

UNISOL® JobAcct™

1. UNISOL® JobAcct™ Overview

UNISOL® JobAcct™ is a job accounting and chargeback software package for UNIX and Windows NT systems and Oracle databases, and it was the first true project level chargeback product, first introduced in 1988.

UNISOL® JobAcct™ performs “actual cost” accounting and chargeback for each user, group, project and cost center, or, “proportional” chargeback on a project/department level. Accounting can be restricted to specific commands or can include all commands, with individual charges broken down into:

- connect time
- disk usage
- cpu usage
- miscellaneous charges
- memory usage
- disk I/O operations (not on NT)
- pages printed
- database usage

Reports are produced with charges itemized for each user, group, project chargeback number and cost center, and can include addresses for direct mailing to users and their organizations. Reports can be easily added or modified with awk or other report writing programs. ASCII reports (flat files) can also be generated and easily reformatted for use with databases or other financial programs.

Features of UNISOL JobAcct include:

- Allocation of charges to many project chargeback numbers by using user-level commands to change project chargeback numbers within a terminal session. System-wide or personal aliases can be used to refer to chargeback numbers.
- Charging different rates for prime-time, non-prime-time and reduced-charge hours, for each chargeback number.
- Variable accounting periods (in one-day intervals) for each project, user or group.
- Flexible distribution of disk charges among many chargeback numbers. Disk usage accounting includes minimum and maximum charges as well as standard disk usage averaging.
- ISP Accounting. Allow for free set amounts of resources for a minimum charge per month while charging for extra resources. Accomodate ISP-type accounting by providing a set of discounted resources for a minimum

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monthly fee while charging different rates beyond the minimum resource usage.

- University Accounting. Keep track of budgets by individual users and disable login or produce a warning when budget is exceeded.
- Users may individually (pre)view their accounting charges (up to the last available accounting summary) for each billing period.
- Reports may be easily combined/produced for all/many systems on the network from a single host.
- Generation of reports indicating logins of users and teletypes, and commands executed by each user (both detailed and summary reports).
- Summary reporting for a top-down view of the overall system or chargeback level accounting charges, including percentage information (of both resource usage and revenue sources) for each chargeable field, and generate pie-charts and bar-charts of system usage at the chargeback number level.
- Direct account billing and project-level budget tracking and reporting.
- A user-friendly Motif graphical user interface (Open Look for Sun systems) simplifies the configuration of JobAcct control tables and the generation of standard and/or ad-hoc reports.
- Wildcards can be used when configuring user project files, thus increasing flexibility and reducing the amount of time spent updating project configuration files.

In order to perform budgeting and accounting by project, UNISOL JobAcct replaces the standard Unix accounting system. A collector copy of JobAcct must be run on every machine for which accounting needs to be collected. A master version of the software is run on the server responsible for generating reports for all of the machines on the network.

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2. Oracle Database Accounting

UNISOL JobAcct™ tracks database usage (for Oracle databases) for the following resources:

- session connect time,
- disk I/O operations,
- SQLNet I/O.
- cpu usage,
- memory usage, and,

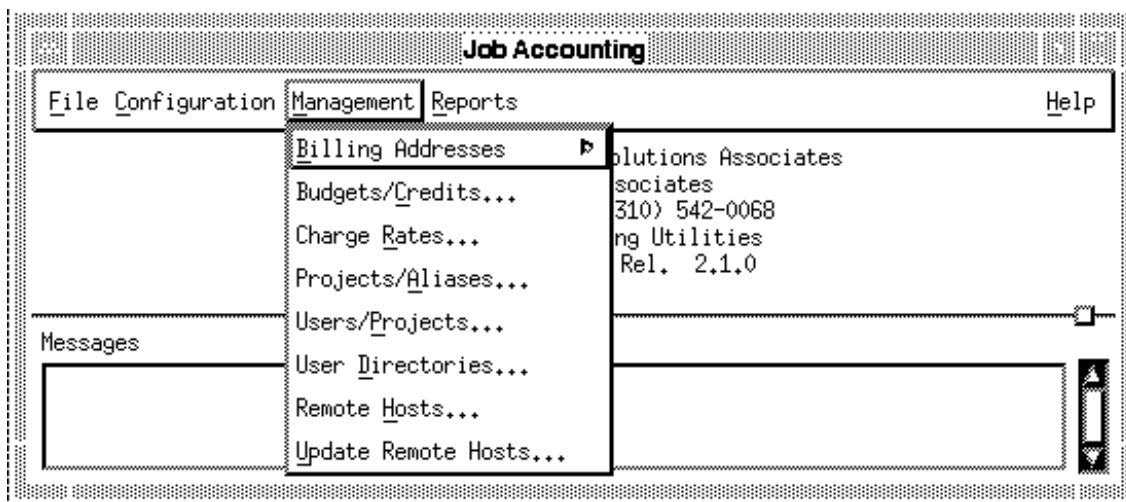
Unlike other implementations of Oracle database accounting, UNISOL JobAcct does not use sampling to collect database usage data because that impacts system performance and may miss data if the sampling interval is too large. UNISOL JobAcct implements Oracle accounting by using database triggers to capture Oracle session activity when the session ends and saves the accounting information within the database itself. The database accounting data is available for inclusion in all of JobAcct's standard reports.

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3. UNISOL JobAcct User Interface

UNISOL JobAcct provides user-level commands for the generation of summary data and reports, suitable for inclusion in shell-scripts or execution from cron. An Application Management Interface is also available for both the curses and X-Windows environments (Motif or Open Look) for the effortless maintenance of product tables and control files and for the generation of usage and billing reports. The Motif and Open Look interfaces also allow cursor manipulation of the menus and forms and use mnemonics and user-defined accelerators. In addition, context-sensitive help makes learning how to use the user interface a breeze.

The following Motif screen shows the main product window, the menu bar and an expanded Management menu showing the functions used to manage system-wide projects, user and project assignments and other product control files:



4. UNISOL JobAcct Reports

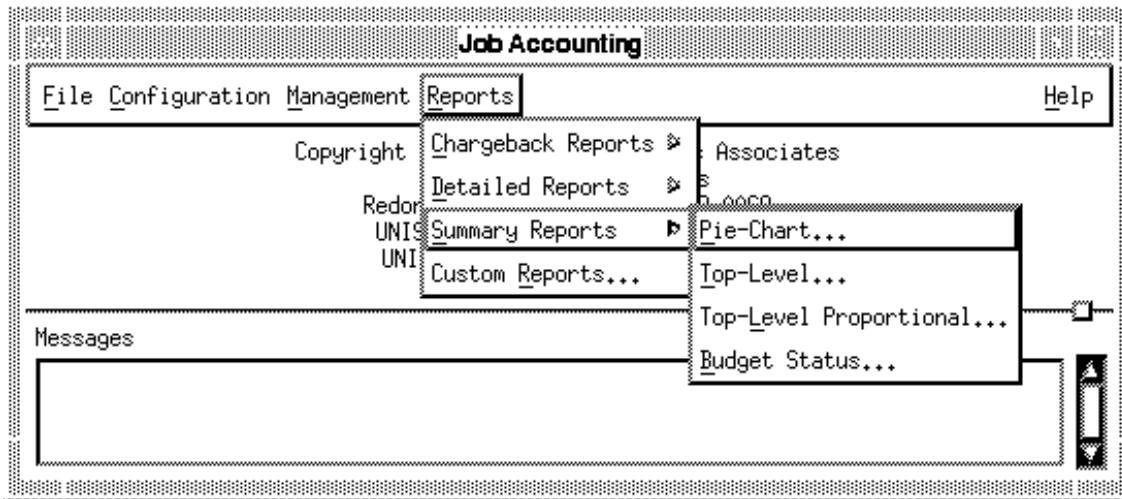
Reports are produced with charges itemized for each user, group, project chargeback number and cost centers, and, can include addresses for direct mailing to users and their organizations. New reports can be easily added (or chargeback reports can be easily changed) with awk or other report writing programs.

The reports currently available through JobAcct are:

- Detailed process accounting report
- Per-User command-usage report
- Detailed user login report
- Summary chargeback report
- Per-user chargeback report (default)
- Per-group chargeback report
- Per-chargenumber chargeback report
- Per-chargegroup chargeback report
- Top-level resource usage report
- Top-level fiscal report
- Top-level pie-charts showing system utilization (postscript printers)
- Top-level bar-charts showing system utilization (X displays)
- Budget Status reports (by uid or project) and automatic low-budget notification reports.
- ASCII reports (flat files) can also be generated and easily reformatted for inclusion into databases or other financial programs.

The following Motif screen shows the types of Summary Reports available from the Application Management Interface of UNISOL JobAcct:

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Reports can be displayed on the screen, sent to the printer, or saved in a file. Reports can also be produced for any specific range of days and hosts providing a flexible accounting period and reporting scheme. The following Motif screen will sent to the display a weekly per-user chargeback report:

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Per-User Chargeback Report

of Days

Start Day

Alternate Host

Hostlist (if any)

Output to

Percent Info

5. Performance Monitoring

This optional module monitors system activity and summarizes system performance data at user selected intervals.

Under normal operation, data is automatically collected (from system startup time) into daily summary reports and data may be independently analyzed for each day under user control and may be summarized and displayed to the screen or printed.

Performance data summaries can be kept on-line for months allowing for the easy comparison of system performance from different time periods, or can be archived to tape for retrieval and analysis at a later time. Ad hoc monitoring and reporting is also supported providing live system monitoring and the generation of short-term reports.

The information that is recorded, reported, and, analyzed by the System Performance Monitoring option includes:

- **Processes** (in run queue, blocked or swapped out),
- **Memory Usage** (used, free),
- **Paging Activity** (pages in, out),
- **Swap Space Usage**,
- **Disk I/O** (number of operations),
- **Faults** (interrupts, system calls, context switches),
- **CPU usage** (user, system, idle time),
- **System Tables** (files, inodes, processes, texts),
- **User Logins**, and,
- **Load Average**.

The summarized data can be further analyzed to provide an insight into system resource utilization and possible expansion needs while providing graphs of interesting events suitable for inclusion in management reports or computer equipment expansion justifications.

X-Windows releases of Performance Monitoring provide clear graphical representations of the collected information, and support zoom capability, and Postscript or Laserjet formatted graphs.

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6. Summary

UNISOL JobAcct is used by organizations to provide system access and services to other organizations. UNISOL JobAcct is also used by organizations that need to distribute a user's work across multiple projects while maintaining reasonable controls over the way system resource usage is distributed among the different projects. UNISOL JobAcct's ability to produce reports for many or all machines on the network make it easy to track all system resources available.

UNISOL JobAcct can be easily customized to fit your local installation requirements and can greatly simplify the resource chargeback task faced by many installations, while meeting government and government contractor reporting criteria.

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