Executive Summary

In an effort to promote continual improvement at the Oak Ridge Leadership Computing Facility (OLCF), users were sent a survey soliciting their feedback regarding their experience as a user of the facilities and support services.

At the end of the nine-week survey period, 312 users completed the survey out of 967 possible respondents, giving an overall response rate of 32.3%. Findings of the survey are outlined as follows:

User Demographics

- 91% (285 of 312) of survey respondents reported using one or more of the following HPC resources systems: Titan (83%), Eos (26%), Rhea (20%), Data Transfer Nodes (42%, HPSS archival storage system (33%), and Lustre/Atlas scratch file system (77%).
- Survey respondents' projects were supported by INCITE (53%), Director's Discretion (51%), ALCC (32%), and Other sources such as NOAA (0.3%).

Overall Evaluation

- Overall ratings for the OLCF were positive, as 96% (296 of 307) reported being "Satisfied" or "Very Satisfied" with OLCF overall. Only four users reported being "Dissatisfied" (n = 2, 0.65%) or "Very Dissatisfied." (n = 2, 0.65%). On the scale of 1 = Very Dissatisfied to 5 = Very Satisfied, the mean rating was 4.64, a slight increase from 4.41 in 2013.
- With regard to overall satisfaction with OLCF, the percent of satisfied ("Satisfied" and "Very satisfied") respondents has slowly, but steadily increased from 2007 (86%) to 2014 (96%).
- In response to an open-ended question about the best qualities of OLCF, thematic analysis of user responses identified user support and assistance (found in 50% of responses), outstanding computing resources (found in 44% of responses), and computing power/performance (found in 18% of responses) as the respondents' top three choices.
- In addition to the best qualities of OLCF, respondents were asked to select the area(s) which they felt OLCF could use improvement to enhance their experience at the OLCF. Compute systems topped the list, with 23% of respondents selecting this option.

User Assistance Evaluation

- For support services used, 65% of the 312 respondents reported using the User Assistance Center (UAC), followed by 25% using the INCITE Scientific Computing/Liaison service, 5% contacting the Visualization liaison, and 1% using the End-to-End Workflow Team.
- Overall satisfaction with the user support services provided by the OLCF was high with an average response of 4.56 (SD = 0.76) on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied. Mean ratings to questions of overall satisfaction with various aspects of user assistance ranged from 4.35 to 4.69.

Training and Education

- The majority of users who responded prefer online documentation (n = 223, 79%) or online training (n = 177, 62%).
- Out of the 291 who indicated the most convenient time to attend a training event, the majority of respondents indicated no preference (n = 190, 65%), and roughly one-quarter (n

= 69, 24%) indicated the summer was the most convenient time.

- Users were asked to provide satisfaction ratings for their overall satisfaction with OLCF and five specific training aspects. Satisfaction ratings for overall satisfaction was positive (*M* = 4.39, *SD* = 0.65, 93% satisfaction). The lowest satisfaction rating for training aspects was for monthly user conference calls (*M* = 4.13, *SD* = 0.81, 73% satisfaction).
- A total of 52 users indicated that they had participated in OLCF training during the 2014 calendar year. Of these users, 28 (55%) said they would recommend attending a future OLCF training event in person, 22 (43%) said maybe, and 1 person said no.
- When asked "What training topic(s) would you like to see offered in the future?" 16 topics were suggested by more than one user. The top three suggestions provided include: "GPUs" (27%), "Parallelization" (12%), and "Debugging" (12%).

OLCF Communications

- 96% of respondents who answered a question about their overall satisfaction with communications from the OLCF rated it as satisfied or very satisfied. The least positive ratings were for the aspect of communications, social media (OLCF Twitter/Facebook: *M* = 4.29, *SD*= 0.77, 80% satisfaction).
- 98% of users responded that they feel adequately informed of OLCF changes (282 out of 288), events (282 out of 287), and current issues (279 out of 286).

OLCF Web Sites

- Overall, respondents indicated they were moderately satisfied with the OLCF Web site (*M* = 4.35, SD = 0.68). The user support aspects with the lowest satisfaction scores were for searchable knowledge base, software pages, and My OLCF. Means for these items ranged from 4.26 to 4.33 and satisfaction percentages ranged from 85% to 87%.
- 99% of respondents to a question about the frequency that they visited the OLCF Web site indicated that they had visited the http://olcf.ornl.gov Web site. Of these users (312), 41% indicated that they visit the site once a week or more, 7 of whom indicated that they visit the site every day. Only four respondents indicated they had never visited the site.

OLCF Systems

- Overall ratings for the OLCF systems were positive, ranging from 89%-99% of users rating the systems with either "Satisfied" or "Very Satisfied" on the scale of 1 = Very Dissatisfied to 5 = Very Satisfied. Mean ratings for the systems ranged from 4.27 (*SD* = 0.72; Rhea) to 4.55 (*SD* = 0.53; Eos).
- Regarding maintenance and outages, 97% indicated sufficient notice is given prior to scheduled maintenance. The majority also indicated that they are "Satisfied" or "Very Satisfied" with project disk space (91%), the bandwidth offered by the OLCF (90%), and the ease of transferring data to/from the OLCF (83%).

Data Analysis, Visualization, and Workflow

- When asked about data analysis and visualization assistance (one-on-one), the average rating was 4.25 (SD = 0.79, 80% Satisfied).
- Users were somewhat satisfied with the aspects of data analysis, visualization, and workflow with overall means ranging from 4.10 to 4.25 with satisfaction percentages ranging from 75% to 82%.

- Ninety-four percent of users (n = 270 out of 286) indicated that they had not taken advantage of the OLCF cross-platform submission capabilities in their workflow with 16 (6%) indicating that they had.
- Users were asked to indicate where they analyze data produced by OLCF jobs. Of 286 users providing a response to the question, 28 (9%) indicated that they do not need data analysis. Of the users indicating need, 22 (9%) indicated producing all analyses at OLCF, 44 (17%) indicated producing most at OLCF, and 44 (17%) indicating producing half at OLCF. The majority of users indicated that they produce all analysis elsewhere (*n* = 66, 26%) or most elsewhere (*n* = 68, 26%).

Looking to the Future

- Respondents were asked to select the area(s) which they felt OLCF could use improvement to enhance their experience at the OLCF, compute systems topped the list, with 23% of respondents selecting this option.
- Among the 202 respondents who run their own code, 91% (n = 183) listed the name of the code they develop, 57% percent (104 of 183) of which the code they listed currently utilizes GPU acceleration.

Introduction

A general survey of all users of the Oak Ridge Leadership Computing Facility (OLCF) at Oak Ridge National Laboratory (ORNL) in 2014 was launched on October 2, 2014 and remained open for participation through November 24, 2014. Information was collected about the various users, the user experience with OLCF, and the OLCF support capabilities. Attitudes and opinions on the performance, availability, and possible improvements for OLCF and its staff were also solicited.

The survey was created with contributions from OLCF staff and the Oak Ridge Institute for Science and Education (ORISE). The survey was conducted by ORISE through an interagency agreement with the U.S. Department of Energy (DOE). ORISE is managed by Oak Ridge Associated Universities under DOE contract number DE-AC05-06OR23100.

The Oak Ridge Institute for Science and Education (ORISE) is a U.S. Department of Energy institute focusing on scientific initiatives to research health risks from occupational hazards, assess environmental cleanup, respond to radiation medical emergencies, support national security and emergency preparedness, and educate the next generation of scientists. ORISE is managed by Oak Ridge Associated Universities (ORAU).

ORAU provides innovative scientific and technical solutions to advance national priorities in science, education, security and health. Through specialized teams of experts, unique laboratory capabilities and access to a consortium of more than 100 major Ph.D.-granting institutions, ORAU works with federal, state, local and commercial customers to advance national priorities and serve the public interest. A 501(c)(3) nonprofit corporation and federal contractor, ORAU manages the Oak Ridge Institute for Science and Education (ORISE) for the U.S. Department of Energy (DOE). Learn more about ORAU at www.orau.org.

ORISE sent e-mails to an OLCF user distribution list provided by OLCF staff. Users on the list included all DOE defined users from 09/24/2013 (the day OLCF staff pulled the last user list for the previous survey) through 09/01/2014. OLCF staff and vendors were removed from the list. PI's of all the projects that do not have an account were added as the OLCF is interested in capturing their feedback.

After an initial e-mail was sent to the user base from the Director of the National Center for Computational Sciences (NCCS) at ORNL, it was determined that 21 of the e-mail addresses were not valid. Over the seven and a half weeks, reminder emails and OLCF Web site postings were sent to users from the NCCS User Assistance and Outreach Group Leader, the NCCS Director of Science, the OLCF User Group Executive Board, and the NCCS Director and Project Director. Refer to Appendix B for copies of each reminder invitation. Appendix C includes a summary of the survey administration timeline with response rates and descriptions of each reminder sent. Each reminder message appealed in a different way to the users expressing why the survey was being conducted, the importance of the feedback provided, and the use of any responses in a positive manner to support OLCF. A total of 312 users completed the survey out of 967 possible respondents (excluding the 21 email addresses that were invalid), giving an overall response rate of 32.3%.

Data Analysis and Findings

Data collected from the users' survey were analyzed using both quantitative and qualitative methods. The two fundamental goals that drove the collection and subsequent analysis were to understand the types of users and to understand their needs and preferences with the systems. Analysis included basic descriptive statistics and qualitative coding of responses to open-ended questions using grounded theory. Examples of the top themes are presented. Refer to Appendix D for users' complete responses to all qualitative questions. Please note that percentages of response categories may add up to more than 100% of the number of users due to users providing multiple themes within an open-ended comment.

User Demographics

The overall response rate for survey completion is 32.3% (n = 312 out of 967). Almost half (48%) of survey respondents indicated using the OLCF for more than 2 years (n = 149), while 26% indicated using the OLCF between 1 and 2 years (n = 82), and 26% indicated having used OLCF for less than 1 year (n = 81). The majority of survey respondents using OLCF were affiliated with a university or DOE/Laboratory/Government facility; see Table 1 for the affiliation categories of survey respondents.

Table 1. *Occupational Affiliation of OLCF Survey Users*

Occupational Affiliation	*n*	%
University	124	40%
DOE/Laboratory/Government	106	34%
Other	21	7%
Industry	19	6%
Foreign	42	13%

Users of the OLCF are categorized according to the following project allocations:

1) **INCITE**. The Department of Energy's Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program aims to accelerate scientific discoveries and technological innovations by awarding, on a competitive basis, time on supercomputers to researchers with large-scale, computationally intensive projects that address "grand challenges" in science and engineering;

2) **DD**. The National Center for Computational Sciences' Director's Discretion program is designed to give new researchers an opportunity to carry out a program of scalability and productivity enhancements to their scientific codes;

3) **ALCC**. The Advanced Scientific Computing Research (ASCR) Leadership Computing Challenge (ALCC) program is open to scientists from the research community in national laboratories, academia and industry, and allocates up to 30% of the computational resources at National Energy Research Scientific Computing Center (NERSC) and the Leadership Computing Facilities at Argonne and Oak Ridge for special situations of

interest to the Department's energy mission, with an emphasis on high-risk, high-payoff simulations; and

The counts and percentages of OLCF users by the different project types are shown in Table 2. Percentages add to more than 100% as users could have multiple project allocations. *Figure 1* illustrates the breakdown of survey respondents according to the combination of OLCF projects indicated. Out of the 312 responses, a total of 204 (65%) users indicate having a single project-type allocation.

The principal investigator (PI) status of users was provided by OLCF staff. In 2014, 135 (13.7%) users were identified with PI status. Almost half of users with PI status completed the survey (*n* = 66), representing 21.1% of the overall survey respondents – see Table 3.

Table 2. *Project Allocations for OLCF Users and Survey Respondents*

	Survey respondents = 312		OLCF 2014 users = 967	
Project(s) allocations	***n***	**%**	***n***	**%**
INCITE	166	53%	511	52.8%
DD	160	51%	499	51.5%
ALCC	99	32%	259	26.8%
NOAA	1	0.3%	3	.3%

Note. Percentages add to more than 100% as users can have multiple projects.

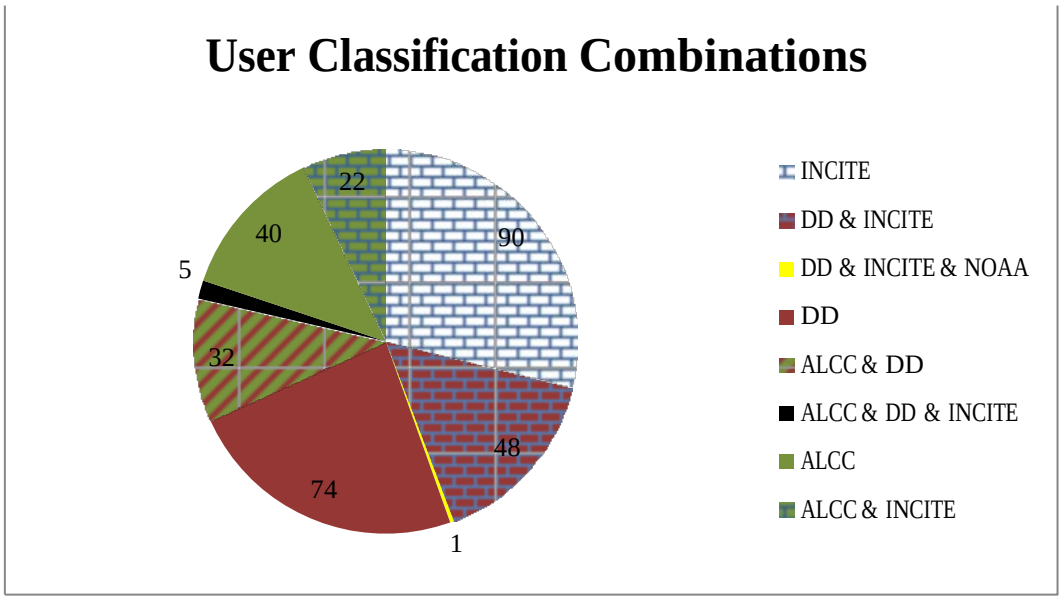

Figure 1. Breakdown of project allocations by each project combination type.

Table 3. *Numbers of Users with PI status for Survey Respondents and OLCF 2014 Users*

	Survey respondents = 312		OLCF 2014 Users = 967	
PI Status	***n***	**%**	***n***	**%**
INCITE	14	5%	37	3.8%
DD	35	11%	64	6.6%
ALCC	15	5%	28	2.9%
Multiple allocations (INCITE+ALCC)	2	< 1%	4	0.4%
No PI status	246	79%	835	86.3%

OLCF users were asked to indicate which OLCF HPC resources they utilized during the 2014 calendar year. The largest number of users indicated using Titan (*n* = 259, 83%), Lustre/Atlas (*n* = 238, 77%), and Data Transfer Nodes (*n* = 129, 42%). For 2014, the smallest number of respondents indicated utilizing Rhea (*n* = 62, 20%). Table 4 indicates the overall utilization of HPC resources as well as provides the breakdown of usage by project allocations and PI status.

The frequency in which survey respondents reported using OLCF support services during 2014 is presented in Table 5. The largest number of responses indicated utilizing the User Assistance Center (*n* = 202, 65%). A quarter of respondents (*n* = 78) indicated using INCITE Scientific Computing Liaison. Responses for using the liaison were compared to feedback regarding the assignment of an INCITE Computing Liaison. Of those who indicated that they had an assigned INCITE Scientific Computing Liaison (*n* = 94), 64 or 67% indicated using the INCITE Scientific Computing Liaison support service. Sixteen users of the support service either indicated that they did not have an assigned liaison (*n* = 10) or did not provide a response for liaison assignment (n = 6). A small number of respondents indicated use of the Visualization Liaison (*n* = 17, 5%) or the End-to-End Workflow Team (*n* = 3, 1%). Roughly one-quarter of respondents indicated that they had not used any of the support services to date (*n* = 75, 24%).

Table 4. *HPC Resources Utilized During 2014 by Project Allocation*

HPC Resources	Total (*n* = 312)		INCITE (*n* = 166)		DD (*n* = 160)		ALCC (*n* = 99)		PI Status (*n* = 66)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Titan	259	83%	141	85%	131	82%	88	89%	55	83%
Eos	79	25%	50	30%	34	21%	31	31%	12	18%
Rhea	62	20%	34	20%	32	20%	20	20%	19	29%
Data Transfer Nodes	129	41%	68	41%	67	42%	42	42%	32	48%
HPSS	100	32%	61	37%	52	33%	30	30%	23	35%
Lustre/Atlas	238	76%	138	83%	118	74%	77	78%	50	76%

Note. Users add up to more than 100% because some use more than one system.

Table 5. *Support Services Used During 2014 by Project Allocation*

Systems	Total (*n* = 312)		INCITE (*n* = 166)		DD (*n* = 160)		ALCC (*n* = 99)		PI Status (*n* = 66)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
User Assistance Center	202	65%	101	61%	113	70%	66	67%	43	65%
INCITE Scientific Computing/Liaison	78	25%	65	39%	34	21%	17	17%	21	32%
Visualization Liaison	17	5%	9	5%	8	5%	6	6%	8	12%
End-to-End Workflow Team	3	1%	1	1%	1	1%	2	2%	1	2%
I have not used any of the support services to date.	74	24%	37	22%	29	18%	24	24%	13	20%

Note. Users add up to more than 100% because some use more than one service.

Overall Evaluation

Users were asked to rate their overall satisfaction with the OLCF (M = 4.64, SD = 0.63), overall satisfaction with OLCF compute resources (M = 4.63, SD = 0.63), with OLCF data resources (M = 4.37, SD = 0.84), and OLCF support services (M = 4.56, SD = 0.75) – Table 6. In addition to means and standard deviations, the percentage of respondents indicating a 4 (*Satisfied*) or 5 (*Very Satisfied*) were calculated to provide additional details for user satisfaction. In general, users were highly satisfied with OLCF (percentages were close to or above 90%). The percentages of users responding "Very Satisfied", "Satisfied", "Neutral", "Dissatisfied", or "Very Dissatisfied" for these overall satisfaction items are displayed in Figure 2.

Additional ratings for overall satisfaction of specific compute resources, data resources and support services are also included in Table 6. Overall means are generally favorable and satisfaction ratings are at or above 90%. Lustre/Atlas (M = 4.29, %Sat = 89%) and Rhea (M = 4.27, %Sat = 90%) had the overall lowest ratings.

In addition to providing satisfaction ratings by project allocation, ratings were provided for those users designated as having PI status or not, Table 7. Overall means were slightly higher for survey respondents with PI status than for survey respondents without PI status for overall satisfaction items with OLCF, OLCF Compute Resources, OLCF Data Resources, and OLCF Support Services. The largest mean difference between PIs and Non-PI users was for overall satisfaction of the INCITE Scientific Computing Liaison (M_{PI} = 4.95, and M_{Non} = 4.60).

Table 6. *Descriptive Statistics for Overall Satisfaction by Project Allocation*

Overall satisfaction with…	INCITE				DD				ALCC				Total			
OLCF	164	4.64	0.57	96%	158	4.63	0.71	96%	97	4.66	0.50	99%	307	4.64	0.63	96%
Compute resources	163	4.64	0.53	98%	155	4.62	0.69	95%	98	4.68	0.57	95%	304	4.63	0.63	96%
-Titan	139	4.45	0.55	97%	130	4.48	0.60	95%	87	4.41	0.58	95%	257	4.46	0.58	96%
-Eos	49	4.49	0.54	98%	34	4.56	0.50	100%	32	4.69	0.47	100%	80	4.55	0.53	99%
-Rhea	35	4.26	0.70	91%	33	4.18	0.68	91%	19	4.37	0.60	95%	63	4.27	0.72	90%
Data resources	151	4.31	0.85	84%	146	4.42	0.81	88%	91	4.30	0.90	81%	283	4.37	0.84	86%
-Data Transfer Nodes	66	4.35	0.83	91%	66	4.44	0.66	94%	41	4.20	0.87	83%	127	4.36	0.75	91%
-HPSS	60	4.42	0.67	90%	51	4.27	0.83	86%	31	4.42	0.62	94%	100	4.38	0.74	90%
-Lustre/Atlas	136	4.23	0.79	88%	117	4.34	0.71	90%	74	4.23	0.80	88%	234	4.29	0.75	89%
Support services	157	4.47	0.78	90%	153	4.58	0.79	93%	93	4.65	0.60	94%	292	4.56	0.76	92%
-Consulting services	118	4.53	0.70	92%	125	4.58	0.67	91%	69	4.64	0.54	97%	228	4.58	0.65	93%
-Account services	116	4.43	0.68	80%	129	4.50	0.66	91%	72	4.49	0.65	92%	228	4.47	0.67	90%
-INCITE liaison	73	4.66	0.56	96%	28	4.71	0.53	96%	19	4.74	0.45	100%	80	4.69	0.54	96%
-Communications	145	4.52	0.57	98%	140	4.56	0.58	96%	88	4.58	0.58	95%	272	4.54	0.58	96%
-Training	124	4.33	0.68	91%	121	4.48	0.61	96%	73	4.40	0.59	95%	229	4.39	0.65	93%
-Website	149	4.28	0.75	87%	140	4.37	0.69	89%	90	4.39	0.57	96%	275	4.35	0.68	91%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 7. *Descriptive Statistics for Overall Satisfaction by PI Status*

Overall satisfaction with…	PI				Non-PI				
	N	*M*	*SD*	%Sat*	*N*	*M*	*SD*	%Sat*	Mean Diff+
OLCF	64	4.78	0.45	98%	243	4.60	0.66	96%	0.18
OLCF compute resources	63	4.76	0.56	97%	241	4.60	0.64	95%	0.16
-Titan	54	4.57	0.60	94%	203	4.43	0.57	96%	0.15
-Eos	13	4.62	0.51	100%	67	4.54	0.53	99%	0.08
-Rhea	18	4.28	0.75	83%	45	4.27	0.72	93%	0.01
OLCF data resources	58	4.43	0.88	84%	225	4.36	0.83	86%	0.08
-Data Transfer Nodes	31	4.35	0.84	84%	96	4.36	0.73	93%	-0.01
-HPSS	23	4.48	0.73	87%	77	4.35	0.74	91%	0.13
-Lustre/Atlas	50	4.30	0.79	84%	184	4.29	0.75	90%	0.01
OLCF support services	63	4.65	0.70	94%	229	4.53	0.77	92%	0.12
-Consulting services	56	4.57	0.81	88%	172	4.59	0.59	95%	-0.02
-Account services	59	4.49	0.73	86%	169	4.47	0.65	92%	0.02
-INCITE liaison	20	4.95	0.22	100%	60	4.60	0.59	95%	0.35
-Communications	60	4.57	0.53	98%	212	4.54	0.59	96%	0.03
-Training	46	4.52	0.72	91%	183	4.36	0.63	93%	0.16
-Website	58	4.36	0.72	90%	217	4.34	0.67	91%	0.02

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied. +Mean Diff represents the difference in scores for respondents with PI status and no PI status.

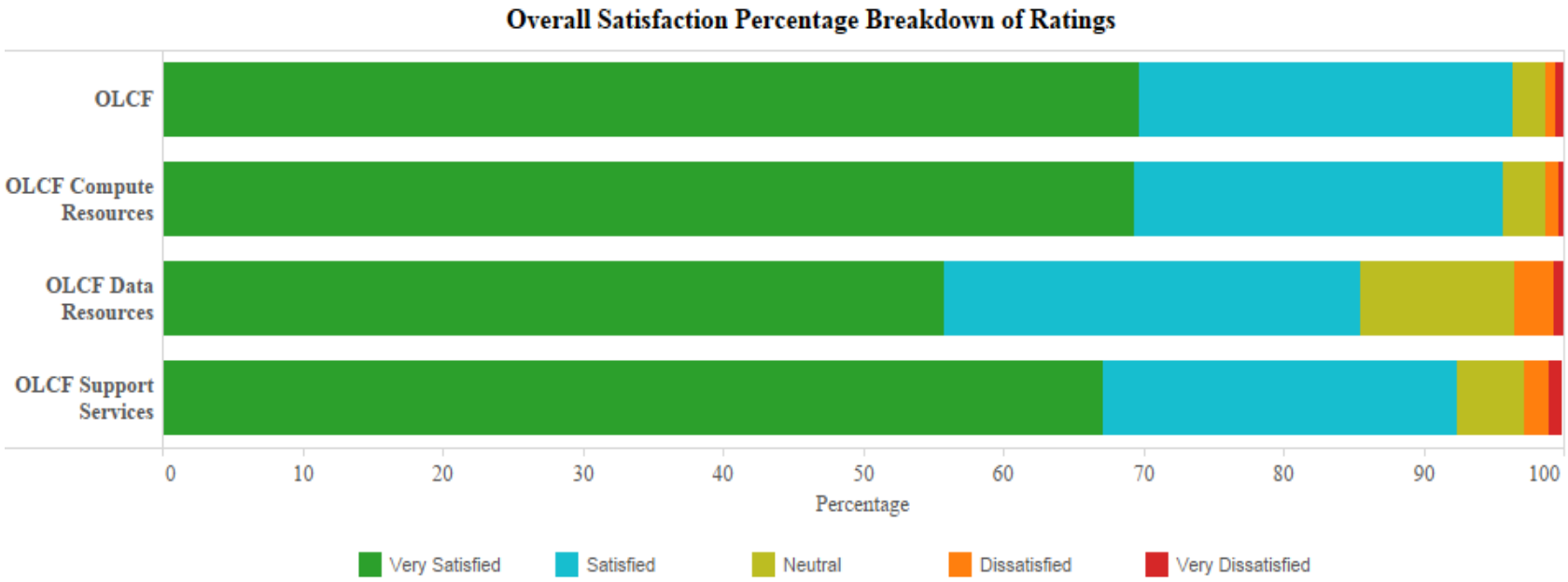

Figure 2. Overall satisfaction ratings for OLCF, OLCF compute resources, OLCF Data Resources, and OLCF Support Services by percentages indicating each response.

If a user rated any of the aspects of their overall satisfaction with the OLCF, its resources and support services with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 8). Out of 18 users who gave a dissatisfied rating on at least one of the four satisfaction items, 13 users provided explanations for their dissatisfaction. The most common explanations dealt with “Performance” (31%). Sample comments for this theme include:

Table 8. *Users’ Explanations for Dissatisfaction with OLCF Resources and Support Services*

If you rated any of the aspects of the items in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 13	%
Performance	4	31%
Purging policy	2	15%
File system issues	2	15%
Unstable/unreliable	2	15%
Poor website material/documentation	2	15%
Issues took a long time to resolve	2	15%
Miscellaneous	3	23%

Note. Users add up to more than 100% because some provided more than one theme in their response.

In response to an open-ended question about the best qualities of OLCF, thematic analysis of user responses identified user support and assistance (found in 50% of responses), the outstanding quality of the computational resource (found in 44% of responses), and performance (found in 18% of responses) as the respondents’ top three choices (Table 9). Some respondent comments about these qualities included:

User assistance staff/outstanding support

> “The people. For example Mike Matheson, Jack Wells, Suzy Tichenor, and so many other important people at OLCF who clearly care about the users and go the extra mile to help us make productive use of this incredibly important resource.”
>
> “My group has had an extremely positive experience with the OLCF, which can be attributed in large to the seamless combination of access to powerful HPC resources with fast and professional support for our specific code development needs - spearheaded in particular through our 2014 INCITE liaison Judith Hill.”

"The overall system with the library, and support environment are top notch. The support staff is second to none in terms of answering questions, supporting libraries, etc."

Outstanding computing resources

"Emphasis on the importance of large-scale computing and moving toward the next generation of hardware and software. The staff is extremely knowledgeable / helpful and it is a pleasure to work with them."

"Unique computing power in the form of 18000+ GPUs (Titan), Adequate analysis processing power in the form of attached clusters (Eos, Rhea), Large filesystem (Atlas), Responsive hotline / special requests management"

"State of the art system resources that allow massively parallel scaling, long running stability, ability to solve unique scientific problems. Combined with a broad technically knowledgeable staff promotes a valuable resource for the scientific community."

Table 9. *Best Qualities of OLCF*

What do you think are the best qualities of the OLCF?	N = 150	%
User assistance staff/outstanding support	75	50%
Outstanding Computing Resource	66	44%
Computing power/performance	27	18%
Stability/Reliability	25	17%
Documentation	10	7%
Low wait time for system use	6	4%
Easy to use	5	3%
Number of nodes available	5	3%
Ease of access and use	4	3%
Training	4	3%
Software libraries	4	3%
Don't know yet	3	2%
Miscellaneous	3	2%

Note. Users add up to more than 100% because some provided more than one theme in their response.

In response to a question regarding how OLCF could improve their computing experience, the most common response themes were that users were satisfied or couldn't think of any suggestions (17%) and "improve performance" (17%). These were followed by "Improve user assistance/better communication/more staff" (13%), "More memory," (9%) and "Better data transfer options/speed" (8%; Table 10).

Table 10. *Suggestions for Improvement to OLCF User Computing Experience*

Please explain, in detail, any improvements that would enhance your experience at the OLCF.	N = 64	%
Satisfied/No recommendations	11	17%
Improve performance	11	17%
Improve user assistance/better communication/more staff	8	13%
More memory	6	9%

Better data transfer options/speed	5	8%
More access to machines/testbeds	4	6%
Longer walltime needed	4	6%
Training requests	3	5%
Purge policy	3	5%
Queueing policy improved	2	3%
Better web site organization	2	3%
Stability	2	3%
Better documentation	2	3%
Tools needed	2	3%
Miscellaneous	8	13%

OLCF HPC Resources

Users who used OLCF HPC Resources were asked to provide satisfaction ratings for the following aspects: a) notice given prior to scheduled maintenance, b) project disk space, c) ease of transferring data to/from the OLCF, and bandwidth offered by the OLCF. Table 11 includes descriptive ratings by project allocation, and Table 12 includes ratings for users with PI Status or not. The highest mean satisfaction rating was for notice given prior to scheduled maintenance (*M* = 4.62, *SD* = .061, 97% satisfied), and the lowest overall mean rating was for "ease of transferring data to/from the OLCF" (*M* = 4.25, *SD* = .88, 83% satisfied).

If a user rated any of the aspects of OLCF compute and data resources with "Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 13). Of 17 who were "Very Dissatisfied" or "Dissatisfied" with one or more aspects of the OLCF compute and data resources, 16 provided explanations for their dissatisfaction. The most common explanations dealt with "Difficulty of data transfer" (38%), "Need larger disk quota/place to save data" (25%), and "Security issues" (25%).

Users were asked to indicate their opinion regarding the performance of OLCF compute and data resources compared to the previous year. Five users with greater than 2 years as a user, noted overall decreases in performance of the OLCF compute and data systems (roughly 3% of those with greater than 2 years of experience). Of users with more than 2 years as a user, 58 (40%) noted overall improvements of the OLCF compute and data systems, and 82 (57%) of users noted the performance of OLCF compute and data systems is about the same as it was the last year. For users with 1 to 2 years of time as a user (n = 79), no one indicated overall decreases, 34 (43%) indicated improvements, and 45 (57%) indicated performance was about the same.

Table 11. *Descriptive Statistics for Aspects of the OLCF HPC Compute and Data Resources by Project Allocation*

	INCITE				DD				ALCC				Total			
Overall satisfaction with…	N	M	SD	%Sat*	N	M	SD	%Sat*	N	M	SD	%Sat*	N	M	SD	%Sat*
Notice given prior to scheduled maintenance	162	4.59	0.54	78%	156	4.66	0.66	96%	97	4.66	0.54	97%	305	4.62	.61	97%
Project disk space	161	4.38	0.74	90%	152	4.49	0.68	92%	96	4.41	0.83	90%	300	4.44	.73	91%
Ease of transferring data to/from the OLCF	157	4.22	0.83	83%	149	4.28	0.91	83%	93	4.16	0.91	80%	292	4.25	.88	83%
Bandwidth offered by the OLCF	155	4.42	0.67	90%	149	4.46	0.71	89%	92	4.42	0.65	91%	290	4.45	.68	90%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 12. *Descriptive Statistics for Aspects of the OLCF HPC Compute and Data Resources by PI Status*

	PI				Non-PI				
Overall satisfaction with…	*N*	*M*	*SD*	%Sat*	*N*	*M*	*SD*	%Sat*	Mean Diff+
Notice given prior to scheduled maintenance	65	4.69	0.56	95%	240	4.60	0.62	97%	0.09
Project disk space	63	4.63	0.60	94%	237	4.39	0.75	90%	0.25
Ease of transferring data to/from the OLCF	60	4.32	0.95	83%	232	4.23	0.87	83%	0.09
Bandwidth offered by the OLCF	59	4.42	0.79	85%	231	4.45	0.64	92%	-0.03

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied. +Mean Diff represents the difference in scores for respondents with PI status and no PI status.

Table 13. *Users' Explanations for Dissatisfaction with OLCF Compute and Data Resources*

If you rated any of the aspects of OLCF HPC compute and data resources in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 16	%
Difficultly of data transfer	6	38%
Need larger disk quota/place to save data	4	25%
Security issues	4	25%
Purge policy	3	19%
Performance	2	13%
Unstable/unreliable	1	6%
Miscellaneous	1	6%

Note. Users add up to more than 100% because some provided more than one theme in their response.

Titan

A total of 259 (83% of survey respondents) indicated using Titan during the 2014 calendar year. For users who utilized Titan during this time, they were asked to provide satisfaction ratings to multiple aspects of the Titan system. Ratings are shown in Table 14 by project allocations. Users' overall satisfaction with Titan was moderately high (M = 4.46, SD = 0.58, 96% satisfaction). Aspects of Titan that appear to have lower satisfaction ratings (as evidenced by their overall mean scores and percent satisfied) include debugging tools, data analysis software, frequency of scheduled outages, batch wait time, and I/O Performance. Means for these aspects were between 4.13 and 4.18 with percentages ranging from 77% to 84%.

If a user rated any of the aspects of Titan with "Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 15). Of 31 users who indicated at least one dissatisfied response, 25 provided explanations for their dissatisfaction. The most common explanations dealt with "Queue issues" (28%), "I/O issues/performance" (20%), and "Can't use debugging tools" (12%).

Table 14. *Descriptive Statistics for Satisfaction Ratings of Titan by Project Allocation*

	INCITE				DD				ALCC				Total			
Aspects of Titan	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat
Batch wait time	140	4.10	0.74	83%	127	4.13	0.84	82%	87	4.21	0.70	86%	254	4.14	0.78	83%
Batch queue structure	140	4.19	0.80	87%	127	4.16	0.86	80%	87	4.29	0.70	89%	254	4.20	0.80	86%
Job success rate	140	4.27	0.70	91%	128	4.44	0.64	94%	87	4.38	0.67	90%	255	4.36	0.68	91%
Frequency of scheduled outages	141	4.02	0.78	77%	130	4.17	0.76	82%	88	4.13	0.87	76%	258	4.13	0.78	80%
Frequency of unscheduled (unanticipated) outages	138	4.14	0.78	81%	125	4.34	0.76	88%	84	4.38	0.73	86%	249	4.29	0.74	86%
Performance tools	94	4.14	0.76	80%	94	4.29	0.73	86%	63	4.25	0.69	86%	176	4.23	0.71	85%
Debugging tools	89	4.13	0.84	79%	91	4.20	0.85	77%	63	4.11	0.76	76%	170	4.15	0.83	77%
Data analysis software	74	4.19	0.77	78%	75	4.19	0.78	80%	53	4.15	0.86	74%	141	4.18	0.78	79%
Software/libraries	133	4.37	0.68	92%	121	4.39	0.68	93%	83	4.30	0.74	90%	241	4.35	0.72	91%
Programming environment	134	4.37	0.71	91%	116	4.41	0.68	92%	79	4.38	0.61	94%	237	4.39	0.68	92%
Scratch configuration	137	4.27	0.67	89%	122	4.33	0.71	89%	81	4.31	0.66	91%	243	4.32	0.67	90%
I/O performance	132	4.09	0.84	80%	121	4.23	0.79	88%	87	4.14	0.75	83%	243	4.17	0.80	84%
Overall satisfaction with Titan	139	4.45	0.55	97%	130	4.48	0.60	95%	87	4.41	0.58	95%	257	4.46	0.58	96%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 15. *Users' Explanations for Dissatisfaction with Titan*

If you rated any of the aspects of Titan in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 25	%
Queue issues	7	28%
I/O issues/performance	5	20%
Can't use debugging tools	3	12%
Unstable/unreliable	3	12%
Software not up-to-date or installed	2	8%
Need better documentation/modules/templates	2	8%
Issues with PGI compiler	2	8%
Miscellaneous	4	16%

Note. Users add up to more than 100% because some provided more than one theme in their response.

Eos

A total of 79 (25% of survey respondents) indicated using Eos during the 2014 calendar year. For users who utilized Eos during this time, they were asked to provide satisfaction ratings to multiple aspects of the Eos system, Table 16. Users' overall satisfaction with Eos was high (M = 4.55, SD = 0.53, 99% satisfaction). The highest rated aspect of the Eos system was for Job success rate (M = 4.60, SD = 0.54, 98% satisfied). The lowest rated aspect of the Eos was data analysis software (M = 4.17, SD = 0.79, 77% satisfied).

If a user rated any of the aspects of Eos with "Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 17). Of 7 users who gave at least one dissatisfaction rating of Eos, 5 provided explanations for their dissatisfaction. The two explanations provided include "Unstable/unreliable" (80%) and "Time consuming debugging/slow performance" (20%).

Table 16. *Descriptive Statistics for Satisfaction Ratings of Eos by Project Allocation*

	INCITE				DD				ALCC				Total			
Aspects of Eos	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat
Batch wait time	51	4.31	0.71	88%	36	4.47	0.65	92%	32	4.63	0.75	91%	82	4.40	0.73	90%
Batch queue structure	51	4.29	0.73	88%	36	4.42	0.65	92%	32	4.59	0.67	91%	82	4.38	0.71	89%
Job success rate	51	4.57	0.54	98%	36	4.64	0.54	97%	32	4.75	0.51	97%	82	4.60	0.54	98%
Frequency of scheduled outages	51	4.18	0.79	80%	36	4.42	0.65	92%	32	4.25	1.08	78%	82	4.23	0.85	83%
Frequency of unscheduled (unanticipated) outages	49	4.29	0.65	90%	35	4.54	0.56	97%	32	4.34	0.90	84%	80	4.33	0.73	90%
Performance tools	28	4.14	0.76	79%	22	4.50	0.67	91%	16	4.31	0.79	81%	45	4.33	0.74	84%
Debugging tools	26	4.08	0.80	73%	23	4.43	0.73	87%	19	4.21	0.85	74%	44	4.27	0.79	80%
Data analysis software	21	3.95	0.80	67%	19	4.32	0.75	84%	12	4.08	0.90	67%	35	4.17	0.79	77%
Software/libraries	49	4.24	0.69	86%	34	4.38	0.70	88%	30	4.33	0.80	87%	76	4.30	0.73	87%
Programming environment	47	4.38	0.68	94%	32	4.50	0.62	94%	27	4.59	0.50	100%	73	4.47	0.63	96%
Scratch configuration	49	4.39	0.53	98%	33	4.39	0.61	94%	27	4.52	0.58	96%	74	4.41	0.57	96%
I/O performance	48	4.29	0.62	92%	31	4.23	0.76	87%	29	4.14	0.83	79%	75	4.21	0.74	87%
Overall satisfaction with Eos	49	4.49	0.54	98%	34	4.56	0.50	100%	32	4.69	0.47	100%	80	4.55	0.53	99%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 17. *Users' Explanations for Dissatisfaction with Eos*

If you rated any of the aspects of Eos in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 5	%
Unstable/unreliable	4	80%
Time consuming debugging/slow performance	1	20%

When asked why they have made little use or not utilized Eos, the most common reason provided was “I do not need Eos/Not applicable” (25%; Table 18). This was followed by “No reason” (22%) and “I am using Titan” (22%).

Table 18. *Users’ Explanations for Having Made Little or No Use of Eos*

If you have made little use or not utilized Eos at all, is there a specific reason why?	N = 128	%
I do not need Eos/Not applicable	32	25%
No reason	28	22%
I am using Titan	28	22%
I do not/did not know about Eos	16	13%
Have not been given access/no allocation	12	9%
My work requires GPUs	5	4%
Have not had time/opportunity to use yet/just started using/will look into using	4	3%
I am using Rhea	4	3%
Miscellaneous	9	7%

Note. Users add up to more than 100% because some provided more than one theme in their response.

Rhea

A total of 62 (20% of survey respondents) indicated using Rhea during the 2014 calendar year. For users who utilized Rhea during this time, they were asked to provide satisfaction ratings to multiple aspects of the Rhea system, see Table 19. Users’ overall satisfaction with Rhea was moderately high (M = 4.27, SD = 0.72, 90% satisfaction). The highest rated aspect of the Rhea system was for batch wait time (M = 4.50, SD = 0.57, 96% satisfied). The lowest rated aspects of Rhea were for debugging tools, performance tools, frequency of scheduled outages, and frequency of unscheduled outages. Means for these aspects were between 4.00 and 4.08 with percentages ranging from 71% to 80%.

If a user rated any of the aspects of Rhea with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 20). Of 9 users indicating a dissatisfaction for at least one aspect of Rhea, 8 users provided explanations for their dissatisfaction. The top two explanations provided were “Problems when doing analyses” (38%) and “Too many outages” (25%).

Table 19. *Descriptive Statistics for Satisfaction Ratings of Rhea by Project Allocation*

	INCITE				DD				ALCC				Total			
Aspects of Rhea	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat
Batch wait time	30	4.43	0.63	93%	19	4.58	0.51	100%	18	4.50	0.62	100%	56	4.50	0.57	96%
Batch queue structure	30	4.30	0.65	90%	19	4.37	0.68	92%	18	4.28	0.75	89%	56	4.32	0.66	89%
Job success rate	30	4.27	0.83	83%	19	4.42	0.69	92%	18	4.39	0.78	89%	56	4.38	0.75	88%
Frequency of scheduled outages	33	4.00	0.87	76%	18	4.28	0.67	70%	19	4.26	0.87	89%	59	4.05	0.88	78%
Frequency of unscheduled (unanticipated) outages	32	4.00	0.84	78%	18	4.33	0.59	74%	19	4.26	0.87	94%	56	4.05	0.92	80%
Performance tools	17	3.88	0.70	71%	12	4.08	0.67	76%	13	4.00	0.82	83%	37	4.08	0.72	78%
Debugging tools	13	3.85	0.80	62%	12	4.00	0.74	71%	13	4.00	0.82	75%	31	4.00	0.86	71%
Data analysis software	26	4.19	0.63	88%	16	4.31	0.60	80%	16	4.19	0.91	94%	46	4.17	0.80	85%
Software/libraries	32	4.03	0.78	84%	19	4.32	0.58	81%	19	4.16	0.83	95%	60	4.07	0.80	85%
Programming environment	31	4.16	0.78	84%	16	4.44	0.51	90%	18	4.39	0.70	100%	56	4.27	0.70	89%
Scratch configuration	32	4.28	0.68	94%	17	4.35	0.49	85%	18	4.17	0.86	100%	56	4.29	0.68	91%
I/O performance	33	4.12	0.96	82%	18	4.28	0.57	79%	18	4.00	1.08	94%	58	4.17	0.84	84%
Available memory	34	4.32	0.68	88%	19	4.37	0.68	83%	19	4.16	0.90	89%	61	4.26	0.77	87%
Overall system size	33	4.24	0.66	88%	19	4.37	0.60	87%	19	4.21	0.71	95%	60	4.25	0.65	88%
Overall satisfaction with Rhea	35	4.26	0.70	91%	19	4.37	0.60	91%	18	4.28	0.75	95%	63	4.27	0.72	90%

Note. *% Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 20. *Users' Explanations for Dissatisfaction with Rhea*

If you rated any of the aspects of Rhea in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 8	%
Problems when doing analyses	3	38%
Too many outages	2	25%
Unstable/unreliable	1	13%
Dislike scratch organization by project	1	13%
Debugging tools not available	1	13%

When asked why they have made little use or not utilized Rhea, the most common reason provided was "I do not need Rhea/Not applicable" (31%; Table 21). This was followed by "No reason" (20%) and "I am using Titan" (16%).

Table 21. *Users' Explanations for Having Made Little or No Use of Rhea*

If you have made little use or not utilized Rhea at all, is there a specific reason why?	N = 143	%
I do not need Rhea/not applicable	45	31%
No reason	28	20%
I am using Titan	23	16%
I do not/did not know about Rhea	12	8%
Have not been given access/no allocation	11	8%
Have not had time/opportunity to use yet/just started using/will look into using	10	7%
My work requires GPUs	5	3%
Better for smaller jobs	5	3%
I am using Eos	3	2%
Miscellaneous	17	12%

Note. Users add up to more than 100% because some provided more than one theme in their response.

Data Transfer Nodes (DTNs)

Users were asked to indicate their satisfaction with using Data Transfer Nodes during the 2014 calendar year. The overall mean satisfaction rating for 127 users providing a rating was *M* = 4.36 (*SD* = 0.75, %Sat = 90.6%). Means varied slightly by project allocations (M_{DD} = 4.44, M_{INCITE} = 4.35, and M_{ALCC} = 4.20).

If a user rated any of the aspects of the Data Transfer Nodes with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 22). All of the users (*n* = 3) who were “Very Dissatisfied" or "Dissatisfied" with one or more aspects of the Data Transfer Nodes provided explanations for their dissatisfaction. The two explanations provided were “Unstable/unreliable” (67%) and “Security set-up issues” (67%).

Table 22. *Users’ Explanations for Dissatisfaction with the Data Transfer Nodes*

If you rated any of the aspects of the Data Transfer Nodes in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 3	%
Unstable/unreliable	2	67%
Security set-up issues	2	67%

Note. Users add up to more than 100% because some provided more than one theme in their response.

HPSS

A total of 100 (32% of survey respondents) indicated using HPSS during the 2014 calendar year. For users who utilized HPSS during this time, they were asked to provide satisfaction ratings to multiple aspects of the HPSS system, see Table 23Table 19 for total ratings and ratings by project allocation. Users’ overall satisfaction with HPSS was moderately high (*M* = 4.38, *SD* = 0.74, 90% satisfaction). The highest rated aspect of the HPSS system was ability to store files (*M* = 4.47, *SD* = 0.73, 93% satisfied). The lowest rated aspects of HPSS were for time to retrieve files, time to store files, and hsi interface. Means for these aspects were between 4.15 and 4.26 with percentages ranging from 81% to 84%.

If a user rated any of the aspects of the HPSS with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 24). Of 8 users providing a dissatisfaction rating for at least one aspect of HPSS, 7 users provided explanations for their dissatisfaction. The top two explanations provided were “his/htar is problematic” (57%) and “Loss of data/files” (29%).

Table 23. *Descriptive Statistics for Satisfaction Ratings of HPSS by Project Allocation*

	INCITE				DD				ALCC				Total			
Aspects of HPSS	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat
hsi interface	61	4.23	0.88	80%	50	4.28	0.90	84%	29	4.34	0.77	90%	99	4.26	0.86	84%
htar interface	48	4.33	0.81	88%	40	4.25	0.87	85%	24	4.29	0.81	88%	81	4.30	0.84	86%
Ability to store files	60	4.53	0.68	93%	50	4.38	0.85	90%	32	4.47	0.57	97%	101	4.47	0.73	93%
Ability to retrieve files	59	4.47	0.65	92%	50	4.32	0.84	86%	31	4.48	0.63	94%	98	4.42	0.75	90%
Reliability (data integrity)	59	4.44	0.75	92%	47	4.32	0.89	87%	31	4.48	0.63	94%	97	4.43	0.78	92%
Time to store files	60	4.30	0.77	85%	50	4.18	0.87	80%	32	4.38	0.66	91%	101	4.26	0.81	84%
Time to retrieve files	60	4.17	0.76	82%	49	4.10	0.85	80%	31	4.35	0.71	87%	99	4.15	0.81	81%
Frequency of scheduled outages	58	4.34	0.69	88%	48	4.33	0.63	92%	30	4.30	0.84	83%	95	4.35	0.70	89%
Frequency of unscheduled (unanticipated) outages	56	4.36	0.70	88%	45	4.36	0.61	93%	31	4.26	0.86	81%	93	4.33	0.73	87%
Overall satisfaction with HPSS	60	4.42	0.67	90%	51	4.27	0.83	86%	31	4.42	0.62	94%	100	4.38	0.74	90%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 24. *Users' Explanations for Dissatisfaction with HPSS*

If you rated any of the aspects of HPSS in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 7	%
his/htar is problematic	4	57%
Loss of data/files	2	29%
Unstable/unreliable	1	14%
Some command options are not available	1	14%

Lustre/Atlas Scratch Filesystem

Seventy-seven percent or 238 users indicated using Lustre/Atlas Scratch Filesystem during the 2014 calendar year. For users who utilized the system during this time, they were asked to provide satisfaction ratings to multiple aspects of the system – see Table 25Table 19 for total ratings and ratings by project allocation. Users' overall satisfaction with Lustre/Atlas was moderately high (M = 4.29, SD = 0.75, 89% satisfaction). The highest rated aspect of the system was size (M = 4.53, SD = 0.55, 97% satisfied). The lowest rated aspects of Lustre/Atlas were for file and directory operations, frequency of unscheduled (unanticipated) outages, and frequency of scheduled outages. Means for these aspects were between 4.20 and 4.27 with percentages ranging from 85% to 87%.

If a user rated any of the aspects of the Lustre/Atlas with "Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 26). Of 20 users who indicated a dissatisfaction with at least one aspect of the Lustre/Atlas Scratch Filesystem, 16 provided explanations for their dissatisfaction. The top two explanations provided were "Performance" (69%) and "Unstable/unreliable" (25%).

Table 25. *Descriptive Statistics for Satisfaction Ratings of Lustre/Atlas Scratch Filesystem by Project Allocation*

	INCITE				DD				ALCC				Total			
Aspects of Lustre/Atlas	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat	N	M	SD	%Sat
Size	134	4.51	0.56	97%	114	4.53	0.55	97%	75	4.57	0.52	99%	231	4.53	0.55	97%
I/O bandwidth	132	4.33	0.74	92%	115	4.43	0.68	93%	74	4.46	0.62	93%	230	4.40	0.70	92%
File and directory operations	137	4.07	1.02	83%	118	4.24	0.91	87%	75	4.16	1.09	84%	236	4.20	0.94	86%
Reliability (data integrity)	135	4.36	0.70	93%	117	4.35	0.80	90%	74	4.35	0.73	88%	234	4.39	0.71	92%
Frequency of scheduled outages	135	4.22	0.73	85%	115	4.31	0.73	88%	75	4.19	0.85	84%	232	4.27	0.74	87%
Frequency of unscheduled (unanticipated) outages	130	4.17	0.81	84%	113	4.28	0.80	86%	75	4.16	0.84	83%	227	4.24	0.80	85%
Overall satisfaction with the Lustre/Atlas filesystem	136	4.23	0.79	88%	117	4.34	0.71	90%	74	4.23	0.80	88%	234	4.29	0.75	89%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 26. *Users' Explanations for Dissatisfaction with Lustre/Atlas*

If you rated any of the aspects of Lustre/Atlas in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 16	%
Performance	11	69%
Unstable/unreliable	4	25%
Purge policy	2	13%
Unable to access files due to glitch	1	6%

Note. Users add up to more than 100% because some provided more than one theme in their response.

In response to a question regarding how OLCF could improve their experience using any of the HPC resources (i.e., Titan, Eos, Rhea, DTNs, HPSS, Lustre/Atlas) and/or tell if any additional resources are needed, the most common response theme was "Satisfied/no suggestions" (21%). This was followed by "Offer other data transfer methods" (13%), and "Improve documentation/website" (11%). Refer to Table 27 for all themes identified.

Table 27. *Users' Descriptions of How the OLCF can Improve Their Experience Using Any of the HPC Resources*

Please describe how the OLCF can improve your experience using any of the HPC resources (i.e., Titan, Eos, Rhea, DTNs, HPSS, Lustre/Atlas) and/or tell us if any additional resources are needed.	N = 96	%
Satisfied/no suggestions	20	21%
Offer other data transfer methods	12	13%
Improve documentation/website	11	11%
Improve system performance	10	10%
Review queue and walltime policies	9	9%
Get more hardware	8	8%
Get more software/update software	7	7%
More/quicker user assistance/support	7	7%
Re-evaluate purge policy/create soon-to-be-purged dashboard	5	5%
Establish some unpurged disk space for users	3	3%
Increase stability/reliability	3	3%
Miscellaneous	9	9%

Note. Users add up to more than 100% because some provided more than one theme in their response.

User Opinions of OLCF Services

Users were asked to approximate the number of queries they submitted during 2014. Roughly one-quarter (*n* = 75, 24%) responded that they did not submit a query and 15 (5%) did not provide a response. The largest number of users indicated submitting between 1 and 5 queries (*n* = 166, 53%), while 32 (10%) submitted between 6 and 10 queries, 13 (4%) submitted between 11 and 20 queries, and 11 (4%) submitted more than 20 queries.

User Assistance

Users who indicated they used the OLCF User Assistance were generally satisfied. The percentages of satisfaction across assistance aspects were all above 90% with means ranging from 4.52 to 4.59. If a user rated any of the aspects of User Assistance with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating. Of 8 users who provided a dissatisfaction rating, 5 provided explanations for their dissatisfaction. All explanations provided fit the theme “Lengthy response time” (100%).

Table 28. *Descriptive Statistics for Satisfaction Ratings of the User Assistance by Project Allocation and PI*

	INCITE			DD			ALCC			PI Status			Total			
Aspects of User Assistance	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	%Sat
User assistance - Speed of initial response to queries	115	4.56	0.70	121	4.58	0.67	66	4.70	0.50	66	4.70	0.50	220	4.59	0.67	96%
User assistance - Speed of final resolution to queries	114	4.50	0.78	120	4.47	0.82	65	4.66	0.51	65	4.66	0.51	218	4.52	0.76	93%
User assistance - Quality of technical information	113	4.49	0.68	117	4.53	0.65	66	4.64	0.52	66	4.64	0.52	215	4.55	0.63	94%
User assistance - Response to special requests (i.e., scheduling exceptions, quota increases, software installations, etc.)	89	4.54	0.71	95	4.62	0.69	55	4.65	0.62	55	4.65	0.62	173	4.59	0.67	93%
User assistance - Overall consulting services	113	4.57	0.67	118	4.58	0.67	65	4.65	0.54	65	4.65	0.54	214	4.60	0.63	94%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Account Management

Users were asked to rate their satisfaction with two aspects of accounts and allocations as well as provide an overall account services rating. Descriptive statistics for ratings overall and by project allocation are shown in Table 29. Overall mean ratings for speed of responses to account management queries, effectiveness of response to account management queries, and overall account services were similar (means of 4.45 and 4.47 with satisfaction percentages of 89% to 91%).

If a user rated any of the aspects of Accounts and Allocations with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating. All of the users (n = 3) who were “Very Dissatisfied" or "Dissatisfied" with one or more aspects of Accounts and Allocations provided explanations for their dissatisfaction. All explanations provided fit one of two themes “Takes a really long time to get an account” (67%) or “Requires multiple requests to get an account” (33%). Comments included:

INCITE Scientific Computing Liaisons

Satisfaction ratings for INCITE Scientific Computing Liaisons are included in Table 30. Ratings of the liaison are favorable, with an overall mean of 4.68 and a satisfaction percentage of 96%. For these aspects, only one user provided a “dissatisfied” rating to the “Response to special requests” aspect. The explanation they provided was “Same unpurged space issue as mentioned above. (i.e., My project could benefit from increased support for automated workflows, and ways to provision resources from an external system.)”

Table 29. *Descriptive Statistics for Satisfaction Ratings of Account Management by Project Allocation and PI*

Aspects of Account Management	INCITE			DD			ALCC			PI-Status			Total			
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	%Sat
Speed of responses to account management queries	116	4.43	0.73	128	4.46	0.72	71	4.48	0.67	59	4.44	0.82	227	4.45	0.72	89%
Effectiveness of response to account management queries	114	4.44	0.67	125	4.49	0.67	70	4.50	0.63	58	4.53	0.68	223	4.47	0.66	91%
Overall account services	116	4.43	0.68	129	4.50	0.66	72	4.49	0.65	59	4.49	0.73	228	4.47	0.67	90%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 30. *Descriptive Statistics for Satisfaction Ratings of INCITE Scientific Computing Liaison by INCITE Project Allocation and PI Status*

Aspects of the INCITE Scientific Computing Liaison	INCITE			No INCITE Project			PI Status			Non-PI Status			Total			
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	%Sat
Speed of initial response to queries	75	4.67	0.58	6	4.67	.816	20	4.80	0.52	61	4.62	.610	81	4.67	.59	94%
Speed of final resolution to queries	75	4.64	0.58	6	4.83	.408	20	4.90	0.31	61	4.57	.618	81	4.65	.57	95%
Quality of technical support	74	4.69	0.55	6	5.00	0.000	20	4.95	0.22	60	4.63	.581	80	4.71	.52	96%
Response to special requests (i.e., scheduling exceptions, quota increases, software installations, etc.)	71	4.63	0.66	6	4.67	.816	20	4.90	0.31	57	4.54	.734	77	4.64	.67	92%
Overall support from your INCITE Scientific Computing Liaison	73	4.66	0.56	6	5.00	0.000	20	4.95	0.22	59	4.59	.591	79	4.68	.54	96%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Communications

Users were generally satisfied with how the OLCF keeps them informed of changes, events, and current issues. Table 31 includes the descriptive statistics for satisfaction ratings of communications overall and by project allocation. The least positive ratings were for the aspect, social media (OLCF Twitter/Facebook: M = 4.29, SD= 0.77, 80% satisfaction).

Two users provided a “Very Dissatisfied" or "Dissatisfied" rating of OLCF communications. Of the two users, one user provided the following explanation: “In completing this survey, I found that there is an OLCF "Hackathon" on OpenACC. I had no idea this was taking place; if I had I might have prepared a team and I would have liked to participate.”

When asked “Do you feel adequately informed about OLCF changes? Please explain.”, 98% (282 out of 288) of users responded that they feel adequately informed of changes while 2% (or 6 users) indicated no, they did not feel adequately informed of changes. Users were asked to explain their responses and of 10 users who provided explanations, 7 had indicated “yes” and 3 had indicated “no”, see Table 32 for qualitative themes. Among those who said “yes”, the most common explanation was “Emails contain needed information” (57%). Among those who said “no”, the most common explanation was “Not enough information provided” (60%).

Table 31. *Descriptive Statistics for Satisfaction Ratings of Communications by Project Allocation and PI*

	INCITE			DD			ALCC			PI-Status			Total			
Aspects of Communications	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	%Sat
E-mail announcements	151	4.55	0.60	141	4.62	0.56	90	4.61	0.57	62	4.63	0.49	279	4.58	0.60	97%
Announcements on the OLCF website	137	4.45	0.64	129	4.53	0.60	83	4.51	0.63	57	4.54	0.57	255	4.47	0.64	93%
Social Media (OLCF Twitter/Facebook)	69	4.29	0.77	69	4.28	0.78	44	4.23	0.86	25	4.16	0.85	133	4.29	0.77	80%
Overall communications	145	4.52	0.57	140	4.56	0.58	88	4.58	0.58	60	4.57	0.53	272	4.54	0.58	96%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 32. *Users' Explanations for Why They Do or Don't Feel Adequately Informed about OLCF Changes*

Do you feel adequately informed about OLCF changes? Please explain.	N = 10	%
Explanations for those who said "yes" (N = 7)		
Emails contain needed information	4	57%
Miscellaneous	3	43%
Explanations for those who said "no" (N = 3)		
Not enough information provided	2	67%
Not easy to find information needed on webpage	1	33%

When asked “Do you feel adequately informed about OLCF events? Please explain.”, 98% (282 out of 287) of users responded that they feel adequately informed of events while <2% (or 5 users) indicated no. Table 33 includes the breakdown summary for 7 users who explained their response (5 said “yes” and 2 said “no”). Among those who said “yes”, the most common explanation was “Emails contain needed information” (60%).

Table 33. *Users’ Explanations for Why They Do or Don’t Feel Adequately Informed about OLCF Events*

Do you feel adequately informed about OLCF events? Please explain.	N = 7	%
Explanations for those who said "yes" (= 5)		
Emails contain needed information	3	60%
Miscellaneous	2	40%
Explanations for those who said "no" (*n* = 2)		
Miscellaneous	2	100%

When asked “Do you feel adequately informed about current issues? Please explain.”, roughly 98% (279 out of 286) of users responded that they feel adequately informed of current issues while 2% (7 users) indicated no. Of users providing explanations for their ratings (n = 6), 3 users had responded with yes and 3 users had responded with no, see Table 34. Among those who said “yes”, the most common explanation was “Emails contain needed information” (67%).

Table 34. *Users’ Explanations for Why They Do or Don’t Feel Adequately Informed about Current Issues*

Do you feel adequately informed about current issues? Please explain.	N = 6	%
Explanations for those who said "yes" (*n* = 3)		
Emails contain needed information	2	67%
Miscellaneous	1	33%
Explanations for those who said "no" (*n* = 3)		
Clarify scratch cleanout schedule	3	100%

Training

A total of 284 (91%) of survey respondents provided a response to the question, “How do you prefer to receive training?” (see *Figure 3*). The majority of users who responded prefer online documentation (*n* = 223, 79%) or online training (*n* = 177, 62%).

Out of the 291 who indicated the most convenient time to attend a training event, the majority of respondents indicated no preference (*n* = 190, 65%), and roughly one-quarter (n = 69, 24%) indicated the summer was the most convenient time.

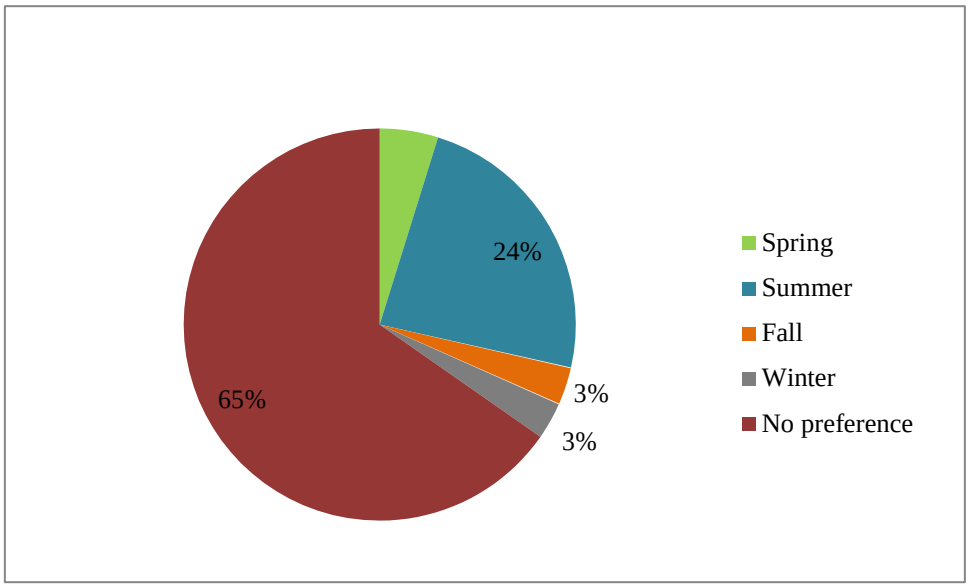

Figure 4. Most Convenient Time to Attend a Training Event.

A total of 52 users indicated that they had participated in OLCF training during the 2014 calendar year. Of these users, 28 (55%) said they would recommend attending a future OLCF training event in person, 22 (43%) said maybe, and 1 person said no.

When asked "What training topic(s) would you like to see offered in the future?" 16 topics were suggested by more than one user (Table 35). The top three suggestions provided include: "GPUs" (27%), "Parallelization" (12%), and "Debugging" (12%).

Table 35. *Users' Suggestions for Training Topics They Would Like to See Offered by the OLCF in the Future*

What training topic(s) would you like to see offered in the future?	N = 81	%
GPUs	22	27%
Parallelization	10	12%
Debugging	10	12%
MPI or Open MP	9	11%
Info and updates on OLCF systems	7	9%
OpenACC	6	7%
Compiling	6	7%
Profiling	6	7%
Performance	4	5%
Data analysis and management	4	5%
No preference	4	5%
I/O	3	4%
CUDA	3	4%
Basic pre-training knowledge	2	2%
Hackathons	2	2%
C++	2	2%
Satisfied with current offerings	2	2%
Don't know	1	1%

Miscellaneous	14	17%

Note. Users add up to more than 100% because some provided more than one theme in their response.

Users were asked to provide satisfaction ratings for their overall satisfaction with OLCF and five specific training aspects (Table 36). Satisfaction ratings for overall satisfaction was positive (M = 4.39, SD = 0.65, 93% satisfaction). The lowest satisfaction rating for training aspects was for monthly user conference calls (M = 4.13, SD = 0.81, 73% satisfaction.

Table 36. *Descriptive Statistics for Satisfaction Ratings of Training Aspects by Project Allocation and PI*

Aspects of Trainin	INCITE N	INCITE M	INCITE SD	DD N	DD M	DD SD	ALCC N	ALCC M	ALCC SD	PI-Status N	PI-Status M	PI-Status SD	Total N	Total M	Total SD	Total %Sat*
Getting Started Guide	125	4.42	.70	120	4.48	.62	75	4.52	.55	45	4.58	.69	233	4.45	.65	93%
Web Tutorials	103	4.28	.72	105	4.44	.59	62	4.48	.57	39	4.51	.68	196	4.36	.66	92%
Training Events	80	4.21	.76	86	4.36	.75	44	4.30	.77	38	4.34	.78	153	4.25	.77	82%
Archived Training Event Slides	79	4.24	.87	86	4.37	.72	46	4.33	.73	35	4.37	.73	154	4.27	.79	86%
Monthly User Conference Calls	56	4.04	.83	73	4.19	.79	35	4.23	.81	32	4.19	.86	119	4.13	.81	73%
Overall satisfaction with OLCF training	124	4.33	.68	121	4.48	.61	73	4.40	.60	46	4.52	.72	229	4.39	.65	93%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

OLCF Website

Users provided satisfaction ratings for User Support aspects of the OLCF website (Table 37) Overall, users were generally satisfied with the user support information provided on the OLCF website. The user support aspects with the lowest satisfaction scores were for searchable knowledge base, software pages, and My OLCF. Means for these items ranged from 4.26 to 4.33 and satisfaction percentages ranged from 85% to 87%.

If a user rated any of the aspects of User Assistance (help@olcf.ornl.gov or (865)241-6536) with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 38). Of 14 users who indicated “Very Dissatisfied" or "Dissatisfied" with one or more aspects of User Assistance (help@olcf.ornl.gov or (865)241-6536), 13 provided explanations for their dissatisfaction. The two most common responses themes included “Trouble finding what I am looking for” (54%) and “Inadequate documentation” (23%).

Table 37. *Descriptive Statistics for Satisfaction Ratings of User Support Aspects of OLCF Website by Project Allocation and PI*

	INCITE			DD			ALCC			PI-Status			Total			
Aspects of OLCF Website	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	%Sat
System user guides	150	4.43	0.70	144	4.47	0.65	91	4.59	0.54	57	4.46	0.78	279	4.47	0.65	94%
Searchable knowledge base:	133	4.26	0.82	134	4.32	0.76	84	4.23	0.78	49	4.33	0.83	253	4.26	0.79	85%
Software pages	136	4.32	0.71	135	4.34	0.70	81	4.40	0.66	54	4.41	0.69	256	4.33	0.71	87%
OLCF system status	145	4.40	0.68	140	4.50	0.63	86	4.43	0.71	56	4.61	0.59	267	4.45	0.67	92%
My OLCF	121	4.33	0.66	129	4.33	0.84	78	4.21	0.84	54	4.26	0.99	233	4.30	0.79	88%
Overall rating of User Support info on the OLCF website	146	4.38	0.69	141	4.44	0.65	88	4.44	0.58	57	4.44	0.78	273	4.40	0.65	93%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 38. *Users' Explanations for Dissatisfaction with User Assistance (help@olcf.ornl.gov or (865)241-6536)*

If you rated any of the aspects of the User Assistance (help@olcf.ornl.gov or (865) 241-6536) with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 13	%
Trouble finding what I am looking for	7	54%
Inadequate documentation	3	23%
Trouble accessing My OLCF	2	15%
Suggestion	2	15%

Note. Users add up to more than 100% because some provided more than one theme in their response.

Additionally, users were asked to provide satisfaction ratings for the OLCF Website overall as well as aspects of a) ease of navigation, b) accuracy of information, and c) timeliness of information. Descriptive statistics for ratings are provided in Table 39 for all users as well as by project allocation. Overall users were generally satisfied with the website, with less satisfied ratings provided for ease of navigation (M = 4.21, SD = 0.79, 83% satisfied).

If a user rated any of the aspects of the OLCF Website, http://olcf.ornl.gov, with “Very Dissatisfied" or "Dissatisfied," they were asked to explain their rating (Table 40). Of 18 users who were “Very Dissatisfied" or "Dissatisfied" with one or more aspects of the OLCF Website, http://olcf.ornl.gov, 7 provided explanations for their dissatisfaction. The two most common responses themes included “Hard to find things on the website” (57%) and “Software and general usage information are out of date” (29%).

Table 39. *Descriptive Statistics for Satisfaction Ratings of the OLCF Website by Project Allocation and PI*

	INCITE			DD			ALCC			PI-Status			Total			
Aspects of the OLCF Website	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	%Sat
Ease of navigation	151	4.17	0.83	143	4.24	0.79	93	4.25	0.76	58	4.22	0.88	281	4.21	0.79	83%
Accuracy of information	147	4.36	0.72	140	4.49	0.67	93	4.44	0.62	55	4.49	0.69	276	4.43	0.66	93%
Timeliness of information	148	4.30	0.77	140	4.42	0.71	92	4.41	0.60	57	4.40	0.82	275	4.37	0.70	90%
Overall satisfaction with the OLCF website	149	4.28	0.75	140	4.37	0.69	90	4.39	0.57	58	4.36	0.72	275	4.35	0.68	91%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Table 40. *Users' Explanations for Dissatisfaction with the OLCF Website, http://olcf.ornl.gov*

If you rated any of the aspects of the OLCF Website, http://olcf.ornl.gov with "Very Dissatisfied" or "Dissatisfied," please explain your rating.	N = 7	%
Hard to find things on the website	4	57%
Software and general usage information are out of date	2	29%
Outdated documentation	1	14%

When asked “What additional services or information would you like to have available on the OLCF website?” eight topics were suggested by more than one user (Table 41). The top suggestion provided was “More information about allocations and tools” (18%). Fifteen percent of respondents (*n* = 6) said that nothing additional was needed in terms of services or information. Eight percent of users each requested the following topics, “Better/easier interaction with support staff”, “Tutorials”, and “Machine downtime status indicators needed.”

Table 41. *Users’ Suggestions for Additional Services or Information They Would Like to Have Available on the OLCF Website*

What additional services or information would you like to have available on the OLCF website?	N = 39	%
More information about allocations and tools	7	18%
Better/easier interaction with support staff	3	8%
Tutorials	3	8%
Machine downtime status indicators needed	3	8%
Example batch scripts	2	5%
Better communication about issues	2	5%
Better website organization	2	5%
Gear materials toward non-computer scientist users	2	5%
Not sure	2	5%
Not applicable	3	8%
Nothing additional needed	6	15%
Miscellaneous	4	10%

Data Analysis, Visualization, and Workflow

Users were somewhat satisfied with the aspects of data analysis, visualization, and workflow, see Table 42. Overall means ranged from 4.10 to 4.25 with satisfaction percentages ranging from 75% to 82%. Users were asked to indicate where they analyze data produced by OLCF jobs. Of 286 users providing a response to the question, 28 (9%) indicated that they do not need data analysis. Of the users indicating need, 22 (9%) indicated producing all analyses at OLCF, 44 (17%) indicated producing most at OLCF, and 44 (17%) indicating producing half at OLCF. The majority of users indicated that they produce all analysis elsewhere (*n* = 66, 26%) or most elsewhere (*n* = 68, 26%).

Table 42. *Descriptive Statistics for Satisfaction Ratings for Aspects of Data Analysis, Visualization, and Workflow by Project Allocation and PI*

Aspects of Data Analysis, Visualization, and Workflow	INCITE			DD			ALCC			PI-Status			Total			
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	%Sat
Data analysis and visualization assistance (one-on-one)	46	4.20	0.83	53	4.21	0.79	37	4.30	0.81	24	4.38	0.82	97	4.25	0.79	80%
Ability to perform data analysis	73	4.12	0.71	72	4.04	0.85	52	4.21	0.85	29	4.17	0.93	142	4.13	0.82	82%
Ability to perform project workflows	71	4.01	0.82	65	4.06	0.83	45	4.18	0.86	22	4.09	0.81	130	4.10	0.82	75%
OLCF hardware for your data analysis, visualization, and workflow needs	75	4.09	0.77	69	4.09	0.76	50	4.26	0.69	26	4.23	0.71	140	4.15	0.76	82%
Tools for your data analysis, visualization, and workflow needs	70	4.10	0.73	71	4.03	0.84	51	4.29	0.70	28	4.07	0.98	139	4.13	0.78	80%

Note. *%Sat is the percentage of respondents indicating Satisfied or Very Satisfied.

Ninety-four percent of users (n = 270 out of 286) indicated that they had not taken advantage of the OLCF cross-platform submission capabilities in their workflow with 16 (6%) indicating that they had. Those who responded yes were then asked, “Do you have any suggestions for improving the OLCF cross-platform submission capabilities?”

When asked “Why haven't you taken advantage of the OLCF cross-platform submission capabilities in your workflow?” 167 of the 270 users who indicated not having taken advantage of the OLCF cross-platform submission capabilities in their workflow chose to provide an explanation (Table 43). The most two common responses included “I do not need to use the OLCF cross-platform submission capabilities in my workflow/not applicable” (43%) and “I do not/did not know/know enough about this capability” (38%).

Table 43. *Users' Explanations for Why They Haven't Taken Advantage of the OLCF Cross-Platform Submission Capabilities in Their Workflow*

Why haven't you taken advantage of the OLCF cross-platform submission capabilities in your workflow?	N = 167	%
I do not need to use the OLCF cross-platform submission capabilities in my workflow/not applicable	72	43%
I do not/did not know/know enough about this capability	63	38%
Have not had time/opportunity to use yet/just started using/will look into using	15	9%
Titan is sufficient	6	4%
Do not have an allocation/access	3	2%
It is more complicated than what I do	3	2%
My project application focused on Titan	2	1%
Miscellaneous	7	4%

While the largest proportion of users (24%) indicated that no additional data analysis, visualization, and/or workflow services are needed, 20% of respondents to this question (n = 11) responded with "miscellaneous data analysis services", 17% responded with "miscellaneous visualization services", and 13% responded with "miscellaneous workflow services." (See Table 44).

Table 44. *Users' Suggestions for Additional Data Analysis, Visualization, and/or Workflow Services they Would Like the OLCF to Provide*

What additional data analysis, visualization, and/or workflow services would you like the OLCF to provide?	N = 54	%
No additional services needed	13	24%
Miscellaneous data analysis services	11	20%
Miscellaneous visualization services	9	17%
Not applicable	8	15%
Miscellaneous workflow services	7	13%
Don't know	4	7%
Satisfied	3	6%
Miscellaneous other	3	6%

Note. Users add up to more than 100% because some provided more than one theme in their response

Overall OLCF Services

When asked "What OLCF services and/or resources contribute most to the success of your OLCF project?" all users who responded (n = 123) listed OLCF compute resources, see Table 45. The top three response themes that fit the category "OLCF compute resources" included: "Titan" (34%), "general compute resources" (11%), and "large number of compute nodes/cores" and "software" (both with 9%). Forty-six percent of users (n = 57) who responded listed OLCF support services. The top three response themes that fit the category "OLCF support services" included: "support/assistance" (33%), "online documentation/webpage" (7%), and "batch queue system" (3%). Refer to Table 45 for all themes of users' responses to this question.

Table 45. *OLCF Services and/or Resources that Contribute Most to the Success of OLCF Users' Projects*

What OLCF services and/or resources contribute most to the success of your OLCF project?	N = 123	%
OLCF compute resources	123	100%
Titan	42	34%
General compute resources	14	11%
Large number of compute nodes/cores	11	9%
Software	11	9%
Performance	9	7%
Computing time	9	7%
Rhea	9	7%
Stability/reliability of the systems	7	6%
Eos	6	5%
GPUs	5	4%
OLCF support services	57	46%
Support/assistance	41	33%
Online documentation/webpage	9	7%
Batch queue system	4	3%
Training	3	2%
OLCF data resources	10	8%
HPSS/HSI	5	4%
Data Transfer Nodes/DTNs	3	2%
Lustre/Atlas	2	2%
Miscellaneous	5	4%

While the largest proportion of users (25%) indicated that no additional services and/or resources are needed to enhance their experience at the OLCF, 10% of respondents to this question (n = 7) responded with "More documentation/improve website" and 9% responded with "Enhanced user support/list of contacts." Coding of responses is provided in Table 46.

Table 46. *Users' Suggestions for Additional Services and/or Resources Needed to Enhance Their Experience at the OLCF*

What additional services and/or resources are needed to enhance your experience at the OLCF?	N = 67	%
No additional needs	17	25%
More documentation/improve website	7	10%
Enhanced user support/list of contacts	6	9%
Not sure	4	6%
More development of GPU resources	4	6%
More memory	4	6%
Training	3	4%
Better performance	3	4%
Data transfer to home institutions/faster data transfer	3	4%
Stability/reliability of systems	2	3%
Continue allocation programs	2	3%
Increase walltime/core hours	2	3%
Review queue policy	2	3%
Miscellaneous	10	15%

Looking to the Future

The final section of the survey was designed to understand how important certain aspects of the OLCF are to users as well as how likely users are to use each aspect. For each aspect, the number of individuals indicating “I will use this”, “I will not use this”, or “I do not know” were found. Then the frequency and percentage of users providing importance ratings (very important, somewhat important, or not important) were provided according to utilization. Importance ratings for those indicating they will use an aspect are provided in Table 47, sorted by frequency of use, are provided in Table 48 for users indicating “I will not use this”, and provided in

Table 49 for user indicating “I do not know.” An evident trend within the tables is that users who indicate usage tended to also rate the aspect as important whereas users that did not intend to use the aspect tended to rate the aspect as not important. User who did not know if they would use an aspect also tended to be in the middle for how important the aspect was.

The largest majority of users indicated that they would use long-term data retention (*n* = 191, 73%), I/O bandwidth to local disk (*n* = 179, 69%) and archival storage space (*n* = 160, 60%). The least reported aspect for use (or for unknown use) were for general public access to your data over the web (*n* = 82 for “no” and *n* = 114 for “I don’t know”, total of 81%), access for collaborators to your data over the web (*n* = 54 for “no” and *n* = 104 for “I don’t know”, total of 65%), and access for your specific OLCF project members to your data over the web (*n* = 48 for “no” and *n* = 87 for “I don’t know”, total of 56%)

Table 47. *Numbers and Percentages of Importance Ratings of Data Aspects for Respondents Indicating "I will use this"*

Aspects of Respondents Indicating "I will use this"	Total	Will Use		Very Important		Somewhat Important		Not Important	
	N	N	%	N	%	N	%	N	%
Long-term data retention	260	191	73%	137	72%	52	28%	0	0%
I/O bandwidth to local disk	259	179	69%	123	69%	53	30%	1	1%
Archival storage space (i.e., long term tape storage)	268	160	60%	111	70%	44	28%	3	2%
Access to a large shared-memory system for data analysis & visualization	272	139	51%	94	69%	40	29%	3	2%
Access for your specific OLCF project members to your data over the web	259	132	51%	76	58%	53	41%	1	1%
Long-term data curation	271	128	47%	84	67%	41	33%	0	0%
Access for collaborators to your data over the web	265	123	46%	71	58%	47	39%	4	3%
Workflow tools/libraries	272	122	45%	79	66%	40	33%	1	1%
Filesystem metadata performance (changing or reading information about files)	275	121	44%	82	69%	37	31%	0	0%
Data management tools	271	117	43%	72	63%	41	36%	2	2%
Analysis and visualization assistance from the OLCF	266	108	41%	57	54%	46	44%	2	2%
Access to a system with GPUs specifically for data analysis & visualization	279	97	35%	58	61%	33	35%	4	4%
Dedicated workflow machines	278	90	32%	50	57%	34	39%	3	3%
Access to databases at the OLCF	279	85	30%	44	54%	33	41%	4	5%
General public access to your data over the web	281	75	27%	40	54%	31	42%	3	4%

Note. Some users who indicated they would use aspects of data, did not provide a rating of importance. Percentages of importance are based on the total number of users who indicated using and provided importance ratings.

Table 48. *Numbers and Percentages of Importance Ratings of Data Aspects for Respondents Indicating "I will not use this"*

Aspects for Respondents Indicating "I will not use this"	Total	Not Use		Very Important		Somewhat Important		Not Important	
	N	N	%	N	%	N	%	N	%
General public access to your data over the web	244	82	34%	4	5%	8	10%	68	85%
Access for collaborators to your data over the web	243	54	22%	1	2%	5	11%	40	87%
Access for your specific OLCF project members to your data over the web	241	48	20%	1	2%	6	13%	38	84%
Long-term data retention	244	47	19%	0	0%	3	18%	14	82%
Long-term data curation	240	45	19%	0	0%	4	14%	24	86%
Access to databases at the OLCF	234	45	19%	0	0%	5	11%	40	89%
Workflow tools/libraries	239	37	15%	0	0%	5	16%	27	84%
Dedicated workflow machines	237	33	14%	0	0%	3	9%	30	91%
Data management tools	234	33	14%	0	0%	6	20%	24	80%
Analysis and visualization assistance from the OLCF	239	32	13%	1	2%	11	23%	35	74%
Access to a large shared-memory system for data analysis & visualization	240	32	13%	1	3%	9	24%	27	73%
Access to a system with GPUs specifically for data analysis & visualization	238	30	13%	2	4%	7	13%	44	83%
Filesystem metadata performance (changing or reading information about files)	236	28	12%	1	3%	6	19%	24	77%
Archival storage space (i.e., long term tape storage)	236	18	8%	1	3%	4	13%	26	84%
I/O bandwidth to local disk	235	10	4%	0	0%	5	50%	5	50%

Note. Some users who indicated they would not use aspects of data, did not provide a rating of importance. Percentages of importance are based on the total number of users who indicated 'I will not use' and provided importance ratings.

Table 49. *Numbers and Percentages of Importance Ratings of Data Aspects for Respondents Indicating "I do not know"*

Respondents Indicating "I will not use this"	Total	Do Not Know		Very Important		Somewhat Important		Not Important	
	N	N	%	N	%	N	%	N	%
General public access to your data over the web	244	114	47%	1	1%	29	35%	53	64%
Access for collaborators to your data over the web	243	104	43%	3	4%	40	58%	26	38%
Access for your specific OLCF project members to your data over the web	241	87	36%	4	7%	37	64%	17	29%
Long-term data retention	244	87	36%	5	15%	20	61%	8	24%
Long-term data curation	240	87	36%	6	8%	45	61%	23	31%
Access to databases at the OLCF	234	85	36%	2	2%	54	57%	38	40%
Workflow tools/libraries	239	84	35%	2	3%	48	62%	28	36%
Dedicated workflow machines	237	83	35%	3	3%	64	62%	37	36%
Data management tools	234	83	35%	3	4%	51	64%	26	33%
Analysis and visualization assistance from the OLCF	239	73	31%	5	6%	48	61%	26	33%
Access to a large shared-memory system for data analysis & visualization	240	64	27%	3	5%	36	60%	21	35%
Access to a system with GPUs specifically for data analysis & visualization	238	64	27%	3	4%	43	52%	37	45%
Filesystem metadata performance (changing or reading information about files)	236	46	19%	1	1%	48	63%	27	36%
Archival storage space (i.e., long term tape storage)	236	43	18%	1	3%	27	69%	11	28%
I/O bandwidth to local disk	235	35	15%	1	2%	34	83%	6	15%

Note. Some users who indicated 'I do not know' for utilizing aspects of data, did not provide a rating of importance. Percentages of importance are based on the total number of users who indicated 'I do not know' and provided importance ratings.

When asked if they run their own code, 73% (202 of 277) of users who responded to the question said "Yes." Those users were then asked to give the name and a brief description of the code they run. 91% (183) of users responded with the name and description of one or more codes. Of the codes listed, 22 were listed by one or more users (Table 50).

Table 50. *Codes OLCF Users Run*

If you develop your own code, please give the name and description of the code, i.e. S3D – direct numerical simulation combustion code.	N = 183	%
GTC (Gyrokinetic Toroidal Code)	8	4%
S3D	8	4%
CESM	7	4%
CHIMERA	5	3%
LSDALTON	4	2%
CASINO	4	2%
MPACT (Michigan Parallel Characteristics based Transport)	4	2%
LAMMPS (and extensions for LAMMPS)	4	2%
AWP-ODC	3	2%
ACME - Accelerated Climate Model for Energy	3	2%
XCG1	3	2%
VERA	3	2%
NAMD	3	2%
AMBER	2	1%
tdslda	2	1%
Vorpal.	2	1%
Chroma	2	1%
CHARMM	2	1%
PSC - plasma particle-in-cell code	2	1%
QMCPACK	2	1%
Maestro	2	1%
Denovo and Shift	2	1%
Miscellaneous	128	70%

Note. Users add up to more than 100% because some provided more than one theme in their response.

Fifty-seven percent (104 of 183) of respondents who run their own code and chose to list the name of the code they develop also indicated that the code they listed currently utilizes GPU acceleration. These users were also asked to indicate which GPU programming technologies they are using. The majority (81%) said they use Cuda, while 32% reported using OpenACC and 9% reported using OpenCL. An additional 13% reported using other GPU programming technologies (see Table 51).

Table 51. *Other GPU Programming Technologies OLCF Users Run*

Miscellaneous (*n* = 13)
PTX and SASS
Legion(S3D), Cuda? for XGC1
We use CUDA and MPI-CUDA, depending on the specific application.
Legion
CUDA Fortran
PGI fortran. [Very limited OpenACC, CUDA.]
cuBLAS
Legion
CULA
NVIDIA Thrust library
OpenGL rasterization, OptiX ray tracing, NVENC hardware-accelerated video encoding
system software hooks for GPUs
Most work on Titan has been without use of GPUs. More recently I have ported some parts of IFS, the spectral transform method, using cuFFT and DGEMM_ACC.

Users who run their own code and have no plans to use GPU programming technologies were asked to explain why they do not plan on using GPU acceleration. The top three most common themes among respondents' comments were "Have not had a chance to use yet" (20%), "Performance issues" (20%), and "Still testing code" (15%). Refer to Table 52 for themes.

Table 52. *Reasons Why Users Do Not Plan to Utilize GPU Accelerator Technologies?*

If you develop your own code and have no plans to utilize GPU programming technologies, could you tell us the reasons why not?	N = 55	%
Have not had a chance to use yet	11	20%
Performance issues	11	20%
Still testing code	8	15%
Do not need	6	11%
Plan to use, but have not had a chance yet	4	7%
Lack of familiarity	4	7%
Do not benefit through time savings	4	7%
GPU implementation is ongoing	3	5%
Not applicable - others are leading the code development	2	4%
Need more resources/assistance	2	4%

General Comments

When asked to respond to what area(s) need improvement to enhance your experience at the OLCF, just over 20% of users indicated that the OLCF Compute Systems (Titan, Eos, and Rhea) and the OLCF Storage Systems (HPSS, Lustre/Atlas) could be improved, see Table 53. Approximately 25 users indicated that Data Analysis & Visualization, Training, and the Website could be improved. Of the 8 users who indicated other, 7 provided open-ended feedback (see Appendix D).

Table 53. *Numbers Indicating Improvement Needs to Enhance OLCF Experience*

	N	% of 153	% of 312
OLCF Compute Systems (Titan, Eos, and Rhea)	71	46%	23%
OLCF Storage Systems (HPSS, Lustre/Atlas)	64	42%	21%
Data Analysis & Visualization	26	17%	8%
Training	25	16%	8%
Website	25	16%	8%
User Assistance Center	16	10%	5%
Account Support	11	7%	4%
End-to-End Workflow Team Support	11	7%	4%
INCITE Scientific Computing Liaison Support	10	7%	3%
Other	8	5%	3%
Communications	4	3%	1%
Visualization Liaison Support	4	3%	1%

Note. While 153 users responded to this question, it was a check all that apply item, so percentages are presented out of 153 (total number of users who checked a box or provided a description for the response option "other" as well as 312 (all survey respondents) since not checking any boxes could be considered indicating no improvement is needed.

When asked to provide comments on anything important that is not covered in the survey, 10% of respondents were satisfied with the OLCF, while the largest proportion of respondents (23%) shared miscellaneous comments (Table 54).

Table 54. *Other Feedback Not Addressed Elsewhere in the Survey*

If there is anything important to you that is not covered in this survey, please tell us about it here.	N = 31	%
Miscellaneous	7	23%
Satisfied	3	10%
Survey comments	3	10%
Queue policy	2	6%
Not applicable/no	16	52%

Appendix

OLCF 2014 User Survey

This survey is conducted by Oak Ridge Institute of Science and Education (ORISE) staff to provide the Oak Ridge Leadership Computing Facility (OLCF) with valuable information. Your name will not be associated with any responses given unless you grant specific permission to ORISE to share the data. Thank you in advance for your time and feedback.

Section I: User Demographics

1. Name and username
   First: Last: _____
   Username: _____
   _____
2. E-mail address:

3. The OLCF takes your feedback very seriously. In some cases, it might be necessary for OLCF staff to contact you for more information in order to address specific issues indicated in your survey responses. If this situation arises, please indicate below if you grant your permission for ORISE to release your identity to OLCF staff.
   - Yes, ORISE can release my name to OLCF staff.
   - No, ORISE cannot release my name to OLCF staff.

4. How long have you been an OLCF user?
   - Less than 1 year
   - 1-2 years
   - Greater than 2 years

5. Which OLCF Support service(s) did you utilize during the 2014 calendar year: *(Check all that apply)*
   - User Assistance Center (help@olcf.ornl.gov/(865)241-6536)
   - INCITE Scientific Computing Liaison
   - Visualization Liaison
   - End-to-End Workflow Team
   - I have not used any of the support services to date.

Section II: Overall Satisfaction with the OLCF

6. Rate your satisfaction with the following:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Overall satisfaction with the OLCF						
Overall satisfaction with OLCF compute resources (Titan, Rhea, and Eos)						
Overall satisfaction with OLCF data resources (Atlas, HPSS, DTNs, etc)						
Overall satisfaction with OLCF services (support, training, communications, website, etc.)						

7. If you rated any of the item(s) in the previous question with “Very Dissatisfied” or “Dissatisfied,” please explain your rating.

Section III: OLCF HPC Resources

8. Please rate your overall satisfaction with the following aspects of OLCF HPC compute and data resources:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Sufficient notice given prior to scheduled maintenance						
Sufficient project disk space						
Ease of transferring data to/from the OLCF						
Bandwidth offered by the OLCF						

9. If you rated any aspect(s) of OLCF computer and data resources in the previous question with "Very Dissatisfied" or "Dissatisfied", please explain your rating.

10. Compared to the previous year, which of the following statements best reflects your opinion regarding the performance of OLCF compute and data resources?
    - I have noted overall improvements in the performance of OLCF compute and data systems.
    - The performance of OLCF compute and data systems is about the same as it was last year.
    - I have noted overall decreases in performance of the OLCF compute and data systems.

Survey Page 2

Titan

1. Did you utilize Titan during the 2014 calendar year?
    - Yes
    - No (skip to question 4)

2. Rate your satisfaction with the following aspects of Titan:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Batch wait time						
Batch queue structure						
Job success rate						
Frequency of scheduled outages						
Frequency of (unanticipated) unscheduled outages						
Performance tools						
Debugging tools						
Data analysis software						
Software/libraries						
Programming environment						
Scratch configuration						
I/O performance						
Overall satisfaction with Titan						

3. If you rated any aspect(s) of Titan in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

Eos

4. Did you utilize Eos during the 2014 calendar year?
    - Yes
    - No (skip to question 7)

5. Rate your satisfaction with the following aspects of Eos:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Batch wait time						
Batch queue structure						
Job success rate						
Frequency of scheduled outages						
Frequency of (unanticipated) unscheduled outages						
Performance tools						
Debugging tools						
Data analysis software						
Software/libraries						
Programming environment						
Scratch configuration						
I/O performance						
Overall satisfaction with Titan						

6. If you rated aspect(s) of Eos in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

7. If you have made little use or not utilized Eos at all, is there a specific reason why?

Rhea

8. Did you utilize Rhea during the 2014 calendar year?
   - Yes
   - No (skip to question 11)

9. Rate your satisfaction with the following aspects of Rhea:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Batch wait time						
Batch queue structure						
Job success rate						
Frequency of scheduled outages						
Frequency of (unanticipated) unscheduled outages						
Performance tools						
Debugging tools						
Data analysis software						
Software/libraries						
Programming environment						
Scratch configuration						
I/O performance						
Overall satisfaction with Titan						

10. If you rated aspect(s) of Rhea in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

11. If you have made little use or not utilized Rhea at all, is there a specific reason?

Survey Page 3

Data Transfer Nodes

1. Did you utilize Data Transfer Nodes during the 2014 calendar year?
   - Yes
   - No (skip to question 4)

2. If you utilized Data Transfer Nodes during the 2014 calendar year, rate your satisfaction using them.
   a. Very Satisfied
   b. Satisfied
   c. Neutral
   d. Dissatisfied
   e. Very Dissatisfied
   f. Not Applicable

3. If you rated the Data Transfer Nodes in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

HPSS

4. Did you utilize HPSS during the 2014 calendar year?
   a. Yes
   b. No (skip to question 7)

5. If you utilized HPSS during the 2014 calendar year, rate your satisfaction with the following aspects:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
hsi interface						
htar interface						
Ability to store files						
Ability to retrieve files						
Reliability (data integrity)						
Time to store files						
Time to retrieve files						
Frequency of scheduled outages						
Frequency of (unanticipated) unscheduled outages						
Overall satisfaction with HPSS						

6. If you rated aspect(s) of HPSS in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

Lustre/Atlas Scratch Filesystem

7. Did you utilize HPSS during the 2014 calendar year?
   a. Yes
   b. No (skip to question 10)

8. If you utilized HPSS during the 2014 calendar year, rate your satisfaction with the following aspects:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Size						
I/O bandwidth						
File and directory operations						
Reliability (data integrity)						
Frequency of scheduled outages						
Frequency of (unanticipated) unscheduled outages						
Overall satisfaction with Lustre/Atlas filesystem						

9. If you rated any of the item(s) in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

Improving HPC Resources

10. Please describe how the OLCF can improve your experience using any of the HPC resources (i.e., Titan, Eos, Rhea, DTNs, HPSS, Lustre/Atlas) and/or tell us if any additional resources are needed.

Section IV: OLCF Services

1. Approximately how many total queries have you submitted (via phone or email) to the OLCF during the 2014 calendar year?
   - 0
   - 1-5
   - 6-10
   - 11-20
   - Greater than 20

User Assistance

2. Rate your satisfaction with the following aspects of the User Assistance (help@olcf.ornl.gov or (865)241-6536):	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Speed of initial response to queries						
Speed of final resolution to queries						
Quality of technical information						
Response to special requests (i.e., scheduling exceptions, quota increases, software installations, etc.)						
Overall consulting services						

3. If you rated any of the item(s) in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

Account Management

4. Rate your satisfaction with the following aspects of Accounts and Allocations:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Speed of responses to account management queries						
Effectiveness of response to account management queries						
Overall account services						

5. If you rated any of the item(s) in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

INCITE Scientific Computing Liaisons

6. Does your project have an assigned INCITE Scientific Computing Liaison?
   - Yes
   - No (skip to question 9)

7. Rate your satisfaction with the following aspects of your INCITE Scientific Computing Liaison:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Speed of initial response to queries						
Speed of final resolution to queries						
Quality of technical support						
Response to special requests (i.e., scheduling exceptions, quota increases, software installations, etc.)						
Overall support from your INCITE Scientific Computing Liaison						

8. If you rated any of the item(s) in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

Communications

9. Rate your satisfaction with the following aspects of Communications which relate to how the OLCF keeps you informed of changes, events, and current issues:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
E-mail announcements						
Announcements on the OLCF website						
Social Media (OLCF Twitter/ Facebook)						
Overall communications						

10. If you rated any of the item(s) in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

11. Do you feel adequately informed about:	Yes	No	Please Explain
Speed of initial response to queries			
Speed of final resolution to queries			
Quality of technical information			
Response to special requests (i.e., scheduling exceptions, quota increases, software installations, etc.)			

Training

12. How do you prefer to receive training? *(Please check all that apply.)*
    - Live – in person
    - Live – via web
    - Online training
    - Online documentation
    - Other, please specify _____

13. What is the most convenient time to attend a training event?
    - Spring
    - Summer
    - Fall
    - Winter
    - No preference

14. Did you participate in an OLCF training event during the 2014 calendar year?
    - Yes
    - No (skip to question 16)

15. Based on your previous experience, would you recommend attending a future OLCF training event in person?
    - Yes
    - No
    - Maybe

16. What training topic(s) would you like to see offered in the future?

17. Rate your satisfaction with the following aspects of Training:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Getting Started Guide: https://www.olcf.ornl.gov/support/gettingstarted/						
Web Tutorials: https://www.olcf.ornl.gov/support/tutorials/						
Training Events: https://www.olcf.ornl.gov/support/trainingevents/						
Archived Training Event Slides: https://www.olcf.ornl.gov/support/trainingevents/						
Monthly User Conference Calls						
Overall satisfaction with OLCF training						

OLCF Website

18. How often do you visit the OLCF Website, http://olcf.ornl.gov?
    - Every day
    - Twice a week
    - Once a week
    - Once a month
    - Less than once a month
    - I have never visited the OLCF website (go to question 24)

19. Rate your satisfaction with the following User Support aspects of the OLCF Website, https://www.olcf.ornl.gov/support/:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
System user guides: https://www.olcf.ornl.gov/support/system-userguides/						
Searchable knowledge base: https://www.olcf.ornl.gov/support/knowledgebase/						
Software pages: https://www.olcf.ornl.gov/support/software/						
OLCF system status: https://www.olcf.ornl.gov/support/						
My OLCF: http://users.nccs.gov						
Overall rating of User Support info on the OLCF website						

20. If you rated any of the item(s) in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

21. Rate your satisfaction with the following aspects of the OLCF Website, http://olcf.ornl.gov:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Ease of navigation						
Accuracy of information						
Timeliness of information						
Overall satisfaction with the OLCF website						

22. If you rated any of the item(s) in the previous question with "Very Dissatisfied" or "Dissatisfied," please explain your rating.

23. What additional services or information would you like to have available on the OLCF website?

Data Analysis, Visualization, and Workflow

24. Rate your satisfaction with the following aspects of data analysis, visualization, and workflow:	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Not Applicable
Data analysis and visualization assistance (one-on-one)						
Ability to perform data analysis						
Ability to perform project workflows						
OLCF hardware for your data analysis, visualization, and workflow needs						
Tools for your data analysis, visualization, and workflow needs						

25. Where do you analyze data produced by your OLCF jobs?
    - All at OLCF
    - All elsewhere
    - Most at OLCF
    - About half at OLCF, half elsewhere
    - Most elsewhere
    - I don't need data analysis

26. Have you taken advantage of the OLCF cross-platform submission capabilities in your workflow?
    - Yes
    - No (skip to question 28)

27. If you answered "Yes" to the above question, do you have suggestions for improvement?

28. If you answered "No" to the question 26 above, why not?

29. What additional data analysis, visualization, and/or workflow services would you like the OLCF to provide?

Overall OLCF Services

30. What OLCF services and/or resources contribute most to the success of your OLCF project?

31. What additional services and/or resources are needed to enhance your experience at the OLCF?

Section V: Looking to the Future

1. For each of the following aspects of data a) indicate how important they are to you and b) your intention for using them:	Importance			Usage		
	Very Important	Somewhat Important	Not Important	I will use this.	I will not use this.	I do not know
General public access to your data over the web						
Access for collaborators to your data over the web						
Access for your specific OLCF project members to your data over the web						
Long-term data retention						
Long-term data curation						
Access to databases at the OLCF						
Workflow tools/libraries						
Dedicated workflow machines						
Data management tools						
Analysis and visualization assistance from the OLCF						
Access to a large shared-memory system for data analysis & visualization						
Access to a system with GPUs specifically for data analysis & visualization						
Filesystem metadata performance (changing or reading information about files)						
Archival storage space (i.e., long term tape storage)						
I/O bandwidth to local disk						

2. Do you develop your own code?
   - Yes
   - No (skip to question 7)

3. Please give the name and description of the code, i.e. S3D – direct numerical simulation combustion code?

4. Does the code you listed above currently utilize GPU acceleration?
   - Yes
   - No (skip to question 6)

5. Which GPU programming technologies are being utilized? *(Check all that apply)*
   - Cuda
   - OpenCL
   - OpenACC
   - Other, please specify

If you answered question 5, skip to question 7.

6. If you develop your own code and have no plans to utilize GPU programming technologies, could you tell us the reasons why not?

Section VI: General Comments

7. What area(s) need improvement to enhance your experience at the OLCF *(Please check all that apply.)*
   - OLCF Compute Systems (Titan, Eos, and Rhea)
   - OLCF Storage Systems (HPSS, Lustre/Atlas)
   - User Assistance Center
   - Account Support
   - INCITE Scientific Computing Liaison Support
   - Communications
   - Training
   - Website
   - Data Analysis & Visualization
   - Visualization Liaison Support
   - End-to-End Workflow Team Support
   - Other, please comment: _____

8. What do you think are the best qualities of the OLCF?

9. Please explain, in detail, any improvements that would enhance your experience at the OLCF.

10. If there is anything important to you that is not covered in this survey, please tell us about it here.