ALTAIR

ONLY FORWARD

# Altair Monitor 2025.1.2

## User Guide

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# Altair Monitor User Guide

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Altair Monitor is a software license tracking tool that reports current and historical license utilization. The license managers that Monitor supports includes FlexNet Publisher, Reprise, LUM, and many others. The primary user interface for accessing Monitor is a web interface.

This chapter covers the following:


- Navigation (p. 4)
- Current Reports (p. 9)
- Views Tab (p. 20)
- Historical Reports (p. 23)
- Project Tracking (p. 62)
- Network Tab (p. 65)


For a complete list of supported license managers, see License Server Management.

# Navigation

## Banner

> **Note:** To use the Monitor web interface, the web browser used must support CSS and JavaScript.

At the top of each page in the Monitor web interface is an informational banner that displays some important details about the running instance and the current web session:

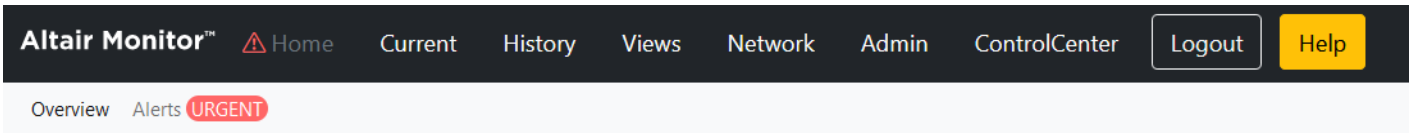



*Figure 1: Monitor Banner*

## Links

In addition to using the tabs to manually navigate to pages, many reports turn the data into cross-links that can be used. For example, clicking on a feature name in the current features report will link to the current checkouts report, pre-filtered to the feature that was clicked:

Current Feature Status (active features only)
As of Thu Jul 13 11:18:36 EDT 2023.

| Tag | Daemon | Feature | Expires | Capacity | Users | Email | Used | Queued | Utilization | Oldest Checkout | Graphs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALM | xformation | NCSlotFeature | 174d13h | 100000 | 9 | | 1235 | 0 | 1% | 97d23h | |
| ALM | xformation | FTSeatLFeature | 174d13h | 100000 | 5 | | 8 | 0 | 0% | 1d06h | |
| ALM | xformation | FTSlotFeature | 174d13h | 100000 | 1 | | 1 | 0 | 0% | 19d20h | |
| ALM | xformation | LAJobFeature | 174d13h | 100000 | 2 | | 3 | 0 | 0% | 97d23h | |
| ALM | xformation | LMUserFeature | 174d13h | 100000 | 6 | | 40 | 0 | 0% | 97d23h | |
| ALM | xformation | WXSlotFeature | 174d13h | 100000 | 2 | | 13 | 0 | 0% | 97d23h | |
| Σ | | | | Σ600,000 | | | Σ1,300 | | | max97d23h | |

*Figure 2: Current Feature Status Page*

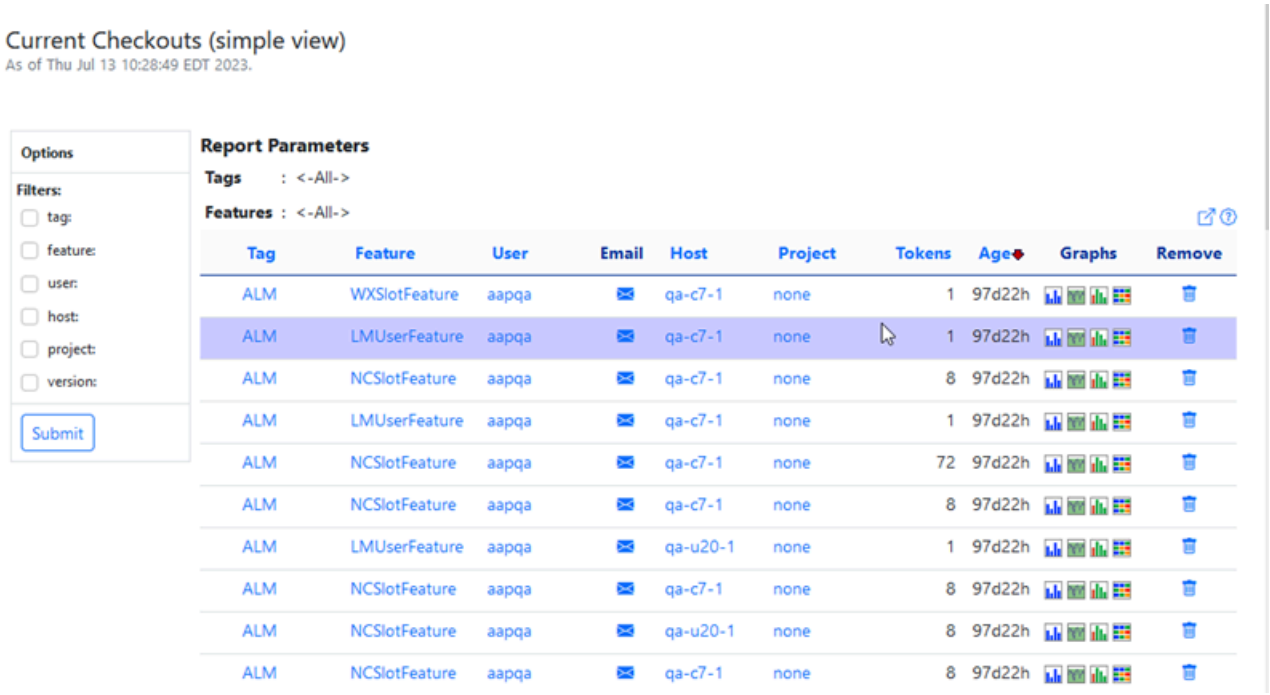



*Figure 3: Current Checkouts*

### Table-based Reports

Many reports in Monitor are displayed in a table format. The tables are sortable by clicking on the column headers, filterable with the filters on the bottom, and exportable in CSV format using the **csv** button.

# Alerts

Monitor includes an alert system that provides visibility to anomalies that occur within the licensing environment or the Monitor product itself.

Each alert has a severity level that indicates how serious the alert should be considered. The four severity levels are:

- INFO - For informational purposes, no cause for concern.
- WARNING - May be of concern, but should not impact operations.
- ERROR - Action should be taken or operations may be impacted.
- URGENT - Action must be taken or operations will be impacted.

### View Alerts

The Alerts menu shows all alerts that have been recently triggered (alerts that are over 24 hours old without a repeat occurrence are discarded). Alerts are shown with their respective severity level, the Monitor system module from which the alert was generated, the title and details of the alert, occurrence statistics, and administrative controls for deleting or acknowledging the alert:

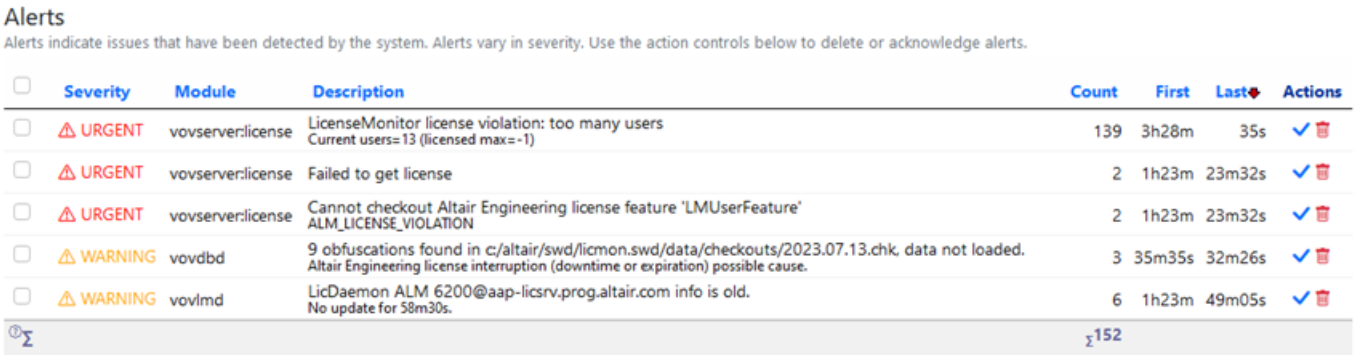



*Figure 4: Alerts Page*

### Administrative Controls

Alerts may be either deleted or acknowledged. Deleting an alert clears it from the system memory. If the alert reoccurs, it will reappear in the alert list. Acknowledging an alert leaves it in the system memory, but it is shown as grayed out in the alert list and it no longer counts as the highest level of alert that is present in the system. Re-occurrences are still counted and shown in the occurrence statistics for the alert.

## Home Page

Primary page for viewing the status of your licenses and views.

The Monitor home page is intended to provide a current, high-level overview of the license environment being monitored. This includes a section for some basic utilization and wait time statistics, a customized view section, and a section that shows the status of the most active license servers. Clicking on the headers takes you to each header's respective page.

### Current Status

The first section on the home page shows some high-level utilization and wait time statistics for the moment of time at which the home page was loaded. The statistics are divided into two categories: "Current Utilization" and "Current Wait":

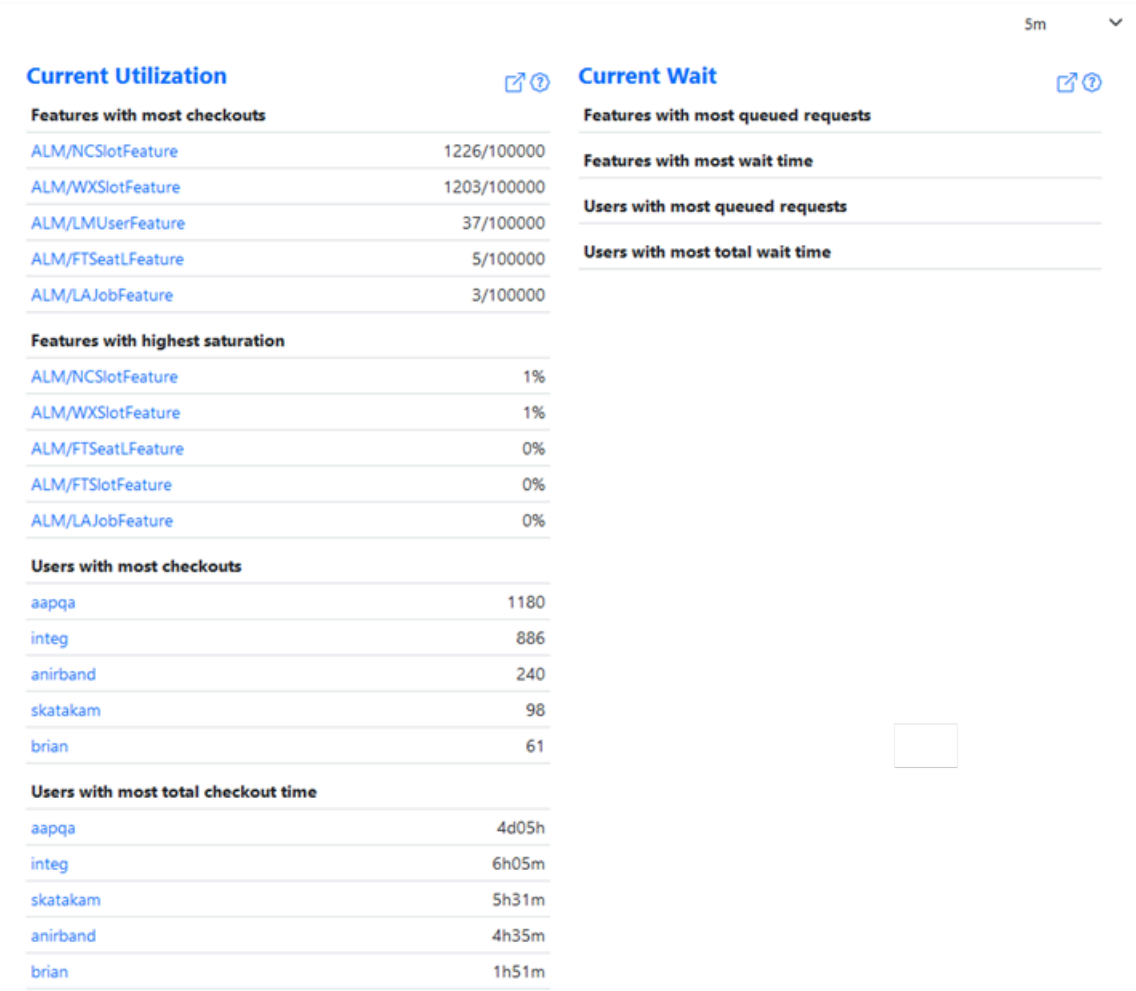



*Figure 5: Home Page: Statistics Section*

Each category is further broken down into a collection of top metrics. This allows you to see the most used features, the most active users, and the features that are the largest bottlenecks. The features and users that show up in these sections are links, which can be clicked on to obtain details about the statistic.

## My View Section

The My View section shows the configured default view for the current authenticated user. A *view* is a pre-configured collection of tag and/or feature filters that are presented in a table for convenience. Views can be created and/or edited in the Views tab. Clicking on **My View** navigates to this page.

## License Server Section

The final section shown on the home page is the license servers section. This section shows the most active license servers, their status, and some basic statistics about the server such as the number of features served by the server, the number of checkouts that are currently active on the server, and the last time the server was sampled by Monitor for data collection.

*Figure 6: License Servers*

# LDAP Viewer

If the Monitor administrator has configured the LDAP interface, information about users can be looked up from an LDAP server anywhere a user name is displayed in the various reports that are provided.

The icon can be clicked to bring up the viewer:

| LDAP info for user 'user' | |
|---|---|
| **Name** | user |
| **Position** | Technical Product Manager |
| **Email** | s@rtda.com |
| **Phone** | (777) 777 7777 |
| **Location** | Noblesville |

*Figure 7: LDAP viewer page*

In the image above, the administrator has configured the Monitor LDAP interface to extract the full name, the position, the e-mail address, the phone number, and the location of the employee with the selected user name.

# Current Reports

## Current Utilization

The **Current Utilization Overview** page is a summary of the features that have active checkouts at the moment that page is loaded.

By hiding the features that have no usage, this page can easily show where the license activity is. The simple metric shown is in the format of "in use" or "available". The features that are saturated (100% utilized) are highlighted in red text.

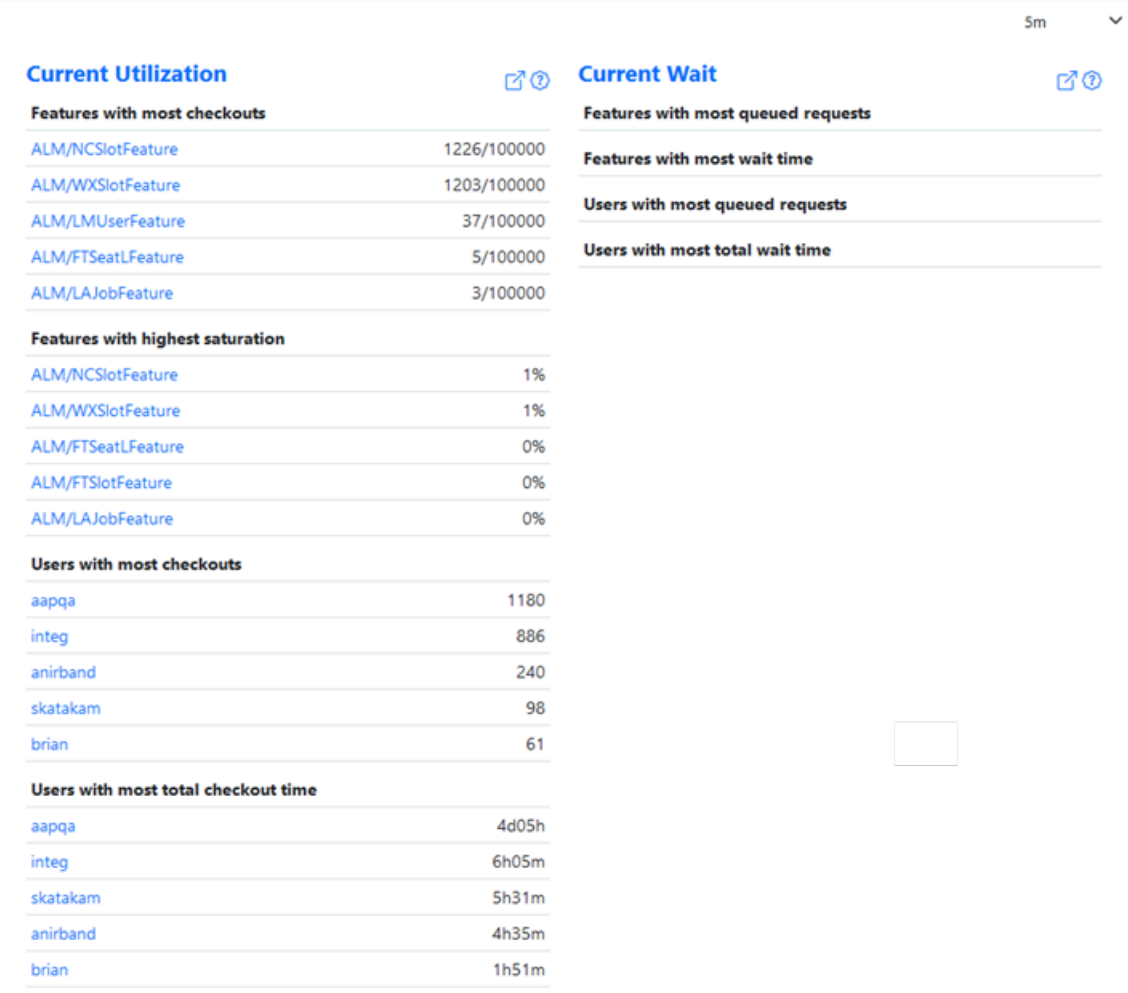



*Figure 8: Home Page: Statistics Section*

# Servers Page

The **License Server** page shows a list of all license servers that are configured to be monitored, along with the status and basic availability and utilization statistics.

License servers that are running with files that contain more than one daemon will result in multiple rows being shown for the server, one row for each daemon.

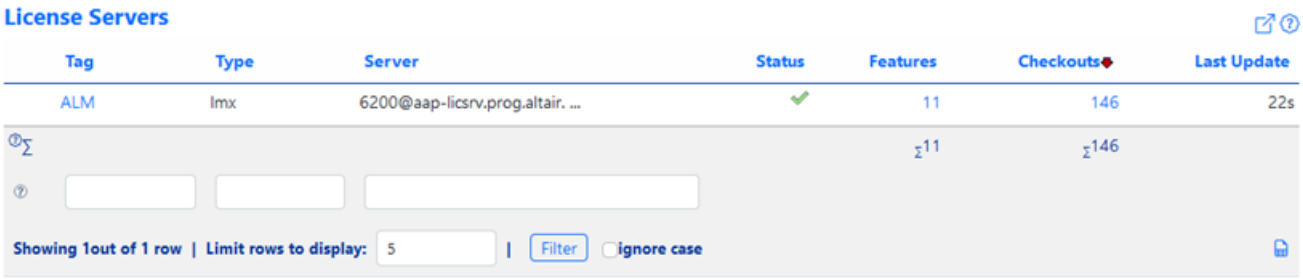



*Figure 9: License Servers*

The table shows the following details for each license server being monitored:

| | |
|---|---|
| **Tag** | A unique identifier for the license server assigned by the Monitor administrator |
| **Type** | The license server type (that is, FlexNet Publisher, Reprise, etc.). |
| **Server** | The port@host or license file specification of the license server. |
| **Status** | One of a green check mark (running normally), a red X (error), a yellow exclamation point (running but with problems), or an image that depicts that a sample is currently being taken. Clicking on the status image navigates to the raw data page for the license server, which can be used to get more details on the status. |
| **Features** | The number of features being served by the daemon. |
| **Checkouts** | The number of checkouts checkouts at the time the page was loaded. |
| **Last Update** | The amount of time that has elapsed since the last sample was taken. |

### FlexNet Publisher Unused Daemon

Every FlexNet Publisher license server being monitored includes a default artificial daemon called "unused". All features will be assigned to this daemon until the INFO parsing job runs (which gathers daemon, version, and expiration information for features from the license server every 12 hours by default) or until usage is detected each feature (at which point the daemon is also known). This is necessary because of how the STAT parsing job (which gathers the feature list and users) does not show the actual daemon until there is usage. Once an actual daemon has been assigned to all features

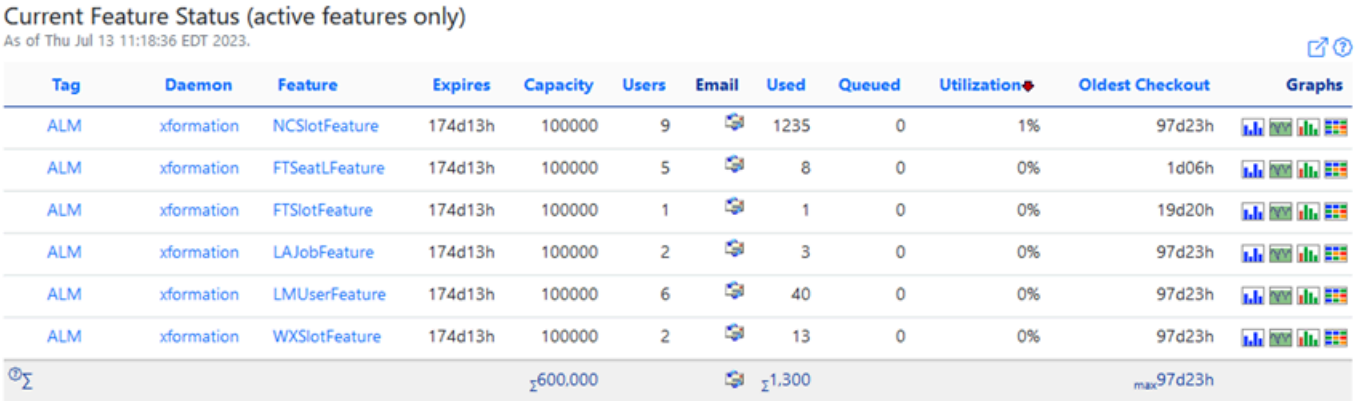
found in the tag, the "unused" daemon will be removed from the system. If Monitor is restarted, the process will be repeated.

# Features Page

The **Current Feature Status** page shows the availability and utilization details of the features.

By default, only active features are shown in the table. The Features View option has four different views:

| | |
|---|---|
| **Active** | Availability and utilization details of active license features. |
| **All** | Availability and utilization details of all features, including idle license features. |
| **Time-based** | Availability and utilization details of time-based features. |
| **Perpetual** | Availability and utilization details of perpetual features. |


Current Feature Status (active features only)
As of Thu Jul 13 11:18:36 EDT 2023.

| Tag | Daemon | Feature | Expires | Capacity | Users | Email | Used | Queued | Utilization | Oldest Checkout | Graphs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALM | xformation | NCSlotFeature | 174d13h | 100000 | 9 | | 1235 | 0 | 1% | 97d23h | |
| ALM | xformation | FTSeatLFeature | 174d13h | 100000 | 5 | | 8 | 0 | 0% | 1d06h | |
| ALM | xformation | FTSlotFeature | 174d13h | 100000 | 1 | | 1 | 0 | 0% | 19d20h | |
| ALM | xformation | LAJobFeature | 174d13h | 100000 | 2 | | 3 | 0 | 0% | 97d23h | |
| ALM | xformation | LMUserFeature | 174d13h | 100000 | 6 | | 40 | 0 | 0% | 97d23h | |
| ALM | xformation | WXSlotFeature | 174d13h | 100000 | 2 | | 13 | 0 | 0% | 97d23h | |
| | | | | Σ600,000 | | | Σ1,300 | | | max97d23h | |

*Figure 10: Current Feature Status Page*

In the table, a row is displayed for each feature found in each tag. By default, the table is sorted by the utilization percentage in descending order. The following information is displayed in the table:

| | |
|---|---|
| **Tag** | The tag representing the license server. |
| **Daemon** | The vendor daemon that is serving out the license server. |
| **Feature** | The license feature name. If the feature name begins with "T:", the feature is a subfeature, which is activated when certain token-based features are checked out. Note that subfeatures are supported on an inclusive basis only. See below for details. |
| **Expires** | The time left until the license feature expires. If there are multiple instances of the same feature being served by the daemon, the earliest expiration is used. |

| | |
|---|---|
| **Capacity** | The total number of tokens of the feature that are available. |
| **Users** | Total number of unique users that have the feature checked out. |
| **Email** | The email icon is a mailto link that can be used to send an email to all users of the feature using the client machine's configured email client. The client must be capable of handling mailto links. |
| **Used** | The number of tokens of the feature consumed by all users. |
| **Queued** | The number of token request currently being queued. |
| **Utilization** | The percentage of tokens currently being used. |
| **Oldest Checkout** | The age of the longest-held checkout of the feature. This is useful for finding features held by abandoned or neglected tool sessions. |
| **Graphs** | Contains shortcut icons for generating plots and heatmaps. |

### Token-Based Subfeatures

Some vendors provide licenses that are token-based. Multiple tools can check out this type of license, with varying token counts. For example, a compiler may check out 1 token-based license, whereas a simulator may check out 2 of that license. To perform the token-based feature tracking (FlexNet Publisher only at this time), Monitor relies on an optional field in the lmstat output that is referred to as the "subfeature" field. This field is located between the display and version fields of the lmstat output. The following is an example of this field, which is highlighted in bold:

```
"Virtuoso_Multi_mode_Simulation" v9999.999, vendor: cdslmd
floating license
bob lnxws1 :0.0 Spectre (v7.000) (licsrv/1797 3031), start Fri 6/20 12:34
```

In this example, the user `bob` has checked out 1 multi-mode simulation license token, and that 1 token is activating the "Spectre" product. In the Monitor reports, if the administrator has enabled subfeature tracking in the monitor configuration for this particular tag, the subfeature will show up as "T:Spectre" to help determine how token-based licenses are being used.

> **Note:** Not all vendors/tools support the subfeature field. In fact, some vendors/tools use this field for other data that is completely unrelated. For this reason, Monitor's FlexNet Publisher parser is designed to support subfeature values on an inclusive basis only. Altair will add support for subfeatures as they are reported to the support team.

# Checkouts Page

The **Current Checkouts** page shows all checkouts for all tags and features at the time the page was loaded. The checkouts are sorted by their age in descending order by default. This order helps to identify problematic checkouts that may require attention.

## Simple View

Each row in the table shows one license checkout.

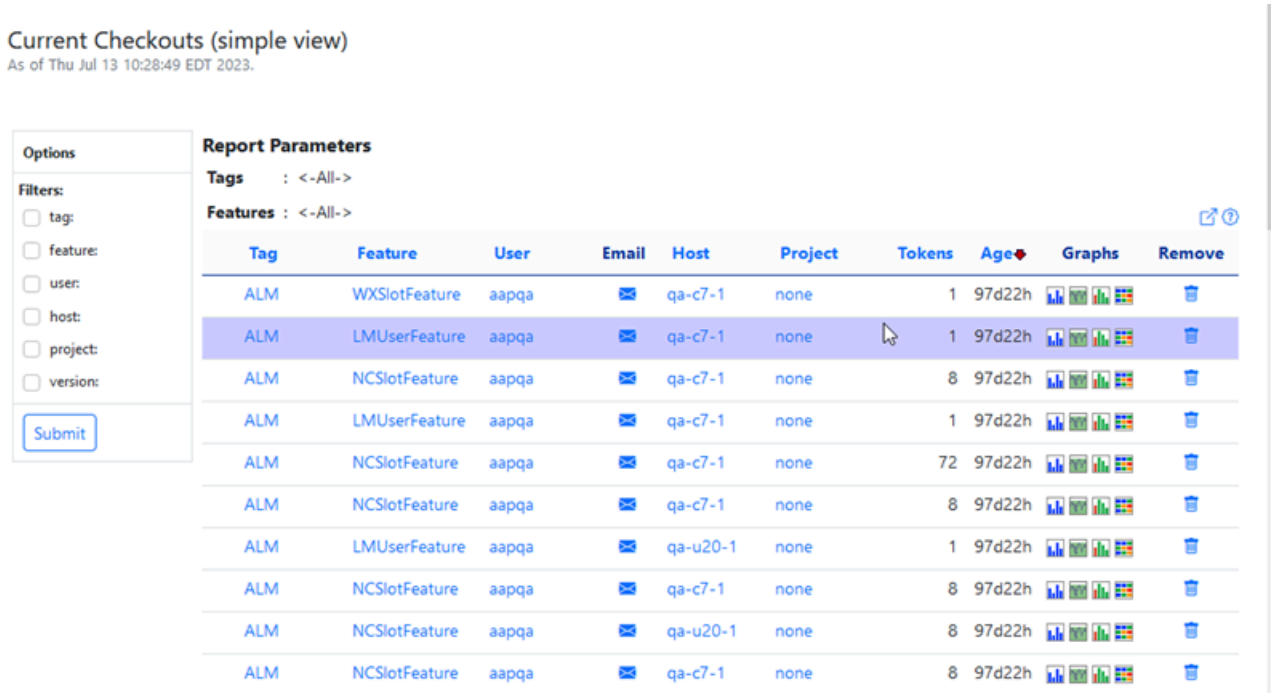



*Figure 11: Current Checkouts*

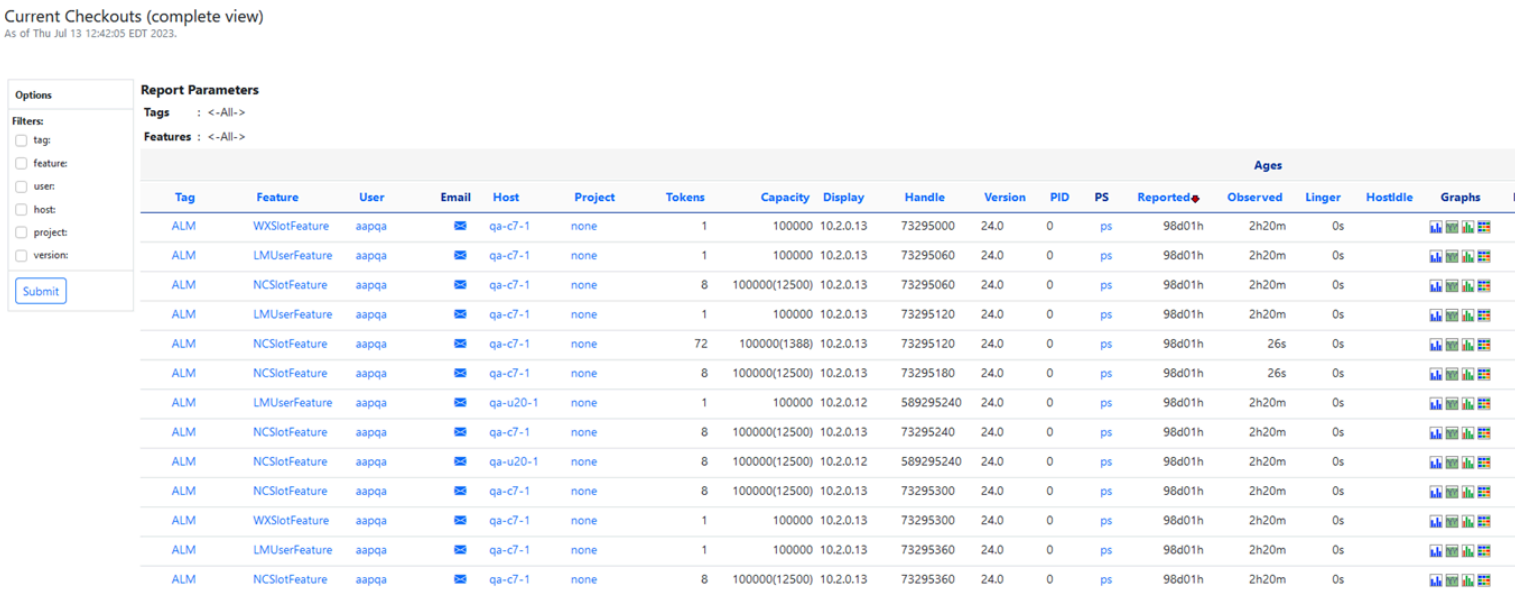
The following information is displayed:

| | |
|---|---|
| **Tag** | The tag representing the license server. |
| **Feature** | The license feature name. If the feature name begins with "T:", the feature is a subfeature, which is activated when certain token-based features are checked out. Note that subfeatures are supported on an inclusive basis only. See the Features Page for details. |
| **User** | The user holding the checkout. If the user begins with "r:", a license reservation is in effect for the user or group indicated. |
| **Email** | The email icon is a mailto link that can be used to send an email to all users of the feature using the client machine's configured email client. The client must be capable of handling mailto links. |
| **Host** | The host on which the job holding the feature is running. |

| | |
|---|---|
| **Project** | The project assignment for the current checkout. |
| **Tokens** | The actual number of licenses. |
| **Age** | The age of the checkout. This is useful for finding features held by abandoned or neglected tool sessions. For FlexNet Publisher, the age used in this column is the age reported by `lmstat`. For the observed age, which is the age at which Monitor first detected the checkout, use the "Complete View". |
| **Graphs** | Contains shortcut icons for generating plots and heatmaps. |
| **Remove** | If the user that is logged in matches that of the checkout, or the user has an administrator security principle, the trash can icon can be used to perform the removal of the checkout. Removal of checkouts can only occur once the age of the checkout is at least two minutes. |

## Complete View

For more details on the checkouts, click the **Complete View** link in the drop-down page menu. This will enable the following columns in the table.


Current Checkouts (complete view)
As of Thu Jul 13 12:42:05 EDT 2023.

Options
Filters:
tag:
feature:
user:
host:
project:
version:
Submit

Report Parameters
Tags : <-All->
Features : <-All->

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Ages | | | |
| Tag | Feature | User | Email | Host | Project | Tokens | Capacity | Display | Handle | Version | PID | PS | Reported | Observed | Linger | Hostidle | Graphs |
| ALM | WXSlotFeature | aapqa | | qa-c7-1 | none | 1 | 100000 | 10.2.0.13 | 73295000 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | LMUserFeature | aapqa | | qa-c7-1 | none | 1 | 100000 | 10.2.0.13 | 73295060 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | NCSlotFeature | aapqa | | qa-c7-1 | none | 8 | 100000(12500) | 10.2.0.13 | 73295060 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | LMUserFeature | aapqa | | qa-c7-1 | none | 1 | 100000 | 10.2.0.13 | 73295120 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | NCSlotFeature | aapqa | | qa-c7-1 | none | 72 | 100000(1388) | 10.2.0.13 | 73295120 | 24.0 | 0 | ps | 98d01h | 26s | 0s | | |
| ALM | NCSlotFeature | aapqa | | qa-c7-1 | none | 8 | 100000(12500) | 10.2.0.13 | 73295180 | 24.0 | 0 | ps | 98d01h | 26s | 0s | | |
| ALM | LMUserFeature | aapqa | | qa-u20-1 | none | 1 | 100000 | 10.2.0.12 | 589295240 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | NCSlotFeature | aapqa | | qa-c7-1 | none | 8 | 100000(12500) | 10.2.0.13 | 73295240 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | NCSlotFeature | aapqa | | qa-u20-1 | none | 8 | 100000(12500) | 10.2.0.12 | 589295240 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | NCSlotFeature | aapqa | | qa-c7-1 | none | 8 | 100000(12500) | 10.2.0.13 | 73295300 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | WXSlotFeature | aapqa | | qa-c7-1 | none | 1 | 100000 | 10.2.0.13 | 73295300 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | LMUserFeature | aapqa | | qa-c7-1 | none | 1 | 100000 | 10.2.0.13 | 73295360 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |
| ALM | NCSlotFeature | aapqa | | qa-c7-1 | none | 8 | 100000(12500) | 10.2.0.13 | 73295360 | 24.0 | 0 | ps | 98d01h | 2h20m | 0s | | |

*Figure 12: Checkouts Complete View*

| | |
|---|---|
| **Capacity** | The capacity of the feature that is checked out. If the capacity shown includes a number inside of parentheses, the checkout is one that utilizes multiple tokens and the enclosed number represents the calculated capacity based upon the number of tokens checked out. For example, if a feature has 100 tokens |

| | |
|---|---|
| | available and the checkout is using 10 tokens, the calculated capacity would also be 10 (100/10=10). |
| **Display** | Shows either the value of the display field from the license server status command. |
| **Handle** | The license manager handle for the checkout. |
| **Version** | The version reported by the tool that has been checked out. |
| **PID** | The PID of the process which has that token checked out. This is currenly only supported for Cadence and Synopsis. |
| **PS** | A link to get process statistics for the host where the checkout is held. This functionality requires the network monitoring capability of Monitor to be configured for the host for which the license checkout exists. |
| **Reported** | The time which has passed since the first checkout was reported by `lmstat`. |
| **Observed** | The age at which `Monitor` first detected the checkout. This is helpful in cases where FlexNet Publisher's `lmstat` utility reports false checkout times. This is the age that is stored in the Monitor database and used for historical reporting. |
| **Linger** | This indicates the time that the checkout will be checked in unless the tool renews it. |
| **HostIdle** | Some users want to use the information about keyboard and mouse activity on a host to determine the status of the license handles checked-out on that host. Specifically, if the keyboard and mouse are idle, then the handles are also to be considered idle, and they can possibly be removed.<br>In Monitor, this capability is enabled for Windows. For other hosts, such as Linux compute servers, the notion of "idle keyboard" is not meaningful. |
| **Graphs** | Links to graphical representations of the data. |

# My Checkouts Page

The **My Checkouts** page is a pop-up page that displays active checkout information for a user. You can export the table to CVS format.

This page automatically refreshes every one minute.

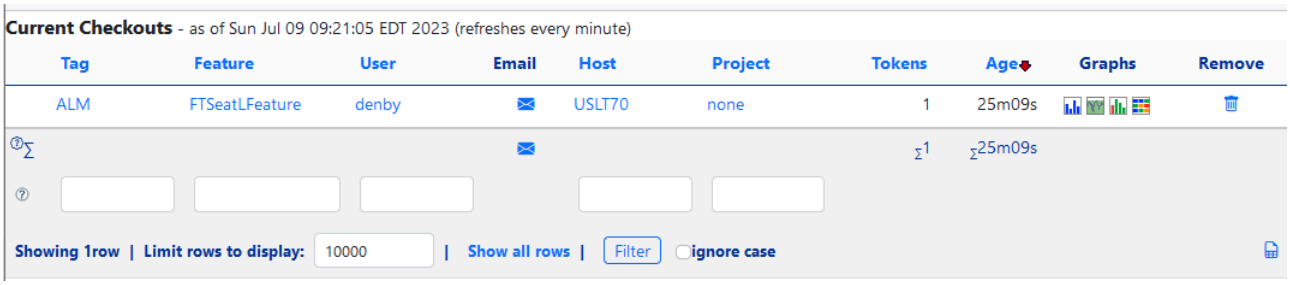



*Figure 13:*

The page defaults the user filter to be equal to the user who is logged in to the Monitor interface at the time. This page provides an unobtrusive window of continuous checkout monitoring.

# Expirations

The **Expirations** page provides an overview of upcoming license feature expirations that have been detected in the licensing environment.

A drop-down menu is provided to select the time frame to consider when viewing expirations. By default, the view is collapsed to the tag level. The view can be expanded to the feature level by click on the expand/collapse (+/-) icons next to the tag name. This view shows all the features that have an upcoming expiration detected, as well as the number of features that are expiring, the time left until expiration, the expiration date, and the total number of tokens that will be expiring:

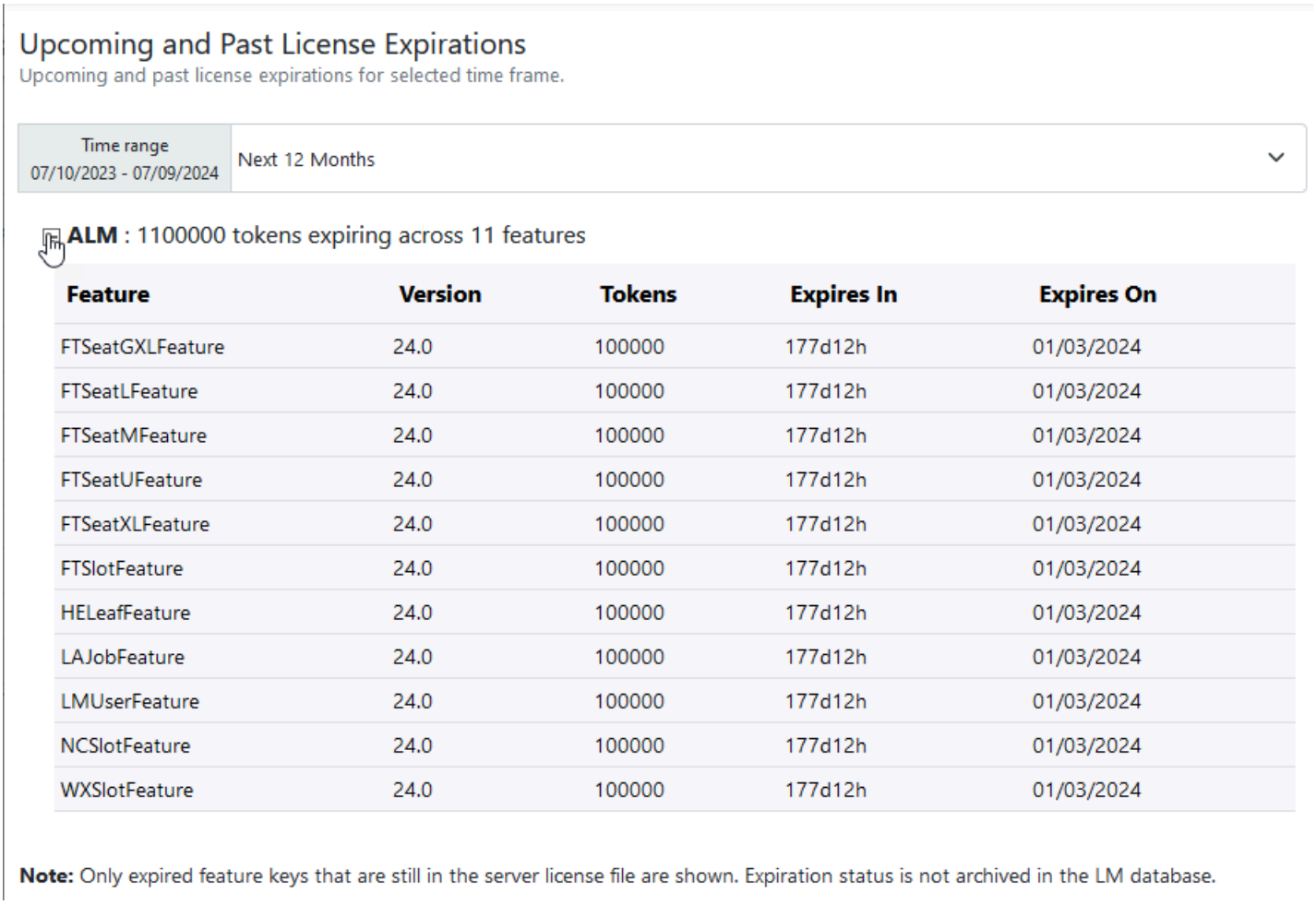



*Figure 14: Expirations Page*

# Raw Data

The **Raw Data** page can be used to view the raw output of the status command for its most recent execution.

This can be useful to debug why a license server is marked as having problems by Monitor. The page includes a drop-down menu at the top of the page to select the raw output per tag.

*Figure 15: Raw Data Page*

## Raw Data URLs

Altair Monitor provides three pages that show the raw data in tabular format, with no user interface. Links to these pages are displayed at the top of the raw data page. These pages can be utilized programmatically via a command-line URL parsing utility such as `wget`. The three pages that are provided, with their respective data shown are:

*/raw/daemons*

- Output: daemonId, type, tag, daemon, version, server, port, licenseFile, lastUpdateTs, status (-1=error, 0=updating, 1=up)
- Arguments: none

*/raw/features*

- Output: featureId, daemonId, tag, daemon, feature, expirationTs, capacity, inUse, version
- Arguments:
  - ?maxage=X - show features only for daemons that have been updated under the specified maximum age, in seconds (default is 900, i.e. 15 minutes)
  - ?tag=X - show features only for the specified tag; default is to show all tags
  - ?feature=X - show specified feature only; default is to show all features
  - ?reservations=X - if set to 0, do not show reservations; default is 1

*/raw/checkouts*

- Output: featureId, tag, feature, account, user, host, handle, display, tokens, pid, requestTs, observerdCheckoutTs, checkintTs, reportedCheckoutTs
- Arguments:
  - ?format=X - specify the format string for the output. This string is a space separated list of tokens from the following set:

    ID FEATUREID TAG FEATURE ACCOUNT USER HOST HANDLE TTY VERSION TOKENS PID QTS COTS CITS CO2TS LINGER,

    and the default value is

    "FEATUREID TAG FEATURE ACCOUNT USER HOST HANDLE TTY TOKENS PID QTS COTS CITS CO2TS"

    Remember that in URL the space is expressed by a "+" sign. Examples:

    ```
    /raw/checkouts?format=ID+TAG+FEATURE+USER
    /raw/checkouts?format=TAG+FEATURE+USER+VERSION+HOST
    ```
  - ?maxage=X - show checkouts only for daemons that have been updated under the specified maximum age
  - ?tag=X - show checkouts only for the specified tag
  - ?feature=X - show checkouts only for the specified feature
  - ?user=X - show checkouts only for the specified user

# Views Tab

Create tables and reports that show the items you're interested in viewing and tracking.

The Views functionality of Altair Monitor allows an authenticated user to create a high-level table-based status report that shows only the items desired by the user.

### My Views

Each user can create one or more views as well as set one view as the default view, which appears in **My View** page, as well as the My View section on the home page. A user can view, as well as set as default, any view created by any user, but cannot edit other users' views. Clicking on the **Views** tab navigates the user to the **My View** page:

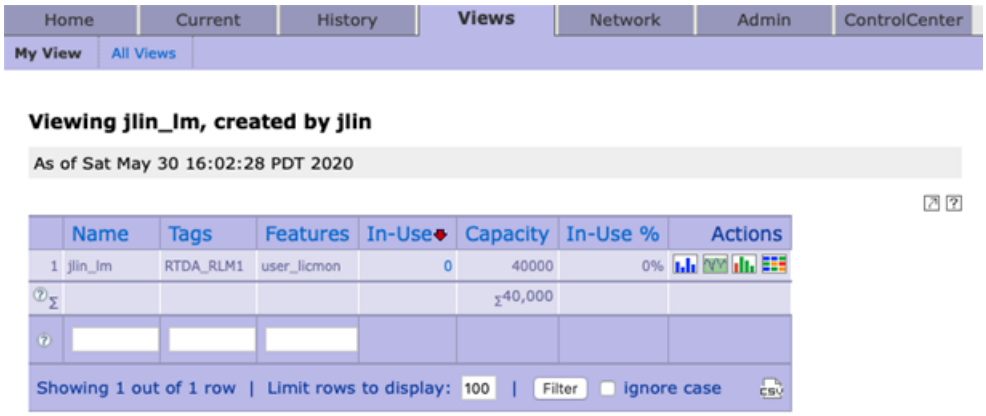



*Figure 16: My View Page*

You cannot add or remove columns.

The following columns are shown on My View table:

| | |
|---|---|
| **Name** | The name of the configured view. |
| **Tags** | The name of the tag name, such as BUILT_IN or a tag pattern (or a tag pattern match). |
| **Features** | The name of license feature being monitored. |
| **In-Use** | The number of license features in use. |
| **Capacity** | The number of licenses you have the capacity to use. |
| **In-Use %** | The percent of time the license feature is in use. |
| **Actions** | The four graphs, which show more detail. This includes the daily plot, the detailed plot, the efficiency histogram, and the heatmap. |

## All Views

This shows all configured views and enables you to set the default views and share your views with others, working from this list. The All Views option shows all existing views. Views can be edited and deleted from this page.

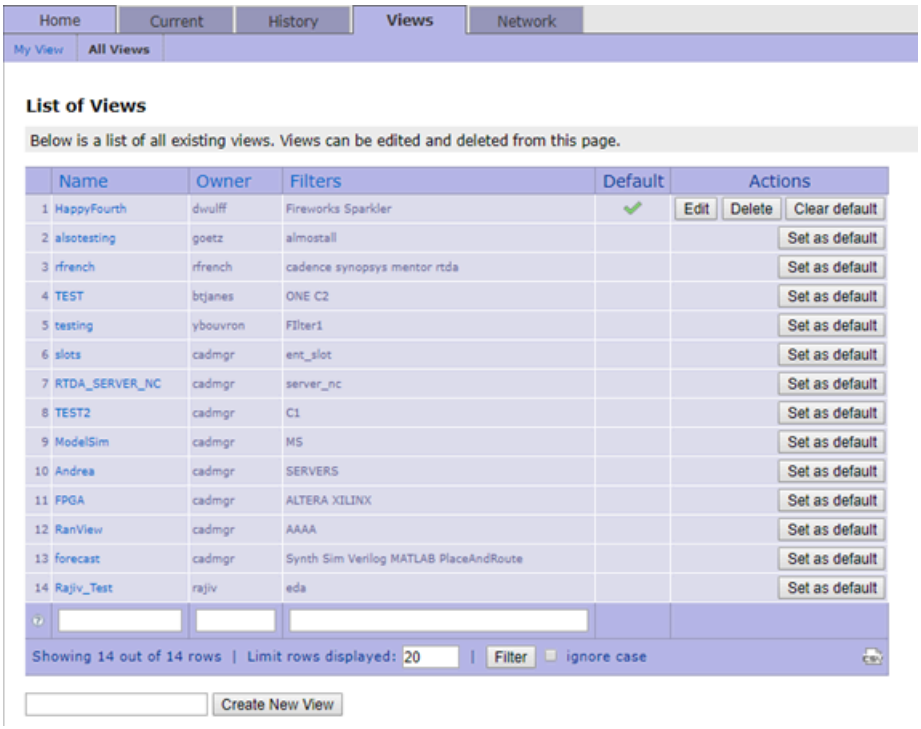



*Figure 17: All Views*

The following columns are shown on the List of Views table:

| | |
|---|---|
| **Name** | The name of the configured view. |
| **Owner** | The user who created the view. |
| **Filters** | The name of the filter. |
| **Default** | The selected default view. |
| **Actions** | The options available to the user: Edit, Delete, Clear default and Set as default. |

To view one of the views in the list, click on its name. To create a new view, enter a view name at the bottom of the page and click the **Create New View** button. This will bring up the View Editor:

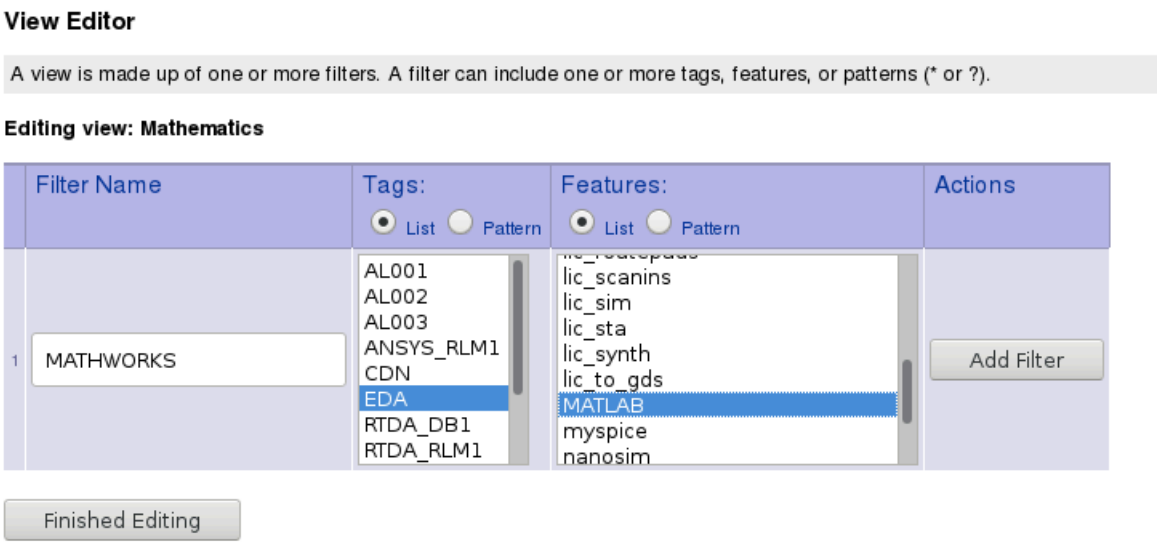



*Figure 18: Edit View Page*

A view is comprised of one or more filters. Each filter requires a name and a definition that may include one or more of the following:

| | |
|---|---|
| **Feature** | An actual license feature name, such as "MATLAB" |
| **Feature pattern** | A license feature pattern match, such as "MAT*" |
| **Tag** | An actual tag name, such as "MATHWORKS" |
| **Tag pattern** | A tag pattern match, such as "MATHWORKS_*". |

For pattern matches, both the ? (single character match) and * (multiple character match) wildcard characters are supported.

Once all filter definitions have been specified for the view being edited, click **Finished Editing** to save the view. This will navigate the user back to the **All Views** page, which can then be used to set the new view as the default view, if desired.

# Historical Reports

Generate and view three types of reports.

From the History menu, there are three general types of reports that you can generate: a usage report, a denials report and batch report.

- A **Usage Report** shows license utilization, and there are 11 types of these reports.
- A **Denials Report** shows statistical information about denial events. This can be used to determine if you have too many or too few licenses.
- A **Batch Report** can combine multiple reports and show multiple data points. They are also persistent and static; the data they display is accurate as of the time they are built, and that data remains available until the report files are deleted from the disk.

Each report has its own benefit, which is explained in this section. Keep in mind, when you view reports, they can be configured with your own settings and columns; the reports shown here have a variety of configurations.

# Daily Feature Statistics

The Usage tab displays the Feature Daily Statistics table. This page serves as a high-level overview of availability and utilization statistics for a given time frame.

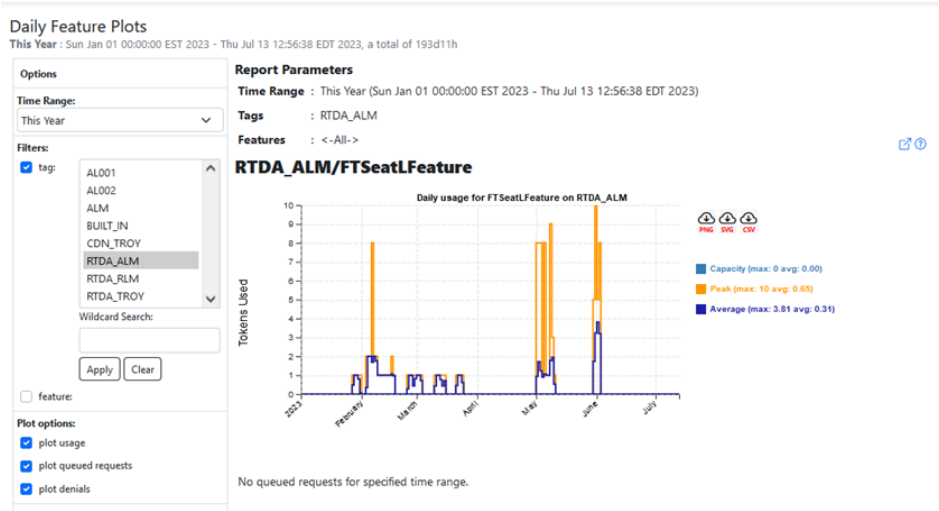



*Figure 19: Daily Feature Statistics Page*

The Daily Feature Statistics Report includes the following columns:

| | |
|---|---|
| **Tag** | The tag representing the license server. |
| **Feature** | The license feature name. |
| **Capacity Peak** | The peak capacity of the feature. |

| | |
|---|---|
| **Capacity Avg** | The average capacity of the future |
| **Usage Peak** | The peak usage of the feature. |
| **Usage Avg** | The average usage of the future. |
| **Usage %** | The average usage divided by the peak for that day. |
| **Queued Peak** | The peak tokens that were waited on. |
| **Queued Avg** | The average tokens that were waited on. |
| **Requests Count** | The number of times the feature was requested. |
| **Requests Denied:** | The number of times that the request was denied. |
| **Request Percent** | The number of denied requests divided by the number of requests that day. |
| **Graphs** | The "Graphs" column contains icons that link to graphical reports for the selected feature. The icon links to the Feature Daily Plots page. The icon links to the Feature Efficiency Statistics page. The icon links to the Feature Efficiency Histogram page. The icon links to the Feature Heatmap report. |

The report is controlled via the time range selector, and the optional tag and feature selectors that are provided to narrow down the number of features shown in the report. The data shown in this report includes peak, average, and percentage statistics for capacity, utilization, queued requests, and denial instances.

### Denial Percentage Calculation

The denial percentage is calculated as the number of denials detected from a debug log for the specified time period over the total number of requests for the same time period. A request includes any queued request or checkout that is detected in the samplings as well as any denied request that is detected from a debug log parsing.

### Population of Data

The information in this report is based on daily averages of various pieces of data. The data is obtained from a summary table in the Monitor database that is populated once per night with these daily averages. For new instances of Monitor, this report will not show data. Additionally, if viewing a report that includes the current day, the report will only show data that was calculated up to the point the summary table was updated, which occurs during the night by default. However, the summary tables can be updated manually by the administrator by visiting the Configuration Information page and running the summary update task.

# Feature Daily Plots

A graph of the metrics shown on the Feature Statistics page for a specific tag/feature combination.

The information in these graphs is based off daily averages. The data is obtained from a summary table in the Altair Monitor database that is populated once per night with these daily averages. For new instances of Altair Monitor, this report will not show data. Additionally, if viewing a report that includes the current day, the report will only show data that was calculated up to the point the summary table was updated, which occurs during the night by default.

The daily feature plots page shows the averages on the Feature Statistics page for a specific tag/feature combination. Three plots are displayed in this report: Usage and Capacity, Queued Requests, and Requests and Denials. These plots are explained in the following sections.

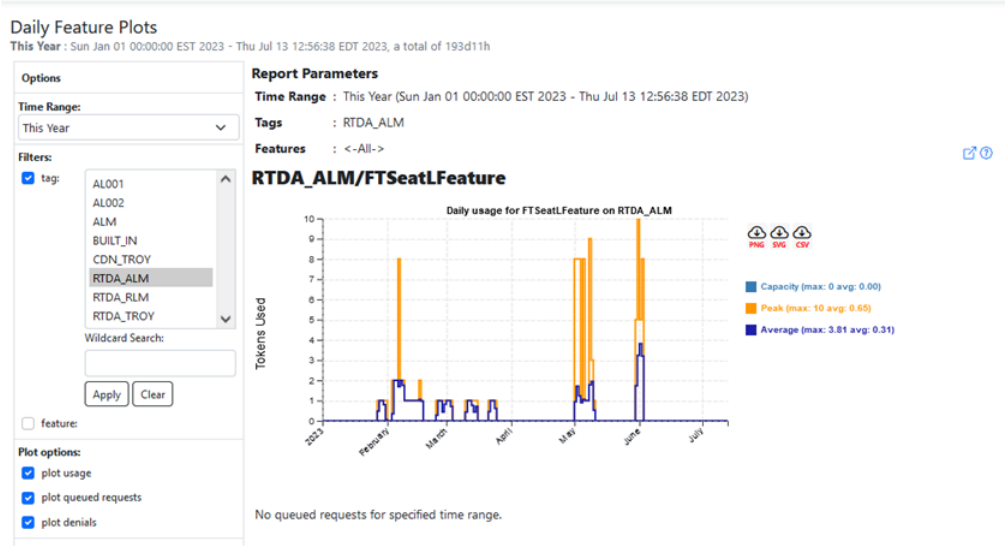



*Figure 20: Feature Daily Plots Page: Reports*

## Usage and Capacity

Capacity is shown as a green background, average utilization per day is shown as blue bars, and peak utilization is show as purple lines for each day.

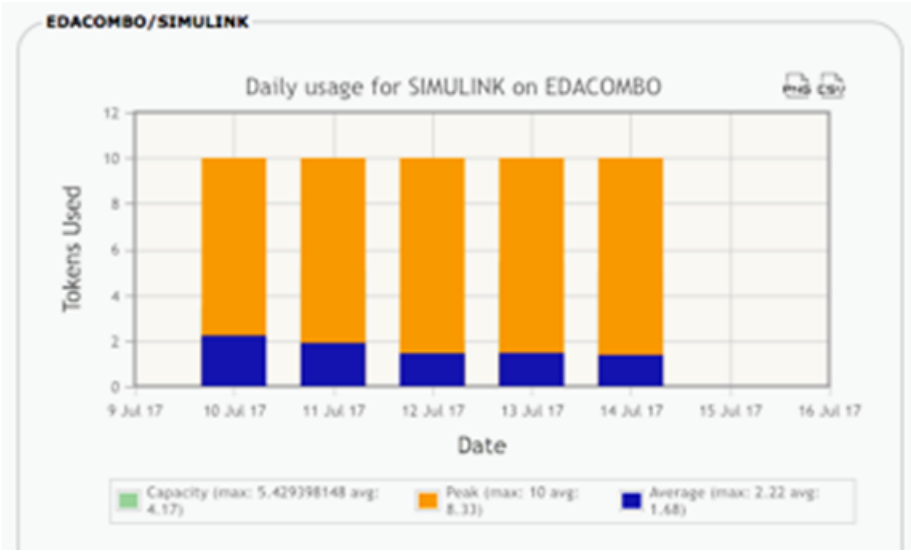



*Figure 21: Usage and Capacity Graph*

## Queued Requests

This provides a visual cue for the number of times a license or feature is requested and put in queue (when the user is waiting in line to use a feature). This indicates when and where you might balance the work load via shifting work times or adding licenses.

Average queued requests per day is shown as teal bars and peak queued requests are shown as teal lines for each day. If there are no queued requests, Monitor will not show a graph. This also depends on if tool vendors support license queuing.

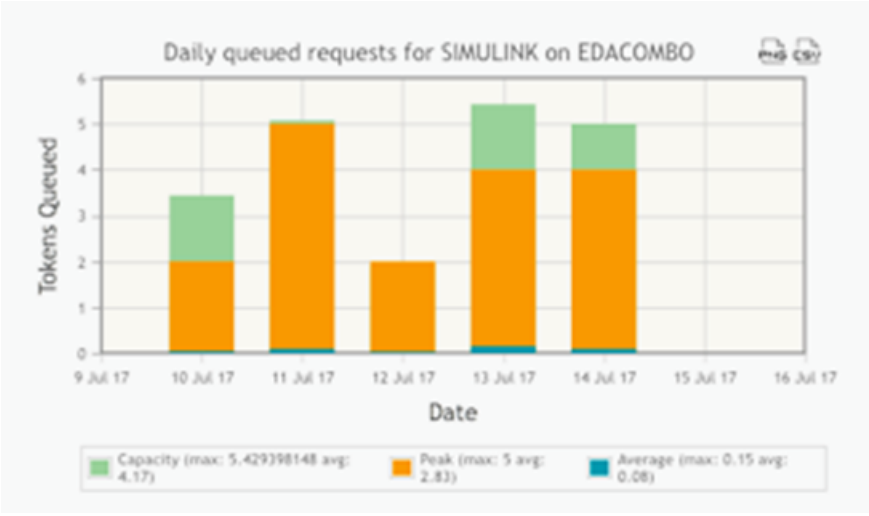



*Figure 22: Queued Requests*

## Requests and Denials

This provides a visual cue for the number of requests versus denials, and it's yet another way to gain insight about your license usage. Many denials indicate that you may need to increase licenses. However, you may want to further verify the reason of license denial.

This graph shows capacity, utilization and peak utilization.

- Blue indicates requests.
- Red indicates denials.

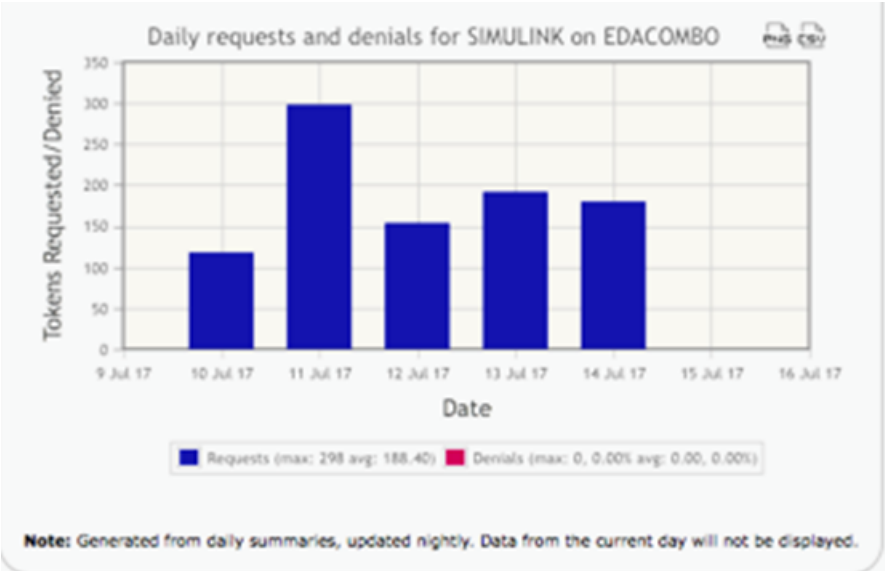



*Figure 23: Requests and Denials*

### Intelligent Denial Scaling

Typically, there are many more requests than denials in a given time frame. Because of this, the scaling of the denials line in the Requests and Denials plot are dynamically adjusted. A multiplier will be shown in the plot legend that indicates the ratio: the value to multiply the value shown in the denial line to obtain the actual value of the denial.

### Data Population

The information in this report is based off of daily averages of various pieces of data. The data is obtained from a summary table in the Monitor database that is populated once per night with these daily averages. For new instances of Monitor, this report will not show data. Additionally, if viewing a report that includes the current day, the report will only show data that was calculated up to the point the summary table was updated, which occurs during the night by default. However, the summary tables can be updated manually by the administrator if needed by visiting the Configuration Information page and running the summary update task.

## Feature Efficiency Statistics

A table showing the metrics associated with efficient licenses usage.

This table shows you the licenses that have been idle too long – and provides a breakdown of recommended license numbers based on historical data. The percentages provide valuable insight into their usage over time. This table shows the metrics associated with efficient license usage.

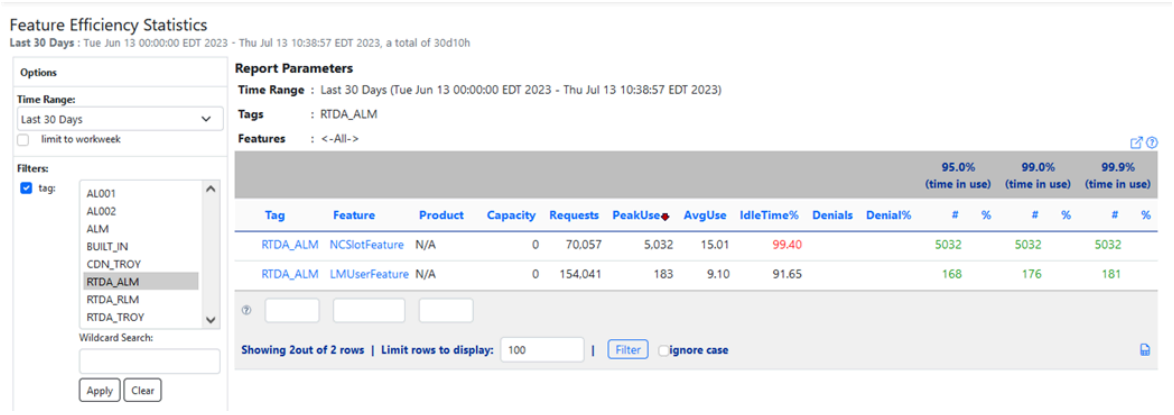



*Figure 24: Feature Efficiency Statistics*

Information in this report includes:

| | |
|---|---|
| **Tag** | Name of the tag. |
| **Feature** | Name of the feature. |
| **Product** | Name of the product, if the administrator has configured product view. |
| **Capacity** | The total number of licenses available for the feature for the specified time range. |
| **Requests** | The total number of requests for the feature for the specified time range. |
| **PeakUse** | The peak number of concurrent checkouts detected for the feature for the specified time range. |
| **AvgUse** | The average number of concurrent checkouts for the feature for the specified time. |
| **Idle Time%** | The percentage of overall time that the license had no usage. |
| **Denials** | The total number of denials for the feature for the specified time range. |
| **Denial%** | The percentage of requests that result in denials for the feature for the specified time range. |
| **Use 95.0% #** | The number and percentage of capacity that is required to meet demand 95.0% of the time. |
| **Use 95.0% %** | The percentage of capacity that is required to meet demand 95% of the time. |
| **Use 99.0% #** | The number and percentage of capacity that is required to meet demand 99.0% of the time. |

| | |
|---|---|
| **Use 99.0% %** | The percentage of capacity that is required to meet demand 99% of the time. |

# Feature Efficiency Histogram

A graph that shows license availability. It can show both licensing bottlenecks and waste.

The data provided by this report can be used to identify both licensing bottlenecks and waste.

> **Note:** The scaling of this report is based on the number of licenses available. For example, if 10 licenses are available, 10 rows will appear, one for each license. If 1000 are licenses available, 10 rows will appear - each row with a range of 100 licenses.

## Examples

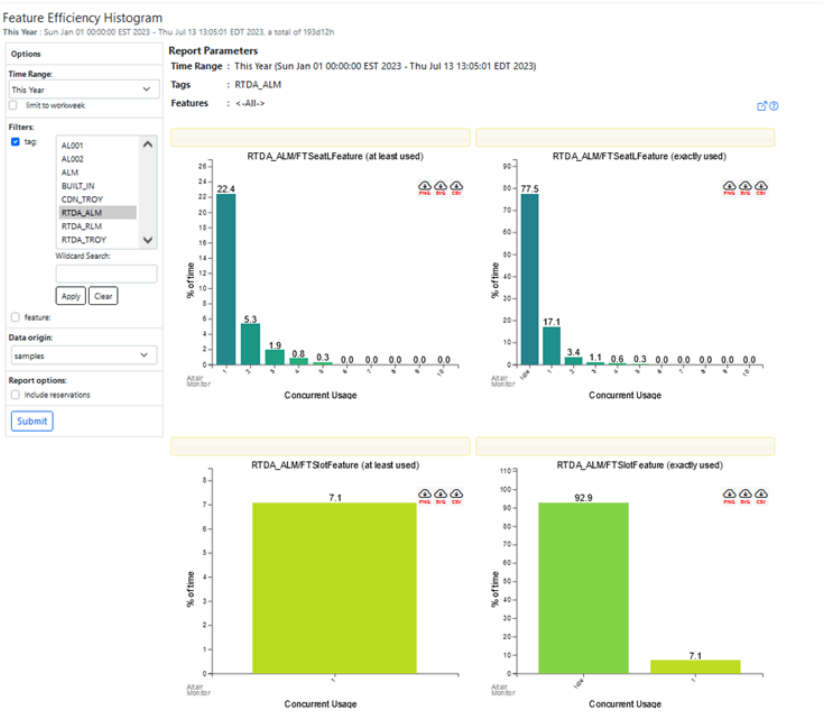



*Figure 25: Feature Efficiency Histogram Page*

Using the example above, from an "overall time" perspective, no licenses checked out 1.83% of the time, **at least** one license checked out 98.17% of the time, and so on. From a "when used" perspective, **exactly** 1 license is used 1.49% of the time, 2 licenses are used 4.43% of the time, and so on. The scaling of this report is based on the number of licenses available. For example, if 10 licenses are available, 10 rows will appear, one for each license. If 1000 are licenses available, 10 rows will appear, each row with a range of 100 licenses.

# Feature Detailed Plots

A group of graphs, which shows availability and utilization statistics.

Feature Detailed graphs show availability and utilization statistics. They are controlled using the options box on the left-hand side of the page. Specifically, they show three graphs:

- **Checkout Count and Duration**: This shows a breakdown of the utilization of the specified feature(s) per user, host, project or custom group.
- **Detailed:** This shows the capacity of the specified feature, usage details and the usage average.
- **Denials:** If denials exist for the specified feature, they will be shown in the denial plot.

*Figure 27: Feature Detailed Plots Page*

## Checkout Count and Duration Graphs

This pie chart provides a visual cue for the number of checkouts and the duration.

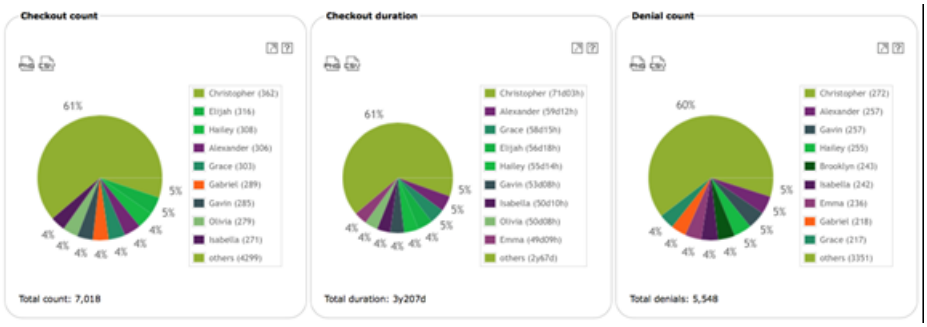



*Figure 28: Feature Detailed Pie Charts – Checkout Count & Checkout Duration*

- **Checkout count**: This shows the percent of checkouts per user or per host for the group.
- **Checkout duration**: This shows the duration of checkouts per user or per host for the group.
- **Denial count**: This shows the percent of the denials per user or per host for the group.

In this example, the pie charts show that "Christopher" used most of these two features, and he is responsible for most of the duration and the denial count. Christopher might be a super user, or he might represent a generic account that is used by many people. This presents an opportunity for further investigation.

## Feature Detailed Plot

This graph provides a visual cue for determining whether you need more or fewer licenses.

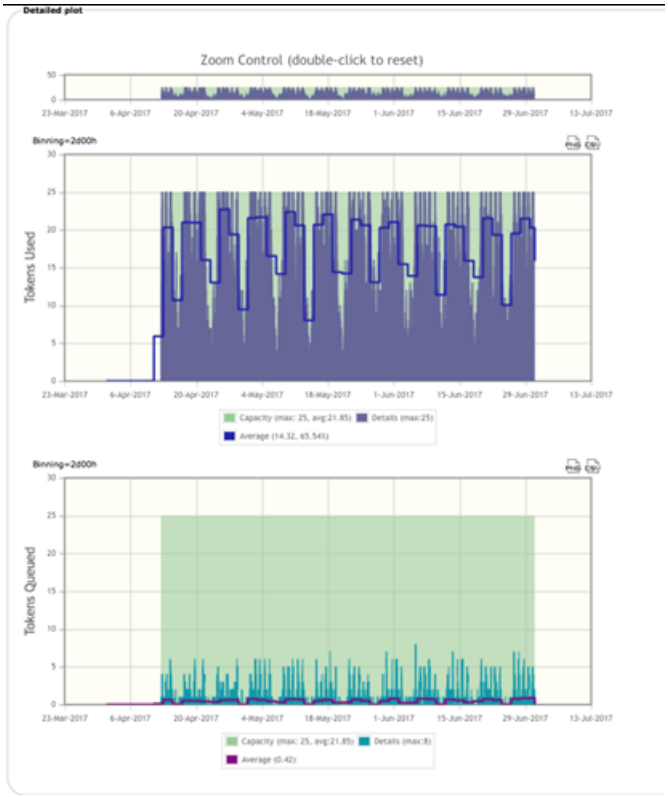



*Figure 29: Detailed Plot – Tokens Used*

Tokens Used are transposed with your maximum capacity and the average capacity daily.

This shows the usage for the give time frame for each breakdown.

- Dark blue is utilized
- Light blue is how much is exactly used, capacity.

This example shows a proper balance of tokens used and tokens queued.

## Denials Plot

If denials exist for the specified feature(s), they will be shown at the bottom of the page in the denial plot. The plot shows a thin red bar that indicates the number of denials detected for each second throughout the specified time period.

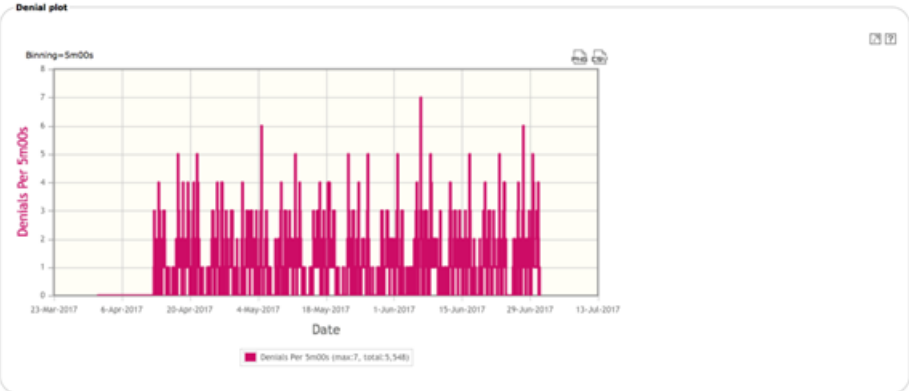



*Figure 30: Denials Plot*

You can limit the scope of the reports on the page to specific tags, features, users, hosts, and projects.

In this example, each vertical bar represents five minutes, (this can be set to a different time parameter). This plot covers the second quarter. It shows 7 to 8 denials as the maximum, which is not too many. If there were no denials, you might be wasting money. But in this case, there is neither too many more too few denials; this is a sweet spot.

## Usage Comparison Plot

This graph simplifies the complex reports generated by checkout statistics page.

*Figure 31:*

This graph accompanies the checkout statistics page, which has complex report-by and filter options. This plot compares the utilization average over time, broken down by the selected option. You can choose different teams, departments, tags, users or groups. It shows which is used the most and which is used the least, and this gives you an idea of how to distribute resources and when to distribute them.

This example plot specifically shows the overall usage of the two features – MATLAB and Calibre – MATLAB gets more use than Calibre, during the second quarter of the year.

As a general rule, the stacked view option can be used when a graphical view of the total usage is desired. For example, in an environment where there are two different synthesis tools available and a report is needed that shows the total synthesis usage while also showing how each tool's usage varies over time, the stacked view would be useful. If a simple comparison of the usage of each tool is desired, the default unstacked view should be used. When using the stacked view, the total usage statistics are also shown at the bottom of the legend.

The report defaults to showing the top five objects that are reported by a group - in this example, reported by users. All other objects, if applicable, are combined into an "others" group.

The report uses a dynamically calculated averaging interval (referred to as the "binning" interval), based on the specified report period. For example, a 1-week report would result in a 4-hour interval, whereas a 1-month report period would result in a 1-day averaging interval.

The options box on the left side of the page provides controls to setup any desired filters, the report-by option, the smoothing basis, and plot customization parameters.

The report can be driven by usage data that has been smoothed according to the peak usage (default) or the average usage. If using the peak, the plot will visualize the usage considering the peak usage, and the statistics in the legend will contain both the peak and average of all peaks found across all of the binned intervals. If using the average usage, the plot will visualize the average usage over time, and the legend statistics will include the peak and average of all averages found across all of the binned intervals. Note that when using the average usage, peaks will be obscured based on the averaging interval. For example, a peak of 30 minutes will not show up in a 1-week report because that usage will be factored into the average.

### Custom Groups

If custom groups have been configured in Monitor, they will be available in the filter and pie chart report by sections of the options box. This is not only where "filter by" options are specified, but also where the specific custom group is selected for Reservation Overdraft Analysis.

### Reservation Overdraft Analysis

Reservation Overdraft Analysis is a way of visualizing how FlexNet Publisher license reservation pools are utilized, and how much excess member usage is hitting the general pool. Paired with the "include reservations" capability, this is an effective tool for identifying waste and tuning how tokens are used. In order for this plot to function correctly, some preparation is required:

- You must be utilizing the license reservation mechanism in FlexNet Publisher options file, otherwise Overdraft Analysis is irrelevant.
- Reservation tracking must be enabled in the FLEXlm monitor page of the tag for which Overdraft Analysis will be done ( or if you are using a manual configuration, it will require the -trackreservations option).
- The specific license options file for the tag must be manually parsed at the command line to create a custom group and group types that correspond to your reservation pools. This custom group type will then show up as a checkbox in the left margin in the options box. The user must generate Custom Group Types/Custom Groups using the desired FlexNet Publisher options file as input. This is the options file that should contain reservations you are interested in analyzing. The groups are generated at a vovproject-enabled shell with the following command:

  ```
  ftlm_accounts loadfromoptions /path/to/options/file   GROUP_TYPE   all
  ```

  For example:

  ```
  ftlm_accounts loadfromoptions /path/to/options/smpsd.opt Synopsys_Reservations
   all
  ```

- When the Detailed Plots report is refreshed, a new Synopsys_Reservations checkbox will be available. A new "overdraft analysis" plot will also show up, which can be disabled with a checkbox.
- Overdraft analysis may be enabled by selecting the checkbox on the left margin in the options area (below "include reservations").

# Feature Heatmap

Monitor provides a unique report type for visualizing license activity, which is called a *heatmap*. A heatmap shows the time period specified, represented as a 24x7 clock view.

For each hour in the view, a color-coded box exists that represents the amount of activity for the license feature relative to no activity (dark blue) and highest activity detected (bright red). The heatmap report page contains four heatmaps: one for peak concurrent usage, one for checkouts, one for checkins, and one for denials.

The yellow and green shows busy times of day, and blue and purple show less busy times. In this example, the system is busy between 9 a.m. and 5 p.m. (working hours). If you can run your job in off hours or schedule it to run then, then choose the times that show blue and green. That said, you can't always run jobs in off hours. If so, send a note to your admin, who may adjust the system, so you can run your job.

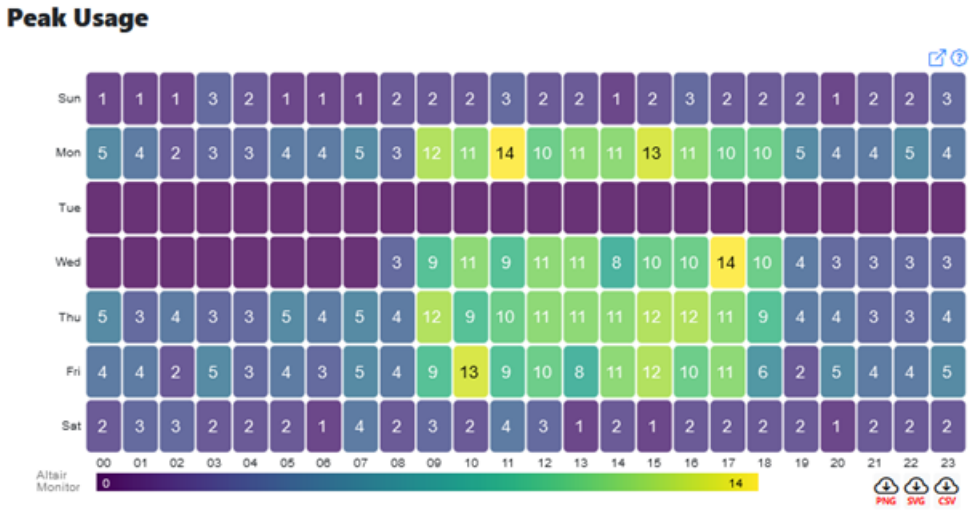



*Figure 32: Heat Maps*

In the example above, Monday through Friday appear to be slightly more active between 9am and 6pm. Most nights have very light activity between 11pm and midnight.

To summarize the heatmap report, it visualizes congestion times so that plans can be made to equalize activity throughout the work day and reduce congestion bottlenecks.

# Checkout Statistics and Details

The **Checkout Statistics** page is a powerful data mining tool that can be used to find pin-pointed answers about license utilization.

By combining the use of filters and the report by option for the report, you can find information on utilization such as:

- The utilization of a feature per project

- The activity of user `Bob` in the GPS project
- The activity of user `Sue` overall
- The number of checkouts that went to jobs on the fastest compute farm machine

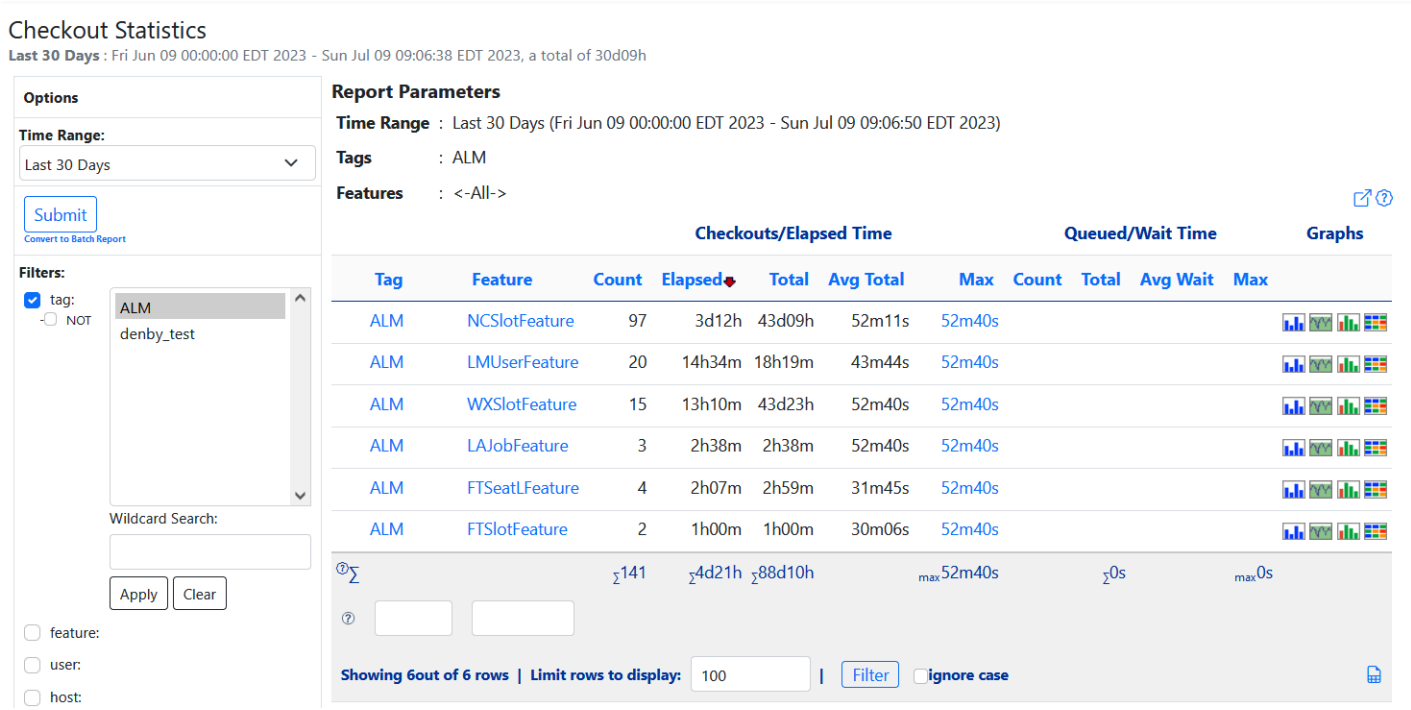



*Figure 33: Current Checkout Statistics Report*

The report shows checkout and elapsed time statistics and queued/wait time statistics, and provides links to the graphs. The Checkout Statistics Report includes the following columns:

- **Tag:** The tag representing the license server.
- **Feature**: The license feature name.
- **Count**: The number of checkouts.
- **Checkouts/Elapsed**: The amount of elapsed time since the feature was checked out.
- **Checkouts/Total**: The elapsed time normalized for the number of tokens checked out. This provides a cumulative value for multi-token features.
- **Checkouts/Avg Total**: The elapsed time divided by the number of checkouts.
- **Checkouts/Max**: The maximum number of checkouts.
- **Queued Count:** The elapsed time normalized for the number of queues. The number of times the feature was requested.
- **Queued Total:** The elapsed time divided by the number of queues.
- **Queued Avg Wait**: The average elapsed time before a queue becomes a checkout.
- **Queued Wait Max**: The max elapsed time before a queue becomes a checkout

The report shows checkout and elapsed time statistics, queued/wait time statistics, and provides links to the plot and heatmap pages for visualization of the report. The Details link, location above the report, is used to switch to a detailed report of the actual checkouts used to calculate the statistics.

The Elapsed column indicates the amount of elapsed wall clock time since the feature was checked out. The Total is the Elapsed time figure normalized for the number of tokens checked out. This provides a cumulative value for multi-token features. The Avg column indicates the Elapsed time divided by the number of checkouts.

Reservations that are performed in the license manager configuration are detected and represented as checkouts by a user beginning with "r:". The remainder of the user name matches the target of the reservation, whether it be a user or a group of users. To include the checkouts for reservation users in the report, simply select the option to include reservations.

## Checkout Details

Switching to the detailed view reports on the actual checkouts that make up the statistics shown in the statistics view. This view shows most of the information that is normally found in a license manager status command. It can be used to narrow down the results using the same filter methodology utilized in the statistics view.

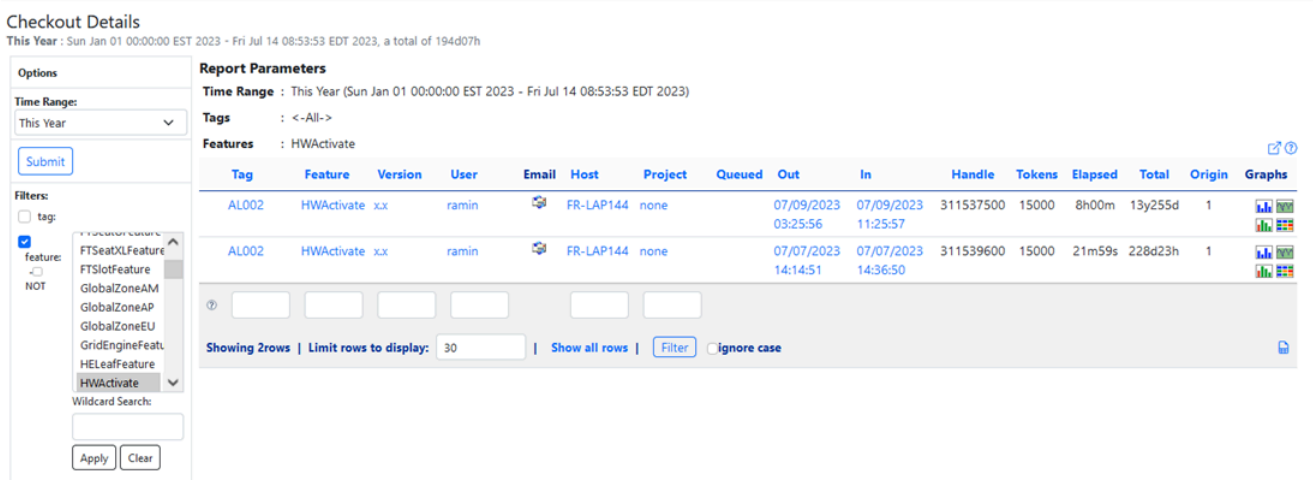



*Figure 34: Checkout Details Report*

The Checkout Details Report includes the following columns:

- **Tag:** The tag representing the license server.
- **Feature**: The license feature name.
- **Version**: The version of the license for the checkout feature.
- **User**: The user holding the checkout.
- **LDAP**: If clicked and configured, the folder icon will show user pre-configured attributes from LDAP such as their phone number, department or location.
- **Email**: The mailto link to all users of the feature using the client machine's configured e-mail client.
- **Host**: The host on which the job is running.
- **Project:** The project assignment for the current checkout.
- **Queued:** The elapsed time before the queue request becomes a checkout.
- **OUT:** The time the checkout occurred.
- **IN:** The time the checkout ended.
- **Handle:** The license manager’s handle for the checkout.

- **Tokens:** The actual number of licenses.
- **Elapsed**: The age of the checkout.
- **Total**: The elapsed time normalized for the number of tokens checked out. This provides a cumulative value for multi-token checkout.
- **Origin**: Usage data source from lmstat-driven sampling (1) or from parsing debug log (2).
- **Graphs**: Icons for generating plots and heatmaps.

The **Checkout Details** page will also display columns for any custom group types that have been configured. The group that is shown is the group to which the user for that row was a member of at the time the checkout was created.

The Elapsed column indicates the amount of elapsed wall clock time since the feature was checked out. The Total is the Elapsed time figure normalized for the number of tokens checked out. This provides a cumulative value for multi-token features.

> **Note:** You can generate additional columns by going to the **Admin** page and selecting **Groups**, and then choosing from the options: Projects, Custom Groups Types and Custom Groups.

## Checkout Duration Histogram

The **Checkout Duration Histogram** page shows the distribution of checkouts based on their durations.

The various durations are calculated and divided into equal-length buckets, which are represented as vertical bars. You may hover over to a specific vertical bar to view further explanation

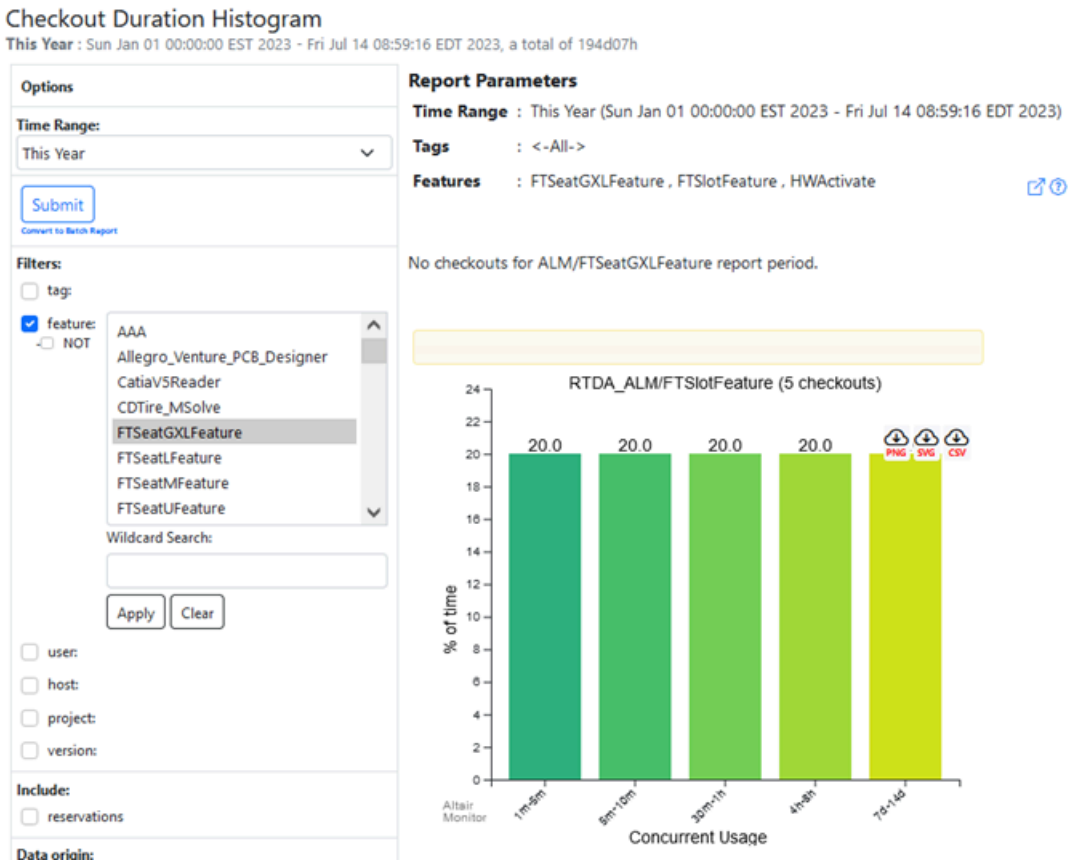



*Figure 35: Duration Histogram*

# Usage Comparison Plot

The Usage Comparison Plot page is a graphical accompaniment to the checkout statistics page, which allows for complex report-by and filter options.

This graph simplifies the complex reports generated by checkout statistics page.

*Figure 36: Usage Comparison Plot*

This graph accompanies the checkout statistics page, which has complex report-by and filter options. This plot compares the utilization average over time, broken down by the selected option. You can choose different teams, departments, tags, users or groups. It shows which is used the most and which is used the least, and this gives you an idea of how to distribute resources and when to distribute them.

This example plot specifically shows the overall usage of the two features – MATLAB and Calibre – MATLAB gets more use than Calibre, during the second quarter of the year.

As a general rule, the stacked view option can be used when a graphical view of the total usage is desired. For example, in an environment where there are two different synthesis tools available and a report is needed that shows the total synthesis usage while also showing how each tool's usage varies over time, the stacked view would be useful. If a simple comparison of the usage of each tool is desired, the default unstacked view should be used. When using the stacked view, the total usage statistics are also shown at the bottom of the legend.

The report defaults to showing the top five objects that are reported by a group - in this example, reported by users. All other objects, if applicable, are combined into an "others" group.

The report uses a dynamically calculated averaging interval (referred to as the "binning" interval), based on the specified report period. For example, a 1-week report would result in a 4-hour interval, whereas a 1-month report period would result in a 1-day averaging interval.

The options box on the left side of the page provides controls to setup any desired filters, the report-by option, the smoothing basis, and plot customization parameters.

The report can be driven by usage data that has been smoothed according to the peak usage (default) or the average usage. If using the peak, the plot will visualize the usage considering the peak usage, and the statistics in the legend will contain both the peak and average of all peaks found across all of the binned intervals. If using the average usage, the plot will visualize the average usage over time, and the legend statistics will include the peak and average of all averages found across all of the binned intervals. Note that when using the average usage, peaks will be obscured based on the averaging interval. For example, a peak of 30 minutes will not show up in a 1-week report because that usage will be factored into the average.

# Usage Trends

The Usage Trends page provides the ability to report on one or more features over a specified time frame while breaking the time frame into smaller segments, each with their own average and peak usage statistics.

For example, a report spanning a quarter can be broken down to also show the individual numbers of each month or each week. The report can also be pivoted, similar to the checkout statistics report, to show the usage per user, host, project, or custom group basis as well.

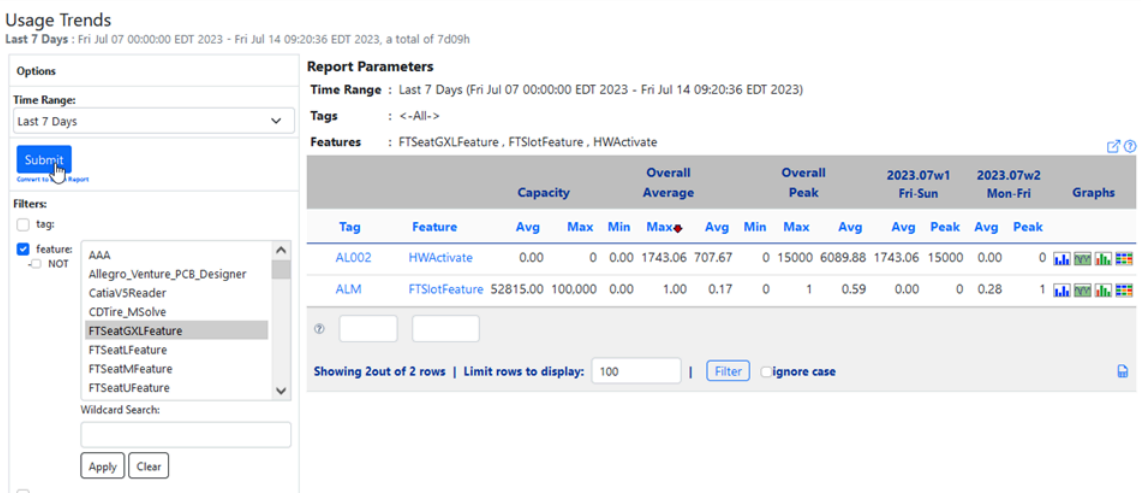



*Figure 37: Usage Trends Page*

In this example, the table shows weekly usage, but it can also be set to hourly, weekly, monthly, semi-monthly and quarterly time frames. The advantage of this table is that you can see specifics on usage. In this case, the average and capacity in alignment, so no changes are necessary.

The supported time break down intervals are:

- Quarterly
- Monthly

- Semi-monthly (first segment includes month days 1-15 and all remaining month days are placed into the second segment)
- Biweekly (if report interval is for a month, the first segment will begin on the first day of the month)
- Weekly (if report interval is for a month, the first segment will begin on the first day of the month)
- Daily
- Hourly

The Usage Trends Report includes the following columns:

| | |
|---|---|
| **Tag** | The tag representing the license server. |
| **Feature** | The license feature name. |
| **Capacity Avg** | The average capacity. |
| **Capacity Max** | The maximum capacity. |
| **Overall Average Min** | The overall minimum average feature usage. |
| **Overall Average Max** | The overall maximum average feature usage. |
| **Overall Average Avg** | The overall average feature usage. |
| **Overall Peak Min** | The peak minimum average feature usage. |
| **Overall Peak Max** | The peak maximum average feature usage. |
| **Overall Peak Avg** | The peak overall average feature usage. |

Options are also provided to hide certain types of statistics from the report as well as whether to include reservation checkouts.

# Denial Reports

Monitor tracks denials, as reported by the license manager. A denial is essentially a license request, which is denied.

The same filters and report by options are available in this page to help find the information desired, with the exception of project and version support. Project support is not available because the debug log contains historical data of its own; currently there is no historical mapping for projects in Monitor. Version support is not available because the debug log does not contain version information for denial events.

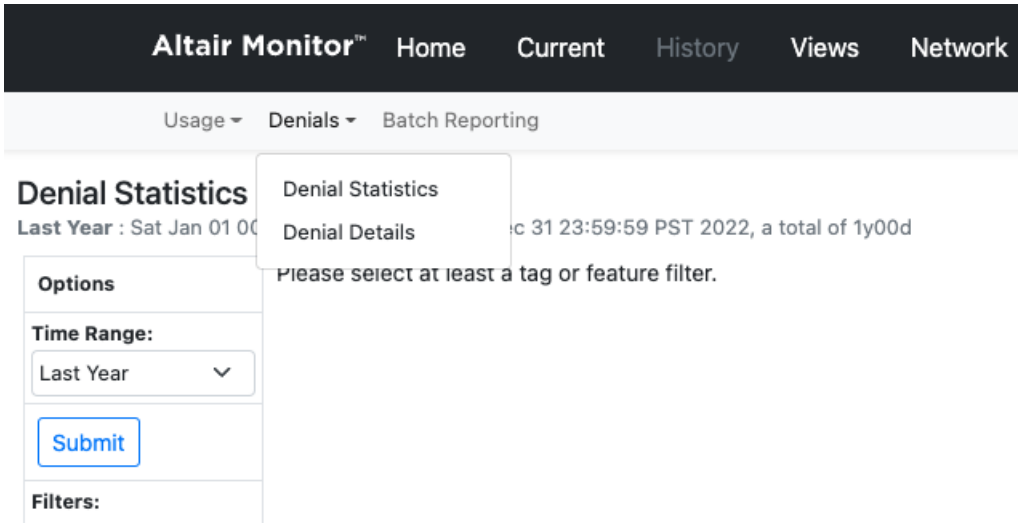



*Figure 38:*

## Denial Statistics

This provides a snapshot of denials. If it shows a high number of denial you may need to add more licenses; if there are no denials you may have too many.

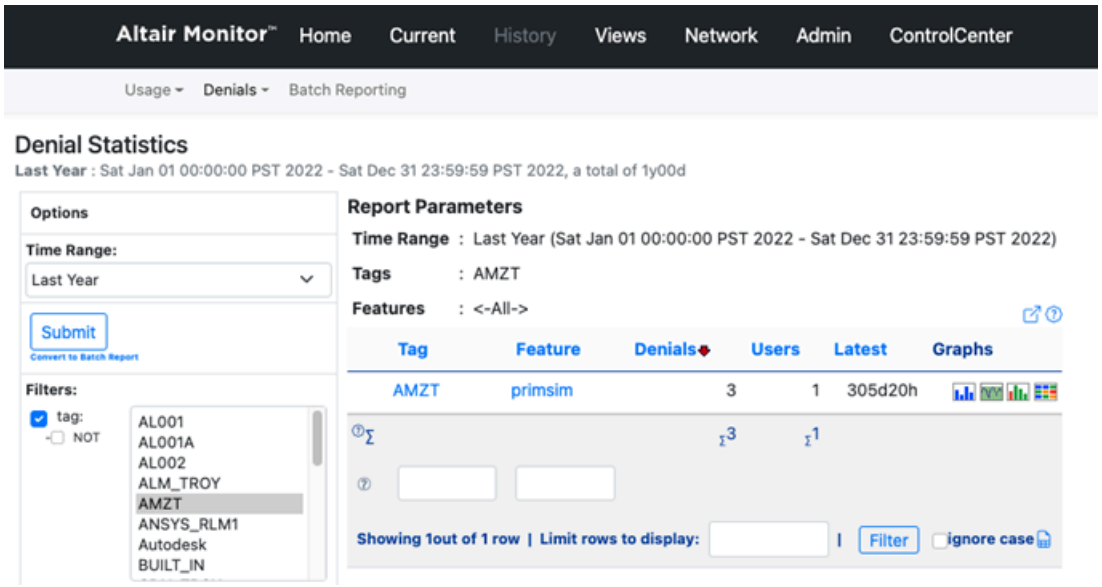



*Figure 39:*

The Denial Statistics page is identical to the Checkout Statistics page with the exception that it shows statistical information about denial events. The same filters and report-by options are available to help you find the desired information, with the exception of project and version support. Project support is not available because the debug log contains historical data of its own; currently there is no historical mapping for projects in Altair Monitor. Version support is not available because the debug log does not contain version information for denial events. The Denial Statistics report shows the number of denials detected and the number of unique users that experienced denials, the timing of the latest denial, and

provides links to the plot and heatmap pages for visualization of the report. The Denial Statistics Report includes the following columns:

The Denial Statistics Report includes the following columns:

| | |
|---|---|
| **Tag** | The tag representing the license server. |
| **Feature** | The license feature name. |
| **Denials** | The number of denials. |
| **Users** | The number of users. |
| **Latest** | The last recorded time of a denial. |
| **Graphs** | The links to the detailed plot page, the statistical plot page, the efficiency histogram page, and the activity heatmap report. |

## Detailed View

This table shows the reason for denials, which enables you gain insight about your license management utilization.

Reasons are taken exactly as they are found from the data source. If no reason is provided, the reason will be unknown. The reason can be used to filter the denial reports to determine the root cause of denials. For example, a denial that is caused by a lack of capacity will most likely hold a different weight than a denial that is caused by a self-imposed limit that is defined in the license manager options file.

In this example, the reason was “timeout from vendor queuing” that means the request took too long. You would need to evaluate that and determine your actions based on your unique license needs.

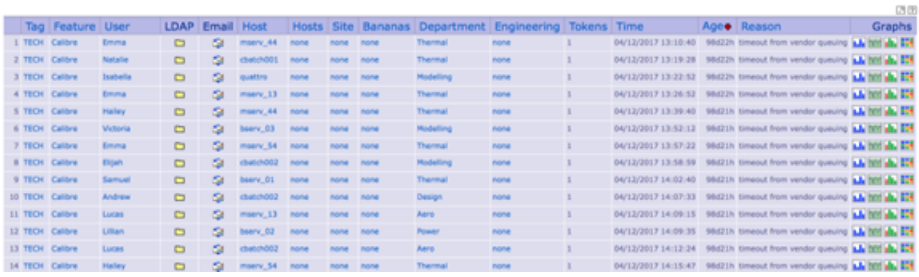



*Figure 40: Denial Details Report*

The Denial Details Report shows the actual denials that are the basis of the statistics shown in the statistics view. This report shows all the information that is normally found in a debug log denial record. The denial details report also displays columns for custom group types that have been configured. The group shown indicated the group that the user was a member of at the time of the denial.

The report can be sorted using the same filtering techniques available in the statistics view.

## About Denial Reasons

Monitor tracks the reasons for denials, as reported by the license manager, if applicable. Currently, only FlexNet Publisher provides denial reasons via the debug log. Reasons are taken exactly as they are found in from the data source. If no reason is provided, the reason will be "unknown".

The reason can be used to filter the denial reports to determine the root cause of denials. For example, a denial that is caused by a lack of capacity will most likely hold a different weight than a denial that is caused by a self-imposed limit that is defined in the license manager options file.

# Batch Reporting

Batch reporting is available through the `ftlm_batch_report` command. Batch reporting is useful when the report period is long or there is a desire to have more than one report shown on the web page.

Batch reports are persistent and static: the data they display is accurate as of the time they are built, and remain available until the report files are deleted from the disk.

You can create a batch report by either specifying a custom report or by specifying the types of tables, charts, and plots you wish to enable.

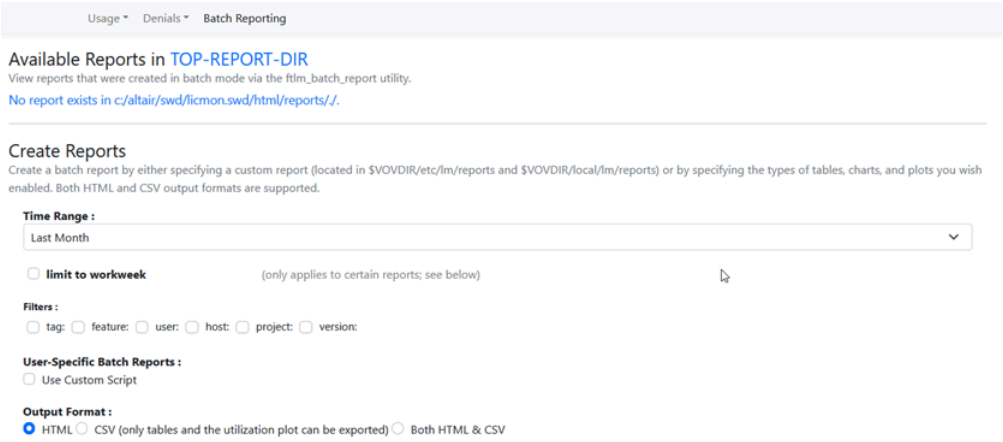



*Figure 41: Create a Batch Report - Admin View*

You may use batch reporting to configure a complex report with html format which includes the corresponding `ftlm_batch_report` commands, then incorporate such command (with proper modification) in a cron job (UNIX) to automate and schedule the report generation.

> **Note:** For `ftlm_batch_report` to be able to extract static images, the machine that runs the utility must have access to Node v14 or higher.

## Create Batch Reports (via the Browser)

> **Note:** Only system administrators can create a report.

1. To create a batch report, go to the **History Batch Reports** page. There are report options to choose from when creating a report.
2. Complete the required fields:

| Option | Description |
| --- | --- |
| **Time Interval** | Specify the time interval of the report. |
| **Filters** | Select types of filters you wish applied to the report. Current tag, feature, host, user, project, and version filters are available. User groups will also show up as filters. |
| **User-Specific Batch Reports** | If this option is selected, a list of known user-specific scripts will be listed, and various input form elements will be hidden since they are no longer applicable. The directories `$VOVDIR/etc/lm/reports` and `$VOVDIR/local/lm/reports` will be searched for user scripts. |
| **Output Format** | Choose between outputting report to HTML or to CSV. If CSV is selected, only tabular report components will be available. |
| **Report Components** | • Feature Statistics (only tag/feature filters apply)<br>• Efficiency Statistics (only tag/feature/project filters apply)<br>• Efficiency Histogram (only tag/feature filters apply)<br>• Sampling Plot (only tag/feature filters apply)<br>• Checkout Statistics (all filters apply)<br>• Checkout Pie Charts (count, duration) (all filters apply)<br>• Denial Statistics (all filters except project/version apply)<br>• Denial Pie Charts (all filters except project/version apply)<br>• Heatmaps (checkout, checkin, denial) (all features apply)<br>• Utilization Plot (all features apply)<br>• Denials Plot (all filters except project/version apply) |
| **Table Row Limit** | Specify the max number of table rows to display for statistics report components. |

| Option | Description |
|---|---|
| **Features Options** | Specify whether to breakdown results by feature. |
| **Data Source** | Specify whether data comes from lmstats samples, from debug logs, or from both. |
| **Report File Options** | Specify whether report output should be placed into a single file, or whether it should be split up by tags and placed in multiple files (per tag). |
| **Report File Name** | Specify name of report output file. |

3. Click **Create Reports**.
   This redirects the input criteria to the CLI utility `ftlm_batch_report` in the form of a job, and the page will be redirected to a page that will display information similar to what is shown below:

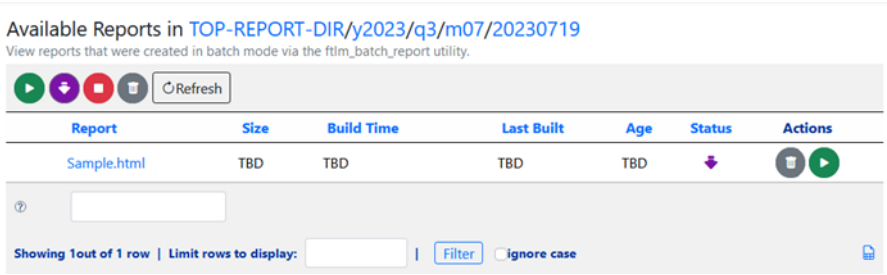



*Figure 42: Example of reports*

This table contains all report jobs for the given time interval directory path, along with the size, the age, and the current status of the each report. Clicking the report name brings up the report contents. Clicking the report status displays the detailed batch report job page. The actions column provides a means of invalidating, executing, and deleting the report. If a report is new, it will be invalid (an empty stub) and will need to be executed. Each report will output either an HTML file or a CSV file.

An available reports tree listing will be shown when the directory path does not contain actual report files. In this case, visual information similar to the following will be displayed:

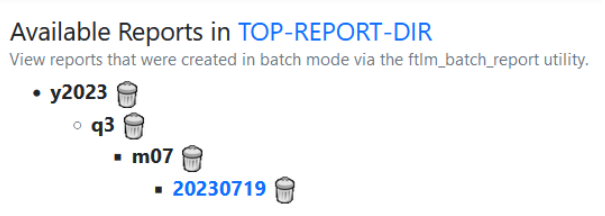



*Figure 43: Example of reports*

This shows that the directory `2023/` exist in the `licmon.swd/html/reports` directory, containing the `Q3/m07/` subdirectories. The time intervals (directories) with links indicate that there are actual reports for these time intervals. The trash icons allow the user to delete all reports contained at that level and in all subdirectories.

## Create Batch Reports (via Command Line)

### ftlm_batch_report

```
ftlm_batch_report: Usage Message

DESCRIPTION:
    ftlm_batch_report [OPTIONS]

NOTE: When generating a report for an option that does not require
      a value, it is recommended that a boolean value 1|0 is provided to
      explicitly enable or disable it to avoid confusion. For example, using
      "-utilPlotShowQueued 1" instead of "-utilPlotShowQueued" to enable
      the tokens queued plot, and using "-utilPlotShowQueued 0" to disable
      the tokens queued plot. No need to guess the default setup for this
      option which may change over time!

OPTIONS:
    -h                      -- Help (usage statement)
    -v                      -- Increase verbosity
    -inputFile <INFILE>     -- Specify all options in a file (use
                               $env(VOVDIR)/etc/config/lm/ftlm_batch_report.tmpl
                               as template), or specify individually as follows
    -tag <TAGS>             -- Specify a comma-separated list of tags
    -feature <FEATURES>     -- Specify a comma-separated list of features
    -user <USERS>           -- Specify a comma-separated list of users
    -host <HOSTS>           -- Specify a comma-separated list of hosts
    -account <ACCOUNTS>     -- Specify a comma-separated list of accounts
                               (projects)
    -version <VERSIONS>     -- Specify a comma-separated list of versions
    -accounting_* <FIELDS> -- Specify a comma-separated list of accounting
                               fields (custom groups)
    -negate_*               -- Negate corresponding filter spec (e.g. tag,
                               feature, user, host, etc, ...)
    -interval <INTERVAL>    -- Choose time interval of report (default: "last
                               quarter"). Symbolic values include "today" and
                              "yesterday", as well as "this" or "last" in
                               combination with one of "week", "month",
                               "quarter", or "year". Custom intervals are
                               acceptable in the following formats:
                                    20120101-20120331
                                    20110101T000000-20110131T235959
    -workweek               -- Apply workweek filtering to specified reports
    -limit <NUM>            -- Default limit for returned rows in all tables
                               (default: 100)
    -title <STRING>         -- Specify a report title string
    -outputFormat
      html|csv|raw          -- Specify whether to output HTML or CSV
```

```
                              (default: html)
    -origin <ORIGIN>        -- Choose data origin
                              ORIGIN : samples, logs (default: samples)
    -breakdownByFeature     -- Break down reporting by feature instead of by tag
    -showAllReports         -- Enable all types of reports
    -showSql 1|2|3          -- Show SQL debugging output:
                               1 shows query
                               2 shows results
                               3 shows explain
    -notUseDataView         -- Do not use materialized view for daily report

    -showFeatureStats                 -- Enable daily feature statistics table
    -showFeatureStatsPlot             -- Enable daily feature statistics plot
    -showEfficiencyStats              -- Enable efficiency statistics table
    -showEfficiencyHistogram          -- Enable concurrent utilization chart
    -showCheckoutStats                -- Enable checkout statistics table
    -showCheckoutDetails              -- Enable checkout details table
    -showCheckoutPieCharts            -- Enable checkout pie charts
    -showDenialPieCharts              -- Enable denial pie charts
    -showUtilizationPlot              -- Enable utilization plot
    -showDenialStats                  -- Enable denials statistics table
    -showDenialDetails                -- Enable denials details table
    -showDenialPlot                   -- Enable denials plot
    -showHeatmaps                     -- Enable heatmap(s)
    -showUsageComparisonPlot          -- Enable usage comparison plot
    -showCheckoutDurationHistogram    -- Enable checkout duration histogram
    -showUsageTrends                  -- Enable usage trends table
    -sort*By <FIELD>                  -- Sort corresponding table by
    -limit*  <NUM>                    -- Limit corresponding table rows
    -glitch  <TIMESPEC>               -- Specify glitch width to ignore
    -denPlotBinInterval               -- Override dynamic averaging window
    -utilPlotYmax                     -- Override dynamic y-axis max
    -utilPlotHeight                   -- Specify custom plot height
    -utilPlotWidth                    -- Specify custom plot width
    -utilPlotBinInterval              -- Override dynamic averaging window
    -utilPlotHideCapacity             -- Hide capacity area on plot
    -utilPlotHideDetail               -- Hide detail line on plot
    -utilPlotHideAverage              -- Hide average usage line on plot
    -utilPlotShowPeak                 -- Show peak usage line on plot
    -utilPlotShowCurrent              -- Show currently usage line on plot
    -utilPlotShowReservations         -- Show reservation line on plot
    -utilPlotShowFuture               -- Show future line on plot
    -utilPlotShowQueued               -- Show separate queued item plot
    -utilPlotHideQueuedCapacity       -- Hide capacity with queued on plot
    -utilPlotShowQueuedPeak           -- Show peak with queued on plot
    -utilPlotLegendLocation           -- Specify location of legend with
                                       respect to plot (s|e, default: s)
    -featureStatsPlotShowUsage        -- Show usage plot on daily feature stats
    -featureStatsPlotShowQueued       -- Show queued requests plot on daily
                                       feature stats
    -featureStatsPlotShowDenial       -- Show denials plot on daily feature
                                       stats
    -usageComparisonPlotStack         -- Stack items to show total summed usage
    -usageComparisonPlotStyle <STYLE> -- Specify plot style (default: line)
                                       Supported styles: line, linefill,
                                       step, stepfill
    -usageComparisonPlotType   <TYPE> -- The type of smoothing for the plot
                                       (default: max)
                                       Supported types: max, avg

    -usageTrendsBreakdown             -- Specify report breakdown interval
                                       (default: weekly)
                                       Supported breakdowns: hourly, daily,
```

```
                                        weekly, biweekly, monthly,
                                        quarterly
    -usageTrendsHideBreakdown         -- Hide statistics for breakdown segments
    -usageTrendsHideAvg               -- Hide average statistics
    -usageTrendsHidePeak              -- Hide peak statistics
    -usageTrendsShowReservations      -- Include reservation checkouts in
                                        statistics.

    -checkoutStatsShowRes             -- Include reservation checkouts in
                                        statistics.
    -checkoutStatsShowIdle            -- Include idle users in statistics.
    -checkoutStatsShowCost            -- Include cost data in statistics.

    -includeIdleFeatures              -- Include idle features in efficiency
                                        statistics.
    -includeIdleTime                  -- Include idle time in efficiency
                                        statistics

    -efficiencyHistogramMaxBars       -- Specify maximum number of bars to show
                                        on histogram

    -heatmapShowNumbers 1|0           -- Show heatmap numbers (default: 1)

    -heatmapType <TYPES>              -- Specify types of heatmaps
                                        (comma-separated list)
                                        TYPES : usage, checkouts, checkins,
                                        denials (default: usage)

    -checkoutPieChartType <TYPES>     -- Specify types of pie charts
                                        (comma-separated list)
                                        TYPE : count, duration
                                        (default: count,duration)
    -checkoutPieChartHeight           -- Specify custom piechart height
    -checkoutPieChartWidth            -- Specify custom piechart width
    -denialPieChartHeight             -- Specify custom piechart height
    -denialPieChartWidth              -- Specify custom piechart width

    -reportCheckoutStatsBy <VALUES>   -- Specify how to report checkout
                                        statistics by (comma-separated list)
                                        VALUES: tag, taggedfeature, taggeduser,
                                        feature, featureuser, user, userhost,
                                        host, account, version, accounting_*,
                                        user_accounting_*, host_accounting_*
                                        (default: user)

    -reportDenialStatsBy <VALUES>     -- Specify how to report denials
                                        statistics by (comma-separated list)
                                        VALUES: tag, taggedfeature, taggeduser,
                                        feature, featureuser, user, userhost,
                                        host, accounting_*, user_accounting_*,
                                        host_accounting_* (default: user)

    -reportCheckoutPieChartsBy        -- Specify how to report checkout pie
      <VALUES>                          charts by (comma-separated list)
                                        VALUES: tag, taggedfeature,
                                        taggeduser, feature, featureuser,
                                        user, userhost, host, account,
                                        version, accounting_*,
                                        user_accounting_*,
                                        host_accounting_* (default: user)

    -reportDenialPieChartsBy <VALUES> -- Specify how to report denial pie
                                        charts by (comma-separated list)
```

```
                                        VALUES: tag, taggedfeature, taggeduser,
                                        feature, featureuser, user, userhost,
                                        host, accounting_*, user_accounting_*,
                                        host_accounting_* (default: user)

    -reportUsageComparisonPlotBy      -- Specify how to report usage comparison
            <VALUES>                    plot by (comma-separated list)
                                        VALUES: tag, taggedfeature, taggeduser,
                                        feature, featureuser, user, userhost,
                                        host, account, version, accounting_*,
                                        user_accounting_*, host_accounting_*
                                        (default: user)

    -reportUsageTrendsBy <VALUES>     -- Specify how to report usage trends by
                                        (comma-separated list)
                                        VALUES: tag, taggedfeature, taggeduser,
                                        feature, featureuser, user, userhost,
                                        host, account, version, accounting_*,
                                        user_accounting_*, host_accounting_n*
                                        (default: user)

    -extractImages <INFILE>           -- Extract PNG images from the plot data
                                        contained in the specified batch report
                                        HTML file.  Image files are exported to
                                        the current working directory.

    -replaceImages <INFILE> [OUTFILE] -- Extract PNG images from the plot
                                        data contained in the specified batch
                                        report HTML file, replace the
                                        corresponding dynamic image elements
                                        in the file, and clean up the
                                        plot-rendering javascript code.
                                        This will reduce the size of the
                                        report file, but some dynamic
                                        features will be unavailable.
                                        Default output file will be based
                                        upon the name of the input file,
                                        with '-static' appended to the name
                                        (eg myreport-static.html), and will
                                        be generated in the current working
                                        directory. Image files are also
                                        exported to the current working
                                        directory and will be linked as such
                                        in the output file.

    -staticImages 1|0                 -- Instructs whether the batch report be
                                        generated as static images for plots.
                                        If set to 1, it is equivalent to first
                                        generating the report normally, then
                                        calling it again with the option
                                        "-replaceImages" to create a batch
                                        report output file that contains
                                        references to static images in one
                                        step. See -replaceImages above for more
                                        details on this functionality.
                                        Requires the -outputFile option.

    -outputFile <OUTFILE>             -- Specify output file.
                                        Default is to output to stdout.

    -script <PATH>                    -- Specify a legacy script to use
                                        The search path for the script includes
                                        the following directories:
```

```
                                        1) .
                                        2) $VOV_REPORT_DIR
                                        3) $VOVDIR/local/lm/reports
                                        4) $VOVDIR/etc/lm/reports

                                        The argument passed to the script is
                                        "tag=$tag&interval=$interval"
                                        which is to be interpreted as a query
                                        string.
                                        Look in $VOVDIR/etc/lm/reports for
                                        examples.

EXAMPLES:
    % ftlm_batch_report -h
    % ftlm_batch_report -inputFile my_lmreport_ctl.txt
    % ftlm_batch_report -script report_tag.tcl -tag ABC -interval "Sep 2024"
    % ftlm_batch_report -interval 20240101-20240131 -tag EDA
                          -feature MATLAB -showFeatureStats 1
    % ftlm_batch_report -interval Yesterday -tag EDA
                          -feature MATLAB -showUtilizationPlot 1
                          -staticImages 1 -outputFile dailyutilplot.html
```

## Create a Custom Report

The batch reporting capability in Monitor requires writing a Tcl script to describe the elements of the report and some work with the command line. The Tcl script generates HTML code that can be displayed in the browser, provided that the report is stored in a subdirectory of `licmon.swd/html/reports`. Example scripts are available in `$VOVDIR/training/lm`. The reporting script is processed by the `ftlm_batch_report` utility.

1. Make a local copy of the standard report script, which is provided as an example:

   ```
   % mkdir -p $VOVDIR/local/lm/reports
   % cp $VOVDIR/etc/lm/reports/report_tag.tcl $VOVDIR/local/lm/reports/.
   ```

2. Go to the directory where the report output is generated:

   ```
   % cd `vovserverdir -p html/reports`
   ```

3. Choose a tag and run the report for that tag.
   In this example, assume the tag name is "EDA":

   ```
   % ftlm_batch_report -script report_tag.tcl -tag EDA -interval 201006 >
    EDA_2010_06.html
   ```

   **Note:** Depending on the size of your database, the report may take several minutes.

If the report contains images, such as plots or pie charts, the generated HTML must refer to the image with an appropriate URL. The URL depends on whether or not the read-only port in the vovserver is enabled.

If the readonly port is open, the URL is complete and includes `http://HOST:READ_ONLY_PORT/gif/file.gif`. For example, `http://lmsrv:5556/gif/plot12345.gif`. The host is the value of

VOV_HOST_HTTP_NAME, if defined, or of VOV_HOST_NAME. These settings are defined in the `licmon.swd/setup.tcl` configuration file. The port number is the read-only port. The reason for using a complete URL is to allow the report to be embedded into external web pages.

If the readonly port is not open, then the URL is relative to the current vovserver, as in the following example: `/gif/plot12345.gif`

## Reports Examples

### Simple Report Example

File: `$VOVDIR/etc/lm/reports/report_simple.tcl`

```
#!/bin/csh -f
# Copyright (c) 1995-2023, Altair Engineering
# All Rights Reserved.

# $Id: $

#  -*- Tcl -*- \
  exec vovsh -f $0 $*:q

###
### Example of a batch report for Monitor.
### You are welcome to take this script and modify it.
###

VovDate::init

set interval "last month"
set interval "aug 2022"

set listOfFeatures "Virtuoso_Multi_mode_Simulation"
set listOfTags     "cadence cadence_gwan cadence_mmc cadence_wan"

# For my testing
set listOfFeatures "Compiler Complier lic_synth lic_drc"
set listOfTags     "EDA_1 DEMO"

set vovutils(verbose) 0

####################################
source $env(VOVDIR)/tcl/vtcl/vovlmreportlib.tcl
vtk_generic_get project projInfo
set topUrl   "http://$projInfo(host):$projInfo(port)"

VovDate::setInterval -interval $interval

VOVHTML_START

HTML {
    HEAD {
        TITLE "Report [clock format $VovDate::TIMERANGE(from)]"
        RAWOUT {
            <style>
            h2   { page-break-before: always }
            body { font-family:sans-serif    }
            .heatmapheader { background-color:white;font-family:sans-serif    }
```

```
            .heatmapcell   { font-family:sans-serif;font-size:80%             }
            .heatmaptitle  { font-family:sans-serif;background-color:\#BBBBFF }
            </style>
        }
    }
    BODY BGCOLOR="white" {
        TABLE BORDER=0 {
            TR { TD COLSPAN=2 { OUT "Report for tags $listOfTags" } }
            TR { TD COLSPAN=2 { OUT "Period of reporting: $interval" } }
            TR {
                TD { OUT "LicenseMonitor Project" }
                TD {
                    HREF "$topUrl/cgi/ftlm.cgi?page=reports" "$projInfo(project)@
$projInfo(host)" }
            }
            TR {
                TD { OUT "From" }
                TD { OUT "[clock format $VovDate::TIMERANGE(from)]" }
            }
            TR {
                TD { OUT "To" }
                TD { OUT "[clock format $VovDate::TIMERANGE(to)]" }
            }
            TR {
                TD COLSPAN=2 {
                    SMALL {
                        EM {
                            OUT "Generated with "
                            HREF "$topUrl/file?name=$argv0" [file tail $argv0]
                            OUT " on "
                            OUT [clock format [clock seconds] -format "%x %X"]
                        }
                    }
                }
            }
        }

        HR

        ########################
        ### FEATURE REPORTS ###
        ########################

        H2 { OUT "Features in this report:" }
        OL {
            foreach feature $listOfFeatures {
                LI { RAWOUT [subst {<a href="#$feature">$feature</a>}] }
            }
        }

        # Individual feature reports
        foreach feature $listOfFeatures {
            HR
            H2 {
                RAWOUT [subst {<a name="$feature">Feature report for '$feature'</a>}]
            }

            ### Pie charts
            TABLE {
                foreach tag $listOfTags {
                    TR {
                        # Usage pie chart
                        TD VALIGN="TOP" {
```

```
                            VovLM::TABLEpieChart -feature $feature -tag $tag \
                                -type count -title "Count $tag/$feature"
                        }
                        # Duration pie chart
                        TD VALIGN="TOP" {
                            VovLM::TABLEpieChart -feature $feature -tag $tag \
                                -type duration -title "Duration $tag/$feature"
                        }
                    }
                }
            }
            BR

            foreach tag $listOfTags {
                # Feature plot
                VovLM::TABLEplotFeature -tag $tag -feature $feature \
                    -width 500 -height 240 -title "Usage $tag/$feature"
                BR

                # Concurrent utilization plot
                if 0 {
                    VovLM::TABLEshowFeatureLevels -source 2 -tag $tag \
                        -feature $feature \
                        -title "Usage of feature $tag/$feature by level"; BR
                }
                # Denials
                set count [VovLM::countDenials -tag $tag -feature $feature ]
                if $count {
                    VovLM::TABLEplotDenials -tag $tag -feature $feature \
                        -width 500 -height 100 -title "Denials $tag/$feature"
                }

                if 0 {
                    # Checkins heatmap
                    VovLM::TABLEheatmap -tag $tag -feature $feature \
                        -type checkout -title "CheckOuts $tag/$feature"
                }
            }
        }
    }
}

VOVHTML_FINISH raw

exit 0
```

### Tag Report Example

File: `$VOVDIR/etc/lm/reports/report_tag.tcl`

```
#!/bin/csh -f
# Copyright (c) 1995-2023, Altair Engineering
# All Rights Reserved.

# $Id: $

#  -*- Tcl -*- \
  exec vovsh -f $0 $*:q

###
### Example of a batch report for LicenseMonitor.
### You are welcome to take this script and modify it.
```

```
###

VovDate::init
VovSQL::init
VovCGI::init
VovHtml::init
namespace import VovHtml::*

source $env(VOVDIR)/tcl/vtcl/vovlmreportlib.tcl

set usage {
    report_tag.tcl [OPTIONS]
    env QUERY_STRING=xxxxx report_tag.tcl

OPTIONS:
     tag        -- Tag to report on. Required.
     limit      -- Limit on number of rows in tables (default 60).
     max        -- Max number of plots (default all)
     interval   -- Interval of interest (default 'last month')
     rx         -- RegExp to filter features
     verbose    -- Verbosity level, for debugging.

EXAMPLES:
    % report_tag.tcl "tag=EDA&rx=lic"
    % env QUERY_STRING="tag=EDA&rx=lic" report_tag.tcl
}

set opt(interval)       "last month"
set opt(tag)            ""
set opt(rx)             ""
set opt(max)            0
set opt(verbose)        0
set opt(limit)          60

if { $argv == {} && ![info exists env(QUERY_STRING)] } {
    VovPrintUsage $usage
}

if { $argv != {} } {
    setenv QUERY_STRING $argv
}

setenv REQUEST_METHOD "GET"
VovCGI::parseQueryString

vtk_generic_get project projInfo
set topUrl   "http://$projInfo(host):$projInfo(port)"
set tag      $opt(tag)
set interval $opt(interval)
set featrx   $opt(rx)

VOVHTML_START

# set vovutils(verbose) 4
VovDate::setInterval -interval $interval

# Get tag ids
set tagIds [VovLM::processTagFilter TAGS $tag]

# Get feature ids
if { [info exists TAGS(allIds)] || $features != {} } {
    set DBHANDLE [VovSQL::open]
    VovSQL::getFeatureIdNameMap $DBHANDLE FEATURES -tagids $tagIds
```

```
    set featureIds $FEATURES(allIds)
}

# Get feature names
set listOfFeatures {}
foreach featureId $FEATURES(allIds) {
    lappend listOfFeatures $FEATURES(name,$featureId)
}

set VovLM::lmr_persistentGif 1

if { $featrx != "" } {
    set newList {}
    foreach f $listOfFeatures {
        if [regexp $featrx $f] {
            lappend newList $f
        }
    }
    set listOfFeatures $newList
}

# Handle limits
if { $opt(max) > 0 } {
    set listOfFeatures [lrange $listOfFeatures 0 $opt(max)]
}

set vovutils(verbose) $opt(verbose)

HTML {
    HEAD {
        TITLE "$tag License Usage Report [clock format $VovDate::TIMERANGE(from)]"
        RAWOUT {
            <link rel="StyleSheet" href="/html/wwwx.css" type="text/css">
            <style>
            h2   { page-break-before: always }
            body { font-family:sans-serif; background-color: white;   }
            .heatmapheader { background-color:white;font-family:sans-serif    }
            .heatmapcell   { font-family:sans-serif;font-size:80%             }
            .heatmaptitle  { font-family:sans-serif;background-color:#BBBBFF }
            .reportpage    { padding:4px;font-size:85%;background-
color:#AAAAFF;color:#000000;font-family:sans-serif }
            </style>
        }
    }
    BODY BGCOLOR="white" {
        set now [clock seconds]

        H1 {
            # A company_logo.gif file can be added
            # in locationlicmon.swd/gif/company_logo.png
            RAWOUT "<img src=/gif/company_logo.png>"
            # RAWOUT "<img src=/gif/company_logo.gif height=40>"
            RAWOUT " "
            OUT "Tag $tag in $interval"
        }

        TABLE BORDER=0 {
            TR {
                TD { OUT "LicenseMonitor Project" }
                TD {
                    set url   "$topUrl/cgi/ftlm.cgi?page=reports"
                    set label "$projInfo(project)@$projInfo(host)"
                    HREF $url $label
```

```
            }
        }
        TR {
            TD { OUT "From" }
            TD { OUT "[clock format $VovDate::TIMERANGE(from)]" }
        }
        TR {
            TD { OUT "To" }
            TD { OUT "[clock format $VovDate::TIMERANGE(to)]" }
        }
        TR {
            TD COLSPAN=2 {
                SMALL {
                    EM {
                        OUT "Generated with "
                        HREF "$topUrl/file?name=$argv0" [file tail $argv0]
                        OUT " on "
                        OUT [clock format [clock seconds] -format "%x %X"]
                    }
                }
            }
        }
    }

    HR

    ###############
    ### SUMMARY ###
    ###############

    H2 { OUT "Summary for all features" }

    VovLM::getCheckoutStats -reportby feature -tag $tag \
        -title "Report by Feature" -limit 30
    BR; BR
    VovLM::getCheckoutStats -reportby user    -tag $tag \
        -title "Report by User" -limit 20
    BR; BR
    VovLM::getCheckoutStats -reportby host    -tag $tag \
        -title "Report by Host" -limit 20
    BR; BR
    VovLM::getCheckoutStats -reportby account -tag $tag \
        -title "Report by Account" -limit 20
    BR; BR

    H2 { OUT "Feature Statistics: $tag in $interval" }
    VovLM::getFeatureStats -tag $tag \
        -showpeakavg 1 \
        -title "Feature Statistics For Tag $tag in $interval" -limit 30

    H2 { OUT "Efficiency Summary: $tag in $interval" }
    VovLM::getFeatureEfficiencyStats -tag $tag \
        -showidle 0 \
        -sortby use999pct \
        -title "Efficiency Summary For Tag $tag in $interval" -limit 30

    HR

    ########################
    ### FEATURE REPORTS ###
    ########################

    # Print feature list
```

```
        RAWOUT [subst {<a name="list"><h2>Index of Features</h2></a>}]

        TABLE WIDTH="90%" BORDER="0" CELLPADDING="3" {
            set i 0
            foreach { f1 f2 f3 } [lsort -dictionary $listOfFeatures] {
                TR {
                    TD { if {$f1!=""} {OUT [incr i]; OUT ". "; RAWOUT [subst {<a
href="#$f1">$f1</a>}] } }
                    TD { if {$f2!=""} {OUT [incr i]; OUT ". "; RAWOUT [subst {<a
href="#$f2">$f2</a>}] } }
                    TD { if {$f3!=""} {OUT [incr i]; OUT ". "; RAWOUT [subst {<a
href="#$f3">$f3</a>}] } }
                }
            }
        }

        # Individual feature reports
        foreach feature $listOfFeatures {
            HR
            H2 {}
            P class=reportpage {
                # RAWOUT "<img side=left src=/gif/gf_logo.gif height=20>  "
                BIG { RAWOUT [subst {<a name="$feature"></a>Feature '$tag/$feature'}]
 }
                OUT " \[ ";
                RAWOUT [subst {<a href="#list">back to list of features</a>}] ;
                OUT " \] "
            }

            ### Pie charts
            TABLE {
                TR {
                    # Usage pie chart
                    TD VALIGN="TOP" {
                        VovLM::getPieChart -feature $feature -tag $tag -type count \
                            -title "Count"
                    }
                    # Duration pie chart
                    TD VALIGN="TOP" {
                        VovLM::getPieChart -feature $feature -tag $tag -type duration
\
                            -title "Duration"
                    }
                }
            }
            BR

            # Feature plot from database.
            VovLM::getFeatureDetailedPlot -tag $tag -feature $feature \
                -showdet 1 -showcap 1 -showavg 1 -showcur 0 \
                -glitch 60 \
                -width 500 -height 250 -title "Usage of $feature"
            BR

            # Plot from resources logs.
            if { 0 } {
                VovLM::getFeatureSamplingPlot -tag $tag -feature $feature \
                    -showdet 1 -showcap 1 -showavg 1 -showcur 0 \
                    -width 500 -height 300 -title "Usage $feature (from samples)"
                BR
            }

            BR
```

```
            VovLM::getCheckoutStats -reportby user   \
                -title "Report by User for $feature" -limit 20 \
                -tag $tag -feature $feature

            BR
            VovLM::getCheckoutStats -reportby account   \
                -title "Report by Account for $feature" -limit 20 \
                -tag $tag -feature $feature

            # Concurrent utilization plot
            VovLM::getFeatureLevels -tag $tag -feature $feature \
                -output html \
                -origin "merged" \
                -maxrows 15 \
                -title "Usage of feature $feature by level"

            # Denials
            set count [VovLM::countDenials -tag $tag -feature $feature ]
            if $count {
                VovLM::getDenialPlot -tag $tag -feature $feature \
                    -width 500 -height 100 -title "Denials $feature"
            }

            # Checkins heatmap
            # VovLM::TABLEheatmap -tag $tag -feature $feature -type checkin  -title
 "CheckIns"
            VovLM::getHeatmap  -tag $tag -feature $feature \
                -origin      samples \
                -output      html \
                -shownumbers 0 \
                -type checkout -title "CheckOuts"
        }
    }
}

VOVHTML_FINISH raw

exit 0
```

# Project Tracking

### LM_PROJECT and UNIX Group Tracking

Monitor provides project-based tracking of license utilization, provided that the user instructs the server to assign incoming checkouts to the appropriate project setting for a specified time.

## Specify the Current Project

A utility is provided, `ftlm_lmproject`, which captures the value of the LM_PROJECT environment variable, if present, and instructs the Monitor server incoming checkouts should be assigned to the project matching the variable setting. To execute the utility, complete the instructions below.

1. Setup the environment to work with the Monitor utilities.
   a) For UNIX-based platforms, this involves sourcing the appropriate `vovrc` script for the user's shell. The `vovrc` scripts are located in the installation tree, in the `common/etc` directory. For Windows, this involves running the `vovinit.bat` script found in the `win64/bat` directory of the installation tree.
2. Set the environment variable VOV_LICMON to point to Monitor:

   Non-SSL:

   ```
   % setenv VOV_LICMON lmsrv:5555
   ```

   Or, SSL:

   ```
   % setenv VOV_LICMON lmsrv:5555:ssl
   ```
3. Any time the variable is set or changed, the `ftlm_lmproject` utility should be called afterward:

   ```
   % setenv LM_PROJECT big_usb_chip
   % $VOVDIR/scripts/ftlm_lmproject
   ```

Many LM_PROJECT variables are assigned via project wrapper scripts. The utility can be called from wrapper scripts to make the action transparent to the user, if desired.

The default parameters for incoming checkout/project assignments: for the host on which the utility is executed, and for four hours from the utility execution time. These parameters can be adjusted by using the available utility arguments.

As shown in the `ftlm_lmproject` command above, to use the current UNIX group as opposed to the value of the LM_PROJECT environment variable, the -unixgroup argument can be passed to the utility to instruct the server to use this for the project assignment.

> **Note:** This utilizes the current UNIX group for the user/shell as opposed to the user's default UNIX group.

The Monitor administrator can also configure static project definitions for users if project assignments do not often change.

# ftlm_lmproject

A utility to capture the value of LM_PROJECT on the current host, for the current user.

```
DESCRIPTION:
    ftlm_lmproject - A utility to capture the value of LM_PROJECT
    on the current host, for the current user.

    Every checkout by the current user on the current host
    will be assigned to the given LM_PROJECT until
    the time has expired.

    Expiration default is 4 hours but can be overridden
    via the VOV_LMPROJECT_EXPIRE environment variable.

    This utility connects to the Monitor
    project specified by the VOV_LICMON environment
    variable.  VOV_LICMON is a comma-separated list
    of hosts, with each host in one of the following forms:

    Non-SSL: <host>:<port>      (Example: lmsrv:5555)
    SSL:     <host>:<port>:ssl  (Example: lmsrv:5555:ssl)

    This utility is also called automatically
    by 'vw' in the context of Accelerator.

TECHNICAL NOTE:
    This is a stand-alone script that can be executed
    by any Tcl interpreter, like tclsh.  A full installation
    of VOV is not required to run this script.


OPTIONS:
    -expire  <TIMESPEC>       -- Default 4h00m
    -var     <VARLIST>        -- Which env. variable to use. VARLIST is a
                                 space separated list of variable names.
      Default: 'LM_PROJECT RLM_PROJECT VOV_JOBPROJ'

    -host    <HOSTLIST>       -- Default 'tr-lap923.prog.altair.com tr-lap923'.
                                 Empty means 'any host'.
    -host+   <HOSTLIST>       -- Append specified hosts to default list
                                 (tr-lap923.prog.altair.com tr-lap923)
    -user    <USER>           -- Default 'o'. Empty means 'any user'.
    -project <PROJECT>        -- Default is value of LM_PROJECT.
    -jobid <JOBID>            -- Take value of PROJECT from the specified job.
                                 Used by vw for automatic link NC->LM
    -unixgroup                -- Use the current Unix group name as project.
    -v                        -- Increase verbosity (may be repeated).
    -h                        -- This help

EXAMPLES:
    % ftlm_lmproject
    % ftlm_lmproject -unixgroup
    % ftlm_lmproject -var RLM_PROJECT -expire 12h
    % ftlm_lmproject -v -v
    % ftlm_lmproject -user john -host pluto -project ChipA -expire 3m
    % ftlm_lmproject -user "" -host pluto -project ChipA -expire never

SEE ALSO:
    ftlm_accounts showlive
    ftlm_accounts setlive  <userList> <project>
```

```
ftlm_accounts setliveall
```

# Network Tab

Displays information on hosts and file systems on which agents are running.

The Network tab shows information on hosts and file systems on which agents are running. Agents are programs configured to monitor remote machines.

There are four options available from Network tab.

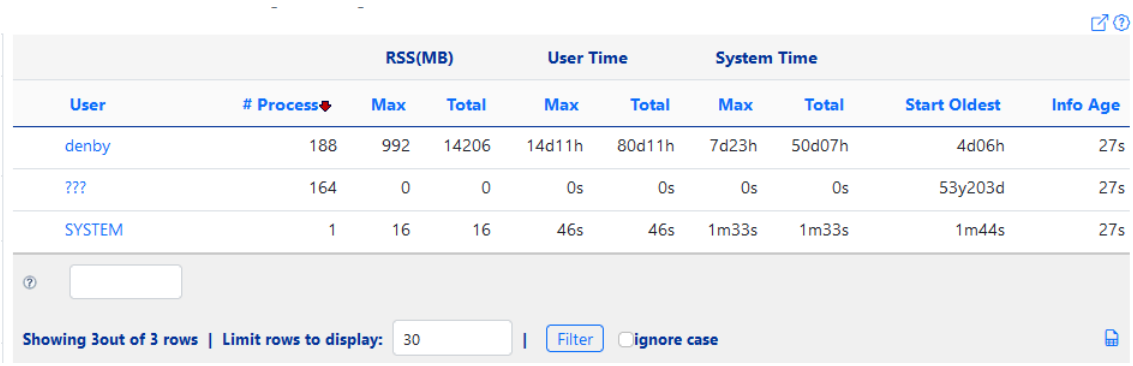
# Process Monitoring

Monitor can be configured to monitor processes on remote machines, provided that an agent program is installed and running on the hosts to be monitored.

Once this has been configured, processes can be viewed and managed on the remote hosts. The Processes option shows a summary of processes that are reported for all machines which have monitor agents running. There are two viewing options: Summary and Details

## Summary

The Summary viewing option shows a summary of processes that are reported for all machines that have monitor agents running.



| | | RSS(MB) | | User Time | | System Time | | | |
|---|---|---|---|---|---|---|---|---|---|
| User | # Process | Max | Total | Max | Total | Max | Total | Start Oldest | Info Age |
| denby | 188 | 992 | 14206 | 14d11h | 80d11h | 7d23h | 50d07h | 4d06h | 27s |
| ??? | 164 | 0 | 0 | 0s | 0s | 0s | 0s | 53y203d | 27s |
| SYSTEM | 1 | 16 | 16 | 46s | 46s | 1m33s | 1m33s | 1m44s | 27s |

Showing 3out of 3 rows | Limit rows to display: 30 | Filter ignore case

*Figure 44:*

| | |
|---|---|
| **User** | The user currently logged in and using the machine. |
| **# Process** | The number of processes running by the user. |
| **RSS (MB) Max** | The maximum amount of non-swapped physical memory the process used in MB. |
| **RSS (MB) Total** | The total amount of non-swapped physical memory the process used in MB. |
| **User Time Max** | The maximum time spent by processes running as that user. |

| | |
|---|---|
| **User Time Total** | The total time by processes running as that user. |
| **System Time Max** | The maximum time spent by the OS on behalf of a user. |
| **System Time Total** | The total time spent by the OS on behalf of a user. |
| **Start Oldest** | How long ago the oldest process was started. |
| **Info Age** | The age of the information viewed (last updated). |

### Details

The Details viewing option shows a snapshot captured at approximately the same time on all monitored hosts. To refresh the data, use the **Update** button at the bottom right of the page. In most cases, the update will be finished in less than 20 seconds, but if hosts are extremely busy, it may take longer. The jobs that gather the process information are automatically killed if they run for longer than 20 seconds. Clicking on a single process ID filters the process list down to the specific process chosen, and displays all its children and its parent process, if applicable.

## Host Monitoring

The **Hosts List** page shows information about each host on which an agent is running:

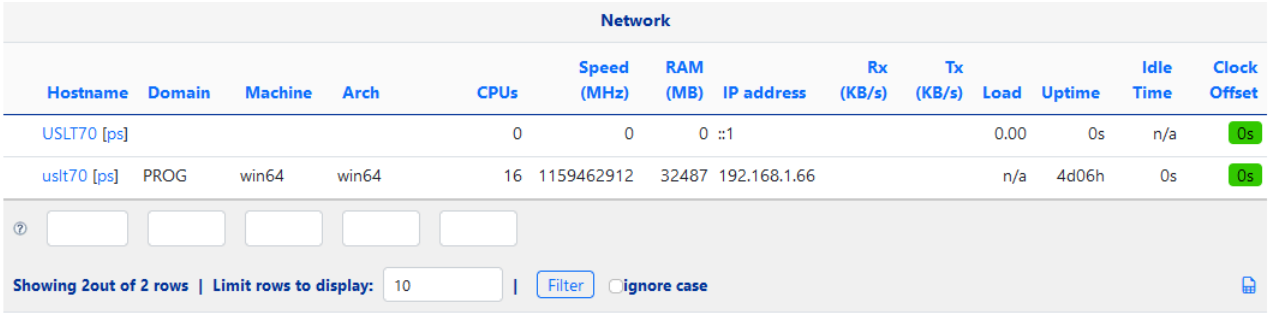



*Figure 45: Host List Page: Network Information*

The following columns are shown on the Host List table:

| | |
|---|---|
| **Hostname** | The host file name. |
| **Domain** | The domain name. |
| **Machine** | The type of the machine. |
| **Arch** | This is the architecture, the machine's platform. |
| **CPUs** | The number of CPUs running on your machine. |
| **Speed (MHz)** | Processing speed. |

| | |
|---|---|
| **RAM (MB)** | Read access memory. |
| **IP address** | The IP Address of your machine. |
| **Rx (KB/s)** | Received from the server being monitored in Kilobytes per second. |
| **Tx (KB/s)** | Transmitted from this server being monitored in Kilobytes per second. |
| **Load** | The Machine Load. |
| **Uptime** | The time that your machine has been up and running. |
| **Idle Time** | The time the machine is running operations and applications. |
| **Clock Offset** | This shows if your machine and your system clock are in sync. |

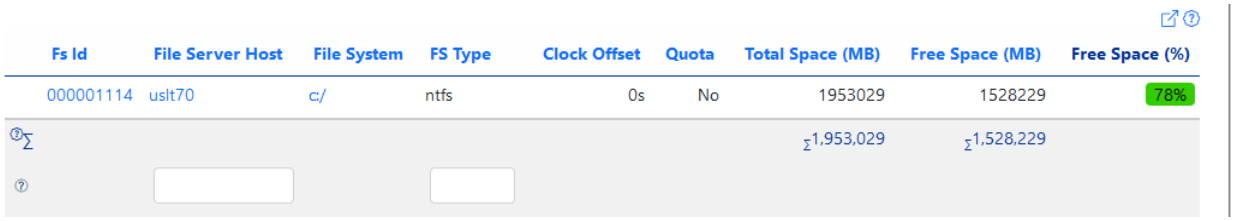
You can update the table by clicking **Update** in the bottom right corner of the page. As with the process list, it may take several seconds for new statistics to be transmitted and processed by the Monitor server.

**Note:** Network Rx/Tx information is only available on Linux hosts that are being monitored.

# File System Monitoring

Similar to the **Hosts List** page, the **File System** page shows information about the various file systems that are present across all of the hosts that are being monitored.

This can be useful in identifying file systems that are low on available disk space. This page color-codes file systems, which provides easy to use file system identifiers that requires little disk space.



| Fs Id | File Server Host | File System | FS Type | Clock Offset | Quota | Total Space (MB) | Free Space (MB) | Free Space (%) |
|---|---|---|---|---|---|---|---|---|
| 000001114 | uslt70 | c:/ | ntfs | 0s | No | 1953029 | 1528229 | 78% |
| | | | | | | Σ1,953,029 | Σ1,528,229 | |

*Figure 46: File Systems Page: Host Information*

The following columns are available on this table:

| | |
|---|---|
| **Fs Id** | The file server ID. |
| **File Server Host** | The file server host name. |
| **File System** | The type of file system. |
| **FS Type** | The file server type. |

| | |
|---|---|
| **Clock Offset** | The difference between your machine's clock time and the file server's clock time. |
| **Quota** | The disk quota is a limit set by a system administrator that restricts certain aspects of file system usage on modern operating systems. The function of using disk quotas is to allocate limited disk space in a reasonable way. If it shows "no," then no quotas are set on your machine. |
| **Total Space (MB)** | Total available space on the file system. |
| **Free Space (MB)** | Total space available left for use. |
| **Free Space (%)** | Percent of available space on the file system. |

# Machine Load Monitoring

The **Machine Load** page provides historical reporting capability for viewing the utilization of the machines being monitored over a specified time period.

The plots shown on this page display the CPU capacity (number of processors or cores) and the 1, 5, and 15-minute load averages for the machine.

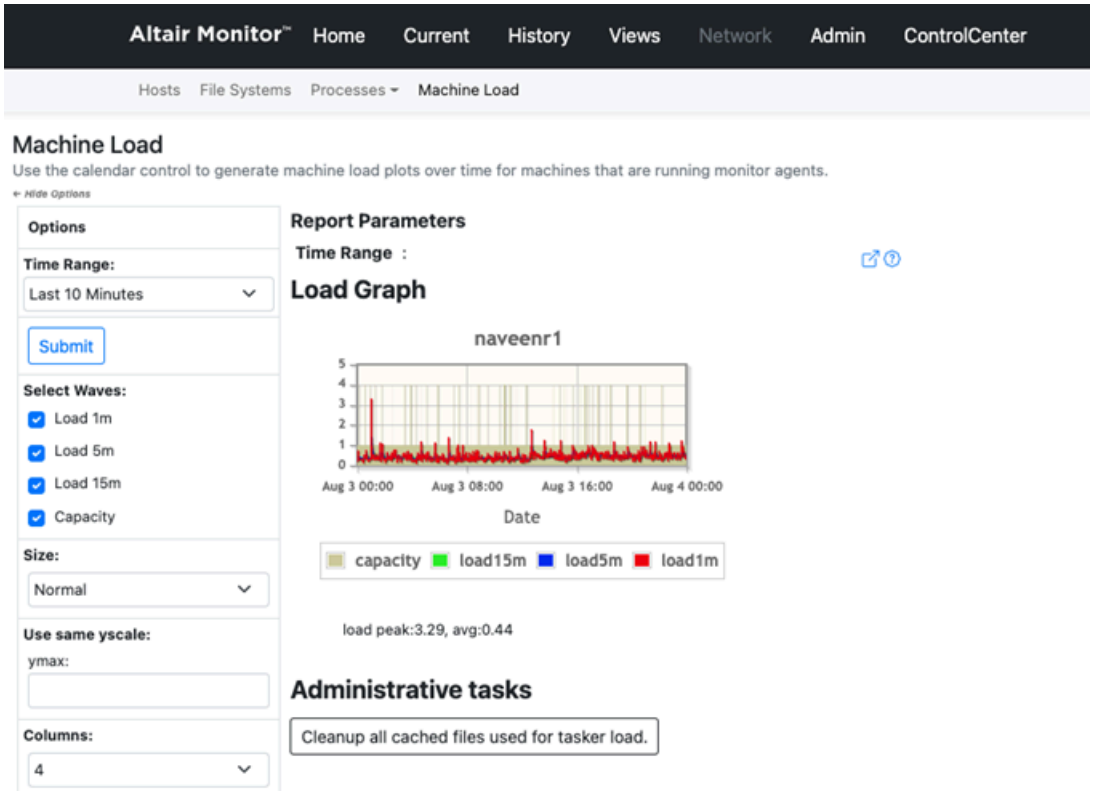



*Figure 47:*

To adjust machine load plots, you adjust the following parameters:

| | |
|---|---|
| **Time Range** | The machine selected time period. |
| **Select Waves** | These are flow waves for 1, 5, 15 minutes or capacity for that machine load. |
| **Size** | The size of the graph – the options are huge, large, normal and small. |
| **Ymax** | The maximum value along the y access, which is the maximum machine load displayed. |
| **Columns** | The number of columns to displayed. |
| **Sort By** | You can sort by Host, Peak Load, Average Load, Capacity or Jobs |
| **Aggregations** | NA - This not currently a working option. |
| **Host List** | The current host, the database host, or the aggregation grouped the data together (aggregated is not currently a working option). |

The calendar-based report period selector on the left hand side of the page can be used to specify how far back in history to look at for the load metrics.

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