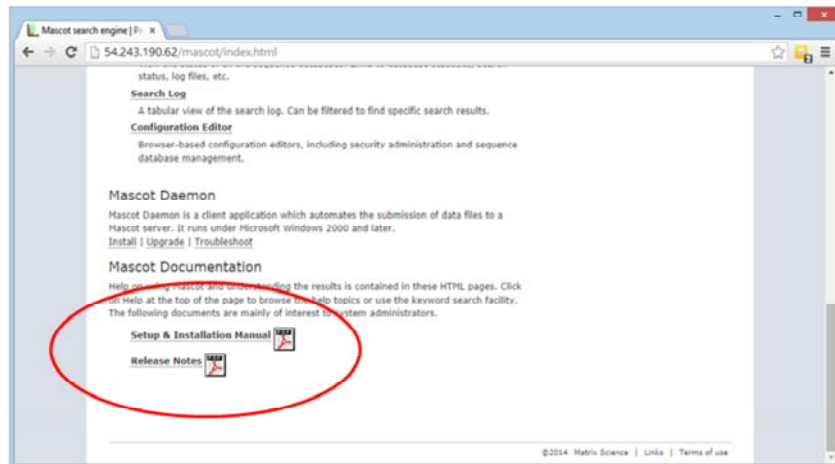


Administration & Configuration

MASCOT



Installation & Setup

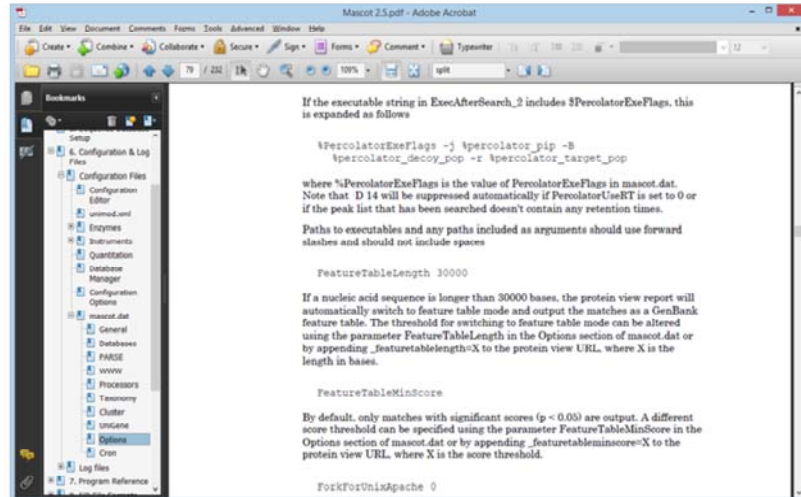


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The Mascot Installation & Setup manual is linked from your local Mascot home page. If you need detailed information on any aspect of Mascot installation or configuration, this is the place to look

Installation & Setup



This is an administrator's manual, not a user manual. You won't find much relating to how to submit a search or how to interpret the results. User help is in the Mascot HTML pages.

Installation & Setup

- Mascot Security
- Configuration Editor
- Log Files
- Cluster mode

These are the topics we will cover in this presentation

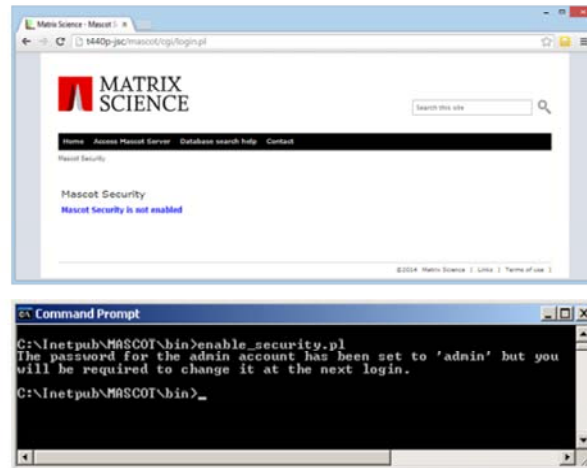
Mascot Security

Examples of how Mascot security can be used:

- Ordinary users can browse configuration files and status screens, but not make changes
- Certain sequence databases are 'private' to a group of users
- Limit some users to one search at a time while others can run many searches simultaneously
- Limit the length of searches from a particular group to 1 hour
- Prevent certain users submitting 'no enzyme' searches
- Let 'customers' view the results of searches run for them without being able to submit searches themselves.

Mascot security is not a substitute for a firewall. It won't stop your server being hacked or infected by a virus. It is a way of managing and allocating the Mascot Server resources.

Mascot Security - enable / disable



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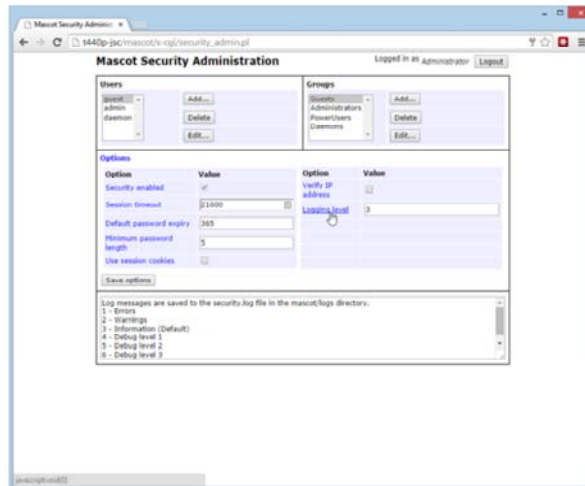


When Mascot is first installed, Mascot security is disabled. So, if you try to log in you will see this message.

To enable security, open a command prompt or a shell on the Mascot server, and change to the mascot/bin directory. Type `enable_security.pl` (or `./enable_security.pl` if Linux).

This takes a few seconds. If you forget the administrator password, it can always be reset to 'admin' by running this script again.

Mascot Security - administration



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All security configuration is browser based. The top level page of the security administration utility looks like this.

There is a list of users, a list of groups and a few options.

If you hold the mouse over any of the blue text, help will appear at the bottom of the screen.

The options shown on this page are global options, which apply to all users.

Reference:

You can't disable security from here - it has to be done on the server using the disable security command

The session timeout is in seconds. After this period of inactivity, the user will be required to login again.

The password expiry time is in days. After this period of time, the user will be required to enter a new password. Set to 0 to allow passwords to be permanent

Any new password must be at least this length.

Session cookies are automatically destroyed when the browser is closed. With some browsers, session cookies are not shared when a new instance of the browser is opened, which might mean that a user has to login again for each new window opened.

If verify the IP address is set, then any request to perform a privileged action will compare the IP address that the request is coming from with the one originally used to login.

Logging level should normally be left at 3

Mascot Security - “role based”

Users

- Login name
- Password, password expiry
- Full name, email address
- Account enabled / disabled
- Member of one or more groups.

Groups

- Name
- List of members
- List of allowed tasks.

Mascot security is “role based”. This means that privileges, known as tasks, are assigned to groups, not individual users.

Users gain these privileges by being members of one or more groups.

Mascot Security - tasks

For example

- Allow PMF search
- Allow MS/MS search
- Maximum number of queries
- Can view the search log
- Can search specific databases
- Can view other peoples results.

There are 30 different tasks that members of a group can be allowed to perform - for example:

Mascot Security - add user

The screenshot shows a web browser window titled "Mascot Security Administration - Add user". The URL is "19440p[sc]mascot[sc]cg[sc]security_admin[sc]". The page is logged in as an Administrator. The form contains the following fields and options:

- Name:** johns
- Password:** [masked]
- Password expiry:** ☐ Never, ☐ Default, ☒ Force change at next login
- Full name:** John Smith
- Email address:** johns@smc.ac.uk
- User type:** Standard Mascot user
- Account enabled:** ☒

On the right, there is a section titled "User is a member of the following groups" with a list box containing "Guests", "Administrators", "Administrators", and "Deputies". Below this is a note: "Multiple selections can be made by means of the shift and control keys (platform dependent)".

At the bottom of the form are "Add user" and "Cancel" buttons. A footer note states: "A user must belong to one or more groups. If a user belongs to multiple groups, then they have rights to perform the any of the tasks specified for any of the groups."

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Adding a new user is very simple.

The Administrator must enter a username and password and it is usually a good idea to force the user to enter a new password when they first login

Enter their full name and email address. The user will be able to change this

I'll return to the choice of user types later - most users should just be standard Mascot users.

Make sure that the account is enabled, and then select one or more groups for the user to belong to.

Example - Core Lab. Customer

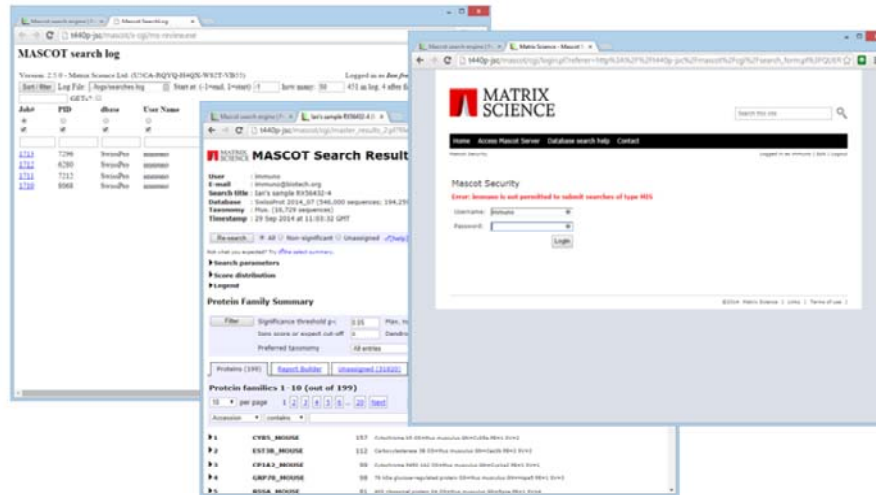
If you don't want the customers to be able to do any searches, but just view the results, then just give them the access to tasks:

SEARCH:	Allow all fasta databases to be searched
VIEW:	See search results from other people in your own group
VIEW:	Allow user to view the search log
ADMIN:	Allow use of Database Status application

In a core lab., you may want a group that enables customers to view their results. In this case, only give them rights to perform these tasks:

You must allow all fasta databases to be searched, otherwise they won't be able to view reports. However, they can't perform PMF or MS/MS searches, because this task is missing.

Example - Core Lab. Customer



A group member will be able to view the search log, see their results, but when they try to do a repeat search, access is denied

Example - Daemon & Distiller



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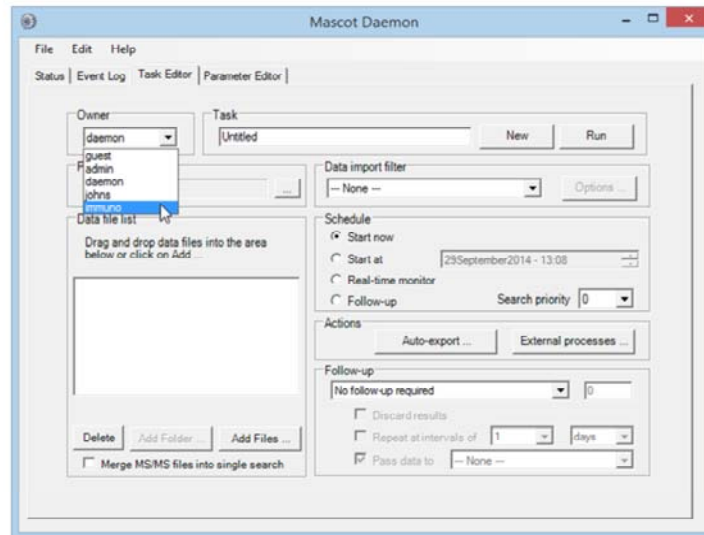


Client software, like Mascot Distiller and Mascot Daemon, requires special privileges. The Mascot Daemon user must have the security token 'Mascot Daemon is allowed to submit searches'. The default daemons group settings shown here are appropriate for either a Daemon or Distiller client.

View config files is required because both clients need to retrieve configuration information from the server, like a list of the databases that are available.

Mascot users can be given the privilege to submit searches under other user names. This is particularly useful in a core lab, when customers only have privileges to see their own search results, so the instrument operator needs to submit their searches under individual customer log-in names. The security task is 'For Mascot Daemon, allow spoofing of another user'.

Example - Daemon & Distiller



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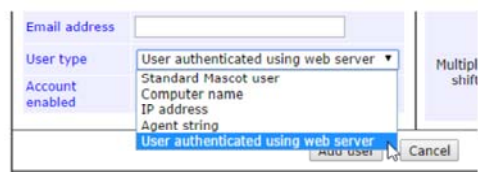
If this has been enabled for the user who is running Mascot Daemon, then a drop down list of other Mascot user names will be enabled on the Task Editor tab.

Example - 3rd party applications

Older applications that submit searches to Mascot won't have their own login

Try logging in using Internet Explorer before running the application - cookies

Use one of the 'special' user types:



The screenshot shows a dialog box for adding a user. It has a 'User type' dropdown menu with the following options: 'User authenticated using web server' (selected), 'Standard Mascot user', 'Computer name', 'IP address', and 'Agent string'. To the right of the dropdown is a 'Multipl shift' checkbox. At the bottom right are 'Add user' and 'Cancel' buttons.

There are potential issues with older, legacy applications that interface with Mascot but don't have code to support the security system.

Since session ids are saved as cookies, and since most Windows applications that access web sites use Microsoft Internet Explorer libraries, it may be sufficient just to login from an Internet Explorer browser window before starting the application.

Alternatively, you can use one of the special user types.

Example - 3rd party applications

Computer name / IP address

- Never have to log in from that computer
- Use the computer name / IP address as the 'name'

Agent string

- Can determine the agent string from the web server logs
- Not secure because someone could create another app to use this agent string

Web server authentication.

These methods are less secure than a password protected login, but ensure that all applications are able to connect somehow.

Mascot Security - general tips

- Plan carefully before implementation
- Login as admin to perform admin tasks
- Enabling Mascot security doesn't stop your server from being hacked.
- Moving Mascot to another computer?

Just copy over *user.xml*, *group.xml* and *security_options.xml*.

I can't stress enough that you should plan what you intend to do before you start. Think carefully about what groups you want to create

As any Unix administrator will tell you, it's always best to separate your administration and user tasks. However, we can't force you, but that is why the default admin user cannot submit searches.

It is very important to understand that Mascot security does not provide protection against a malicious hacker. Hackers don't attack a server through Mascot ... they've probably never heard of Mascot. They attack through weaknesses in the operating system and through flaws in well known applications, like the web server. It is still essential to have a dedicated firewall between the Mascot server and the Internet

Configuration Editor

(Almost) everything in Mascot is configured using text files in the config directory

- General settings - *mascot.dat*
- Masses and modifications - *unimod.xml*
- Enzymes - *enzymes*
- MS/MS ions series - *fragmentation_rules*
- Taxonomy categories - *taxonomy*
- Cluster geometry - *odelist.txt*
- Security - *group.xml*, *user.xml*,
security_options.xml, *security_tasks.xml*

(Almost) everything in Mascot is configured using these text files in the config directory. The syntax for each of these files is described in the manual.

Configuration Editor



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You can edit these files in a text editor, but it is easier and safer to use the browser-based Configuration Editor. The first three entries are interfaces to different sections of unimod.xml.

Configuration Editor

Symbol	Name	Monoisotopic	Average	Composition
13C	Carbon 13	13.003355	13.0034	13C
15N	Nitrogen 15	15.000109	15.0001	15N
18O	Oxygen 18	17.999160	17.9992	18O
2H	Deuterium	2.014102	2.0141	2H
Ac	Acetate	42.010595	42.0207	C(2) H(3) O(2)
Ag	Silver	106.905092	107.8682	Ag
As	Arsenic	74.921594	74.9216	As
Au	Gold	196.966542	196.9666	Au
B	Boron	11.009306	10.811	B
Br	Bromine	79.918336	79.904	Br
C	Carbon	12	12.0107	C
Ca	Calcium	39.962591	40.078	Ca
Cd	Cadmium	112.903357	112.411	Cd
Cl	Chlorine	34.968852	35.453	Cl
Co	Cobalt	58.933196	58.9332	Co
Cr	Chromium	51.940510	51.9961	Cr
Cu	Copper	62.929599	63.546	Cu
dHex	Deoxy Hexose	146.057909	146.1412	C(6) H(10) O(4)
F	Fluorine	18.998403	18.9984	F
Fe	Iron	55.934939	55.845	Fe
H	Hydrogen	1.007825	1.0079	H
Hex	Hexose	180.063388	180.1666	C(6) H(12) O(6)
Hex	Hexose	162.052624	162.1466	H(10) C(16) O(5)
HexNAc	Hexosamine	176.032086	176.1241	C(8) H(14) N(1) O(6)
HexNAc	N-Acetyl Hexosamine	203.079372	203.1925	C(8) H(13) N(1) O(5)
Hg	Mercury	200.595847	200.59	Hg
I	Iodine	126.904473	126.9045	I
K	Potassium	39.0983707	39.0983	K
Kdu	3-deoxy-D-glucero-D-galacto-nonulosonic acid	250.048868	250.2027	C(9) H(14) O(8)
Kdu	2-keto-3-deoxyoctulosonic acid	220.059383	220.1787	C(8) H(12) O(7)
Li	Lithium	7.016003	6.941	Li
Mg	Magnesium	24.30467	24.305	Mg
Mn	Manganese	54.938047	54.9380	Mn
Mu	Molybdenum	95.94	95.94	Mu

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You may need to add or edit an element or an amino acid, but its fairly unlikely.

Configuration Editor

Unimod - protein modifications for mass spectrometry

Logged as unimod | Log out | Change password | Advanced search

Search for: Any field Contains Show all Search Details found: 531 Page 7 of 27 Records Per Page: 20

Select/Unselect all Delete selected

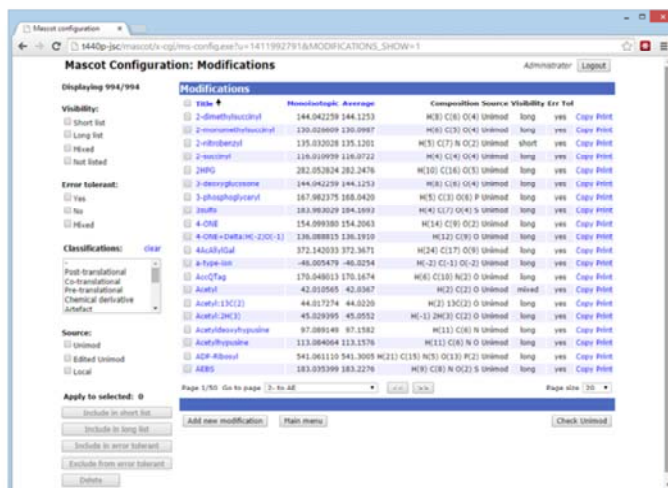
	Accession #	PSI-MS Name	Interim name	Description	Monoisotopic mass	Average mass	Composition
Edit Copy View	267	Label:13C(6)15N(4)	13C6-15N4	13C(6) 15N(4) Silac label	10.006269	9.9296	C(-6) 13C(6) N(-4) 15N(4)
Edit Copy View	452		Ser->Pro	Ser->Pro substitution	10.020735	10.0379	HE2 C(2) O(-1)
Edit Copy View	269	Label:13C(9)15N(1)	13C9-15N1	13C(9) 15N(1) Silac label	10.027228	9.9273	C(-9) 13C(9) N(-1) 15N
Edit Copy View	664		Thr->Ile	Thr->Ile substitution	12.036386	12.0538	H(4) C(2) O(-1)
Edit Copy View	660		Thr->Asn	Thr->Asn substitution	12.995249	12.9988	H(-1) N
Edit Copy View	337	Methylamine	MethylamineST	Michael addition with methylamine	13.031634	13.0418	HE3 C N O(-1)
Edit Copy View	358	Pro->isoPro-Glu	Pyroglutamic	proline oxidation to pyroglutamic acid	13.979265	13.9835	HE(-2) O
Edit Copy View	288	Trp->>Oxaladione	Oxaladione	tryptophan oxidation to oxaladione	13.979265	13.9835	HE(-2) O
Edit Copy View	34	Methyl	Methyl	Methylation	14.015458	14.0266	HE2 C
Edit Copy View	938		Asp->Glu	Asp->Glu substitution	14.015458	14.0268	HE2 C

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The modifications file, unimod.xml, is an XML representation of a public database called Unimod. This is the interface to the public database. From time to time, you should update your local file by downloading the latest file using the links in the Unimod help

Configuration Editor



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If you need to add a new modification that will be of interest to others, it's best to add it to the public Unimod database, so that the information is available to all Mascot users. If you want to create a local definition, because the modification is confidential or because you are just experimenting. If so, use the Modifications section of the configuration editor

Configuration Editor

The screenshot shows a web browser window titled 'Mascot configuration' with the URL '1440p-jsc/mascot/ox-ep/mco-configure/?m=1411952791'. The main content area is titled 'View Modification : Piperidine' and includes a 'Logout' link for the 'Administrator' user. Below the title, there are tabs for 'Delta', 'Specificity', 'Ignore Names', 'Mass', and 'References'. The 'Delta' tab is active, showing a table with the following data:

Modification	Mass
Average	66.1170
Composition	H(8) C(8)

Below the table, there is an 'OK' button and a 'Make editable' link. A help text box at the bottom explains the chemical composition of the modification as a delta between the modified and unmodified residue or terminal. It states: 'The chemical composition of the modification as a delta between the modified and unmodified residue or terminal. For example, if the modification removes an H and adds a CH3 group, the Composition could be shown as H(2) C. The formula is displayed and entered as 'atoms', optionally followed by a number in parentheses. The number may be negative and, if there is no number, 1 is assumed. Hence, H(2) C is the same as H(2) C(1)'.

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The user interface is fairly self explanatory, and help is displayed for each field when you mouse over the label. If the modification is from the downloaded unimod.xml file, and you want to make changes, click on the 'Make editable' link

Configuration Editor

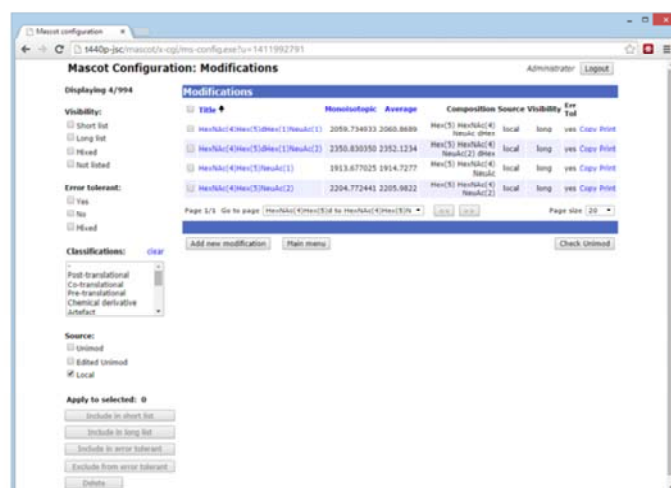
The screenshot shows a web browser window titled 'Mascot configuration' with the URL '1440p-jsc/mascot/ix engines-configuration.html?1411992791'. The page is titled 'Edit Modification :Piperidine' and includes a user menu for 'Administrator' with a 'Logout' link. The form is divided into several sections: 'Name' with a 'Title' field containing 'Piperidine' and a 'Fullname' field containing 'Piperidine'; 'Data' with tabs for 'Specify', 'Specify Masses', 'Mass', and 'References'; 'Delta' with 'Monoisotopic' (68.062600) and 'Average' (66.1170) values; and 'Composition' with a dropdown set to 'MRE C15' and a 'Symbols' field showing '13C' and '1'. At the bottom, there are buttons for 'Save changes', 'Cancel', 'Update', 'Revert to Unimod', and 'Show differences', along with a 'Help Window' text area.

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All aspects of the modification become editable. If you want to see the differences between the original Unimod entry and the local entry, choose 'Show differences'. If you want to discard your changes, choose 'Revert to Unimod'

Configuration Editor



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The top level page allows you to filter the listing. Here, we have checked the box to show only local definitions

Configuration Editor

Title	Name	Class	at	Restrict	Independent	Sensitive	
Trypsin	C-Term	KR		P	no	no	Delete
Trypsin/P	C-Term	KR			no	no	Delete
Asp-C	C-Term	R		P	no	no	Delete
Asp-N	N-Term	BD			no	no	Delete
Asp-N_ambic	N-Term	DE			no	no	Delete
Chymotrypsin	C-Term	FLWY		P	no	no	Delete
Chtr	C-Term	H			no	no	Delete
Chtr+Trypsin	C-Term	KR		P	no	no	Delete
Formic_acid	N-Term	D			no	no	Delete
Formic_acid	C-Term	D			no	no	Delete
Lys-C	C-Term	K		P	no	no	Delete
Lys-C/P	C-Term	K			no	no	Delete
Lys-N	N-Term	BD			no	no	Delete
Lys-N_Aspic	C-Term	R		P	no	no	Delete
Lys-N	N-Term	K			no	no	Delete
Peptidase	C-Term	FL			no	no	Delete
semiTrypsin	C-Term	KR		P	no	yes	Delete
Thrombolytic	C-Term	RLKRVY		P	no	no	Delete
Trypsin	N-Term	J			no	no	Delete
Trypsin/HSP90	C-Term	KR		P	no	no	Delete
Trypsin/HSP90	C-Term	J			no	no	Delete
Trypsin/HSP90	N-Term	J			no	no	Delete
Trypsin/HSP90	C-Term	JAK			no	no	Delete
VB-DE	C-Term	DEEZ		P	no	no	Delete
VB-E	C-Term	EZ		P	no	no	Delete
NoCleav	C-Term	J	ABCDEFGHIKLMNPQRSTUWVXYZ		no	no	Delete
None							

[Add new enzyme](#) [Main menu](#)

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Similarly for Enzymes and Instruments. The other sections: Quantitation, Database Manager, and Security, have been touched on in earlier presentations.

Configuration Editor

The screenshot shows a web browser window titled 'Mascot configuration' with the URL '1440p-jsc/mascot/tx.cgi?db_gui.pl'. The page is titled 'Configuration Editor: Edit Mascot Options'. It contains several configuration fields: 'ProxyType' (set to 'Auto'), 'proxy_server host' (set to 'proxy'), 'proxy_server port' (set to '3128'), 'proxy_username' (empty), 'proxy_password' (empty), 'UseHTTPProxyForFTP' (radio buttons for 'yes', 'no', and 'clear'), 'SaveLastQueryAsc' (radio buttons for 'yes', 'no', and 'clear'), 'SaveEveryLastQueryAsc' (radio buttons for 'yes', 'no', and 'clear'), 'LastQueryAscFile' (set to '.../logs/lastquery.asc'), 'Interf0dbasePath' (set to '.../netpub/mascot/data'), 'Interf0dbPath' (set to '.../data'), and 'ResultsPerScript' (set to '.../cgi/master_results.pl'). There is a 'Test Proxy Settings' button.

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The Configuration Options section deals with various global settings stored in mascot.dat. Remember that all the sections of mascot.dat that deal with sequence database configuration may be re-written at any time by Database Manager. If you've been in the habit of editing mascot.dat in a text editor, only the Options and Cluster sections can be modified safely unless you decide never to use Database Manager.

There are two configuration files that are missing from the configuration editor: Taxonomy categories (taxonomy) and Cluster geometry (nodelist.txt). If you need to make changes to these, you still have to use a text editor. You can find full details of the file formats in the manual.

Log Files - Troubleshooting

The files in the logs directory are the first place to look if there is a problem

- Installation - *install.log* (Windows only)
- General errors - *errorlog.txt*
- Database update utility - *ftp_log.txt*
- Mascot Monitor events - *monitor.log*
- Security events - *security.log*
- Cluster bootstrapping - *load_node.log* (Unix only)
- Cluster communication - *ipc.log*.

The log files are the first place to look if there is a problem. Most of these files can be accessed from a browser via links in the database status utility, which we'll come to in a minute

Log files - *searches.log*

- May need to split / roll over the log if it gets very large
- Can be recreated using *ms-makesearchlog.exe*
- If you move Mascot to a new machine, transfer *searches.log* and *mascot.job* along with the search results files
- Tab separated values; easily transferred to spreadsheet or relational database.

Every Mascot search adds a new line to the searches log. If the server is busy, the log files can get very large. For most of the logs, you'll probably want to delete the file from time to time. The searches log is different, and you'll probably want to keep all entries indefinitely. Best idea is to rename the file periodically. For example, *searches.log.20060301*. The system will then create a new one automatically.

If the search log is accidentally damaged, a new one can be created by scanning all the result files on the disk

If you move Mascot to a new machine, you'll probably want to transfer or rebuild *searches.log*. The other important file is *mascot.job*, which contains the "next" job number. If you don't copy this across, your job numbers will start all over and you'll have to sort the search log by descending start time to locate the most recent searches.

Some people import the search log into a database application so as to make it easier to search or filter, especially if it gets very large

Log files - database status



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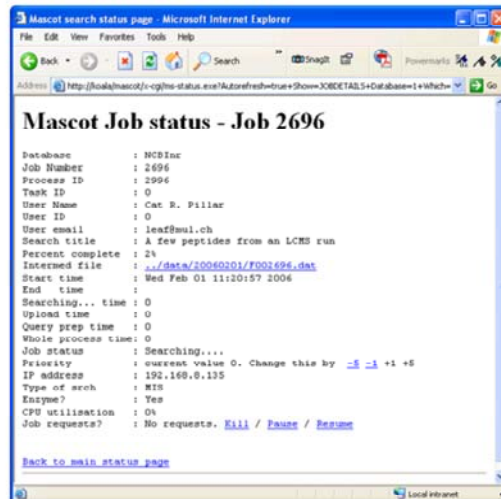


The database status page has links to many of the log files mentioned earlier.

This is the starting point for troubleshooting problems, especially those connected with database updates

When Mascot Monitor first starts, there is a single entry per database. Once a database has been updated, there are two entries, one for the “old” file and one for the ‘new’. We need this double view, because of the way databases can be updated in the background, without interrupting searches. During database exchange, while the new file is compressed and tested, searches can still be submitted to run against the old file. Once the new file is ready, all new searches are run against the new file. So, on a busy server, there may be a period when you have searches running against both the old and new files. As soon as the last search on the old file has completed, the old database can be taken out of use. Mascot monitor takes care of all of this automatically.

Log files - database status



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You can drill down from the database status page to a list of searches for each database, and then down to the details of an individual search, as shown here.

If necessary, you can kill or pause a search from this page, or change its priority

Log files - search log viewer

The screenshot shows the Mascot Search Log Viewer interface. Annotations point to various features:

- Select log file:** Points to the 'Log File' dropdown menu.
- Set range:** Points to the 'Start at' and 'how many' input fields.
- Sort on column:** Points to the 'Sort/Filter' radio buttons.
- Filter:** Points to the 'Filter' input field.
- Uncheck to hide column:** Points to the checkboxes for columns like 'Ti' and 'In'.

The interface displays a table with columns: Job#, PID, dbase, User Name, Email, Ti, In, start time, and Dur. The table shows search results for various jobs and users.

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MATRIX SCIENCE

This is the search log viewer. You can sort on any of the columns using the radio buttons and then pressing Sort / filter.

The checkboxes determine whether a column is shown or hidden. The two hidden columns are Ti for title and In for intermediate file. This is a hyperlink to display the raw mascot result file, but you can only see the first two characters of the file name, which are “..”. The hyperlink in the first column displays the formatted result report.

You can set the number of lines to display, and whether to start at the beginning or end of the file.

You can also filter the display by entering text into the edit boxes. For example, your user name or a word from the search title

If you have split the search log into sections, then you can choose which file to display by entering the path

Log Files - Troubleshooting

Other useful files

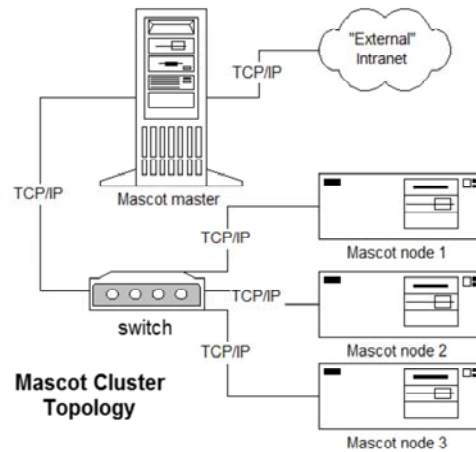
- Database compression
`<database>/current/<database>.errors`
- Database taxonomy
`<database>/current/<database>.NoTaxonomyMatch.txt`
- Database statistics
`<database>/current/<database>.stats`
- Web server access and error logs
- System event or message log.

The first three files are most easily viewed using the links in database status.

Sometimes, there will be nothing in the Mascot logs because the problem is external to Mascot. Sometimes, it can be useful to look at the web server logs or even the operating system logs.

The Windows Event Viewer (control panel; administrative tools) allows you to browse Windows system messages

Cluster mode



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Just a few words about Mascot cluster mode

Mascot supports cluster operation using a Beowulf-like topology. Mascot supports cluster mode as standard, whenever the licence is for 4 CPU's or more. You just have to hook up an appropriate number of PC's on a local LAN

Cluster mode

- **Every search is distributed to all the cluster nodes**
 - Each node searches a portion of the sequence database
 - Get the parallel processing advantage for a single spectrum
 - Search results are returned to the master, which merges them, and writes the result file to disk
- **All master - node communication is via TCP/IP**
 - Simple, socket-based communication
 - No parallel operating system required
- **Configuration and program files are distributed and updated automatically from the Master node**
 - A cluster behaves and looks like a single server
- **Need dedicated or partitioned hardware**
 - Cannot allocate machines dynamically
 - General purpose server farm usually not cost effective

In cluster mode, every search is distributed to all the cluster nodes, and each node searches a portion of the sequence database. This means that you get the parallel processing advantage for a single spectrum. Search results are returned to the master, which merges them, and writes the result file to disk

All master - node communication is via TCP/IP. This uses simple, socket-based communication. A parallel operating system is not required

Configuration and program files are distributed and updated automatically from the Master node, so the cluster behaves and looks like a single server

Sometimes, we are asked about running Mascot on a general purpose server farm, that is being used for other applications.

For standard PC hardware, the cost of the Mascot licence is greater than that of the hardware. For a given capacity, the lowest cost route will always be a minimum number of licences on dedicated hardware. If you want to run Mascot on machines that are part of a larger cluster, best to partition off a number of nodes, either for exclusive Mascot use, or where Mascot has absolute priority over other processes.

Mascot cluster nodes cannot be dynamic because of the size of the database files. The time taken to move these files between machines, or even just in and out of memory, would always be unacceptable

Cluster mode

The screenshot shows the 'Mascot search status page' in a web browser. It displays details for three search nodes: 'NCBIref_20120710.fasta', 'rice-proteome_20120419.fasta', and 'ITAG2_3'. Each node entry includes its name, family path, filename, status, state time, search progress, and various flags like 'Man mapped', 'Request to mem map', 'Request unmap', 'Mem locked', and 'Number of threads'.

Below the node details is a section titled 'Cluster Nodes' containing a table with the following data:

Node	IP Address	OS	Responding	Physical Memory	Swap file	Disk space
node01	10.251.1.1	Linux	OK	80% free	100% free	15% free
node02	10.251.1.2	Linux	OK	81% free	100% free	19% free
node03	10.251.1.3	Linux	OK	81% free	100% free	19% free
node04	10.251.1.4	Linux	OK	81% free	100% free	19% free
node05	10.251.1.5	Linux	OK	82% free	100% free	23% free

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If you have a Mascot cluster, it is almost as easy to administer as a single machine. Everything is reported and controlled through the master node. The Cluster Nodes table provides an overview of the search nodes; smiley faces or green unhappy faces. If you need a closer look at one of the search nodes, follow the links to view the search node log files.

Sources of Information

Using Mascot Server

- The HTML help pages

Mascot Server installation, configuration, and troubleshooting

- Installation & Setup Manual
- Support pages on www.matrixscience.com

Using Mascot Daemon

- Online help (F1)

Using Mascot Distiller

- Online help (F1)

Anything not answered by the above

- support@matrixscience.com

Finally, a reminder of where you can find technical information about Mascot