The OneOklahoma Cyberinfrastructure Initiative

Henry Neeman, University of Oklahoma
Assistant Vice President, Information Technology – Research Strategy Advisor
Director, OU Supercomputing Center for Education & Research (OSCER)
Associate Professor, College of Engineering
Adjunct Faculty, School of Computer Science

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People
Things
Thanks for your attention!

Questions?
www.oscer.ou.edu
OneOK Cyberinfrastructure Initiative

- All non-commercial institutions and organizations in Oklahoma are eligible to sign up to use centrally-owned Cyberinfrastructure (CI) resources at:
  - U Oklahoma (OU)
  - Oklahoma State U (OSU)
  - Langston U – OK’s only Historically Black University
  - Tandy Supercomputing Center – part of a 501(c)3 in Tulsa
- 8 types of service originally, now 10

OneOCII Service Methods Part 1

**Access (A):** for all non-commercial users, to centrally owned research CI (20 OK academic institutions to date).
- **Supercomputers** totaling 200+ TFLOPs at OU, OSU, Langston U (HBCU), Tandy Supercomputing Center (501c3)
- **Oklahoma PetaStore @ OU:** archival storage – pay for tape cartridges and disk drives only, no usage charges

**Dissemination (D):** Oklahoma Supercomputing Symposium – annual advanced computing conference: over 3000 attendees:
- 106 academic institutions in 27 US states & territories including 70 institutions in 14 EPSCoR jurisdictions, among them 25 institutions in OK
- 129 private companies, 36 govt agencies, 19 other organizations
OneOCII Service Methods Part 2

- **Education (E):** “Supercomputing in Plain English” (SiPE) workshop series: 11 talks about advanced computing, taught with stories, analogies and play rather than deep technical jargon. Have reached 248 institutions (academic, government, industry, nonprofit) in 47 US states and territories and 10 other countries (14 OK academic institutions to date) – *coming again in Spring 2015!*

- **Outreach (O):** “Supercomputing in Plain English” (SiPE) overview talk (24 OK academic).

- **Proposal Support (P):** Letters of commitment for access to OneOCII resources; collaborations with OneOCII lead institutions (4 OK academic, 1 nongovernmental).
OneOCII Service Methods Part 3

- **Faculty Development (F):** Workshops held at OU and OSU on advanced computing and computational science topics, sponsored by the National Computational Science Institute, the SC supercomputing conference series, the Linux Clusters Institute, the Virtual School for Computational Science & Engineering. Oklahoma is the only state to have hosted multiple events sponsored by each of these (18 OK academic).


- **Technology (T):** Got or helped get technology (e.g., network upgrade, mini-supercomputer, hi def video camera for telepresence) for that institution (14 OK academic).
OneOCII Service Methods Part 4

- **Workforce Development (W)** – (36 OK academic)
  - Oklahoma Information Technology Mentorship Program (OITMP)
  - “A Day in the Life of an IT Professional” presentations to courses across the full spectrum of higher education.
  - Job shadowing opportunities and direct mentoring of individual students.
  - Institution Types: high schools (2), career techs (11), community colleges (7), regional universities (13), PhD-granting universities (3)

- Special effort to reach underrepresented populations: underrepresented minorities, non-PhD-granting, rural
  - Includes 1 HBCU, 4 NASNIs
OneOCII Service Methods: NEW!

- NEW! Informatics: Full time professionals available to embed in research projects to advance the data- and/or computing-intensive aspects (2 OK academic to date).
- NEW! Research Data Stewardship: Institutional repository; workshops led by library professionals (2 held already).
- EXPANDED: Resources now include:
  - OU Research Cloud
  - Hadoop cluster (being deployed)
- EXPANDED: Oklahoma STEM Mentorship Program
OneOCII Institution Profile

To date, OneOCII has served 98 Oklahoma institutions, agencies and organizations:

- 50 OK academic
- 48 OK non-academic
OneOCII Institution Profile

To date, OneOCII has served 98 Oklahoma institutions, agencies and organizations:

- 50 OK academic
  - Universities & Colleges
    - 3 comprehensive PhD-granting
    - 21 regional non-PhD-granting
  - Community Colleges: 10
  - Career techs: 11
  - Secondary schools: 3
  - Public school systems: 2
- 48 OK non-academic
To date, OneOCII has served:

- 50 OK academic
- 9 Minority Serving Institutions:
  - Oklahoma’s only Historically Black University: Langston U
  - Native American Serving Non-tribal Institutions
    - East Central U (Ada)
    - Northeastern Oklahoma A&M College (Miami)
    - Northeastern State U (Tahlequah)
    - Southeastern Oklahoma State U (Durant)
  - Tribal Colleges
    - College of the Muscogee Nation (Okmulgee)
    - Comanche Nation College (Lawton)
    - Pawnee Nation College (Pawnee)
- Other Minority Serving Institution
  - Bacone College (Muskogee)
- 48 OK non-academic
OneOCII Institution Profile

To date, OneOCII has served 98 Oklahoma institutions, agencies and organizations:

- 50 OK academic
  - 8 Minority Serving Institutions
  - 15 other institutions with above state and national average for one or more underrepresented minorities
- 48 OK non-academic
OneOCII Institution Profile

To date, OneOCII has served 98 Oklahoma institutions, agencies and organizations:

- 50 OK academic institutions
- 48 OK non-academic organizations
  - 16 commercial
  - 19 government
  - 2 military
  - 11 non-governmental
OneOCII Academic Institutions

1. Bacon College (MSI, 30.9% AI, 24.0% AA): T
2. Cameron U (8.1% AI, 15.4% AA):
   A, D, E, F, O, T, W
   Teaching advanced computing course using OSCER’s supercomputer.
3. Canadian Valley Tech Center: W
4. College of the Muscogee Nation (Tribal): O, T
5. Comanche Nation College (Tribal): D, O, T
6. DeVry U Oklahoma City: D, F, O
7. East Central U (NASNI, 20.4% AI, rural):
   A, D, E, F, O, P, T, W
   Taught advanced computing course using OSCER’s supercomputer.
8. Eastern Oklahoma State College (24.5% AI): W
   Average: ~3 (mean 3.4, median 3, mode 1)

9. Eastern Oklahoma County Tech Center (10.4% AI): W
10. Elgin Middle School: O (tour only)
11. Francis Tuttle Tech Center: D, W
12. Gordon Cooper Tech Center (18.5% AI, nonmetro): D, O, W
13. Great Plains Tech Center (11.7% AI): T, W
14. Kiamichi Tech Center (18.6% AI): W
15. Langston U (HBCU, 82.8% AA):
    A, D, E, F, O, P, T, W
    NSF Major Research Instrumentation grant for supercomputer awarded in 2012.

Note: Langston U (HBCU) and East Central U (NASNI) are the only two non-PhD-granting institutions to have benefited from every category of service that OneOCII provides.

AA = African American (7.4% OK population, 12.6% US population)
AI = American Indian (8.6% OK, 0.9% US)
H = Hispanic (8.9% OK, 16.3% US)
ALL = 24.9% OK, 29.8% US
HBCU: Historically Black College or University
NASNI = Native American Serving Non-Tribal Institution
MSI = Minority Serving Institution

OneOCII
NSF EPSCoR Nat'l Conf 2013
16. Lawton Christian School (high school): W
17. Metro Tech Centers (30.6% AA): D
18. Mid-America Tech Center (23.5% AI): D, T, W
19. Mid-Del Public Schools: D
20. Moore Norman Tech Center: D
21. Northeast Tech Center (20.9% AI): W
22. Northeastern Oklahoma A&M College (NASNI, 20.1% AI): W
23. Northeastern State U (NASNI, 28.3% AI, nonmetro): A, D, E, F, O, T, W
   Taught computational chemistry course using OSCER’s supercomputer.
25. Oklahoma Baptist U (nonmetro): A, D, E, F, O, W
26. Oklahoma Christian U: W
27. Oklahoma City U: A, D, E, F, O, T, W
   Educational Alliance for a Parallel Future mini-supercomputer proposal funded in 2011.
   Teaching advanced computing course using OSCER’s supercomputer (several times).
28. Oklahoma City Community College: O, W
29. Oklahoma Panhandle State U (rural, 15.4% H): A, D, O, W
30. Oklahoma School of Science & Mathematics (high school): A, D, E, O, W
31. Oklahoma State U (PhD, 8.3% AI): A, D, E, F, O, T, W
   NSF Major Research Instrumentation proposal for supercomputer funded in 2011.
32. Oklahoma State U Institute of Technology (Comm College, 24.2% AI): W
   Average: ~3 (mean 3.4, median 3, mode 1)

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H = Hispanic (8.9% OK, 16.3% US)
ALL = 24.9% OK, 29.8% US

HBCU: Historically Black College or University
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OneOCII
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OneOCII Academic (cont’d)

33. Oklahoma State U OKC (Comm College): O, W
34. Oral Roberts U: A, F, O, W
35. Panola Public Schools: D
36. Pawnee Nation College (Tribal): T
37. Pontotoc Tech Center (30.4% AI): W
38. Rogers State U (13.9% AI): A, D, F, O
39. Rose State College (17.4% AA): W
40. St. Gregory’s U (nonmetro): A, D, E, F, O
41. Southeastern Oklahoma State U (NASNI, 29.6% AI, nonmetro): A, D, E, F, O, T, W

Educational Alliance for a Parallel Future mini-supercomputer grant funded in 2011.

42. Southern Nazarene U: A, D, F, O, P, T, W

Teaching computational chemistry course using OSCER’s supercomputer.

43. Southern Tech Center (9.1% AI): W
44. Southwestern Oklahoma State U (rural): A, D, E, F, O
45. Tulsa Community College: W
46. U Central Oklahoma: A, D, E, F, O, W

NSF Major Research Instrumentation proposal for supercomputer submitted in 2011-12.

47. U Oklahoma (PhD): A, D, E, F, O, P, T, W

NSF Major Research Instrumentation proposal for large scale storage funded in 2010.

48. U Phoenix: D
49. U of Science & Arts of Oklahoma (14.1% AI): A, O
50. U Tulsa (PhD): A, D, E, F, O

Taught bioinformatics course using OSCER’s supercomputer.

Average: ~3 (mean 3.4, median 3, mode 1)

AA = African American (7.4% OK population, 12.6% US population)
AI = American Indian (8.6% OK, 0.9% US)
H = Hispanic (8.9% OK, 16.3% US)
ALL = 24.9% OK, 29.8% US

HBCU: Historically Black College or University
NASNI = Native American Serving Non-Tribal Institution
MSI = Minority Serving Institution
### OneOCII Non-academic

**Commercial (16)**

1. Andon Corp : D, F  
2. Chesapeake Energy Corp : D  
3. Creative Consultants : D  
4. Fusion Geophysical: D  
5. Indus Corp: D, E  
6. Information Technologic: D  
7. KANresearch: D  
8. KeyBridge Technologies: D  
9. Lumenate: D  
10. OGE Energy Corp: D  
11. Perfect Order (now defunct): D  
12. PowerJam Production Inc: D  
13. Versatile: D  
14. Visage Production Inc: D, E  
15. Weather Decision Technologies Inc : A  
16. Weathernews Americas Inc.: A, D

**Government (19)**

1. City of Duncan: D  
2. City of Edmond: D  
3. City of Nichols Hills: D  
4. City of Tulsa: E  
5. NOAA National Severe Storms Laboratory: A, D, E, F  
6. NOAA Storm Prediction Center: D  
7. NOAA National Weather Service: D  
8. NOAA Radar Operations Center: D  
9. OK Climatological Survey: D  
10. OK Department of Health: D, E  
11. OK Department of Human Services: D, E  
12. OK Department of Libraries: D  
13. OK Department of Mental Health and Substance Abuse Services: D  
14. OK Office of State Finance: D  
15. Oklahoma State Chamber of Commerce: D  
16. OK State Regents for Higher Education: A, D  
17. OK State Supreme Court: D  
18. OK Tax Commission: D  
19. Tulsa County Court Services: D
OneOCII Non-academic (cont’d)

- Military (2)
  1. Fort Sill Army Base: E
  2. Tinker Air Force Base: A, D, E, F, O

- Non-governmental/non-profit (11)
  1. American Society of Mechanical Engineers, Oklahoma City chapter: O
  2. Engineering Club of Oklahoma City: O
  3. Lions Club of Norman OK: O
  4. Lions Club of Shawnee OK: O
  5. Norman Science Café: O
  6. Oklahoma EPSCoR: D
  7. Oklahoma Historical Society: D
  8. Oklahoma Innovation Institute: D
  9. Oklahoma Medical Research Foundation: A, D, P
  10. Oklahoma Nanotechnology Initiative: D
  11. Samuel Noble Roberts Foundation (rural): A, D, E, F, T
OneOCII Outcomes: Research

- At OU Norman, since OSCER was founded it has facilitated over 1/7 of all research funding, with a Return on Investment of better than 7-to-1.
  - External research funding to OK institutions facilitated by OneOCII lead institutions (Fall 2001- Fall 2013): over $170M
  - Funded projects facilitated: over 250
  - OK faculty and staff: over 130 in ~20 academic disciplines
- Publications facilitated: over 1000
OneOCII Outcomes: Research

Specifically needed OneOCII just to be funded: **over $41M**
(OneOCII was necessary but far from sufficient.)

- NSF EPSCoR RII Track-1 (2008-13): $15M to OK
- NSF EPSCoR RII Track-2 (2009-13): $3M to OK + $3M to KS
- NSF EPSCoR RII C2 (2010-13): $1.17M to OK
- NSF MRI @ OU (2010-14): $793K
- NSF MRI @ OSU (2011-14): $908K
- NSF MRI @ Langston U (2012-15): $250K
OneOCII Outcomes: Teaching

Teaching: 7 + 1 institutions including 2 MSIs

- Teaching/taught parallel computing using OSCER resources:
  - Cameron U
  - East Central U (NASNI)
  - Oklahoma City U
- Taught parallel computing via LittleFe baby supercomputer:
  - Southeastern Oklahoma State U (NASNI)
- Taught computational chemistry using OSCER resources:
  - Northeastern State U (NASNI)
  - Southern Nazarene U
  - Rogers State U

OneOCII Outcomes: Resources

6 institutions including 2 MSIs, plus C2 institutions

- NSF Major Research Instrumentation grants: $1.95M
  - OU: Oklahoma PetaStore, $793K (in production)
  - Oklahoma State U: Cowboy cluster, $909K (in production)
  - Langston U: cluster, $250K (to be acquired)

- LittleFe baby supercomputer grants ($2500 each)
  - OU: Ron Barnes
  - Oklahoma City U: Larry Sells & John Goulden
  - Southeastern Oklahoma State U: Mike Morris & Karl Frinkle

- Networking: C2 grant: $1.17M
OneOCII Outcomes: C2 Grant

- NSF EPSCoR RII C2 networking grant: $1.17M
- Major upgrades to:
  - Statewide ring
  - OU, OSU, TU, Langston U, Noble Foundation
- Smaller upgrades to:
  - College of the Muscogee Nation
  - Bacone College
  - Pawnee Nation College
  - Comanche Nation College
- Oklahoma IT Mentorship Program: 35 institutions served
  - 3 PhD-granting, 13 regional colleges/universities
  - 7 community colleges, 10 career techs, 2 high schools
- NEW! Follow-on NSF CC-NIE networking grant
Thanks for your attention!

Questions?
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