WINS: Year two

Inclusivity

Kali McLennan, Marla Meehl, Jessica Shaffer, Jason Zurawski

SC '16 - Salt Lake City, Utah

- WINS funded for three years by NSF: SC 16, SC 17, SC 18
- We had a very strong pool of candidates and the selection was challenging - 33 applications
  - WINS funded 5 and DOE funded 3
- The selection team led by Wendy Huntoon:
  - Dave Jent - University of Indiana
  - Florence Hudson - Internet2
  - Susan Lucas - ESnet
  - Linda Winkler - ANL
- 3 of 5 women returned from SC 15 funded by RMCM

SC16
Salt Lake City, Utah | hpc matters.

WINS SC 16 Awardees

- Angie Asmus - Colorado State University - Edge Network - Funded by WINS
- Denise Grayson - Sandia National Labs - Network Security - Funded by DoE
- Indira Kassymkhanova - Lawrence Berkeley National Laboratory/ESnet - DevOps/Routing - Self Funded
- Julia Locke - NIE-TS (LANL) - Fiber (development period) + Edge Network (SCinet) Funded by DoE
- Kali McLennan - University of Oklahoma - WAN Transport - Funded by WINS
- Amber Rasche - North Dakota State University - Communications - Funded by WINS
- Jessica Shaffer - Georgia Institute of Technology - Routing - Funded by WINS
- Julia Staats - CENIC - DevOps - Funded by WINS

[SC Keynote focused on diversity and inclusion](#)

- Child care
- Internships for students
- WINS

SCinet - The Fastest Network Connecting the Fastest Computers

SC16 was once again host of one of the most powerful and advanced networks in the world - SCinet. The Volunteers follow a simple mantra for SCinet:

- *1 Year* to design
- *1 Month* to build
- *1 Week* to operate
- *1 Day* to teardown

SCinet brings to life a very high-capacity network that supports the revolutionary applications and experiments that are a hallmark of the SC conference - linking the convention center to the world

Volunteers from academia, government and industry work together to design and deliver the SCinet infrastructure

Industry vendors and carriers donate millions of dollars in equipment and services needed to build the local and wide area networks

SC16 Network Statistics

- 56 miles of optical fiber in the Salt Palace Convention Center
- 3.15 Terabits per second of available bandwidth provided by 5 R&E and Commercial ISPs
    - 1.2 Terabits per second of network use at peak*****
- $32 million in vendor loaned equipment from 30 companies
- Supported wireless for 11,100 attendees, via 200+ hand-placed APs
- 200 total volunteers, spanning 18 countries, and 62 organizations******

*http://sc16.supercomputing.org/2016/11/18/sc16-scinet-set-new-1-2-terabyte-record/

**These volunteers are distributed across 19 teams that are each focused on one unique area of the network implementation or management of the conference experience

Total SCinet Traffic monitored by sFlow/NetFlow

sFlow/NetFlow Traffic total - auto de-duplicated

Flow Monitoring Protocol
☐ sflow
☐ netflow
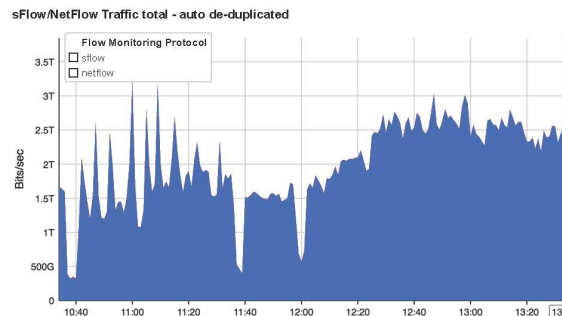
Results of Participant and Mentor surveys

Highly successful and valuable program for both Participants & Mentors

- Participants:
  - Average rating on value of experience (1 - 10 scale, 10 being highest) = 9.75
  - Average rating on recommendation of program to other women (1 - 10 scale) = 10
  - 100% felt participation in WINS and SCinet was beneficial to their career, goals, or professional network.
- Mentors:
  - Average recommendation of program to other women (1 - 10 scale) = 9.57
  - 100% felt their Participant contributed value to the team and should be invited back as a SCinet volunteer
  - 100% would like to participate as a WINS Mentor again

WINS Challenges

- Scaling
  - How many women can SCinet support - new and returning (13 total to date)
  - How many women can the WINS Management team support, e.g. travel, logistics, report-outs
- Funding
  - Returning participants - RMCMOA funded this year
  - Report outs - a valuable component to raise awareness and broaden exposure and professional network - regionals, RMCMOA, and Quilt funded this year and last year
  - International participants
  - Possibilities: vendor funding, related workforce grants, SC scholarships

WINS Participants - Kali McLennan & Jessica Shaffer

- Introduction

- Why WINS?

- My SCinet Experience

Jessica's SCinet Experience

- Reasons for applying:
  - Encouragement from mentors
  - Desire to learn
  - Interest in meeting other network professionals
- Routing Team mentors:
  - JP Velders and Conan Moore
- Team responsibilities:
  - Install, configure, support exhibit floor and commodity network
  - Coordinate external connectivity with commodity Internet and R&E WAN service providers

Jessica's SCinet Experience

- Individual responsibilities:
  - Patch fiber between routers, rack switches, and WAN equipment
  - Coordinate configuration and patching changes with other teams
  - Review and update router and switch configurations
  - Monitor help-desk ticket queue and follow up with customers
  - Use SDN to push flows to show floor switches
  - Learn as much as possible
  - Assist with removal of aerial fiber

Jessica's SCinet Experience

- Benefits of participation:
  - Unique opportunity with endless learning opportunities
  - Networking with other SCinet members, especially WINS participants
  - Information and experience to share with home institution
  - Learning equipment unavailable to configure and test outside of SCinet
- WINS program highly recommended

Office of Science and Technology Policy Executive Office of the President Dr. John P. Holdren, Assistant to the President for Science and Technology and Director Megan Smith, Assistant to the President and United States Chief Technology Officer Cabinet Exit Memo | January 5, 2017

"OSTP continues to be optimistic about America's ongoing leadership in science and technology because of two exceptional characteristics of Americans. Americans continue to lead the world in our curiosity and desire to understand the world around us, which helps us innovate and improve the world around us. And, Americans are exceptionally diverse and can bring a wide range of experiences and backgrounds to solving the hardest problems. Our country's diversity continues to be the greatest source of its strength.

President Obama has repeatedly shown his commitment to inclusion, noting that, "research has shown that diverse groups are more effective at problem solving than homogeneous groups. Policies that promote diversity and inclusion will enhance our ability to draw from the broadest possible pool of talent, solve our toughest challenges, maximize employee engagement and innovation, and lead by example by setting a high standard for providing access to opportunity to all segments of our society." Taking on the S&T frontiers that we describe in this memorandum requires including all Americans in leading innovation across industry, academia, and government."

Women in computing to decline to 22% by 2025

- New research warns that at the rate we're going, the number of women in the computing workforce will decline to 22% from 24% by 2025 if nothing is done to encourage more of them to study computer science.
- "The solution starts with education — we need to develop more tailored programs that appeal to girls' interests, and take a more targeted and sequenced approach to encourage girls to pursue (computer science) related learning at each stage of their education."
- "The research shows that the gender gap in computing is getting worse, not better," said Reshma Saujani, founder and CEO of Girls Who Code.
- The share of women in the computing workforce has slipped to 24% today from 37% in 1995.

Google/Gallup studies

- Four leading factors that influence a woman's decision to pursue a CS degree:
  - social encouragement to study CS
  - self-perception (having an interest in areas applicable to CS, such as problem solving and tinkering)
  - academic exposure to CS
  - career perception (including understanding broader professional applications for CS)

[Google/Gallup studies](#) - cont'd

- In general, when students have access to CS learning in school, they are more likely to say they are very interested in learning it — suggesting that exposure to these opportunities is key to piquing students' interest in the first place.
- Students' exposure to adults who work with computers and technology can influence their attitudes toward CS. Male and female students are equally likely to say there is an adult in their life who works with computers or technology (63% for each).

[Google/Gallup studies](#) - cont'd

- Among seventh- to 12th-grade students in the U.S., one quarter are "very interested" and slightly fewer than six in 10 are "somewhat interested" in learning CS in the future.
- However, there is a sizable difference between male and female students' responses to this question, with twice as many male students (34%) as female students (16%) saying they are "very interested" in learning CS in the future, and nearly twice as many female students (24%) as male students (13%) saying they are "not at all interested."

[Google/Gallup studies](#) - cont'd

- While student reports of "often" seeing people "doing CS" in the media are relatively low, female students are even less likely than male students to report seeing people like themselves "doing CS" in the media.
- Students who report often seeing people like themselves "Doing CS" in the media are much more likely to say they are "Very Interested" in learning CS.
- These groups are much more likely to see White or Asian men engaged in computer science. They also often see computer scientists portrayed "wearing glasses."

Google/Gallup studies - cont'd

- Stereotypes may influence implicit beliefs about who can do computer science and might introduce unconscious bias in educators and parents, who may disproportionately and unconsciously encourage students who fit the computer scientist stereotype to pursue
- Male students are more likely than female students to have been told by a teacher (39% vs. 26%) or a parent (46% vs. 27%) that they would be good at CS
  - Teachers and parents may inadvertently reinforce stereotypes by telling more male students they think they would be good at CS, thus furthering the underrepresentation of females in CS

[Google/Gallup studies](#) - cont'd

- Opportunities exist to better educate students, parents, teachers and school administrators on what differentiates computer science from computer literacy
  - If these groups better understand what computer science is, learning opportunities can branch beyond literacy and delve deeper into computer science concepts, allowing students to acquire skills that are useful and in demand across a growing number of fields
  - Most students, parents, teachers and school principals surveyed correctly identified "creating new software" and "programming and coding" as computer science activities. However, many also incorrectly identified "creating documents or presentations" and, to a lesser extent, "searching the Internet" as part of computer science.

Opportunities

- Expose students to CS early and often in a positive format
  - Encourage your schools, universities, etc. to require CS classes
  - President Obama Announces Computer Science For All Initiative
  - Home environment: Bitsbox, Littlebits, Girls Who Code, etc.
  - Internships
    - Mid career internships are a low-risk, high-reward tactic to re-integrate people with gaps into the professional workforce
    - Student internships: Middle, High, and College
  - Sabbaticals for professional development and career transition
- Project positive images of CS - reward books, movies, TV that do this
- Educate parents, students, teachers on what CS is and how it is part of their daily lives - fun and relevant examples - positive differences CS makes
- Google for education

WINS Participant Personal Diversity Experiences

- What was your path to IT?
- What kinds of encouragement did you receive and by whom?
- What challenges did you face along the path as a woman in IT?
- What challenges do you face today as a woman in IT?
- What advice would you give to other women considering IT?
- What ideas do you have to increase the number of women in IT?
- Do any of the results of these studies resonate with you?

Questions for Quilt Participants

- What activities do you have at your organization to address diversity?
- Is a commitment to diversity written into your organization's strategic plan?
- Are there activities that the Quilt should initiate to encourage diversity, e.g. scholarship programs, internship programs, etc.?

Questions/Discussion