

## Athena Metrics

This quarter features the debut of Athena metrics in the IS&T Quarterly Reports. Statistical data about Athena has been collected for many years, going as far back as 1992 in some cases, but metrics were provided on an as-requested basis and presentation was tailored to meet the needs of the requester. Going forward, we hope to provide a regular presentation of Athena metrics in these quarterly reports.

### Notable Accomplishments

Q2 represents the first full quarter of Debathena deployments. Debathena represents not only a new version of Athena, but also a fundamental re-engineering of many components of Athena. This re-engineering would not have been possible without significant student effort from SIPB, and with the two primary developers graduating in June 2010, *reliance on the current level of student involvement is not sustainable.*

### Machine Count

All Athena machines periodically report their existence and version number to OIS servers, and this information is summarized on a monthly basis. As of October 1, there were 1472 Athena machines (43 Quickstations, 308 Cluster (including dorm clusters), 8 Dialup, 1113 Personal/DLC). 71 machines were Sun workstations, 1 was a legacy SGI, and the remaining 1400 were Linux workstations. Of the 1400 Linux workstations, 962 were running Debathena, and 438 were still running Athena 9. The quarter saw an expected decrease in the number of Athena 9 machines and an increase in the number of Debathena machines, as we begin to phase out Athena 9.

### Login Count\*

\*Because login count data is available on a weekly basis, Q2 data includes September 27-30 and January 1-2

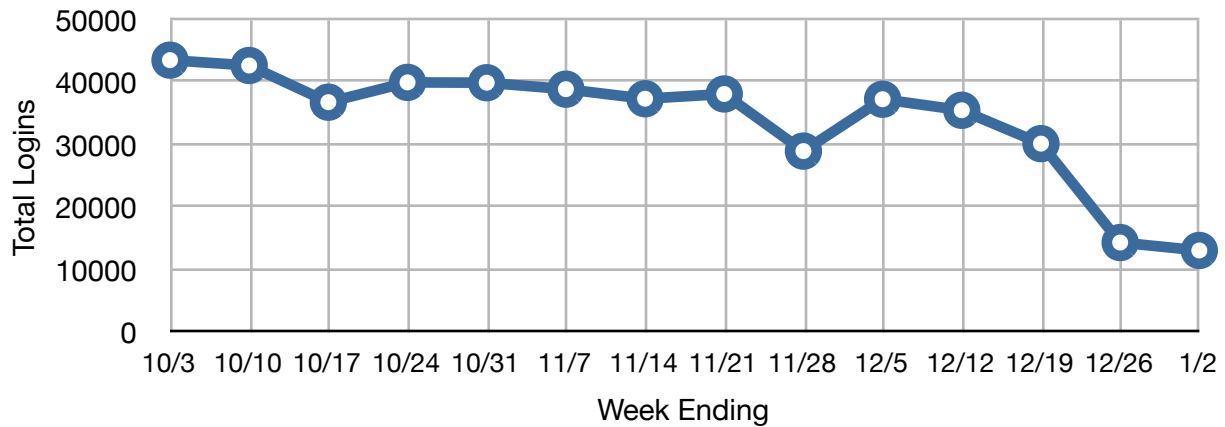
This login count information is provided by OIS. It is possible (either deliberately or inadvertently) for users to bypass the counting mechanism, so these numbers are likely underreported. Data is available on a weekly (Sun-Sat) basis only, and includes total logins per week and unique logins per week, broken down by the various components of Athena.

Over the 14 weeks of the quarter, there were a total of 477,650 logins, with a weekly minimum of 13,120, a maximum of 43,618 and a median of 37,395.

The login trend shown in Figure 1 is standard for this quarter, showing expected decreases in usage during vacation times (w/e 10/17 and w/e 11/28). Athena usage declines towards the end of the semester, as few classes have final projects that rely on Athena, however usage remains relatively high throughout final exams (12/14-12/18).

The login breakdown shown in Figure 2 is expected. Cluster and Personal/DLC Workstations make up the biggest components of Athena in terms of login frequency. Personal/DLC Workstations also make up the majority of Athena workstations throughout campus, followed by Cluster workstations. Quickstations make up the smallest number of workstations throughout campus.

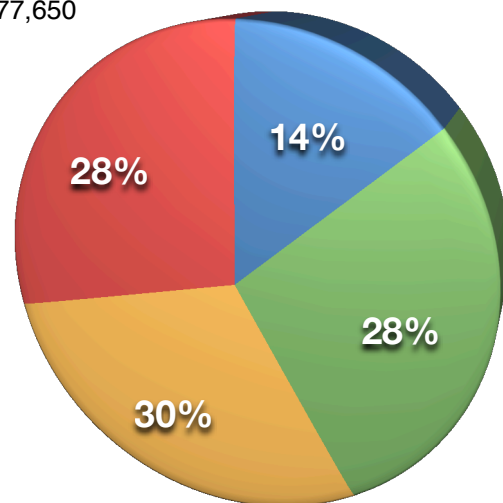
**Figure 1: Quarterly Trend**



**Figure 2: Login Breakdown**

Total Logins: 477,650

- Quickstations
- Cluster
- Personal & DLC Workstations
- Dialup



## Cluster Usage and Occupancy

Cluster usage data is sampled hourly throughout the day and the raw data is presented by OIS as a tuple of (lowest utilization, highest utilization, average utilization). The average is calculated on a daily basis, and is undoubtedly skewed by the fact that Athena cluster usage is nearly nonexistent between the hours of 12am and 10am on an average day. For future quarterly reports, we plan to work with OIS to increase the resolution of the raw data to an hourly basis, to provide a more accurate representation of cluster usage.

To best normalize for this shortcoming in the raw data, weekends and Institute holidays have been removed from this data prior to analysis. Additionally, the data set is deliberately truncated to end on Dec 18, the last day of finals week.

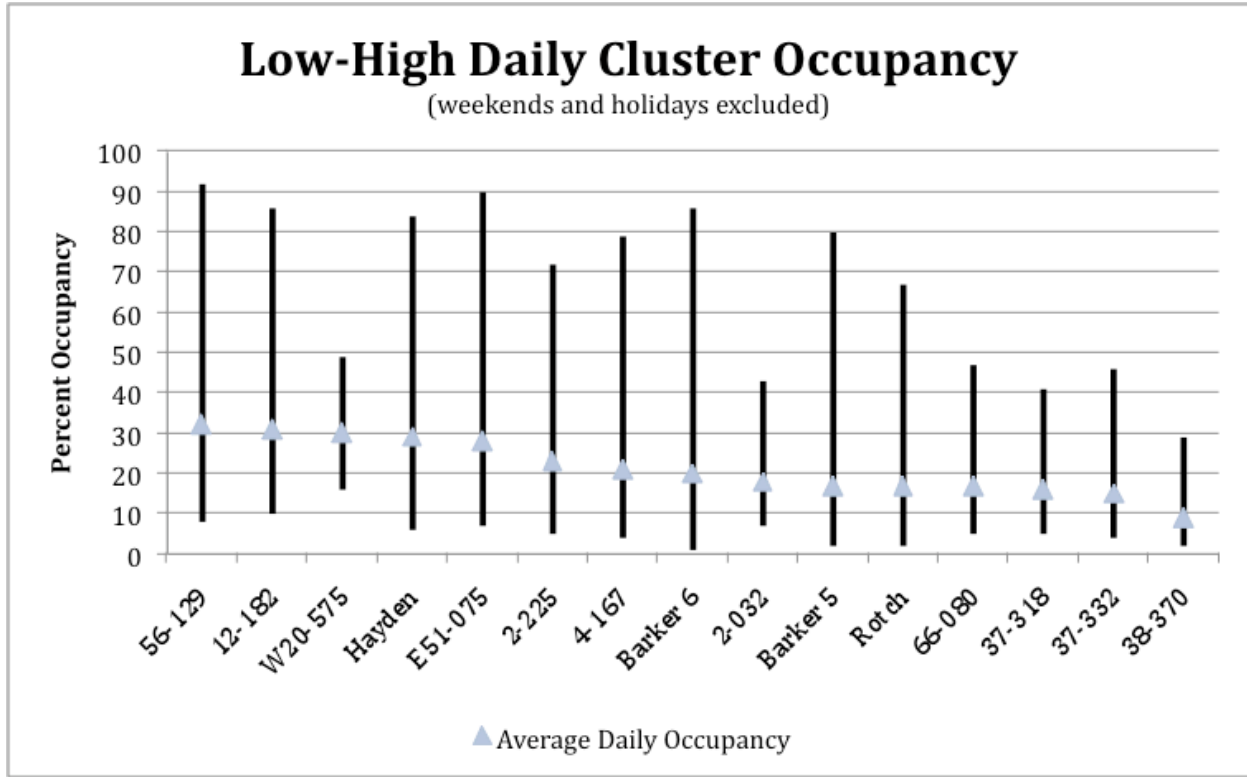
Athena was busiest in mid October, and two notable peaks in utilization occurred in the days after holiday weekends (12/1 and 10/13, 10/14), suggesting that despite the ubiquity of student laptops which would permit remote work, Athena is still widely used for coursework.

Due to the shortcomings in the raw data noted above, average utilization never exceeds 32% for a given cluster, and is thus not a useful data point. However, if we look at minimum and maximum daily utilization for each cluster, we see that usage fluctuates drastically throughout the day, as shown in Figure 3. Even a cluster such as Barker 5, which sees less than 20% average utilization, sees peaks of 80%. By contrast, W20-575, which has one of the highest average utilization values (29%), never exceeded 71% occupancy this quarter, with an average daily maximum occupancy of 48%. Abnormally low utilization of 38-370 and 2-032 is likely explained by their obsolete 10Mbit half-duplex networks.

Many Athena clusters experienced 100% occupancy this quarter, which is a good indication of the popularity of any given cluster. Table 1 shows the clusters that experienced 100% utilization this quarter, and the number of days when the cluster was at full capacity at least once during the day. Of particular note is the fact that all the library clusters experienced 100% utilization during the quarter, perhaps demonstrating their value as quiet workspaces, even if their average occupancy (in the case of Barker 5 and Rotch) is somewhat lower.

**Figure 3. Cluster Occupancy**

(The black bars represent the average daily *minimum* occupancy and average daily *maximum* occupancy for a given cluster, and the blue triangles represent the average daily occupancy.)



**Table 1. Clusters Experiencing Full Capacity**

	Full Capacity Days
<b>E51-075</b>	28
<b>Barker 6</b>	21
<b>56-129</b>	20
<b>Barker 5</b>	17
<b>Hayden</b>	14
<b>12-182</b>	6
<b>4-167</b>	6
<b>2-225</b>	3
<b>Rotch</b>	3

**Future Directions**

A new data source came online earlier this semester, providing us with new data points: application usage and login session duration. Analysis of that data will begin over IAP, and we hope to include it in the Q3 or Q4 reports.