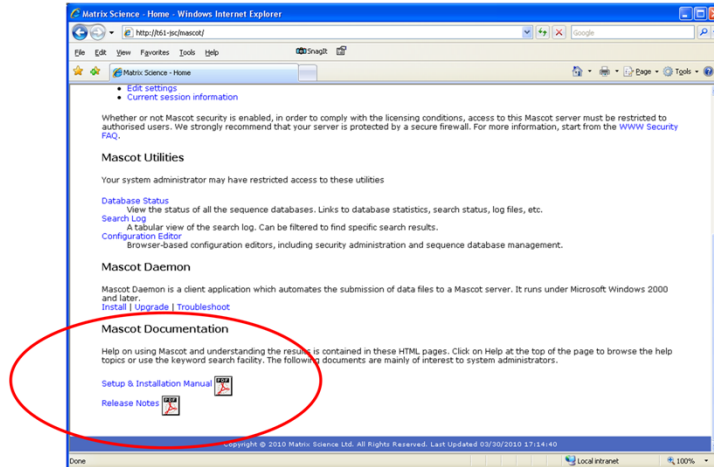


Administration & Configuration

MASCOT



Installation & Setup

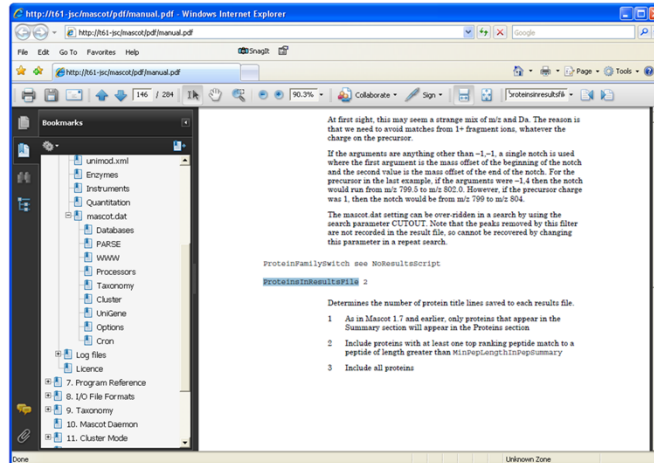


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The Mascot Installation & Setup manual is linked from your local Mascot home page. If you need detailed information on any aspect of Mascot installation or configuration, this is the place to look

Installation & Setup



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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

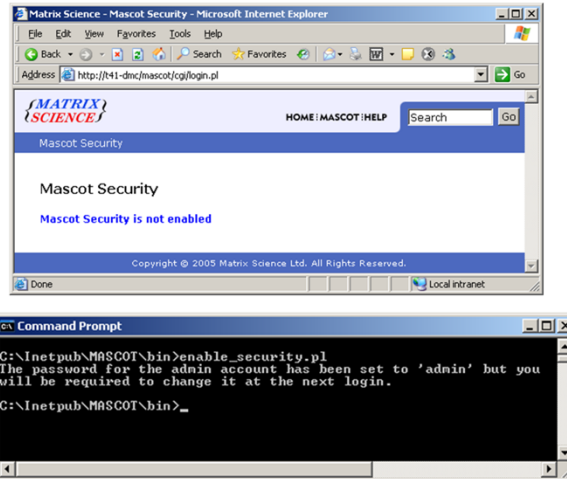
Examples of how Mascot security can be used:

- 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`.

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

Mascot Security Administration Logged in as Administrator [Logout](#)

Users		Groups	
Guest	Add...	Guest	Add...
admin	Delete	Administrators	Delete
daemon (system)	Edit...	PowerUsers	Delete
		Daemons	Delete
		MascotIntegraSystem	Edit...

Options		Options	
Option	Value	Option	Value
Security enabled	<input checked="" type="checkbox"/>	Verify IP address	<input checked="" type="checkbox"/>
Session timeout	21600	Logging level	3
Default password expiry	365	Mascot Integra server URL	http://integra:8080/topaz
Minimum password length	5	Mascot Integra database	integra
Use session cookies	<input type="checkbox"/>	Integra Oracle server	integra

[Save options](#)

This is the URL of a local Mascot Integra server. Will generally be on port 8080.
Default: http://integra:8080/topaz

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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 Utility - Microsoft Internet Explorer". The address bar shows "http://141-dmc/mascot/v-cgi/security_admin.pl". The page title is "Mascot Security Administration - Add user" and it indicates "Logged in as Administrator" with a "Logout" link. The form contains the following fields and options:

- Name:
- Password:
- Password expiry: ☐ Never, ☐ Default, ☒ Force change at next login
- Full name:
- Email address:
- User type:
- Account enabled: ☒

On the right, under "User is a member of the following groups", there is a list box containing: Guests, Administrators, **PowerUsers**, Daemons, and MascotIntegraSystem. Below the list box, it says "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 small text box at the bottom left states: "A user must belong to one or more groups. If a user belongs to multiple groups, then they have rights to perform 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:

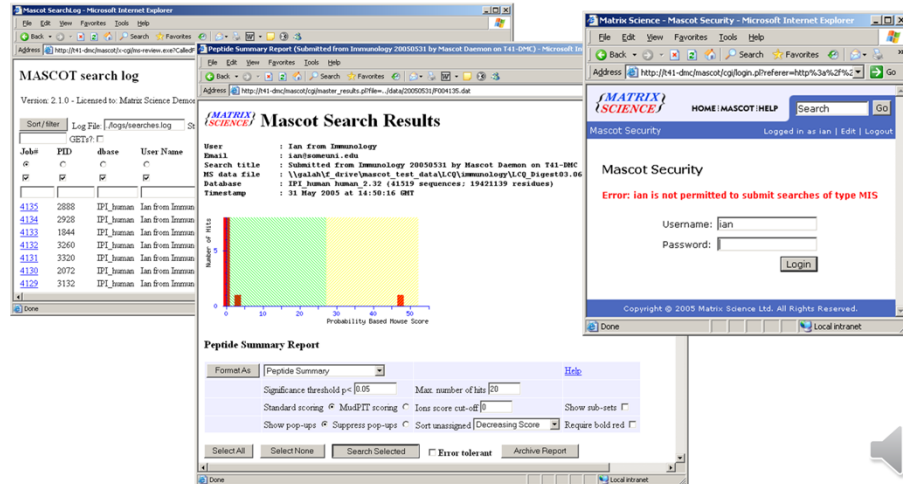
SEARCH:	Allow all fasta databases to be searched
VIEW:	See search results from other people in your own group
VIEW:	Allow user to view the search log
ADMIN:	Allow use of Database Status application



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

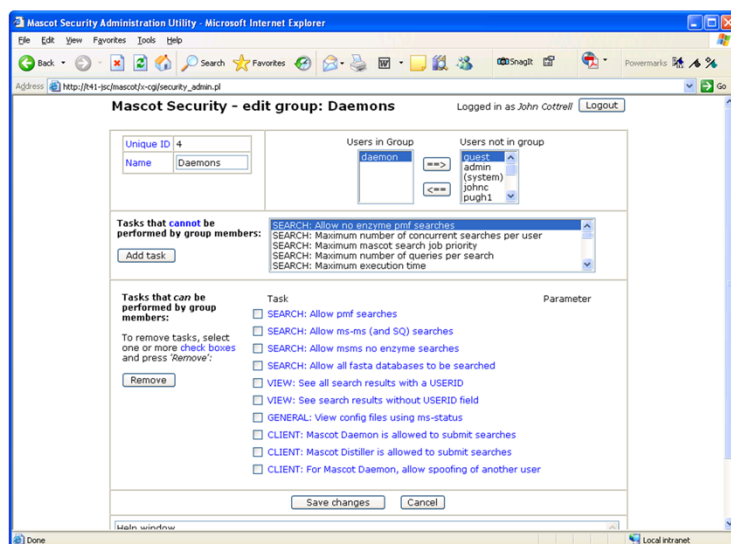


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A group member will be able to view the search log, see their results, but when they try to do a repeat search, access is denied

Example - Daemon & Distiller



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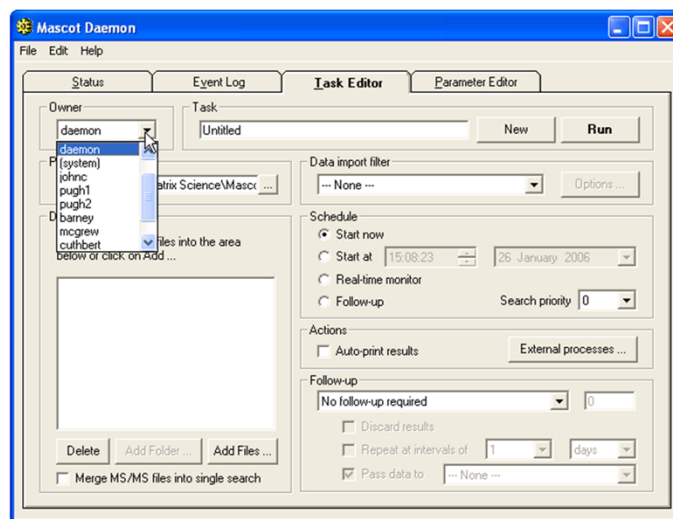


Client software, like Mascot Distiller and Mascot Daemon, requires special privileges. The Mascot Daemon user must have the security token 'Mascot Daemon is allowed to submit searches'. The group settings shown here are appropriate for either a Daemon or Distiller client.

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:

User type	Standard Mascot user
Account enabled	Standard Mascot user
	Mascot Integra user
	Computer name
	IP address
	Agent string
	User authenticated using web server



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

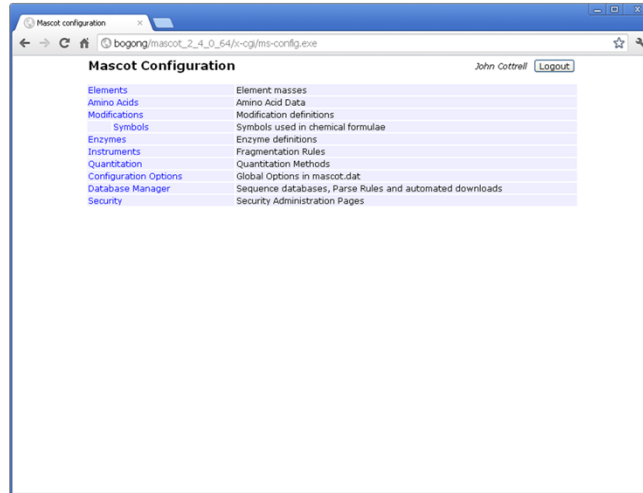
(Almost) everything in Mascot is configured using text files in the config directory

- General settings - *mascot.dat*
- Masses and modifications - *unimod.xml*
- Enzymes - *enzymes*
- MS/MS ions series - *fragmentation_rules*
- Taxonomy categories - *taxonomy*
- Cluster geometry - *nodelist.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 4 entries are interfaces to different sections of unimod.xml.

Configuration Editor

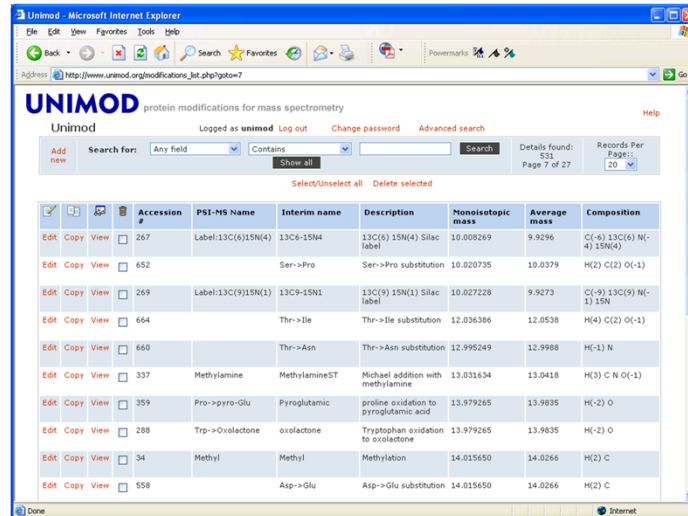
Element	Name	Monoisotopic (Da)	Average (Da)
13C	Carbon13	13.00335483	13.00335483 Edit
15N	Nitrogen15	15.00010897	15.00010897 Edit
18O	Oxygen18	17.9991603	17.9991603 Edit
2H	Deuterium	2.014101779	2.014101779 Edit
Ag	Silver	106.905092	107.8682 Edit
Au	Gold	196.966543	196.96655 Edit
Br	Bromine	78.9183361	79.904 Edit
C	Carbon	12	12.0107 Edit
Ca	Calcium	39.9625906	40.078 Edit
Cl	Chlorine	34.96885272	35.453 Edit
Cu	Copper	62.9295989	63.546 Edit
e	electron	0.000549	0.000549 Edit
F	Fluorine	18.99840322	18.9984032 Edit
Fe	Iron	55.9349393	55.845 Edit
H	Hydrogen	1.007825035	1.00794 Edit
Hg	Mercury	201.970617	200.59 Edit
I	Iodine	126.904473	126.90447 Edit
K	Potassium	38.9637074	39.0983 Edit
Li	Lithium	7.016003	6.941 Edit
Mo	Molybdenum	97.9054073	95.94 Edit
N	Nitrogen	14.003074	14.0067 Edit
Na	Sodium	22.9897677	22.98977 Edit
Ni	Nickel	57.9353462	58.6934 Edit
O	Oxygen	15.99491463	15.9994 Edit
P	Phosphorous	30.973762	30.973761 Edit
S	Sulfur	31.9720707	32.065 Edit
Se	Selenium	79.9165196	78.96 Edit
Zn	Zinc	63.9291448	65.409 Edit

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

Configuration Editor



Accession #	PSI-MS Name	Interim name	Description	Monoisotopic mass	Average mass	Composition
267	Label:13C(6)15N(4)	13C6-15N4	13C(6) 15N(4) Silac label	10.008269	9.9296	C(-6) 13C(6) N(-4) 15N(4)
652		Ser->Pro	Ser->Pro substitution	10.020735	10.0379	H(2) C(2) O(-1)
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(1)
664		Thr->Ile	Thr->Ile substitution	12.036386	12.0538	H(4) C(2) O(-1)
660		Thr->Asn	Thr->Asn substitution	12.995249	12.9988	H(-1) N
337	Methylamine	MethylamineST	Michael addition with methylamine	13.031634	13.0418	H(3) C N O(-1)
359	Pro->pyro-Glu	Pyroglutamic	proline oxidation to pyroglutamic acid	13.979265	13.9835	H(-2) O
288	Trp->Oxalactone	oxalactone	Tryptophan oxidation to oxalactone	13.979265	13.9835	H(-2) O
34	Methyl	Methyl	Methylation	14.015650	14.0266	H(2) C
558		Asp->Glu	Asp->Glu substitution	14.015650	14.0266	H(2) 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

Title	Monoisotopic	Average	Composition
Phe->Ser	-60.036386	-60.0966	H(-4) C(-6) O Copy Delete Print
Phe->Tyr	15.994915	15.9994	O Copy Delete Print
Phe->Val	-48.000000	-48.0428	C(-4) Copy Delete Print
Phenylisocyanate	119.037114	119.1207	H(5) C(7) N O Copy Delete Print
Phenylisocyanate:2H(5)	124.068498	124.1515	2H(5) C(7) N O Copy Delete Print
Phospho	79.966331	79.9799	H O(3) P Copy Delete Print
Phosphoadenosine	329.052520	329.2059	H(12) C(10) N(5) O(6) P Copy Delete Print
Phosphoguanosine	345.047435	345.2053	H(12) C(10) N(5) O(7) P Copy Delete Print
PhosphoHex	242.019154	242.1205	H O(3) P Hex Copy Delete Print
PhosphoHexNAc	283.045704	283.1724	H O(3) P HexNAc Copy Delete Print
Phosphopantetheine	340.085794	340.3330	H(21) C(11) N(2) O(6) P S Copy Delete Print
PhosphoribosylphosphoCoA	881.146604	881.6335	H(42) C(26) N(7) O(19) P(3) S Copy Delete Print
PhosphoUridine	306.025302	306.1660	H(11) C(9) N(2) O(8) P Copy Delete Print
Phycocyanobilin	586.279135	586.6780	H(38) C(33) N(4) O(6) Copy Delete Print
Phycoerythrobilin	588.294785	588.6939	H(40) C(33) N(4) O(6) Copy Delete Print
Phytocromobilin	584.262485	584.6621	H(36) C(33) N(4) O(6) Copy Delete Print
Piperidine	68.062600	68.1170	H(8) C(5) Copy Delete Print
Pro->Ala	-26.015650	-26.0373	H(-2) C(-2) Copy Delete Print
Pro->Arg	59.048347	59.0705	H(5) C N(3) Copy Delete Print
Pro->Gln	31.005814	31.0140	H N O Copy Delete Print

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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. Also, if you add a definition to your local file, it will be lost if you download an updated file from the public server. On the other hand, there may be reasons why you have to create a local definition, such as confidentiality or because you are just experimenting. If so, use the Modifications section of the configuration editor

Configuration Editor

Edit Modification : Piperidine Administrator Logout

Name: _____

Title: Piperidine

Fullname: Piperidination

Delta | Specificity | Ignore Masses | Misc | References

Delta

Monoisotopic: 68.062600

Average: 68.1170

Composition: H(8) C(5)

Symbols: 13C 1 Add

Save changes Cancel Update

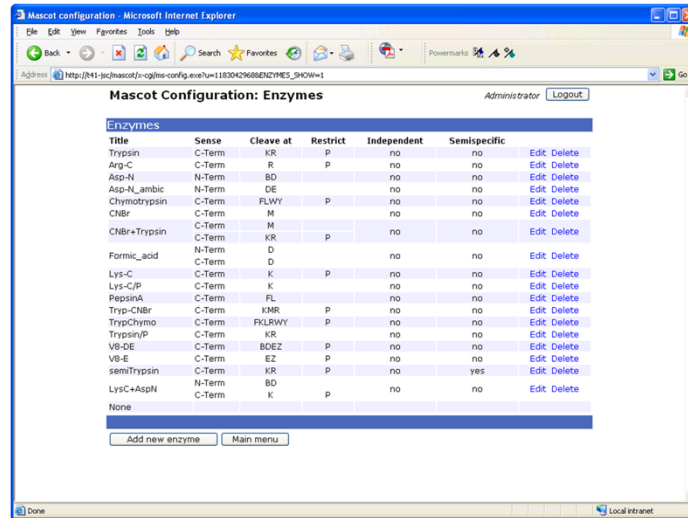
The chemical composition of the modification as a delta between the modified and unmodified residue or terminus. For example, if the modification removes an H and adds a CH3 group, the Composition would be shown as H(2) C. The formula is displayed and entered as 'atoms', optionally followed by a number 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

Configuration Editor



Mascot Configuration: Enzymes

Title	Sense	Cleave at	Restrict	Independent	Semispecific	
Trypsin	C-Term	KR	P	no	no	Edit Delete
Arg-C	C-Term	R	P	no	no	Edit Delete
Asp-N	N-Term	BD		no	no	Edit Delete
Asp-N_ambic	N-Term	DE		no	no	Edit Delete
Chymotrypsin	C-Term	FLWY	P	no	no	Edit Delete
CNBr	C-Term	M		no	no	Edit Delete
CNBr+Trypsin	C-Term	KR	p	no	no	Edit Delete
Formic_acid	N-Term	D		no	no	Edit Delete
Lys-C	C-Term	K	P	no	no	Edit Delete
Lys-C/P	C-Term	K		no	no	Edit Delete
PepsinA	C-Term	FL		no	no	Edit Delete
Tryp-CNBr	C-Term	KMR	P	no	no	Edit Delete
TrypChymo	C-Term	FKLWY	P	no	no	Edit Delete
TrypsinP	C-Term	KR		no	no	Edit Delete
V8-DE	C-Term	BDEZ	P	no	no	Edit Delete
V8-E	C-Term	EZ	P	no	no	Edit Delete
semiTrypsin	C-Term	KR	P	no	yes	Edit Delete
LysC+AspN	N-Term	BD		no	no	Edit Delete
None						

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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

Configuration Editor: Edit Mascot Options

Detailed descriptions of individual options can be found in Chapter 6 of the Mascot Setup and Installation manual.

To drop an option, clear the value field

No changes are written to mascot.dat until you choose APPLY

SaveLastQueryAsc	0
SaveEveryLastQueryAsc	1
LastQueryAscFile	./log/lastquery.asc
InterFileBasePath	./usr/local/mascot_2_4_0_64/data
InterFileRelPath	./data
ResultsPerScript	./cgi/master_results.pl
ResultsPerScript_2	./cgi/master_results_2.pl
ResultsFullURL	http://bogong/mascot_2_4_0_64/cgi/master_r
ResultsFullURL_2	http://bogong/mascot_2_4_0_64/cgi/master_r
NoResultsScript	./cgi/master_results.pl
TestDirectory	./data/test
MascotCmdLine	./cgi/nph-mascot.exe
MascotControlFile	./data/mascot.control
MascotNodeControlFile	./data/mascotnode.control
MascotJobFile	./data/mascot.job

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The Configuration Options section deals with various global settings stored in mascot.dat. Remember that, in Mascot 2.4, 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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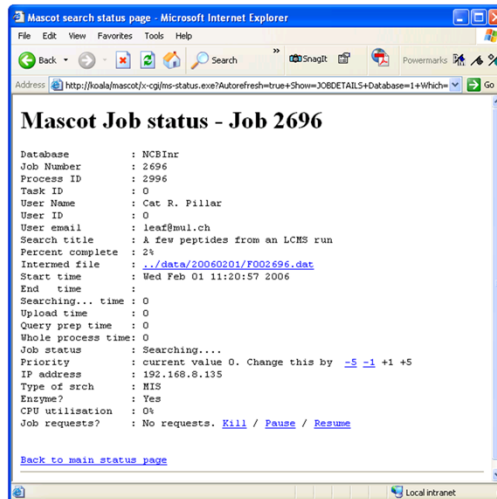


The database status page has links to many of the log files mentioned earlier.

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' input field.
- Set range:** Points to the 'Start at' and 'how many' input fields.
- Sort on column:** Points to the 'Sort/filter' dropdown menu.
- Uncheck to hide column:** Points to the checkboxes in the column headers.
- Filter:** Points to the 'Data dir' input field.

The interface displays a table with the following columns: Job#, PID, dbase, User Name, Email, Ti, In, start time, and Dur. The table contains search log entries with details such as job numbers, PIDs, database names, user names, email addresses, start times, and durations.

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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.

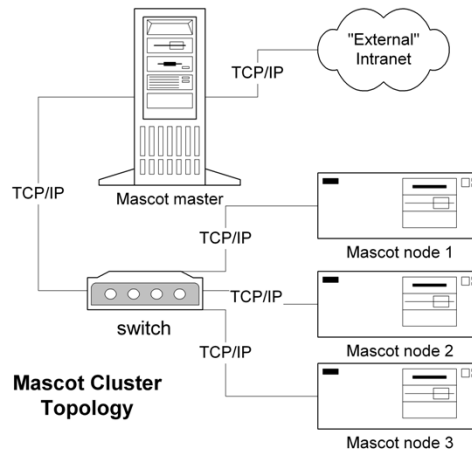


The first three files are most easily viewed using the links in database status.

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



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



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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

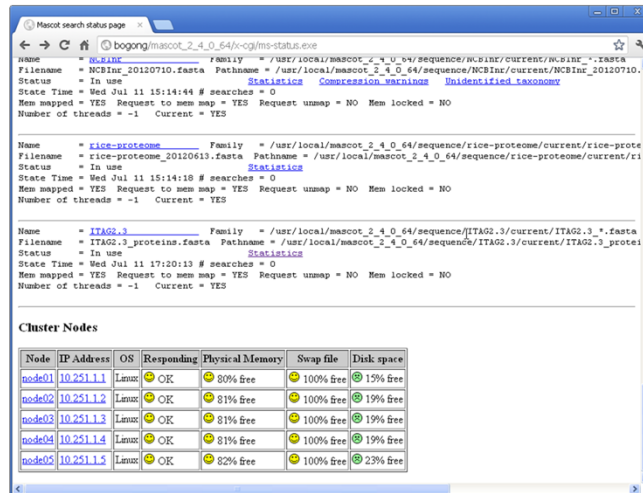
Configuration and program files are distributed and updated automatically from the Master node, so the cluster behaves and looks like a single server

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 search details for three different searches: NCBInr_20120710, rice-proteome_20120615, and ITAG2.3. Below the search details, there is a 'Cluster Nodes' table showing the status of five nodes in the cluster.

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