XSEDE Project-wide KPIs & Metrics

More Information: What is a KPI - KPI Guidelines - Annual KPI Reviews

1 Executive Summary

Computing in science and engineering is now ubiquitous: digital technologies underpin, accelerate, and enable new, even transformational, research in all domains. Researchers continue to integrate an increasingly diverse set of distributed resources and instruments directly into their research and educational pursuits. Access to an array of integrated and well-supported high-end digital services is critical for the advancement of knowledge. XSEDE (the Extreme Science and Engineering Discovery Environment) is a socio-technical platform that integrates and coordinates advanced digital services within the national ecosystem to support contemporary science. This ecosystem involves a highly distributed, yet integrated and coordinated, assemblage of software, supercomputers, visualization systems, storage systems, networks, portals and gateways, collections of data, instruments and personnel with specific expertise. XSEDE fulfills the need for an advanced digital services ecosystem distributed beyond the scope of a single institution and provides a long-term platform to empower modern science and engineering research and education. As a significant contributor to this ecosystem, driven by the needs of the open research community, XSEDE substantially enhances the productivity of a growing community of scholars, researchers, and engineers. XSEDE federates with other high-end facilities and campus-based resources, serving as the foundation for a national e-science infrastructure with tremendous potential for enabling new advancements in research

and education. *Our vision is a world of digitally-enabled scholars, researchers, and engineers participating in multidisciplinary collaborations while seamlessly accessing computing resources and sharing data to tackle society's grand challenges*.

Researchers use advanced digital resources and services every day to expand their understanding of our world. More pointedly, research now requires more than just supercomputers, and XSEDE represents a step toward a more comprehensive and cohesive set of advanced digital services through our mission: *to substantially enhance the productivity of a growing community of scholars, researchers, and engineers through access to advanced digital services that support open research; and to coordinate and add significant value to the leading cyberinfrastructure resources funded by the NSF and other agencies*.

XSEDE has developed its strategic goals in a manner consistent with NSF's strategies stated broadly in the *Cyberinfrastructure Framework for 21st Century Science and Engineering* [1] vision document, and the more specifically relevant *Advanced Computing Infrastructure: Vision and Strategic Plan* [2] document.

1.1 Strategic Goals

To support our mission and to guide the project's activities toward the realization of our vision, three strategic goals are defined:

Deepen and Extend Use: XSEDE will *deepen the use—make more effective use*—of the advanced digital services ecosystem by existing scholars, researchers, and engineers, and *extend the use* to new communities. We will *contribute to preparation—workforce development*—of the current and next generation of scholars, researchers, and engineers in the use of advanced digital services via training, education, and outreach; and we will *raise the general awareness of the value of advanced digital services*.

Advance the Ecosystem: Exploiting its internal efforts and drawing on those of others, XSEDE will advance the broader ecosystem of advanced digital services by *creating an open and evolving e-infrastructure*, and by *enhancing the array of technical expertise and support services* offered.

Sustain the Ecosystem: XSEDE will sustain the advanced digital services ecosystem by *ensuring and maintaining a reliable, efficient, and secure infrastructure*, and *providing excellent user support services*. XSEDE will further *operate an effective, productive, and innovative virtual organization*.

The strategic goals of XSEDE cover a considerable scope. To assure we are delivering our mission and to assess progress toward our vision, we have identified key metrics to measure our progress toward meeting each sub-goal. These key performance indicators (KPIs) are a high-level encapsulation of our project metrics that measure how well we are meeting each sub-goal. Planning is driven by our vision, mission, goals, and these metrics— which are in turn rooted in the needs and requirements of the communities we serve.

The key concept is not that the KPIs themselves must have a direct causal effect on eventual outcomes, or measure eventual outcomes or long-term impacts, but rather that the KPIs are chosen so that actions and decisions which move the metrics in the desired direction also move the organization in the direction of the desired outcomes and goals.

Table 1-1 below shows the project's three strategic goals and associated sub-goals along with the KPIs used to measure progress toward achieving those goals.

Table 1-1: Summary of key performance indicators (KPIs) for XSEDE.

Strategic Goals	Sub-goals	KPIs
Deepen and Extend Use	Deepen use (existing communities)	• Number of completed ECSS projects • Average ECSS impact rating • Average satisfaction with ECSS support
	Extend use (new communities)	• Number of new users from underrepresented communities and non-traditional disciplines of XSEDE resources and services • Number of sustained users from underrepresented communities and non-traditional disciplines of XSEDE resources and services
	Prepare the current and next generation	• Number of attendees in synchronous and asynchronous training • Average impact assessment of training for attendees registered through the XSEDE User Portal
	Raise awareness of the value of advanced digital services	• Number of pageviews to the XSEDE website • Number of pageviews to the XSEDE User Portal • Number of social media impressions • Number of media hits
Advance the Ecosystem	Create an open and evolving e-infrastructure	• Number of new capabilities made available for production deployment • Average satisfaction rating of XCI services
	Enhance the array of technical expertise and support services	• Average rating of staff regarding how well-prepared they feel to perform their jobs
Sustain the Ecosystem	Provide reliable, efficient, and secure infrastructure	• Average composite availability of core services • Hours of downtime with direct user impacts from an XSEDE security incident

	Provide excellent user support	• Mean time to ticket resolution • Average user satisfaction ratings for allocations and other support services
	Operate an effective and productive virtual organization	• Percentage of recommendations addressed by relevant project areas
	Operate an innovative virtual organization	• Number of key improvements addressed from systematic evaluation • Number of key improvements addressed from external sources • Ratio of proactive to reactive improvements • Number of staff publications

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2 Discussion of Strategic Goals and Key Performance Indicators

The strategic goals of XSEDE cover a considerable scope. Additionally, the specific activities within our scope are often very detailed; therefore, to ensure that this significant and detailed scope will ultimately deliver our mission and realize our vision, we decompose the three strategic goals into components or sub-goals to be considered individually.

In determining the best measures of progress toward each of the sub-goals, KPIs that correlate to impact on the scientific community are used. These often pair measurements of outcome with an assessment of quality or impact to provide both a sense of scope and significance of the supporting activities. In some cases, metrics for impact, outcome, or both are not currently being collected. In these cases, the best available metric is used.

2.1 Deepen and Extend Use

XSEDE will 1) *deepen the use—make more effective use*—of the advanced digital services ecosystem by existing scholars, researchers, and engineers and 2) *extend the use* to new communities. We will 3) *contribute to preparation—workforce development*—of scholars, researchers, and engineers in the use of advanced digital technologies via training, education, and outreach; and we will 4) *raise the general awareness of the value of advanced digital research services*.

2.1.1 Deepen use to Existing Communities

Although efforts to identify new technologies and new service providers along with efforts to evolve the e-infrastructure and enhance the research prowess of current and future researchers all serve to also deepen use, the collaborative, yearlong work done to help research teams more effectively and broadly use the ecosystem is the best indicator of deeper use. These efforts enable increased scale and efficiency of usage and allow use of new capabilities for the delivery of science. The project has chosen three metrics (Table 2-1) that together measure the scope, quality, and impact of these activities: 1) the *total* number of projects completed by the Extended Collaborative Support Services team through work with *research teams*, *community codes*, and *gateways* and the average ratings for 2) satisfaction with and 3) overall impact from the ECSS work. Satisfaction and overall impact are scores provided by the PIs of the projects on a 1-5 scale following project completion.

Table 2-1: KPIs for the sub-goal of deepen use (existing communities).

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Number of completed ECSS projects	RY5							ECSS (§4)
	RY4							
	RY3							
	RY2							
	RY1	50 / yr	10					
	Definition/Description: The total number of completed ECSS projects consists of projects that were completed through work in ESRT, ESCC, and ESSGW. A completed project is defined as a project that has progressed through the complete support pipeline. This pipeline includes steps such as assignment of a consultant, production of a work plan, execution of the work plan and reporting of progress through quarterly reports, and the filing of a final project report. **Collection methodology:** The number of completed projects is tracked in Sciforma, XSEDE's project management software. A report has been created in Sciforma that queries all the ECSS projects, filters for allocations that have ended in that quarter and also for projects that have a final report.							
Average ECSS impact rating	RY5							ECSS (§4)
	RY4							
	RY3							
	RY2							
	RY1	4 out of 5 / qtr	4.56					

	Definition/Description: After an ECSS project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate the impact of the ECSS support on their research on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ECSS staff members. The L2 Director asks the PI to rate the impact of the ECSS support on their research on a scale of one to five and this number is recorded in a spreadsheet which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual impact rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							
Average satisfaction with ECSS support	RY5							ECSS (§4)
	RY4							
	RY3							
	RY2							
	RY1	4.5 out of 5 / qtr	4.86					
	Definition/Description: After an ECSS project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate their satisfaction with the ECSS support they have received on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ECSS staff members. The L2 Director asks the PI to rate their satisfaction with the support received on a scale of one to five and this number is recorded in a spreadsheet which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

2.1.2 Extend Use to New Communities

New communities are defined as new fields of science, industry, and under-represented communities. New fields of science are those that represent less than 1% of XSEDE Resource Allocation Committee (XRAC) allocations. The Novel & Innovative Projects (NIP) team and the Broadening Participation team both work to bring advanced digital services to new communities. XSEDE measures both the number of new users and the number of sustained users on research projects from under-represented communities and non-traditional disciplines of XSEDE resources and services as the indicators of progress (Table 2-2).

Table 2-2: KPIs for the sub-goal of extend use (new communities).

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Number of new users from underrepresented communities and non-traditional disciplines of XSEDE resources and services	RY 5							ECSS – NIP (§4.3) CEE - Broadening Participation (§3.4)
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 200 / yr	297					
	Definition/Description: This KPI tracks progress in extending participation in XSEDE by first-time users from new communities. **Collection methodology:** This is the sum of the number of new users from underrepresented communities measured by Community Engagement and Enrichment - WBS 2.1 and the number of new users from non-traditional disciplines measured by Novel and Innovative Projects - WBS 2.2.3							
Number of sustained users from underrepresented communities and non-traditional disciplines of XSEDE resources and services	RY 5							ECSS – NIP (§4.3) CEE - Broadening Participation (§3.4)
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 1,100 / yr	773					
	Definition/Description: This KPI tracks progress in extending participation in XSEDE by persistent engagement of users from new communities. **Collection methodology:** This is the sum of the number of persistent users from underrepresented communities measured by Community Engagement and Enrichment - WBS 2.1 and the number of persistent users from non-traditional disciplines measured by Novel and Innovative Projects - WBS 2.2.3.							

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2.1.3 Prepare the Current and Next Generation

Part of XSEDE's mission is to provide a broad community of existing and future researchers with access and training to use advanced digital services via the sub-goal of preparing the current and next generation of computationally-savvy researchers. While many activities support this sub-goal, such as the various Champion (§3.6), Student Engagement (§3.4), and Education (§3.2) programs, the training offered through Community Engagement & Enrichment (CEE) impacts the most people directly. This, and a complementary measure of impact as indicated by those same individuals, are therefore considered the key indicators (Table 2-3) of performance toward this goal.

Table 2-3: KPIs for the sub-goal of prepare the current and next generation

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Number of attendees in synchronous and asynchronous training	RY 5							CEE - Workforce Development (§3.2)
	RY 4							
	RY 3							
	RY 2							
	RY 1	6,000 / yr[1]	1,304					
	Definition/Description: We will report number of attendees in two categories: • The total number of attendees at synchronous events (in-person and webinar), where an attendee is any XSEDE User Portal registrant who attends the event for any length of time. For an in-person workshop, attendees are those who physically attend, and for webinars, attendees are those who sign in with their XSEDE User Portal username; and • The number of classes taken by all attendees, where an attendee is anyone who loaded page(s) in an online training module. Regardless of activity level, an attendee will be counted as taking a course no more than once in a given quarter. Only attendees who signed in with an XUP username are count. **Collection methodology:** ◦ For synchronous events, information about attendees (XUP username, date, and course) who register and participate using their XSEDE User Portal username are recorded and uploaded to a central metrics database via the course coordinator. Walk-ins are not counted. ◦ For asynchronous events, attendee information (XUP username, date, and course) is pulled from CI-Tutor and Cornell Virtual Workshop databases and uploaded to the XSEDE User Portal database by the training lead and is uploaded to a central metrics database. Visiting pages in one asynchronous module multiple times during a quarter count as one participant. If this person visits the course again the next quarter, it is counted as a new class that quarter, as it's the equivalent of a person attending the same course/event a second time.							
Average impact assessment of training for attendees registered through the XSEDE User Portal	RY 5							CEE - Workforce Development (§3.2)
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	4.54					
	Definition/Description: This is the average of all attendees' self-rating of each event in which they attend, on a scale of 1 to 5. **Collection methodology:** The data is collected from post event surveys and recorded in the database. Specific items included in this index are: ◦ Q1. The training session fulfilled my expectations. ◦ Q2. The trainer stimulated my interest. ◦ Q6. The training session was well-organized. ◦ Q8. I was able to easily access this training session. ◦ Q10. Overall I would rate my experience as successful.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1] The target total for synchronous and asynchronous attendees (2,000 and 4,000, respectively) was previously listed as 5,600 / yr. This was an error. The target total should be 6,000.

2.1.4 Raise Awareness of the value of advanced digital services

While many PY1 activities, such as our Workforce Development (§3.2), User Engagement (§3.3) and Broadening Participation (§3.4) efforts, and the visibility of our Champions and other Campus Engagement (§3.6) activities, contribute to our efforts to measure our ability to raise the general awareness of the value of advanced digital research services, we have chosen to focus on outcomes in four areas (Table 2-4): website, social media, public relations, and media hits. Desirable trends in these key outcomes can be correlated to success for this sub-goal.

Table 2-4: KPIs for the sub-goal of raise awareness of the value of advanced digital research services

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Number of pageviews to the XSEDE website	RY 5							Community Engagement and Enrichment - UII (§3.5)
	RY 4							
	RY 3							
	RY 2							
	RY 1	80,000 / qtr	49,409					
	Definition/Description: Per Google Analytics, "a pageview is defined as a view of a page on your site that is being tracked by the Analytics tracking code. If a user clicks reload after reaching the page, this is counted as an additional pageview. If a user navigates to a different page and then returns to the original page, a second pageview is recorded as well." **Collection methodology:** This is the number reported in the Google Analytics tracking software for the given time period.							
Number of pageviews to the XSEDE User Portal	RY 5							Community Engagement and Enrichment - UII (§3.5)
	RY 4							
	RY 3							
	RY 2							

	RY 1	100,000 / qtr	183,408					
	Definition/Description: Per Google Analytics, “a pageview is defined as a view of a page on your site that is being tracked by the Analytics tracking code. If a user clicks reload after reaching the page, this is counted as an additional pageview. If a user navigates to a different page and then returns to the original page, a second pageview is recorded as well.” **Collection methodology:** This is the number reported in the Google Analytics tracking software for the given time period.							
Number of Social Media impressions	RY 5							Program Office - ER (§8.2)
	RY 4							
	RY 3							
	RY 2							
	RY 1	190,000 / yr	52,500					
	Definition/Description: Number of people who have seen XSEDE interactions on Facebook + Twitter. Both Facebook and Twitter count “impressions,” which is essentially how many people saw a certain post. A user of FB or Twitter no longer has to directly “like” or “retweet” a post to get this number - “impressions” would refer to people who see the post based on their friends or followers sharing our information. It is a better way of collecting social media awareness than just “followers” or “shares.” **Collection methodology:** Facebook and Twitter both have internal methods of tracking metrics - we simply go to those sites and find the “impressions” numbers we need at the end of each reporting cycle. Anyone with access to the FB and Twitter pages can easily gather this information.							
Number of media hits	RY 5							Program Office - ER (§8.2)
	RY 4							
	RY 3							
	RY 2							
	RY 1	140 / yr	32					
	Definition/Description: This is the number of XSEDE-related stories we find in the media, many times through Google alerts for “XSEDE,” that mentions XSEDE by name. Often, we manually search “XSEDE,” as well, in case the daily alert email is missed. **Collection methodology:** NCSA tracks media hits for both NCSA and XSEDE, so that is a baseline collection of numbers. The ER team can then do additional manual searching - as an example, oftentimes the hits of HPCwire are not collected on the NCSA page, so an additional manual count is needed.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

2.2 Advance the Ecosystem

Exploiting its internal efforts and drawing on those of others, XSEDE will advance the broader ecosystem of advanced digital services by 1) *creati ng an open and evolving e-infrastructure*, and by 2) *enhancing the array of technical expertise and support services* offered.

2.2.1 Create an Open and Evolving e-Infrastructure

External factors, such as the number of XSEDE Federation members and the variety of services they provide alongside internal efforts, such as Operations (§6) of critical infrastructure and services and the evaluation and integration of new capabilities, all affect the evolution of the e-infrastructure. While we actively seek new Federation members and Service Providers, and partnerships with national and international cyberinfrastructure projects, we view our role as connector of these elements to be the most impactful. Thus, XSEDE focuses on the number of new capabilities made available for production deployment along with the satisfaction rating of all XSEDE Community Infrastructure (XCI) services as indicators of performance with respect to this sub-goal (Table 2-5).

Table 2-5: KPIs for the sub-goal of create an open and evolving e-infrastructure

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Number of new capabilities made available for production deployment	RY 5							XCI (§5)
	RY 4							
	RY 3							
	RY 2							
	RY 1	7 / yr	0					
	Definition/Description: We measure the efficacy of the efforts from the five areas that make up the software engineering pipeline (Technology Investigation, Systems & Software Engineering, Architecture & Design, Software Development & Integration, and Software Testing & Deployment) through the number of new capabilities made available for production deployment. **Collection methodology:** This is a simple count from records kept by the Level 3 Manager for Software Testing & Deployment of the number of new capabilities made available for production deployment.							
Average satisfaction rating of XCI services	RY 5							XCI (§5)
	RY 4							
	RY 3							
	RY 2							

	RY 1	4 out of 5 / yr	4.8					
	Definition/Description: Customer satisfaction rating of XCI staff provided services (does not include software services which are covered in RACD metrics) **Collection methodology:** Customer satisfaction survey(s).							

NOTE: RY 1 is unique and only spans September 2016-April 2017. RY 1 RP1 includes September-October 2016.

2.2.2 Enhance the Array of Technical Expertise and Support Services

To enhance the technical expertise of our staff to offer an evolving set of support services, we will continue many activities including workshops, symposia, and training events hosted by Extended Collaborative Support Services (ECSS) and Service Providers (§4.6). The average rating by staff for training will continue to be a KPI; the staff climate survey question that measures this has been changed to focus on staff having the training they need, instead of staff turning to XSEDE training to fulfill these needs (Table 2-6). This represents a change in approach to staff training that reflects budget constraints, where we will leverage existing training offered by the Service Providers, universities, and professional associations alongside our training to enhance the expertise of staff.

Table 2-6: KPIs for the sub-goal of enhance the array of technical expertise and support services.

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Average rating of staff regarding how well-prepared they feel to perform their jobs	RY 5							Program Office - Strategic Planning, Policy & Evaluation (§8.5)
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	3.70					
	Definition/Description: An annual Staff Climate Study is a survey administered and analyzed by an external evaluation team as part of an effort to understand whether XSEDE staff feel adequately prepared to conduct their XSEDE work. The survey study includes items regarding staff training. **Collection methodology:** Respondents rate closed-ended Likert scale items regarding training on scale of 1 (strongly disagree) to 5 (strongly agree). The average of all staff responses for a given year is calculated to determine this metric. The specific item used to calculate this metric is Q2m: "I have access to adequate training to conduct my XSEDE-related work."							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

2.3 Sustain the Ecosystem

XSEDE will sustain the advanced digital services ecosystem by 1) *ensuring and maintaining a reliable, efficient, and secure infrastructure*, and 2) *providing excellent user support services*. Furthermore, XSEDE will operate an 3) *effective*, 4) *productive,* and 5) *innovative virtual organization*.

2.3.1 Provide Reliable, Efficient, and Secure Infrastructure

Many activities support this sub-goal—such as User Information & Interfaces (§3.5), Security (§6.2), Data Transfer Services (§6.3), Systems Operations and Support (§6.5), support for Allocations (§7.2), and Allocations, Accounting & Account Management (§7.3)—but perhaps the truest measure of an infrastructure's reliability is its robustness as reflected by sustained availability. Thus, the KPI for this sub-goal is a composite measure of the availability of XSEDE infrastructure components and the number of hours of downtime with direct user impacts from a security incident (Table 2-7). The composite measure is a geometric mean of the availability of critical enterprise services and the XRAS allocations request management service.

Table 2-7: KPIs for the sub-goal of provide reliable, efficient, and secure infrastructure

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Average composite availability of core services	RY 5							Operations (§6) RAS(§7)
	RY 4							
	RY 3							
	RY 2							
	RY 1	99% / qtr	99.9%					
	Definition/Description: The percent average composite availability of core services is the geometric mean of % core enterprise services availability and % POPS/XRAS availability. Because the availability percentage of each of these components is measured separately, they are aggregated and then averaged using a geometric mean to determine the composite availability. **Collection methodology:** See the individual collection methodologies for each component in the responsible WBS area below: Core enterprise services (Systems Operational Support 2.4.5) and POPS/XRAS (AA&AM 2.5.3).							
Hours of downtime with direct user impacts from an XSEDE security incident.	RY 5							Operations - Cybersecurity (§6.2)
	RY 4							

	RY 3							
	RY 2							
	RY 1	< 24 / qtr	0					
	Definition/Description: This metric will measure resource unavailability for users as a result of an XSEDE-wide security event (involving a Tier 1 service or spanning more than one SP). The metric will be calculated as the Time to Return to Repair (TTR) summed across all applicable services and incidents during the quarter. **Collection methodology:** The Cybersecurity co-leads determine that an XSEDE-wide security event is responsible for an outage. The Sysops lead will determine the TTR based on monitoring and other information in logs and tickets, and the TTR value will be the data point reported.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

2.3.2 Provide Excellent User Support

Although nearly every group in the organization has some support function, we have chosen to focus on metrics with respect to two primary support interfaces to the community: the XSEDE Operations Center (XOC) metrics with respect to ticket resolutions times and the average satisfaction rating of the allocations process. The XOC is the frontline centralized support group that either resolves or escalates tickets to the appropriate resolution center depending on the request. Two KPIs are measured (Table 2-8): the mean time to resolution on support tickets that are resolved by the XOC or routed to, and resolved by, other XSEDE areas, and the average satisfaction rating for the allocations process measured via a quarterly survey of users who have interacted with the allocations request system and the allocations process more generally.

Table 2-8: KPIs for the sub-goal of provide excellent user support

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Mean time to ticket resolution (hours)	RY 5							Operations (§6)
	RY 4							
	RY 3							
	RY 2							
	RY 1	< 24 / qtr	24.0					
	Definition/Description: XSEDE-funded areas are measured to ensure that, on average, tickets are resolved in a timely manner. This includes all XSEDE WBS ticket queues as well as the XSEDE Operations Center (XOC) queue. This metric does NOT apply to Service Provider ticket queues. End-users expect for their issues to be responded to within a reasonable amount of time, so the target is a resolution time under 24 hours. **Collection methodology:** The data is stored locally via the Request Tracker service, which is the XSEDE ticket software and which is located at TACC. Reports are generated against the RT database to determine MTTR and other metrics.							
User satisfaction with allocations process and other support services	RY 5							RAS (§7)
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	3.98					
	Definition/Description: Average of the two area metrics “Averager user satisfaction with XRAS” and “average user satisfaction of allocations process.” The average user satisfaction with XRAS is the measure of users’ satisfaction with using XRAS, the primary tool for submission, review, and administration of allocation requests. The “average user satisfaction with the allocations process” is the measure of users’ satisfaction with allocation policies and procedures for the submission, review, and administration of allocation requests. **Collection methodology:** Because this is a composite KPI that consists of an AM from XSEDE Allocations Process & Policies (WBS 2.5.2) and an AM from Allocations, Accounting & Account Management (WBS 2.5.3), see those sections below for how the data is collected each AM.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

2.3.3 Effective and Productive Virtual Organization

During the first five years of XSEDE, in conjunction with developing a methodology for driving and assessing performance excellence, XSEDE adopted the Baldrige Criteria [3] and has assessed and applied applicable criteria from all seven criteria by that methodology. These include annual reviews of the vision, mission, strategic goals, project-wide processes and standards (KPIs and area metrics); user and staff surveys (§3.3 , §8.5); stakeholder communications (§8.2); advisory boards (§8.1); community engagement (§3); workforce enhancement (§3.2); and the analysis of organizational data that leads to organizational learning, strategic improvement and innovation. Thus, XSEDE has chosen to monitor its continuous improvement efforts as an organizational measurement of recommendations addressed by the relevant project areas (Table 2-9). The idea here is that a stable or expanding number of improvements shows that XSEDE continues to systematically evaluate the organization and make informed, proactive improvements.

Table 2-9: KPIs for the sub-goal of operate an effective and productive virtual organization.

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Percentage of recommendations addressed	RY 5							Program Office - Strategic Planning, Policy & Evaluation (§8.5)
	RY 4							

by relevant project areas	RY 3							
	RY 2							
	RY 1	90% / qtr	NA[1]					
	Definition/Description: The SP&E team will calculate the metric based off the data from two measurements; total key recommendations made and total key recommendations addressed. Total key recommendations addressed will be divided by the total key recommendations made at the point in time of data capture (at the end of the IPR reporting period). The number of key recommendations made according to the annual XSEDE Climate Study findings + the total number of recommendations recorded on the XSEDE Project-Wide Improvements & Recommendations Google Sheet, such as XAB, NSF, and SP&E recommendations. The number of key recommendations addressed during a quarter. **Collection methodology:** The SP&E team intends to work with the PM&R team to track recommendations made and recommendations addressed with the XSEDE Project-Wide Improvements & Recommendations Google Sheet. If a recommendation is unable to be addressed and instead closed, those will not be counted. NOTE: an improvement made is not necessarily a recommendation addressed; but a recommendation addressed is an improvement made and therefore should also be tracked in the XSEDE Project-Wide Improvements & Recommendations Google Sheet once fully implemented; it is OK to have duplication between Improvements fully implemented and Recommendations addressed.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1] L2 Directors are currently responding to climate study recommendations; data will be available in RP2.

2.3.4 Innovative Virtual Organization

Measuring innovation for an organization like XSEDE (or for organizations in general) is difficult and represents an area of open research. A partial measure is the number of staff publications produced since this shows that XSEDE staff is involved in novel activities that achieve peer-reviewed publication. Additionally, after much thought and discussion both internally and with external stakeholders and advisors, we have identified two additional indicators that strongly correlate to innovation: 1) the ratio of proactive organizational improvements to those that were reactive and 2) the number of improvements that are innovative or lead to innovations. The first indicator is a measurement of organizational maturity and agility; the second measures innovative actions directly (Table 2-10). While these provide some indication of innovation, they are still not satisfactory. These KPIs will continue to be the subject of an open conversation within the organization and with stakeholders and advisors as XSEDE assesses these measurements and how to best quantify innovation. In particular, this will be discussed in earnest within the Strategic Planning, Policy and Evaluation team (§8.5).

Table 2-10: KPIs for the sub-goal of operate an innovative organization

KPI	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Number of strategic or innovative improvements	RY 5							Program Office - Strategic Planning, Policy & Evaluation (§8.5)
	RY 4							
	RY 3							
	RY 2							
	RY 1	9 / yr	3					
	Definition/Description: The number of strategic or innovative process improvements implemented is a measure of innovative actions directly. Strategic or innovative process improvements are those that resulted from the analysis of KPIs or area metrics or resulted in a new and novel measurement, method, research product, or insight. **Collection methodology:** Process improvements are tracked via a self-reporting method (Each quarter, all of the WBS level 3 managers and WBS Level 2 Directors are queried via e-mail asking them to self-report on any process improvements they have implemented in the last quarter. This information is collected in a google spreadsheet and totaled each quarter.). All areas of the project are asked to submit the process improvements they have made to their areas on a quarterly basis. From this list, the improvements are then classified as being either strategic or innovative.							
Ratio of proactive to reactive improvements	RY 5							Program Office - Strategic Planning, Policy & Evaluation (§8.5)
	RY 4							
	RY 3							
	RY 2							
	RY 1	3:1 / yr	8:1					
	Definition/Description: The ratio of proactive to reactive improvements is a measurement of organizational maturity and agility. An improvement is classified as being reactive if the change was due to a problem that occurred naturally and had to be corrected for the process to continue. A proactive improvement is an improvement that is made in anticipation of future problems, needs, or changes. **Collection methodology:** Process improvements are tracked via a self-reporting method (Each quarter, all of the WBS level 3 managers and WBS Level 2 Directors are queried via e-mail asking them to self-report on any process improvements they have implemented in the last quarter. This information is collected in a google spreadsheet and totaled each quarter.). All areas of the project are asked to submit the process improvements they have made to their areas on a quarterly basis. From this list, the improvements are then classified as being either proactive or reactive based on the definitions above.							
Number of staff publications	RY 5							Organization metric
	RY 4							
	RY 3							
	RY 2							
	RY 1	70 / yr	5					

	Definition/Description: **Collection methodology:**

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

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3 Community Engagement & Enrichment - CEE (WBS 2.1)

At the core of Community Engagement & Enrichment (CEE) is the researcher, broadly defined to include anyone who uses or may potentially use the array of resources and services offered by XSEDE. The CEE team is dedicated to actively engaging a broad and diverse cross-section of the open science community, bringing together those interested in using, integrating with, enabling, and enhancing the national cyberinfrastructure. Vital to the CEE mission is the persistent relationship with existing and future users, including allocated users, training participants, XSEDE collaborators, and campus personnel. CEE will unify public offerings to provide a more consistent, clear, and concise message about XSEDE resources and services, and bring together those aspects of XSEDE that have as their mission teaching, informing, and engaging those interested in advanced cyberinfrastructure.

The five components of CEE are Workforce Development (§3.2), which includes Training, Education and Student Preparation, User Engagement (§3.3), Broadening Participation (§3.4), User Interfaces & Online Information (§3.5) and Campus Engagement (§3.6). These five teams will ensure routine collection and reporting of XSEDE's actions to address user requirements. They will provide a consistent suite of web-based information and documentation and engage with a broad range of campus personnel to ensure that XSEDE's resources and services complement those offered by campuses. Additionally, CEE teams will expand workforce development efforts to enable many more researchers, faculty, staff, and students to make effective use of local, regional, and national advanced digital resources. CEE will expand efforts to broaden the diversity of the community utilizing advanced digital resources. The CEE team will tightly coordinate with the rest of XSEDE, particularly Extended Collaborative Support Services (§4), Resource Allocation Services (§7), XSEDE Community Infrastructure (§6), and External Relations (§8.2).

CEE is focused on personal interactions, ensuring that existing users, potential users and the general public have sufficient access to materials and have a positive and effective experience with XSEDE public offerings and frontline user support. As such, the CEE area metrics are designed to broadly assess this performance. CEE has focused on metrics that will quantify how many users in aggregate are benefiting from XSEDE resources and services. Additionally, CEE has focused on how well the user base is sustained over time and how well training offerings evolve with changing user community needs.

Table 3-1: Area Metrics for Community Engagement & Enrichment

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of new users of XSEDE resources and services	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 1,000 / qtr	1,881					
	Definition/Description: This is the number of portal accounts created within the selected time period **Collection methodology:** This is the number of portal accounts created with Liferay. This is queried in the Liferay database by looking in the Users table and seeing how many accounts have a timestamp in the created field between the selected dates.							
Number of sustained users of XSEDE resources and services	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 5,000 / qtr	4,755					
	Definition/Description: This is the number of active users logged into the XSEDE User Portal within the selected time period. **Collection methodology:** There is a usage log parsing script that collects the tomcat logs and parses out the relevant data during the selected time period.							
Number of new users from underrepresented communities using XSEDE resources and services	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 100 / yr	150					

	Definition/Description: First-time awardees of XSEDE compute resources or an “allocation” (i.e. Startup, Research, Education, etc.) from underrepresented communities including women and racial/ethnic domestic minorities in HPC as well as anyone from a Minority Serving Institution (MSI) as defined by the Carnegie Classification of Institutions of Higher Education are tracked. **Collection methodology:** XSEDE portal users are able to specify their race/ethnicity, gender, and institution in their user profile and are encouraged to complete this data when registering for training events through the XSEDE portal. Date of allocation awards is also recorded in the XSEDE database (XDCDB). A query is then run to generate the number of individuals meeting the aforementioned criteria within a given quarter. Care is taken to not over represent this metric by ensuring an individual who meets multiple criteria is only accounted for one time.							
Number of sustained users from underrepresented communities using XSEDE resources and services	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 1,000 / yr	322					
	Definition/Description: Awardees of XSEDE compute resources or an “allocation” (i.e. Startup, Research, Education, etc.) from underrepresented communities including women and racial/ethnic domestic minorities in HPC as well as anyone from a Minority Serving Institution (MSI) as defined by the Carnegie Classification of Institutions of Higher Education are tracked that access their “allocation” during the time period. **Collection methodology:** XSEDE portal users are able to specify their race/ethnicity, gender, and institution in their user profile and are encouraged to complete this data when registering for training events through the XSEDE portal. Date of allocation awards is also recorded in the XSEDE database (XDCDB). A query is then run to generate the number of individuals meeting the aforementioned criteria within a given quarter. Care is taken to not over represent this metric by ensuring an individual who meets multiple criteria is only accounted for one time.							
Number of attendees in synchronous and asynchronous training	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 6,000 / yr[1]	1,304					

	Definition/Description:
	
	• We will report number of attendees in two categories:
	  ○ The total number of attendees at synchronous events (in-person and webinar), where an attendee is any XSEDE User Portal registrant who attends the event for any length of time. For an in-person workshop, attendees are those who physically attend, and for webinars, attendees are those who sign in with their XSEDE User Portal username; and
	  ○ The number of classes taken by all attendees, where an attendee is anyone who loaded page(s) in an online training module. Regardless of activity level, an attendee will be counted as taking a course no more than once in a given quarter. Only attendees who signed in with an XUP username are counted
	
	Collection methodology:
	
	  ○ For synchronous events, information about attendees (XUP username, date, and course) who register and participate using their XSEDE User Portal username are recorded and uploaded to a central metrics database via the course coordinator. Walk-ins are not counted.
	  ○ For asynchronous events, attendee information (XUP username, date, and course) is pulled from CI-Tutor and Cornell Virtual Workshop databases and uploaded to the XSEDE User Portal database by the training lead and is uploaded to a central metrics database. Visiting pages in one asynchronous module multiple times during a quarter count as one participant. If this person visits the course again the next quarter, it is counted as a new class that quarter, as it’s the equivalent of a person attending the same course/event a second time.							

Average impact assessment of training for attendees registered through XSEDE User Portal	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	4.54					

	Definition/Description: This is the average of all attendees’ self-rating of each event in which they attend, on a scale of 1 to 5.
	
	Collection methodology:
	
	• The data is collected from post event surveys and recorded in the database. Specific items included in this index are:
	  ○ Q1. The training session fulfilled my expectations.
	  ○ Q2. The trainer stimulated my interest.
	  ○ Q6. The training session was well-organized.
	  ○ Q8. I was able to easily access this training session.
	  ○ Q10. Overall I would rate my experience as successful.							

Number of pageviews to the XSEDE website	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital research services
	RY 4							
	RY 3							
	RY 2							
	RY 1	80,000 / qtr	49,409					

	Definition/Description: Per Google Analytics, “a pageview is defined as a view of a page on your site that is being tracked by the Analytics tracking code. If a user clicks reload after reaching the page, this is counted as an additional pageview. If a user navigates to a different page and then returns to the original page, a second pageview is recorded as well.” **Collection methodology:** This is the number reported in the Google Analytics tracking software for the given time period.							
Number of pageviews to the XSEDE User Portal	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital research services
	RY 4							
	RY 3							
	RY 2							
	RY 1	100,000 / qtr	183,408					
	Definition/Description: Per Google Analytics, “a pageview is defined as a view of a page on your site that is being tracked by the Analytics tracking code. If a user clicks reload after reaching the page, this is counted as an additional pageview. If a user navigates to a different page and then returns to the original page, a second pageview is recorded as well.” **Collection methodology:** This is the number reported in the Google Analytics tracking software for the given time period.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1]The target total for synchronous and asynchronous attendees (2,000 and 4,000, respectively) was previously listed as 5,600 / yr. This was an error. The target total should be 6,000.

3.1 CEE Director's Office (WBS 2.1.1)

The CEE Director’s Office has been established to provide the necessary oversight to ensure the greatest efficiency and effectiveness of the CEE area. This oversight includes providing direction to the L3 management team, coordination of, and participation in, CEE planning activities and reports through the area’s Project Manager, and monitoring compliance with budgets, and retarget effort if necessary. The Director’s Office also attends and supports the preparation of project level reviews and activities.

The CEE Director’s Office will continue to manage and set direction for CEE activities and responsibilities. They will contribute to and attend bi-weekly senior management team calls, contribute to the project level plan, schedule, and budget, contribute to XSEDE quarterly, annual, and other reports as required by the NSF and attend XSEDE quarterly and annual meetings.

3.2 Workforce Development (WBS 2.1.2)

The Workforce Development mission is to provide a continuum of learning resources and services designed to address the needs and requirements of researchers, educators, developers, integrators, and students utilizing advanced digital resources. This includes providing professional development for the XSEDE team members.

Workforce Development provides an integrated suite of training, education, and student preparation activities to address formal and informal learning about advanced digital resources addressing the needs of researchers, developers, integrators, IT staff, XSEDE staff, faculty, and undergraduate and graduate students. CEE – Workforce Development will provide business and industry with access to XSEDE’s workforce development efforts including training services and student internships that have proven beneficial to industry in the first five years of the project.

Workforce Development is comprised of three areas: Training, Education and Student Preparation. The Training team will develop and deliver training programs to enhance the skills of the national open science community and ensure productive use of XSEDE’s cyberinfrastructure. The Education team will work closely with Training and Student Preparation to support faculty in all fields of study with their incorporation of advanced digital technology capabilities within the undergraduate and graduate curriculum. The Student Preparation program will actively recruit students to use the aforementioned training and education offerings to enable the use of XSEDE resources by undergraduate and graduate students to motivate and prepare them to pursue advanced studies and careers to advance discovery and scholarly studies.

The Training metrics have been dramatically revised based on lessons learned. Beginning with PY1, the metrics will include the number of people who attended training rather than the number of people who registered. This will more accurately represent the number of people who are benefitting from the training offerings. Further, since the learning environment and usage modalities for synchronous (which includes in-person and web-cast events) and asynchronous (which includes usage of CI-Tutor and Cornell Virtual Workshop tutorials) training are very different in nature, the number of people benefitting from these will be reported separately. In addition, the number of unique people benefitting from the full range of training offerings, as well as the number of people benefitting from each of the synchronous and asynchronous training offerings, will be reported. These metrics will better represent the impact of training among the community.

The Education metrics are consistent with those reported in previous years. They will include the adoption and incorporation of computation and data-enabled techniques and methods within the curriculum, and the sharing of course materials. This will include offerings of certificate and degree programs, new and modified course modules, the number of modules shared with the community, and the downloads of course modules for adoption and/or adaptation in courses.

The Student Preparation metrics will include the number of students engaged in utilizing XSEDE resources and services through internships, their participation in the annual XSEDE Conference, or working on XSEDE projects. Also included will be the number of under-represented students who are involved.

Table 3-2: Area Metrics for Workforce Development.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported

Number of unique attendees, synchronous training	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	1,600 / yr	112					
	Definition/Description: Number of unique attendees at synchronous events (in-person and webinar), where an attendee is any XSEDE User Portal registrant who attends the event for any length of time. For an in-person workshop, attendees are those who physically attend, and for webinars, attendees are those who sign in with their XSEDE User Portal username. **Collection methodology:** Information about attendee (XUP username, date, and course) who register and participate using their XSEDE User Portal username are recorded by the session moderator and uploaded to a central metrics database via the course coordinator. For the annual total, the query is rerun to look at the year as a whole and not just the quarter. Walk-ins are not counted.							
Number of total attendees, synchronous training **(One person can take several classes)**	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	2,000 / yr	188					
	Definition/Description: The total number of attendees at synchronous events (in-person and webinar), where an attendee is any XSEDE User Portal registrant who attends the event for any length of time. For an in-person workshop, attendees are those who physically attend, and for webinars, attendees are those who sign in with their XSEDE User Portal username. **Collection methodology:** Information about attendees (XUP username, date, and course) who register and participate using their XSEDE User Portal username are recorded and uploaded to a central metrics database via the course coordinator. Walk-ins are not counted.							
Number of unique attendees, asynchronous training	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	2,000 / yr	215					
	Definition/Description: Number of unique attendees using asynchronous materials (CI-Tutor and Cornell Virtual Workshop), where an attendee is any XSEDE User Portal user logged in who visited at least one page in an online course. **Collection methodology:** Attendee information (XUP username, date, and course) is pulled from CI-Tutor and Cornell Virtual Workshop databases and uploaded to the XSEDE User Portal database by the training lead and is uploaded to a central metrics database, for the time period listed.							
Number of total attendees, asynchronous training **(One person can take several classes)**	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	4,000 / yr	1,116					
	Definition/Description: The number of classes taken by all attendees, where an attendee is anyone who loaded page(s) in an online training module. Regardless of activity level, an attendee will be counted as taking a course no more than once in a given quarter. Only attendees who signed in with an XUP username are counted. **Collection methodology:** Attendee information (XUP username, date, and course) is pulled from CI-Tutor and Cornell Virtual Workshop databases and uploaded to the XSEDE User Portal database by the training lead and is uploaded to a central metrics database. Visiting pages in one asynchronous module multiple times during a quarter count as one participant. If this person visits the course again the next quarter, it is counted as a new class that quarter, as it's the equivalent of a person attending the same course/event a second time.							
Average impact assessment of training for attendees **registered through XSEDE User Portal**	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 /qtr	4.54					
	Definition/Description: This is the average of all attendees' self-rating of each event in which they attend, on a scale of 1 to 5. **Collection methodology:** This data is collected from post event surveys and recorded in the database. Specific items included in this index are: ○ Q1. The training session fulfilled my expectations. ○ Q2. The trainer stimulated my interest. ○ Q6. The training session was well-organized. ○ Q8. I was able to easily access this training session. ○ Q10. Overall I would rate my experience as successful.							
Number of formal degree, minor, and certificate **programs added to the**	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							

curricula	RY 2							
	RY 1	3 / yr	1					
	Definition/Description: The number of degrees, minors, and certificate programs addressing computational and data-enabled science and engineering added to course curricula in higher education institutions. This will span all disciplines. **Collection methodology:** This is self-reported by these institutions as a result of XSEDE polling them on an annual basis. Pre and post NCSI workshop surveys are sent for each event. A follow up survey approximately 6 months post participation is also conducted. The data is stored in a surveymonkey account. The education lead pulls these numbers from the interim reports that the evaluation team provides based on the survey data.							
Number of training and education materials contributed to HPC University's public repository	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	40 / yr	10					
	Definition/Description: This is a count of training and education materials that are posted to the HPC University repository (http://www.hpcuniversity.org). **Collection methodology:** This data is maintained by the HPC University web site and is extracted quarterly.							
Number of training and education materials downloaded from HPC University's repository	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	56,000 / yr	11,114					
	Definition/Description: This is a count of training and education materials downloaded from the HPC University repository (http://www.hpcuniversity.org). **Collection methodology:** This data is maintained by the HPC University web site and is extracted quarterly.							
Number of computational science modules added to courses in higher education institutions	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	40 / yr	-					
	Definition/Description: The number of courses addressing computational and data-enabled science and engineering modules added to courses in higher education institutions. This spans all disciplines. **Collection methodology:** This is self-reported by these institutions as a result of us polling them on an annual basis. We poll the faculty and the institutions with whom we are working and have contact over the years.							
Number of students benefitting from XSEDE resources and services	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	50 / qtr	276					
	Definition/Description: This counts the total number of students supported by XSEDE to work on XSEDE projects and to attend the annual XSEDE Conference. **Collection methodology:** This data is provided by the organizations receiving student financial support from XSEDE on a quarterly basis.							
Percentage of under-represented students benefitting **from XSEDE resources and services**	RY 5							Deepen/Extend – Prepare the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	50% / qtr	42%					
	Definition/Description: Percentage of underrepresented students out of total students supported by XSEDE to work on XSEDE projects and to attend the annual XSEDE/PEARC Conference. **Collection methodology:** This data is provided by the organizations receiving student financial support from XSEDE on a quarterly basis							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

3.3 User Engagement (WBS 2.1.3)

The mission of the User Engagement (UE) team is to capture community needs, requirements and recommendations for improvements to XSEDE's resources and services, and report to the national community how their feedback is being addressed. In PY1 and beyond, XSEDE will

place greater emphasis on maintaining consistent user contact, traceability in tracking user issues, and closing the feedback loop.

The UE team will track three area metrics: the number of active and new PIs that are contacted quarterly, the number of user issues that are identified via PI responses to the contact emails that require follow-up, and the number of user issues that are resolved within each reporting period.

The UE team will maintain quarterly contact with all active research teams via email to the project PI to ensure the team is making progress, any obstacles to the team are being addressed, and user requirements are being gathered. Startup PIs will be contacted 15-45 days after their allocation start date and new and renewal project PIs will be contacted 15-30 days following the start of the new allocation period. Also, active PIs within their second, third and fourth quarters of their allocation period will be contacted in the first month of each allocation quarter.

Issues that are raised in response to these contact emails will be logged and tickets generated on the user's behalf if further action is required. Tickets will be handled by the UE team, assigned to another XSEDE team, or assigned to the appropriate Service Provider(s) for resolution. The UE team will track tickets to ensure resolution. UE will also use the ticket data to identify community needs and file Use Cases for further follow-up by the XCI area.

Action items resulting from issues and community needs will be recorded and tracked along with the status and this information will be made available to the user community. The number of user issues/requirements resolved within each reporting period will be included in each quarterly report.

Table 3-3: Area Metrics for User Engagement.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Percentage of active and new PIs **contacted quarterly**	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	100% / qtr	100% (1,533)					
	Definition/Description: The percentage of PIs with an active allocation that are sent an email to identify user issues that need to be addressed (user requirements) and pass the issues on to the appropriate XSEDE group for resolution. **Collection methodology:** Members of the User Engagement team send emails, acknowledge user responses, create XSEDE tickets on the user's behalf, track the issues to resolution, and close the loop with the user. Currently a spreadsheet is maintained that includes the number of PIs contacted and the date the emails were sent. The goal is to use Jira to keep track of this metric.							
Percentage of user requirements **entered/tracked**	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	100% / qtr	100% (32)					
	Definition/Description: The percentage of user requirements that are entered to be tracked that result from responses to the PI contact emails from PIs and/or members of their research teams. **Collection methodology:** A member of the User Engagement team submits a ticket on the user's behalf. Currently a spreadsheet is maintained that includes the nature of the user requirement, PI or team member pointing out the user requirement, and XSEDE ticket # being used to resolve the issue. The goal to use a Jira/RT plugin to track XSEDE tickets and Jira alone to track issues that do not require the generation of an XSEDE ticket.							
Percentage of user requirements resolved	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	100% / yr	50% (16/32)					
	Definition/Description: The percentage of user requirements that are resolved. **Collection methodology:** Currently a spreadsheet is maintained that includes the status of each ticket and we report on the number of tickets that have been resolved in the quarter. The goal is to use Jira to track and report this metric.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

3.4 Broadening Participation (WBS 2.1.4)

Broadening Participation will engage under-represented minority researchers from domains that are not traditional users of HPC and from Minority Serving Institutions. This target audience ranges from potential users with no computational experience to computationally savvy researchers,

educators, Champions, and administrators that will promote change at their institutions for increased use of advanced digital services for research and teaching.

Broadening Participation will continue the most effective recruitment activities— conference exhibiting, campus visits, and regional workshops—while increasing national impact through new partnerships and the utilization of lower cost awareness strategies to continue the growth in new users from under-represented communities. The Diversity Forum and the Minority Research Community listservs and community calls focus on user persistence in their use of XSEDE services and their deepening engagement through participation in committees such as the User Advisory Committee (UAC) and XRAC, participation in Champions, bridging, and other programs. Persistent institutional engagement is enabled by curriculum reform and larger numbers of researchers adopting the use of advanced digital resources as a standard research method.

The “Number of new under-represented individuals using XSEDE resources and services” is defined as the number of first-time awardees of XSEDE compute resources or an “allocation” (i.e. Startup, Research, Education, etc.) from underrepresented communities including women and racial/ethnic domestic minorities in HPC as well as anyone from a Minority Serving Institution (MSI) as defined by the Carnegie Classification of Institutions of Higher Education are tracked. The “Number of sustained under-represented individuals using XSEDE resources and services” is the number of awardees of XSEDE compute resources or an “allocation” (i.e. Startup, Research, Education, etc.) from underrepresented communities including women and racial/ethnic domestic minorities in HPC as well as anyone from a Minority Serving Institution (MSI) as defined by the Carnegie Classification of Institutions of Higher Education are tracked that access their “allocation” during the time period. For both metrics, “Longitudinal assessment of inclusion in XSEDE” and “Longitudinal assessment of diversity in XSEDE”, a mean index score is generated from annual Staff Climate Study responses to items within the "Inclusion" and “Diversity” dimension of the study, respectively.

Table 3-4: Area Metrics for Broadening Participation.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of new under-represented individuals using XSEDE resources and services (KPI)	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 100 / yr	150					
	Definition/Description: First-time awardees of XSEDE compute resources or an “allocation” (i.e. Startup, Research, Education, etc.) from underrepresented communities including women and racial/ethnic domestic minorities in HPC as well as anyone from a Minority Serving Institution (MSI) as defined by the Carnegie Classification of Institutions of Higher Education are tracked. **Collection methodology:** XSEDE portal users are able to specify their race/ethnicity, gender, and institution in their user profile and are encouraged to complete this data when registering for training events through the XSEDE portal. Date of allocation awards is also recorded in the XSEDE database (XDCDB). A query is then run to generate the number of individuals meeting the aforementioned criteria within a given quarter. Care is taken to not over represent this metric by ensuring an individual who meets multiple criteria is only accounted for one time.							
Number of sustained under-represented individuals using XSEDE resources and services (KPI)	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	> 1,000 / yr	322					
	Definition/Description: Awardees of XSEDE compute resources or an “allocation” (i.e. Startup, Research, Education, etc.) from underrepresented communities including women and racial/ethnic domestic minorities in HPC as well as anyone from a Minority Serving Institution (MSI) as defined by the Carnegie Classification of Institutions of Higher Education are tracked that access their “allocation” during the time period. **Collection methodology:** XSEDE portal users are able to specify their race/ethnicity, gender, and institution in their user profile and are encouraged to complete this data when registering for training events through the XSEDE portal. Date of allocation awards is also recorded in the XSEDE database (XDCDB). A query is then run to generate the number of individuals meeting the aforementioned criteria within a given quarter. Care is taken to not over represent this metric by ensuring an individual who meets multiple criteria is only accounted for one time.							
Longitudinal Assessment of Inclusion in XSEDE via the Staff Climate Survey	RY 5							Advance – Enhance the array of technical expertise and support services
	RY 4							
	RY 3							
	RY 2							
	RY 1	5% improvement / yr	-					
	Definition/Description: A measure of XSEDE staff perception and experience relating to inclusion in the project. **Collection methodology:** A mean index score is generated from annual Staff Climate Study responses to items within the "Inclusion" dimension of the study. This score is then compared to the previous year to determine percent change on an annual basis.							
Longitudinal Assessment of Equity in XSEDE via the Staff Climate Survey	RY 5							Advance – Enhance the array of technical expertise and support services
	RY 4							
	RY 3							
	RY 2							
	RY 1	5% improvement / yr	-					

NOTE: RY 1 is unique and only spans September 2015-April 2017. RY 1 RP1 includes September-October 2016.

- Data reported annually

Definition/Description: A measure of XSEDE staff perception and satisfaction with diversity at the project.

Collection methodology: A mean index score is generated from annual Staff Climate Study responses to items within the "diversity" dimension of the study. This score is then compared to the previous year to determine percent change on an annual basis.

3.5 User Interfaces & Online Information (WBS 2.1.5)

User Interfaces & Online Information (UII) is committed to enabling the discovery, understanding, and effective utilization of XSEDE's powerful capabilities and services. UII has immediate impact on XSEDE users from day one, providing them with an information rich website, the XSEDE User Portal, and a uniform set of user documentation.

The UII team will track six area metrics: number of new users of XSEDE resources and services, number of sustained users of XSEDE resources and services, number of unique visitors to the website and User Portal, and user satisfaction rating of the website, User Portal, and online documentation.

The number of new users of XSEDE resources and services is comprised of the number of new XSEDE User Portal accounts that are created in PY1. The number of sustained users of XSEDE resources and services is the total number of users who have logged into the XSEDE User Portal during PY1 including new users that created accounts during PY1. The number of pageviews to the website and User Portal will be tracked using Google Analytics. This is defined as both new and returning users that have at least one session within the selected time period. User satisfaction of the website, User Portal and user documentation will be a rating from the annual XSEDE User Survey. If additional surveys such as micro-surveys are conducted to measure satisfaction, they will be shared in the appropriate quarterly report.

Table 3-5: User Interfaces & Online Information.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of new users of XSEDE resources and services	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	>1,000 / qtr	1,881					
	Definition/Description: This is the number of portal accounts created within the selected time period. **Collection methodology:** The Liferay Database is queried for the number of users in the Users table that was created during the selected time periods. Sample query: select screenName, createDate from User_ where createDate between '2016-09-01 00:00:00' AND '2016-10-31 00:00:00';							
Number of sustained users of XSEDE resources and services	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	>5,000 / qtr	5,610					
	Definition/Description: This is the number of users logged into the XSEDE User Portal within the selected time period that were existing XUP users before the selected reporting period. Users who have created their account during that time period are not counted. **Collection methodology:** The UII team provides the list of username's logged in during this period to the evaluation team, they filter out the accounts that were created during this time to get the total number of sustained users.							
Number of unique pageviews to the XSEDE website	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	80,000 / qtr	49,409					
	Definition/Description: Per Google Analytics, "a pageview is defined as a view of a page on your site that is being tracked by the Analytics tracking code. If a user clicks reload after reaching the page, this is counted as an additional pageview. If a user navigates to a different page and then returns to the original page, a second pageview is recorded as well." **Collection methodology**: This is the number reported in the Google Analytics tracking software for the given time period.							
Number of pageviews to the XSEDE User Portal	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	100,000 / qtr	183,408					
	Definition/Description: Per Google Analytics, "a pageview is defined as a view of a page on your site that is being tracked by the Analytics tracking code. If a user clicks reload after reaching the page, this is counted as an additional pageview. If a user navigates to a different page and then returns to the original page, a second pageview is recorded as well." **Collection methodology**: This is the number reported in the Google Analytics tracking software for the given time period.							

User satisfaction with the website	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	-					
	Definition/Description: The user satisfaction rating of the web site as determined by the Annual User Survey on a scale of 1-5. **Collection methodology:** An annual user survey is emailed to all users of XSEDE resources and users are asked to rate their satisfaction with the website based on a scale of 1-5. The statement is “Please rate your overall satisfaction with XSEDE on a scale of 1 to 5, with 1 being “very dissatisfied” and 5 being “very satisfied.” If you have no basis for rating your satisfaction, please select "Not applicable."							
User satisfaction with the XSEDE User Portal	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	-					
	Definition/Description: The user satisfaction rating of the portal from the Annual User Survey on a scale of 1-5. **Collection methodology:** An annual user survey is emailed to all users of XSEDE resources and users are asked to rate their satisfaction with the website based on a scale of 1-5. The statement is “Please rate your overall satisfaction with XSEDE on a scale of 1 to 5, with 1 being “very dissatisfied” and 5 being “very satisfied.” If you have no basis for rating your satisfaction, please select "Not applicable."							
User satisfaction with user documentation	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	-					
	Definition/Description: The user satisfaction rating of user documentation from the Annual User Survey on a scale of 1-5**.** **Collection methodology:** An annual user survey is emailed to all users of XSEDE resources and users are asked to rate their satisfaction with the user documentation based on a scale of 1-5.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

- Data reported annually

3.6 Campus Engagement (WBS 2.1.6)

The Campus Engagement program promotes and facilitates the effective participation of a diverse national community of campuses in the application of advanced digital resources and services to accelerate discovery, enhance education, and foster scholarly achievement.

Campus Engagement, via the Campus Champions, works directly with institutions across the US both to facilitate computing and data-intensive research and education, nationally and with collaborators worldwide, and to expand the scale, scope, ambition and impact of these endeavors. This is done by increasing scalable, sustainable institutional uptake of advanced digital services from providers at all levels (workgroup, institutional, regional, national, international), fostering a broader, deeper, more agile, more sustainable and more diverse nationwide cyberinfrastructure ecosystem across all levels, and cultivating inter-institutional interchange of resources, expertise and support.

Campus Engagement’s core approach is to assist researchers and educators in identifying and facilitating the use of the most appropriate advanced digital capabilities for their extant and emerging needs, including workgroup, institutional, regional, national and/or international level (which is anticipated in a subset of cases to include XSEDE resources). Campus Engagement’s activities include, but are not limited to, fostering the expansion of both the scale and the scope of the national and worldwide community of cyberinfrastructure practitioners, both via internal initiatives and in collaboration with other related efforts. CE also aims to assist with the establishment and expansion of consortia (for example, intra-state, regional, domain-specific) that collaborate to better serve the needs of their advanced computing stakeholders. XSEDE teams (e.g., Service Providers, diversity leadership, Champions) will be leveraged to both reach appropriate stakeholders and provide them with the information and capabilities they need. CE will also inform institutional leadership about the value proposition of advanced digital services and the impact of these capabilities on research and education outcomes, as a driver for stimulating investment across all scales.

Metrics include the number of institutions with a Champion, the number of unique contributors to the Champion email list and the number of activities that (i) expand the emerging CI workforce and/or (ii) improve the extant CI workforce, participated in by members of the Campus Engagement team. The number of institutions with Champions represents the breadth of the reach of the Campus Engagement/Champion program. The email list metric demonstrates active involvement across institutions and shows the extent to which peer mentoring is valued. The number of activities that expand and/or improve the extant CI workforce demonstrates the efforts of the team to nurture continued development of the CI workforce across the community.

Table 3-6: Area Metrics for Campus Engagement.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported

Number of institutions with a Champion	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	225 / yr	224					
	Definition/Description: The total number of Institutions that have a signed MOU with the Champion program. **Collection methodology:** These are collected from a spreadsheet kept by the Campus Engagement leadership and on the public website listing Champion institutions.							
Number of unique contributions to the Champion email list (campuschampions@xsede.org)	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	50 / yr	90					
	Definition/Description: The total number of distinct champions that sent a message to the champion email list. **Collection methodology:** Archives are available at https://mhonarc.xsede.org/campuschampions/ as mbox files that can be parsed and counted.							
Number of activities that (i) expand the emerging CI workforce and/or (ii) improve the extant CI workforce, participated in by members of the Campus Engagement team	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	20 / yr	10					
	Definition/Description: CI workforce development activities engaged in by any member of the Campus Engagement team, including but not limited to the Campus Engagement Level 3 Co-Managers, the Campus Champions Coordinator, Campus Engagement staff and leadership team, and the Campus Champions. This includes but isn't limited to all education, outreach, training, mentoring, team-building, fostering of relevant communities, professional development, recruitment, proposal submissions, workshops, dissemination (for example, papers, posters, presentations etc, at conferences, in journals, and in other venues), which are intended to, or have the effect of, expanding and/or improving the CI workforce, across all segments (academic, industry, government, non-profit/non-governmental). **Collection methodology:** Written reports (documents, e-mails, etc) provided by any and all members of the Campus Engagement team, as enumerated above, including but not limited to any internal survey or other data collection results.							

NOTE: RY 1 is unique and only spans September 2016-April 2017. RY 1 RP1 includes September-October 2016.

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4 Extended Collaborative Support Service - ECSS (WBS 2.2)

The Extended Collaborative Support Service (ECSS) improves the productivity of the XSEDE user community both through successful, meaningful collaborations and well-planned training activities. The goal is to optimize applications, improve work and data flows, increase effective use of the XSEDE digital infrastructure and broadly expand the XSEDE user base by engaging members of under-represented communities and domain areas. The ECSS program provides professionals who can be part of a collaborative team—dedicated staff who develop deep, collaborative relationships with XSEDE users—helping them make best use of XSEDE resources to advance their work. These professionals possess combined expertise in many fields of computational science and engineering. They have a deep knowledge of underlying computer systems and of the design and implementation principles for optimally mapping scientific problems, codes, and middleware to these resources. ECSS includes experts in not just the traditional use of advanced computing systems but also in data-intensive work, workflow engineering, and the enhancement of scientific gateways.

ECSS projects fall into five categories: Extended Support for Research Teams (ESRT), Novel and Innovative Projects (NIP), Extended Support for Community Codes (ESCC), Extended Support for Science Gateways (ESSGW), and Extended Support for Training, Education and Outreach (ESTEO). Project-based ECSS support is requested by researchers via the XSEDE peer-review allocation process. If reviewers recommend support and if staff resources are available, the ECSS expert and the requesting PI develop a work plan outlining the project tasks. The work plan includes concrete quarterly goals and staffing commitments from both the PI team and ECSS. ECSS managers review work plans and also track progress via quarterly reports.

The main metrics of ECSS are the number of projects with workplans per year (targets are ESRT (30), ESCC (10), ESSGW (10)), the average satisfaction with the ECSS support as reported by PIs in post-project interviews (target is 4.5/5), and the impact that those PIs think the ECSS support has had on their project (target is 4/5). The other two metrics, number of new users from non-traditional disciplines of XSEDE resources and services and number of sustained users from non-traditional disciplines of XSEDE resources and services are explained in more detail just before Table 4 3.

Table 4-1: Area Metrics for Extended Collaborative Support Services.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of completed	RY 5							Deepen/Extend – Deepening use to existing communities

ECSS projects **(ESRT + ESCC + ESSGW)** **(KPI)**	RY 4							
	RY 3							
	RY 2							
	RY 1	50 / yr	10					
	Definition/Description: The total number of completed ECSS projects consists of projects that were completed through work in ESRT, ESCC, and ESSGW. A completed project is defined as a project that has progressed through the complete support pipeline. This pipeline includes steps such as assignment of a consultant, production of a work plan, execution of the work plan and reporting of progress through quarterly reports, and the filing of a final project report. **Collection methodology:** The number of completed projects is tracked in Sciforma, XSEDE's project management software. A report has been created in Sciforma that queries all the ECSS projects, filters for allocations that have ended in that quarter and also for projects that have a final report.							
Average ECSS impact rating **(KPI)**	RY 5							Deepen/Extend – Deepening use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	4.56					
	Definition/Description: After an ECSS project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate the impact of the ECSS support on their research on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ECSS staff members. The L2 Director asks the PI to rate the impact of the ECSS support on their research on a scale of one to five and this number is recorded in a spreadsheet, which is provided to the L2 Project Manager (PM). The PM then transfers this number to Sciforma. Each individual impact rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							
Average satisfaction with ECSS support **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	4.5 out of 5 / qtr	4.86					
	Definition/Description: After an ECSS project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate their satisfaction with the ECSS support they have received on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ECSS staff members. The L2 Director asks the PI to rate their satisfaction with the support received on a scale of one to five and this number is recorded in a spreadsheet, which is provided to the L2 Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							
Number of new users from non-traditional **disciplines of XSEDE resources and services** **(KPI)**	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	100 / yr	147					
	Definition/Description: This metric tracks the progress of extending XSEDE allocations to first-time users from fields of science (FOS) that have not been significant consumers of HPC resources and services. **Collection methodology:** A set of 60 FOS have been identified in the XD Central Database (XDCDB), each of whose usage over the past 10 years is below 0.5% of the total normalized usage. A scripted query to XDCDB counts the total number of users on the grants newly activated from these FOS.							
Number of sustained users from non-traditional **disciplines of XSEDE resources and services** **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	100 / yr	451					
	Definition/Description: This metric tracks the progress of users from fields of science (FOS) that have not been significant consumers of HPC resources and services, who are benefiting from their XSEDE allocations in a sustained manner. **Collection methodology:** A set of 60 FOS have been identified in the XD Central Database (XDCDB), each of whose usage over the past 10 years is below 0.5% of the total normalized usage. A scripted query to XDCDB counts the total number of users on the grants from these FOS that have used at least 10% of their allocated usage in the past year.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

4.1 ECSS Director's Office (WBS 2.2.1)

The ECSS Director's Office has been established to provide the necessary oversight to ensure the greatest efficiency and effectiveness of the ECSS area. This oversight includes providing direction to the L3 management team, coordination of, and participation in, ECSS planning activities and reports through the area's Project Manager, and monitoring compliance with budgets, and retarget effort if necessary. The Director's Office also attends and supports the preparation of project level reviews and activities.

The ECSS Director's Office will continue to manage and set direction for ECSS activities and responsibilities. They will contribute to and attend bi-weekly senior management team calls, contribute to the project level plan, schedule, and budget, contribute to XSEDE quarterly, annual, and other reports as required by the NSF and attend XSEDE quarterly and annual meetings.

4.2 Extended Support for Research Teams (WBS 2.2.2)

Extended Support for Research Teams (ESRT) accelerates scientific discovery by collaborating with researchers, engineers, and scholars in order to optimize their application codes, improve their work and data flows, and increase the effectiveness of their use of XSEDE digital infrastructure.

ESRT projects are initiated as a result of support requests or recommendations obtained during the allocation process. Most projects focus on home-grown codes, as community codes fall under ESCC (§4.4) but are not exclusively restricted to this classification. The primary mandate of ESRT is the support of individual research teams within the context of their research goals.

The area metrics for ESRT include the 1) number of completed projects, 2) average impact rating, and 3) average satisfaction with support. The number of completed projects will be monitored throughout the project. A completed project is defined as a project that has progressed through the complete support pipeline, which includes steps such as assignment of a consultant, production of a work plan, execution of work plan and reporting of progress through quarterly reports, and the filing of a final project report. The PIs of these completed projects are contacted by ECSS leadership for an interview where PIs relay their experience with ECSS support and its impact upon their research. These discussions culminate in a numerical ranking (out of 5 possible) that expresses the level of satisfaction with ECSS support and its impact upon their research goals.

Table 4-2: Area Metrics for Extended Support for Research Teams.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of completed ESRT projects **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	30 / yr	3					
	Definition/Description: A completed project is defined as a project that has progressed through the complete support pipeline. This pipeline includes steps such as assignment of a consultant, production of a work plan, execution of the work plan and reporting of progress through quarterly reports and the filing of a final project report. **Collection methodology:** The number of completed projects is tracked in Sciforma, XSEDE's project management software. A report has been created in Sciforma that queries all the ECSS projects, filters for allocations that have ended in that quarter and also for projects that have a final report. This report can be filtered by the 3 project areas in ECSS: ESRT, ESCC, or ESSGW.							
Average ESRT impact rating **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	5					
	Definition/Description: After an ESRT project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate the impact of the ESRT support on their research on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ESRT staff members. The L2 Director asks the PI to rate the impact of the ESRT support on their research on a scale of one to five and this number is recorded in a spreadsheet, which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							
Average satisfaction with ESRT support **(KPI)**	RY 5							Deepen/Extend – Deepening use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	4.5 out of 5 / qtr	5					

	Definition/Description: After an ESRT project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate their satisfaction with the ECSS support they have received on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ESRT staff members. The L2 Director asks the PI to rate their satisfaction with the support received on a scale of one to five and this number is recorded in a spreadsheet which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

4.3 Novel & Innovative Projects (WBS 2.2.3)

Novel and Innovative Projects (NIP) accelerates research, scholarship, and education provided by new communities that can strongly benefit from the use of XSEDE's ecosystem of advanced digital services. Working closely with the XSEDE Outreach team, the NIP team identifies a subset of scientists, scholars and educators from *new communities,* i.e. from disciplines or demographics that have not yet made significant use of advanced computing infrastructure, who are now committed to projects that appear to require XSEDE services and are in a good position to use them efficiently. NIP staff then provides personal mentoring to these projects, helping them to obtain XSEDE allocations and use them successfully.

XSEDE projects generated by, and mentored by, the personal efforts of the NIP experts should stimulate additional practitioners in their field to become interested in XSEDE. Strategies used will include building and promotion of science gateways serving communities of end-users and the enhancement of the Domain Champions program by which successful practitioners spread the word about the benefits of XSEDE to their colleagues.

A set of 60 fields of science (FOS) have been identified in the XD Central Database, each of whose usage over the past 10 years is below 0.5% of the total normalized usage. The area metric "number of new users from non-traditional disciplines of XSEDE resources and services" (an XSEDE KPI) will report the total number of users on the projects newly activated from these FOS. The area metric "number of sustained users from non-traditional disciplines of XSEDE resources and services" (an XSEDE KPI) will report the total number of users on the projects from these FOS that have used at least 10% of their allocated usage. The area metric "number of new XSEDE projects from target communities generated by NIP" will report the number of projects from the targeted FOS that will be generated by the personal efforts of NIP staff members. The area metric "number of successful XSEDE projects from target communities mentored by NIP" will report the number of projects from the targeted FOS, personally mentored by NIP staff members that have used at least 10% of their allocated usage.

Table 4-3: Area Metrics for Novel and Innovative Projects.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of new users from non-traditional disciplines using XSEDE resources and services (KPI)	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	100 / yr	147					
	Definition/Description: This metric tracks the progress of extending XSEDE allocations to first-time users from fields of science (FOS) that have not been significant consumers of HPC resources and services. **Collection methodology:** A set of 60 FOS have been identified in the XD Central Database (XDCDB), each of whose usage over the past 10 years is below 0.5% of the total normalized usage. A scripted query to XDCDB counts the total number of users on the grants newly activated from these FOS.							
Number of sustained users from non-traditional disciplines using XSEDE resources and services (KPI)	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	100 / yr	451					
	Definition/Description: This metric tracks the progress of users from fields of science (FOS) that have not been significant consumers of HPC resources and services, who are benefiting from their XSEDE allocations in a sustained manner. **Collection methodology:** A set of 60 FOS have been identified in the XD Central Database (XDCDB), each of whose usage over the past 10 years is below 0.5% of the total normalized usage. A scripted query to XDCDB counts the total number of users on the grants from these FOS that have used at least 10% of their allocated usage in the past year.							
Number of new XSEDE projects from target communities generated by NIP	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	20 / yr	16					

	Definition/Description: This metric tracks the success of the personal efforts of NIP staff members to generate new XSEDE projects from fields of science (FOS) that have not been significant consumers of HPC resources and services. **Collection methodology:** First-time grants generated by the personal efforts of NIP staff members are flagged in XDCDB. A scripted query reports the number of these grants.							
Number of successful XSEDE projects from target communities mentored by NIP	RY 5							Deepen/Extend – Extend use to new communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	10 / yr	23					
	Definition/Description: This metric tracks the success of the personal efforts of NIP staff members to mentor sustained projects from fields of science (FOS) that have not been significant consumers of HPC resources and services. **Collection methodology:** Grants generated by the personal efforts of NIP staff members are flagged in XDCDB. A scripted query reports the number of these grants that have used at least 10% of their allocated usage in the past year..							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

4.4 Extended Support for Community Codes (WBS 2.2.4)

Extended Collaborative Support for Community Codes (ESCC) extends the use of XSEDE resources by collaborating with researchers and community code developers to deploy, harden, and optimize software systems necessary for research communities to create new knowledge.

ESCC supports users via requested projects and initiated projects. ESCC projects may be created in two different ways. Most ESCC projects are initiated as a result of requests for assistance during the allocation process. These projects are similar in nature to ESRT projects but involve community codes rather than codes developed for and by individual research groups. ESCC projects may also be initiated by staff to support a community's needs.

ESCC has three key metrics: number of completed projects, impact rating, and satisfaction rating. These metrics are collected on a quarterly basis although the targets are annual.

The number of completed projects refers to the number of projects that were assigned, progressed to the workplan phase, and completed with a final report. The impact rating is an estimate of the impact the ESCC project had on a PI's research based on a number the PI assigns to it. The satisfaction rating measures the PI's satisfaction with the support provided by ECSS.

Table 4-4: Area Metrics for Extended Support for Community codes.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of completed ESCC projects **(KPI)**	RY 5							Deepen/Extend – Deepening use to existing communities
	RY 4							
	RY 3							
	PY27							
	RY 1	10 / yr	3					
	Definition/Description: A completed project is defined as a project that has progressed through the complete support pipeline. This pipeline includes steps such as assignment of a consultant, production of a work plan, execution of the work plan and reporting of progress through quarterly reports, and the filing of a final project report. **Collection methodology:** The number of completed projects is tracked in Sciforma, XSEDE's project management software. A report has been created in Sciforma that queries all the ECSS projects, filters for allocations that have ended in that quarter and also for projects that have a final report. This report can be filtered by the 3 project areas in ECSS: ESRT, ESCC, or ESSGW.							
Average ESCC impact rating **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	4.67					
	Definition/Description: After an ESCC project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate the impact of the ESCC support on their research on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ESCC staff members. The L2 Director asks the PI to rate the impact of the ESCC support on their research on a scale of one to five and this number is recorded in a spreadsheet which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							
Average satisfaction with ESCC support **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							

	RY 2						
	RY 1	4.5 out of 5 / yr	4				
	Definition/Description: After an ESCC project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate their satisfaction with the ESCC support they have received on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ESCC staff members. The L2 Director asks the PI to rate their satisfaction with the support received on a scale of one to five and this number is recorded in a spreadsheet which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.						

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

4.5 Extended Support for Science Gateways (WBS 2.2.5)

Extended Support for Science Gateways (ESSGW) broadens science impact and accelerates scientific discovery by collaborating in the development and enhancement of science-centric gateway interfaces and by fostering a science gateway community ecosystem.

ESSGW projects primarily begin through user requests from the XSEDE allocation process. Similar to ESRT and ESCC, ESSGW projects progress through three activities. First, the project is assigned to an ECSS expert. Second, the project is quantified with the formation of a work plan through collaboration with the research group. Third, when the project is completed, the ESSGW expert produces a final report with input from the research group. A successful project is the completion of all three phases. Each state of the progression is measured to provide an assessment of progress. Submission of work plans within 45 days of initial contact, 90% of projects with work plans completed, and 85% of completed projects with final reports within three months are additional criteria for success.

Area metrics are direct measurements of ESSGW's operations and effectiveness. The target of ten completed ESSGW projects per year measures ESSGW's operations and indicates that the area is both bringing in new projects, and concluding previous consultations. The effectiveness of the consultations is measured by the next two metrics, impact rating and satisfaction of the support recipients. These two metrics are measured through interviews. The fourth metric measures the unique number of gateway users across all gateways.

Table 4-5: Area Metrics for Extended Support for Science Gateways.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of completed ESSGW projects **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	10 / yr	4					
	Definition/Description: A completed project is defined as a project that has progressed through the complete support pipeline. This pipeline includes steps such as assignment of a consultant, production of a work plan, execution of the work plan and reporting of progress through quarterly reports, and the filing of a final project report. **Collection methodology:** The number of completed projects is tracked in Sciforma, XSEDE's project management software. A report has been created in Sciforma that queries all the ECSS projects, filters for allocations that have ended in that quarter and also for projects that have a final report. This report can be filtered by the 3 project areas in ECSS: ESRT, ESCC, or ESSGW.							
Average ESSGW impact rating **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	4					
	Definition/Description: After an ESSGW project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate the impact of the ESSGW support on their research on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ESSGW staff members. The L2 Director asks the PI to rate the impact of the ESSGW support on their research on a scale of one to five and this number is recorded in a spreadsheet which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							
Average satisfaction with ESSGW support **(KPI)**	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	4.5 out of 5 / qtr	5					

	Definition/Description: After an ESSGW project is marked as completed (i.e. has a workplan, work has progressed, and a final report has been filed), the L2 Directors interview the PIs, preferably via phone, and ask them to rate their satisfaction with the ESSGW support they have received on a scale of 1 to 5. **Collection methodology:** PIs are contacted by the L2 Directors post filing of a final report by ESSGW staff members. The L2 Director asks the PI to rate their satisfaction with the support received on a scale of one to five and this number is recorded in a spreadsheet which is shared with the L2 Area Project Manager (PM). The PM then transfers this number to Sciforma. Each individual satisfaction rating that is reported for the reporting period is then added together and divided by the total number of interviews conducted for the average.							
Number of unique gateway users per quarter	RY 5							Deepen/Extend – Deepen use to existing communities
	RY 4							
	RY 3							
	RY 2							
	RY 1	3,000 / qtr	2694					
	Definition/Description: number of unique users per quarter who ran a job through an XSEDE resource job scheduler. **Collection methodology:** Most numbers are collected by gateways running a reporting script when the jobs are launched. Some manual collection is also performed by contacting gateways directly.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

4.6 ECSS Communities – Extended Support for Education, Outreach, & Training (WBS 2.2.6)

Extended Collaborative Support for Training, Education & Outreach (ESTEO) prepares the current and next generation of researchers, engineers, and scholars in the use of advanced digital technologies by providing the technical support for Training, Education and Outreach planned activities.

Typical events include train-the-trainers events, on-site classes requested by Campus Champions, regional workshops, conferences, and summer schools (including the International HPC Summer School). Staff also create and review online documentation and training modules. This on-demand training is increasingly popular with the user community when both time and travel budgets are limited.

A few of the overall activities performed by ESTEO are represented in the Area Metrics table, namely, metrics surrounding support of the campus champions fellows program, a metric to gauge the number of live training events staffed, and metrics designed to measure breadth of attendees participating in both staff training and ECSS symposium activities. The full breadth of ESTEO activities is captured in the “ongoing activities” section below, which are measured and reported quarterly in the metrics appendix.

Table 4-6: Area Metrics for Extended Support for Education, Outreach, & Training.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of Campus Champions fellows	RY 5							Deepen/Extend – Preparing the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 / yr	5					
	Definition/Description: This is the number of campus champion fellows supported on an annual basis. **Collection methodology:** Count of campus champion fellows appointed at beginning of each project year.							
Average score of fellows assessment	RY 5							Deepen/Extend – Preparing the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	4.33					
	Definition/Description: Satisfaction score generated by participants of the Champion Fellows program. **Collection methodology:** As of 2015, Champion Fellows are sent an annual follow up survey to assess their overall experience in the program. This is developed and administered by the XSEDE Evaluation team. Fellows are asked to rate a set of statements regarding their experience on a scale of 1 (strongly disagree) - 5 (strongly agree). This metric is calculated by averaging responses to the statement “Overall I am satisfied with my experience.”							
Number of live training events staffed	RY 5							Deepen/Extend – Preparing the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	20 / yr	7					

	Definition/Description: Count of live training events staffed by ESTEO trainers, as reported in ESTEO staff quarterly reports. **Collection methodology:** Tally of live training events as reported by ESTEO staff.							
Number of staff training events	RY 5							Deepen/Extend – Preparing the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	2 / yr	0					
	Definition/Description: Number of staff training events held. **Collection methodology:** The number of ECSS staff training events is totaled.							
Attendees at staff training events	RY 5							Deepen/Extend – Preparing the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	40 / yr	0					
	Definition/Description: Number of attendees at every ECSS staff training event held. **Collection methodology:** An approximate total of attendees at ECSS staff training events based on sign-in sheet provided, as well as count of attendees in room and on teleconference.							
Attendees at ECSS Symposia	RY 5							Deepen/Extend – Preparing the current and next generation
	RY 4							
	RY 3							
	RY 2							
	RY 1	300 / yr	78					
	Definition/Description: Number of attendees at ECSS symposia **Collection methodology:** An approximate total of attendees at ECSS symposia based on sign-ins to web conferencing technology.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

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5 XSEDE Community Infrastructure (XCI, WBS 2.3)

The mission of XSEDE Community Infrastructure (XCI) is to facilitate interaction, sharing, and compatibility of all relevant software and related services across the national CI community, building on, and improving upon, the foundational efforts of XSEDE.

XCI envisions enabling users by targeting services allocated by XSEDE (including OSG resources), campus-based CI facilities, commercial cloud providers, CI software services such as science gateways and Globus Online, and even the individual researcher who wants to interact effectively with the national CI via her or his own laptop. Through XCI, XSEDE will serve an aligning function within the nation, not by rigorously defining a particular architecture, but rather by assembling a technical infrastructure that facilitates interaction and interoperability across the national CI community. The suite of interoperable and compatible software tools that XSEDE will make available to the community will be based on those already in use but will add additional services that address emerging needs including data and computational services.

There are four area metrics for XCI: Average satisfaction rating of XCI services; number of new capabilities made available for production deployment; number of capabilities delivered vs. those planned; and total number of systems that use one or more CRI provided toolkits.

For the average satisfaction rating of XCI services, the L2 Director and Deputy Director will focus their attention on current and new community stakeholders who can benefit from XCI services. This will be a critical method for demonstrating return on investment (ROI) for XCI. They will work with the XSEDE Evaluation team to survey all community stakeholders on the value of XCI services.

For the number of new capabilities made available for production deployment, XCI will accept Use Cases from CEE, ECSS and Capability and Resource Integration (CRI) and will quickly provide capability development plans (CDP) that will be prioritized and executed based on feedback from the User Requirement Evaluation and Prioritization (UREP) and the SMT.

Measuring the number of capabilities delivered versus those planned is essentially an efficiency ratio. With proper vetting and prioritization by the UREP and Senior Management Team (SMT), XCI is committed to the efficient and effective delivery of new capabilities.

The total number of systems that use one or more CRI provided toolkits is a measure of effectiveness in broadening the community and participation in national cyberinfrastructure. If CRI is successful, participation in national cyberinfrastructure means sharing resources beyond institutional boundaries, not just consuming them.

Table 5-1: Area Metrics for XSEDE Community Infrastructure.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4		Total	Goal Supported
Average satisfaction rating of XCI services **(KPI)**	RY 5								Advance – Create an open and evolving e-infrastructure
	RY 4								
	RY 3								
	RY 2								
	RY 1	4 out of 5 / yr	4.8						
	Definition/Description: Customer satisfaction rating of XCI staff provided services (does not include software services which are covered in RACD metrics) **Collection methodology:** User interviews and micro-surveys done on an as need basis after services have been delivered.								
Number of new capabilities made available **for production deployment** **(KPI)**	RY 5								Advance – Create an open and evolving e-infrastructure
	RY 4								
	RY 3								
	RY 2								
	RY 1	7 / yr	0						
	Definition/Description: New use cases that have been fully enabled using new or enhanced components. **Collection methodology:** Count in JIRA the new use cases that have been made available by RACD completed CDP activities.								
Number of capabilities delivered/ Number planned	RY 5								Advance – Create an open and evolving e-infrastructure
	RY 4								
	RY 3								
	RY 2								
	RY 1	1 / yr	0						
	Definition/Description: The number of new capabilities actually delivered during a project year divided by the number of new capabilities that were planned for that year. **Collection methodology:** Identify the subset of UREP prioritized use cases we are planning to deliver in PY1. Divide the “Number of new capabilities made available for production deployment” metric by this number.								
Total number of systems that use one or more CRI provided toolkits	RY 5								Advance – Create an open and evolving e-infrastructure
	RY 4								
	RY 3								
	RY 2								
	RY 1	450 / yr	512						
	Definition/Description: Systems using one or more of the software provided or advocated by CRI (Globus Online, the XSEDE Basic Compatible Cluster (XCBC) or XSEDE National Integration Toolkit (XNIT), or other toolkits as they are developed). **Collection methodology:** For Globus numbers, these are reported each quarter from the Globus Team. XCBC installation numbers are collected by direct contact with installation sites (site visits, tickets to help@xsede.org, “stand and be counted” installation script), XNIT and other toolkit users are based on download statistics from software distribution sites.								

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

5.1 XCI Director's Office (WBS 2.3.1)

The XCI Director’s Office has been established to provide the necessary oversight to ensure the greatest efficiency and effectiveness of the XCI area. This oversight includes providing direction to the L3 management team, coordination of, and participation in, XCI planning activities and reports through the area’s Project Manager, and monitoring compliance with budgets, and retarget effort if necessary. The Director’s Office also attends and supports the preparation of project level reviews and activities.

The XCI Director’s Office will continue to manage and set direction for XCI activities and responsibilities. They will contribute to and attend bi-weekly senior management team calls, contribute to the project level plan, schedule, and budget, contribute to XSEDE quarterly, annual, and other reports as required by the NSF and attend XSEDE quarterly and annual meetings.

5.2 Requirements Analysis and Capability Delivery (RACD, WBS 2.3.2)

The Requirements Analysis & Capability Delivery (RACD) team facilitates the integration, maintenance, and support of cyberinfrastructure capabilities addressing user technical requirements. The process begins by preparing Capability Delivery Plans (CDPs) that describe the technical gaps in XSEDE’s prioritized Use Cases. To fill the gaps, RACD evaluates and/or tests existing software solutions, engages with

software providers and facilitates software and service integration. To ensure software and service adoption and ROI, RACD will involve users, Service Providers and operators in an integration process that uses engineering best practices and instrument components to measure usage. Once components are integrated, RACD will facilitate software maintenance and enhancements in response to evolving user needs and an evolving infrastructure environment.

RACD helps create an open and evolving e-infrastructure by integrating components that support XSEDE Use Cases. The first key activity in that process involves preparing Capability Delivery Plans (CDPs) that detail how RACD plans to address software capability gaps in XSEDE prioritized Use Cases. Some capability gaps may require engaging with current or new software partners and this number of engagements is to be tracked. Based on lessons learned in the previous years of the project, the engineering process further improves both user and service provider engagement during the capability integration process and thus the satisfaction of this engagement is tracked.

Table 5-2: Area Metrics for Requirements Analysis and Capability Delivery.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of capability delivery plans (CDPs) **prepared for prioritized Use Cases**	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	7 / yr	9					
	Definition/Description: A CDP is a workplan for how to deliver what a use case describes; this metric is the number of CDPs that we prepare based on the UREP prioritized use cases selected for implementation. **Collection methodology:** Using our JIRA logs, we total the number of CDPs prepared.							
Number of CI integration assistance engagements	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	6 / yr	4					
	Definition/Description: The number of engagements (meetings, conferences) with non-XSEDE components to integrate new CI components with XSEDE. Potential initial candidates include: Federating OpenStack Keystone with XSEDE;Molecular Sciences Software Institute; Globus Groups XSEDE Integration; QBEST XSEDE Integration; Data Hubs **Collection methodology:** Count in JIRA how many CI integration assistance engagement activities we worked on during the reporting period.							
User rating of components delivered in production	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	5[1]					
	Definition/Description: The rating that surveyed users give to the components delivered into production. **Collection methodology:** A micro-survey implemented in the XSEDE Community Software Repository.							
Operator rating of components delivered **for production deployment**	RY 5							Sustain-Provide reliable, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	5[2]					
	Definition/Description: The rating given by users to the components delivered to them to deploy in production (we need to identify which we integrated versus those that we facilitated others to integrate). **Collection methodology:** A micro-survey implemented in the XSEDE Community Software Repository.							
Software/service provider rating of our **integration assistance**	RY 5							Advance - Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	5[3]					
	Definition/Description: Software/service provider rating of XCI staff-provided component integration assistance engagements counted by the “Number of CI integration assistance engagements” metric. **Collection methodology:** User interviews and micro-surveys conducted on an as need basis after integration assistance has been provided.							
Responsiveness to defect and support requests	RY 5							Advance - Create an open and evolving e-infrastructure
	RY 4							

	RY 3							
	RY 2							
	RY 1	45 days or less / yr	7 days					
	Definition/Description: Days from defect/support submitted to solution communicated. **Collection methodology:** From a report of all tickets resolved during the reporting period calculate the number of days between solution communicated and ticket opened.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1]RACD delivered 5 components this period, one targeting internal developers and four user facing. Of the user facing, only one was available to users long enough to collect user ratings. We will report on the others in future progress reports.

[2]RACD delivered 5 components this period, three operated by us/RACD and two by XSEDE and SP Operations. Of those two delivered to XSEDE and SP Operations, only one was available long enough to collect an operator rating.

[3]RACD has four active assistance engagements, one that is new and too early to rate and three that are ongoing. One engagement gave us a rating while the other two did not have notable interactions with us during this reporting period.

5.3 XSEDE Capability & Resource Integration (WBS 2.3.3)

The mission of the Capability & Resource Integration (CRI) team is to work with SPs, CI providers and campuses to maximize the aggregate utility of national cyberinfrastructure. CRI will coordinate interactions between SP's and XSEDE in the SP Forum, engage with national CI providers, gather requirements for tools and training that assist users of XSEDE and other CI, identify and disseminate benefits and costs of interoperating with XSEDE, and create toolkits that fit and improve common usage modalities.

CRI's activities are reflected in the uptake of CRI-integrated toolkits, such as the XSEDE Campus Bridging Cluster toolkit and XSEDE National Integration Toolkit, but also Globus Transfer clients and other toolkits as developed. The Area Metrics reflect users of CRI toolkits as well as integration of toolkits on Level 1 SP resources and the aggregate CI (in Teraflops) taking advantage of CRI tools.

The number of systems using one or more CRI provided toolkits includes systems using the Globus Transfer software, the XSEDE National Integration Toolkit (XNIT), and XSEDE Campus Bridging Cluster (XCBC), as well as any new toolkits developed by CRI. The number of Level 1 total systems that incorporate tools reflects the level of adoption of CRI toolkits within the SP community. Thanks to incorporating SP Forum coordination, CRI hopes to get SP input on requirements for potential new toolkits, which paves the way towards a broader CI utility set. The number of repository subscribers indicates the number of campus sites which receive regular updates from the XSEDE Community Software Repository, indicating regular and prolonged use of the XNIT. Aggregate Teraflops of cluster systems reflects the uptake of both the XNIT and XCBC software and gives some measure of the overall capability provided by these toolkits. Metrics for partnership interactions reflect sustained work on the part of CRI with other CI providers, campuses, and SP representatives to be responsive to a broad set of needs.

Table 5-3: Area Metrics for XSEDE Capability & Resource Integration.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Total number of systems that use one or more CRI provided toolkits	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	450 / yr	512					
	Definition/Description: Systems using one or more of the software provided or advocated by CRI (Globus Online, the XSEDE Basic Compatible Cluster (XCBC) or XSEDE National Integration Toolkit (XNIT), or other toolkits as they are developed). **Collection methodology:** For Globus numbers, these are reported each quarter from the Globus Team. XCBC installation numbers are collected by direct contact with installation sites (site visits, tickets to help@xsede.org, "stand and be counted" installation script), XNIT and other toolkit users are based on download statistics from software distribution sites.							
Number of Level 1 total systems that fully incorporate all of the recommended tools from the XSEDE Community Repository	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	5 / qtr	6/6					
	Definition/Description: Number of Tier 1 Service Provider systems with installed community repository software. Recommended tools currently are Globus Transfer. The XCBC and XNIT toolkits are based off of software expected to already be installed on XSEDE Tier 1 SP's and would thus be redundant. **Collection methodology:** XSEDE SP Coordinator verifies on SP systems that toolkits are installed and provides CRI manager with numbers.							
Number of repository subscribers to SCRI cluster and laptop toolkits	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							

	RY 3							
	RY 2							
	RY 1	150 / yr	91					
	Definition/Description: Number of systems getting updates for XCRI toolkit software. **Collection methodology:** Download logs for CRI toolkits are checked for regular access, systems that check the repository more than once per quarter are regarded to be subscribers and added to the count. Logs are stored on the software.xsede.org and cb-repo.iu.xsede.org systems.							
Aggregate number of TeraFLOPS of cluster systems using SCRI toolkits	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	1,000/ length of project	100					
	Definition/Description: Total number of TeraFLOPS of all clusters which have XCRI software toolkits installed. **Collection methodology:** Users of clusters with XCRI toolkits installed are surveyed (self reporting) to ask their TF. The first of these surveys was conducted in May of 2016 and will be repeated annually.							
Number of partnership interactions between XCRI and SPs, national CI organizations, and campus CI providers	RY 5							Advance-Create an open and evolving e-infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	12 / yr	3					
	Definition/Description: Meetings and presentations attended by XCRI and SP's, organizations such as ACI-REF and Open Science Grid, or individual campus CI providers. **Collection methodology:** Whoever attends the meeting or presentation is asked to make a count of attendees; the event titles and counts are stored in a document at box.iu.edu and the XCRI section of confluence.xsede.org.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

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6 XSEDE Operations (WBS 2.4)

The mission of XSEDE Operations is to install, connect, maintain, secure, and evolve an integrated cyberinfrastructure that incorporates a wide range of digital capabilities to support national scientific, engineering, and scholarly research efforts.

In addition to the Operations Director's Office (§6.1), Operations staff is subdivided into four teams based on the work breakdown structure: Cybersecurity (§6.2), Data Transfer Services (§6.3), XSEDE Operations Center (XOC) (§6.4), and Systems Operational Support (§6.5). The Operations management team meets weekly and individual Operations groups meet approximately bi-weekly with all meeting minutes posted to the XSEDE wiki.

XSEDE Operations has three Area Metrics: (1) average composite availability (as a geometric mean) of both critical central services and the XSEDE Resource Allocation Service (XRAS) (2) hours of downtime of critical central services or multiple Service Providers resulting from a security incident with direct user impact, and (3) mean time to resolution (MTTR) of external user tickets.

Maintaining and evolving an integrated cyberinfrastructure requires the availability, reliability, and security of digital resources. To that end, XSEDE Operations is charged with monitoring a number of hardware and software services.

Along with monitoring and maintaining resources, the XOC provides XSEDE with effective and efficient user support by responding to service requests from end users and staff. All user (non-staff) service requests handled by the XOC and WBS ticket queues comprise this metric.

Table 6-1: Area Metrics for XSEDE Operations.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Average composite availability of core services (geometric mean of critical services and XRAS) **(KPI)**	RY 5							Sustain – Provide reliable, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	99% / qtr	99.9%					

	Definition/Description: The percent average composite availability of core services is the geometric mean of % core enterprise services availability and % POPS/XRAS availability. Because the availability percentage of each of these components is measured separately, they are aggregated and then averaged using a geometric mean to determine the composite availability. **Collection methodology:** See the individual collection methodologies for each component in the responsible WBS area below: Core enterprise services (Systems Operational Support 2.4.5) and POPS/XRAS (AA&AM 2.5.3).							
Hours of downtime with direct user impacts from an XSEDE security incident **(KPI)**	RY 5							Sustain – Provide reliable, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	<24 / qtr	0					
	Definition/Description: This metric will measure resource unavailability for users as a result of an XSEDE-wide security event (involving a Tier 1 service or spanning more than one SP). The metric will be calculated as the Time to Return to Repair (TTR) summed across all applicable services and incidents during the quarter. **Collection methodology:** The Cybersecurity co-leads determine that an XSEDE-wide security event is responsible for an outage. The Sysops lead will determine the TTR based on monitoring and other information in logs and tickets, and the TTR value will be the data point reported.							
Mean time to ticket resolution by XOC and WBS ticket queues (hrs.) **(KPI)**	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	<24 / qtr	24.0					
	Definition/Description: XSEDE-funded areas are measured to ensure that, on average, tickets are resolved in a timely manner. This includes all XSEDE WBS ticket queues as well as the XSEDE Operations Center (XOC) queue. This metric does NOT apply to Service Provider ticket queues. End-users expect for their issues to be responded to within a reasonable amount of time, so the target is a resolution time under 24 hours. **Collection methodology:** The data is stored locally via the Request Tracker service, which is the XSEDE ticket software and which is located at TACC. Reports are generated against the RT database to determine MTTR and other metrics.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

6.1 Operations Director's Office (WBS 2.4.1)

The Operations Director's Office has been established to provide the necessary oversight to ensure the greatest efficiency and effectiveness of the Operations area. This oversight includes providing direction to the L3 management team, coordination of, and participation in, Operations planning activities and reports through the area's Project Manager, and monitoring compliance with budgets, and retarget effort if necessary. The Director's Office also attends and supports the preparation of project level reviews and activities.

The Operations Director's Office will continue to manage and set direction for Operations activities and responsibilities. They will contribute to and attend bi-weekly senior management team calls, contribute to the project level plan, schedule, and budget, contribute to XSEDE quarterly, annual, and other reports as required by the NSF and attend XSEDE quarterly and annual meetings.

6.2 Cybersecurity (WBS 2.4.2)

The Cybersecurity Security (Ops-Sec) group protects the confidentiality, integrity and availability of XSEDE resources and services. The Area Metric for the Cybersecurity group is the hours of time that critical XSEDE resources are unavailable due to a security incident.

Downtime resulting from security incidents has a direct impact on the availability of critical XSEDE resources to users and is the key evaluative measurement of the Cybersecurity group's efforts. Users expect XSEDE resources to be reliable and secure, thus the security team's goal is to minimize any interruption of services related to a security event.

Table 6-2: Area Metrics for Cybersecurity.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Hours of downtime with direct user impacts from an XSEDE security incident **(KPI)**	RY 5							Sustain – Provide reliable, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	<24 / qtr	0					

	Definition/Description: This metric will measure resource unavailability for users as a result of an XSEDE-wide security event (involving a Tier 1 service or spanning more than one SP). The metric will be calculated as the Time to Return to Repair (TTR) summed across all applicable services and incidents during the quarter. **Collection methodology:** The Cybersecurity co-leads determine that an XSEDE-wide security event is responsible for an outage. The Sysops lead will determine the TTR based on monitoring and other information in logs and tickets, and the TTR value will be the data point reported.

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

6.3 Data Transfer Services (WBS 2.4.3)

The Data Transfer Services (DTS) group facilitates data movement and management for the community by maintaining and continuously evolving XSEDE data services and resources. The Area Metric for the DTS group is the performance (Gbps) of intra-XSEDE GridFTP transfers > 1GB. The metric for data transfer performance on large files reflects the ability to consistently provide high performance data movement facilities.

Table 6-3: Area Metrics for Data Transfer Services.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Performance (Gbps) of instrumented, intra-XSEDE Grid FTP transfers > 1 GB	RY 5							Sustain – Provide reliable, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	1 Gbps / qtr	1.6					
	Definition/Description: The metric for data transfer performance on large files reflects the ability to consistently provide high performance data movement facilities. **Collection methodology:** Each SP logs all GridFTP transfer data locally. These logs are collected on a quarterly basis by XSEDE staff and loaded into a database. A number of SQL queries are then run to select intra-XSEDE transfers of the appropriate size and to compute the average transfer performance on those queries.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

6.4 XSEDE Operations Center (WBS 2.4.4)

The XSEDE Operations Center (XOC) staff serve as user advocates, providing timely and accurate assistance to the XSEDE community, while simultaneously monitoring and troubleshooting user-facing systems and services.

The XOC has two Area Metrics. The mean time to ticket resolution (MTTR) for XSEDE user service requests in the XOC queue demonstrates how responsive and efficient the XOC is when handling and resolving tickets. This metric does not apply to WBS ticket queues, Service Provider ticket queues or to internal tickets issued to XSEDE staff or other XSEDE funded individuals. The user satisfaction metric directly gauges users opinions of their experience with the XOC.

Table 6-4: Area Metrics XSEDE Operations Center

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Meantime to resolution in XOC ticket queue	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	<24 / qtr	4.2					
	Definition/Description: Tickets resolved by the XOC are measured to ensure that, on average, they are resolved in a timely manner. This is only the XSEDE Operations Center (XOC) ticket queue. This metric does NOT apply to the WBS ticket queues or the Service Provider ticket queues. End-users expect for their issues to be responded to within a reasonable amount of time, so the target is a resolution time under 24 hours. **Collection methodology:** The data is stored locally via the Request Tracker service, which is the XSEDE ticket software and which is located at TACC. Reports are generated against the RT database to determine MTTR and other metrics.							
User satisfaction with tickets closed by the XOC	RY 5							Sustain - Provide excellent user support
	PY 9							
	PY 8							
	PY 7							
	PY 6	4 out of 5 / qtr	4.8					

	Definition/Description: This is a survey of all external users whose help tickets are closed by the XOC during the specified reporting period. **Collection methodology:** Within two hours of the resolution and closure of a ticket, the user receives an e-mail containing a link to a Survey Monkey survey. The survey consists of five questions using a 5 point Likert scale and the results are stored in Survey Monkey.

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

6.5 Systems Operational Support (WBS 2.4.5)

Systems Operational Support (SysOps) provides enterprise level support and system administration for all XSEDE central services. The Area Metric for the SysOps group is the percentage of time that enterprise XSEDE services (a geometric mean) are available.

The availability metric shows the amount of time that the critical enterprise services (Tier 1) are available for use. Services are grouped into criticality tiers based on their significance and dependence that other services have on them. Tier 1 systems are systems such as Kerberos, XDCDB (XSEDE Central Database), and DNS (Domain Name Service). Tier 2 are business-day supported services such as JIRA. Tier 3 are development supported systems such as the RT test instance. When calculated as a geometric mean, the availability metric will show the cumulative impact of the enterprise services to the stakeholders.

Table 6-5: Area Metrics for Systems Operational Support

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Average availability of critical enterprise services (%) [geometric mean] **(KPI)**	RY 5							Sustain – Provide reliable, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	99% / qtr	99.9%					
	Definition/Description: The availability metric shows the amount of time that critical enterprise services are available for use. Services are grouped into criticality tiers based on their significance and dependence that other services have on them. Tier 1 systems are systems such as Kerberos, XDCDB, and DNS whereas Tier 3 services are development or business-day supported systems such as the RT test instance and Sciforma test instance. When calculated as a geometric mean, the metric shows a more accurate availability of the enterprise services to the users. **Collection methodology:** The data is stored locally to the Nagios service at IU. Nagios is an application that constantly logs the availability of core central services. These logs are queried to determine if/when a service becomes unavailable to users.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

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7 Resource Allocation Service (WBS 2.5)

The Resource Allocation Service (RAS) is building on XSEDE's current allocation processes and evolving to meet the challenges presented by new types of resources to be allocated via XSEDE, new computing and data modalities to support increasingly diverse research needs, and large-scale demands from the user community for limited XSEDE-allocated resources. RAS is pursuing these objectives through three activities: managing the XSEDE allocations process in coordination with the XD Service Providers, enhancing and maintaining the RAS infrastructure and services, and anticipating changing community needs.

The area metrics for RAS focus on support for two of XSEDE's key sub-goals: providing excellent user support and providing reliable, efficient and secure infrastructure. An updated quarterly survey of users who have interacted during the quarter with the allocations request system and the allocations process more generally is being used to determine the user satisfaction ratings metrics. The survey has been developed with, and is coordinated through, the XSEDE Evaluation Team. The availability of XDCDB and XRAS will be measured by tracking the planned and unplanned outages for the XDCDB server on which XRAS and many other XSEDE services rely.

Table 7-1: Area Metrics for Resource Allocation Service

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Average User satisfaction rating with allocations and other support services (KPI)	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	3.98					

	Definition/Description: This is a composite metric that measures user satisfaction with with allocation policies and procedures for the submission, review, and administration of allocation requests as well as satisfaction with using XRAS, the primary tool for submission, review, and administration of allocation requests. **Collection methodology:** Users are surveyed each quarter. For the allocations process, the calculation is the weighted average of responses to set of questions about satisfaction with various aspects of allocations (time to prepare documents, documentation, support available, reviewer comments, etc.). For satisfaction with using XRAS, submitters within the current quarter are sent a post-submission survey prior to award notification. Respondents are asked to rate aspects of the submission process on a scale of 1 (not at all satisfied) - 5 (extremely satisfied). Responses to several questions are then averaged for the current quarter to determine this metric. Specific items include; (Q11B) Ease of use of the online submission system, (Q11D) Interactive responsiveness of the online submission system, (Q11H) Ease of finding reviewer comments and/or the outcome of your allocation request.							
Availability of XRAS (KPI)	RY 5							Sustain – Provide reliable, efficient, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	99% / qtr	99.9%					
	Definition/Description: This is an availability metric that encompasses the A3M services associated with XRAS, including the XRAS Review GUI and the XRAS Admin GUI, the XRAS Submit API as well as the XDCDB. **Collection methodology:** There is a table acct.downtime in the XDCDB, which is manually completed when there is an outage in the XDCDB, a network outage disrupting availability of the XRAS services, or an outage of the XSEDE User Portal. Currently, outages are detected via a variety of e-mail notifications, and the data is manually entered into the XDCDB.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

7.1 RAS Director's Office (WBS 2.5.1)

The RAS Director's Office has been established to provide the necessary oversight to ensure the greatest efficiency and effectiveness of the RAS area. This oversight includes providing direction to the L3 management team, coordination of, and participation in, RAS planning activities and reports through the area's Project Manager, and monitoring compliance with budgets, and retarget effort if necessary. The Director's Office also attends and supports the preparation of project level reviews and activities.

The RAS Director's Office will continue to manage and set direction for RAS activities and responsibilities. They will contribute to and attend bi-weekly senior management team calls, contribute to the project level plan, schedule, and budget, contribute to XSEDE quarterly, annual, and other reports as required by the NSF and attend XSEDE quarterly and annual meetings.

7.2 XSEDE Allocations Process & Policies (WBS 2.5.2)

Allocations enable the national open science community to easily gain access to XSEDE's advanced digital resources, allowing them to achieve their research and education goals. In support of the goal *"Sustain – Provide excellent user support,"* Allocations has two area metrics: user satisfaction with the allocations process and the average time to process Startup requests. Allocations also supports the goal "*Provide reliable, efficient, and secure infrastructure"* by measuring the percentage of XRAC-recommended service unit (SUs) allocated, which is a third Area Metric for this group. This third metric provides insight for RAS, the XSEDE program, NSF, and Service Providers into the success of the XSEDE ecosystem at meeting users' scientific objectives.

Table 7-2: Area Metrics for XSEDE Allocations Process & Policies

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
User satisfaction with allocation process (KPI)	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	3.97					
	Definition/Description: Measure of users' satisfaction with allocation policies and procedures for the submission, review, and administration of allocation requests. **Collection methodology:** Quarterly survey of persons who have submitted allocation requests in the prior quarter. Weighted average of responses to set of questions about satisfaction with various aspects of allocations (time to prepare documents, documentation, support available, reviewer comments, etc.)							
Average time to process Startup requests	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	2 weeks or less / qtr	10.65 days					

	Definition/Description: Average number of days it takes a Startup request to be processed and awards relayed to SPs (or a rejection to be finalized). **Collection methodology:** The XRAS database schema is queried to average the days between time submitted and time notifications were sent for each Startup for which notifications are sent in a given quarter. XRAS automatically logs timestamps for each of these events as part of standard submission and processing steps.							
Percentage of XRAC-recommended SUs allocated	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	100% / qtr	62%					
	Definition/Description: The total SUs allocated (compute resources only) at each XRAC meeting divided by the total SUs recommended by the XRAC. **Collection methodology:** Tallied from the meeting spreadsheet.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

7.3 Allocations, Accounting & Account Management CI (WBS 2.5.3)

The Allocations, Accounting & Account Management CI (A3M) group maintains and improves the interfaces, databases and data transfer mechanisms for XSEDE-wide resource allocations, accounting of resource usage, and user account management. The Area Metrics for A3M are satisfaction results from surveys on the use of the XSEDE Resource Allocation Service (XRAS)—the primary user-facing service for RAS—the aggregated availability of XDCDB and XRAS systems, and the percentage of approved feature change requests implemented. The activities in A3M support the XSEDE sub-goals of providing a reliable and secure infrastructure, and creating an open and evolving e-infrastructure.

Table 7-3: Area Metrics for Allocations, Accounting, & Account Management CI

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
User satisfaction with XRAS system (KPI)	RY 5							Sustain – Provide excellent user support
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / qtr	3.98					
	Definition/Description: Measure of users' satisfaction with using XRAS, the primary tool for submission, review, and administration of allocation requests. **Collection methodology:** XRAS submitters within the current quarter are sent a post-submission survey prior to award notification. Respondents are asked to rate aspects of the submission process on a scale of 1 (not at all satisfied) - 5 (extremely satisfied). Responses to several questions are then averaged for the current quarter to determine this metric. Specific items include; (Q11B) Ease of use of the online submission system, (Q11D) Interactive responsiveness of the online submission system, (Q11H) Ease of finding reviewer comments and/or the outcome of your allocation request.							
Availability of XRAS systems (KPI)	RY 5							Sustain – Provide reliable, efficient, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	99% / qtr	99.9%					
	Definition/Description: This is an availability metric that encompasses the A3M services associated with XRAS, including the XRAS Review GUI and the XRAS Admin GUI, the XRAS Submit API as well as the XDCDB. **Collection methodology:** There is a table acct.downtime in the XDCDB, which is manually completed when there is an outage in the XDCDB, a network outage disrupting availability of the XRAS services, or an outage of the XSEDE User Portal. Currently, outages are detected via a variety of e-mail notifications, and the data is manually entered into the XDCDB.							
Percentage of approved feature change requests implemented	RY 5							Sustain – Provide reliable, efficient, and secure infrastructure
	RY 4							
	RY 3							
	RY 2							
	RY 1	100% / qtr	100% (7/7)					
	Definition/Description: A3M development is driven by stakeholder input, either by direct requests or discussions with stakeholder groups. This input along with developer/management institutional knowledge will be evaluated, scoped and prioritized quarterly for inclusion into the A3M systems. The percentage of the requested features approved for implementation which are delivered in the quarter will be reported as this metric. **Collection methodology:** A3M feature development numbers are manually entered into a wiki page, which serves as the repository for that data. Feature and release numbers include prioritization, workload estimation, status, and number of approved requests implemented.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

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8 Program Office (WBS 2.6)

The purpose of the Program Office is to ensure the critical project level functions are in place and operating effectively and efficiently. The oversight, provided via the Project Office, is necessary to provide consistent guidance and leadership to the L3 managers across the project. A common and consistent approach managing projects and risks is provided by the Project Management, Reporting and Risk Management (PM&R) team, while Business Operations manages all financial and sub-awards. The crucial aspect of communications to all stakeholders is the focus of the External Relations team. Finally, Strategic Planning, Policy and Evaluation focuses attention in precisely those areas to ensure the best possible structure continues to exist within XSEDE to allow the support of all significant project activities and enable efficient and effective performance of all project responsibilities.

As with other areas of the project, the Program Office has established Area Metrics to track performance against attaining the project's strategic goals. The Area Metrics for "Social Media," and "Media Hits" have been separated as a way to show the impact of each primary activity with one number best representing the performance each quarter and year. "Social Media" refers to "impressions," which is more comprehensive than just "followers" or "likes," but includes the amount of people who may see content based on people sharing XSEDE's content to their friends and followers on both Facebook and Twitter. "Media Hits" refers to the number of stories that were shared or written by external print or digital publications.

To deliver the most advanced and useful digital services for researchers, XSEDE must constantly evolve. This makes continuous evaluation and improvement of processes and policies critical to the effectiveness of XSEDE as an organization; therefore, as tracked by the PM&R team, the project's KPI for sustaining an effective virtual organization is the number of improvements made. Potential improvements consist of recommendations based on the staff climate survey, efforts by area managers to increase efficiency or quality, adaptations in response to an evolving project, or improvements to overall execution through implementation of widely validated methodologies.

Measuring innovation for an organization like XSEDE (or for organizations in general) is difficult and represents an area of open research. A partial measure is the number of staff publications produced since this shows that XSEDE staff is involved in novel activities that achieve peer-reviewed publication. Additionally, after much thought and discussion both internally and with external stakeholders and advisors, XSEDE has identified two additional indicators that strongly correlate to innovation: 1) the ratio of proactive organizational improvements to those that were reactive and 2) the number of improvements that are innovative or lead to innovations. The first indicator is a measurement of organizational maturity and agility; the second measures innovative actions directly. This will continue to be an open conversation within the organization and with XSEDE's stakeholders and advisors as XSEDE assess these measurements and how to best to qualify innovation.

Table 8-1: Area Metrics for Program Office.

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of Social Media impressions	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	190,000						
	Definition/Description: Number of people who have seen XSEDE interactions on Facebook + Twitter. Both Facebook and Twitter count "impressions," which is essentially how many people saw a certain post. A user of FB or Twitter no longer has to directly "like" or "retweet" a post to get this number - "impressions" would refer to people who see the post based on their friends or followers sharing our information. It is a better way of collecting social media awareness than just "followers" or "shares." **Collection methodology:** Facebook and Twitter both have internal methods of tracking metrics - we simply go to those sites and find the "impressions" numbers we need at the end of each reporting cycle. Anyone with access to the FB and Twitter pages can easily gather this information.							
Number of media hits	RY 5							Deepen/Extend – Raise the awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	140						
	Definition/Description: This is the number of XSEDE-related stories we find in the media, many times through Google alerts for "XSEDE," that mentions XSEDE by name. Often, we manually search "XSEDE," as well, in case the daily alert email is missed. **Collection methodology:** NCSA tracks media hits for both NCSA and XSEDE, so that is a baseline collection of numbers. The ER team can then do additional manual searching - as an example, oftentimes the hits of HPCwire are not collected on the NCSA page, so an additional manual count is needed.							
Percentage of recommendations addressed by relevant project areas	RY 5							Sustain – Operate an effective and productive virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	90% / yr	NA[1]					

	Definition/Description: The SP&E team will calculate the metric based off the data from two measurements; total key recommendations made and total key recommendations addressed. Total key recommendations addressed will be divided by the total key recommendations made at the point in time of data capture (at the end of the IPR reporting period). The number of key recommendations made according to the annual XSEDE Climate Study findings + the total number of recommendations recorded on the XSEDE Project-Wide Improvements & Recommendations Google Sheet, such as XAB, NSF, and SP&E recommendations. The number of key recommendations addressed during a quarter. **Collection methodology:** The SP&E team intends to work with the PM&R team to track recommendations made and recommendations addressed with the XSEDE Project-Wide Improvements & Recommendations Google Sheet. If a recommendation is unable to be addressed and instead closed, those will not be counted. NOTE: an improvement made is not necessarily a recommendation addressed; but a recommendation addressed is an improvement made and therefore should also be tracked in the XSEDE Project-Wide Improvements & Recommendations Google Sheet once fully implemented; it is OK to have duplication between Improvements fully implemented and Recommendations addressed.							
Number of strategic or innovative improvements	RY 5							Sustain – Operate an innovative virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	9 / yr	3					
	Definition/Description: The number of strategic or innovative process improvements implemented is a measure of innovative actions directly. Strategic or innovative process improvements are those that resulted from the analysis of KPIs or area metrics or resulted in a new and novel measurement, method, research product, or insight. **Collection methodology:** Process improvements are tracked via a self-reporting method (Each quarter, all of the WBS level 3 managers and WBS Level 2 Directors are queried via e-mail asking them to self-report on any process improvements they have implemented in the last quarter. This information is collected in a google spreadsheet and totaled each quarter.). All areas of the project are asked to submit the process improvements they have made to their areas on a quarterly basis. From this list, the improvements are then classified as being either strategic or innovative.							
Ratio of proactive to reactive improvements	RY 5							Sustain – Operate an innovative virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	3:1 / qtr	2:1					
	Definition/Description: Ratio, of the above number of strategic or innovative improvements, of proactive versus reactive improvements. **Collection methodology:** Wiki page.							
Number of staff publications	RY 5							Sustain – Operate an innovative virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	70 / yr	5					
	Definition/Description: Publications by XSEDE staff. **Collection methodology:** When an XSEDE staff member has a publication, he or she enters the publication data into their profile on the XUP. This data is then summed for the appropriate quarter and reported.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1]L2 Directors are currently responding to climate study recommendations; data will be available in IPR2.

8.1 Project Office (WBS 2.6.1)

The Project Office has been established to provide the necessary oversight to ensure the greatest efficiency and effectiveness of the Program Office area and to establish responsibility for assuring advisory activities of the project occur. This oversight includes providing direction to the L3 management team and coordination of and participation in Program Office planning activities and reports through the area's Project Manager. The Project Office also attends and supports the preparation of project level reviews and activities. Importantly, the Project Office is responsible for assuring that the XSEDE Advisory Board, the User Advisory Committee, and the SP Forum are functioning. Lastly, the Project Office is responsible for coordination of project-level meetings such at the bi-weekly Senior Management Team (SMT) teleconference calls and the project quarterly meetings.

8.2 External Relations (WBS 2.6.2)

External Relations' (ER) mission is to communicate the value and importance of XSEDE to all stakeholders (including the internal audience) through creative and strategic communications.

The ER team will measure its ability to effectively communicate with internal and external stakeholders by the number of social media impressions

gained through user engagement, the responsiveness of email communications, and by the frequency and quality of content developed by the ER team, or successfully placed pitches to targeted media outlets.

Social media impressions are an indicator of the quality of information and content XSEDE is generating and sharing with current communities, advanced computing enthusiasts, XSEDE users, and new communities. Effective use of social media tools and the generation of good content allows XSEDE to raise awareness of the value of advanced digital services.

The number of science stories and announcements produced by media outlets are Area Metrics because they are an indicator of XSEDE's ability to identify science success stories and to effectively work with targeted media in order to reach key audiences.

Table 8-2: Area Metrics for External Relations

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Number of Social Media Impressions	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	228,000 / yr	52,200					
	Definition/Description: Number of people who have seen XSEDE interactions on Facebook + Twitter. Both Facebook and Twitter count "impressions," which is essentially how many people saw a certain post. A user of FB or Twitter no longer has to directly "like" or "retweet" a post to get this number - "impressions" would refer to people who see the post based on their friends or followers sharing our information. It is a better way of collecting social media awareness than just "followers" or "shares." **Collection methodology:** Facebook and Twitter both have internal methods of tracking metrics - we simply go to those sites and find the "impressions" numbers we need at the end of each reporting cycle. Anyone with access to the FB and Twitter pages can easily gather this information.							
Number of media hits	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	147 / yr	32					
	Definition/Description: This is the number of XSEDE-related stories we find in the media, many times through Google alerts for "XSEDE," that mentions XSEDE by name. Often, we manually search "XSEDE," as well, in case the daily alert email is missed. **Collection methodology:** NCSA tracks media hits for both NCSA and XSEDE, so that is a baseline collection of numbers. The ER team can then do additional manual searching - as an example, oftentimes the hits of HPCwire are not collected on the NCSA page, so an additional manual count is needed.							
Number of science success stories and announcements appearing in media outlets	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	62 / yr	14					
	Definition/Description: Email newsletter open rates can be used to measure the communities engagement in ER-outreach via email. Click-through rates help us understand which stories are of most interest to our readers. **Collection methodology:** NCSA runs engagement reports through our email management system. These reports collect how many readers open a given email and how many readers click-through embedded links to learn more or take action on a prompt.							
Monthly open and click-through rates of XSEDE's newsletter	RY 5							Deepen/Extend – Raise awareness of the value of advanced digital services
	RY 4							
	RY 3							
	RY 2							
	RY 1	Open: 35% / qtr Click-through: 20% / qtr	Open: 34.4% Click-through: 10.9%					
	Definition/Description: Email newsletter open rates can be used to measure the communities engagement in ER-outreach via email. Click-through rates help us understand which stories are of most interest to our readers. **Collection methodology:** NCSA runs engagement reports through our email management system. These reports collect how many readers open a given email and how many readers click-through embedded links to learn more or take action on a prompt.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

8.3 Project Management, Reporting, & Risk Management (WBS 2.6.3)

Project Management, Reporting & Risk Management (PM&R) enables an effective virtual organization through application of project management principles, provides visibility to project progress, successes, and challenges, brings new ideas and management practices into the project and disseminates lessons learned in XSEDE to other virtual organizations.

Communication is critical to success in this highly distributed virtual organization. The coordination provided by PM&R ensures timely delivery of status reports to NSF, full and timely consideration of project change requests (PCRs), and awareness and evaluation of risks.

Table 8-3: Area Metrics for Project Management, Reporting, & Risk Management

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Variance, in days, between relevant report submission and due date	RY 5							Sustain – Operate an effective and productive virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	0 / qtr	NA[1]					
	Definition/Description: As part of its reporting process, XSEDE has to submit various quarterly and annual reports to the NSF. The XSEDE PI and the NSF PO agree on a day that reports are to be submitted by and this is then communicated to the XSEDE team for the reporting schedule to be built. **Collection methodology:** The XSEDE PI tracks when the relevant document was submitted to FastLane and records the number of days between the due date and this date in a spreadsheet.							
Percentage of risks reviewed	RY 5							Sustain – Operate an effective and productive virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	95% / qtr	100%					
	Definition/Description:Definition/Description: Risk Management is key to the success of XSEDE. By identifying risks, their triggers, mitigation strategy and contingency plans, XSEDE can proactively manage these risks to mitigate effects that may adversely impact the organization or take advantage of those that may help XSEDE. **Collection methodology:Collection methodology:** All XSEDE risk owners are queried quarterly via e-mail with their risks attached in a spreadsheet. Each owner is asked to review their risks, note any changes in the spreadsheet, and email the spreadsheet back to the PM lead. Each risk in the spreadsheet requires a notation that it was reviewed. The PM lead then records any changes and updates the risk register accordingly. The percentage is calculated by dividing the total number of acknowledged reviews by the total number of risks project wide.							
Average number of days to execute PCR	RY 5							Sustain – Operate an effective and productive virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	< 30 calendar days / qtr	4					
	Definition/Description:Definition/Description: A Project Change Request (PCR) form documents requests for any baseline changes. The PCR process allows for documentation of project changes that affect such components as scope, budget, staff, KPI/Area Metrics, and/or schedule changes. Execution is being defined as starting from the time at which all approvals have been received to the time the PCR is fully implemented. **Collection methodology:Collection methodology:** JIRA will be used to track the different stages of the PCR and these numbers will be reported**.**							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1]There are no relevant report submissions in RY1 RP1. IPRs are submitted in the quarter following the reporting period and thus, this variance will be reported in the subsequent quarter.

8.4 Business Operations (WBS 2.6.4)

The Business Operations group, working closely with staff at the University of Illinois' Grants and Contracts Office (GCO) and National Center for Supercomputing Applications' (NCSA) Business Office, will handle budgetary issues, manage sub-awards and assure timely processing of sub-award amendments and invoices.

Business Operations will measure its ability to manage the business relationships with all sub-award institutions through the processing cycle-time of sub-award amendments and invoices. Efficient processing of sub-award amendments and invoices is required to avoid possible delays in the overall execution of the project.

Table 8-4: Area Metrics for Business Operations

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Goal Supported
Processing times for stages of processing sub-award amendments	RY 5							Sustain – Operate an effective and productive virtual organization
	RY 4							

	RY 3							
	RY 2							
	RY 1	< 41 calendar days / qtr	NA[1]					
	Definition/Description: Department submits subaward documents to OSP + OSP reviews and verifies funding available + OSP sends amendment to subaward + institution returns signed agreement to OSP + OSP sends final executed agreement. **Collection methodology:** Data stored on Business Operations wiki table.							
Processing times for stages of processing invoices	RY 5							Sustain – Operate an effective and productive virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	< 45 calendar days / qtr	NA[1]					
	Definition/Description: Institution/sub submits invoice to UIUC GCO + GCO Review time. **Collection methodology:** Data stored on Business Operations wiki table.							
Total decisions and subsequent actions for business practice and/or project improvement	RY 5							Sustain – Operate and effective and productive virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	5 / per quarter	17					
	Definition/Description: Sum count of decisions or actions taken toward business practice and/or project improvement submitted during a given quarter. **Collection methodology:** Data stored on Business Operations wiki table.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1]Sub-award institutions do not have XSEDE2 contracts in place yet, so no amendments or invoices can be charged against the grant yet.

8.5 Strategic Planning, Policy & Evaluation (WBS 2.6.5)

XSEDE dedicates effort to project-wide strategic planning, policy development, evaluation and assessment, and organizational improvement in support of sustaining an effective and productive virtual organization.

XSEDE has engaged an independent Evaluation Team designed to provide XSEDE with information to guide program improvement and assess the impact of XSEDE services. Evaluations are based on five primary data sources: (1) an Annual User Survey that will be part of the XSEDE annual report and program plan; (2) an Enhanced Longitudinal Study encompassing additional target groups (e.g., faculty, institutions, disciplines, etc.) and additional measures (e.g., publications, citations, research funding, promotion and tenure, etc.); (3) an Annual XSEDE Staff Climate Study; (4) XSEDE KPIs, Area Metrics, and Organizational Improvement efforts, including ensuring that procedures are in place to assess these data; and (5) Specialized Studies as contracted by Level 2 directors and the Program Office.

The first Area metric was designed to address the extent to which evaluation recommendations are considered by project leadership. The metric intentionally does not measure “implementation” of recommendations due to the many factors that may impede implementation (e.g. timelines, funding, capacity, etc.). The evaluation team intends to track this metric with new tools currently being implemented in XSEDE, namely JIRA and Confluence. The team intends to upload evaluation reports to Confluence and copy recommendations to JIRA for tracking. Since this L3 area is also responsible for strategic planning and policy, the second Area Metric measures how well-prepared XSEDE staff feel to perform their jobs. This metric is obtained by staff self-report via the Annual XSEDE Staff Climate Study conducted by the external evaluation team. Staff responses to a set of Likert scale items measured on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree) and relating to staff preparation are combined to determine a mean index score.

Table 8-5: Area Metrics for Strategic Planning, Policy & Evaluation

Area Metric	Program Year	Target	RP1	RP2	RP3	RP4	Total	Owner(s)
Percentage of recommendations addressed by relevant project areas	RY 5							Sustain – Operate and effective and productive virtual organization
	RY 4							
	RY 3							
	RY 2							
	RY 1	90% / qtr	NA[1]					

	Definition/Description: The SP&E team will calculate the metric based off the data from two measurements; total key recommendations made and total key recommendations addressed. Total key recommendations addressed will be divided by the total key recommendations made at the point in time of data capture (at the end of the IPR reporting period). The number of key recommendations made according to the annual XSEDE Climate Study findings + the total number of recommendations recorded on the XSEDE Project-Wide Improvements & Recommendations Google Sheet, such as XAB, NSF, and SP&E recommendations. The number of key recommendations addressed during a quarter. **Collection methodology:** The SP&E team intends to work with the PM&R team to track recommendations made and recommendations addressed with the XSEDE Project-Wide Improvements & Recommendations Google Sheet. If a recommendation is unable to be addressed and instead closed, those will not be counted. NOTE: an improvement made is not necessarily a recommendation addressed; but a recommendation addressed is an improvement made and therefore should also be tracked in the XSEDE Project-Wide Improvements & Recommendations Google Sheet once fully implemented; it is OK to have duplication between Improvements fully implemented and Recommendations addressed.							
Average rating of staff regarding how well-prepared they feel to perform their jobs	RY 5							Advance – Enhance the array of technical Expertise and support services
	RY 4							
	RY 3							
	RY 2							
	RY 1	4 out of 5 / yr	3.70					
	Definition/Description: An annual Staff Climate Study is a survey administered and analyzed by an external evaluation team as part of an effort to understand whether XSEDE staff feel adequately prepared to conduct their XSEDE work. The survey study includes items regarding staff training. **Collection methodology:** This is being revised and will be updated once the change is implemented.							
Number of key improvements addressed from systematic evaluation	RY 5							
	RY 4							
	RY 3							
	RY 2							
	RY 1	9 / yr	3					
	Definition/Description: The number of strategic or innovative process improvements implemented is a measure of innovative actions directly. Strategic or innovative process improvements are those that resulted from the analysis of KPIs or area metrics or resulted in a new and novel measurement, method, research product, or insight. **Collection methodology:** Process improvements are tracked via a self-reporting method (Each quarter, all of the WBS level 3 managers and WBS Level 2 Directors are queried via e-mail asking them to self-report on any process improvements they have implemented in the last quarter. This information is collected in a google spreadsheet and totaled each quarter.). All areas of the project are asked to submit the process improvements they have made to their areas on a quarterly basis. From this list, the improvements are then classified as being either strategic or innovative.							
Ratio of proactive to reactive improvements	RY 5							
	RY 4							
	RY 3							
	RY 2							
	RY 1	3:1 / yr	8:1					
	Definition/Description: That ratio of proactive to reactive improvements is a measurement of organizational maturity and agility. An improvement is classified as being reactive if the change was due to a problem that occurred naturally and had to be corrected for the process to continue. A proactive improvement is an improvement that is made in anticipation of future problems, needs, or changes. **Collection methodology:** Process improvements are tracked via a self-reporting method (Each quarter, all of the WBS level 3 managers and WBS Level 2 Directors are queried via e-mail asking them to self-report on any process improvements they have implemented in the last quarter. This information is collected in a google spreadsheet and totaled each quarter.). All areas of the project are asked to submit the process improvements they have made to their areas on a quarterly basis. From this list, the improvements are then classified as being either proactive or reactive based on the definitions above.							

NOTE: RY1 is unique and only spans September 2016-April 2017. RY1 RP1 includes September-October 2016.

[1]L2 Directors are currently responding to climate study recommendations; data will be available in IPR2.

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1. http://www.nsf.gov/cise/aci/cif21/CIF21Vision2012current.pdf
2. http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf12051
3. http://www.nist.gov/baldrige/