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, 386 users completed the survey out of 1,029 possible respondents, giving an overall response rate of 38%. Findings of the survey are outlined as follows:

User Demographics

- Of the OLCF users who responded to the survey, 375 (97%) reported using one or more of the following systems: XT5 Jaguar (97%), Spider/Lustre file system (45%), HPSS (35%), and Lens (27%).

- Survey respondents' projects were supported by INCITE (55%), Director's Discretion (29%), ALCC (9%), and other sources such as Frost (22%).

Overall Evaluation

- Overall ratings for the Oak Ridge Leadership Computing Facility (OLCF) were positive, as 91% reported being "Satisfied" or "Very Satisfied" with OLCF overall. Only 0.3% reported being "Dissatisfied" and 1% reported being "Very Dissatisfied". On the scale of 1 = Very Dissatisfied to 5 = Very Satisfied, the mean rating was 4.23, a slight increase from 4.16 in 2011.

- With regard to overall satisfaction with OLCF, the percent of satisfied ("Satisfied" and "Very satisfied") respondents has been relatively steady from 2007 (86%) to 2012 (91%)

- 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 46% of responses), computational capacity (found in 39% of responses), and performance (found in 26% of responses) as the respondents' top three choices. In addition to the best qualities of OLCF, respondents were asked what they felt OLCF could do to improve their computing experience. The most prevalent theme identified was related to the systems (44%). The second and third most prevalent themes were the web sites (28%) and training and education (28%).

User Assistance Evaluation

- For support services used, 69% of the 386 respondents reported using the User Assistance Center (UAC), followed by 46% who contacted Account Management staff, 29% who used the Scientific Computing/Liaison service, and 8% who contacted Visualization staff.

- Overall satisfaction with the user support services provided by the OLCF (i.e., UAC, Account Management, Scientific Computing Liaison, and Visualization) was high with an average response of 4.40 (SD = 0.95) 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 4.34 to 4.43.

- Overall satisfaction with the account management provided by the OLCF was also high with an average response of 4.47 (SD = 0.84) on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied. Mean ratings to questions of overall satisfaction with various aspects of account management ranged from 4.47 to 4.49.

Training and Education

- Mean ratings to questions of overall satisfaction with various OLCF training events ranged from 3.70 to 4.33 on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

- The majority of OLCF users said "Yes" (33%) or "Maybe" (58%) to the prospect of attending future OLCF training, based on their previous experience.

- When presented with a list of training topics, respondents' most frequently requested topic was GPU Programming (62%), followed by Tuning and Optimization (53%), and Advanced MPI (49%). OLCF Communications

- Eighty-one percent of respondents who answered a question about their overall satisfaction with communications from the OLCF rated it as satisfied or very satisfied, while only 2% indicated they were dissatisfied.

Communications

- Users were asked to rate communications methods on a scale from 1 = Not useful to 3 = Very useful. Respondents indicated the email message of the week was most useful (Mean = 2.52). A significant percentage of users found most types of communication methods useful, however smartphone apps and Twitter were only found "somewhat useful" or "very useful" by 24% and 10% of users, respectively.

OLCF Web Sites

- Overall, respondents indicated they were moderately satisfied with the main OLCF Web site (M = 4.05, SD = 0.71) and the OLCF Users' Web site (M = 3.96, SD = 0.71).

- Ninety-eight percent of respondents indicated that they had visited the http://olcf.ornl.gov web site. Of these users (119), 33% indicated that they visit the site once a week or more, 15 of whom indicated that they visit the site every day. Only six respondents indicated they had never visited the site.

- Seventy percent of respondents indicated that they had visited the http://users.nccs.gov web site for either project and/or allocation information. Of these users, 9% indicated that they visit the site once a week or more, 1% of whom indicated that they visit the site every day. One-hundred four respondents indicated they had never visited the site.

OLCF Systems

- The majority of XT5 Jaguar PF users (87%) rated their satisfaction with Jaguar's overall system performance as "Satisfied" (54%) or "Very Satisfied" (33%) on the scale of 1 = Very Dissatisfied to 5 = Very Satisfied, with a mean rating of 4.19.

- Regarding maintenance and outages, 86% indicated sufficient notice is given prior to scheduled maintenance. On average across the machines, the majority also indicated that the level/frequency of unanticipated outages and scheduled outages was acceptable, 58% and 61% respectively.

Looking to the Future

- Among the 243 respondents who run their own code, 34% percent (82) reported they have started using GPU programming technologies.

- Forty-eight percent of respondents who do not currently use GPU programming technologies reported that they have started thinking about using them, with the majority reporting that they have started thinking about using either CUDA (47%) or OpenACC (28%).

Introduction

A general survey of all users of the Oak Ridge Leadership Computing Facility (OLCF) at Oak Ridge National Laboratory (ORNL) in 2012 was launched on the Internet September 4th, 2012 and remained open for participation through November 9, 2012. 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).

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. Please note that percentages of response categories may add up to more than 100% due to the allowance of multiple responses to some questions.

User Demographics
While the response rate is 37.5%, there is a good representative sample as shown below. Each segment of users is represented. The majority of users reported using the XT5 Jaguar PF (97%, Table 1) and the User Assistance Center (69%, Table 2). OLCF has a relatively equally balanced distribution of users in terms of their length of time using the systems (Table 3).

Table 1. Systems Used (*n* = 386)

Systems	*n*	%
XT5 Jaguar PF	375	97%
Spider/Lustre file system	174	45%
HPSS	135	35%
Lens	104	27%

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

Table 2. Support Services Used (*n* = 386)

Services	*n*	%
User Assistance Center	265	69%
Account Management Staff	177	46%
Scientific Computing/Liaison	110	29%
Visualization Staff	31	8%

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

Table 3. Length of Time as an OLCF User (*n* = 386)

Years as an OLCF user	*n*	%
Greater than 2 years	162	42%
1 - 2 years	97	25%
Less than 1 year	127	33%

Overall User Satisfaction with OLCF

Users were asked to rate their overall satisfaction with the OLCF. Table 5 contains descriptive statistics by project classification. Mean responses were between 4.16 and 4.24 showing a high degree of satisfaction with OLCF across

project classifications (Table 4). Of the 353 users who responded to this item, a total of 91% (321 respondents) reported being "Satisfied" or "Very Satisfied" with OLCF overall, only one (0.3%) reported being "Dissatisfied," and only four (1%) reported being "Very Dissatisfied".

Table 4. Overall OLCF Evaluation – Descriptive Statistics by Project Classification

Satisfaction with OLCF	n	Mean	Standard Deviation	Variance
INCITE	178	4.24	0.74	0.55
Director's Discretion	99	4.24	0.83	0.70
ALCC	27	4.19	0.92	0.85
Other	70	4.16	0.65	0.42
All Users	353	4.23	0.69	0.48

Note. Rating scale: 1 = Very Dissatisfied to 5 = Very Satisfied.
Note. All Users total is less than total for Project Classifications because some have more than one project type.

User Assistance

Seventy-six percent of the respondents had at least one interaction with the User Assistance Center (UAC) and its staff. The project classification with the highest percentage of users (86%) who had at least one interaction with the UAC was Director's Discretion projects (Table 5).

Table 5. Number of User Assistance Queries by Project Classification

Approximately how many total queries have you forwarded (via phone or e-mail) to the UAC this year?	INCITE (n = 183)	Director's Discretion (n = 100)	ALCC (n = 30)	Other (n = 73)	All Users (n = 364)
	# (%)	# (%)	# (%)	# (%)	# (%)
0	48 (26%)	14 (14%)	6 (20%)	23 (31%)	88 (24%)
1 – 5	108 (59%)	61 (61%)	19 (64%)	41 (56%)	221 (61%)
6 – 10	19 (11%)	13 (13%)	4 (13%)	5 (7%)	36 (10%)
11 – 20	6 (3%)	9 (9%)	1 (3%)	2 (3%)	12 (3%)
Greater than 20	2 (1%)	3 (3%)	0 (0%)	2 (3%)	7 (2%)

Note. All Users total may be more or less than total for Project Classifications either because some did not provide a project classification or some have more than one project type.

When asked to rate their overall satisfaction with the user assistance provided by the OLCF, the average response was 4.40 (*SD* = 0.95) 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 4.34 to 4.43. Among project classifications, users with "Other" projects (*M* = 4.48, *SD* = 0.92) and INCITE projects (*M* = 4.46, *SD* = 0.84*)* were Overall, users reported a high level of satisfaction with OLCF service in providing support the most satisfied (Table 6) and responding to needs.

Table 6. User Assistance Evaluation by Project Classification

Overall, rate your satisfaction with the following aspects of User Assistance:	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Speed of initial response to queries	4.52 (0.86)	4.43 (1.05)	4.33 (0.92)	4.39 (0.94)	4.43 (0.95)
Speed of final resolution to queries	4.48 (0.87)	4.37 (1.08)	4.30 (0.97)	4.48 (0.89)	4.40 (0.96)
Response to special requests (e.g. scheduling exceptions, software installation, etc.)	4.43 (0.89)	4.36 (1.06)	3.93 (1.44)	4.60 (0.81)	4.37 (0.98)
Effectiveness of problem resolution	4.40 (0.93)	4.30 (1.13)	4.25 (1.07)	4.52 (0.91)	4.34 (1.00)
Overall experience with User Assistance	4.46 (0.84)	4.40 (1.03)	4.33 (0.96)	4.48 (0.92)	4.40 (0.95)

When asked about the speed of initial response to queries, a large majority of the users (89%) were "Satisfied" or "Very satisfied" (Table 7). Users who were dissatisfied with one or more of the user assistance items were asked to explain why they were dissatisfied. Among those who responded (n = 11), the predominant explanation provided was that they either received no response or received a delayed response (64%).

Table 7. User Assistance Evaluation –All Users

Overall, rate your satisfaction with the following aspects of User Assistance:	n	1 = Very Dissatisfied	2 = Dissatisfied	3 = Neutral	4 = Satisfied	5 = Very Satisfied	Not applicable
Speed of initial response to queries	273	10 (4%)	4 (1%)	17 (6%)	70 (26%)	172 (63%)	83
Speed of final resolution to queries	268	9 (3%)	7 (3%)	15 (6%)	73 (27%)	164 (61%)	86
Effectiveness of problem resolution	268	10 (4%)	7 (2%)	23 (8%)	69 (26%)	159 (60%)	84
Response to special requests (e.g., scheduling exceptions, software installation, etc.)	189	7 (4%)	4 (2%)	14 (7%)	52 (28%)	112 (59%)	161
Overall experience with User Assistance	267	9 (3%)	5 (2%)	18 (7%)	74 (28%)	161 (60%)	86

When asked to rate their overall satisfaction with the account management provided by the OLCF, the average response was 4.47 (SD = 0.84) on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied. Mean ratings to questions of overall satisfaction with various aspects of account management ranged from 4.47 to 4.49. Among project classifications, users with INCITE projects (M = 4.60, SD = 0.75) and ALCC projects (M = 4.50, SD = 1.00) were the most satisfied (Table 8). Overall, users reported a high level of satisfaction with OLCF account management. When asked about the 'speed of response to account management queries' and the 'effectiveness of response to account management query', a large majority of the users (91% and 90%, respectively) were "Satisfied" or "Very satisfied" (Table 9).

Table 8. Account Management Evaluation by Project Classification

Please rate your satisfaction with the following aspects of Account Management (the team responsible for user access to OLCF resources):	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Speed of response to account management query	4.61 (0.72)	4.49 (0.87)	4.40 (1.05)	4.39 (0.79)	4.47 (0.83)
Effectiveness of response to account management query	4.61 (0.75)	4.49 (0.88)	4.53 (1.02)	4.42 (0.80)	4.49 (0.84)
Overall experience with account management staff	4.60 (0.75)	4.49 (0.88)	4.50 (1.00)	4.31 (0.85)	4.47 (0.84)

Note. Means and standard deviations based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

Table 9. Account Management Evaluation – All Users

Overall, rate your satisfaction with the following aspects of User Assistance:	*n*	1 = Very Dissatisfied	2 = Dissatisfied	3 = Neutral	4 = Satisfied	5 = Very Satisfied	*Not applicable*
Speed of response to account management query	257	5 (2%)	3 (1%)	16 (6%)	76 (30%)	157 (61%)	97
Effectiveness of response to account management query	254	5 (2%)	4 (2%)	15 (6%)	68 (27%)	162 (63%)	98
Overall experience with account management staff	254	5 (2%)	4 (2%)	15 (6%)	73 (29%)	157 (62%)	98

Note. Percentages are based on N, which does not include the not applicable responses displayed in the last column.

Users were asked to rate their overall experience with their scientific computing liaison, if they had utilized one, and the OLCF visualization staff, if utilized (Table 10). Among respondents who utilized the scientific computing liaison, the highest ratings were observed among those with INCITE projects. Regarding users' ratings of the OLCF visualization staff, users with ALCC projects gave the highest ratings. For both services, no users reported being dissatisfied, and only four users reported being very dissatisfied (3 with the scientific computing liaison and 1 with the OLCF visualization staff).

Table 10. Scientific Computing Liaison and OLCF Visualization Staff Evaluation by Project Classification

If utilized, please rate your experience with the:	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Scientific computing liaison	4.58 (0.63)	4.19 (1.05)	4.30 (1.34)	4.43 (0.62)	4.40 (0.79)
OLCF visualization staff	4.57 (0.73)	3.75 (1.39)	4.67 (0.58)	4.53 (0.81)	4.36 (0.83)

Note. Means and standard deviations based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

Training and Education

Twenty-four percent (65) of users reported that they participated in one or more live OLCF training events (either via Webcast or in-person). The Titan workshop had the highest attendance among the training topics, with 35 users participating either online via Webcast (n =13) or in person (n = 22). Attendance at other training events ranged from as few as six to as many as sixteen users.

The majority of OLCF users said "Yes" (33%) or "Maybe" (58%) to the prospect of attending future OLCF training, based on their previous experience (Table 11).

Table 11. Plans to Attend Future Training Events by Project Classification

Based on your previous experience, would you attend a future OLCF training event?	INCITE (*n* = 168)	Director's Discretion (*n* = 90)	ALCC (*n* = 27)	Other (*n* = 63)	All Users (*n* = 328)
	# (%)	*# (%)*	*# (%)*	*# (%)*	*# (%)*
Yes	44 (26%)	39 (43%)	12 (44%)	26 (41%)	107 (33%)
Maybe	104 (62%)	45 (50%)	14 (52%)	33 (53%)	189 (58%)
No	20 (12%)	6 (7%)	1 (4%)	4 (6%)	32 (9%)

Note. All Users totals may be more or less than totals for Project Classifications either because some did not provide a project classification or some have more than one project type.

For four out of the seven training events offered by the OLCF last year, "Do not have the time to attend" was the most frequently provided reasons users did not participate in training events. The top reasons for not participating in the other three training sessions were "Do not require training" and "Do not have the budget to attend".

When presented with a list of training topics, respondents' most frequently requested topic was GPU Programming (62%), followed by Tuning and Optimization (53%), and Advanced MPI (49%). The frequencies of requested topics varied across programs with GPU Programming (59-77%), followed by Tuning and Optimization (40-74%), and Advanced MPI (43-52%). Respondents from the ALCC program indicated a slightly higher preference for Hybrid Programming (MPI and OpenMP) for their 3rd place selection (63% versus 52%). Also, respondents from the INCITE programs indicated Hybrid Programming (MPI and OpenMP) was equally important as their 3rd place choice, Advanced MPI (both 51%). Other less frequently requested topics included help with debugging, visualization and data analysis tools, managing I/O, MPI basics, code porting tools, and center-specific topics (Table 12).

Table 12. Training Desired by Project Classification

Training Topics	INCITE (n = 159)	Director's Discretion (n = 94)	ALCC (n = 27)	Other (n = 68)	All Users (n = 322)
	# (%)	# (%)	# (%)	# (%)	# (%)
GPU Programming	101 (64%)	72 (77%)	18 (67%)	40 (59%)	201 (62%)
Tuning and Optimization	86 (54%)	57 (61%)	20 (74%)	27 (40%)	171 (53%)
Advanced MPI	81 (51%)	45 (48%)	14 (52%)	29 (43%)	157 (49%)
Hybrid Programming (MPI and OpenMP)	81 (51%)	39 (42%)	17 (63%)	28 (41%)	151 (47%)
Debugging	57 (36%)	37 (40%)	11 (41%)	27 (40%)	125 (39%)
Visualization and Data Analysis Tools	53 (33%)	32 (34%)	9 (33%)	28 (41%)	111 (35%)
Managing I/O	48 (30%)	33 (35%)	6 (22%)	17 (25%)	98 (30%)
MPI Basics	33 (21%)	17 (18%)	6 (22%)	21 (31%)	78 (24%)
Code Porting Tools	24 (15%)	18 (19%)	5 (19%)	7 (10%)	49 (15%)
Center-Specific	11 (7%)	6 (6%)	3 (11%)	5 (7%)	20 (6%)

Note. Users add up to more than 100% per column because some offered more than one suggestion. All Users totals may be more or less than totals for Project Classifications either because some did not provide a project classification or some have more than one project type.

The majority of respondents selected documentation (75%) as their preferred method of training, followed by online training (52%), live in-person (29%), and live – via web (29%) – see Table 13. The eight "other" training methods respondents suggested included:

- "Introductory materials"
- "PGAS languages/libraries: UPC, CAF, SHMEM, GA, etc."
- "Advances in supercomputing"
- "Tips on getting around problems or limitations in system or libraries or compiler"
- "I rely on my team members' expertise to resolve all issues"
- "new parallel environments"
- "CESM on center-specific resources"
- "What options do I have for Lustre to make file access faster?"

The order of preferred methods of training is consistent across programs except for Director's Discretion and ALCC projects which respondents indicated a preference for live training via the web (48% and 40%, respectively) over live training in –person (30% and 33%, respectively).

Table 13. Users' Training Preferences by Project Classification

Training Method	INCITE (n = 194)	Director's Discretion (n = 103)	ALCC (n = 31)	Other (n = 70)	All Users (n = 346)
	# (%)	# (%)	# (%)	# (%)	# (%)
Documentation	135 (78%)	77 (82%)	24 (80%)	47 (67%)	258 (75%)
Online training	80 (46%)	58 (62%)	14 (47%)	37 (53%)	179 (52%)
Live – in-person	51 (30%)	28 (30%)	10 (33%)	20 (29%)	99 (29%)
Live – via web	43 (25%)	45 (48%)	12 (40%)	18 (26%)	99 (29%)
Other, please specify	1 (<1%)	1 (1%)	0 (0%)	1 (1%)	3 (1%)

Note. Users add up to more than 100% per column because some preferred more than one training method. All Users totals may be more or less than totals for Project Classifications either because some did not provide a project classification or some have more than one project type.

The most favorable time of year among OLCF users to attend training is in the summer (60%). The order of preference by season was the same across users of all project types: summer, spring, winter, and fall (Table 14).

Table 14. Users' Training Preferences by Project Classification

What is the most convenient time of year to attend a training event?	INCITE (n = 147)	Director's Discretion (n = 90)	ALCC (n = 27)	Other (n = 62)	All Users (n = 300)
	# (%)	*# (%)*	*# (%)*	*# (%)*	*# (%)*
Spring	47 (32%)	44 (49%)	8 (30%)	23 (37%)	106 (35%)
Summer	85 (58%)	54 (60%)	14 (52%)	37 (58%)	180 (60%)
Fall	35 (24%)	22 (24%)	2 (7%)	18 (29%)	74 (25%)
Winter	39 (27%)	29 (32%)	5 (19%)	15 (24%)	85 (28%)

Note. Users add up to more than 100% per column because some preferred more than one time of year. All Users totals may be more or less than totals for Project Classifications either because some did not provide a project classification or some have more than one project type.

Users were asked to provide comments on ways in which OLCF can improve their training and education curriculum. The majority of respondents (36%) suggested offering more online tutorials and providing more online documentation, while 21% felt that better advertisement was needed, and 18% complained about scheduling issues (Table 15).

Table 15. Comments to Help the OLCF Improve Their Training and Education Curriculum (*n* = 28)

Theme	*n*	%
More online tutorials and better documentation	10	36%
Better advertisement needed	6	21%
Scheduling issues	5	18%
Other suggestions	4	14%
Budget constraints	3	11%
Topic suggestions	2	7%
Already knowledgeable	2	7%
New user, no comment	5	18%

Note. Users add up to more than 100% because some provided more than one suggestion for improvement.

OLCF Communications

Eighty-one percent of respondents (290) rated their overall satisfaction (on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied) with communications from the OLCF as "satisfied" or "very satisfied", while only 2% indicated they were "dissatisfied" or "very dissatisfied" (M = 4.00, SD = 0.72). Satisfaction with OLCF communications was highest among users with Director's Discretion projects (M = 4.08, SD = 0.71). Refer to Table 16 for users' satisfaction with OLCF communication by project classification.

Table 16. Users' Overall Satisfaction with Communications from the OLCF by Project Classification

Satisfaction with OLCF	n	Mean	Standard Deviation
Director's Discretion	99	4.08	0.71
INCITE	181	4.05	0.70
Other	71	4.01	0.62
ALCC	29	3.90	0.82
All Users	359	4.00	0.72

Users were asked to rate communications methods on a scale where 1 = Not at all useful, 2 = Somewhat useful, 3 = Very useful. Respondents indicated the weekly email message was most useful (M = 2.52, SD = 0.55). Users found most types of communication methods useful, however smartphone apps and Twitter were only found "somewhat useful" or "very useful" by 24% and 10% of users, respectively (Table 17). These findings are consistent across project classifications. See Table 18 for a more detailed breakdown of averages.

Table 17. Users' Communication Methods by Project Classification

Please rate the following communications methods:	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Weekly Email Message	2.57 (0.54)	2.54 (0.52)	2.48 (0.58)	2.42 (0.57)	2.52 (0.55)
General Email Announcements	2.54 (0.54)	2.51 (0.53)	2.50 (0.51)	2.53 (0.54)	2.49 (0.53)
Opt-In Email Notification Lists	2.51 (1.52)	2.49 (0.50)	2.45 (0.51)	2.40 (0.55)	2.47 (0.51)
Message of the Day (MOTD)	2.27 (0.56)	2.20 (0.62)	2.44 (0.51)	2.03 (0.61)	2.19 (0.59)
Smartphone Apps	1.56 (0.72)	1.70 (0.81)	1.80 (0.84)	1.67 (0.77)	1.63 (0.74)
Twitter	1.27 (0.57)	1.12 (0.43)	1.29 (0.49)	1.63 (0.83)	1.31 (0.62)

Note. Means and standard deviations based on a rating scale where 1 = Not at all useful, 2 = Somewhat useful, 3 = Very useful.

Table 18. Communication Methods – All Users

Please rate the following communications methods:	n	Not aware of method	Not at all useful	Somewhat useful	Very useful	Not applicable
Weekly Email Message	334	15 (5%)	8 (2%)	137 (41%)	174 (52%)	10
General Email Announcements	313	13 (4%)	5 (2%)	143 (46%)	152 (48%)	20
Opt-In Email Notification Lists	260	64 (24%)	1 (<1%)	102 (39%)	93 (36%)	57
Message of the Day (MOTD)	283	93 (33%)	18 (6%)	117 (41%)	55 (19%)	41
Smartphone Apps	218	104 (48%)	60 (28%)	36 (16%)	18 (8%)	101
Twitter	203	109 (54%)	73 (36%)	13 (6%)	8 (4%)	114

Note. Percentages are based on *n*, which does not include the not applicable responses displayed in the last column.

Users were asked to list other communication methods they prefer (Table 19). The most common responses were via email (42%), via web site (39%), and smartphone apps (13%).

Table 19. Other Communication Methods – All Users (*n* = 31)

Please list other communication methods you prefer.	Number of respondents	%
Email	13	42%
Web Site	12	39%
Smartphone Apps	4	13%
MOTD	3	10%
RSS feed	2	6%

Note. Users add up to more than 100% because some mentioned more than method of communication.

OLCF Web Site Evaluation

Ninety-eight percent of respondents indicated that they had visited the http://olcf.ornl.gov web site. Of these users (119), 33% indicated that they visit the site once a week or more, 15 of whom indicated that they visit the site every day. Only six respondents indicated they had never visited the site. Twenty-one percent of both Director's Discretion and ALCC users indicated they visited the OLCF web site at least twice a week. ALCC users had the highest visitation with 49% of users visiting the web site at least once a week. See Table 20 for a more complete breakdown by project classification.

Table 20. Frequency of Visits to OLCF Web Site by Project Classification

How often do you visit the OLCF web site, http://olcf.ornl.gov?	INCITE (n = 179)	Director's Discretion (n = 99)	ALCC (n = 29)	Other (n = 68)	All Users (n = 355)
	# (%)	# (%)	# (%)	# (%)	# (%)
Every day	8 (4%)	4 (4%)	2 (7%)	3 (4%)	15 (4%)
Twice a week	16 (9%)	17 (17%)	4 (14%)	5 (7%)	40 (11%)
Once a week	29 (16%)	17 (17%)	8 (28%)	13 (19%)	64 (18%)
Twice a month	37 (21%)	19 (20%)	10 (35%)	11 (16%)	69 (19%)
Once a month	38 (21%)	22 (22%)	3 (10%)	16 (24%)	77 (22%)
Less than once a month	50 (28%)	18 (22%)	1 (3%)	18 (27%)	84 (24%)
I have never visited an OLCF web site	1 (1%)	2 (18%)	1 (3%)	2 (3%)	6 (2%)

Note. All Users totals may be more or less than totals for Project Classifications either because some did not provide a project classification or some have more than one project type.

Overall, respondents indicated they were moderately satisfied with the main OLCF Web site (*M* = 4.05, SD = 0.71) based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied. OLCF system status information was the highest rated across programs (means ranged from 4.18 to 4.26) indicating users were more than satisfied. See Table 21 for a detailed breakdown of satisfaction with various web site aspects by project type.

Table 21. Evaluation of OLCF Web site by Project Classification

Aspects of the OLCF Web site	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
OLCF system status information	4.18 (0.81)	4.22 (0.78)	4.26 (0.86)	4.24 (0.71)	4.19 (0.76)
Accuracy of information	4.08 (0.76)	4.02 (0.83)	4.29 (0.66)	4.24 (0.68)	4.10 (0.75)
Timeliness of information	3.93 (0.79)	3.92 (0.84)	4.07 (0.66)	4.14 (0.66)	3.98 (0.78)
Ease of finding information	3.77 (0.90)	3.82 (0.82)	3.86 (0.76)	3.92 (0.77)	3.80 (0.85)
Overall satisfaction with the OLCF web site	4.01 (0.76)	4.09 (0.67)	4.21 (0.69)	4.10 (0.67)	4.05 (0.71)

Note. Means and standard deviations based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

The greatest number of respondents indicated being satisfied with the accuracy of information provided, with 81% reporting they were either "Satisfied" or "Very Satisfied" with this aspect of the site (Table 45). The aspect which had the highest percentage of respondents indicating they were either "Dissatisfied" or "Very Dissatisfied" was ease of finding information (7%). For each of the other aspects of the web site addressed, approximately 1-4% of users reported being either "Dissatisfied" or "Very Dissatisfied." The three main themes in explanations for their dissatisfaction with the web site included: the web site was not easy to navigate (59%), system status was hard to find (36%), and information is outdated (32%; Table 22).

Table 22. Evaluation of OLCF Web Site - All Users

Aspects of the main OLCF Web site	*n*	1 = Very Dissatisfied	2 = Dissatisfied	3 = Neutral	4 = Satisfied	5 = Very Satisfied	*Not Applicable*
OLCF system status information	314	0 (0%)	10 (3%)	37 (12%)	150 (48%)	117 (37%)	24
Accuracy of information	317	1 (0.3%)	4 (1%)	57 (18%)	154 (49%)	101 (32%)	22
Timeliness of information	313	1 (0.3%)	10 (3%)	61 (20%)	163 (52%)	78 (25%)	26
Ease of finding information	327	3 (1%)	18 (6%)	85 (26%)	156 (48%)	65 (20%)	15
Overall satisfaction with the OLCF web site	330	0 (0%)	4 (1%)	63 (19%)	176 (53%)	87 (26%)	14

Note. Percentages are based on *n*, which does not include the not applicable responses displayed in the last column.

The three main themes identified among all users' responses to a call for suggestions for both of the web sites, including information and/or documentation that they would like to have access to were: increase and improve documentation (20%), add more online training and tutorials (20%), and improve the system status web page (15%), (see Table 23)

Table 23. Suggestions for both OLCF Web Sites (*n* = 20)

Theme	Number of respondents	%
Improved, updated documentation	4	20%
Add more online training and tutorials	4	20%
Improve system status web page	3	15%
Easier login access	2	10%
Improved practices for new accounts	2	10%
Miscellaneous	5	25%

OLCF Systems Evaluation

Overall, respondents indicated they were satisfied with the OLCF systems (*M* =

3.97, *SD* = 0.78). Satisfaction with OLCF Systems was highest among users with INCITE projects (*M* = 4.00, SD = 0.82) and lowest among users with ALCC projects (*M* = 3.77, SD = 0.90). Refer to Table 24 for users' satisfaction with OLCF systems by project classification.

Table 24. Users' Satisfaction with OLCF Systems by Project Classification

Aspects of the OLCF Web sites	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Sufficient notice given prior to scheduled maintenance	4.15 (0.74)	4.09 (0.74)	3.96 (0.65)	4.09 (0.66)	4.10 (0.72)
Sufficient project disk space	3.97 (0.88)	4.01 (0.78)	3.81 (1.02)	4.02 (0.65)	3.99 (0.80)
Ease of transferring data to/from the OLCF	3.88 (0.86)	3.88 (0.85)	3.62 (0.98)	3.80 (0.80)	3.84 (0.84)
Bandwidth offered by OLCF	3.99 (0.81)	3.95 (0.78)	3.67 (0.96)	4.00 (0.62)	3.95 (0.77)
Overall Mean (*SD*)	**4.00 (0.82)**	**3.98 (0.79)**	**3.77 (0.90)**	**3.98 (0.68)**	**3.97 (0.78)**

Note. Means and standard deviations based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

Overall, respondents indicated they were "Satisfied" or "Very Satisfied" with the OLCF systems (Table 25). Respondents indicated being most satisfied with the notice given prior to scheduled maintenance, with 86% reporting they were either "Satisfied" or "Very Satisfied" with this aspect of the systems (Table 25). Sufficient project disk space and ease of transferring data to/from the OLCF were tied at 6% for the highest percentage of respondents indicating they were either "Dissatisfied" or "Very Dissatisfied". For the bandwidth offered by OLCF, approximately 3-6% of users reported being either "Dissatisfied" or "Very Dissatisfied."

Table 25. Users' Satisfaction with OLCF Systems – All Users

Aspects of the OLCF Systems	*n*	1 = Very Dissatisfied	2 = Dissatisfied	3 = Neither Satisfied nor Dissatisfied	4 = Satisfied	5 = Very Satisfied	Mean
Sufficient notice given prior to scheduled maintenance	341	1 (0.3%)	9 (3%)	39 (11%)	198 (58%)	94 (28%)	4.10 (0.72)
Sufficient project disk space	339	3 (1%)	16 (5%)	43 (13%)	195 (57%)	82 (24%)	3.99 (0.80)
Ease of transferring data to/from the OLCF	338	3 (1%)	17 (5%)	83 (25%)	164 (48%)	71 (21%)	3.84 (0.84)
Bandwidth offered by OLCF	334	2 (1%)	8 (2%)	71 (21%)	178 (53%)	75 (23%)	3.95 (0.77)

Of the 216 respondents who provided answers when asked "Compared to previous years, have you noticed a change in systems performance overall at the OLCF?" 58% (125 respondents) said they noticed an overall improvement in systems performance. Users with ALCC projects noted the most agreement that there was an improvement in systems performance (70% selected yes). Users with INCITE and Director's Discretion projects indicated the highest disagreement with this question, both with 46% who responded "no." Details are provided in Table 26.

Table 26. Changes in Systems Performance Overall at the OLCF Compared

to Previous Years

Compared to previous years, have you noticed a change in systems performance overall at the OLCF?	INCITE (*n* = 138)	Director's Discretion (*n* = 54)	ALCC (*n* = 23)	Other (*n* = 32)	All Users (*n* = 216)
	# (%)	# (%)	# (%)	# (%)	# (%)
Yes	75 (54%)	29 (54%)	16 (70%)	21 (66%)	125 (58%)
No	63 (46%)	25 (46%)	7 (30%)	11 (34%)	91 (42%)

Note. All Users totals may be less than totals for Project Classifications because some have more than one project type.

When asked about satisfaction with various features of specific platforms, users were moderately satisfied in their satisfaction ratings of various aspects of the XT5 (Tables 27 and 28).

Table 27. Evaluation of Jaguar PF by Project Classification

Aspects of XT5 Jaguar PF	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Accessibility of batch queue system	4.24 (0.63)	4.17 (0.79)	4.19 (0.83)	4.27 (0.75)	4.19 (0.72)
Usability of batch queue system	4.26 (0.69)	4.19 (0.83)	4.11 (0.93)	4.19 (0.86)	4.19 (0.78)
Job success rate	4.23 (0.67)	4.16 (0.79)	4.19 (0.68)	4.25 (0.72)	4.18 (0.73)
Job turnaround time	3.95 (0.84)	3.94 (0.85)	4.00 (0.96)	3.96 (0.93)	3.94 (0.89)
Debugging tools	3.79 (0.80)	3.79 (0.79)	4.00 (0.84)	3.89 (0.89)	3.78 (0.80)
Available 3rd party software, applications, and/or libraries	4.01 (0.79)	3.97 (0.73)	4.04 (0.86)	4.08 (0.68)	3.99 (0.76)
Frequency of scheduled outages	3.65 (0.83)	3.64 (0.89)	3.52 (1.05)	3.76 (0.98)	3.60 (0.88)
Frequency of unscheduled (unanticipated) outages	3.62 (0.86)	3.76 (0.77)	3.67 (0.88)	3.78 (0.99)	3.68 (0.84)
Overall system performance	4.18 (0.67)	4.21 (0.68)	4.41 (0.64)	4.28 (0.62)	4.19 (0.69)

Note. Means and standard deviations based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

Table 28. Evaluation of Jaguar PF – All Users

Aspects of XT5 Jaguar PF	1 = Very Dissatisfied	2 = Dissatisfied	3 = Neither Satisfied nor Dissatisfied	4 = Satisfied	5 = Very Satisfied	*M (SD)*
Accessibility of batch queue system	2 (1%)	5 (2%)	30 (9%)	173 (54%)	108 (34%)	4.19 (0.72)
Usability of batch queue system	1 (0.3%)	11 (3%)	34 (11%)	153 (48%)	120 (38%)	4.19 (0.78)
Job success rate	0 (0%)	7 (2%)	41 (13%)	160 (50%)	111 (35%)	4.18 (0.73)
Job turnaround time	3 (1%)	19 (6%)	59 (19%)	149 (47%)	86 (27%)	3.94 (0.89)
Debugging tools	0 (0%)	5 (3%)	77 (38%)	77 (38%)	42 (21%)	3.78 (0.80)
Available 3rd party software, applications, and/or libraries	0 (0%)	8 (3%)	58 (21%)	140 (51%)	70 (25%)	3.99 (0.76)
Frequency of scheduled outages	3 (1%)	30 (10%)	99 (32%)	136 (44%)	43 (14%)	3.60 (0.88)
Frequency of unscheduled (unanticipated) outages	4 (1%)	16 (5%)	98 (33%)	138 (46%)	46 (15%)	3.68 (0.84)
Overall system performance	0 (0%)	6 (2%)	34 (11%)	175 (54%)	107 (33%)	4.19 (0.69)

When asked about satisfaction with various features of the HPSS Archival Storage Platform, users were moderately satisfied in their satisfaction ratings (Tables 29 and 30). The HPSS aspect rated highest among users was the ability to store files (*M* = 4.10, *SD* = 0.72). The ability to store files was highest for all project classifications except among users of Other projects who rated the ability to retrieve files highest (*M* = 4.16, *SD* = 0.58). Users with Director's Discretion

and ALCC projects each had two aspects of HPSS rated highest. In addition to the ability to store files, they also rated time to store files highest ($M = 4.13$, $SD = 0.82$ and $M = 4.00$, $SD = 0.71$, respectively).

Table 29. Evaluation of HPSS Archival Storage Platform by Project Classification

Aspects of the HPSS Archival Storage Platform	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Ability to store files	4.14 (0.75)	4.13 (0.71)	4.00 (0.71)	4.13 (0.67)	4.10 (0.72)
Ability to retrieve files	4.08 (0.75)	4.09 (0.78)	3.67 (1.00)	4.16 (0.58)	4.07 (0.73)
htar interface	4.06 (0.87)	3.97 (0.73)	3.83 (0.75)	4.00 (0.73)	4.01 (0.81)
Time to store files	3.98 (0.82)	4.13 (0.82)	4.00 (0.71)	4.06 (0.68)	4.00 (0.79)
hsi performance	4.02 (0.88)	4.09 (0.71)	3.88 (0.99)	4.00 (0.68)	4.00 (0.81)
Frequency of scheduled outages	4.02 (0.71)	4.00 (0.67)	3.88 (0.70)	3.93 (0.75)	3.99 (0.70)
Time to retrieve files	3.87 (0.85)	3.91 (0.86)	3.67 (1.00)	4.00 (0.87)	3.89 (0.84)
Frequency of unscheduled (unanticipated) outages	4.00 (0.73)	3.91 (0.72)	3.88 (0.70)	3.90 (0.82)	3.96 (0.73)

Note. Means and standard deviations based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

Table 30. Evaluation of HPSS Archival Storage Platform – All Users

Aspects of the HPSS Archival Storage Platform	n	1 = Very Dissatisfied	2 = Dissatisfied	3 = Neither Satisfied nor Dissatisfied	4 = Satisfied	5 = Very Satisfied	Not Applicable
hsi performance	173	2 (1%)	5 (3%)	30 (17%)	90 (52%)	46 (27%)	142
htar interface	149	1 (1%)	3 (2%)	32 (21%)	70 (47%)	43 (29%)	163
Ability to store files	182	0 (0%)	3 (2%)	30 (16%)	95 (52%)	54 (30%)	131
Ability to retrieve files	182	0 (0%)	5 (3%)	28 (15%)	99 (54%)	50 (28%)	132
Time to store files	181	0 (0%)	6 (3%)	38 (21%)	87 (48%)	50 (28%)	131
Time to retrieve files	178	1 (1%)	9 (5%)	41 (23%)	85 (48%)	42 (23%)	133
Frequency of scheduled outages	172	0 (0%)	0 (0%)	43 (25%)	88 (51%)	41 (24%)	136
Frequency of unscheduled (unanticipated) outages	168	0 (0%)	0 (0%)	48 (29%)	78 (46%)	42 (25%)	141

Note. Percentages are based on *n*, which does not include the not applicable responses displayed in the last column.

The three main themes identified among all users' responses to a call for suggestions for improvements to make HPSS more useful to their projects include: improve performance (32%), add the ability to use Tab to autocomplete (21%), and dedicate a queue for transfers (11%; see Table 31):

Table 31. Users' Suggestions for HPSS Archival Storage Platform Improvements by Project Classification (*n* = 19)

Are there any improvements needed to make HPSS more useful to your project?	Number of respondents	%
Better performance	6	32%
Ability to use Tab to autocomplete	4	21%
Dedicated queue for transfers needed	2	11%
Not applicable	2	11%
Miscellaneous	9	47%

Note. Users add up to more than 100% because some provided more than one suggestion.

When asked about satisfaction with various features of the Lustre/Spider Storage Platform, users were moderately satisfied in their satisfaction ratings (Tables 32 and 33). The Lustre aspect rated highest among users was the size of the platform (M = 4.18, SD = 0.74). The size of the platform was highest for all project classifications.

Table 32. Evaluation of the Lustre/Spider Storage Platform by Project

Classification

Aspects of the Lustre/Spider Storage Platform	INCITE	Director's Discretion	ALCC	Other	All Users
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Size	4.14 (0.76)	4.22 (0.73)	4.19 (0.68)	4.37 (0.62)	4.18 (0.74)
Frequency of scheduled outages	3.99 (0.81)	3.92 (0.90)	3.90 (0.79)	4.17 (0.77)	3.96 (0.80)
Frequency of unscheduled (unanticipated) outages	3.91 (0.87)	3.89 (0.89)	3.75 (0.79)	4.10 (0.82)	3.91 (0.85)
Performance	3.75 (1.07)	3.69 (1.21)	3.43 (1.03)	4.29 (0.60)	3.81 (1.03)

Note. Means and standard deviations based on a rating scale of 1 = Very Dissatisfied to 5 = Very Satisfied.

Table 33. Evaluation of the Lustre/Spider Storage Platform – All Users

Aspects of the Lustre/Spider Storage Platform	*n*	1 = Very Dissatisfied	2 = Dissatisfied	3 = Neither Satisfied nor Dissatisfied	4 = Satisfied	5 = Very Satisfied	*Not Applicable*
Size	257	1 (<1%)	6 (2%)	28 (11%)	133 (52%)	89 (35%)	57
Performance	257	7 (3%)	27 (10%)	41 (16%)	115 (45%)	67 (26%)	57
Frequency of scheduled outages	247	2 (1%)	5 (2%)	56 (23%)	121 (49%)	63 (25%)	67
Frequency of unscheduled (unanticipated) outages	244	2 (1%)	11 (4%)	55 (23%)	116 (47%)	60 (25%)	69

Note. Percentages are based on N, which does not include the not applicable responses displayed in the last column. All Users totals may be more or less than totals for Project Classifications either because some did not provide a project classification or some have more than one project type.

The three main themes identified among all users' responses to a call for suggestions for improvements to make HPSS more useful to their projects include: improve performance (56%), improve stability (23%), and data is purged too frequently (15%; see Table 34):

Table 34. Users' Suggestions for Improvements to the Lustre Widow/Spider Storage Platform by Project Classification (n = 39)

Are there any improvements needed to make Lustre widow/spider storage more useful to your project?	Number of respondents	%
Improve performance	22	56%
Improve stability	9	23%
Data is purged too frequently	6	15%
Miscellaneous	4	10%
No, Don't know	2	5%

Note. Users add up to more than 100% because some provided more than one suggestion.