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**Illinois Campus Cluster Program  
Service Level Definition**

Overall Program

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## Table of Contents

<b>Table of Contents</b>	<b>2</b>
<b>Program Definition</b>	<b>3</b>
<b>Term</b>	<b>3</b>
<b>Terminology</b>	<b>4</b>
<b>ICCP Operational Responsibilities</b>	<b>4</b>
<b>Investor Responsibilities</b>	<b>5</b>
<b>Job Scheduling</b>	<b>6</b>
Primary Queue	6
Secondary Queue	6
Changes	6
<b>Governance</b>	<b>6</b>
Executive Steering Committee	7
Investor Forum	7
Illinois Campus Cluster Operators	7
<b>Service Availability</b>	<b>8</b>
<b>Storage</b>	<b>8</b>
User/Group Storage	8
Scratch Storage	9
<b>User Account Termination</b>	<b>9</b>
<b>Retirement Phase</b>	<b>9</b>
<b>Acceptable Use</b>	<b>10</b>
<b>Facilities</b>	<b>10</b>
<b>Support Process</b>	<b>10</b>
<b>Signature Page</b>	<b>11</b>



# ICCP Service Level Definition

## Overall Program

## Program Definition

The Illinois Campus Cluster Program (ICCP) is an ongoing service providing shared computing resources in support of research. This Service Level Definition (SLD) covers the entire Illinois Campus Cluster Program and applies to all Illinois Campus Cluster hardware and service offerings except where specifically overridden by a clause in hardware or service offering SLD. Illinois Campus Cluster systems and infrastructure are hereafter also referred to in this document as the “campus cluster,” “cluster,” or “clusters.” Investors are faculty and/or units who, individually or as a group, invest in shared computing resources as part of the Illinois Campus Cluster Program. As referred to in this document, “Investor” is assumed to include both the Investor and any designated representatives. Each Investor designates a Technical Representative who serves as the liaison to the Illinois Campus Cluster Operators.

Additional information regarding the operation of the Illinois Campus Cluster Program is documented on the Illinois Campus Cluster website<sup>1</sup>. This includes a technical operations manual.

Investors agree to invest in either or both of compute and storage resources. The technical details of each investment may vary as hardware and service offerings will follow market availability of current-generation computing and storage hardware. The details of compute and storage offerings are detailed in SLDs specific to those offerings. An investment in compute resources is required to invest in storage resources.

Each compute node Investor has a Primary Queue that has priority access to the number and type of nodes in which they invested. The characteristics of the Primary Queues are defined by the Investor.

A Secondary Queue is available to all compute node Investors and allows utilization of nodes not in use by Primary Queue jobs. An Investor may have their nodes removed from the Secondary Queue, but in doing so will not be permitted to make use of the Secondary Queue. The characteristics of the Secondary Queue is defined by the Executive Steering Committee.

## Term

The term for each ICCP hardware investment or service offering is defined in the SLDs specific to those offerings. See the “Retirement Phase” section of this document for disposition of equipment at the normal end of term. This document applies to all ICCP hardware and service offerings and is subject to modification by the Executive Steering Committee.

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<sup>1</sup> The ICCP website can be found at <http://campuscluster.illinois.edu/>



# ICCP Service Level Definition

## Overall Program

## Terminology

**Illinois Campus Cluster Program (ICCP):** An ongoing service providing shared computing resources in support of research.

**Investor:** Faculty and/or units who, individually or as a group, invest in shared computing resources as part of the Illinois Campus Cluster Program. As referred to in this document, “Investor” is assumed to include both the Investor and any designated representatives. The Investor, or their designee, represents their interests as part of the Investor Forum.

**Technical Representative:** Designated representative of an Investor who serves as the technical liaison to the Illinois Campus Cluster Operators.

**Illinois Campus Cluster:** The physical cluster(s) built by the Illinois Campus Cluster Program and operated on behalf of the Investors.

**Illinois Campus Cluster Operators (or “Operators”):** The team responsible for installing, operating, and maintaining Illinois Campus Cluster hardware and services and for providing basic support to Users.

**Users:** Faculty, staff, students, and collaborators who have access to the computing services of the Illinois Campus Cluster Program.

**Investor Forum:** A group that represents the interests of all Investors in the Illinois Campus Cluster Program and that participates in the governance process for the program.

**Executive Steering Committee:** The oversight and decision-making body for the Illinois Campus Cluster Program.

**Primary Queues:** Queues belonging to Investors that have priority access to the number and type of nodes in which they invested. The characteristics of each Primary Queue are defined by the respective Investors.

**Secondary Queue:** Queue available to all Investors that allows utilization of nodes not in use by Primary Queue jobs. The characteristics of the Secondary Queue is defined by the Executive Steering Committee.

## ICCP Operational Responsibilities

The Illinois Campus Cluster Program has the following operational responsibilities:

- Provide infrastructure in support of the cluster which includes, but is not limited to power, cooling, networking, and security.
- Provide system administration services and technical support.
- Establish and maintain user accounts and job submission queues.
- Maintain cluster system hardware and software.



# ICCP Service Level Definition

## *Overall Program*

- Provide a base suite of software including compilers, operating system software, and some applications and libraries, not to exceed limits provided in our current campus licensing agreements with vendors.<sup>2</sup>
- Install and provide best-effort support for commercial and public domain packages and libraries beyond the base software suite when the packages and libraries will be available for use cluster-wide. The Operators will install and maintain such software upon receipt of the software, licensing, and vendor contact information.
- Provide best-effort assistance with the installation and support of additional applications provided by the Investors and installed in accordance with licensing agreements. The primary responsibility for support of Investor-specific application software will remain with the Investors.
- Provide information regarding this system, via email and the Illinois Campus Cluster Program website, to Investors, Users, and other stakeholders.
- Facilitate the ability to host restricted access data (e.g. ITAR).

## Investor Responsibilities

The Investor has the following responsibilities:

- Provide funding for equipment and services as identified.
- Name a Technical Representative who will serve as technical liaison to the Operators.
- Specify Primary Queue characteristics and identify Users who are allowed to access the Investor's Primary Queues.
- Maintain and keep current the list of Users with access to their Investment.<sup>3</sup>
- License and install Investor-specific software as needed. Investors are responsible for the installation of Investor-specific software into their own storage. The Operators will provide best-effort assistance with the installation and maintenance of such packages.
- Provide support for Investor-specific application software and/or procedures.
- Participate in the Governance process that will establish general guidelines for the management and use of the cluster.
- Route all requests and problem reports through appropriate channels as defined by documentation on the ICCP website.
- If available, provide a website URL with Investor-specific information (e.g. Primary Queue characteristics, Investor-specific software, support for Investor-specific application software and/or procedures, etc.) and maintain these pages. This URL will be shared with the community via a page on the ICCP website that describes the ICCP Investors.

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<sup>2</sup> A current list of installed software will be maintained on the ICCP website.

<sup>3</sup> Investors can maintain the list of Users with access to their Investment via the ICCP website's User Management Portal, located at [https://campuscluster.illinois.edu/manage\\_users/manage.html](https://campuscluster.illinois.edu/manage_users/manage.html).



## Job Scheduling

The job scheduling for the cluster includes both Primary Queues and Secondary Queue.

### Primary Queue

The Investor will be given unrestricted access to a dedicated queue with concurrent access to the number and type of nodes in which they invested. The queue may be configured within the capabilities of the batch software running on the cluster. Jobs submitted to primary Investor queues will start either immediately or as soon as sufficient resources are available within the limits of the resources in which they invested. The longest wait time an Investor will experience for access to their Primary Queue is the maximum runtime for Secondary Queue jobs. Investors may also utilize nodes beyond the number and type of nodes in which they invested when those nodes would otherwise be idle (i.e. because there are no jobs in the associated Primary Queue).

### Secondary Queue

One of the advantages of the Illinois Campus Cluster Program is the ability to pool resources. A shared Secondary Queue will allow other Investors and Users access to any idle nodes. Users must have access to a Primary Queue participating in the Secondary Queue in order to be eligible to use the Secondary Queue.

While each Investor has full access to the number and type of nodes in which they invested, those resources not fully utilized by each investor will become eligible to run Secondary Queue jobs. If there are resources eligible to run Secondary Queue jobs but there are no jobs to be run from the Secondary Queue, jobs in Investors' Primary Queues that fit within the constraints of the Secondary Queue may be run on any otherwise appropriate idle nodes. By default, the system will select jobs for execution amongst the Primary Queues of all Investors based on an ordered list of Investors ranked by level of investment, largest Investor first.

The Executive Steering Committee will establish maximum time durations and node limits for the Secondary Queue after consulting with the Investor Forum. Historically, time limits of 4 hours and 6 hours have been used successfully. The current maximum runtime for Secondary Queue jobs is 4 hours.

## Changes

The Primary Queue parameters can be changed upon a request from Investors directly or via the Investor's Technical Representative to the Operators. The Operators will facilitate communication and resource sharing between Investors to help accommodate special requests (e.g. a research deadline requiring extra computation time).

## Governance

The Illinois Campus Cluster Program governance model is structured to provide a clear delineation of roles, responsibilities, accountability, and stakeholder inclusiveness for effective and efficient execution



# ICCP Service Level Definition

## Overall Program

of the Program to meet the needs of the campus research and education community. The organization has three bodies: Executive Steering Committee, Investor Forum, and the Illinois Campus Cluster Operators. The high-level roles of these teams are:

- Executive Steering Committee – decision-making
- Investor Forum – recommendations
- Illinois Campus Cluster Operators – implementation and technical advisors

## Executive Steering Committee

The Executive Steering Committee is the oversight and decision-making body for the Illinois Campus Cluster Program. It reports to the University of Illinois IT Faculty Advisory Committee. The committee makeup will include the Investor Forum representatives (see below), the Director of Illinois Campus Cluster Program and their designates (*ex officio*), a representative of the Illinois Office of the Chancellor (OC), a representative of the Illinois Office of the Vice Chancellor for Research (OVCR), a representative of the Illinois IT Faculty Advisory Committee, and a representative of the Urbana campus CIO's Office. Each entity will appoint their own representative(s). The Executive Steering Committee will annually select a chairperson. The chairperson is responsible for convening regular meetings of the Executive Steering Committee. Subcommittees may be formed with members from the Executive Steering Committee, Investor Forum, Illinois Campus Cluster Operators, and other stakeholders such as prospective new Investors to focus on specific issues. The Executive Steering Committee is responsible for annually reviewing and updating, as necessary, the SLDs for the Illinois Campus Cluster Program. The Executive Steering Committee is also responsible for reporting regularly to the Faculty Advisory Committee on the status of the Illinois Campus Cluster Program.

## Investor Forum

The Investor Forum represents the interests of the Investors in the Illinois Campus Cluster Program governance process. The Investor Forum will annually elect a member to serve as the Chairperson of the Investor Forum. The Chairperson is responsible for convening regular meetings of the Investor Forum and for bringing recommendations from the Investor Forum to the Executive Steering Committee.

The Chairperson, along with two additional members also annually elected by the Investor Forum, serve as representatives to the Executive Steering Committee. For purposes of electing the Chairperson and the additional representatives to the Executive Steering Committee, each investor shall receive one vote regardless of the number of nodes in which they have invested. No one may serve more than two consecutive terms as Chairperson or additional representative. The timing of elections for these positions will be tied to the timing of selection of new representatives for the Illinois IT Faculty Advisory Committee.

## Illinois Campus Cluster Operators

The Illinois Campus Cluster Operators are responsible for installing, operating, and maintaining all Illinois Campus Cluster hardware and services and for providing basic support for Users. This team will implement and execute the policies of the Illinois Campus Cluster Program as directed by the Executive Steering Committee. The Operators also serve as needed as technical advisors to the Executive Steering Committee and the Director of the ICCP.



## Service Availability

During production operations, the Operators will maintain the cluster as 24x7x365 resources. However, there are exceptions to these terms of service:

- Unplanned system outages due to issues with other aspects of the facility such as power, HVAC, network, or emergency maintenance to address computer security incidents may prevent the use of the system in a timely manner.
- Routine software and hardware maintenance of the system. Preventive maintenance (PM) on the cluster and common infrastructure is scheduled on a monthly basis on the third Wednesday of each month from 8 a.m. to 8 p.m. Central Time. The cluster and infrastructure will be returned to service earlier if maintenance is completed before the scheduled end time. If there are no preventative maintenance activities necessary, the PM period for that month will not be taken. The cluster and infrastructure requiring work during each PM period will be announced at least 5 business days in advance of the PM period by the Operators.
- Whole-system runs that exploit the entire systems for purposes of benchmarks or other demonstrations of systems capability will be scheduled infrequently. The Illinois Campus Cluster Operators will work with the Investor Forum and make a best-effort attempt to accommodate Investor and Users' needs with respect to the timing of these runs.

## Storage

There are two types of storage available: User/Group Storage and Scratch Storage. Each Investor receives a User/Group Storage allocation for every node in which they invest. They may also choose to invest in additional User/Group Storage. The integrity of all storage options is accomplished via a RAID-based disk system. The User/Group Storage allocation received with node investments and (optionally) additional investments in User/Group Storage have snapshots enabled to provide some protection against accidental file changes. Details regarding snapshots are documented on the ICCP website. No off-site backups for disaster recovery are provided for any storage. No backups of any kind are provided for Scratch Storage.

### User/Group Storage

The amount of User/Group Storage each Investor receives for every node in which they have invested is defined in the hardware and service-specific SLDs. Investors may also invest in storage resources as defined in the Illinois Campus Cluster Program Storage SLD. These allocations have snapshots enabled to allow historical versions of files to be recovered when needed. An investment in compute resources is required to invest in storage resources.

By default, each user will have a home directory (User Storage) quota of 2GB. The balance of the User/Group Storage each Investor receives for the nodes they have invested in will be allocated to project space (Group Storage). This allocation of User/Group Storage can be adjusted for an Investor Group at the request of the Investor directly or via their Technical Representative.





# ICCP Service Level Definition

## Overall Program

### Scratch Storage

Scratch storage space is shared storage space available to all Users across the entire cluster. Older files are subject to being automatically purged per the operational policies documented on the ICCP website. No backups of any kind are performed for this storage.

### User Account Termination

Per-User access to a given Investor's compute and storage resources is controlled by membership in the security groups associated with each Investment and controlled by that Investor. Membership in these groups is maintained by the Investor using the ICCP User Management Portal (see *Investor Responsibilities* above). A User may be a member of and have access to many Investor groups.

When a User account is removed from a given Investor's group, that User will no longer be able to submit jobs to the Investor's queues and will no longer have access to the Investor's Group Storage. The User may retain access to the ICCP if they are a member of another Investor's group and the User is expected to request that their home directory be transferred into that group; pending approval from the Investor, the User's home directory storage will be counted against the Investor's disk quota.

Any User account that is no longer a member of an Investor group will lose access to submit compute jobs and their account and home directory will be flagged for deletion after 90 days. During this 90 day period, the User will still be able to log in to the ICCP and access the data in their home directories, and may regain access to the ICCP by becoming a member of another Investor group, thereby avoiding account deletion. After the 90 day period, the User account and associated home directory will be subject to deletion without notice to the User or Investor.

### Retirement Phase

At the end of the term of each hardware investment SLD agreement, all Users of that hardware will be required to migrate off of that hardware. At that time, the hardware will be decommissioned from service in the ICCP. The Illinois Campus Cluster Operators will collaborate with the Investors to transfer the equipment to a location of the Investors' choosing (costs incurred will be paid by the Investor), or the program can choose to integrate those nodes into the HTC service. Investors may receive back the nodes of the number and type in which they invested. The ICCP can also assist in sending the retired nodes to surplus.

**PLEASE NOTE:** certain nodes may require rails, chassis, or other shared system components to function outside of the ICCP. Purchasing that additional equipment will be the responsibility of the Investor.

Similarly, at the end of the term of each Storage SLD agreement, all Users of that storage resource will be required to migrate off of that storage resource. The hardware associated with Storage Investments will be removed from service and not returned to the Investors.



# ICCP Service Level Definition

## *Overall Program*

The ICCP will start communicating with the primary investor and/or technical representative to plan out the hardware retirement phase. The communication process will start as early as a year in advance of the upcoming hardware retirement. The ICCP will provide the details of the upcoming hardware retirement to the Investor. The Investor will be expected to respond to these requests to ensure there are no disruptions of service to the Investor. In the event an Investor fails to communicate with the ICCP by the equipment retirement date, the ICCP will have permission to decommission the hardware.

## Acceptable Use

The Investor, Users, and Illinois Campus Cluster Operators agree to comply with all University of Illinois policies and procedures outlined in the Campus Administrative Manual<sup>4</sup>, specifically the Policy on Appropriate Use of Computers and Network Systems at the University of Illinois at Urbana-Champaign and the Information Security Policy. Questions about policies, procedures, and information security may be directed to [help@campuscluster.illinois.edu](mailto:help@campuscluster.illinois.edu).

## Facilities

All Illinois Campus Cluster systems and infrastructure will be housed at the Advanced Computation Building (ACB) on the Urbana campus.

## Support Process

All requests for help or problem reports should be done through appropriate channels as defined by documentation on the ICCP website. The Illinois Campus Cluster Operators will provide a response within one business day. In general, critical issues will be addressed as soon as possible. Critical issues are defined as disruptions to large portions of the cluster or infrastructure.

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<sup>4</sup> The current version of the Campus Administrative Manual can be found at <http://cam.illinois.edu/>



ICCP Service Level Definition  
Overall Program

## Signature Page

The Investor acknowledges that they have read, understand, and accept the terms and provisions of the Illinois Campus Cluster Program as described in this Service Level Definition.

The Investor acknowledges that they will be required to read, understand, and accept the terms of separate Service Level Definitions for the individual hardware investments and services in which they choose to invest.

The Investor further acknowledges their understanding that the Executive Steering Committee, to which they will have representation through the Investor Forum, may change the terms of this Service Level Definition at any point in the future and that any such changes will apply to the Investor's usage and investment in the Illinois Campus Cluster Program.

This page must be signed and returned before any orders to invest in ICCP hardware or service offerings may be processed.

## Participating Investor

Name of Investor or Investor Group representative <i>(Print Name)</i>	<input type="text"/>
Department	<input type="text"/>
Phone	<input type="text"/>
Illinois E-Mail Address	<input type="text"/>
Signature	<input type="text"/>
Date	<input type="text"/>

*Please fill out and sign this page, then send it to Jed Willard ([willardj@illinois.edu](mailto:willardj@illinois.edu)) via email or mail the original signed page to Jed Willard, Room 1008, NCSA Bldg, MC-257 so that the ordering process may begin immediately.*

