REANZ

FEBRUARY 24, 2016

SCINET

THE WORLD'S FASTEST NETWORK TO SHOWCASE THE WORLD'S FASTEST COMPUTERS

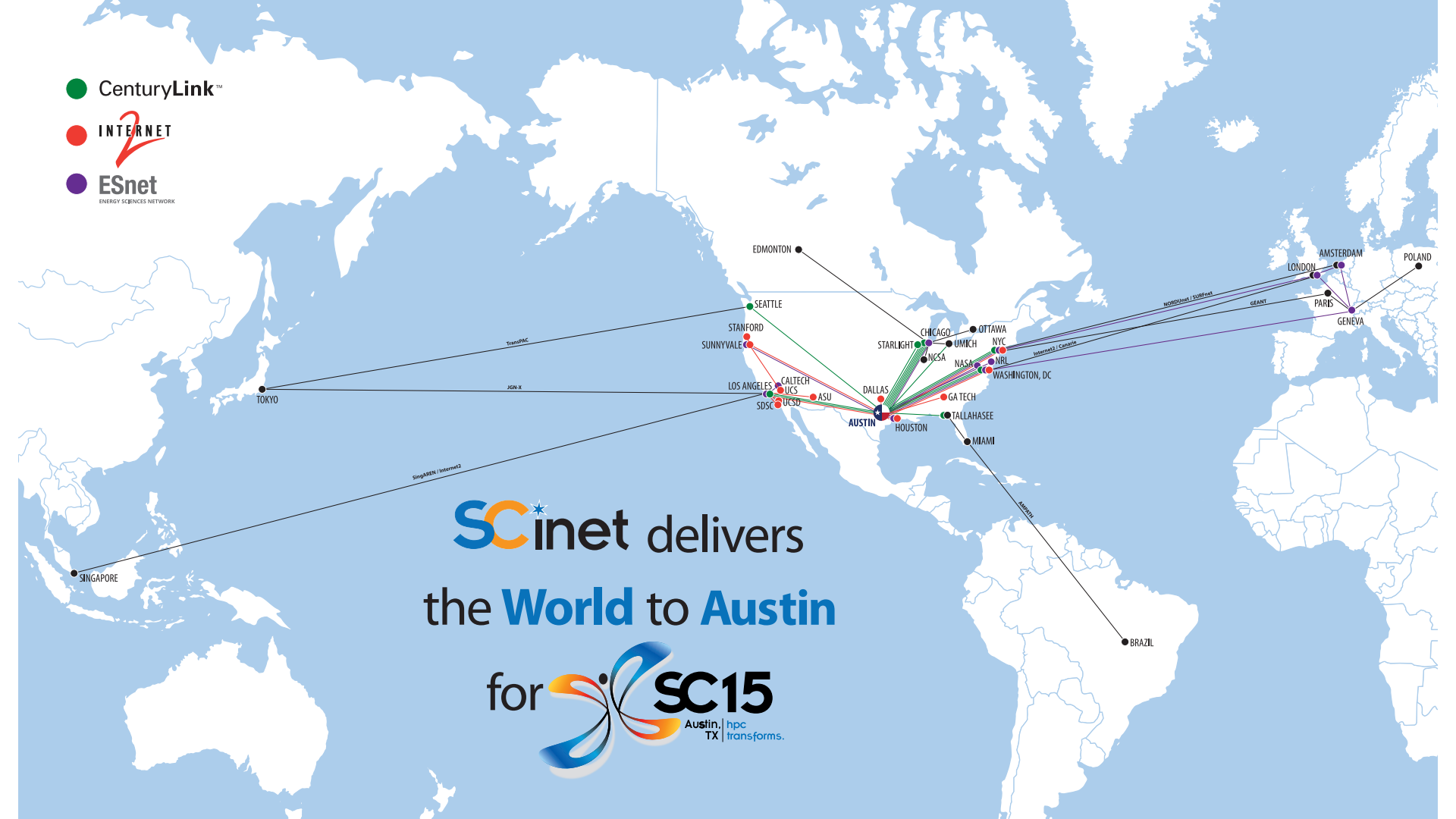
JAMIE CURTIS

REANNZ

SCINET?

WHAT IS SCINET?

- Built to support SC – the worlds largest HPC and supercomputing conference
- Network allows the demonstration of HPC applications and experiments from across the globe on the conference floor
- Booths may request (multiple) connections at 1, 10 or 100Gbps
- WAN circuits are built to the event from around the US
- R&E networks enable connections to the rest of the world


CenturyLink™
INTERNET 2
ESnet
ENERGY SCIENCES NETWORK
EDMONTON
SEATTLE
STANFORD
SUNNYVALE
TOKYO
LOS ANGELES
CALTECH
UCS
ASU
SDSC
UCSD
SINGAPORE
TransPAC
JGN-X
SingAREN / Internet2
CHICAGO
STARLIGHT
NCSA
UMICH
OTTAWA
NYC
MRL
NASA
WASHINGTON, DC
DALLAS
GA TECH
AUSTIN
HOUSTON
TALLAHASEE
MIAMI
AMPATH
BRAZIL
AMSTERDAM
LONDON
PARIS
GENEVA
POLAND
NORDUnet / SURFnet
GEANT
Internet2 / CANARIE
SCinet delivers
the World to Austin
for SC15
Austin, TX | hpc transforms.

FACTS & FIGURES

- Total bandwidth delivered: 1.63 Tbps
- 143 km of fibre deployed on exhibit floor
- Over USD$22 million in loaned equipment
- Over 130 international volunteers from over 15 countries
- 337 SCinet wireless access points configured
- 7 Distributed NOCs (DNOC) on exhibit floor
- 39 managed and 73 unmanaged switches

juniper
ciena
ciena
Adaptive
DDN
STORAGE
HPC LEADERSHIP &
INNOVATION
DDN
DDN
DDN
STORAGE
GCAS
GCAS
TEXAS A&M

HOW?

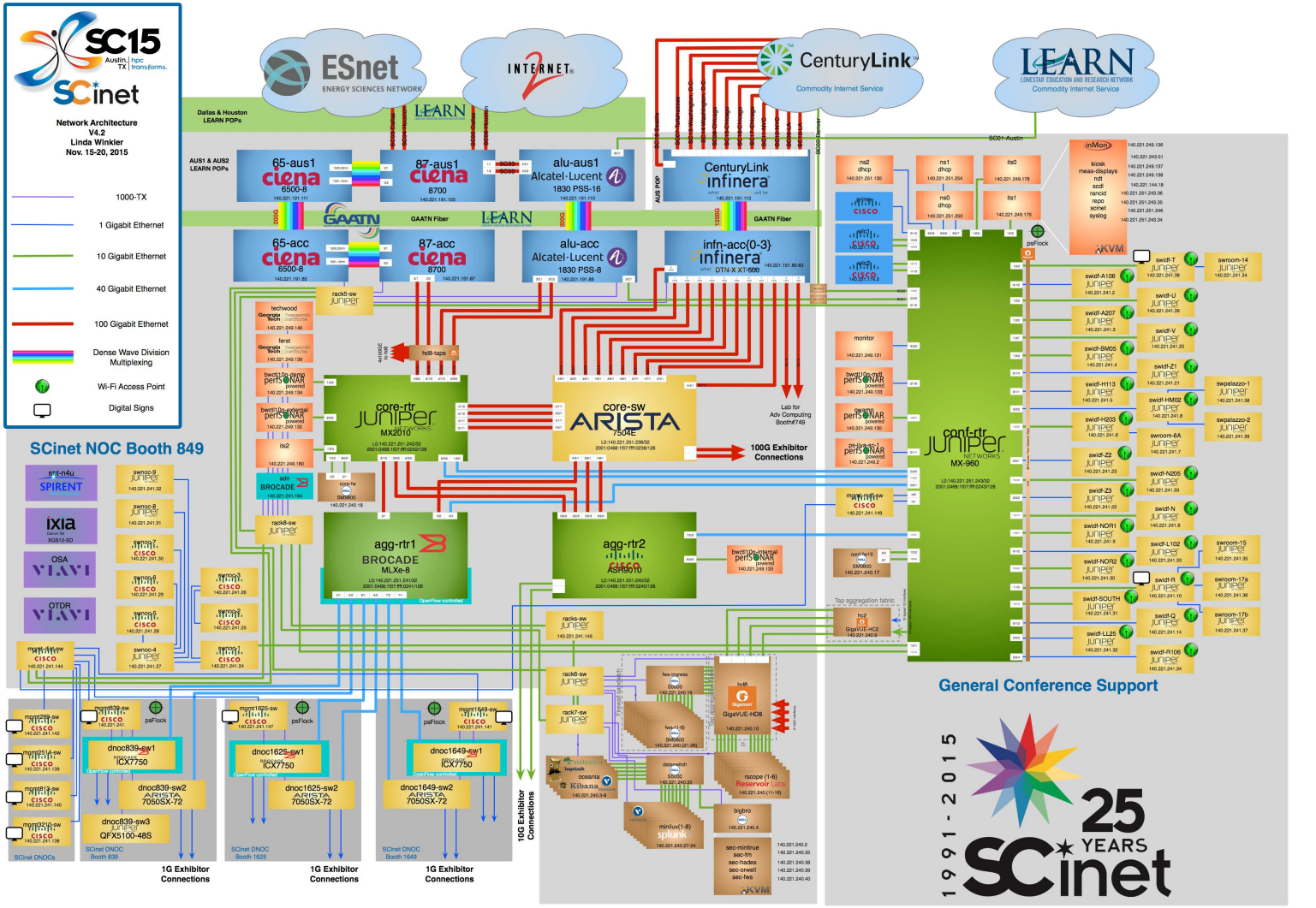
SCinet
SC15
ESnet
ciena
ARISTA
LEARN
JUNIPER
NETWORKS
works that know to go big and go cloud.
COMMSCOPE

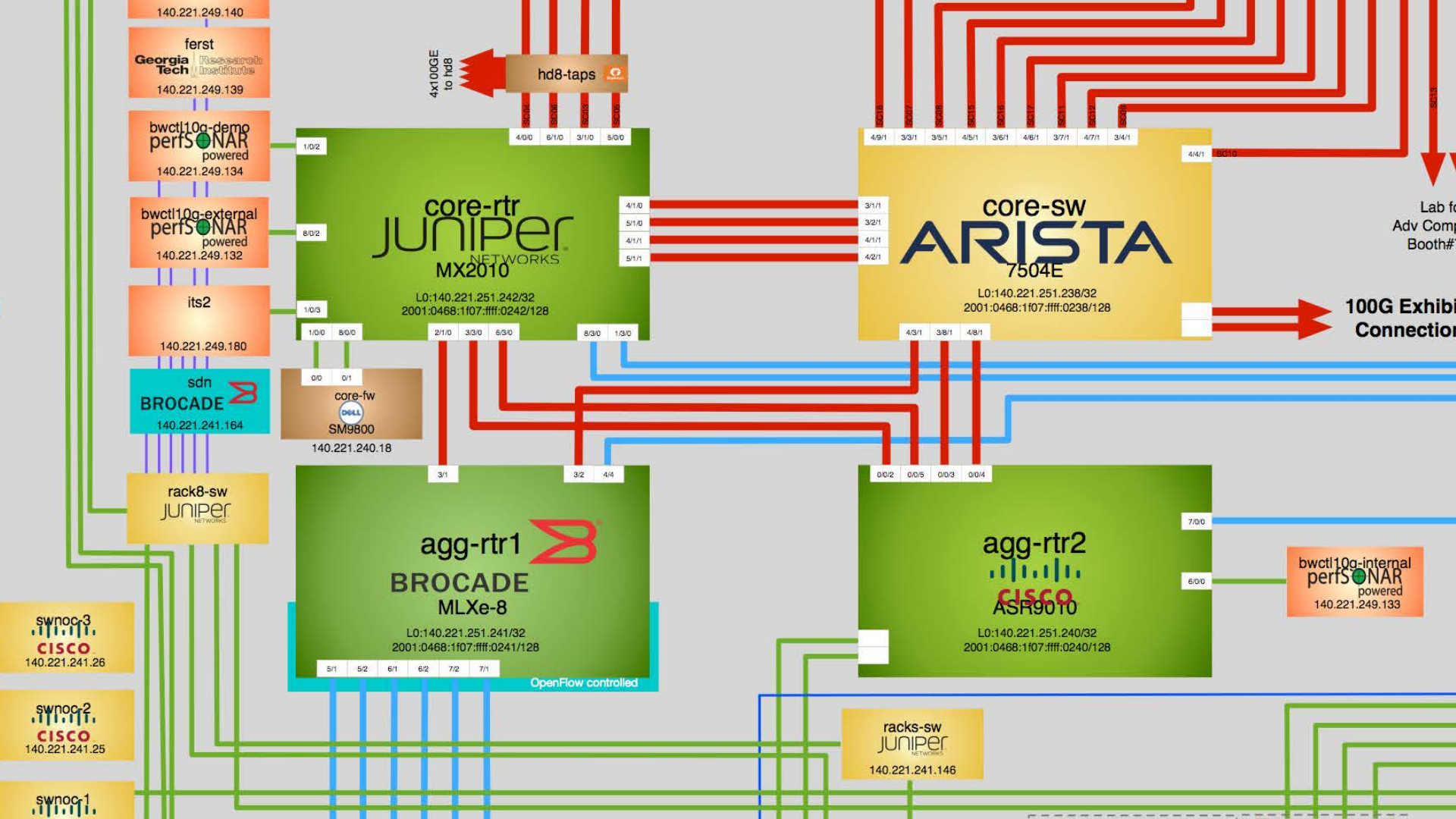
SCinet
IEEE computer society
PLATINUM
GOLD
SILVER
BRONZE
CenturyLink
ciena
BROCADE
Alcatel·Lucent
DELL
GAATN
inMon
SPIRENT
CABLExpress
RESPECT LAYER ONE
COMMSCOPE
ESnet
infinera
INTERNET2
CISCO
AUSTIN CONVENTION CENTER
Reservoir Labs
ixia
splunk>
VERISIGN
VIAVI
JUNIPER NETWORKS
LEARN
Gigamon
ARISTA
Idaho State University
ILLINOIS
ARL
CENIC
CLEMSON
University of Colorado Boulder
DDN STORAGE
DFN
FAU
FLR
GlobalNOC
Georgia Tech
NYSERNet
PACIFIC WAVE
PennState
perfSONAR powered
KINBER
NCAR
NCSA
NICS
n-wave
PURDUE
REANNZ
SDSC
Sandia National Laboratories
STARLIGHT
SURFNET
TACC
TeliaSonera
UNIVERSITY of TENNESSEE
UEN
Universiteit van Amsterdam
VirginiaTech Transportation Institute
WISCONSIN
ziti

TEAMS

- Architecture
- Commodity
- Communications
- Fiber
- Helpdesk
- Interconnect
- IT
- Logistics
- Management
- Measurement
- Network Security
- Security
- Power
- Routing
- WAN
- Wireless

WHAT?


SC15
Austin, TX | hpc transforms.
SCinet
Network Architecture
V4.2
Linda Winkler
Nov. 15-20, 2015
1000-TX
1 Gigabit Ethernet
10 Gigabit Ethernet
40 Gigabit Ethernet
100 Gigabit Ethernet
Dense Wave Division Multiplexing
Wi-Fi Access Point
Digital Signs
ESnet
ENERGY SCIENCES NETWORK
INTERNET2
CenturyLink
Commodity Internet Service
LEARN
LONESTAR EDUCATION AND RESEARCH NETWORK
Commodity Internet Service
Dallas & Houston LEARN POPs
AUS1 & AUS2 LEARN POPs
65-aus1 ciena 6500-8
87-aus1 ciena 8700
alu-aus1 Alcatel-Lucent 1830 PSS-16
CenturyLink infinera
GAATN
GAATN Fiber
LEARN
65-acc ciena 6500-8
87-acc ciena 8700
alu-acc Alcatel-Lucent 1830 PSS-8
infn-acc{0-3} infinera DTN-X XT-3600
SCinet NOC Booth 849
core-rtr JUNIPER MX2010
core-sw ARISTA 7504E
100G Exhibitor Connections
agg-rtr1 BROCADE MLXe-8
agg-rtr2 CISCO ASR9010
conf-rtr JUNIPER MX-960
General Conference Support
dnoc839-sw1 ICX7750
dnoc839-sw2 ARISTA 7050SX-72
dnoc839-sw3 QFX5100-48S
dnoc1625-sw1 ICX7750
dnoc1625-sw2 ARISTA 7050SX-72
dnoc1649-sw1 ICX7750
dnoc1649-sw2 ARISTA 7050SX-72
SCinet DNOCs
SCinet DNOC Booth 839
SCinet DNOC Booth 1625
SCinet DNOC Booth 1649
1G Exhibitor Connections
10G Exhibitor Connections
GigaVUE-HD8
Kibana
1991 - 2015
25 YEARS
SCinet


140.221.249.140
ferst
Georgia Tech Research Institute
140.221.249.139
bwctl10g-demo
perfSONAR
powered
140.221.249.134
bwctl10g-external
perfSONAR
powered
140.221.249.132
its2
140.221.249.180
sdn
BROCADE
140.221.241.164
rack8-sw
JUNIPER
NETWORKS
swnoc-3
CISCO
140.221.241.26
swnoc-2
CISCO
140.221.241.25
swnoc-1
4x100GE
to hd8
hd8-taps
core-rtr
JUNIPER
NETWORKS
MX2010
L0:140.221.251.242/32
2001:0468:1f07:ffff:0242/128
core-fw
DELL
SM9800
140.221.240.18
core-sw
ARISTA
7504E
L0:140.221.251.238/32
2001:0468:1f07:ffff:0238/128
100G Exhibi
Connectior
Lab f
Adv Comp
Booth#
agg-rtr1
BROCADE
MLXe-8
L0:140.221.251.241/32
2001:0468:1f07:ffff:0241/128
OpenFlow controlled
agg-rtr2
CISCO
ASR9010
L0:140.221.251.240/32
2001:0468:1f07:ffff:0240/128
bwctl10g-internal
perfSONAR
powered
140.221.249.133
racks-sw
JUNIPER
NETWORKS
140.221.241.146

BRIGGS
Yale

Yale

COMMSCOPE
ARISTA
BROCADE
CISCO
splunk>
ciena

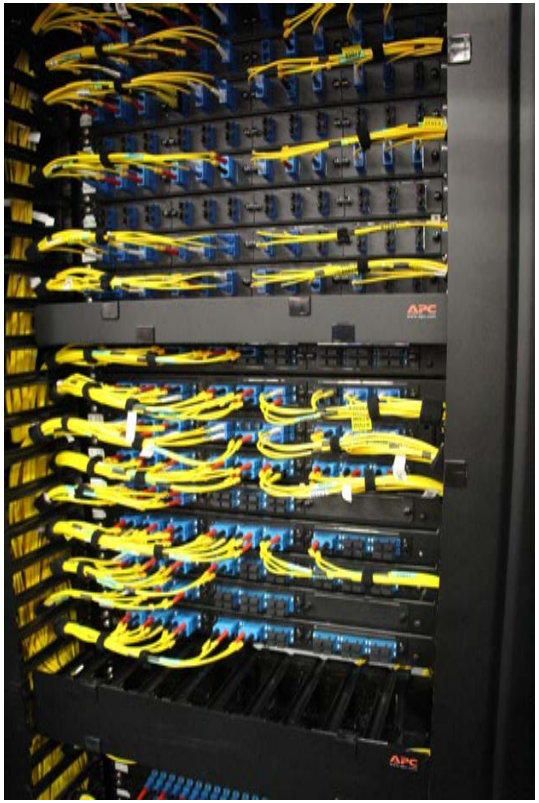
WHY?

WHY?

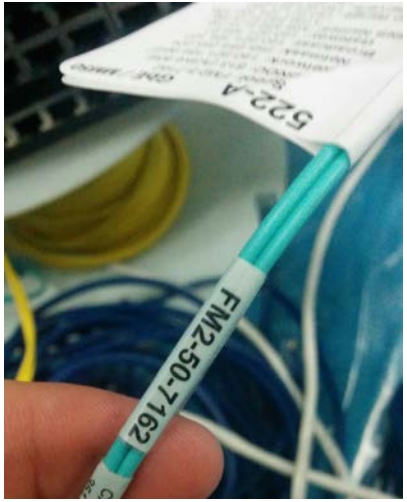
- Not just about supporting the exhibitors….
- Research & experimentation
- Vendor showcase
- Training
- Collaboration
- Profile

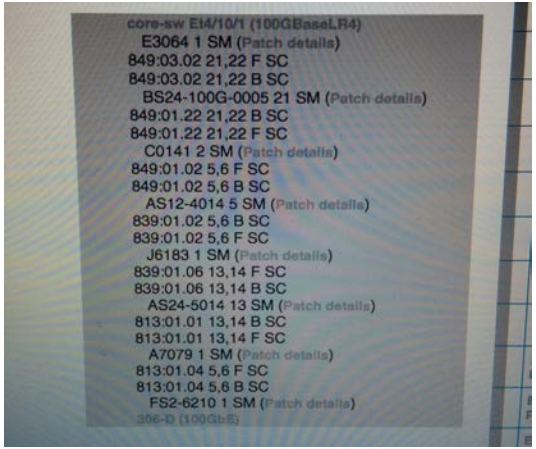
R&D & TRAINING

- SC15 marked the first deployment of SDN in SCinet
  - 50% of 1G connections via switches controlled by OpenFlow
  - Brocade ICX switches with OpenDaylight controller
- Working alongside vendor SE's for multiple weeks on equipment you've never used
- Brand new equipment – Infinera and Arista QSFP28 deployment for SC15


APC
APC

522-C
DF B2B / SM
Spool: FS2-6118
DNOC: 813 (Active 839)
To Booth: Booth 462 (Altera Corporati
Peer: 462-A


522-A
FM2-50-7162


core-sw Et4/10/1 (100GBaseLR4)
E3064 1 SM (Patch details)
849:03.02 21,22 F SC
849:03.02 21,22 B SC
BS24-100G-0005 21 SM (Patch details)
849:01.22 21,22 B SC
849:01.22 21,22 F SC
C0141 2 SM (Patch details)
849:01.02 5,6 F SC
849:01.02 5,6 B SC
AS12-4014 5 SM (Patch details)
839:01.02 5,6 B SC
839:01.02 5,6 F SC
J6183 1 SM (Patch details)
839:01.06 13,14 F SC
839:01.06 13,14 B SC
AS24-5014 13 SM (Patch details)
813:01.01 13,14 B SC
813:01.01 13,14 F SC
A7079 1 SM (Patch details)
813:01.04 5,6 F SC
813:01.04 5,6 B SC
FS2-6210 1 SM (Patch details)
306-D (100Gb/E)

THANKS

- Linda Winkler, David Wheeler – diagrams / slides
- Conan, JP and the other Routerheads
- SCinet & SC teams
- REANNZ!

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