Talis System Manager
(Beginner)

Student Guide

Document ID: SUB-SG-003

About this student guide

- This document accompanies the Talis System Management (Beginner) course.
- The course is for staff who are responsible for the operation and management of a Talis system, and who need a full understanding of both Talis and UNIX environments.
- Attendees should be familiar with basic UNIX commands, navigating around the UNIX file systems, and also the vi text editor

Student guide icons

Throughout this Student Guide, icons have been used where necessary, to draw attention to important information and to help with the completion of the exercises.

Note: When you see this icon, there will be something that you must take note of in order to complete the action successfully.

Tip: When you see this icon, there will be something that you must take note of in order to complete the action successfully.

Warning: When you see this icon, there will be something that you must take note of in order to complete the action successfully.

Agenda

1. Introducing the Talis System

1.1 About this section

The purpose of this chapter is to introduce you to the basic concept of the Talis Library Management System.

Upon completing this chapter, you should be able to:

- Understand the basic architecture of the Talis product suite
- Understand the various System Components

1.2 Overview – What is “Talis”?

Talis is an integrated library automation system consisting of a series of inter-related business areas that perform the basic library functions such as circulation, OPAC, acquisitions and cataloguing. It has a database, which holds all the library data and work records. It also has a number of "offline" or batch utilities that enable the system to be managed and for management information reports to be generated.

Talis Alto is a **Windows** based, full client application that accesses the Talis database.

1.3 System Components

1.3.1 Client/Server

The Talis machine uses client server architecture. The **client** can be considered as the software (**Talis Alto**) and the users connecting to the system to use it. The **server** holds the database containing the information that the client needs to access.

Talis Alto does not use the client software held on the Talis machine, rather the PC upon which it resides is considered as the client. It does however connect to the database or “server” on the Talis machine.

1.3.2 Multiple Systems

The command **uname -n** will give information about the machine you are currently logged onto. This command displays the **node** name, or the name the machine is known by to a communications network.

You can login to a server from another, by using the **rlogin** (remote login) command.

To access servers across a network, use the **telnet** command.

The remote machines are accessed via their node names. These are listed in the file **/etc/hosts** on the relevant machine.

The **telnet** command can be used to connect to other machines on the network. This means you can telnet from the main machine to the MIS machine, or vice versa.

1.4 UNIX

UNIX is a computer operating system. An operating system manages the activities of programs, and manages files and peripheral devices.

One of the most popular and widespread operating systems in the world, UNIX runs on more brands of computers than probably any other operating system. UNIX is the chosen operating system for Talis machines.

Talis provide machines made by **Sun Microsystems**. Sun systems have their own flavour of UNIX operating system known as **Solaris** (or **SunOS**).

Talis offers a course for customers to introduce basic UNIX operating system commands.

1.5 Sybase

Sybase is a third party Relational Database Management System (**RDBMS**). The Talis database has been built upon the Sybase platform. It is the skeleton upon which the Talis database is constructed. Sybase manages all the requests that relate to the database.

All Talis data is held in a Sybase relational database. There are several databases in this area. The live Talis database, containing the parameters, rules and data, is called **prod_talis**.

1.6 SQL

SQL (Structured Query Language) is the program or interface into the various Sybase databases. Even though there are many programs that access the database, they all use SQL. Transact-SQL and **isql** (interactive structured query language), are flavours of SQL favoured by Sybase.

isql can also be executed directly from the UNIX prompt.

Talis offer a one-day course introducing the structure of the Talis database and the use of SQL.

1.7 Scripts

Commands can be run at the UNIX prompt on the Talis machine. It is also possible to string a series of UNIX commands or programs together and incorporate them into a single file. Such a file is known as a **script**. Typing the name of the script in at the UNIX prompt will cause the contained commands to be executed in sequence.

Talis provides a variety of scripts that carry out tasks, usually involving access to the database.

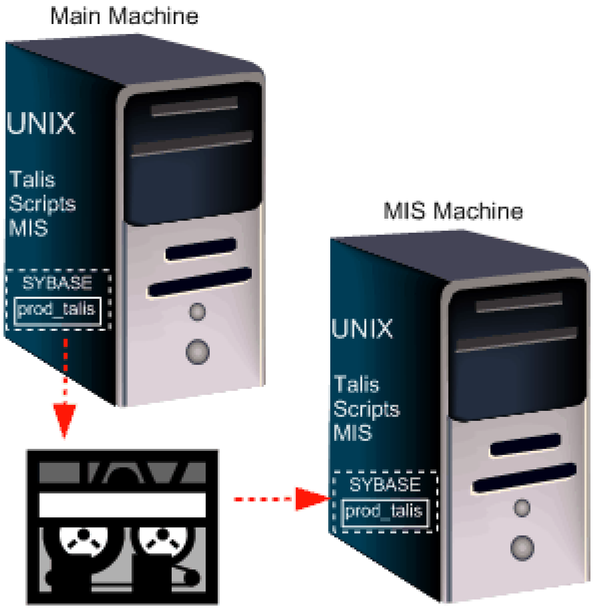
Large tasks that might have a detrimental affect on performance (for example, financial year rollover, unlock, update works from item update) are performed by batch jobs at quiet times or when there is no on-line activity. Such jobs are run via scripts, which in many cases can be set to run automatically.

1.8 The MIS Machine and Management Information

Running complex management information queries can impact on system performance. For this reason Talis recommends the installation of a **MIS** (Management Information) machine. The **MIS server** stands alone from the main system, and contains a copy of the Talis (**prod_talis**) database. In this way queries can be run without causing deterioration in performance on the main Talis machine.

The MIS machine can offer other advantages. Upgrades or scripts may be tested against it, prior to running them against the true data held on the main machine. It also serves to prove the success of the script that secures the database.

The prod_talis database is transferred via a **DAT** tape from the main machine to the MIS machine. The frequency of this transfer will vary dependant upon the requirements of each library.



There are two main tools for extracting Management Information from the Talis system.

1.8.1 Talis Decisions

Talis Decisions is based upon **Business Objects**. **Business Objects** is a third party product that offers both a full client application, and a thin client, Web browser based program. Taking advantage of drag and drop technology, it offers an intuitive and friendly means of reporting information. Because of its read-only nature, **Business Objects** can be pointed at the database on the MIS machine.

1.8.2 Perl

Perl (Practical extraction report language) is third party software, utilised by Talis in a number of ways, but notably for running management information reports against the database.

Perl differs from Business Objects in that it is UNIX command prompt driven. Further to this, in many cases, Perl reports will not only report information, but will also update the database. For example, Perl can generate overdue letters, but also increment the letters count within the database, influencing the letter to be sent on any subsequent run.

1.9 Processes

Processes are tasks that run on the Talis machine. These include:

1.9.1 CRON

The **CRON** is a UNIX process that can be used to schedule tasks, for example scripts or reports.

1.9.2 Daemons

Daemons are UNIX processes that run in the background. Talis has provided its own **daemons** which process records generated or amended using the Talis application (for example, authority headings or orders).

1.10 Talis Software

In addition to the **Talis Alto** application, Talis provides a variety of software products and services. Current offerings include:

- Talis Alto
- Talis Prism
- Talis List
- Talis Engage
- Talis Mobile
- Talis Message
- Talis Assure
- Talis Decisions
- Talis Base
- Talis Security
- Talis Gateway
- Talis Additions
- Webmin

2. Talis system architecture

2.1 About this section

The purpose of this chapter is to gain an understanding of what the Main server and the MIS server is used for.

Upon completing this chapter, you should be able to:

- Understand the differences between the two servers
- Understand the differences between the different databases

2.2 Servers

2.2.1 Talis server

The main Talis machine is loaded with the UNIX operating system and is supplied by **Sun Microsystems**. The version of UNIX on the machine is that supplied by Sun and is known as **Solaris** (or SunOS). UNIX is a command prompt driven operating system. This machine is accessed when running the Talis application. The graphical application **Talis Alto** is PC based, but still needs to communicate with the Talis database which is housed on the main Talis machine. UNIX on the main Talis machine can be accessed through terminal emulation software (such as E-Term) running on a PC.

2.2.2 MIS server

A second machine known as the **MIS** or Management Information Server may also be supplied. This reflects the main machine, but allows for management information reports to be run against it without impacting upon the performance of the main machine. It is usual for it to have less processing power than the main machine.

The Talis database can be copied and loaded onto this machine as required using the daily backup tape taken from the main machine.

The MIS machine has other possible uses and advantages.

1. The database will be loaded to this machine using a backup taken from your main machine. This will increase confidence in the securities that are being taken.
2. Upgrades to Talis software can be tested.
3. Self-penned reports or queries can be tested.
4. It may be possible to use it for OPAC access in the event of the main system being unavailable.

2.2.3 Linux box

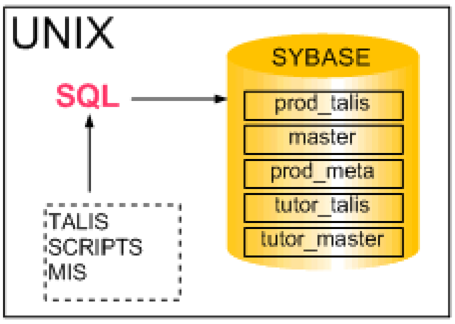
If you are running **Talis Prism** (the Web-based catalogue) you are likely to have one or more computers running the **Linux** operating system. Linux is very like UNIX, and this machine runs **Talis Prism** and related software.

2.2.4 Talis Decisions

Talis Decisions is a third party offering, providing a suite of management information and decision support reporting tools. The Web-based product called **Infoview** and **WebIntelligence** requires software that exists on a computer running Windows 2003. This software accesses the copy of the Alto database residing on the MIS machine. If you do not have a MIS machine, then Talis Decisions software must access the live database on your main Talis machine. This, however, is not a preferred solution as having the application running on the main server could have serious performance implications.

2.3 Databases

Talis library management applications access databases based upon **Sybase**. Sybase is a third-party relational database management system (**RDBMS**). There are a number of Sybase databases on the Talis machine.



2.3.1 prod_talis

The main Talis database is called **prod_talis** (prod being short for production). This is by far the most important and volatile database within the Talis system.

It changes constantly as you carry out work through Talis applications. It also houses all of the parameters or rules which are entered through Talis and which govern what can be carried out and by whom. It contains your unique live library data. The size of the database will vary greatly between libraries, but when shipped it is typically set to accommodate 4 gigabytes of data.

⚠ **Warning:** Whilst it is possible to recreate other areas of your system, failing to secure (or back up) this database on a regular basis can, in the event of a system failure, lead to total transaction loss. Therefore, this database must be regularly secured.

2.3.2 prod_meta

The **prod_meta** database contains Talis messages and working information. It should only change when the Talis system is upgraded. However, certain processes can make minor alterations to this database (notably the Talis daemons). It is prudent therefore to take a backup of this database. Consequently it is automatically secured when a backup of the **prod_talis** database is taken.

2.3.3 tutor_talis

The **tutor_talis** database will ideally reflect the structure of **prod_talis**. It can be accessed through **Talis Alto**, by editing the **Set Alto Database** application. As such, it can be used for training or testing. The quantity of data it contains is very small, rarely exceeding 50 or 60 MB. It will usually be loaded with sample bibliographic records and it is the library's responsibility to add borrowers and items.

A backup of this database is particularly important for new Talis libraries as it is heavily used during training courses and can be used to return the tutor system to a pristine condition.

2.3.4 tutor_meta

Just as the main **prod_talis** database has a related meta database, so does the tutor system. It's content, size and structure effectively mirrors that of **prod_meta**. It is automatically secured when a backup of the **tutor_talis** database is taken.

2.3.5 master

Sybase has a small, but very important and controlling database known as **master**. Changes to such things as database users and options are recorded here. It is beneficial to have a backup of this database and therefore it is secured when any other database is written to tape.

2.3.6 temp_db

Sybase uses this temporary database for storing information as it processes complex queries. This is particularly true when running management information queries that cross multiple tables or which access very large tables. As the query returns results the temporary data is cleared from **temp_db**. If this database fills then the Talis application will fail to respond. Avoid this by not running untested queries against the **prod_talis** database.

2.3.7 Other databases

There are other databases held on the Talis machine. Some are system related and others exist if the library has additional Talis products (for example, **Talis Inquire™**, **Talis List™**, **Talis Signpost™** or **Talis Decisions**).

2.3.8 Transaction log

This is an area of a database rather than a database in its own right. Also known as the **translog** or **syslog**, each main database has one. Transactions against the database are recorded here, in addition to being added to the main part of the database. Internal Sybase mechanisms can be used to recover data from this area in the event of a problem

2.4 SQL

Structured Query Language or **SQL** is the language understood by many relational databases. The version in use with Sybase is known as **isql** (interactive structured query language). Whilst this tool can be used to access the database(s) directly, it is normal to use applications such as **Talis Alto** to interact with them. Such applications will generate the complex SQL on your behalf.

Talis offer a one-day course which introduces the concepts of the Talis database and basic SQL.

2.4.1 Stored procedures

Stored procedures are often repeated SQL statements that are held within the database. This allows large and repeatable transactions to be executed in a more efficient way. The Talis program does not have to re-create common SQL each time it is required.

Although held within the Sybase database, they are written externally and have to be imported. The original SQL statements are held in files in the **/usr/opt/blcmp/talis/database/proc** directory.

2.4.2 Triggers

These are also held within the database, and they carry out specific transactions automatically as a result of another action. The original SQL statements files are held in the **/usr/opt/blcmp/talis/database/trigger** directory.

2.5 Scripts

Scripts are files on the Talis machine that can contain a sequence of UNIX commands or programs. They are used to run regular or repetitive tasks, most usually against the Talis database. Talis provide a number of batch scripts.

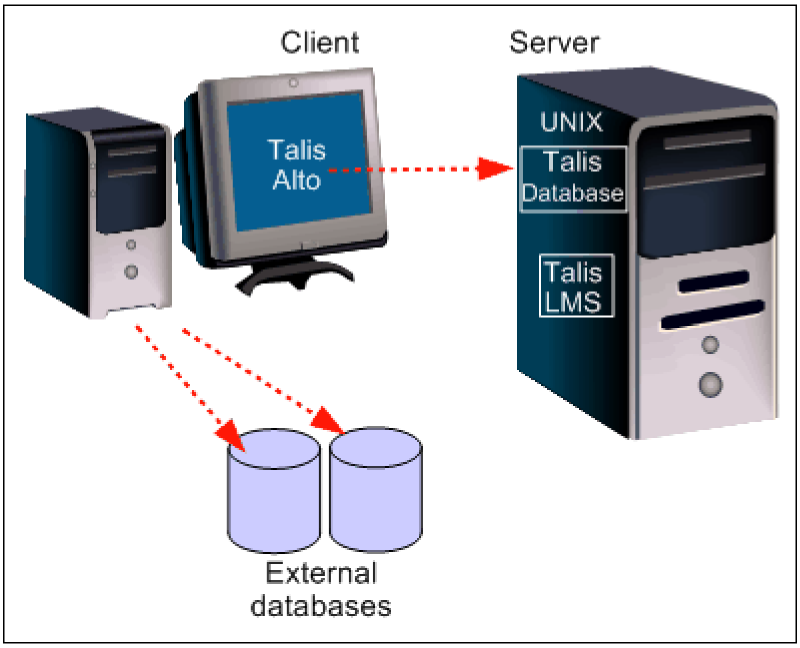
2.5.1 Perl

Perl or **Practical Extraction and Reporting Language** is used as a reporting tool by Talis. However, batch scripts are also being increasing written in Perl to run tasks against the Talis database.

2.6 Client-server architecture

The machine that runs the Talis library application software is considered to be the client, whilst the machine that holds the database is the server. Talis supply a graphical, PC based client application, **Talis Alto**.

2.6.1 Talis Alto



Talis Alto does not require the user to have a UNIX account. The UNIX environment is bypassed. Consequently, user passwords, barcode validation and environment variables are stored within the Talis database (**prod_talis**). They are added and maintained using the PC application **Configure Alto**.

2.7 Talis Base 2

Talis Base 2 ™ is a massive database of bibliographic records that can be searched through the Talis applications. Once located, records can be imported into the application.

Talis Base 2 ™ comprises a range of databases that can be searched either individually or as a single store. Constituent databases include Talis' union database (a unique database comprising records contributed by over one hundred libraries), British National Bibliography, Library of Congress, Whitaker, Stationery Office, British Catalogue of Music, and British Library Document Supply Centre Monographs and Conference Proceedings.

3. Stopping and Starting the System

3.1 About this section

The purpose of this chapter is to introduce you to ways to bring a system up or down.

Upon completing this chapter, you should be able to:

- reboot the server
- shutdown the server

3.2 Introduction

The main Talis machine can be powered down and switched off. Alternatively it can be re-booted. This is equivalent to 'restarting' as you might do with a PC running Microsoft Windows.

Clearly it is vital that no important processes are running when either a shutdown or a reboot takes place. Any such processes will of course be terminated.

3.3 Run Levels

Unix servers have a concept of run levels. At each run level certain scripts are executed in order. These 'rc scripts' are kept in a series of directories in /etc which correspond with the run level. for example, /etc/rc0.d/ , /etc/rc1.d/ and so on.

The run levels are as follows.

- S : Single user state (useful for recovery)
- 0 : Access Sun Firmware (ok> prompt)
- 1 : System administrator mode
- 2 : Multi-user w/o NFS (network filesystems)
- 3 : Multi-user with NFS
- 4 : Unused
- 5 : Completely shutdown the host (like performing a power-off @ OBP)
- 6 : Reboot but depend upon initdefault entry in /etc/inittab

3.4 Starting the system

To bring the system up from 'cold', power up any peripherals (e.g. monitor, tape drives) then turn on the power to the main machine. The system will boot automatically, and start any background system processes required for Talis to operate correctly. When it has finished booting you should get a login prompt at the system console. If not, hit **Enter** to display the prompt.

Users may now use Talis Alto or log into UNIX.

Please note that background Talis processes, such as Talis daemons (for example **work_exp_dae**) are not started automatically on power-up. They will need to be started.

3.5 Re-booting the system

It is recommended that you re-boot the Talis machine on a regular basis. This will clear any redundant processes that may be impacting upon system performance.

However, be aware that a system re-boot will terminate all running processes. Whilst system processes will be automatically re-started, Talis sessions or Talis batch jobs will not. It is vital to ensure that no processes will be impacted by the re-boot.

If you are intending on offering a 24 hours per day, 7 days per week service, the system should not be re-booted. It may be possible to switch certain services (such as the OPAC) to alternative machines to allow a system re-boot. Should this be required, please contact **Talis Support** for guidance.

3.5.1 Re-boot procedure

1. Log onto the system as **root**.
2. Check all other users are logged out by using the **who** command.
3. Examine all running processes using the **ps –ef** command. If necessary you can send out a message warning **Talis Alto** users that the system is about to be brought down by using the **Shutdown** tab in **Configure Alto**.

   You can warn **Talis Text** users by use of the UNIX **wall** command. This command can only be executed by the **root** user. To send a wall message enter:

   ```
   wall {return}
   ```

   The prompt will be missing. You should now enter your message, for example:

   ```
   The system is about to be brought down. {return}
   Please log off immediately. {return}
   ```

   When you have finished typing the message, press **CTRL-D** and your message will appear on all users screens.
4. Enter the following command:

   ```
   init 6
   ```

   or alternatively

   ```
   shutdown -g0 -y -i6
   ```

The system will be re-booted. Any users still logged on to the system at this point will be logged out by the reboot.

3.6 Powering the System Down

To bring the system down completely you must be logged on as the root user. You should enter the command:

```
shutdown   -g0   -y
```

You will be prompted to input a password to enter System Maintenance. Enter the root password. The system will inform you when the shutdown is complete and you will be returned to the UNIX prompt.

Finally halt the processor with the command:

```
halt
```

An **OK** prompt will be returned. At this point the machine and its peripherals can be powered off .

Alternatively, the command:

```
shutdown   -g0   -i0  -y
```

will completely stop the operating system. The system will be returned to the **OK** prompt. Power can then be turned off at the main machine and any peripheral devices.

A further alternative

```
shutdown   -g0   -i5  -y
```

Uses **–i5** which will shutdown and power off the main machine, leaving power only to external devices.

3.7 Webmin

The system can be re-booted or shutdown from within **Webmin** at the click of a button.

4. Disk hygiene and managing files

4.1 About this section

The purpose of this chapter is to introduce ways of managing files that may accumulate.

Upon completing this chapter, you should be able to:

- Monitor disk space
- Find where disk usage is highest
- Delete files
- Manage log files

4.2 Introduction

Various UNIX directories are written to as processes are executed on the system. If not monitored and maintained, directories may fill and ultimately, so may the disks. This can lead to system performance issues and even to the seizure of Talis programs.

It is important to monitor your disks to ensure there is sufficient free space, and to periodically clear out obsolete files.

4.3 Monitoring disk space

4.3.1 df

The UNIX **df** command is used to monitor the amount of used and free disk space on the system.

df (**-k**, **-a**) status of disk file sytems

For example:

df -k

displays the following and reports on space free and available for all mounted file systems:

```
Filesystem             kbytes   used       avail     capacity  Mounted on
/dev/dsk/c0t0d0s0      96391    13280      73481     16%       /
/dev/dsk/c0t0d0s3      336871   198536     104655    66%       /usr
/dev/dsk/c0t0d0s5      96391    43512      43249     51%       /opt
/dev/dsk/c0t1d0s0      192799   29371     144158     17%       /usr/opt/sybase
/dev/dsk/c2t0d0s0      962983   219398     647295    26%       /usr/opt/blcmp
/dev/dsk/c2t1d0s0      96391    916        85845     2%        /users
/dev/dsk/c3t0d0s0      1925934   570408    1162936    33%      /scratch
```

Alternatively, the command:

df -k /scratch

reports on free space in the specified directory, in this case **/scratch**

```
Filesystem        Kbytes    used          avail         capacity      Mounted on
/dev/dsk/scratch  500000    337093        114757        75%           /scratch
```

4.3.2 du

The UNIX **du** command can also be used to monitor disk space. It displays disk blocks used.

du (**-a**, **k**) number of blocks used by each directory or file (one block = 512 bytes).

This can be useful to display information about the amount of disk space used beneath specified directories. For example:

du /users

The output can also be sorted in descending order, by size of blocks by adding the UNIX sort command:

du /users | sort –nr

du can also be used to show the disk space used in the current directory by file or file systems:

du –sk * | sort –n

4.3.3 Size definitions

Depending on the command used, listings will display in bytes, kilobytes, or blocks.

- 1 block = 512 bytes
- 1 kbyte = 1,024 bytes
- 1 mbyte = 1,000,000 bytes (or 1,024 kbytes)
- 1 gigabyte = 1,024 mbytes (or 1,000,000 kbytes, or 1,000,000,000 bytes)
- The listing produced by “ls -l” is in bytes.
- The listing produced by “df -k” is in Kbytes.
- The listing produced by “du” is in blocks, (unless a “-k” switch for kilobytes is used).

4.4 Clearing files out

Redundant disk files can be removed manually using the UNIX **rm** command. However any available technique to automate such work should be employed. Talis include lines within the scheduling tool known as **cron**. One such line calls a script called **clear_logs**.

In addition, **cron** lines can be set up to delete files in specified directories that are above a cited number of days in age. For example, this technique is used to clear old Talis **daemon** report files. The system manager should consider copying this technique to clear older files from other directories, for example those that contain **Perl** report files and logs.

4.4.1 Deleting files

The UNIX command to delete files is **rm**. The command syntax is:

```
rm   (-i,-r)  {filename}
```

For example:

```
rm  /users/fred/date.sc
rm  -i  /users/talis/reports/*.old
```

Note the use of **–i** switch in the second example. This causes the system to prompt for confirmation that each file should be deleted, and is a useful means of safeguarding against accidental file deletion.

Warning: Once a file or directory has been deleted, it cannot be recovered, unless you have taken a backup copy of it. Consequently the **rm** and **rmdir** commands should be used with caution.

To clear out the contents of a file without deleting the file itself, you can use the following command:

```
 >  {filename}
```

If you do not have the correct access rights to a file, you will not be able to delete it. You must have **w** (write) access to be able to delete a file. Use the **ls -l** command to view the access rights of a file.

4.4.2 Deleting directories

To delete a directory use the UNIX **rmdir** command.

```
rmdir   {directory}
```

For example

```
rmdir /users/talis/testfile.out
```

rmdir will only delete an empty directory. If the directory contains files or other directories, an error will be output, and the directory will not be deleted. As with files, you need write (**w**) access to a directory in order to be able to delete it.

To delete a directory and its contents, use the command:

```
rm –r  {directory}
```

For example, to delete an empty directory:

```
rmdir   /users/talis/ill_reports
```

or if the directory contains files:

```
rm  -r  /users/talis/ill_reports
```

4.4.3 clear_logs

This Talis UNIX script resides in the **/users/talis/admin** directory and is set to run on a weekly basis. It truncates a number of system log files that would otherwise grow in size unchecked. These log files include:

- **/var/adm/messages** (system messages)
- **/var/adm/sulog** (log of users logging on as **su** - the **root** user)
- **/var/cron/log** (list of all executed cron commands)

The above files are listed in **/users/talis/admin/logs_to_clear** and it is this file that is used by the **clear_logs** script to determine which logs to truncate. Consequently, if there are logs you would rather retain, or if there are logs you would like to add to the list, you should edit **logs_to_clear**.

If your system is Solaris 10 you may find that the **/var/adm/messages** file is rotated using a solaris 10 utility called **logadm**.

4.4.4 Mail from cron

Output from **cron** lines which are not directed at a disk file, will be sent to a UNIX **mail** account. The **root** user mail file is particularly likely to grow if an output is not specified. Often the output can be directed to**/dev/null** which effectively suppresses output either to file or to mail.

4.4.5 Talis daemon report files

Report, log and error files from Talis daemons are held in the directory **/usr/opt/blcmp/talis/reports** .

They are renamed, usually on a daily basis, by the script **archive_daemon_reports**. These files need to be cleared out regularly. Whilst this can be done manually using **rm**, an easier alternative is to implement a line in the cron to delete all files in this directory greater in age than a specified number of days.

For example, to delete any files in the **/usr/opt/blcmp/talis/reports** directory which are more than thirty days old, the following line can be added to the cron file and will run weekly:

```
0 7 * * 1 /usr/bin/find   /usr/opt/blcmp/talis/reports -mtime +30 exec rm -f {}
\; >/dev/null 2>&1
```

4.4.6 Perl report files

Talis provide numerous scripts written using a third party, programming language called **Perl**. **Perl** is the language behind many Talis reports, such as overdues and reservation recall letters. **Perl** reports will rename any existing previous version of a report file with a date extension. Over time, this will result in report files that are no longer required. It is the responsibility of the system manager to remove such redundant files.

4.4.7 /scratch

The **/scratch** directory is a repository for a variety of files. It is used as a storage area for many temporary files. It frequently commands a large partition of disk space. Like most directories on the system, should it fill, it will cause Talis programs to freeze. Whilst there are likely to be many files that can safely be removed, certain sub-ordinate directories and files must be retained, namely:

- /scratch/prod_talis
- /scratch/blcmp
- /scratch/var_tmp
- /scratch/master

If you require guidance, please do not hesitate to call Talis Support.

4.4.8 Zebra Index file

The **/var/tmp** directory can fill quite quickly if the logging level is set too high for the marcgrabber. If this directory fills up, so that the indexing process cannot write to the log files, it is possible for the indexes to become corrupted, requiring an index rebuild.

Set the logging level of the marcgrabber to fatal after the initial build. This can be set by editing the **/scratch/altoindexes/marcgrabber_daemon_<database>.cfg** file.

If the log files are getting too large, they may safely be nulled, even while the marcgrabber is running. The following log files can be nulled:

- zebra_bib.log
- zebra_auth.log
- marcgrabber_prod_talis.out
- zebra_bib_index_prod_talis.log
- zebra_auth_index_prod_talis.log
- grab_delta_prod_talis.log

The indexes exist in **/scratch/altoindexes**. After the initial index build, the indexes should not grow very quickly. However, once **/scratch/altoindexes** gets over 90% full it should be allocated more space. Raise a service call with Talis to request this.

4.4.9 Looking for clues

Information often exists that will help you to decide about the importance of a file. As files are created, ownership will be assigned. The **df –k** command can be used to identify the owner of a file, who can be quizzed as to it's nature, usefulness and purpose. The same command will reveal the date on which the file was last modified. The age of a file can often indicate its value.

Your own agreed file naming conventions will also make the task of disk hygiene easier. Give files meaningful names and appropriate extensions. You should also consider creating sub-ordinate directories for certain types of file (for example, differing Talis Perl reports).

Once again however, if you have doubts as to the purpose of a file or directory, seek assistance from Talis.

4.5 Wildcards

Wildcards can be used in UNIX to represent one or more characters in a filename or file extension when copying, moving, listing or removing files. They are extremely useful when it is necessary to carry out an operation on multiple files in a single command.

*****	represents any number of characters at this position
?	represents a single character at this position

For example

pg *.rep - will pg all files with a .rep file extension

ls –l *.rep - will list files ending with a .rep extension

Clearly, wildcards can be useful when it is necessary to delete multiple files containing common characters or file extensions. For example the command:

rm *.out

- will remove all files with the **.out** extension.

However, extreme caution should be used when using wildcards with the **rm** command. You should check the directory that you are in, and be confident in your command line. Remember, there is no undo button in UNIX.

5. Managing UNIX Processes

5.1 About this section

The purpose of this chapter is to gain an understanding of how to track and manage UNIX processes.

Upon completing this chapter, you should be able to:

- Check process activity
- Be confident in using a number of tools to analyse these processes

5.2 What is a process?

A process is created whenever the user or the system runs a program or executes a command. For example, when a user logs on, a login process is created.

As UNIX is a multi-user, multi-tasking operating system, there will be many processes active on the system at any given time. Processes are either system processes or user processes.

System processes are initiated by the system and generally run in the background, for example:

- **Init** (the initial process which is run when the system is booted)
- **Cron** (the UNIX scheduling process)

5.3 Monitoring system activity

The extent of current and recent system activity can be revealed by use of the UNIX **sar** command.

5.3.1 sar

Current activity

To see a snapshot of current system activity, you can run the UNIX **sar** command:

```
sar x y
```

where **x** is the interval in seconds, between the number of lines displayed which is represented by **y,** for example

```
sar 5 7
```

This will provide 7 lines of information broken at 5 second intervals, at which point the UNIX prompt will be returned. The **sar** command can be executed by any user.

Past activity

Regular snapshots of system activity are run automatically through the **cron** scheduling tool. These can be viewed in the **/var/adm/sa** directory. The **sar** files contained in this directory are updated on a daily cycle and are named in the form **sa*xx*** where ***xx*** represents the date of the month.

These files *cannot* be read using **pg**, **more**, **cat** or **view** as they are not text files. To view a file, the **sar** command must be used in conjunction with the **–f** switch. For example, to view the file for the 2nd of a month, enter the following command:

```
sar -f sa02
```

5.3.2 vmstat

A snapshot of virtual memory usage can be viewed by executing the command:

```
vmstat   x   y
```

where **x** is the interval in seconds between the number of lines displayed (**y**). The key figure of importance is that relating to free memory. For further information run the **man vmstat** command.

5.3.3 prstat

The **prstat** command will list processes on the system in order of CPU activity. That is, the most CPU hungry processes will be at the top. To enable this, execute the command:

```
prstat
```

The command should be terminated with **Ctrl C**. For further information run the **man prstat** command from the UNIX prompt.

5.4 Monitoring processes

All processes on the system can be monitored using the UNIX **ps** command. The **ps** command accepts a number of switches, as described in the following table:

Switches	Function
-e	every process now running
-f	full listing
-l	long listing
-t[pts/nn]	only processes associated with pts (terminal) **nn**
-u uid	only processes for this user id (e.g. ps –utalis)

As the output from the **ps** command can scroll for several screens, it is useful to pipe it to the UNIX **pg** command

```
ps -ef | pg
```

The output from the **ps** command appears in columns. The columns show the information as detailed over the page:

Column Heading	Function	Notes
UID	Login ID of the user running the process.	e.g. **talis**, **root**, **ops**
PID	Process ID.	A unique, sequentially allocated number
PPID	Parent Process ID.	Useful as a cross reference
C	Process's interactivity level (0-7).	
STIME	Process's start date/time.	Useful for problem analysis
TTY	Terminal the process is running from. The '**?**' character indicates a process not running from a terminal.	The terminal (pts) number may change the next time the terminal logs on.
TIME	Amount of CPU time used	
CMD	Command line used to initiate this process.	Useful for problem analysis.

5.5 Identifying specific processes

The UNIX **grep** command is useful to search for process lines containing specific text. For example, the following command will display in 'page' format, all processes containing the word "cron"

```
ps –ef | grep cron
```

5.6 Terminating a process

The UNIX **kill** command can be used to terminate a process. Use this command with caution. If you are in any doubt as to the purpose of a process, please consult Talis Support before terminating it.

5.6.1 Using the kill command

To terminate a process you first need to obtain its process id by first using the **ps** command. If you are not the owner of the process you must change to **su** (superuser or root) to terminate it.

Then pass the process id to the **kill** command as an argument.

For example, if the ps command identified a process with the process id of 24862, you would use the command:

```
kill   24862
```

5.7 Other useful commands

The following table describes other useful commands.

Command	Description
who	Displays who is logged on to the system.
who am I	Displays your login information.
w	Displays current activity on the system (a useful summary of who's doing what).
id	Displays your current username and user ID.
finger {login-name}	Displays information about users, whether logged in or not (may be disabled as a result of server hardening by Talis).
last -n {login-name}	Displays the specified number of most recent logins of a given name. For example: **last -5 talis** would displays the last five times the user **talis** logged in.

5.8 Parent and child processes

Many programs and processes (parents) work by creating sub-processes (children). If you need to terminate such processes, you must first kill all the sub-processes (youngest first) and then the master process. You cannot assume that terminating the parent process will also terminate its children.

Failure to do this can result in the program not being terminated, or rogue processes being retained on the system, which may cause performance problems.

After running the **kill** command, ensure that it has worked by repeating the **ps** command.

5.9 Alto processes

As the **Talis Alto** application does not use the UNIX environment, no **Talis Alto** processes will be visible using the **ps –ef** command. Rather you should use the Active Users tab within **Configure Alto**.

6. Backing up the System

6.1 About this section

This section describes how to back up your system.

Upon completing this chapter, you should be able to:

- Back up Sybase databases and Talis and UNIX disk files.

6.2 Introduction

It is **crucial** to regularly backup Talis and UNIX software and disk files and all Sybase databases. Should the system become corrupted or crash, it can be restored from the most recent successful database and software securities.

You should also secure a copy of your databases and disk files whenever there is to be a major change or system event, for example an upgrade of the Talis system, or repair or replacement of system hardware.

You should take daily securities of the Talis databases and keep at least three weeks of backup tapes, and you are strongly recommended to retain a copy at an off-site location.

It is essential that you have confidence that all system backup processes have been successful. You should validate success by referring to the backup log files. All backup log files are held within the **/var/tmp** directory.

In order to carry out all database, software and disk file backup activities, you should be logged in as the **ops** user.

6.3 Backing up the Talis databases (full_dbdump)

The script that is used to backup the **prod_talis** database is called **full_dbdump**. This same script can be used to secure all other Sybase databases. It can be executed interactively, but typically is set to run as a regular routine through the UNIX scheduling process, know as the **cron**.

Run without arguments, **full_dbdump** will secure the **prod_talis**, **prod_meta** and **master** databases to DAT tape. The DAT tape needs to have been previously loaded into the DAT tape drive. If the tape drive is empty, the **full_dbdump** will fail.

full_dbdump will always secure the **master** database in addition to any database(s) you have specified to be backed up.

The script accepts the following switches:

Switch	Description
-d	Specifies the database to be secured.

Switch	Description
-h	Displays help text.
-i	Specifies the path to a filename containing the databases you wish to be secured.
-j	Specify an alternate tape drive.
-tALL	Dumps all Sybase databases. This option is highly recommended.
-y	Emails the addresses contained in the file **mail_helpdesk** in the event of an error.
-g	Indicates the number of retries to attempt if a tape error is encountered.

6.4 Running full_dbdump

6.4.1 Interactively

To run a **full_dbdump** to interactively secure the **prod_talis** database to the DAT drive, load a tape to the drive, log in as **ops** and type:

```
full_dbdump
```

Read the onscreen information. This will confirm the database you are about to secure and the tape drive that will be used. Press **c** {return} to confirm the tape is in the drive (or mounted).

You can secure alternative databases. For example, the **tutor_talis** database can be secured to DAT tape with the command:

```
full_dbdump -dtutor_talis
```

6.4.2 Automatically

To run **full_dbdump** automatically you must schedule the task through the UNIX **cron** utility. Talis will already have set this up, but you may wish to amend the time at which the job is executed. The cron process is covered elsewhere during this course.

However, you must ensure that a tape is loaded into the drive prior to the automated **full_dbdump** taking place.

6.4.3 full_dbdump log files

If **full_dbdump** is run more than once on the same day the present log is kept and a new log file is generated. The log files have names in the format:

```
fulldbdump.[YYYYMMDD].log.[Count]
```

For each run of **full_dbdump** on the same day, the count will increment by one.

full_dbdump retains ALL output files generated while attempting to access the backup tape. These are the results of attempting to:

1. Dump the databases.
2. Verify the contents of the tape.
3. Unload the tape.

There will be such output files for each attempt/re-try and the file name formats are:

1) fulldbdump.[YYYYMMDD].dump.[Count].[RunNumber]
2) fulldbdump.[YYYYMMDD].verify.[Count].[RunNumber]
3) fulldbdump.[YYYYMMDD].unload.[Count].[RunNumber]

These log files are created in **/var/tmp** and it is important that log **fulldbdump.[YYYYMMDD].log.[Count]** is inspected after each run to ensure **full_dbdump** completed successfully.

The amount of used space in the database is also reported in this log file. When securing the **prod_talis** database, you should check the database capacity reported in the log.

6.4.4 When to run

full_dbdump must be executed on a daily basis. It should be run before the start of normal working on the system. Not only does it take a copy of the database(s), it also ensures that **trandump**s will work correctly throughout the day.

⚠ **Warning:** Failure to run **full_dbdump** early each morning will **render your system insecure**. Not only will you be without a recent database copy, but **trandumps** are also highly likely to fail.

6.4.5 In the event of failure

Talis treats any failure of **full_dbdump** as a **high priority** call and you should of course contact **Talis Support**. However, prior to any call you should carry out a few simple checks and procedures:

1. Ensure a tape has been loaded into the drive.
2. Ensure that the tape is not write-protected.
3. Clean the tape heads.
4. Attempt an interactive **full_dbdump**, preferably using a new tape.

6.5 Backing up databases transactions (trandump)

Every change to the Talis database is considered to be a transaction, be that an issue of a book, an order for an item or a change to a borrower's details. In addition to being recorded in the appropriate place in the database, the transaction is also logged to an area of the database known as the **transaction log** (also described as **translog** or **syslog**).

This log will reside on a different disk to the rest of the database and it can be used to recover transactions in the event of a failure.

The transaction log is of a limited size, and if it becomes full, Talis Alto will cease to be responsive and the database will not accept further transactions. It becomes necessary to clear the transaction log area whilst retaining the valuable data that it contains.

To this end the script called **trandump** is executed.

6.5.1 Running trandump

The script, which should be set up in cron to run automatically, copies the contents of the transaction log to disk space in the **/scratch/prod_talis** directory and then clears the transaction log area of the database. It runs as the **ops** user.

6.5.2 trandump log files

Log files are created in the **/var/tmp** for each run of trandump. They take the form:

trandump.log.[Date of Month].[Hour].[Minute]

6.5.3 When to run

trandump must be executed at regular intervals throughout normal working hours. Usually this is on an hourly basis, but this interval may need amending depending upon local circumstances. It usually does not need to run overnight, but this may be required depending upon local circumstances. Please discuss this with Talis Support if you are uncertain. **Unsuccessful trandumps will render your system insecure**.

6.6 Backing up trandumps (archive_trandumps)

The execution of trandump places a file into the **/scratch/prod_talis** directory at regular intervals. The files are potentially large, and as such older copies of such files need to be removed from the disk to avoid the disk becoming full. The files are important and should not be removed before being transferred to tape.

A script called **archive_trandumps** is run to achieve this.

6.6.1 Running archive_trandumps

Whilst this script can be automated through the cron, it is more usual for it to be dealt with manually. Load a tape into the DAT drive and login as the **ops** user to run this script.

By default the script will transfer all trandump files from disk to tape if they are older than 24 hours.

6.6.2 archive_trandumps log files

archive_trandumps does not create a log file.

6.6.3 When to run

Typically this script is run weekly, but this interval may need amending depending upon local circumstances.

6.6.4 In the event of failure

Failure of this script should be reported to **Talis Support**.

6.7 Backing up disk files (full_softdump)

In addition to the Talis supplied script **full_softdump**, you may wish to consider using the UNIX utility called **ufsdump** explained in section 6.8.

6.7.1 Running full_softdump

Interactively

To take a full software backup, logon as **ops** and enter the following command:

```
full_softdump
```

This script backs up all files under the **root** directory (/) to your DAT tape drive.

Automatically

Whilst **full_softdum**p can be automated through the cron, more typically the task is carried out manually.

6.8 Backing up disk files (ufsdump)

In addition to the Talis supplied script **full_softdump**, you may wish to consider using the UNIX utility called **ufsdump**.

ufsdump offers the advantage of not only securing disk files, but recording valuable information about the way the disks have been partitioned. The ufsdump command makes two passes when backing up a file system.

Some customers are now using a script called **full_ufsdump.sh**, which will make full_softdump redundant. This script may already be running on your system. If you are interested in setting this up please contact Talis Support.

6.9 Backup cycle and tape life

You should maintain a three-week cycle of backup tapes.

Most DAT tapes can only be safely written to between 20 and 30 times, depending on the quality of the DAT. You should therefore make sure a note of the date is made on the cartridge case each time it is used. An old or worn DAT may start generating errors when dumped to. If in doubt as to how many times a given DAT may be used, check with the manufacturer.

6.10 Offsite copies

You are strongly recommended to keep copies of all of your tape backups at an offsite location or in a fire-proof box.

7. System security

7.1 About this section

This section explains the importance of keeping your UNIX server secure.

Upon completing this chapter, you should be:

- Aware of the techniques you can use to ensure your system is secure

7.2 Introduction

Any library running a UNIX server needs to make a serious and ongoing commitment to maintaining the machine in a secure manner. You need to perform security maintenance in addition to normal file or user maintenance.

7.3 Justification

Your system will never be absolutely secure, but you can make it more secure than most. Think of it like the neighbourhood watch; it doesn't reduce crime, it just makes it go elsewhere where there are easier pickings.

You also have a responsibility to all other systems. If your security fails, then your machine can be used as a launch pad for a host of other attacks. If root is compromised on your system every other system on your local network is almost certainly compromised immediately.

7.4 Techniques

- **Protect your passwords**. Change passwords regularly. Be particularly protective of the root password.
- **Enforce good password practices on your users**. Have a formal password policy that requires strong passwords. Don’t use blank passwords. Use a mix of uppercase and lowercase alpha-numerics.
- **Stay up to date**. If you do not stay current you will eventually become vulnerable. Read appropriate news groups and mailing lists on a regular basis. Check your vendor’s site for new patches weekly. Get on your vendor’s patch notification list.
- **Educate your users on good practice**. Make sure they don’t give out their passwords or leave terminals or PCs accessing your system unattended.
- **Review your logs regularly**. Question unusual traffic patterns.
- **Read CERT advisories**. CERT is the ``Computer Emergency Response Team''. It publishes ``advisories'' about security holes from time to time. These are published once the vendors concerned have produced patches. Visit http://www.cert.org for more information.

- **Don’t log into root directly**. Resist the temptation to run as **root** all the time. It’s not good practice for the system manager to always logon as root (or **superuser**). It’s easy to make a trivial mistake and damage the system (perhaps by using **rm *** in an important directory). Instead, logon as a regular user (such as **talis**), then switch to **superuser** with the **su** command when you need it. You are likely to find direct access to the root user via telnet blocked, particularly if your server has been hardened by Talis.
- **Take backups**. Regularly secure your file systems, software and databases.
- **Install patches**. But only if you are confident that they will no have a detrimental effect upon the system. Contact Talis Support if you require guidance. Always backup your system before applying patches.
- **Use a Firewall**.
- **Consider Anti-Virus**. Although anti-virus software is not as large an issue for UNIX users as for users of other systems, it is still an issue. If your UNIX system is used to serve files to Windows machines, then that system should be aware of Windows viruses so as not to redistribute infected files that could be stopped at the server level. Additionally, a small number of UNIX-native viruses do exist, particularly for the Linux platform. For these reasons, UNIX file-serving systems (mail servers, Web servers, FTP servers, Samba servers, etc.) should have up-to-date anti-virus software in place.
- **Understand file permissions**. Question whether files really need **rwxrwxrwx** permission and avoid using **chmod 777**.
- **Read books**. Works are available on UNIX system administration and security, for example:
  - Essential System Administration written by Æleen Frisch, and published by O'Reilly & Associates. ISBN: 0-937175-80-3
  - The manual pages on your own particular system.
  - Practical UNIX Security written by Simson Garfinkel and Gene Spafford, and published by O'Reilly & Associates. ISBN: 0-937175-72-2
  - The Cuckoo's Egg written by Clifford Stoll, and published by The Bodley Head. ISBN: 0-370-31433-6

7.5 Server hardening with Talis Assist

Talis offers a competitively priced system hardening service, **Talis Assist**. The service comprises:

- Single application of all the latest SUN security patches.
- Removal/disablement of services not required to run the Talis product set.
- Addition of tested secure encryption tools to all administration activities.
- Mechanisms to effectively control access for administration/support activities.

- Cycling and checking of all system logs with email notification.
- Limiting remote access to mail services.
- Automated file system integrity checks.
- User account and environment security.
- Server hardening report, with recommendations based on best practise.
- Security of all third-party applications associated with the Talis product set.

8. System user accounts

8.1 About this section

This chapter describes system user accounts and how to add users in UNIX.

Upon completing this chapter, you should be able to:

- Add and administer UNIX users
- Understand the UNIX mail and UNIX write and UNIX wall commands

8.2 Introduction

In pre Alto versions of Talis it was a requirement that each person who logged into Talis also had a unix account for the correct operation of Talis Text. However this is no longer a requirement.

There are now very few situations in which you would want to add a UNIX user. however the following info may be of use when managing current users on the system.

The following procedure describes how to add a new user to UNIX and how to configure the environment for that user.

Note: This assumes that these users **do not** have a prior account to use UNIX.

8.3 Adding a new user to UNIX

1. Login as **talis** or **ops**
2. Enter the command:

   su root
3. To add the new user to UNIX, enter the command:

   useradd –m –d /users/xxx -g131 xxx

   where xxx is the name of your new login
4. To set (or change) the password for your new user, enter the command:

   passwd xxx
5. where xxx is the user name.
6. Logout.

8.4 Changing passwords

The following command as the root user will tell you the status of the user account.

passwd -s <username>

The following command run as the root user will reset a user password, you will be prompted for the new password.

passwd <username>

8.5 Setting the Environment

The Environment is explained in more detail in the section on environment variables

1. Login as the user you have just created.
2. To create a working profile for your new user, enter the command:

   cp /users/talis/.profile .profile
3. Logout.
4. Login as the new user.
5. To change the PS1 variable, enter the command:

   vi .profile
6. This will change the prompt when you next login.
7. Logout.

8.6 Messaging to users

8.6.1 Unix mail

UNIX user accounts are usually provided with a mailbox. Mail messages may be sent to an inbox from the system or from other user accounts.

If mail messages have been delivered, the user will see a message "You have mail" when logging in.

8.6.2 Reading mail

At the UNIX prompt enter the command:

```
mail
```

This will display the most recent message and the prompt will change to the **?** symbol. To read the next message, simply hit the <enter >key.

To delete the current message and proceed to the next, enter the command:

```
dp
```

To quit from the inbox, enter the command:

```
q
```

This will close mail and return you to the UNIX prompt.

8.6.3 Writing Email

Emails can be sent from the system to external email addresses. this is useful for sending reports to staff in other departments.

The following command would send the file report.txt as the body of the email:

```
mailx -s"The subject" user.name@emailaddress.com < /path/to/report.txt
```

The following command (one single line split over several lines) would send the file report.txt as an attachment to the email:

```
uuencode /path/to/report.txt  /path/to/report.txt | mailx -s"The subject"
user.name@emailaddress.com < /path/to/message.txt
```

The above line also uses another file as the message body. Note that the repetition of the filename is deliberate. If a file is attached using the full path, this will become part of the name of the file. If you want to create a text document that will be opened in word by the user, you can call the file **report.doc** on the server.

These lines can be used from within scripts to email reports as soon as the script is complete.

8.6.4 UNIX write

The **write** command requires the name of another UNIX account as an argument, for example:

```
write ops
```

If the user you specify is logged in, the UNIX prompt will be removed and you will be allowed to type lines of text that will appear on the screen of the specified user.

Close the message by typing:

Ctrl D

Note that if your system has undergone hardening by Talis, the **write** facility may be disabled as it presents a possible system vulnerability.

8.6.5 UNIX wall

The **wall** (write all) command allows a message to be broadcast to all users logged into the UNIX system. This will include users of Talis Text. Consequently, it may only be executed by the root user. To send a message to all users, enter the command:

```
wall
```

The UNIX prompt will be removed and you will be allowed to type lines of text. These will *not* appear on the screen of UNIX users until you close the wall dialogue by typing:

Ctrl D

Talis Text users may clear the message and correct the Talis screen by entering:

Ctrl L

9. Scheduling jobs

9.1 About this section

This chapter explains how to add jobs to the cron, a UNIX system process used to automate repetitive tasks.

Upon completing this chapter, you should be able to:

- Add scripts to the cron to run at times specified.

9.2 Introduction

Many processing jobs, particularly those batch jobs affecting the Talis database, need to be scheduled to run at quieter periods. Some need to be run at regular intervals throughout the working day. The UNIX system process known as **cron** can be used to automate repetitive tasks.

An alternative UNIX toll known as **at** allows one-off jobs to be scheduled.

9.3 cron

9.3.1 Description

The **cron** process enables the system manager to set up jobs that will run automatically on pre-determined days and times. It may be used to schedule overnight or weekend jobs, or jobs that need to run at regular intervals during the day.

The **cron** process reads a file known as the **root** cron file into memory and executes the jobs it contains at the times that are specified.

cron files can potentially exist for each UNIX account on the system. However, for ease of maintenance and support, Talis recommend that a cron file exists only for the **root** user (or **superuser**).

9.3.2 Command line order

The order of the lines in the cron is not significant. Lines can be entered anywhere in the file, but it is sensible to group related lines together (for example, all daily jobs).

Any line in the cron beginning with “#” is treated as a comment, and is not executed as a command. Liberal commenting of the root cron file will can help others understand the function of each line.

9.3.3 Editing the cron

In order to make additions or changes to scheduled tasks, the root cron file must be edited and loaded into memory. Editing can be carried out using vi. This is achieved using the **crontab -e** command whilst logged into UNIX as the **root** user.

A standard root cron file is provided with the Talis system. This resides in the **/var/spool/cron/crontabs** directory. You should tailor this file to meet your own requirements.

To edit the cron file:

1. Log into UNIX root account, using the **su** command and the correct password.
2. Make a backup of the cron file:

   cd /var/spool/cron/crontabs
   cp root root.[date] (where date is today's date)
3. Edit the cron file:

   crontab -e

This command will invoke the UNIX vi text editor. Make your required changes then exit the editor using **:wq!** at the command line prompt. This will update the information held by the **cron** process.

9.3.4 The cron command line syntax

Each 'cron job' is composed of six fields: Minute (0-59), Hour (0-23), Day of Month (1-31), Month of Year (1-12), Day of Week (0-6), and the Command.

Minute (0-59)	**Hour** (0-23)	**Day of Month** (1-31)	**Month of Year** (1-12)	**Day of Week** (0-6)	**Command**

Note that field 5, the 'Day of Week', begins with Sunday (0) and ends Saturday (6).

9.3.5 Comments

Hash symbols (#) can be used to comment out entries in the cron file. Commenting your cron lines will help others to understand their purpose.

Be careful not to add blank lines to improve the readability of your file. This can result in problems to your scheduled cron jobs. Instead, precede blank lines with the pound symbol so that the rest of the line will not be interpreted.

9.3.6 Special symbols

An asterisk can be used to signify all values in a field. For example, by placing an asterisk in the third field, the cron daemon will run a job every day. Use asterisks with caution - you may impact on system performance.

Ranges can also be defined by using the minus (-) symbol. For example, if you wanted to run a job for the first four months of the year, you could add **1-4** to the fourth field.

A comma can also be used to select certain values in the field. If you wanted to run a report every 1st and 15th of the month, you could add **1, 15** to the third field.

9.3.7 Commands

In the sixth field of each cron line, commands can be added. The Talis convention is to use the **/bin/su –** syntax to run the job as a specified user. For example to run a UNIX script called **daliystatus.sc** as the user called **talis**, the following syntax would be appropriate:

```
          /bin/su – talis –c  “/users/talis/dailystatus.sc”
```

Note that the full pathname to the required script is being cited. This is good practice.

You may wish to consider saving such commands in a separate file where they can be commented and pointed to from the cron line. Jobs will be much easier to document, test and maintain and will run sequentially.

9.3.8 Output files

Reference to an output or report file can be made within the quotes surrounding the command. This will generate output just as if the command had been run directly from the UNIX command prompt. For example, to create a report from the **dailystatus.sc** script, the output could be re-directed thus:

```
          /bin/su – talis –c  “/users/talis/dailystatus.sc >/scratch/dailystatus.out”
```

Note that the full pathname to the output target is used, in this case re-directing the file into the **/scratch** directory.

In addition to the output from the script, output can be created that relates to the running of the cron line itself. For example:

```
/bin/su – talis –c  “/users/talis/dailystatus.sc >/scratch/dailystatus.out”
1>/var/tmp/dailystatus.cron  2>/var/tmp/dailystatus.err
```

The **1>** is cron output and the **2>** is error information. Typically this is re-directed into the **/var/tmp** directory. You may also see lines that force any cron error output into the same file as the cron output. This done using the syntax **2>&1** for example:

```
/bin/su – talis –c  “/users/talis/dailystatus.sc >/scratch/dailystatus.out”
1>/var/tmp/dailystatus.cron  2>&1
```

As quite often the cron output is not required, it can be re-directed into **/dev/null**. This effectively suppresses the output. For example:

```
/bin/su – talis –c  “/users/talis/dailystatus.sc >/scratch/dailystatus.out”
1>/dev/null  2>&1
```

If the cron outputs are not directed to a file or to **/dev/null** then such output will be sent to the UNIX mailbox for the **root** account. Use re-direction to limit the growth of this mailbox.

9.3.9 An example cron line

The following line would run the **dailystatus.sc** script as a user called **talis**, at 8am Monday to Friday. It disregards the date. The script output would be placed into the **/scratch** directory and the cron output into **/var/tmp** whilst the cron error output is suppressed.

```
08   00   *   *   1-5  /bin/su – talis –c   "/users/talis/dailystatus.sc
>/scratch/dailystatus.out"  1>/var/tmp/dailystatus.cronl  2>/dev/null
```

9.3.10 Stopping the cron

There are two ways to do this. You must be the root user

1. Stop the cron daemon from running.
   a. Solaris 8
      i. To stop:
         /etc/init.d/cron stop
      ii. To start:
         /etc/init.d/cron start
   b. Solaris 10
      i. To stop, as root
         svcadm disable svc:/system/cron:default
      ii. To start
         svcadm enable svc:/system/cron:default
2. You may wish to still schedule jobs, but only a limited set. You can move the existing cron out of the way and create a temporary cron. (as the root user)
   a. The crontab files live in /var/spool/cron/crontabs
      cd /var/spool/cron/crontabs
   b. Move the existing file to a new filename. The cron will only process commands found in the crontab that matches an existing user's username.
      mv root root.save
   c. If you need to add a temporary cron, simply create a new file called **root** with your cron lines in. when you have finished, copy the **root.save** over the **root** file.
      cp root.save root

9.3.11 Once only jobs

If you have a job which you do not intend to run on a regular basis (rather it is a one-off or an infrequent task) you must always either comment out or delete the line once it has been executed. If you are likely to want to run the job again at some later stage, it is a good idea to comment it out. Then you can use the same line again by un-commenting it and changing the date/time values.

Note: It is especially important to comment out or delete 'used' cron lines if they contain a day or month template. Failure to do this may lead them to re-run unexpectedly.

An alternative to using the cron for scheduling one-off jobs is to use the UNIX **at** command.

9.4 at

9.4.1 Description

at is a UNIX command which allows a script to be executed once at a specified time and/or date.

This is an alternative to running one-off jobs in the cron. In using it, you do not need to remember to remove the cron line once it is no longer required.

9.4.2 Scheduling a job

The following syntax used at the UNIX command prompt, allows a job to be scheduled using **at**:

at {time-to-run) {date-to-run)

For example entering

at 0800 Feb 23

This will produce the **at>** prompt at which you should enter the command you wish to be run at that time.

- If no date is specified, today is assumed.
- If no date is specified and the time is less than now, tomorrow is assumed.
- If no month is specified, the current month is assumed.
- If a month earlier than the current month is given, next year is assumed.

Using **CTRL-D** will exit the prompt and offer you a job reference number.

When an **at** job has run, a message will be written to the UNIX mailbox of the account name running the job.

9.4.3 Checking and cancelling jobs

Your queued jobs can be viewed using the **atq** command at the UNIX prompt. This will reveal the job reference number, owners and the date and time that jobs are due to run.

To cancel a job, use the command **atrm {job reference}** at the UNIX prompt. You must have appropriate permissions to do this. The **atrm –a** command will cancel all jobs for your current UNIX account.

When using these commands, the root user account has the privilege to view or cancel all **at** jobs.

10. Talis Daemons

10.1 About this section

This chapter explains Talis daemons, processes provided by Talis that run constantly on the computer.

Upon completing this chapter, you should be able to:

- Stop and start Talis demons, and check if they are running
- Understand daemons reports

10.2 Introduction

A daemon is a process that is theoretically, running constantly on the computer. The **cron** process is an example of a system related daemon.

Talis provide a number of processes, which interact with the **prod_talis** database. They regularly search for changes to the database requiring action.

For example, these real-time daemons must be running when Cataloguing or Acquisitions work is likely to be carried out. They run in the background and continually monitor and process any waiting records (such as orders which are to be transmitted via EDI or catalogue records which are to be added to Talis Base).

10.3 The daemons

The Talis daemon executable files reside in the directory **/usr/opt/blcmp/talis/bin**.

10.3.1 work_exp_dae

The **work exporter** daemon transmits catalogued works with 'Contribute' status to Talis Base. This must be running to enable access to catalogue records and to ensure works appear the following day in the Talis OPACs.

10.3.2 authorisor_dae (pre Alto 4.1)

The **authorisor** daemon processes works created or edited in Talis. It must be running to enable access to catalogue records and to ensure works will appear in the OPACs. It builds authority records if Authority Control is implemented, but must still be running even if authority control is not employed.

10.3.3 authority_ap (pre Alto 4.1)

The authority_ap daemon adds cross references to the old OPAC. The daemon is usually run from the cron after update_daily_access_points.

10.3.4 work_merge_dae (pre Alto 4.1)

The **work merger** merges Authority headings and updates headings in works. It need only be run if Authority Control is implemented.

10.3.5 ord_exp_dae

The **order exporter** daemon Transmits orders to the offices of Talis for forwarding on to suppliers. If EDI has been implemented then this daemon must be executed.

The work_merge and authorisor daemons no longer need to run in Alto 4.1

10.4 Stopping and starting Talis daemons

The **ops** user must be used when starting or stopping Talis daemons. This user has access to the required scripts. It is essential that daemons are always terminated by the same login that started them. If an attempt to run the scripts whilst logged in as a different user, errors will be reported.

10.5 Starting archive_daemon_reports

Talis daemons should be started using a script called **archive_daemon_reports**. You will need to edit this script to execute those Talis daemons appropriate to your deployment. The script can be found in the **/usr/opt/blcmp/talis/utils/bin** directory. The script carries out the following tasks:

1. It attempts to terminate any Talis daemons that may currently running.
2. It renames any existing Talis daemon report, log or error files.
3. It starts the Talis daemons using the **dae_start** command.

A line is included in the cron to run **archive_daemon_reports** before the start of work each day, which you may wish to edit to meet local requirements

Note: Talis daemons are not started automatically when the system is powered up or re-booted. In this circumstance it is recommended that you manually rename any daemon reports and then execute **archive_daemon_reports**.

10.5.1 An example cron line

```
0 8 * * 1-6 /bin/su - ops -c "archive_daemon_reports" >/dev/null 2>&1
```

10.5.2 Stopping (dae_term)

The script **dae_term** is used to terminate Talis daemons. This allows the daemon to cleanly conclude its current processing before terminating.

To stop a Talis daemon:

```
dae_term   [daemon_name]
```

For example

dae_term ord_exp_dae

Talis daemons should be terminated each evening following library closure. This can be scheduled and automated through the cron. Lines are included in the cron at the time of installation, but these may need amendment to meet local circumstances. Any processing that has not been completed will be picked up by the daemons when they are next re-started.

10.5.3 Example cron lines

```
0 20 * * 1-6 /bin/su - ops -c "dae_term work_exp_dae" >/dev/null 2>&1
0 20 * * 1-6 /bin/su - ops -c "dae_term ord_exp_dae"  >/dev/null 2>&1
```

Allowing Talis daemons to run overnight can lead to problems for the processes during subsequent processing. It is for this reason that **archive_daemon_reports** attempts to terminate the daemons prior to renaming reports and re-starting them.

10.6 Reports

10.6.1 Directory and names

Talis daemon output files are written to the **/usr/opt/blcmp/talis/reports** directory.

There are three potential output files per daemon:

1. **[daemon_name].rep**
   Lists transactions performed by the daemon.
2. **[daemon_name].err**
   Lists failed transactions and cause of failure.
3. **[daemon_name].log**
   Records start and stop time, and processing information.

Each time the daemons are started **dae_start** the existing output files are over-written. As they contain potentially useful information, it is appropriate to retain them for a period. To this end, the script **archive_daemon_reports** renames the report files on a daily basis.

10.7 Removal

If allowed to accumulate indefinitely, the output from Talis daemons will take up disk space. You may move or delete them manually. However, it is also possible to create a scheduled job to remove older files after a set number of days, e.g. the following cron line:

```
0 7 * * 1 /usr/bin/find /usr/opt/blcmp/talis/reports -mtime +30 -exec rm -f {} \;
>/dev/null 2>&1
```

will delete files in the reports directory that are older than 30 days.

Note: This powerful command line can be copied and modified to delete older files from other directories, but should be used with extreme caution.

10.8 Checking Talis daemons

The following UNIX command will reveal if Talis daemons are running:

```
ps –ef | grep dae
```

- and you are recommended to check for daemon processes each morning.

The output will look similar to this

```
ops  4727     1     0 08:02:17  ?   0:01 ./work_merge_daeSunOS.exe
ops  4719     1     0 08:01:36  ?   0:00 ./ord_exp_daeSunOS.exe
ops  4715     1     0 08:01:16  ?   0:01 ./work_exp_daeSunOS.exe
ops  4723     1     0 08:01:56  ?   0:03 ./authorisor_daeSunOS.exe
```

11. SQL

11.1 About this section

This chapter introduces Structured Query Language or SQL.

Upon completing this chapter, you should be able to:

- Access and quit SQL

Bring a database online

11.2 Introduction

Structured Query Language or **SQL**, is the language understood by the Talis database. Talis system managers will have occasion to use it to access the database system directly to carry out various tasks. The **Sybase** version of SQL is known as **isql** or Interactive Structured Query Language.

11.3 Accessing SQL

Log in to a UNIX account for which the operating system prompt is visible (for example **ops**). Enter the following command line

```
isql -Usa -P
```

The SQL prompt will be returned which takes the form:

```
1>
```

As you enter SQL lines, the prompt number will be incremented. SQL statements are executed by using the **go** command.

11.4 Database connections

You can identify the processes currently accessing the database. At the SQL prompt enter:

```
sp_who
go
```

11.5 Bringing a database online

When a database has been restored, it is necessary to make it available to users by bringing it online. This can be achieved at the SQL prompt by using the command:

```
online database {database}
```

For example, the **tutor_talis** database can be brought online by entering the following commands at the SQL prompt

online database tutor_talis
go <Enter>

11.6 Quitting SQL

You may exit SQL by entering the following command at the SQL prompt:

quit <Enter>

This will return the UNIX command line prompt.

12. Database Checkers

12.1 About this section

This section describes a number of dbcc (Database Consistency Checker) scripts.

Upon completing this chapter, you should be able to:

- Use the scripts to check the integrity of Sybase databases

12.2 Introduction

dbcc (Database Consistency Checker) scripts check the internal integrity of Sybase databases.

It's essential that they are run regularly against the main prod_talis database, and this has to be carried out when Talis is not in use. For this reason, both scripts are set up to run in the cron, usually on a Sunday.

12.3 checkdb and checkalloc

12.3.1 Issues with checkdb and checkalloc

There are two main issues with these scripts:

1. Library services (including any Web-based OPACs) must be suspended, as must any scheduled batch jobs. This is because the scripts must run in single-user mode (that is, no other processes can be accessing the database).
2. On older systems, or systems with extremely large databases, they can take many hours to run.

However, it is possible to overcome these difficulties:

1. The scripts can be run against a copy of the **prod_talis** database that has recently been loaded to a MIS machine.
2. Sybase 12 offers an alternative script called **checkstorage**, which is more efficient and substantially faster. See below for more detail.

12.3.2 Checking the Output

The names of the output files from **checkdb** and **checkalloc** are defined in the relevant cron line, but typically they will be called **checkdb.log** and **checkalloc.log**. Like the output from many of the security scripts, the files can be found in the **/var/tmp** directory.

You should ensure that the **checkdb** and **checkalloc** output files are checked after each run. You can use the **grep** command to search for Sybase error messages (they will contain the text **Msg**). For example:

```
$ grep Msg /var/tmp/checkdb.log
Msg 2506, Level 16, State 2:
Msg 2524, Level
16, State 1:
Msg 2506, Level 16, State 2:
Msg 2524, Level 16, State 1:$
```

Any errors that you find should immediately be reported to Talis Support.

12.4 checkstorage

12.4.1 Description

Under Sybase 12, the database consistency checker (dbcc) has been improved. It is faster and the way in which it detects, records, and reports errors has been changed.

The checkstorage command can check the database even whilst it is in use, with minimal impact on performance. The results of the check are stored in a new database called **dbccdb**. When checkstorage has completed, new dbcc stored procedures can be used to generate reports based on the collected data.

12.4.2 Advantages of using checkstorage

The checkstorage command:

- Does not lock tables for extended periods, which allows checkstorage to locate errors while allowing concurrent database access
- Combines checks provided by other dbcc commands such as **checkdb** and **checkalloc**
- Provides a description of used database space
- Separates checking and reporting functions
- Records checkstorage activity and results in the dbccdb database

12.4.3 Running checkstorage

Checkstorage should be run weekly. Log in as **ops** to run the command. The command takes no switches. It need only be run against **prod_talis** which it treats as the default database. To check the consistency of other databases, please use **checkdb** and **checkalloc**.

checkstorage creates an output file which is housed in the **/var/tmp** directory. The output file is called **checkstorage.md.log** where **m** is month and **d** is date.

In the light of the improved performance, **checkstorage** can usually be run against the live database in preference to the MIS machine. Seek advice from Talis Support.

12.4.4 Checking checkstorage output

The output file contains the start and end time of checkstorage. It will report any hard or soft errors in the database. An example of the critical line is shown below:

```
DBCC CHECKVERIFY for database 'prod_talis' sequence 3 completed at Oct 15 2002
2:18PM. 0 suspect conditions were resolved as faults, and 0 suspect conditions were
resolved as harmless. 0 objects could not be checked.
```

If any conditions are identified as faults or suspect, this should be reported to Talis Support.

12.5 Maintaining the dbccdb database

The dbccdb database requires the regular removal of old data to clear free space for the checkstorage output. dbccdb will fill if data is not discarded. The checkstorage command writes its results to the dbccdb system tables. The **sp_dbcc_deletehistory** stored procedure deletes old data. It is important to run this regularly (typically weekly).

12.5.1 sp_dbcc_deletehistory

This stored procedure can be executed from an **isql** prompt. You should use the **dbccdb** database.

The stored procedure is executed with the command:

sp_dbcc_deletehistory [“delete_date”[,”database_name”]]

Where:

- **delete_date** deletes all checkstorage data up to and including the **delete_date**. If not specified, only the latest checkstorage output is retained.
- **database_name** specifies the database name for which the checkstorage data is to be deleted. If not supplied data is deleted for the databases in the **dbcc_config** table.

For example:

sp_dbcc_deletehistory “01 Jan 2002”,”prod_talis”

12.6 checkstorage, checkdb or checkalloc?

checkstorage is preferred in preference to **checkdb** and **checkalloc** under the following circumstances:

- If **checkdb** and **checkalloc** take a combined time in excess of 5 hours to run.
- If your machine can afford the additional memory and disk space requirement demanded by checkstorage (notably the creation of the dbccdb database). You must be running Sybase 12.

However, be aware that if checkstorage does reveal errors, then it may be necessary to run checkdb or checkalloc to resolve them.

13. update_stats

13.1 About this section

This section describes the **update_stats** script, a script that ensures that the information contained in the statistics pages of the tables is kept up to date.

Upon completing this chapter, you should be able to:

- Understand how Sybase extracts data from tables
- Run the **update_stats** script

13.2 Introduction

The Talis library management applications access Sybase relational databases, which consist of numerous tables. Each table holds data of a particular type such as **Loans** or **Borrowers**. Each time new data is added, a new row is inserted in the appropriate table. Rows can also be updated when changes are made to existing data.

Sybase has two methods of extracting data from tables:

- **Table scanning**: Sybase searches through the relevant table, starting at the first row, until it reaches the data it needs. As some tables have many rows, this can be very time consuming. On the other hand, if the table has few rows, this can be an efficient method of searching.
- **Indexes**: Most tables have associated indexes, which Sybase uses to find the data it needs.

13.3 How update_stats works

Sybase calculates the most efficient way of conducting a search on the basis of information held in an area known as the statistics page for each table in the database. As rows are inserted or updated in the table, the information in the statistics page becomes out of date; accordingly calculations of the most efficient way to search may become invalid. This can result in searches being conducted by scanning each row in the table in turn in large tables, rather than using an index.

The **update stats** script ensures that the information contained in the statistics pages of the tables is kept up to date. This prevents long response times and consequent degradation of system performance.

13.3.1 Running update_stats

The script should be run regularly, ideally once a week when the Talis system is not in use. The script should be automated through the cron scheduling tool. The output from **update_stats** should be directed into a log file.

The script uses the following syntax:

update_stats [database name] [table name(s)]

The database name is mandatory. It does not default to **prod_talis**.

It is not necessary to specify table names. If no table name is entered, the statistics pages will be updated for all tables (including those which have not changed). Individual table names can however be entered as arguments to the script.

13.4 Creating a log file

You are strongly advised to create a log file when executing **update_stats**. This can be achieved by using UNIX re-direction in the command line thus:

update_stats prod_talis > /var/tmp/update_stats.log

You should check the log after each weekly run to confirm that it has completed successfully. The UNIX grep command can be used to quickly identify any lines in the log file that contain errors thus:

grep Msg /var/tmp/update_stats.log

13.5 Stored Procedures

The **update_stats** script also sets a flag against all the stored procedures. The next SQL query which uses a stored procedure will cause it to re-compile. This process is invisible and has no impact on the system.

14. Tutor system

14.1 About this section

This chapter explains what the tutor database is.

Upon completing this chapter, you should be able to:

- Backup a database
- Restore a database

14.2 What is the tutor system?

Talis systems are shipped with a tutor environment in place. As the name suggests, the primary purpose of the **tutor_talis** system is for training. Staff can use this **tutor_talis** environment to test changes before applying them to the live system, for example, amending parameters. Upgrades to Talis software may also be carried out on **tutor_talis** first, thus allowing staff to familiarise with new functionality.

14.3 Environment

The **tutor_talis** database resides on the same machine as the live Talis database (**prod_talis**). The database is a Sybase relational database and is called **tutor_talis**. Just as the main **prod_talis** database has a related meta database, so does the tutor system, in this case it is called **tutor_meta**.

When shipped, the **tutor_talis** database contains approximately a thousand example bibliographic records. You will be expected to populate it with dummy borrower and item records prior to your initial circulation training.

14.4 Logging in

tutor_talis can be accessed via Talis Alto. Add the tutor_talis database as a target by using the **Set Alto Database** application.

14.4.1 Talis Alto

If **tutor_talis** is not chosen as the default database, you will need to click on the **Change Database** button at the login dialogue. Once returned to the login dialogue, enter **tutor_tali** as your **User ID** (note the absence of the final 's') and enter the correct password and choose your site.

If the **tutor_talis** database is not visible when you use Change Database, you will need to create a new database target through the **Set Alto Database** application.

14.5 Backing up and Restoring

14.5.1 Backing up the tutor_talis system

Once you have records entered into the **tutor_talis** database, you should secure it to tape. You can use the **full_dbdump** script to do this.

1. Load a tape into the drive.
2. Login as the **ops** user.
3. Enter the command:

   full_dbdump -dtutor_talis

4. Follow the onscreen instructions.
5. Check the report for the **full_dbdump** by entering the commands

   ```
   cd  /var/tmp
   pg  fulldbdump.[YYYYMMDD].log.[Count]
   ```

   where **Count** reflects the number of security dumps carried out on that date. Use <newline> to page down through the document

6. Take the tape out and label it with details of the dump (**tutor_talis** and the date).

14.5.2 Restoring the tutor_talis system

You can use your backup to return the **tutor_talis** database to its original status, good for repeated training sessions such as Circulation cascade training.

To recover the **tutor_talis** database use the **full_dbrestore** script.

1. Load the tape in the drive.
2. Login as the **ops** user.
3. Enter the command:

   full_dbrestore tutor_talis

4. Follow the onscreen instructions.
5. On completion of the restore, take the tape out of the drive.
6. To bring the database online so it can be accessed by staff, an **SQL** command must be entered. Enter the following lines at the numbered prompt:

   ```
   isql -Usa -P
   1> online database tutor_talis
   2> go
   3> quit
   ```

For more information on SQL, please refer to the SQL section of the Talis System Management course notes.

Remember to take a new backup of the **tutor_talis** database following any changes you make that you wish to retain, particularly following an upgrade to a new revision of Talis.

15. Implementing Talis Alto

15.1 About this section

This chapter explains how to install and maintain the Alto Application.

Upon completing this chapter, you should be able to:

- Install Alto
- Upgrade Alto

15.2 What is Talis Alto?

Talis Alto is a full PC client application using its own executable program**.** Talis Alto does not access the UNIX operating system directly, but it does need to connect to the Talis database. Talis Alto understands and uses **Z39.89** search techniques, particularly when accessing Talis Base 2. It can be configured to access other external targets.

15.3 Requirements

- The Talis database must be at version 12.2 or greater.
- User PCs must have Talis Alto software installed.
- User PCs must be able to access the Talis database and Talis Base.
- The PCs must have minor configuration carried out following software installation. Specifically, a program called **Set Alto Database** must be executed to identify the Talis databases to which connection may be required. Typically, this is the **prod_talis** database. Additionally, it is necessary to know the IP or hostname of the machine on which the Talis database resides.
- The Set Alto Database program can be accessed through the Windows **Start** Menu.
- Talis Alto client software will also be loaded to the Talis database and the versions of this and the user PC software must match.

15.4 Installing Talis Alto

Talis Alto software for both database server and PC client can be downloaded from the Web at http://alto.talis.com . When Talis Alto is ordered, Talis will supply you with a login and password to allow you to download software.

If preferred, **Talis Alto** software can be downloaded from the Talis FTP server. Please contact **Talis Support** for details.

15.5 Database requirements

The database must have Sybase version 12 (or greater) installed. New tables, table changes, indexes and amended stored procedures have all been introduced.

The Talis database must be directly visible to the PC clients. To this end, port **2025** must be opened on the Talis machine.

15.6 Upgrading the database

Full instructions on installing **Talis Alto** and the appropriate directories to use can be found on the Talis Alto Web site. Access the Talis Alto Web site or Talis FTP server and download the following files onto your UNIX machine.

- **unixAlto.tar** (database upgrade)
- **AltoZipfile.tar** (client software to be stored within the database)

Login to the UNIX machine as the **talis** user, unwrap/tar **unixAlto.tar**. Stop all access to the database and take a database security using **full_dbdump**.

Run the server upgrade. This typically will take just a few minutes.

Unwrap/tar **AltoZipfile.tar** and secure the database once more (using a separate tape).

15.7 PC client requirements

Each Talis Alto PC must meet the following minimum specifications.

- 128MB RAM or more
- 300MHz processor or better
- 50MB spare disc space at least
- Screen supporting 1024x768 screen resolution and 16bit colour or better
- Windows XP or Windows 2003
- MDAC 2.6 or higher

15.8 Installing Talis Alto PC software

A choice of two executable files is available in order to install Talis Alto to a PC:

- **manualSetup.exe**

  or

- **autoSetup.exe**

The installation will create an Alto icon on the desktop and an Alto programme group beneath the Windows Start Menu.

When Talis Alto is called by double-clicking on the desktop icon, a comparison is made against the version of the software held in the database. If this does not match, the installation executable file that was chosen determines the subsequent action.

- If **manualSetup.exe** is used, then the user will see a message advising them to contact the System Manager. The System manager will then have responsibility for installing the latest version of **Talis Alto**.
- However, if the **autoSetup.exe** is used, the latest version of software will be downloaded from the database and installed to the PC automatically.

15.9 Set Talis Alto Database application

The **Set Talis Alto Database** application is accessible from the Alto Programme Group, which will have been added to the Windows **Start** Menu. You should use this to determine the databases that may be accessed from the PC.

Typically, Talis Alto should be set to access the **prod_talis** database, but you may wish it to be able to connect to other Talis databases such as **tutor_talis**.

When you use the **Set Alto Database** application, a file called **DataSource.dat** is created or edited on the PC. This file holds details of the databases that Talis Alto can connect to. Once created, you can copy this file to other Talis Alto PCs rather than having to run the Set Alto database following every **Talis Alto** PC installation.

15.10 Configure Talis Alto application

The **Configure Talis Alto** application is accessible from the Alto Program Group, which will have been created in the Windows **Start** Menu. You should use this to configure

- Environment variables
- Barcode validates
- External databases and search options
- User passwords
- Web menu options

For further information, please refer to the online help available with the Configure Talis Alto online help.

15.11 Reference PC

The setting up of a reference PC is a requirement of your SLA (Service Level Agreement) with Talis. This will be used to support your Talis Alto deployment.

The PC should only be loaded with the Windows operating system and minimum driver software. A virgin install of Talis Alto should then be carried out.

The reference PC should be accessible by Talis support staff via remote access wherever possible. It may then be used as a point of reference to verify problems on other Talis Alto PCs.

It may also be used as a source for copying Talis Alto software and configuration files to other PCs. A further advantage is that upgrades to Talis Alto software may be tested against the reference PC.

15.12 Scripts and batch utilities

Talis provide a number of scripts that carry out system management functions at a database level (for example, updating Talis Prism indexes, processing catalogued records). Such scripts are executed at the UNIX operating system level on the Talis machine. Please note that Talis Alto does **not** remove the requirement to administer and execute these scripts.

16. Managing Alto Processes

16.1 About this section

This section describes the best way of monitoring Talis Alto's user connections.

Upon completing this chapter, you should be able to:

- Check users connected to Alto
- Shut down Alto cleanly, sending out notifications

16.2 Introduction

A database process is created whenever a user logs into an Alto application.

16.3 Monitoring Talis Alto activity

The **Configure Talis Alto** application includes a tab called **Active Users**. By clicking on the **Continue** button, all current Alto users will be revealed. **User Id**s will be displayed as will **Location**, **IP address**, **PC Name** and the application in use. An attribute or combination of attributes can also be used to filter the results prior to clicking the **Continue** button.

For further guidance, please use the **F1** key whilst the **Active Users** tab is selected. This will provide detailed online help.

16.4 Shutting down Talis Alto sessions

You can automatically shutdown the Talis Alto sessions of all active users by sending a broadcast shutdown message. Once the system has been shutdown, new users will not be able to log into Talis Alto or the Configure Talis Alto application until the shutdown message is removed.

Please note that only users who have **Send shutdown message** enabled through the **Parameter Management** tab of **Configure Alto** will have visibility of the **Shutdown** tab.

You should further note that the enablement to **Logon with shutdown** must also be set to **Yes**. This is essential in order to allow subsequent removal of the shutdown message.

For full information, please use the **F1** key whilst the **Shutdown** tab is selected. This will provide detailed Help. Help is also available on **Parameter Management** through **Configure Alto**.

17. Adding a new Talis Alto User

17.1 About this section

This chapter describes how to add users to Talis Alto.

Upon completing this chapter, you should be able to:

- Add a new user to the database
- How to configure Talis Alto for new users

17.2 Introduction

The following procedure describes how to add a new user to Talis Alto and further, how to configure Talis Alto for that user. Please note that this assumes that these users **do not** have a prior account to use Talis Text.

17.3 Adding a new user to the database

1. Open the **Configure Alto** application.
2. Login as a user with appropriate enablements.
3. Navigate to **Parameter Management | Names |Operators | Operators** .
4. Click on the **Insert** button.
5. This will insert a new row allowing you to add a new **Login ID** (or user) and link it to an **Operator Profile**.
6. Save your changes and close the **Configure Alto** application.

17.4 Setting the user password

When set, **Talis Alto** user passwords are stored (encrypted) within the Talis database.

1. Open the **Configure Alto** application.
2. Navigate to **Operators**.
3. Choose the newly-created user from the drop-down list and set the password.
4. Save your changes and close the **Configure Alto** application

17.5 Creating new enablements

Enablements control which areas of Alto an operator has access to.

1. Open the **Configure Alto** application.
2. Navigate to **Parameter Management |Permissions |Names** .
3. Insert the new enablement profile name.

4. Save your changes.
5. Navigate to **Parameter Management |Permissions | Rules**
6. Select the new enablement profile from the drop down and enable the options appropriately.
7. Save your changes and close the **Configure Alto** application.

17.6 Making locations visible

Appropriate user enablement links must also be set up through the parameters interface. Without this, locations will not be visible at initial login to **Talis Alto** users.

1. Open the **Configure Alto** application.
2. Login as a user with appropriate enablements.
3. Navigate to **Parameter Management | Permissions | Enablements Link** .
4. Ensure that the **Operator Profile** used by your newly created user is linked to a **Site Profile** and an **Enablement** [profile]. Create an appropriate link if one does not exist. You may create additional links if required.
5. Save your changes and close the **Configure Alto** application.

17.7 Setting environment variables

Environment variables in **Talis Alto** can be set to apply to all users or can be specific to individual user accounts. Once set, such variables are stored in the Talis database and are applicable to the **Talis Alto** user, regardless of which PC they work at.

17.7.1 Setting global variables

1. Open the **Configure Alto** application.
2. Choose the **Environment Variables** tab, then choose **Global variables** from the drop-down list. Set variables as appropriate. These variables will then be applicable to all **Talis Alto** users.
3. Save your changes and close the **Configure Alto** application.

17.7.2 Setting user specific variables

1. Open the **Configure Alto** application.
2. Choose the **Environment Variables** tab, then choose the user you wish to set variables for from the drop-down list. Set variables as appropriate. These variables will then be applicable to the specified user in addition to any global variables. A variable previously defined in global settings will be over-ridden if set for a specified user.
3. Save your changes and close the **Configure Alto** application.

17.8 User locking

If a user makes a number of unsuccessful attempts to log in to **Talis Alto**, that user will be locked out of the application. By default the number of unsuccessful login attempts allowed before the user account is locked is set to 5. This number can be over-ridden by setting the environment variable. Where this occurs, the intervention of the System Manager is required to free the account.

The **TAL_PASSWORD_MAX_ATTEMPTS** variable can be set for each individual user or for all users by setting using Global Default.

17.8.1 Unlocking a user account

Locked user accounts may be released through the **Configure Alto** application.

1. Open the **Configure Alto** application.
2. Login as a user with appropriate enablements.
3. Navigate to **Parameter Management | Rules | Operators |Operators**.
4. Identify the locked user and click on the cell in the **Locked** column. Set this to **No**.
5. Save your changes.
6. You may also need to change the user's password (see above).
7. Close the **Configure Alto** application

18. Environment Variables

18.1 About this section

This chapter explains environment variables, which are used to establish components of the user's working environment.

Upon completing this chapter, you should be able to:

- Set UNIX environment variables
- Set Talis environment variables

18.2 Introduction

An **environment variable** defines an aspect of a Talis user's environment that can vary. Usually set during the login procedure, an environment variable establishes some component of the user's working environment, such as the database to be used, or text editor to be used. Since they are preset values specific to a given user, they save time that would be otherwise used defining values at each login. Many variables affect the way in which Talis works for that user.

18.2.1 UNIX environment variables

The UNIX shell uses environment variables can send information about the user's environment (such as the current working directory) to programs being run. The environment variable can then be passed on to any program that is not built into the shell, and can be consulted, or modified by the program.

18.2.2 Talis Alto environment variables

Talis Alt**o** also uses environment variables. These are held within the Talis database and added for a user using the **Configure Alto** application.

18.3 Setting Environment Variables in UNIX

By convention, environment variables are entered in uppercase.

Variables are only valid in the shell in which they are defined, and since running any subsequent program or process generates a new shell, it is essential to export them after setting them. This is achieved by use of the **export** command. For example:

```
PS1=”talis$ ;  export PS1
```

This allows the variable to be carried into any programs that the user executes. Environment variables are normally set up when a user logs in to UNIX. The files in which variables are set, are read in as the user starts a UNIX session. Such files may affect all users, a section of users or may be user specific.

18.3.1 Files containing variables

/etc/profile

This is the UNIX system profile. This contains global environment variables which affect all users.

/users/{login-name}/.profile

For example, **/users/talis/.profile** . This is where environment variables are set for an individual user, enabling user-specific values to be set. Variables set in this file will override previously set environments.

18.3.2 Identifying your environment

To identify those environment variables that are currently defined, use the **env** command.

18.4 UNIX environment variables

The following are examples of environment variables that have specific meaning to the UNIX operating system:

UNIX environment variables	Description
PATH	A list of directories that will be searched when executing a command.
PS1	The UNIX command prompt. By default this is '**$**'.
HOME	The user's home directory.
LOGNAME	The user id of the current shell. This variable is often used by a script or program, in order to determine which user is executing it.
TZ	The time zone for the current session.

18.5 Talis environment variables

Some environment variables have been developed by Talis to have a specific meaning to a Talis program when it runs. As the variables are carried into the program, they will affect the way in which the application works. Talis makes heavy use of such variables to control or customise its operation. The application or file in which you set the variables will determine which Talis users they affect.

Normally these environment variables will be set through the Configure Talis Alto application or the user's unique UNIX **.profile**, but they can be entered manually for a one-off session or to test their use.

Some Talis environment variables are general purpose, whilst others are specific to a functional area.

18.6 General environment variables

The following are examples of general Talis environment variables:

UNIX environment variables	Description
BLCMP_HOME	The directory which the Talis script searches for BLCMP and Talis directories.
TAL_DAEMON_DIR	The directory for Talis daemons.
TALIS_HOME	The directory for the majority of Talis software
TAL_DEFAULT_DBNAME	Determines which database will be used by the Talis program. Typically this is **prod_talis**.
TAL_LOCATION	Sets user's location (or library site) at login.

18.7 Functional area variables

The following are just a few **examples** of Talis function specific environment variables. Definitions of these variables can be found in the Talis Alto online help.

OPAC

- TAL_CANCEL_WAITING_RES
- TAL_DEWEY_ON
- TAL_LC_ON
- TAL_NO_CLASS
- TAL_NO_BACK_BROWSE
- TAL_OPAC_WANTS_NOTE
- TAL_TYPE_AHEAD

Circulation

- TAL_AUTOCHOP
- TAL_BOOKING_AUTOSHELF
- TAL_BOOKING_INTERCEPT
- TAL_BOOKING_NOBORRLIST
- TAL_BOOKING_SHELF
- TAL_BOOKING_NO_SLOT
- TAL_HOUSEBOUND

Acquisitions

- TAL_RECEIPT_STATUS
- TAL_ORD_NO_ITEMS

18.8 Personal environment variables

It is of course possible to set up your own personal variables in UNIX. These can be made available each time you login by including them in the **.profile** in your own home directory. Remember to include the export command in the line.

18.9 Setting environment variables in Talis Alto

Both UNIX and personal environment variables may not be set for use with Talis Alto as they are not needed. Only Talis environment variables have any significance when using Talis Alto. These are set using the Configure Alto application, which is accessible through the Windows **Start** Menu.

Choose the **Environment** tab and pick the user you wish to apply an environment variable to from the drop-down list. To add a new variable click the **Add New** button and complete the resulting dialogue box.

For information on environment variables, press **F1** to invoke the **Help** system. This contains a listing of variables and their purpose.

Any variables assigned to the **Global default** user will be applied to all Talis Alto users, thus reducing the need to duplicate common variables against specific users.

19. Local catalogue

19.1 About this section

This chapter introduces the local catalogue and discuss the ways that the indexes are kept current.

Upon completing this chapter, you should be able to:

- Understand the difference between LMS and Zebra indexes
- Complete an LMS index rebuild
- Complete a Zebra index rebuild

19.2 Introduction

The Online Public Access catalogue (**OPAC**) is your local Talis catalogue. The library users are most likely to access the OPAC through the Web-based product Talis Prism. Access to Talis Prism can be made available through Talis Alto. Bibliographic searching of the catalogue is also available through Talis Alto.

The OPAC contains Bibliographic and Item information. Bibliographic records (sometimes called Bib or Work records) can be taken from the central database Talis Base, or created locally using Cataloguing or Quick Manage Work. Bib records added through Quick Manage Work are held on the Local Catalogue and can be contributed like other records.

19.3 Architecture

The OPAC is based on the two types of indexes:

- The Zebra indexes used extensively in Talis Prism and to support Bibliographic searching in Alto. (They also support Authority search too.) These are held in the UNIX file system (that is, externally to the Sybase database).
- The LMS indexes only used in Talis Prism by the browse facility. These are held in tables in the Sybase database.

Both types of indexes need to be maintained to reflect new additions to stock, deletions or changes to existing bib records. Occasionally they may need to be rebuilt. Different mechanisms are used to achieve this for each of the two types of index. These are documented in the following sections

19.4 Updating and re-building the Zebra indexes

New additions to stock and deletions or changes to existing bib records are reflected back into the Zebra indexes using the **marcgrabber** process. Each time it runs, the

marcgrabber reads its configuration file which determines whether or not it is updating (delta mode) or rebuilding (initial or build mode) the indexes.

The parameter file also determines whether or not the authority indexes are updated or rebuilt. By default they are included.

19.4.1 MARC 21 tags

There is no interface for amending the MARC 21 tags which are indexed in the Zebra indexes. A full list of all MARC 21 tags indexed can be found on the Talis Alto 4.1 Index Maintenance Manual on the Talis Lyra Pages (http://www.talis.com/lyra).

19.4.2 Updating the Zebra indexes

In the standard implementation the **marcgrabber** process runs on the LMS server in the background every 30 seconds. Sometimes it is scheduled to run less frequently for performance reasons.

When updating the indexes (delta mode) the **marcgrabber** does three things:

1. It runs the make collection daemon to add bib records in the appropriate collection.
2. It extracts MARC21 data (grabber process).
3. It runs the **zebraidx** process to update the zebra indexes.

19.4.3 Checking the parameter file for the marcgrabber

The marcgrabber is controlled by a parameter file which it reads each time it starts to run. The parameter file can be found at:

/scratch/altoindexes/marcgrabber_daemon_<database>.cfg

It will look similar to the following:

```
MCOLL=1
KILL_WAIT=300
LOGLEVEL=fatal
GRAB_MODE=delta
INDEX_MODE=delta
INDEXES='bib auth'
```

If the parameter file contains a line "DELAY = <value>", this determines the length of time in seconds the marcgrabber waits between each run. By default the line does not appear and the marcgrabber runs every 30 seconds.

Note: More details about the contents of the parameter file can be found in the Talis Alto 4.1 Index Maintenance Manual on the Talis Lyra Pages (http://www.talis.com/lyra).

19.4.4 Checking the parameter file for the marcgrabber

There are three sets of logs which can be checked for the marcgrabber which correspond to the three stages it goes through:

Mcoll_dae logs

In **/usr/opt/blcmp/talis/reports** the **mcoll_dae** reports exist as before: **mcoll_dae.log**, **mcoll_dae.rep** and **mcoll_dae.err**. However as the **mcoll_dae.log** and **mcoll_dae.rep** are overwritten each time (the **mcoll_dae.err** is only overwritten if there is a problem), the marcgrabber script copies the existing files, appending them to **mcoll_dae_history.log**, **mcoll_dae_history.rep** and **mcoll_dae_history.err** in the same directory.

Note: If there are problems with the mcoll daemon then records will appear in Alto Bib search but not on Prism.

Marcgrabber logs (summary of the marcgrabber's activities)

In **/var/tmp** the **marcgrabber** appends to two log files:

- **marcgrabber_daemon_<database>.out** Summarises the marcgrabber progress.
- **grab_delta_<database>.log** Provides more details of the grabbing process provided the logging level is high enough. See the Talis Lyra Pages (http://www.talis.com/lyra) for more details about logging levels.

A sample section of the **marcgrabber_daemon_<database>.out** looks as follows:

```
Sun Apr 1 23:35:35 BST 2007 Sun Microsystems Inc. SunOS 5.8 Generic Patch
December 2002
Sun Apr 1 23:35:35 BST 2007 stty: : No such device or address
Sun Apr 1 23:35:35 BST 2007 stty: : No such device or address
Sun Apr 1 23:35:35 BST 2007 Executing /usr/opt/blcmp/talis/mcoll_daeSunOS.exe
Sun Apr 1 23:35:47 BST 2007 Sun Microsystems Inc. SunOS 5.8 Generic Patch
December 2002
Sun Apr 1 23:35:47 BST 2007
/scratch/altoindexes/marcgrabber_daemon_prod_talis.cfg.lck:
No such file or directory
Sun Apr 1 23:35:47 BST 2007 /usr/local/marcgrabber/libexec/marcgrabber -v3 -
l/var/tmp
/grab_delta_prod_talis.log -c/usr/local/marcgrabber/etc/marcgrabber.cfg
```

Indexing logs (indexing the data)

In **/var/tmp**, the **zebraidx** process writes to two files:

- **zebra_bib_index_<database>.log** - relating to the indexing of bib records)
- **zebra_auth_index_<database>.log** - relating to the indexing of authority records)

These reports often contain lots of information. A sample section of the **zebra_bib_index_<database>.log** would appear as follows.

```
15:31:54-12/10 zebraidx(6875) [log] zebra_start 2.0.7
/usr/local/idzebra/etc/zebra_bib.cfg
15:31:54-12/10 zebraidx(6875) [log] enabling shadow
spec=/scratch/altoindexes/bib/shadow:8G
15:31:54-12/10 zebraidx(6875) [log] cache_fname =
/scratch/altoindexes/bib/shadow/cache
15:31:54-12/10 zebraidx(6875) [log] dir
/scratch/altoindexes/dump/delta/bib/prod_talis/norm
15:31:54-12/10 zebraidx(6875) [log] key_block_create t=1
```

```
15:31:54-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 0
15:31:54-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 804
15:31:54-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 2090
15:31:54-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 3340
15:31:54-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 4686
15:31:54-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 6254
15:31:55-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 7494
15:31:55-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 8923
15:31:55-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 10032
15:31:55-12/10 zebraidx(6875) [log] update grs.marc.usmarc
/scratch/altoindexes/dump/delta/bib/prod_talis/norm/grabbed.bibs.mrc 11697
15:31:55-12/10 zebraidx(6875) [log] sorting section 1
15:31:55-12/10 zebraidx(6875) [log] writing section 1
15:31:55-12/10 zebraidx(6875) [log] finished section 1
15:31:59-12/10 zebraidx(6875) [log] Iterations          6597
15:31:59-12/10 zebraidx(6875) [log] Distinct words      1057
15:31:59-12/10 zebraidx(6875) [log] Updates             1027
15:31:59-12/10 zebraidx(6875) [log] Deletions              2
15:31:59-12/10 zebraidx(6875) [log] Insertions            28
15:32:00-12/10 zebraidx(6875) [log] Records: 14 i/u/d 1/13/0
15:32:00-12/10 zebraidx(6875) [log] zebraidx times:  6.78  0.85  0.78
```

In this sample, the penultimate line shows that 14 records have been processed, 1 has been inserted, 13 have been updated but none have been deleted.

19.4.5 Starting and stopping the marcgrabber

You need to be logged in as root to stop and start the marcgrabber process. The script resides in **/usr/local/marcgrabber/bin**.

To start the marcgrabber:

1. Log in as **root**.
2. Enter the command:

   /usr/local/marcgrabber/bin/marcgrabberctl.sh start

To stop the marcgrabber:

1. Log in as **root**.
2. Enter the command:

   /usr/local/marcgrabber/bin/marcgrabberctl.sh stop

Always use the script with the stop command to stop the marcgrabber process. Terminating the PID may corrupt the indexes.

19.4.6 Rotating the log files for the Zebra indexes

The log files for the zebra process grow very quickly so it is important to rotate them on a regular basis. See the Solution: “How do I set up logrotate” for more information. The logs should be rotated at least once per week.

The following logs should be rotated:

- In /usr/opt/blcmp/talis/reports:
- mcoll_dae_history.log
- mcoll_dae_history.rep
- mcoll_dae_history.err
- In /var/tmp:
- marcgrabber_<database>.out
- zebra_bib_index_<database>.log
- zebra_auth_index_<database>.log
- grab_delta_<database>.log

19.4.7 Rebuilding the Zebra indexes

Changes to OPAC collections (also referred to as Mindexes) or indexing criteria will require a complete rebuild of the zebra indexes. The marcgrabberctl.sh is used to set the marcgrabber to build mode to achieve this.

Rebuilding the zebra indexes could impact the general performance of the system so should be completed at a quiet time on the system. The time required is variable depending on a variety of factors, including the processing power, memory and disk space of your hardware, the number of collections, and the number of Work records to be processed. The space required is also dependent on a number of factors. If you have concerns about disk space then contact the Service desk for advice on this.

If you would like the job to run overnight it’s a good idea to create a script which can then be put into the cron. This section describes the steps to go through to rebuild the indexes and then the things to include in the script.

When rebuilding the indexes (initial or build mode) the marcgrabber does two things:

1. It extracts MARC21 data
2. It runs the zebraidx process to build the zebra indexes

Once the rebuild is complete the marcgrabber will automatically go into update mode.

Note: If you are adding a new collection you will need to run **auto_access_points** first to ensure all bib records are processed by the mcoll daemon.

19.4.8 Availability of Zebra indexes during the rebuild

During the index rebuild staff and Prism users will not be able to search the Zebra indexes, they will see “ZOOM ERROR” messages instead. It is possible to point Talis Prism at the LMS indexes temporarily so that they are unaffected by this process. See the Talis Solution “Switching Prism to the old indexes” under Talis Prism 2.1 section.

19.4.9 Securing the zebra indexes

Because the zebra indexes reside in the UNIX file system they will usually be secured as part of a **full_softdump** or **ufs** dump. Generally they are comparatively quick to rebuild and therefore it is not usually essential to secure them before starting a rebuild.

19.4.10 Steps to complete when rebuilding the zebra indexes

1. Login as **root** and stop the marcgrabber using:

   ```
   /usr/local/marcgrabber/bin/marcgrabberctl.sh stop
   ```

2. Empty the log files (so it is easier to see what is going on) using the commands:

   ```
   >/var/tmp/zebra_auth_index_prod_talis.log
   >/var/tmp/zebra_bib_index_prod_talis.log
   >/var/tmp/grab_initial_prod_talis.log
   ```

3. Login as **root** and set the marcgrabber to build mode:

   ```
   /usr/local/marcgrabber/bin/marcgrabberctl.sh build
   ```

4. Login as **root** and start the marcgrabber:

   ```
   /usr/local/marcgrabber/bin/marcgrabberctl.sh start
   ```

19.4.11 Checking the progress of the rebuild of the zebra indexes

You can check the progress of the build by looking at a number of files.

Periodically look at the **marcgrabber** parameter file. It will show when the process has switched from initial or build mode to delta (update) mode. (i.e. the build has completed). To do this, enter the command:

```
pg /scratch/altoindexes/marcgrabber_daemon_<database>.cfg
```

For more detailed information about how the build is progressing, you can check the following:

- The progress of the grab stage. To do this, enter the following commands:

  ```
  cd /var/tmp
  grep "Grab range" grab_initial_prod_talis.log
  ```

  It will return lines similar to the following:

  ```
  <info> Mon Jul 16 10:08:42 2007: [Launch] Grab range is from WID: 0 to WID:
  200000
  <info> Mon Jul 16 10:11:40 2007: [Launch] Grab range is from WID: 200001 to WID:
  400000
  ```

```
<info> Mon Jul 16 10:12:40 2007: [Launch] Grab range is from WID: 400001 to WID:
600000
<info> Mon Jul 16 10:12:40 2007: [Launch] Grab range is from WID: 600001 to WID:
800000
<info> Mon Jul 16 10:12:41 2007: [Launch] Grab range is from WID: 800001 to WID:
10000000
```

- Once it has processed all the WIDs (WORK_IDs) in the WORKS_META table it will go onto the indexing stage. To check the progress of the indexing stage, enter the following commands:

  cd /var/tmp
  grep "i/u/d" zebra_bib_index_prod_talis.log | pg

  This is likely to return a large number of lines. You are looking for a set where the insert value is high. For example:

  Records: 0 i/u/d 203000/0/0

19.4.12 Scheduling the rebuild of the zebra indexes to take place in the cron

The script needs to include the following lines. It should be scheduled in the cron to run as root.

/usr/local/marcgrabber/bin/marcgrabberctl.sh stop
>/var/tmp/zebra_auth_index_prod_talis.log
>/var/tmp/zebra_bib_index_prod_talis.log
>/var/tmp/grab_initial_prod_talis.log
/usr/local/marcgrabber/bin/marcgrabberctl.sh build
/usr/local/marcgrabber/bin/marcgrabberctl.sh start

19.5 Updating and rebuilding the LMS indexes

19.5.1 Description

New additions to stock, deletions or changes to existing works are reflected into the LMS indexes by running a UNIX script called **update_daily_access_points**. This should be run each night by the **talis** UNIX account, following cataloguing work during the working day. This regular task can be scheduled in the **cron**.

19.5.2 Talis MARC tags

The LMS indexes are rebuilt using a script called **auto_access_points**. You can amend which Talis MARC tags are included using a script from the Talis Developer Network which is available from http://www.talis.com/tdn/alto_script. A standard configuration is supplied with your Talis system.

19.5.3 update_daily_access_points

The **update_daily_access_points** script resides in the **/usr/opt/blcmp/talis/utils/bin** directory. It should be run each night to update the LMS indexes within the database. This is normally run from the UNIX cron, but it can be started manually. It is not essential that all users are logged off before running this, although they may experience a slight degradation in performance whilst it is running.

This script calls two daemon processes. The first is **mcoll_dae**, which identifies which collections works should be part of; the second is **access_points_dae**, which assigns works to LMS indexes.

Starting update_daily_access_points

1. Logon to UNIX as **ops**
2. Enter the command:

   update_daily_access_points

Checking update_daily_access_points

You must check first thing in the morning that **update_daily_access_points** has completed successfully. This can be checking the **access_points_dae.log** file beneath the **/usr/opt/blcmp/talis/reports** directory. This directory also contains a report file:

19.5.4 access_points_dae.log

This log gives an account of when the process was started. It indicates that the **access_points** daemon is running in update mode and shows the number of works read so far. If there are large numbers of works then a fresh line will be started for each successive 1,000 works processed. Providing this daemon has been terminated legally, the final line of the log will indicate the date and time when it was stopped.

19.5.5 access_points_dae.rep

This indicates the number of records processed, the speed with which they were processed and the number of updates to the various LMS database indexes.

19.5.6 Interrupting update_daily_access_points

You can check whether **update_daily_access_points** is still running by entering **ps -ef | grep access** at the UNIX prompt.

Should you need to do so, **update_daily_access_points** can safely be interrupted by terminating the process. However, the source of the delay in completing the process should be identified, as any unprocessed works will be carried over to the next run. As such, the delay is likely to re-occur.

19.5.7 auto_access_points

Changes to OPAC collections (also referred to as Mindexes) or indexing criteria will mean that the **mcoll** daemon should be run against all the bib records. This can be achieved by running the UNIX script called **auto_access_points**.

auto_access_points regenerates the LMS indexes, and should be executed with no other processes running against the system, and when there is sufficient time for it to complete. The time required is variable dependent upon a variety of factors, including the processing power, memory and disk space of your hardware, the number of collections, and the number of Work records to be processed.

19.5.8 Subordinate processes

The **auto_access_points** script calls two main processes:

- **mcoll_dae** (builds the collections)
- **access_points_dae** (rebuilds the LMS indexes)

It also calls the **build_opac** script with a number of default conditions. By default this will build all indexes. The **build_opac** script can be run independently if it is necessary to run indexes on an individual basis. For example:

build_opac –sscratch –make_collection –author –title -keyword -class –number –READONLY –LOADONLY

where:

–READONLY specifies that the data will be extracted and processed, but the revised data should not be loaded into the Talis database

and

–LOADONLY specifies that the processed data files should be loaded.

19.5.9 auto_access_points checklist

The following should be considered before running aurto_access_points

- Take a backup of the **prod_talis** database using **full_dbdump**.
- If possible, ensure that sufficient time is available to complete the run. The report file from any previous LMS index re-build may still be available to view. If so, it will be found in the **/scratch** directory and is called **access_points.report**. It will include start and end times of previous runs. However, be aware that adding a new collection or new MARC tags as access points, can make a significantly increase the time taken to complete the process.
- Suppress the **cron** process or apply an empty cron file (having first secured a backup).
- Ensure that all Web-based LMS index services are suspended i.e. **Talis Prism**.
- **auto_access_points** appends its output to the previous report file, so may include the information from several previous runs. You are advised to rename the previous report file so that a new file is created by using the UNIX cp command thus:

  mv /scratch/access_points.report /scratch/access_points.report.old

  Do not delete **access_points.report** as it provides a useful record for predicting how much disk space and time should be allocated for future runs.

- Schedule the job using **cron** or **at**.
- Check if **auto_access_points** is still running: using the following command:
  ps -ef | grep build_opac
- Check the success of the job by viewing **/scratch/access_points.report**
- Take a further backup of the **prod_talis** database to a different tape, using **full_dbdump**. After running **auto_access_points**, it is vital to perform a **full_dbdump** in order to re-start transaction logging on the database. This applies whether or not the process completed successfully.

19.5.10 Interrupting auto_access_points

Do not terminate the auto_access_points process without consulting **Talis Support**. The process goes through a number of stages including the removal of the existing LMS indexes. Termination at the wrong point may leave you without any LMS indexes i.e. browse searching in Talis Prism will not work.

20. Management Information

20.1 About this section

This chapter provides an overview of Talis Decisions and perl reporting.

Upon completing this chapter, you should be able to:

- Navigate decisions
- Have an understanding of the perl report structure

20.2 Introduction

Reports within Talis fall into 2 groups:

- Reports that provide management information (for example, loan counts)
- Reports that are essential to the library's business (for example, overdue letters)

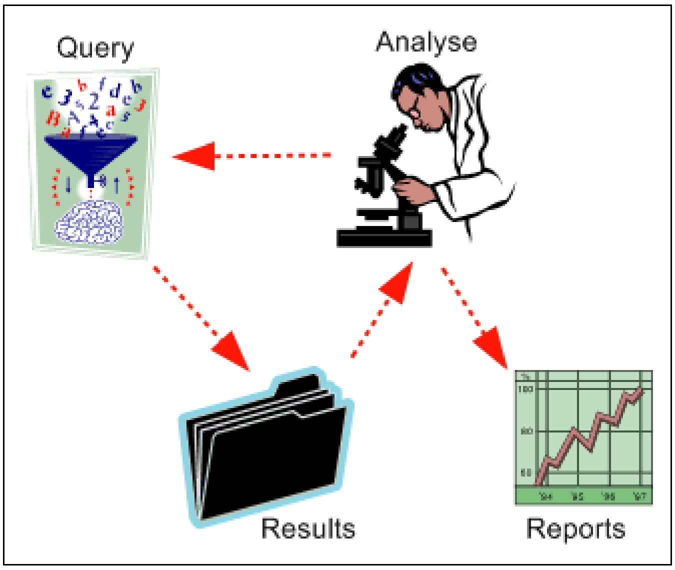
There are two main methods of generating documents from the Talis database.

1. **Talis Decisions** is based on a third party product (Business Objects Xi) which offers both Web based and full application reporting tools, with drag and drop technology. The Talis Decisions is configured to access the Alto database (**prod_talis)**. The database is not updated in any way by Talis Decisions.
2. Many standard Talis scripts have been written in **Perl** (Practical Extraction and Report Language). This is an open source programming language, which allows scope for local customisation of formats and select criteria.

   Perl scripts are run from the UNIX command prompt or can be scheduled from the cron and often go beyond the scope of management information, being directly related to business functionality (for example, overdues or recall letters). Significantly, Perl scripts will often make changes within the database rather than simply extracting information. For this reason they are usually run against the live database rather than a copy on the MIS machine.

20.3 Talis Decisions

Talis Decisions aids decision making. Talis Decisions enables you to gain easy access to data that can inform the decision making process. It enables you to query data, analyse the results and produce output, as shown in the following diagram:

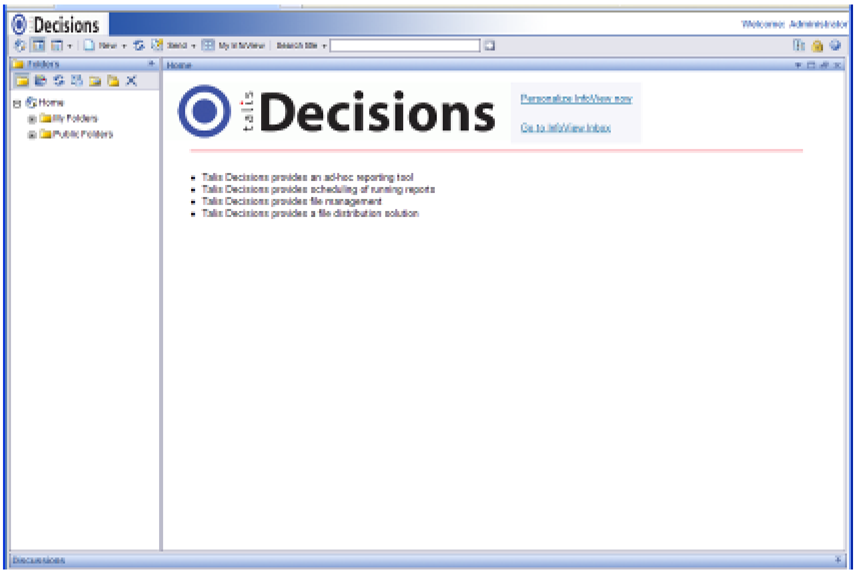


The key advantages of Talis Decisions are:

1. The learning curve required to enable use of Decisions is short. There is no requirement to learn Structured Query Language (SQL) or understand relational databases, particularly the structure of the Talis database, before being able to make queries. Decisions uses ‘objects’ based on business terms that are held in ‘universes’.
2. There is an easy-to-use interface.
3. There is no longer a reliance on information systems departments to produce reports.
4. The data is secure and easy to maintain.

20.3.1 InfoView

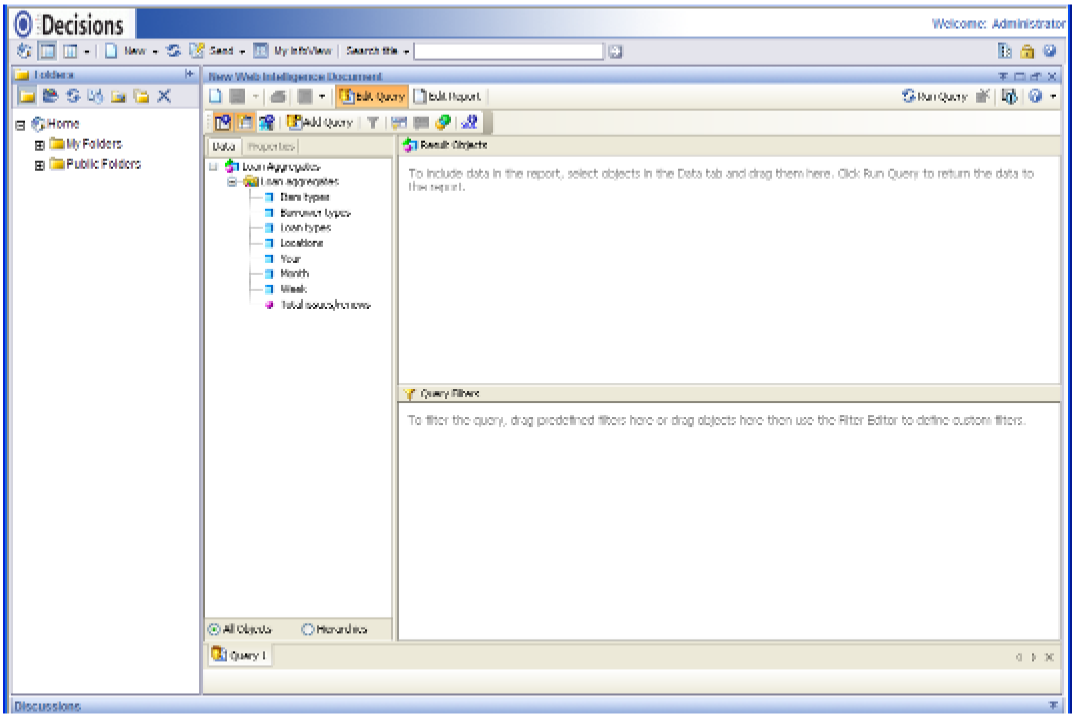
InfoView is a portal which allows you to view, schedule, refresh Talis Decisions documents and bring together and organise other management information.



- Talis Decisions provides an ad-hoc reporting tool
- Talis Decisions provides scheduling of running reports
- Talis Decisions provides file management
- Talis Decisions provides a file distribution solution

InfoView can store a variety of files, not just Web Intelligence and Desktop Intelligence documents, but also Word, Excel, PDFs and PowerPoint and other documents. This enables the creation of a rich environment to meet management information needs. InfoView is used to organise, refresh, schedule and disseminate reports either within Decisions and via email. It is also used to invoke Web Intelligence to create and modify reports.

20.3.2 Web Intelligence



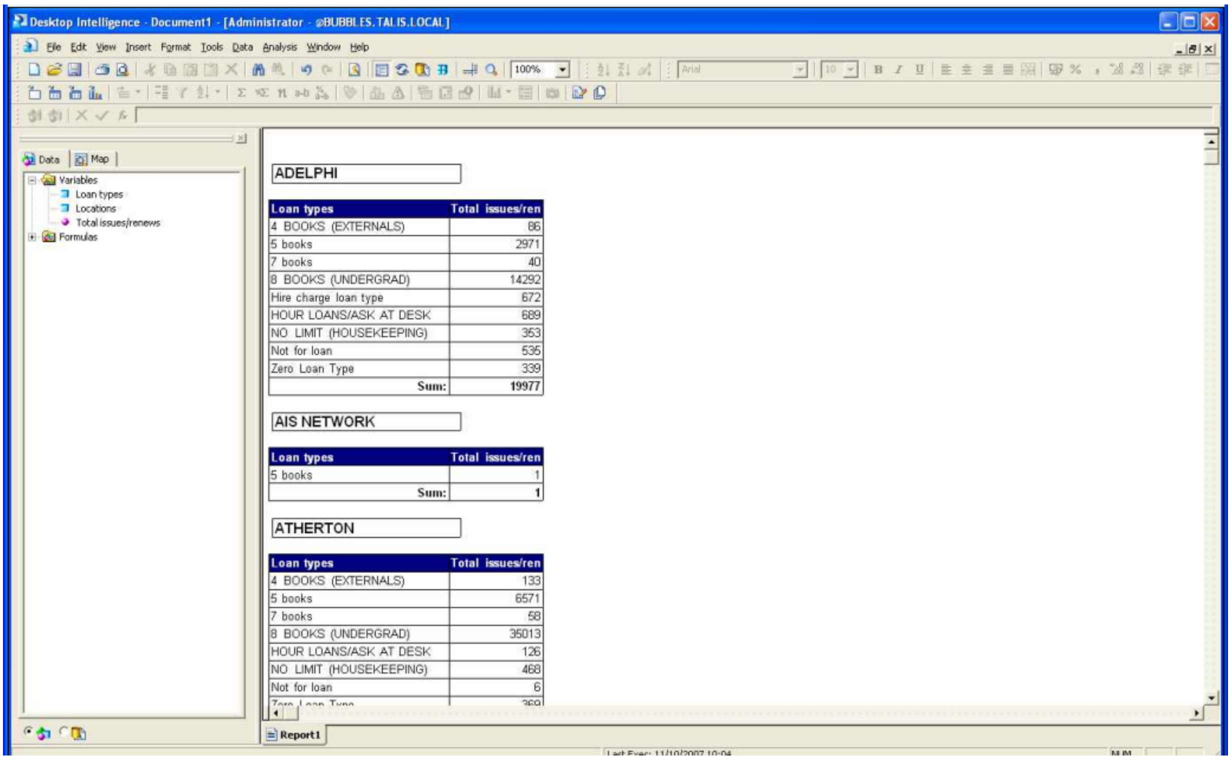
To include data in the report, select objects in the Data tab and drag them here. Click Run Query to return the data to the report.

To filter the query, drag predefined filters here or drag objects here then use the Filter Editor to define custom filters.

This is an enterprise application which is a Java applet that eliminates the need for client-side installation. It provides organisations with a cost-effective way to broadly deploy query writing and document delivery.

20.3.3 Desktop Intelligence

Desktop Intelligence is a PC based querying, analysis and reporting tool. It provides all the functionality of Web Intelligence. Reports produced in Desktop Intelligence can be viewed in InfoView and converted into Web Intelligence documents.


Desktop Intelligence - Document1 - [Administrator - @BUBBLES.TALIS.LOCAL]
File Edit View Insert Format Tools Data Analysis Window Help
Data
Map
Variables
Loan types
Locations
Total issues/renews
Formulas
Report1

ADELPHI

Loan types	Total issues/ren
4 BOOKS (EXTERNALS)	86
5 books	2971
7 books	40
8 BOOKS (UNDERGRAD)	14292
Hire charge loan type	672
HOUR LOANS/ASK AT DESK	689
NO LIMIT (HOUSEKEEPING)	353
Not for loan	535
Zero Loan Type	339
Sum:	19977

AIS NETWORK

Loan types	Total issues/ren
5 books	1
Sum:	1

ATHERTON

Loan types	Total issues/ren
4 BOOKS (EXTERNALS)	133
5 books	6571
7 books	58
8 BOOKS (UNDERGRAD)	35013
HOUR LOANS/ASK AT DESK	126
NO LIMIT (HOUSEKEEPING)	468
Not for loan	6
Zero Loan Type	369

20.4 Perl MIS reports

A series of Talis Perl reports are shipped as standard (such as overdue letters and printed orders) within Talis Alto. Perl also allows scope for local customisation of formats and select criteria. Talis scripts written in Perl are recognisable by their .pl file extension. A separate UNIX login called **report**, is provided for running Talis Perl reports.

20.4.1 Talis Perl report structure

Each standard Talis Perl report is made up of a parameter file and five files of Perl code.

The parameter file for each report is located in the **/usr/opt/blcmp/talis/mis/param** directory and bears the name of the report, for example, **orr_order_letter**

One of the functions of the parameter file is to indicate whether a local version of, for example, a format is to be used instead of the default version.

The Perl code files are located in a directory, which also bears the name of the report, under **/usr/opt/blcmp/talis/mis**.

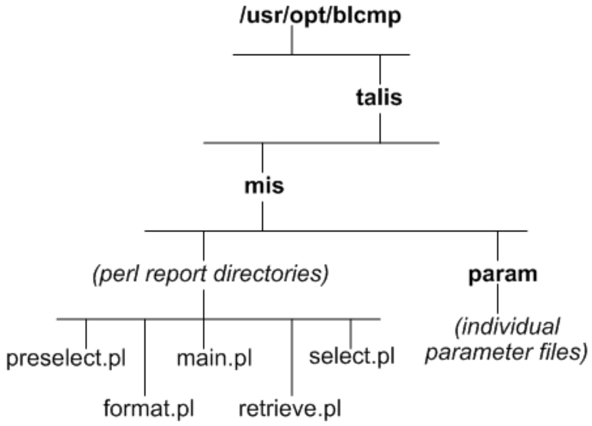
The code files are:

- **main.pl** - the main body of the program
- **preselect.pl** - a template which can be edited if local variations of select criteria are required
- **select.pl** - refines the returned data rows

- **retrieve.pl** - obtains the data required for output file
- **format.pl** - a template for output formatting

20.4.2 Perl MIS environment

The following diagram shows the directory structure of the Perl MIS environment:



20.4.3 Running Perl reports

You must be logged as the user called **report**. The basic syntax for running a Talis Perl report is:

```
report  -p[report_name]
```

The **-p** switch is mandatory for every report and identifies the report parameter file. There are a number of other optional switches, which vary according to which report is being run. The command:

```
report  -p[report_name]  -h
```

Will display a summary of all the switches which can be applied to a given report.

By default, both the output file and the report file are written to the directory **/usr/opt/blcmp/data/mis**.

Subsequent runs of the report overwrite neither the output file nor the report file. They are preserved by the addition of a date/time suffix to the last output and report file.

For example, to produce a file of all orders created since 1st September 2002, you would use the command:

```
report  -porr_order_letter  -b01/09/02
```

This would create a file of orders in the directory **/usr/opt/blcmp/data/mis** called **orr_order_letter.out** with a corresponding report file **orr_order_letter.out** .

20.4.4 Significant Perl MIS reports

You will need to determine which Perl MIS reports are appropriate to your library. A full listing of Talis Perl reports can be found in the Talis Scripts Help which is available from http://www.talis.com/scripts . However, what follows is a list of some of those reports that you are most likely to consider employing:

Report	Description
loa_odue_charges	Produces overdue notices for all Borrowers that have outstanding loans within a date range.
res_waiting_letter	Produces reservation notices to Borrowers to inform them that their reserved items are available for collection. It updates the database to record the fact that the letter has been sent out.
rec_loa_letter	Produces Recall Notices for item's that have already been recalled by online Talis. It updates the database to record the sending of the relevant Recall Letter.
orr_order_letter	Produces Purchase Orders. It can process individual orders or outstanding orders from a start date.
edi_orders_list	Lists all orders waiting to be sent to Suppliers with an "Awaiting transmission" status, and/or all unsuccessful EDI Order transmissions with a "Transmission failed" or "Conversion failed" status.
oor_order_letter	Produces Purchase Orders for Open Orders. The report can process individual Open Order(s) or outstanding Open Orders from a start date.
orr_order_letter	Produces Purchase Orders. The report can process individual Open Order(s) or outstanding Open Orders from a start date.

21. Local versions of shell and perl scripts

21.1 About this section

The purpose of this chapter is to provide an overview on setting up local shell and Perl scripts.

Note this only applies to new installations of Talis Products - but is a good practice that you can emulate.

Upon completing this chapter, you should be able to:

- Have an understanding of the local script structure.

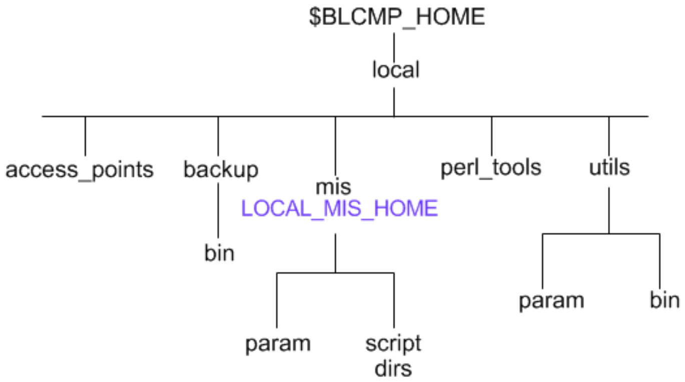
21.2 Introduction

It may be necessary to create your own shell and Perl scripts or create local versions of standard Talis scripts.

For instance it is likely that the text of the overdues may vary from the shipped text or that you require different versions for different borrower types e.g. adult and junior. This requires changing the standard overdues script, loa_odue_charges or even creating multiple versions. These need to be held in a local area so any changes are not lost during an upgrade.

The same is potentially true for utilities scripts or you may have written your own shell scripts.

In order to make managing such scripts straightforward there is a default location for scripts.



$BLCMP_HOME/local/mis

This reflects the standard directory structure for mis scripts. Every component of a script that is altered needs to be copied to this directory. An environment variable LOCAL_MIS_HOME needs to be set for each user that needs to run the local versions.

A training course exists for configuring local mis scripts.

$BLCMP_HOME/perl_tools

The Perl scripts use common subroutines called Perl tools and changing these for one script could affect other scripts detrimentally. Any non standard perl tools can be placed in here and accessed.

Further details on local perl tools is available on the Talis Developer Network.

$BLCMP_HOME/utils/bin and $BLCMP_HOME/utils/params

Variations of utils scripts can be placed here and it is the default location for customers own scripts.

Any scripts need to be called using the full path.

$BLCMP_HOME/access_points

For opac collection stored procedures

$BLCMP_HOME/backup/bin

For variants of database scripts. e.g. dump2disk.pl

It is possible to create additional directories under $BLCMP_HOME/local as required.

22. Webmin

22.1 About this section

The purpose of this chapter is to demonstrate what you can and shouldn't do with Webmin

Upon completing this chapter, you should be able to:

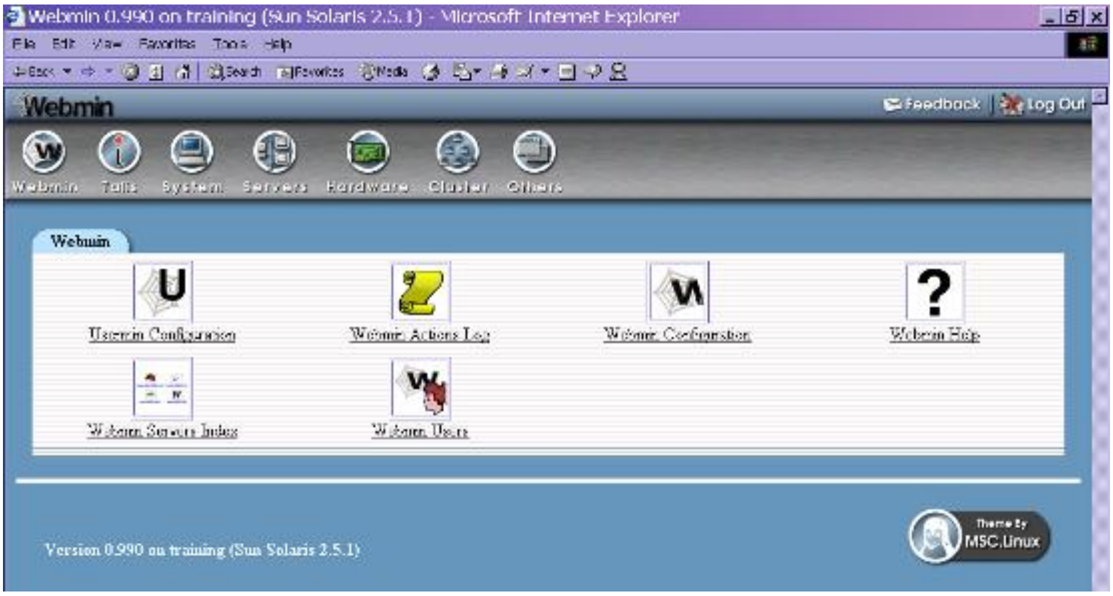
- Use webmin to mange aspects of prism 2.n
- Understand the limitations of Webmin

22.2 Introduction

Webmin was written in Perl by Jamie Cameron and is a Web-based, password protected interface for the system administration of UNIX. It can be accessed via any browser that supports tables, forms and Java. It can be used to set up user accounts, set environment variables, edit files, run custom commands and more.

Webmin consists of its own Web server, and a number of (CGI) programs, which update system files. The Web server and the CGI programs are written in Perl version 5.

Webmin may be freely distributed and modified for commercial and non-commercial use.



It is possible for individuals to create their own Webmin modules. The version supplied by Talis contains modules especially written for use with the Talis system.

22.3 Modules

Each Webmin Module is intended to manage a single service or system administration function. Modules are grouped together under one of four headings, according to the purpose of the Module:

- Webmin
- Talis
- System
- Servers
- Hardware
- Cluster
- Others

22.4 Module description

Field	Description
Webmin Configuration	Configure settings such as access, colour scheme for Webmin itself.
Webmin Help	Search and browse Webmin's own help facilities.
Webmin Servers Index	Find and provide links to other servers running Webmin on your network.
Webmin Users	Control who can access Webmin and what they can do within Webmin.
Bootup and Shutdown	Configure the boot and shutdown process of your machine; shutdown or re-boot the machine.
Running Processes	Examine running processes, kill off processes if required.
Scheduled Cron Jobs	Manage the UNIX 'cron' (scheduling) facility.
Software Packages	Manage software installed using the Solaris 'package' tool.
Users and Groups	Add, edit and remove UNIX users and groups.
Manage Talis GUI Server	Start and stop the Talis GUI server process.
Network Configuration	Configure machine's network settings.
Printer Administration	Manage print queues.

Field	Description
Custom Commands	Run UNIX programs and commands via Webmin.
External Web Resource	Link to other Web resources.
File Manager	Manage Files on UNIX machine.
Install Talis GUI PC Client	Download GUI Client software to PCs from this Module.
Manage Environment Variables	Help with the management of Talis-related environment variables.
Manage Programs and Scheduled Tasks	Enhanced UNIX 'cron' (scheduling) module. Also includes help on commonly used Talis batch software.
Manage Talis Users	Add or remove the privilege to use Talis or Tutor Talis for a UNIX login.
Prism	Configure Talis Prism.

22.5 Tutor

There is no equivalent 'Tutor' environment for Webmin. Thus changes made through Webmin are always 'for real'. This should be borne in mind when familiarising yourself with the operation of Webmin.

22.6 Installation

Webmin requires Perl Version 5.005. This version of Perl software is installed when loading Talis 10.

22.7 Configuration

When Webmin is first installed, it allows access from any IP address. Therefore, as soon as possible after installing you should restrict access to appropriate IP addresses (such as your own PC). To do this, connect to Webmin on your machine by pointing your browser at the URL specified at the end of the Webmin installation. Typically this will be something like:

http://yourmachine.network:10000/

By default, the port number will be set at 10000.

1. Log in using the user name and password that you supplied when you installed Webmin.
2. From the Webmin section click the **Webmin Configuration** module. You will be presented with a page of sub-modules.

3. Click the **IP Access Control** sub-module icon.
4. If the **Allow from all addresses** radio button is highlighted then Webmin is currently available to users at all locations. If so, restrict access to Webmin to selected IP addresses as shown below:
5. Choose the **Only allow from listed addresses** radio button and enter the IP addresses (or networks) from which you wish to allow access to Webmin.
6. Click on the **Save** button to save your changes.

22.8 Users

When you install Webmin, three users are installed, each with differing levels of access to Modules. It is necessary to configure the users so that they reflect the users who need access to Webmin. The supplied default users are:

- admin
- root
- talis

You may wish to change some or all of the above users. Modules may be added to, or removed from, a user's login using the **Webmin Users** module. Webmin users can also be added or deleted using the **Webmin Users** module.

22.8.1 Admin

You may have chosen a different name for this user when installing Webmin, but hereafter references to this login will use the default name **admin**. The password for this user will have been set at the time of installation. The **admin** user has access restricted various modules including the following:

Webmin modules (admin user)	
Webmin Configuration	Webmin Help
Webmin Servers Index	Webmin Users
Bootup and Shutdown	Running Processes
Scheduled Cron Jobs	Software Packages
Users and Groups	Manage Talis GUI Server
Network Configuration	Printer Administration
Custom Commands	External Web Resource
File Manager	Install Talis GUI PC Client
Manage Environment Variables	Manage Programs and Scheduled Tasks
Manage Talis Users	Telnet Login

22.8.2 Root

The **root** login has access to all available Webmin modules. In addition to those available to the admin user, root also has access to the following modules:

Webmin modules (root user)	
Disk Quotas	Disk and Network Filesystems
NFS Shares	SysV Init configuration
System Logs	Apache Webserver
BIND 4 DNS Server	BIND 8 DNS Server
DHCP Server	wu-FTP Server
Internet Services and Protocols	Majordomo List Manager
MySQL Database Server	Samba Windows File Sharing
Sendmail Configuration	Squid Proxy Server
Partitions on Local Disks	

22.9 Using Webmin

22.9.1 Starting and stopping Webmin

Webmin exists as a daemon process on the UNIX system. As such, starting or stopping the Webmin process is achieved by entering commands at the UNIX prompt.

For added security, the System Manager may choose to start the Webmin process prior to use and to stop it when finished.

To start Webmin, log in as **root** and enter:

```
/etc/webmin/start
```

To stop Webmin, log in as **root** and enter:

```
/etc/webmin/stop
```

22.9.2 Changing Webmin passwords

This can be achieved via the Webmin interface, whilst logged in as **root**. Alternatively, passwords can be changed at the UNIX prompt by running the script **changepass.pl**. This script is supplied within the installation file for Webmin. It is not installed as standard.

22.10 Useful webmin related unix commands

To see if webmin is running Webmin shows as a script called miniserv.pl

ps -ef | grep mini

To see which port webmin is listening on. look for a port in the 10000 range.

netstat -nap | grep LISTEN

22.11 Further Information

Further information on Webmin can be found online at:

www.webmin.com

There is also an independent guide available from:

www.swelltech.com/support/webminguide/index.html

23. Talis Services – Support

23.1 About this section

This section explains how to raise support calls with Talis.

Upon completing this chapter, you should be able to:

- Have an understanding of how to raise calls and in what format
- Raise concerns/issues helpful documentation on LIS Talis and the forums
- Access the Talis website/forums and navigate to locate information

23.2 Availability

The core hours of support are between 08:30 and 17:30.

Extended support is available Mon – Fri 17:30 – 20:00 and Sat 09:00 – 16:00 at an additional cost

If you are interested in subscribing to this service, please contact your Account Manager or email sales@talis.com.

23.3 Preparation

Before raising an incident with Talis Services – Support

- Gather information about the issue and check for existing solutions on the Talis Support web site. Also consult the relevant Talis documentation (also available online).
    - What screen were you looking at?
    - What did you expect to happen?
    - What actually happened?
    - Can you reproduce it with a different record?
    - Provide brief, precise details and examples of what worked and what didn't.
        - Which record were you using?
        - Authority ID
        - Bib ID
    - Can you get a screenshot of the error?
- If you can reproduce the problem, then note down the path taken. Also note any special circumstances that surround the problem (for example is it site or date/time specific).

- When raising a hardware call, you will need location and serial number information in addition to a problem statement.

23.4 Contacting Talis Services

23.4.1 Talis Support

The **Talis Services** Web site offers registered Talis customers the ability to raise, monitor or update support cases in real time. Your requests are logged to **Talis Services - My Support**.

In addition, customers can obtain answers from a knowledge base of past support cases and new solutions that are immediately visible to you.

The service is available 24 hours per day, 7 days per week.

You will not need to keep paper records of service requests you have raised with **Talis Services - Support**. **Talis Solutions™** allows you to see your open requests, your recent requests and even historical requests.

Talis Support can be accessed directly at http://support.talis.com

23.4.2 Telephone

Talis Services - Support telephone number is 0870 400 5400

23.5 Processing your case

- On raising your incident a confirmation email of receipt is sent to the contact, detailing the priority and brief description of the incident.
- During an initial 30 minutes analysis the case details are verified and the knowledgebase, FAQ's and PERS (Product Enhancement Request) /Defects are examined for previous resolutions. If no immediate resolution is found the case is reassigned for further detailed analysis.
- The status of logged incidents can be reviewed and updated at any time via access to Talis Solutions.

23.6 Case resolution

- Customers are notified when incidents are closed, this may be verbal or via email.
- Hardware calls are closed through the contractors contacting **Talis Services - Support** on completion of the work.

If a problem is diagnosed as being either a PER or a Defect, the customer is notified of the PER/Defect number and the case is then closed.

Product Enhancement Requests (PER's) & Defect fixes to the application will normally be addressed as part of a general or interim product release.

Existing PERS and Defects are searchable via The Talis My Support Services Portal.

23.7 Escalation

To escalate a call, please contact Sandra Lowe or Kristian Kelly, Senior Support Analysts on 0870 400 5400 or directly via their email address: sandra.lowe@talis.com or kristian.kelly@talis.com

23.8 The Talis Community

Talis have a community of users who have experience with day to day operations of Talis software. There is plenty of opportunity for you to get involved and share in the wealth of knowledge that Talis users have contributed.

23.8.1 LIS-TALIS

LIS-TALIS is an email list hosted on the jiscmail servers dedicated to system admin level Talis users. This list can be joined by finding the list at http://www.jiscmail.ac.uk/ and following the subscribe instructions. The list is independently managed by customers of Talis.

23.8.2 Talis Developer Network

http://www.talis.com/tdn is a source of extra scripts and utilities contributed by Talis users. This is also a place where you can ask questions on subjects of SQL and Perl scripting.

23.8.3 Talis Forums

http://www.talis.com/forums is where you can ask any question you like, related to both Talis software and issues affecting the library world in general. You can get assistance and guidance on best practice from other Talis Users or Talis staff.

23.8.4 Documentation

http://www.talis.com/applications/services/documentation.shtml

Full documentation of Talis products can be sourced from the website, along with updates on new product releases. RSS feeds are available to keep you in touch.