National Science Foundation
National Institutes of Health

Part 2: Computing and Networking Capacity
(for research and instructional activities)

FY 2007 Survey of Science and Engineering Research Facilities

Who should be contacted if clarification of Part 2 answers is necessary?

Name:_____

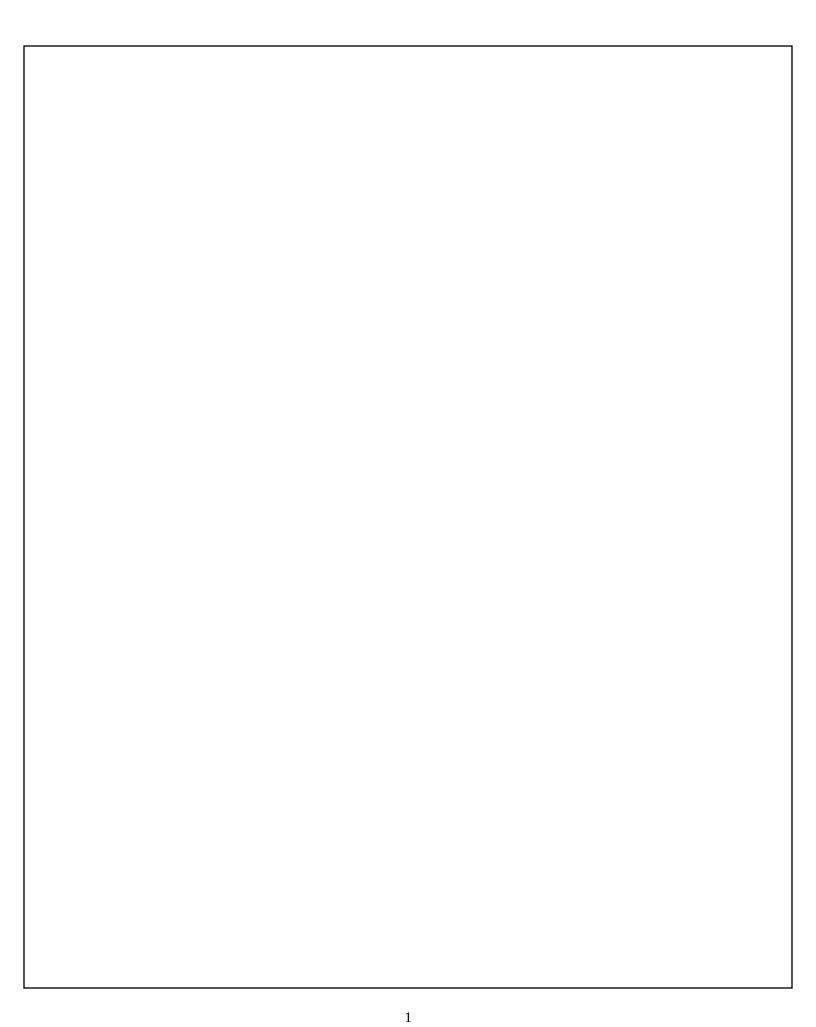Telephone:_____

Title/position:_____

E-mail address:_____

Please complete the questionnaire and submit it according to the arrangements you made with your institutional coordinator named in the label above. You may complete this questionnaire online at www.facilitiessurvey.org. You will need to click on "Part 2" and then enter the survey ID and password printed on the label above.

If you have a question, please contact *[name]* of *[contractor]* via e-mail at *[email address]* or call *[toll-free number.]* The survey director at the National Science Foundation is Dr. Leslie Christovich.

If you do not have exact figures for any part of this questionnaire, please provide estimates.

Thank you for your participation.

OMB #3145-0101

Question 1: Commodity internet (Internet1) and Abilene (Internet2) total bandwidth

1. At the end of your FY 2007, what was your institution's *total* bandwidth to the commodity internet (Internet1) and Abilene (Internet2)? What is your estimate of the total for your institution at the end of your FY 2008?

    Bandwidth is the amount of data that can be transmitted in a given amount of time, measured in bits per second.

    Commodity internet (Internet1) is the general public, multiuse network often called the "Internet."

    Abilene (Internet2) is a high performance backbone network managed by the Internet2 consortium of academia, industry, and government. The purpose of Internet2 is to develop and deploy advanced network applications and technologies.

    Please do __not__ include:

    - Redundant connections, which are not normally active but available if a failure occurs with the active connection;
    - Burstable bandwidth;
    - Standard modems (57,600 bps or slower);
    - DSL (Digital Subscriber Lines), communication over copper wires;
    - Cable modems;
    - ISDN (Integrated Services Digital Network), a communications standard for sending voice, video, and data over telephone lines.

    Please include networking capacity for research, instruction, and residence halls.

Total bandwidth

(Mark one "X" for each column.)

Speed	At end of FY 2007	Estimated at end of FY 2008
a. *No bandwidth to EITHER commodity internet (Internet1) OR Abilene (Internet2)*	☐	☐
b. Less than 1.6 megabits/second	☐	☐
c. 1.6 to 9 megabits/second	☐	☐
d. 10 megabits/second	☐	☐
e. 11 to 45 megabits/second	☐	☐
f. 46 to 99 megabits/second	☐	☐
g. 100 megabits/second	☐	☐
h. 101 to 155 megabits/second	☐	☐
i. 156 to 622 megabits/second	☐	☐
j. 623 to 999 megabits/second	☐	☐
k. 1 to 2.4 gigabits/second	☐	☐
l. 2.5 to 9 gigabits/second	☐	☐
m. 10 gigabits/second	☐	☐
n. More than 10 gigabits/second	☐	☐
o. Other *(Please specify.)*	☐	☐

_____

_____

Question 2: Abilene (Internet2) bandwidth

Questions 2-11 include networking capacity for: research, instruction, and residence halls.

2. At the end of your FY 2007, what was your institution's bandwidth to Abilene (Internet2)? What is your estimate of the bandwidth to Abilene at the end of your FY 2008?

Bandwidth is the amount of data that can be transmitted in a given amount of time, measured in bits per second.

Abilene (Internet2) is a high performance backbone network managed by the Internet2 consortium of academia, industry, and government. The purpose of Internet2 is to develop and deploy advanced network applications and technologies.

Please do __not__ include redundant connections. A redundant connection is not normally active but is available if a failure occurs with the active connection.

Bandwidth for Abilene

(Mark one "X" for each column.)

Speed	At end of FY 2007	Estimated at end of FY 2008
a. *No bandwidth to Abilene (Internet2)*	☐	☐
b. Less than 1.6 megabits/second	☐	☐
c. 1.6 to 9 megabits/second	☐	☐
d. 10 megabits/second	☐	☐
e. 11 to 45 megabits/second	☐	☐
f. 46 to 99 megabits/second	☐	☐
g. 100 megabits/second	☐	☐
h. 101 to 155 megabits/second	☐	☐
i. 156 to 622 megabits/second	☐	☐
j. 623 to 999 megabits/second	☐	☐
k. 1 to 2.4 gigabits/second	☐	☐
l. 2.5 to 9 gigabits/second	☐	☐
m. 10 gigabits/second	☐	☐
n. More than 10 gigabits/second	☐	☐
o. Other *(Please specify.)*	☐	☐

_____

_____

Question 3: Commodity internet (Internet1) bandwidth

3. At the end of your FY 2007, what was your institution's bandwidth to the commodity internet (Internet1)? What is your estimate of the bandwidth to the commodity internet at the end of your FY 2008?

Bandwidth is the amount of data that can be transmitted in a given amount of time, measured in bits per second.

Commodity internet (Internet1) is the general public, multiuse network often called the "Internet."

Please do not include:

- Redundant connections, which are not normally active but available if a failure occurs with the active connection;
- Burstable bandwidth;
- Standard modems (57,600 bps or slower);
- DSL (Digital Subscriber Lines), communication over copper wires;
- Cable modems;
- ISDN (Integrated Services Digital Network), a communications standard for sending voice, video, and data over telephone lines.

Bandwidth for commodity internet

(Mark one "X" for each column.)

Speed	At end of FY 2007	Estimated at end of FY 2008
a. *No bandwidth to commodity internet (Internet1)*	☐	☐
b. Less than 1.6 megabits/second	☐	☐
c. 1.6 to 9 megabits/second	☐	☐
d. 10 megabits/second	☐	☐
e. 11 to 45 megabits/second	☐	☐
f. 46 to 99 megabits/second	☐	☐
g. 100 megabits/second	☐	☐
h. 101 to 155 megabits/second	☐	☐
i. 156 to 622 megabits/second	☐	☐
j. 623 to 999 megabits/second	☐	☐
k. 1 to 2.4 gigabits/second	☐	☐
l. 2.5 to 9 gigabits/second	☐	☐
m. 10 gigabits/second	☐	☐
n. More than 10 gigabits/second	☐	☐
o. Other *(Please specify.)*	☐	☐

_____

_____

4

Question 4: Commodity internet (Internet1) connections

4. At the end of your FY 2007, how many lines did your institution have to the commodity internet (Internet1) at each of the connection speeds listed below? Please estimate this information for your FY 2008.

Commodity internet (Internet1) is the general public, multiuse network often called the "Internet."

If your institution has bonded lines, please report the speed of the bonded lines together and count as one line. For example, if your institution has two T1 lines joined to act as a single line, report the speed as 3 megabits/second.

Please do not include:

- Redundant connections, which are not normally active but available if a failure occurs with the active connection;
- Burstable bandwidth;
- Standard modems (57,600 bps or slower);
- DSL (Digital Subscriber Lines), communication over copper wires;
- Cable modems;
- ISDN (Integrated Services Digital Network), a communications standard for sending voice, video, and data over telephone lines.

Number of lines

Connection speed	At end of FY 2007	Estimated at end of FY 2008
a. *No bandwidth to commodity internet (Internet1)*...............	☐	☐
b. Less than 1.6 megabits/second....................................	_____	_____
c. 1.6 to 9 megabits/second..	_____	_____
d. 10 megabits/second..	_____	_____
e. 11 to 45 megabits/second...	_____	_____
f. 46 to 99 megabits/second...	_____	_____
g. 100 megabits/second..	_____	_____
h. 101 to 155 megabits/second.....................................	_____	_____
i. 156 to 622 megabits/second.....................................	_____	_____
j. 623 to 999 megabits/second.....................................	_____	_____
k. 1 to 2.4 gigabits/second..	_____	_____
l. 2.5 to 9 gigabits/second..	_____	_____
m. 10 gigabits/second...	_____	_____
n. More than 10 gigabits/second...................................	_____	_____
o. Other *(Please specify.)*...	_____	_____
_____		
_____		

5

Question 5: Bandwidth from consortia

5. At the end of your FY 2007, did any of your institution's bandwidth come from a consortium? Do you expect to obtain bandwidth from a consortium at the end of your FY 2008?

A **consortium** is a collaboration of any combination of educational institutions (e.g., university system, K-12), state and local agencies, network infrastructure operators (e.g., Internet2), vendors, health care organizations, or non-profit organizations with the purpose of coordinating and facilitating networking activities.

Bandwidth is the amount of data that can be transmitted in a given amount of time, measured in bits per second.

(Mark one "X" for each row.)

Fiscal year	Yes	No
a. Bandwidth from consortia at the end of FY 2007.....................	☐	☐
b. Bandwidth from consortia at the end of FY 2008....................	☐	☐

Please provide the names of all consortia from which you expect to obtain bandwidth at the end of your FY 2008.

_____

_____

_____

_____

Question 6: High performance network connections

6. At the end of your FY 2007, did your institution have connections to the following high performance networks? Do you expect to have connections to any of these networks at the end of your FY 2008?

A **high performance network** is characterized by high bandwidth, low latency, and low rates of packet loss. Additionally, a high performance network is able to support delay-sensitive, bandwidth-intensive applications such as distributed computing, real-time access, and control of remote instrumentation.

Abilene (Internet2) is a high performance backbone network managed by the Internet2 consortium of academia, industry, and government. The purpose of Internet2 is to develop and deploy advanced network applications and technologies.

National LambdaRail is an initiative of research universities and technology companies to provide a national infrastructure for research and experimentation in networking technologies and applications.

ESnet is the Department of Energy's Energy Sciences Network.

NREN is the NASA Research and Education Network.

(Mark one "X" for each row.)

At the end of FY 2007	Yes	No
a. Abilene	☐	☐
b. National LambdaRail	☐	☐
c. Federal government research network (e.g., Department of Energy ESnet, NASA NREN)	☐	☐
d. State or regional high performance network	☐	☐
e. Other *(Please specify.)*	☐	☐

_____

_____

Estimated at the end of FY 2008	Yes	No
f. Abilene	☐	☐
g. National LambdaRail	☐	☐
h. Federal government research network (e.g., Department of Energy ESnet, NASA NREN)	☐	☐
i. State or regional high performance network	☐	☐
j. Other *(Please specify.)*	☐	☐

_____

_____

Question 7: Desktop port connections

7. At the end of your FY 2007, what percentage of your institution's desktop ports had hardwire connections at each of the speeds listed below? What percentage do you estimate will be at these speeds at the end of your FY 2008? If your answer is between 0 and 1 percent, please round to 1 percent.

Please report on the *capacity of the ports themselves* and not the speed of the workstations connected to them. Also, *do __not__ include servers* when determining your responses.

Percentage of desktop ports

Speed of connection	At end of FY 2007	Estimated at end of FY 2008
a. 10 megabits/second or less	_____%	_____%
b. 100 megabits/second	_____%	_____%
c. 1 gigabit/second or more	_____%	_____%
d. Other *(Please specify.)*	_____%	_____%
_____		
Total	**100%**	**100%**

Question 8: Type of cable for desktop ports

8. At the end of your FY 2007, what percentage of your institution's desktop ports were connected to your institution's network by the following types of cable? What percentages do you estimate at the end of your FY 2008? If your answer is between 0 and 1 percent, please round to 1 percent.

Please *do __not__ include servers* when determining your responses.

Percentage of desktop ports

Type of cable	At end of FY 2007	Estimated at end of FY 2008
a. Unrated	_____%	_____%
b. Category 3	_____%	_____%
c. Category 5	_____%	_____%
d. Category 5e	_____%	_____%
e. Category 6	_____%	_____%
f. Other *(Please specify.)*	_____%	_____%
_____		
Total	**100%**	**100%**

Question 9: Dark fiber

9. At the end of your FY 2007, did your institution own any dark fiber to your institution's internet service provider (ISP) or between your institution's buildings? Do you plan to acquire any dark fiber to your ISP or between your institution's buildings during your FY 2008?

   Dark fiber is fiber-optic cable that has already been laid but is not being used. Include only fiber that was dark (i.e., unlit) when it was purchased by your institution.

   (Mark one "X" for each row.)

   Owned at the end of FY 2007   Yes   No

   a. To your institution's ISP... ☐   ☐

   b. Between your institution's buildings... ☐   ☐

   To be acquired during FY 2008   Yes   No

   c. To your institution's ISP... ☐   ☐

   d. Between your institution's buildings... ☐   ☐

Question 10: Speed on your network

10. At the end of your FY 2007, what was the *distribution speed* (or backbone speed) that a desktop computer on your network could connect to another computer *on your institution's network*? What distribution speed will your institution have at the end of your FY 2008?

(Mark one "X" for each column.)

Speed	At end of FY 2007	Estimated at end of FY 2008
a. Less than 1.6 megabits/second	☐	☐
b. 1.6 to 9 megabits/second	☐	☐
c. 10 megabits/second	☐	☐
d. 11 to 45 megabits/second	☐	☐
e. 46 to 99 megabits/second	☐	☐
f. 100 megabits/second	☐	☐
g. 101 to 155 megabits/second	☐	☐
h. 156 to 622 megabits/second	☐	☐
i. 623 to 999 megabits/second	☐	☐
j. 1 to 2.4 gigabits/second	☐	☐
k. 2.5 to 9 gigabits/second	☐	☐
l. 10 gigabits/second	☐	☐
m. More than 10 gigabits/second	☐	☐
n. Other *(Please specify.)*	☐	☐

_____

_____

Question 11: Wireless connections

11. At the end of your FY 2007, what percentage, if any, of your institution's building area was covered by wireless capabilities for network access? What percentage do you estimate will have wireless access at the end of your FY 2008?

Building area refers to the sum of floor by floor calculations of square footage.

Please *do **not** include rogue* wireless access points.

**Wireless coverage
for network access**

(Mark one "X" for each column.)

Percent of building area	At end of FY 2007	Estimated at end of FY 2008
a. None..	☐	☐
b. 1 to 10 percent...	☐	☐
c. 11 to 20 percent...	☐	☐
d. 21 to 30 percent...	☐	☐
e. 31 to 40 percent...	☐	☐
f. 41 to 50 percent...	☐	☐
g. 51 to 60 percent...	☐	☐
h. 61 to 70 percent...	☐	☐
i. 71 to 80 percent...	☐	☐
j. 81 to 90 percent...	☐	☐
k. 91 to 100 percent...	☐	☐

Question 12: Architectures for centrally administered high performance computing (HPC) of 1 teraflop or faster

12. At the end of your FY 2007, did your institution provide centrally administered high performance computing (HPC) of 1 teraflop or faster at peak performance for each type of architecture listed below?

Centrally administered HPC is within a distinct organizational unit with a staff and a budget; the unit has a stated mission that includes supporting the HPC needs of faculty and researchers.

If some of your high performance computing systems are slower than 1 teraflop and some are faster, please report only the systems that are 1 teraflop or faster. For example, if you have 2 clusters of ½ teraflop and 1 cluster of 1 teraflop, report information for the 1 teraflop system. Or, if you have 3 clusters of ½ teraflop each, then you would report that you have no high performance computing with a cluster architecture.

Had at end of FY 2007

(Mark one "X" for each row.)

Centrally administered HPC architectures	Yes	No	Uncertain
a. **Cluster**... This architecture uses multiple commodity systems with an Ethernet based or high performance interconnect network to perform as a single system.	☐	☐	☐
b. **Massively parallel processors (MPP)**................................. This architecture uses multiple processors within a single system with a high performance interconnect network. Each processor uses its own memory and operating system.	☐	☐	☐
c. **Symmetric multiprocessors (SMP)**.................................... This architecture uses multiple processors sharing the same memory and operating system to simultaneously work on individual pieces of a program.	☐	☐	☐
d. **Parallel vector processors (PVP)**....................................... This architecture uses multiple vector processors sharing the same memory and operating system to simultaneously work on individual pieces of a program.	☐	☐	☐
e. **Experimental/Emerging architecture** *(Please describe.)*................. This architecture uses technologies not currently in common use for HPC systems (e.g., an accelerator-based architecture). _____	☐	☐	☐
f. **Special purpose architecture** *(Please describe.)*.............................. This custom-designed architecture uses established technology that supports a special purpose system that is dedicated to a single type of problem. _____	☐	☐	☐
g. **Other architecture** *(Please describe.)*.. _____	☐	☐	☐

Question 13: HPC centrally administered resources

13. In Question 12 (a-g), did you report having any centrally administered HPC of 1 teraflop or faster at the end of your FY 2007?

Yes (Check this box and continue with Question 14)........... ☐

No (Check this box and go to Question 37)......................... ☐

Question 14: Centrally administered clusters of 1 teraflop or faster

14. In Question 12 (a), did you report having any centrally administered *clusters* for HPC at the end of your FY 2007?

Yes (Check this box and continue with Question 15)........... ☐

No (Check this box and go to Question 21)......................... ☐

Question 15: Centrally administered single-core clusters

15. At the end of your FY 2007, how many single-core computing clusters of each size listed below did your institution provide at a speed of 1 teraflop or faster? Include only clusters that are centrally administered.

A computing cluster uses multiple commodity systems with an Ethernet based or high performance interconnect network to perform as a single system.

If your institution did not administer any such clusters, check this box and go to Question 16................................. ☐

	Number of single-core
Size	clusters
a.	128 nodes or less.._____
b.	129 to 512 nodes.._____
c.	513 to 1,024 nodes.._____
d.	1,025 to 2,048 nodes..._____
e.	2,049 or more nodes *(Please specify.)*................._____

_____

Question 16: Centrally administered dual-core clusters

16. At the end of your FY 2007, how many dual-core computing clusters of each size listed below did your institution provide at a speed of 1 teraflop or faster? Include only clusters that are centrally administered.

A computing cluster uses multiple commodity systems with an Ethernet based or high performance interconnect network to perform as a single system.

If your institution did not administer any such clusters, check this box and go to Question 17.................................☐

Size	Number of dual-core clusters
a. 128 nodes or less..	_____
b. 129 to 512 nodes..	_____
c. 513 to 1,024 nodes..	_____
d. 1,025 to 2,048 nodes...	_____
e. 2,049 or more nodes *(Please specify.)*..................	_____

_____

Question 17: Centrally administered quad-core clusters

17. At the end of your FY 2007, how many quad-core computing clusters of each size listed below did your institution provide at a speed of 1 teraflop or faster? Include only clusters that are centrally administered.

A computing cluster uses multiple commodity systems with an Ethernet based or high performance interconnect network to perform as a single system.

If your institution did not administer any such clusters, check this box and go to Question 18.................................☐

Size	Number of quad-core clusters
a. 128 nodes or less..	_____
b. 129 to 512 nodes..	_____
c. 513 to 1,024 nodes..	_____
d. 1,025 to 2,048 nodes...	_____
e. 2,049 or more nodes *(Please specify.)*..................	_____

_____

Question 18: Centrally administered 8-core clusters

18. At the end of your FY 2007, how many 8-core computing clusters of each size listed below did your institution provide at a speed of 1 teraflop or faster? Include only clusters that are centrally administered.

    A computing cluster uses multiple commodity systems with an Ethernet based or high performance interconnect network to perform as a single system.

    If your institution did not administer any such clusters, check this box and go to Question 19.................................☐

Size	Number of 8-core clusters
a. 128 nodes or less..	_____
b. 129 to 512 nodes..	_____
c. 513 to 1,024 nodes..	_____
d. 1,025 to 2,048 nodes...	_____
e. 2,049 or more nodes *(Please specify.)*..................	_____

    _____

Question 19: Clarifications on HPC clusters

19. Please provide any clarifications you may wish to make about your responses to Questions 15 through 18 concerning HPC clusters centrally administered by your institution.

Question 20: Peak performance of clusters of 1 teraflop or faster

20. At the end of your FY 2007, what was the peak theoretical performance of a) your *fastest* computing cluster of 1 teraflop or faster, and b) *all* your computing clusters of 1 teraflop or faster (including the fastest one)? Include only clusters that are centrally administered.

A computing cluster uses multiple commodity systems with an Ethernet based or high performance interconnect network to perform as a single system.

If you have only one cluster that is 1 teraflop or faster, report the same number for rows a and b.

Number of
teraflops

a. Fastest cluster of 1 teraflop or faster...................._____

b. All computing clusters of 1 teraflop or more
(including the fastest cluster)..............................._____

Question 21: Centrally administered MPP systems of 1 teraflop or faster

21. At the end of your FY 2007, how many MPP systems of 1 teraflop or faster did your institution administer? Include only systems that are centrally administered.

Massively parallel processing (MPP) **systems** use multiple processors within a single system with a high performance interconnect network. Each processor uses its own memory and operating system.

If some of your MPP systems for high performance computing are slower than 1 teraflop and some are faster, please report only the systems that are 1 teraflop or faster. For example, if you have one MPP system at ½ teraflop and another at 1½ teraflops, report only the one at 1½ teraflops.

If your institution did not administer any such systems,
check this box and go to Question 23.................................☐

Number of MPP systems of 1 teraflop or faster......................................_____

Question 22: Peak performance of MPP systems of 1 teraflop or faster

22. At the end of your FY 2007, what was the peak theoretical performance of a) your *fastest* MPP system of 1 teraflop or faster, and b) *all* your MPP systems of 1 teraflop or faster (including the fastest one)? Include only systems that are centrally administered.

Massively parallel processing (MPP) **systems** use multiple processors within a single system with a high performance interconnect network. Each processor uses its own memory and operating system.

If you have only one system that is 1 teraflop or faster, report the same number for rows a and b.

Number of
teraflops

a. Fastest MPP system of 1 teraflop or faster..........._____

b. All MPP systems of 1 teraflop or more
(including the fastest system)............................._____

Question 23: Centrally administered SMP systems of 1 teraflop or faster

23. At the end of your FY 2007, how many SMP systems of 1 teraflop or faster did your institution administer? Include only systems that are centrally administered.

    Symmetric multiprocessing (SMP) systems use multiple processors sharing the same memory and operating system to simultaneously work on individual pieces of a program.

    If some of your SMP systems for high performance computing are slower than 1 teraflop and some are faster, please report only the systems that are 1 teraflop or faster. For example, if you have one SMP system at ½ teraflop and another at 1½ teraflops, report only the one at 1½ teraflops.

    <div align="right">

    If your institution did not administer any such systems,
    check this box and go to Question 25................................. ☐

    Number of SMP systems of 1 teraflop or faster...................................._____

    </div>

Question 24: Peak performance of SMP systems of 1 teraflop or faster

24. At the end of your FY 2007, what was the peak theoretical performance of a) your *fastest* SMP system of 1 teraflop or faster, and b) *all* your SMP systems of 1 teraflop or faster (including the fastest one)? Include only systems that are centrally administered.

    Symmetric multiprocessing (SMP) systems use multiple processors sharing the same memory and operating system to simultaneously work on individual pieces of a program.

    If you have only one system that is 1 teraflop or faster, report the same number for rows a and b.

    <div align="center">Number of
teraflops</div>

    a.   Fastest SMP system of 1 teraflop or faster..........._____

    b.   All SMP systems of 1 teraflop or faster
           (including the fastest system)..............................._____

Question 25: Centrally administered PVP systems of 1 teraflop or faster

25. At the end of your FY 2007, how many PVP systems of 1 teraflop or faster did your institution administer? Include only systems that are centrally administered.

    Parallel vector processing (PVP) systems use multiple vector processors sharing the same memory and operating system to simultaneously work on individual pieces of a program.

    If some of your PVP systems for high performance computing are slower than 1 teraflop and some are faster, please report only the systems that are 1 teraflop or faster. For example, if you have one PVP system at ½ teraflop and another at 1½ teraflops, report only the one at 1½ teraflops.

    <div align="right">

    If your institution did not administer any such systems,
    check this box and go to Question 27................................. ☐

    Number of PVP systems of 1 teraflop or faster...................................._____

    </div>

Question 26: Total peak performance of PVP systems of 1 teraflop or faster

26. At the end of your FY 2007, what was the total peak theoretical performance of *all* your PVP systems of 1 teraflop or faster? Include only systems that are centrally administered.

    Parallel vector processing (PVP) systems use multiple vector processors sharing the same memory and operating system to simultaneously work on individual pieces of a program.

    Number of
    teraflops

    All PVP systems of 1 teraflop or faster.........................._____

Question 27: HPC used for administrative functions

27. At the end of your FY 2007, were any of the following HPC architectures used for administrative functions (that is, for the business activities of your institution)?

Used for administrative functions

(Mark one "X" for each row.)

Architectures	Yes	No	Uncertain	Does not apply*
a. Clusters...	☐	☐	☐	☐
b. Massively parallel processors..............................	☐	☐	☐	☐
c. Symmetric multiprocessors.................................	☐	☐	☐	☐
d. Parallel vector processors...................................	☐	☐	☐	☐

   * Does not apply because none of our centrally
      administered HPC has this architecture.

Question 28: Centrally administered experimental/emerging computing systems of 1 teraflop or faster

28. At the end of your FY 2007, how many experimental/emerging computing systems of 1 teraflop or faster did your institution administer? Include only systems that are centrally administered.

    Experimental/Emerging computing systems use technologies not currently in common use for HPC systems (e.g., an accelerator-based architecture).

    If your institution did not administer any such systems,
    check this box and go to Question 29..................................☐

    Number of experimental/emerging computing systems of
    1 teraflop or faster..._____

Question 29: Centrally administered special purpose computing systems of 1 teraflop or faster

29. At the end of your FY 2007, how many special purpose computing systems of 1 teraflop or faster did your institution administer? Include only systems that are centrally administered.

    Special purpose computing systems use a custom-designed architecture using established technology that supports a special purpose system that is dedicated to a single problem.

    If your institution did not administer any such systems,
    check this box and go to Question 30................................. ☐

    Number of special purpose computing systems of 1 teraflop or faster…._____

Question 30: External users of centrally administered HPC

30. During your FY 2007, which types of external users listed below used any of your institution's centrally administered HPC?

	Used HPC during FY 2007 *(Mark one "X" for each row.)*		
Type of external user	Yes	No	Uncertain
a. **Colleges and universities**.. Include public and private academic institutions and systems.	☐	☐	☐
b. **Governments**... Include local, state, and regional jurisdictions.	☐	☐	☐
c. **Non-profit organizations**... Include legal entities chartered to serve the public interest and that are exempt from most federal taxation.	☐	☐	☐
d. **Industry**.. Include for-profit companies, either publicly or privately held.	☐	☐	☐
e. **Other** *(Please describe.)*... _____ _____	☐	☐	☐

Question 31: Usable online storage for centrally administered HPC of 1 teraflop or faster

31. At the end of your FY 2007, what was the total **usable** online storage available for centrally administered HPC?

Usable storage is the amount of space for data storage that is available for use after the space overhead required by file systems and applicable RAID (redundant array of independent disks) configurations is removed.

Online storage includes all storage providing immediate access for files and data from your HPC systems (of at least 1 teraflop). Storage can be either locally available to specific HPC systems or made available via the network. For example, storage may be available via SAN (storage area network) or NAS (network attached storage) environments.

(Mark one "X.")

a. Less than 1 terabyte...☐

b. 1 to 5 terabytes...☐

c. 6 to 10 terabytes...☐

d. 11 to 25 terabytes...☐

e. 26 to 50 terabytes...☐

f. 51 to 100 terabytes..☐

g. 101 to 250 terabytes..☐

h. 251 to 500 terabytes..☐

i. 501 to 1,000 terabytes...☐

j. 1,001 or more terabytes *(Please specify.)*..............................☐

_____

k. Uncertain..☐

Question 32: Usable shared storage for centrally administered HPC of 1 teraflop or faster

32. At the end of your FY 2007, how much of the usable online storage reported in Question 31 was shared storage?

Usable storage is the amount of space for data storage that is available for use after the space overhead required by file systems and applicable RAID (redundant array of independent disks) configurations is removed.

Online storage includes all storage providing immediate access for files and data from your HPC systems (of at least 1 teraflop). Storage can be either locally available to specific HPC systems or made available via the network. For example, storage may be available via SAN (storage area network) or NAS (network attached storage) environments.

Shared storage includes the portion of online storage that is available simultaneously to multiple HPC systems (of at least 1 teraflop) via a network making use of SAN, NAS, file system mounting, or similar technologies.

(Mark one "X.")

a. Less than 1 terabyte.. ☐

b. 1 to 5 terabytes.. ☐

c. 6 to 10 terabytes.. ☐

d. 11 to 25 terabytes.. ☐

e. 26 to 50 terabytes.. ☐

f. 51 to 100 terabytes... ☐

g. 101 to 250 terabytes... ☐

h. 251 to 500 terabytes... ☐

i. 501 to 1,000 terabytes.. ☐

j. 1,001 or more terabytes *(Please specify.)*............................ ☐

_____

k. Uncertain... ☐

Question 33: Usable online storage for HPC available for administrative functions

33. At the end of your FY 2007, was any of the usable online storage reported in Question 31 used for administrative functions (that is, for the business activities of your institution)?

(Mark one "X.")

a. Yes.. ☐

b. No... ☐

c. Uncertain... ☐

Question 34: Archival storage for centrally administered HPC of 1 teraflop or faster

34. At the end of your FY 2007, what was the total archival storage available specifically for centrally administered HPC? *Do not* include backup storage.

    Archival storage is off-line, typically long-term storage for files and data that does not support immediate access from your HPC resources.

    (Mark one "X.")

    a. None...☐

    b. Less than 100 terabytes..☐

    c. 101 to 250 terabytes...☐

    d. 251 to 500 terabytes...☐

    e. 501 to 750 terabytes...☐

    f. 751 to 1,000 terabytes...☐

    g. 1,001 to 5,000 terabytes..☐

    h. 5,001 to 10,000 terabytes..☐

    i. 10,001 or more terabytes *(Please specify.)*.........................☐

    _____

    j. Uncertain...☐

Question 35: Archival storage for HPC available for administrative functions

35. At the end of your FY 2007, was any of the archival storage reported in Question 34 used for administrative functions (that is, for the business activities of your institution)?

    (Mark one "X.")

    a. Yes..☐

    b. No..☐

    c. Uncertain...☐

Question 36: Conditioned machine room space for centrally administered HPC of 1 teraflop or faster

36. At the end of your FY 2007, what was the total net assignable square feet (NASF) of conditioned machine room space for all centrally administered HPC at your institution?

Net assignable square feet (NASF) is the sum of all areas on all floors of a building assigned to, or available to be assigned to, an occupant for a specific use, such as research or instruction. NASF is measured from the inside faces of walls.

Conditioned machine rooms are specifically designed to house computing systems and are engineered to keep processors at a cool temperature so they can run efficiently and effectively.

Conditioned machine room space..._____ NASF

Question 37: Comments

37. Please add any comments for Part 2 below.

Thank you. This is the end of Part 2. Please submit this part of the survey according to the arrangements you made with your institutional coordinator (named on the label on the front cover of the survey questionnaire).