

Women in IT: the untapped talent pool

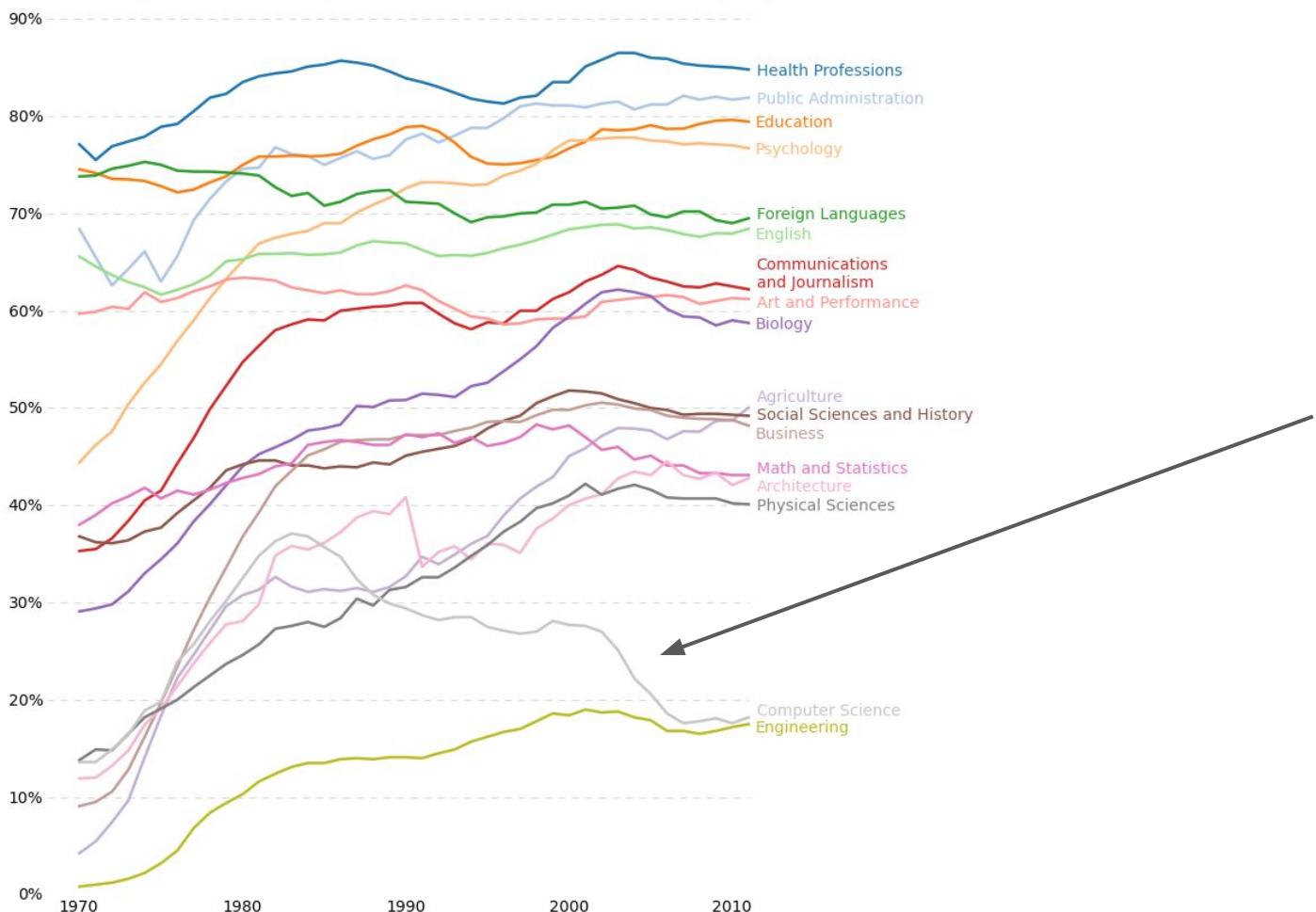
Quilt - 217/16

Sana Bellamine, Wendy Huntoon, Amy Liebowitz,
Marla Meehl, Megan Sorensen, Jason Zurawski

Why are we talking to you about this today?

- Wendy and I are women who have been in technical careers for more than 30 years
- Wendy and I have seen a pretty consistent 10% women in our field for those 30 years
- We have become involved in gender diversity efforts in IT
- Through these efforts, we have become much more aware of the magnitude and scope of the problem
- We have become much more aware of the value of diversity
- We hope to bring awareness to others about the issue and possible steps each of us can take to **influence change**

Percentage of Bachelor's degrees conferred to women in the U.S.A., by major (1970-2012)



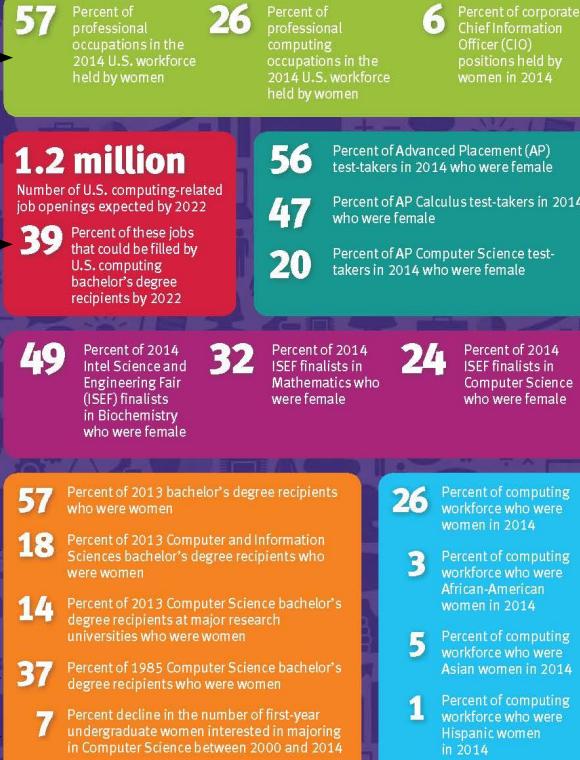
Data source: nces.ed.gov/programs/digest/2013menu_tables.asp

Author: Randy Olson ([@randal_olson](http://randalolson.com))

Note: Some majors are missing because the historical data is not available for them

By the Numbers

Women in
Information
Technology



Sources: U.S. Department of Labor, Bureau of Labor Statistics, 2014 (Occupational Category: 15-0000); Harvey Nash, 2014; Includes new and replacement jobs and assumes current undergraduate degree (CIP 11); production levels persist; College Board AP Program Summary Report, 2014 (Calculus AB & BC, Computer Science A); Intel ISEF finalist breakdown by gender, 2014 (Unpublished); National Center for Education Statistics (NCES), 2013 (CIP 11); 2012-2013 CRA Taubee Survey (Computer Science); The American Freshman: Forty Year Trends, 1966-2006; The American Freshman: National Norms Fall 2014, Higher Education Research Institute (HERI).



Material from the National Center for Women in IT (NCWIT)

- Although women today comprise half the world's population and more than half of the U.S. professional workforce, **they play only a small role in inventing the technology of tomorrow.**
- The lack of girls and women in computing and technology represents a **failure to capitalize on the benefits of diverse perspectives:**
 - a. In a world dependent on innovation, it can bring the **best and broadest problem-solvers to the table**
 - b. At a time when technology drives economic growth, it can **yield a larger and more competitive workforce.**
- **Women represent a vastly untapped talent pool.**
- Groups with greater diversity solve complex problems better and faster than do homogenous groups, and the presence of women in a group is more likely to increase the collective intelligence (problem-solving ability, creativity) of the group.
- Companies with the highest representation of women in their management teams have a 34% higher return on investment than did those with few or no women.
- Gender-balanced companies:
 - a. Demonstrate superior team dynamics and productivity.
 - b. Produce work teams that stay on schedule and under budget.
 - c. Demonstrate improved employee performance.

Material from the National Center for Women in IT (NCWIT)

- Computing-related jobs are interesting, well-paying, secure, and abundant, so why aren't more women working in this creative field that produces the technology that is central to our daily lives?
 - At the high school level most high school students are unaware of computing as a field of study or profession, and they have had little experience with or exposure to it.
 - Girls in particular typically are not encouraged by their parents, teachers, and counselors to pursue computing or engineering subjects.
 - At the postsecondary level female students end up not choosing to study computing or engineering in college because they have had little prior exposure to or experience with computing, and little or no encouragement from adult influencers and peers.
 - Female undergraduates often find themselves either as the only female in a class or one of just a few. This can, of course, be alienating.
 - Media portrayals of IT careers generally depict the employees as predominantly male and socially deficient.

Material from the National Center for Women in IT (NCWIT)

- In industry, it can be disconcerting to be a woman in a male dominated field.
- Unconscious biases operate in classrooms and workplaces despite our best intentions - losing women in IT due to this
 - Work environment
 - Job descriptions
 - Resumes
 - Interviews
 - Promotions/advancement/training opportunities
- Shortage of male advocates:
 - Men are often the leaders, power holders, and gatekeepers in the computing workplace so enlisting men's participation is vital for change efforts to be truly effective.
 - Women report that support and encouragement to pursue and persist in technical careers often comes from men and is vital.
 - Gender reform is not a women's issue; it is also about men - women and men need to work together as allies in order to change work culture.

A Letter to Our Daughter by Mark Zuckerberg

Promoting equality is about making sure everyone has access to these opportunities -- regardless of the nation, families or circumstances they are born into.

Our society must do this not only for justice or charity, but **for the greatness of human progress.**

Today we are robbed of the potential so many have to offer. The only way to achieve our full potential is to channel the talents, ideas and contributions of every person in the world.

Women in IT Networking at SC (WINS)

- Women in IT Networking at SC (WINS)
 - As the result of a NSF-funded partnership between the University Corporation for Atmospheric Research (UCAR), the Department of Energy's Energy Sciences Network (ESnet) and the Keystone Initiative for Network Based Education and Research (KINBER), five women received funding to participate in the 2015 Supercomputing Conference (SC15) while gaining valuable hands-on training in building one of the world's premier IT networks, known as SCinet.
 - WINS is an effort to expand the diversity of SCinet volunteer staff and provide professional development opportunities to highly qualified women in the field of networking.



WINS

- WINS team: Mary Hester (ESnet), Wendy Huntoon (KINBER), Marla Meehl (UCAR), Lauren Rotman (ESnet), Jason Zurawski (ESnet)
 - Kate Mace (ESnet) will join the team going forward
- 19 highly qualified applicants
 - The candidates applications were reviewed by an expert panel of research and education community leaders, including: Wendy Huntoon (lead), Greg Bell (ESnet), John Hernandez (UCAR), Jennifer Schopf (IU), and Linda Winkler (ANL)
- WINS awardees:
 - Sana Bellamine, CENIC, Measurement Team
 - Debbie Fligor, University of Illinois, Routing Team
 - Amy Liebowitz, University of Michigan, Commodity Team
 - Megan Sorensen, Idaho State University, Wireless Team
 - Kyongseon (Kathy) West, Indiana University of Pennsylvania, Network Security Team

WINS

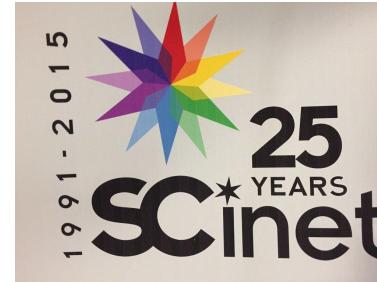
- WINS was highly successful from the SC leadership, mentors, awardees, and WINS team feedback received
 - Surveys solicited and received from all mentors
 - Surveys solicited and received from all awardees
- A number of report outs planned to communicate problem and project as well as expand the awardees personal and professional network
 - Westnet - Complete 1/6/16
 - Quilt
 - CENIC
 - iLight
 - KINBER
 - MERIT
 - I2 Global Summit

WINS

- Working to secure ongoing funding for the WINS project
 - NSF
 - DOE
 - Quilt
 - SC
 - Vendors

SCinet - The Fastest Network Connecting the Fastest Computers

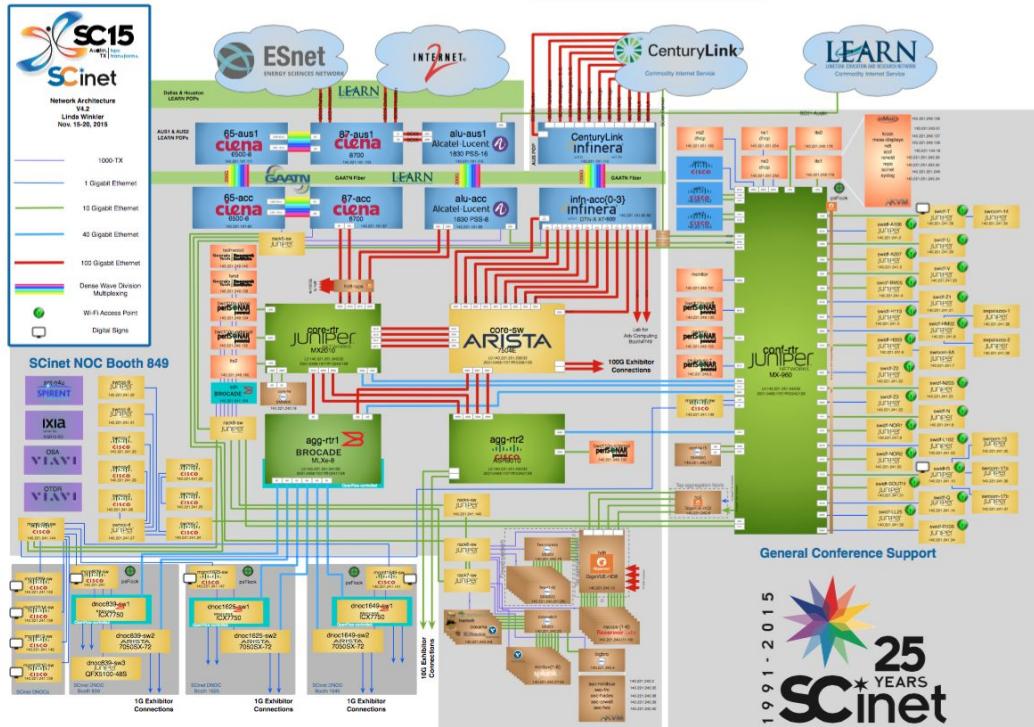
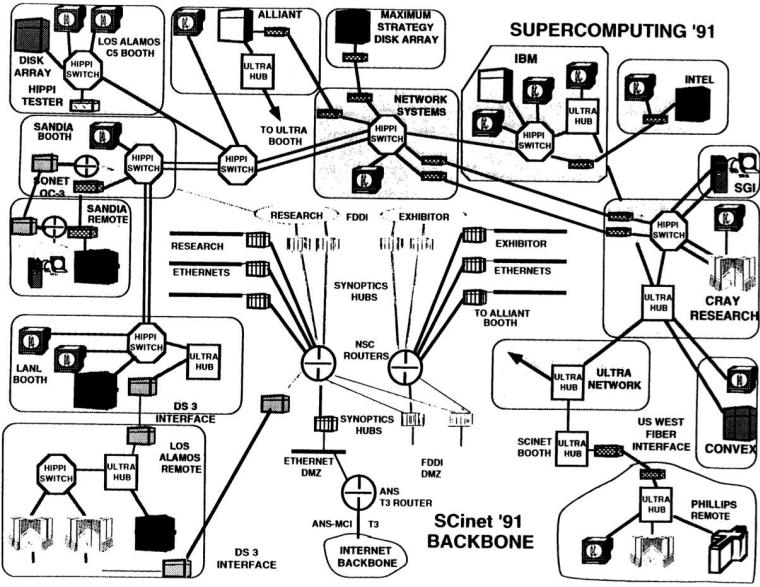
- SC15 was once again host of one of the most powerful and advanced networks in the world - SCinet: a network best described with a simple mantra:
 - **1 Year** to design
 - **1 Month** to build
 - **1 Week** to operate
 - **1 Day** to teardown
- SCinet brings to life a very high-capacity network that 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



got bandwidth?



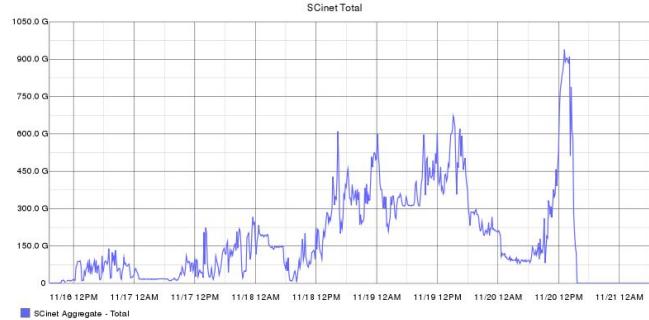
25 Years of Experience



1991 - 2015
25 YEARS
SCinet

SCinet - The Fastest Network Connecting the Fastest Computers

- Statistics:
 - **89 miles** of optical fiber in the Austin Convention Center
 - **1.63 Terabit per second** of available bandwidth
 - **\$22 million** in vendor loaned equipment
 - Supported a peak of over **6000 wireless clients**
 - **130 total volunteers**, spanning **15 countries**, and **68 organizations***
- These volunteers are distributed across 19 teams that are each focused on one unique area of the overall network implementation



*Want to be involved? info@scinet.supercomputing.org

Panel discussion

- What were your goals when you started as a participant on SCinet and were those goals met?
- What were your duties as a participant of SCinet?
- As a candidate, what were the benefits and/or drawbacks of participating in SCinet?
- Overall, did you find your participation in SCinet valuable to your career, goals, or professional network? Why or why not?
- Would you like to participate in SCinet again? Why or why not?
- Would you recommend the WINS program to other women professionals to participate in the future?
- How valuable do you think this experience was for you as a participant?

Discussion and Questions



SCinet Experience - Meg

- Mentors for Wireless Team: Matt Smith (NOAA-Boulder) and Mark Mitchell
- Goals: When I first arrived my goals were to be helpful and learn as much as I could
- Duties:
 - Interact with other networking groups to solve cross team issues
 - bittorrenting
 - Deploy wireless solutions such as Tripods
 - Trouble Zones
 - Hunt Rogue access points
 - Monitor and tweak wireless network as needed
 - Learn as much as possible

SCinet Experience - Meg

- Benefits:
 - This experience made me realize I am not alone
 - **Being able to meet other women in networking specifically**
 - Confidence level where it should be.
 - SCinet is instrumental to building a professional network
 - **Your organization benefits, being around others in the industry and learning from them**
 - Before this I knew maybe 15 people involved with networking.
 - The benefits of this opportunity are ongoing and still revealing themselves

SCinet Experience - Meg

- Would you participate in SCinet again
 - Yes, just for the learning environment alone is worth participating. Everyone who teach others.
 - Also the opportunity to build your professional network is extremely valuable.
- Would you recommend SCinet and WINS to others
 - Yes, definitely!

SCinet Experience – Sana (CENIC)

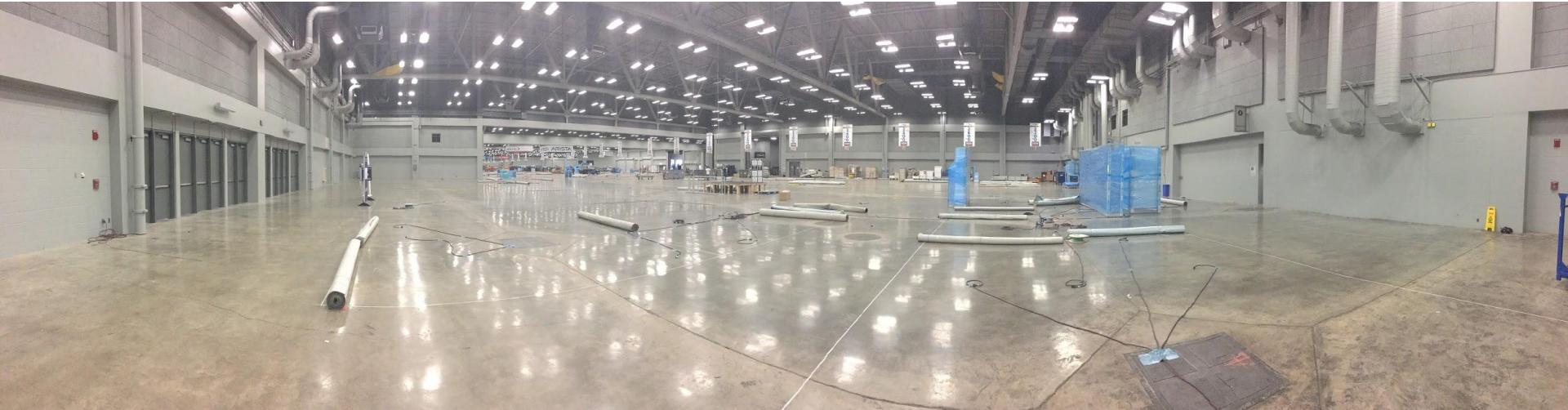
- Mentor for Performance Measurement team: Jason Zurawski
- Goals:
 - Exposure to the different phases of setting up and operating a large networking conference.
 - As one of the lead engineers for Cenic's 100GE optical deployments, I had strong interest in having more exposure to HPC applications and demos requiring connectivity at 100Gbps.

SCinet Experience – Sana (cont.)

- Duties at SCinet:
 - Assist with the configuration of the SC15 performance measurement dashboard.
 - Assist with the configuration of monitoring tools that report on performance to the SC15 show floor from various US sites, from Asia and from Europe.
 - Provide support for performance related issues
 - Assist with various setup activities: setting up displays, Go Pro cameras, cabling...

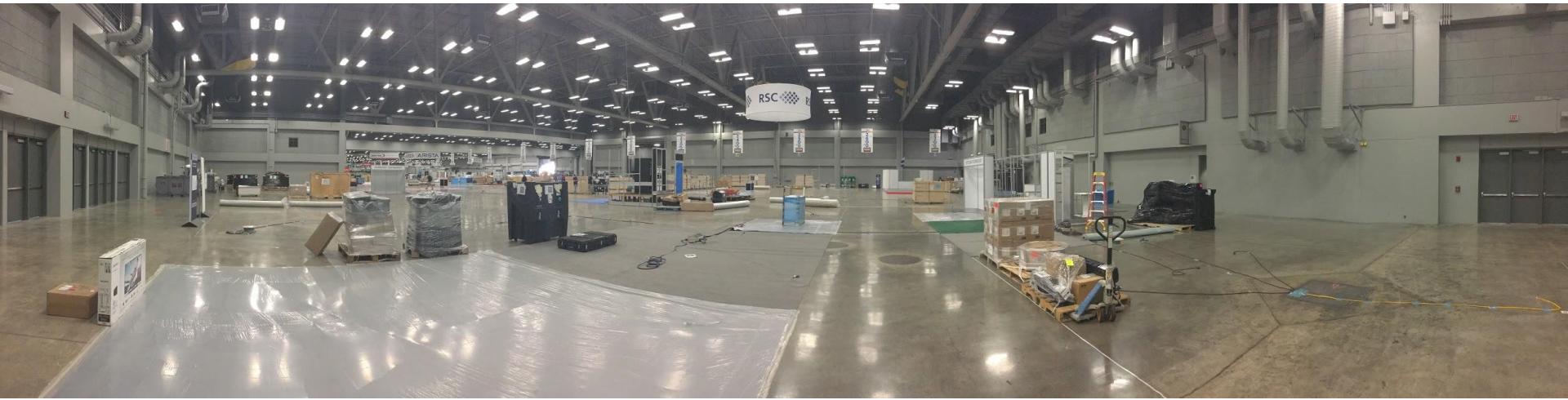
SCinet Experience – Sana (cont.)

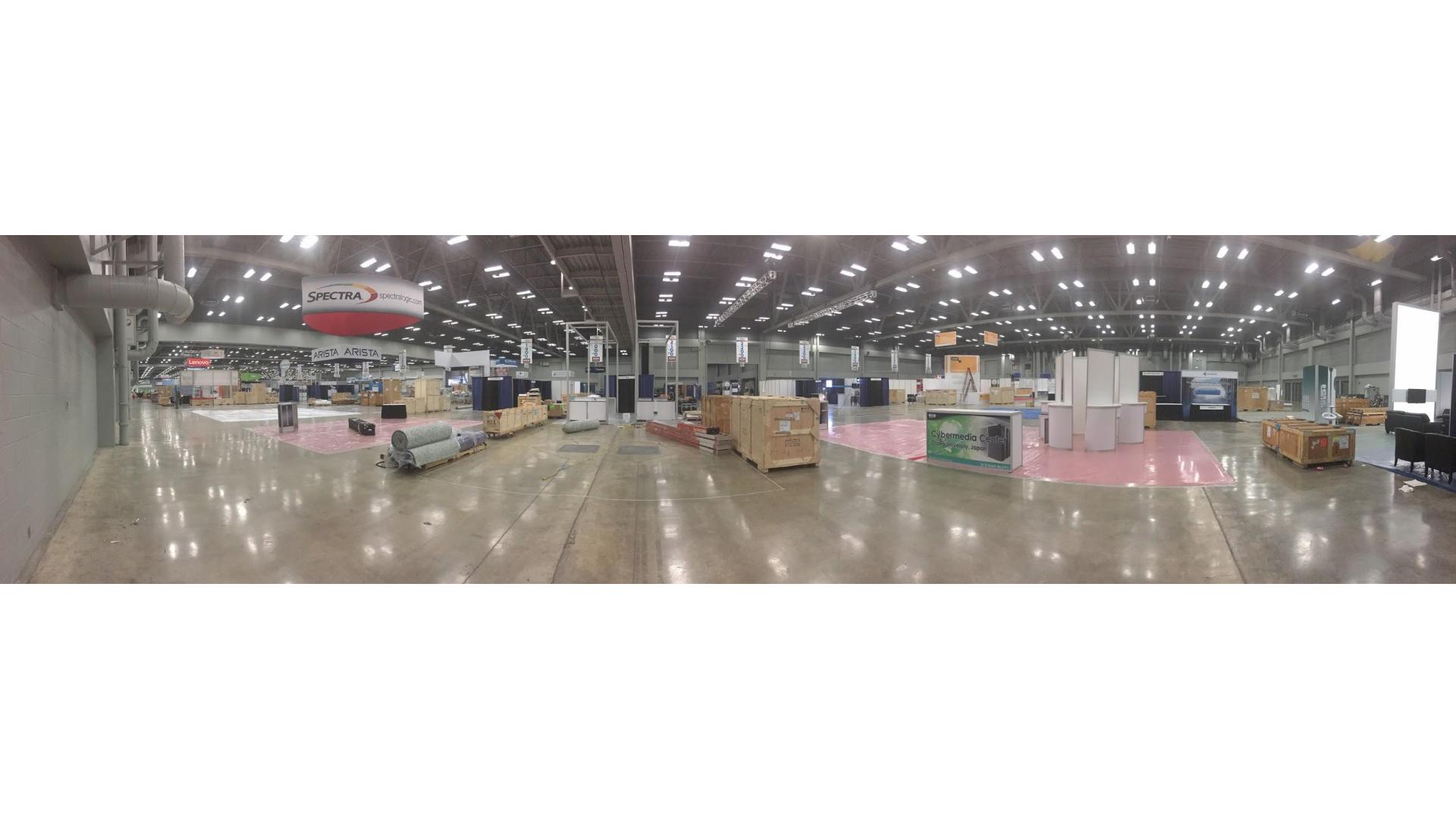
- Benefits:
 - Networking: great opportunity for expanding professional contacts. The ‘SCinet ladies’ are now technical colleagues and friends (Thank you WINS!).
 - Great opportunity for technical collaboration and for learning how to efficiently interact with multiple groups in a fast paced environment.
 - Exposure to monitoring and reporting tools successfully deployed and tested in HPC environments. Can these tools be used at CENIC?
 - I will gladly participate again.











Cybermedia Center
Osaka University, Japan
N1-14 Booth No. 1102



