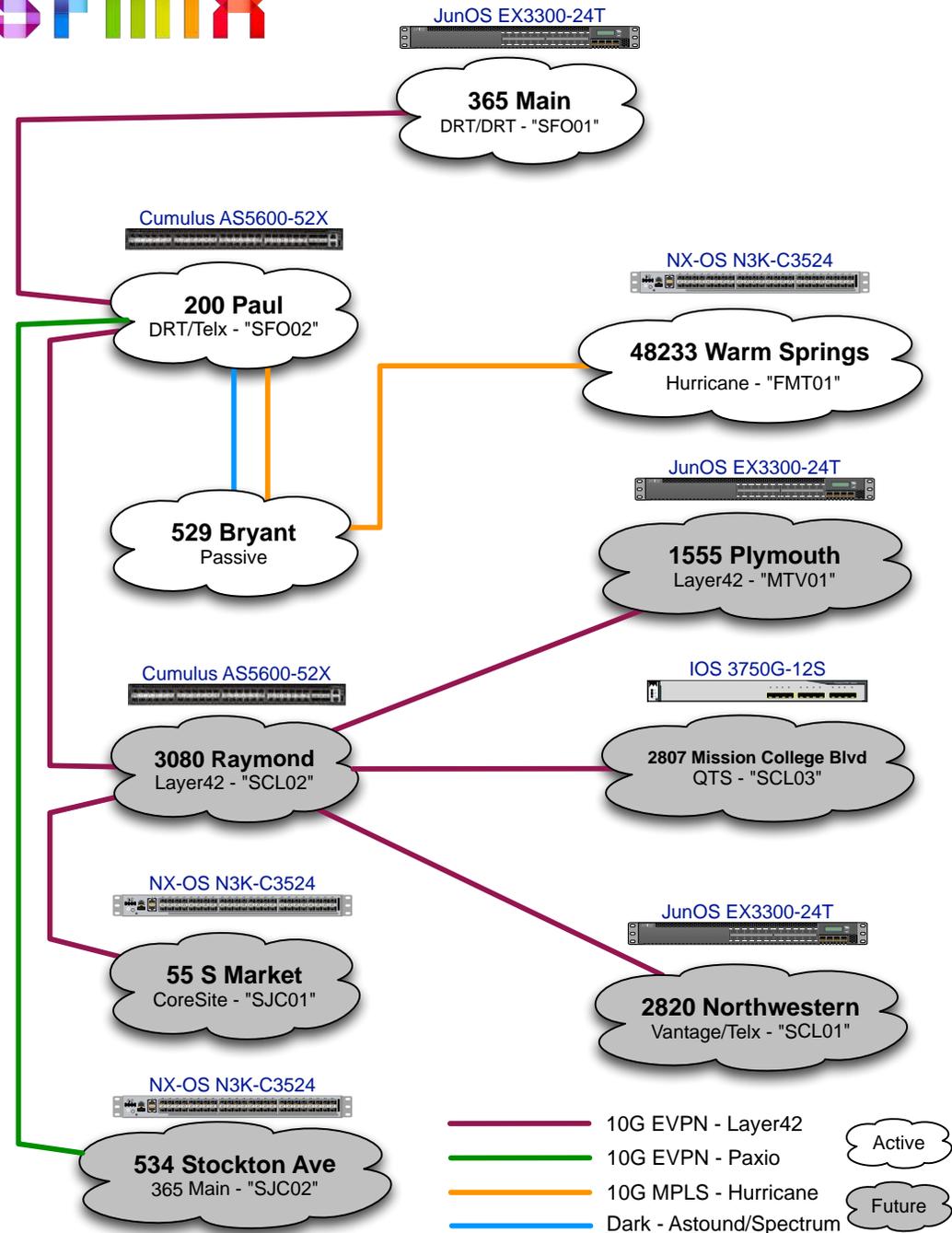- Sustainability
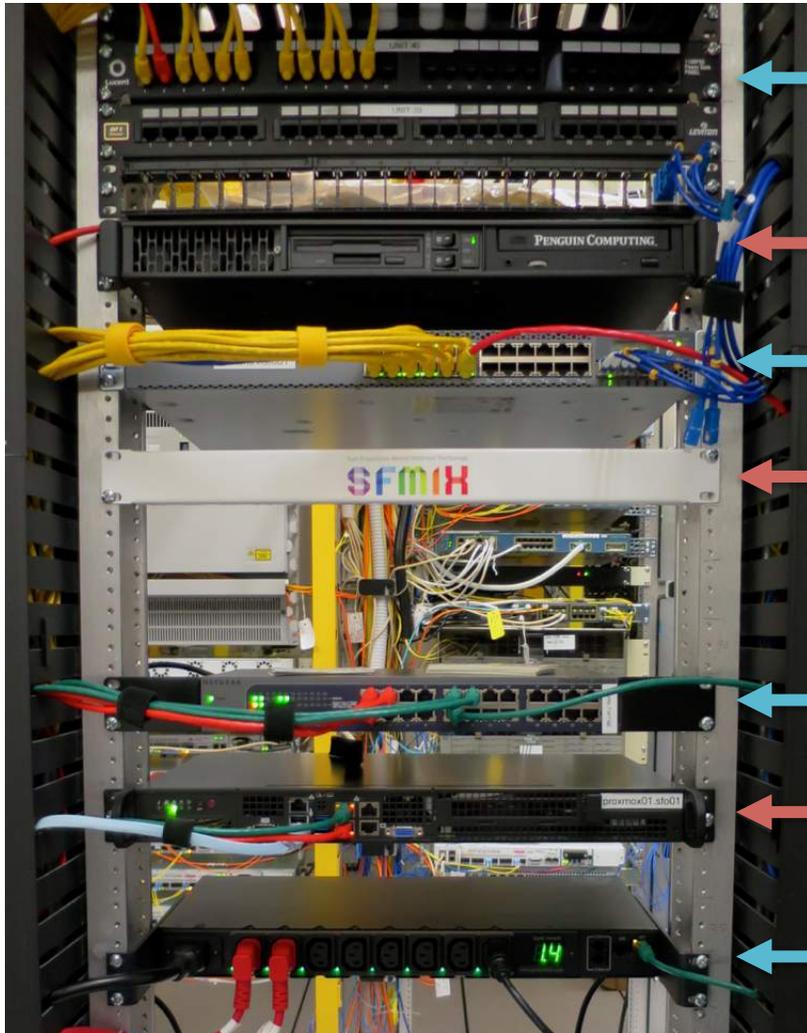- Future opportunities

# Architecture

## Active POP's
- SF001 (est. 2006)
- SF002 (11/2013)
- FMT01 (04/2015)

## Future POP tasks
- SCL01, SCL02, MTV01: Transport (contract signed, cabinet allocated, OOB transit provisioned)
- SJC01: Mgmt approval

SFMIX

JunOS EX3300-24T

**365 Main**
DRT/DRT - "SFO01"

Cumulus AS5600-52X

**200 Paul**
DRT/Telx - "SFO02"

NX-OS N3K-C3524

**48233 Warm Springs**
Hurricane - "FMT01"

**529 Bryant**
Passive

JunOS EX3300-24T

**1555 Plymouth**
Layer42 - "MTV01"

Cumulus AS5600-52X

IOS 3750G-12S

**3080 Raymond**
Layer42 - "SCL02"

**2807 Mission College Blvd**
QTS - "SCL03"

NX-OS N3K-C3524

JunOS EX3300-24T

**55 S Market**
CoreSite - "SJC01"

**2820 Northwestern**
Vantage/Telx - "SCL01"

NX-OS N3K-C3524

**534 Stockton Ave**
365 Main - "SJC02"

| | |
|---|---|
| —— 10G EVPN - Layer42 | Active |
| —— 10G EVPN - Paxio | |
| —— 10G MPLS - Hurricane | Future |
| —— Dark - Astound/Spectrum | |

# "SF001" – 365 Main



Pre-wired cross-x patching

(soon to retire) OpenBSD 4.1 MRTG

Juniper EX3300-24T (2x 10G available)

Guerrilla marketing (free stickers)

Transit / OOB switch (Netgear)

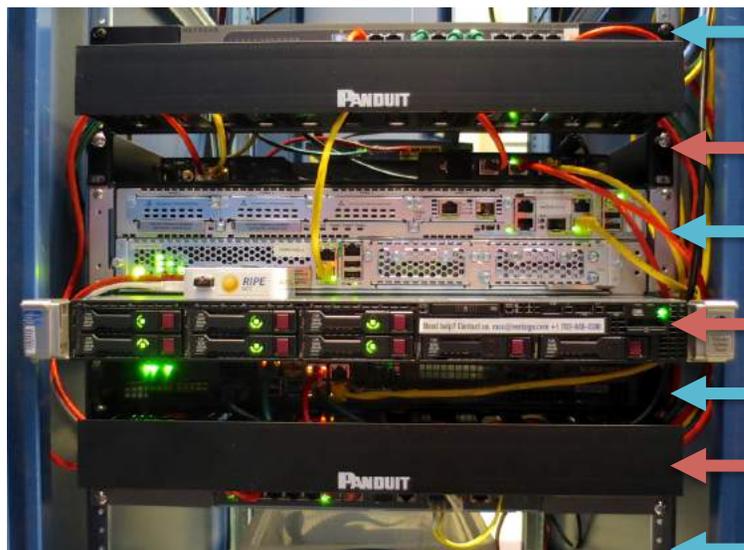(newly installed) Proxmox VM host

ServerTech managed PDU

# "SF002" – 200 Paul



- 60 SMF strands (1/4$^{th}$ consumed)

- (behind) 2x ServerTech PDU's

- Cumulus 48x10GE 4x40GE switch (A & B power fed)

- OOB switch (Netgear GS524E)

- SFMIX AS12276 router, Esgob

- Packet Clearing House

- Verisign

- Proxmox VM's (rs #1, web site, mailman)

- Transit switch (Juniper EX2200-C)

- RouteViews (after photo taken)

# SFMIX 'design patterns'

*Slow start*

- Consider a site when owner sponsors space, power, cross-x's along with an identified transport provider

- Initially transport agnostic (MPLS, dim, wave)

*Mature as demand warrants*

- Migrate to dark when possible

- Partner w/ colo sales & marketing for outreach/education

*Regional patriotic effort*

- Built and consumed by local volunteers & organizations

# Services



*DNS*

- PCH         D-root, E-root, 100+ TLD's
- ISC          F-root, TLD's
- Verisign     J-root, .com gTLD
- Esgob       extensive free secondary DNS

*R&E*

- RouteViews   powerful debugging tools, feeds bgp.HE.net tool
- RIPE atlas probe: https://atlas.ripe.net/probes/10415/

*Route Server*

- 70% of membership utilized for IPv6, 45% IPv6

# 2006..

- Landscape: Equinix (San Jose), S&D PAIX (Palo Alto)
- Anchor site: 365 Main Street
- Fiscal sponsor: Packet Clearing House
- 6 members: ~~GlobalNetOpex~~, ~~Meta Interfaces~~, ~~Centauri~~, UnitedLayer, Unwired, Layer42
- Single 6509 (Sup2), all copper fast & gigE

# ..2013

- Landscape: Equinix 2x IX's, CoreSite Any2
- Open-IX movement gains traction
- Telx + Layer42 offer to expand in 200 Paul Ave
- 10GE available at both sites
- 10 members, added: Telx, Lookout, Hurricane Electric, Webpass
- IPv6 allocations *(more on that later..)*
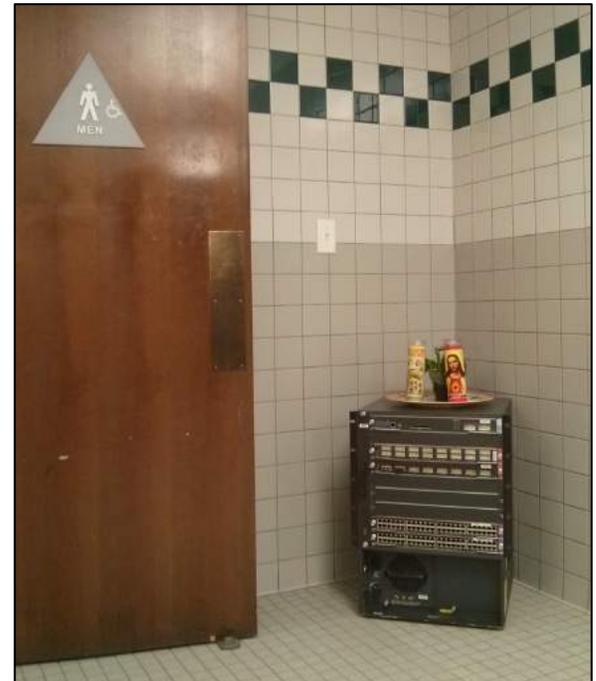
# 2014

- Landscape: Equinix 2x, Any2, AMS-IX Bay
- 19 members, added: Yelp, Digital Ocean, Monkeybrains, PCH, Spectrum Networks/Wave Broadband, Monkey Inferno, Reliablehosting/Black Oak, Esgob, Weebly, ISC
- BIRD based dual-stack route server (AS63055)
- SFMIX admin assets (web site, mailing list, primary DNS) moved to 200P VM's (AS12276)
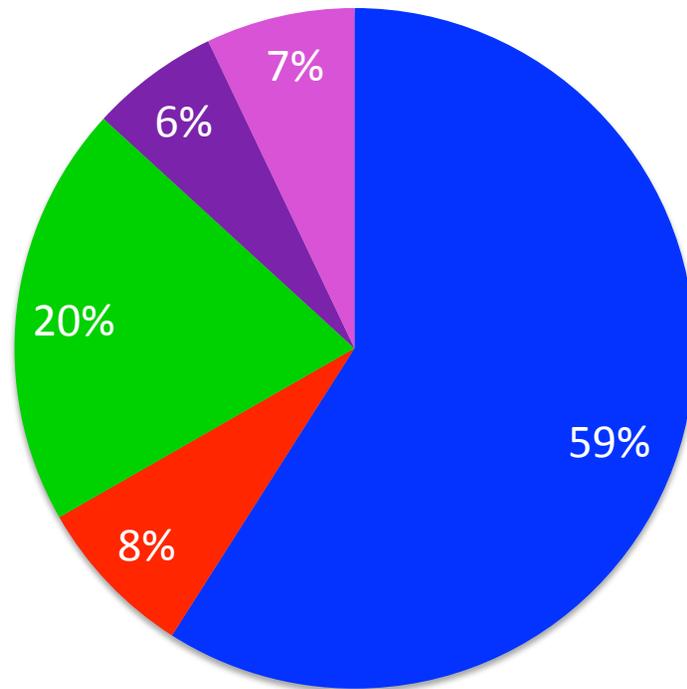- Expansion: Vantage (Santa Clara) campus

# (current) 2015

- 22 members, added: Verisign, RouteViews, T-Mobile
- Admin network multi-homes: Telx, ISC, & Hurricane
- Formalized as 501(c)6 non-profit: same as SIX, NWAX
- Maintenance: software & physical wiring updates

# (planned) 2015

- 501(c)6 non-profit effort:
  - Hold first board meeting
  - Insurance
  - Sign over existing contracts
- Expansion: Layer42 (Mountain View & Santa Clara), Hurricane Electric (Fremont), Vantage, Coresite, QTS, & 365Main "SV7"
- (additional) maintenance: software & physical wiring updates (move to dark and/or protected L2 circuits)
- IPv6 re-number day: 4-byte ASN compliant
  - Likely sequential instead of encoding 2-byte number
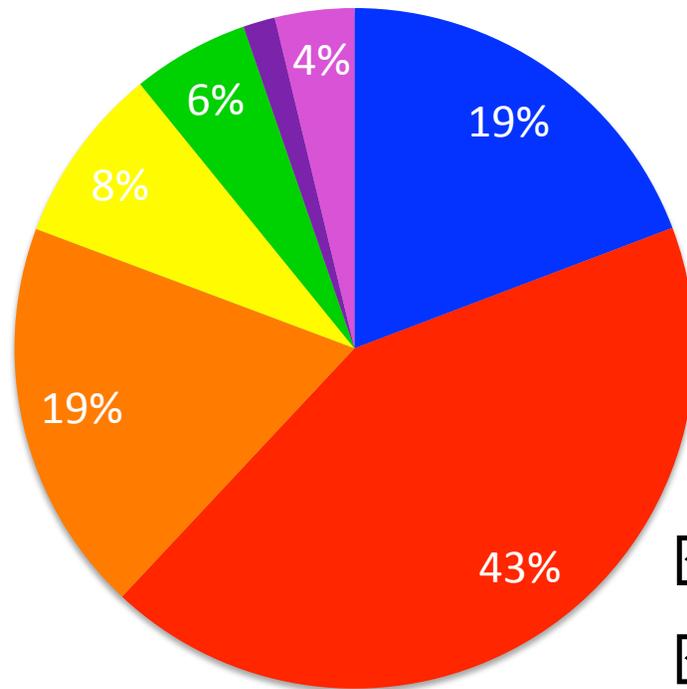
# (late) 2013 - Expenditures



Yearly Total
$847.25

Legend:
- ARIN (blue) — 59%
- Equipment (red) — 8%
- Legal (orange)
- Marketing (yellow)
- Optics (green) — 20%
- Patch Cords (purple) — 6%
- Physical Infrastructure (magenta) — 7%

☑ ARIN: peering /48, rs ASN

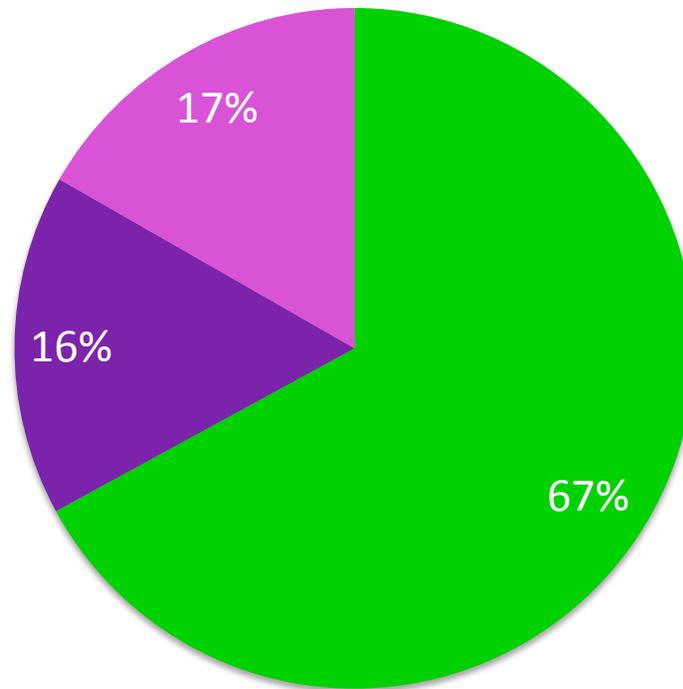☑ 200 Paul: 1& 10GE optics,
patches, OpenWRT OOB

# 2014 - Expenditures



Yearly Total
$11,695.28

Legend:
- ARIN (blue) — 19%
- Equipment (red) — 43%
- Legal (orange) — 19%
- Marketing (yellow) — 8%
- Optics (green) — 6%
- Patch Cords (purple)
- Physical Infrastructure (magenta) — 4%

☑ ARIN: admin /24 & /48

☑ 501(c)6 incorporation

☑ VM servers

☑ OOB switches, managed PDU's

☑ 1 & 10GE optics, patches

☑ Logo, stickers

# (early) 2015 - Expenditures

Yearly Total
$2,062.66

17%

16%

67%

- ☑ 10GE optics, patches
- ☑ (no ARIN bill, yet)
- ☑ (many new sites coming)

■ ARIN
■ Equipment
■ Legal
■ Marketing
■ Optics
■ Patch Cords
■ Physical Infrastructure

# Expenditures Summary

- $14,605.19 over 1.5yrs (late 2013 to current 2015)
  - Many "one time" events – incorporation, server VM hosts, logo, ARIN initial resources

- Not exhaustive - *Google Apps, domains, labeling tape, pastries, etc.*
  - Trivial expenses not recorded or just written off as a donation
  - Business cards, parking tickets, conferences, gas, etc. obviously not counted

# North America non-profit IX's

- SIX     *"One time fees, annual donations"*
- NWAX   *"GigE free, 10G $2950/yr"*
- TorIX   *"GigE $1200/yr, 10G $10,000/yr"*

NOT (even by a wide margin) a fair comparison

- Established large membership

- Majority 10GE ports, significantly more routes

- Regional incumbents, no obvious commercial "competitor"

# Sustainability

- 501(c)6 maturity brings new responsibilities:
  - Insurance (colo requirement)
  - Tax filing
- Bare minimum yearly operations *(assuming zero growth)*
  - $3k : ARIN resources, domain names, insurance
- "Comfortable" budget : $10k/yr
  - Covers bare minimums + optics, patches, misc. consumables
  - Backup / expansion equipment reserves, "rainy day" fund
  - Continue with all volunteers, no paid staff

# Current & previous sponsors

- Colo, power
  - Digital Realty, Telx, Layer42, Hurricane Electric
- Transit, transport
  - Layer42, Telx, ISC, Paxio, Spectrum Networks
- Switching
  - Cumulus Networks, Packet Clearing House, JNet Solutions

# In-kind support

- Optics
  - flexOptix (discounted pricing)

- Transport equipment
  - DE-CIX (6x 16 channel DWDM muxes + 16 mating optics! *danke*)

- Administrative guidance
  - PCH, INEX, SIX, NWAX

- Legal
  - Kaufhold Gaskin LLP (Ruth Hawley)

# Future

- Expand membership
  - Pushing aggressively with large content players *(Google calculated 11Gbps based on existing member participation)*
  - Spread the word! *T-shirts @ NANOG63?*
- 2$^{nd}$ route server
  - Current is BIRD+FreeBSD, looking at Quagga+Ubuntu
- Improve operations
  - IXP Manager as authoritative database
  - QBRIDGE support for Cumulus
  - Extend Ansible modules (love to open source for other IX's)

# Discussion

- Sustainability
  - Fee by port speed (1 or 10GE), by 95$^{th}$ percentile?
  - Fundraising drives (SIX 3yr mean $11k/yr)?
  - Continue to rely on *Bank of Matt & Tim* (not scalable)?


- Volunteers
  - Operations software (provisioning, monitoring)


- Consider the project a good attempt and fold?