Spam and Virus Scanning with Exim 4

using Exiscan and/or SA-Exim

Mini-HOWTO

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2. Introduction - what's all this?

This document briefly describes how to install and configure the following items of software, so that they work together to provide not only e-mail handling, but realtime spam and virus scanning:

- Exim 4.x (this version refers to 4.20 but most parts are applicable to earlier versions of Exim 4)
- Exiscan/Exiscan-ACL (this document refers to Exiscan release 26/Exiscan-ACL release 9)
- SA-Exim (this document refers to version 3.0)
- SpamAssassin
- Clam Antivirus/Sophos Antivirus/sophie

In here I hope to summarise much of the information already available from various sources on the Web, therefore helping those new to using these tools to understand the options available, and successfully get a basic configuration up and running. It is not entirely comprehensive, though, and is definitely not a substitute for reading the software documentation.

The instructions should be moderately generic, though they are geared to those using GNU/Linux and an RPM-based packaging system (e.g. Red Hat Linux) and as such provide some detailed information for those users. If you're using something else (e.g. deb packaging), you will need to refer to other sources for detailed installation advice, although the general configuration details given here should remain similar or the same. Details on how to acquire the various items of software are provided inline.

In all cases, if you're having trouble with something, read the software documentation thoroughly, understand how the instructions given there relate to what you've done, and troubleshoot based on that. If that fails, there are mailing lists available for the various pieces of software:

- Exim: http://www.exim.org/mailman/listinfo/exim-users
- Exiscan/Exiscan-ACL: http://duncanthrax.net/exilist/exilist.cgi.pl
- SA-Exim: http://lists.merlins.org/lists/listinfo/sa-exim
- SpamAssassin: http://spamassassin.org/lists.html
- Clam Antivirus: http://sourceforge.net/mail/?group_id=86638

This document assumes you are using Exim 4. If you are still using Exim 3, you are strongly recommended to upgrade, and I have no idea whether (or how well) any of these techniques will work.

Important Note: Whilst this document does detail (to a certain extent) how to install the software mentioned (since it is necessary to compile and install from scratch), it does assume a basic familiarity with Exim and SMTP. If you are new to Exim, you are strongly recommended to install Exim on its own, and become familiar with how it works, before attempting the projects described in this document. You should also be aware that to achieve the results described you will need to be capable of patching and recompiling software – whilst not excessively complicated (especially if you use the RPM packaging discussed), it is not recommended for complete beginners.

3. Mail Scanning Concepts and Options

3.1. Introduction

In these days of ever-increasing junk e-mail, it's increasingly necessary to employ a variety of methods to reduce the amount of unwanted 'spam'. There are many ways of doing this (DNS-based blocking lists, sender verification etc.) but this document studies one particularly powerful and common requirement: to be able to make decisions on whether or not to accept particular messages based on their content. This does not by any means preclude or supercede the use of other solutions such as DNSBL's; in fact, you'll find the most effective spam-stopping solutions involve a combination of different methods.

There are two primary ways of handling mail scanning:

a) Accept all messages, then apply some sort of filtering, and bounce any that you don't want
b) Scan incoming messages as they arrive, and reject at SMTP DATA time

These are explained and discussed below.

3.1.1. Accept all messages, then scan

This is the simplest way, and does not require patching or recompiling Exim. The normal route is to accept the mail and then set up some kind of router which passes the mail to an external scanner (typically SpamAssassin). This has been covered in detail before by many people (including on the exim-users list), and details on how to set it up can be found at the following URL:

http://dman.ddts.net/~dman/config_docs/exim4_spamassassin.html

The main problem with this method is what to do with a mail once it's classified as spam. You could:

- discard it (to /dev/null), but then there's no indication to the sender, which is not good if you get a false positive.
- bounce it, but the sender is often forged, in which case the bounce will either bounce (and end up frozen in your queue), or go to some innocent bystander (so-called "collateral spam")
- move it into a separate mailbox, but then someone has to check it, and the sender has no idea their mail might be delayed (unless you send a notification, but then see the above point about bouncing and it all gets rather clumsy).

None of these are ideal, which is why many people choose the second method, which is to scan at SMTP time.

3.1.2. Scan incoming messages as they arrive (while the SMTP session is open)

This is a more advanced way of rejecting spam and viruses, the main focus of this document. What happens in this case is that after the remote server has connected to your Exim server and sent the message envelope and body, your server scans the complete mail and makes a decision on whether to accept or reject it *before* sending the final SMTP confirmation. If it chooses to reject the mail, it can therefore send an SMTP reject code (550) and the problem of what to do with the mail is left entirely to the originating server. Frequently, the "originating server" is not really a mail server at all, but some "spamware" software or perhaps an open proxy, in which case it is unlikely a bounce will be generated. So this method also helps to reduce "collateral spam".

This is the approach that will be documented here. Before you begin, you should be aware that this approach can be costly on resources, and so it isn't recommended in situations where CPU time (in particular) is at a premium. If you're handling high volumes of mail, you're likely to need hefty resources to implement a solution along these lines.

There is, however, one main inherent disadvantage of this method: where spam is concerned you will, largely, lose the ability to provide per-user options on filtering (blacklists/whitelists etc.), because each mail that comes in is scanned only once, and can only be rejected or accepted, but it might have a number of different recipients all on your server.

There are some 'hybrid' solutions/workarounds you could use to mitigate this limitation, such as:

a) all mails over a certain (high, e.g. 25) SpamAssassin "spam score" (see later) are discarded at SMTP time, but for any mails that are accepted, you then have customisable per-user filtering after that.

b) you conditionally scan mails based on one or more recipients having selected scanning (i.e. if one of the recipients wants scanning, everyone gets it whether they like it or not)

c) using the method outlined by Tom Kistner on http://www.exim.org/pipermail/exim-users/Week-of-Mon-20030317/051275.html whereby you allow only one recipient per mail (by temporarily rejecting second and subsequent recipients for a mail at SMTP RCPT time) but this is considered by some to be rather clumsy, and it will delay delivery to the second or subsequent recipients (because the originating server will delay for some period before retrying the mail with the other recipient(s)).

Either way, you could also use the Exim RCPT ACL to provide a certain degree of per-user-configurable black/whitelisting based on sender address, but that is beyond the scope of this document.

4. What Software To Use?

You can consider that you'll need three types of software (other than Exim itself) to do spam and virus scanning at SMTP time. You'll need:

1. Some kind of Exim patch to handle the mail during transmission and pass it on to the spam and virus scanning software
2. Spam scanning software
3. Virus scanning software

The options are discussed below.

4.1. Exim patch

You have some choice here. There is a 'universal' scanning package for Exim called Exiscan (http://duncanthrax.net/exiscan-acl/). This integrates virus, spam and other forms of scanning into Exim. So you can just use this if you want, and this is probably the simplest solution. In any case we'll use this for virus scanning. However, if you want more options and more detailed control of *spam* scanning (only), you might prefer to use SA-Exim (http://marc.merlins.org/linux/exim/sa.html). In particular, SA-Exim lets you save rejected messages to a file, which you might find handy if you're jittery about rejecting 'possible spam'. Exiscan and SA-Exim can co-exist peacefully, so you can use Exiscan for virus scanning and SA-Exim for spam scanning if you want.

It's suggested that you read the introductory information given on the websites for the two pieces of software, to decide which you prefer for spam scanning. If in doubt, you can always install both, and then switch between them at leisure by adjusting your configuration.

4.2. Spam scanning software

If you're going to be doing spam scanning, the most important part of the jigsaw is a piece of software which can scan message contents and make some kind of recommendation as to the 'spamminess' of the message. For the purposes of this document, we will use the most common software, SpamAssassin (http://spamassassin.org/). You should bear in mind, however, that there are competing solutions (bogofilter, spamprobe etc.) which might be better suited to your needs. In that case, however, these instructions won't help you.

4.3. Virus scanning software

You've got a number of choices here. Exiscan supports a number of virus scanners directly, and supports virtually any scanner (or multiple scanners) indirectly via it's generic command-line scanner configuration.

Some common choices, all of which provide a memory-resident daemon (this is good to ease resource load and generally speed things up) are:

- Sophos Antivirus (either using the SAVI library in conjunction with a daemon such as 'sophie', or with the commandline-based 'sweep' scanner)
- Kaspersky Antivirus (has it's own daemon)
- ScannerDaemon (from the OpenAntivirus project – http://www.openantivirus.org/)
- Clam Antivirus (uses the OpenAntivirus virus database)

The first two are commercial software; the latter two are free software and can provide a totally free virus scanning solution. You can download a fully-working trial version of Sophos from the Sophos website (http://www.sophos.com/), and I believe some kind of trial is also available for Kaspersky (http://www.kaspersky.com/).

Please see the Exiscan documentation for further information about your options when selecting a virus scanner.

This document details how to install either Clam Antivirus or Sophos Antivirus (with the 'sophie' daemon).

5. Installing the software

5.1. Installing SpamAssassin

You can download the SpamAssassin source from http://spamassassin.org/. The latest stable version at the time of writing is 2.55, and you' re advised to use that (and keep up to date with new releases). If you like living on the edge, you might like to try the latest CVS version.

5.1.1. Installing using RPMs

You can either download a pre-built binary package, if there is a suitable one available for your system, or use the spec file provided as part of SpamAssassin.   If you' re unsure about how to build an RPM from source, see Appendix A.

NOTE: The spec file supplied with SpamAssassin 2.43 and 2.50 doesn' t work properly when building on default installs of Red Hat 7.2. See http://www.hughes-family.org/bugzilla/show_bug.cgi?id=1115 for details and workarounds.

You' ll also need some Perl modules that may not be installed by default. Please see the SpamAssassin INSTALL file for full details of the required modules, but for Red Hat 7.3, these may (depending on your installation) include:

- perl-Time-HiRes (available on Red Hat 7.3 CD 3)
- perl-Digest-MD5 (available on Red Hat 7.3 CD 1)
- perl-MIME-Base64 (available on Red Hat 7.3 CD 1)

You may also need some others, such as:

- Digest::SHA1
- Digest::HMAC_MD5
- Test::Simple (ignore the Test::Harness warnings)
- Net::DNS

You can either install these additional modules from CPAN using the ' normal'   Perl method (perl -MCPAN...), or if (like me), you prefer to install them as RPMs, you can use Andy Jeffries'   cpan2rpm utility available from http://www.timj.co.uk/linux/ (other similar utilities are also available and will probably do the job equally well).

5.1.2. Installing without RPMs

Follow the instructions in the SpamAssassin distribution.

5.1.3. Testing

In either case, assuming you' ve managed to get SpamAssassin installed, you should now follow the ' testing' instructions in the INSTALL file provided with SpamAssassin to test it, namely:

```
spamassassin -t < sample-nonspam.txt > nonspam.out
spamassassin -t < sample-spam.txt > spam.out
```

(The sample-spam and sample-nonspam files are provided as part of the SpamAssassin distribution, and can be found in the documentation directory of SA.)

With a bit of luck, all should be working. If not, check you' ve got all the necessary Perl modules installed (see the INSTALL file) as that' s the main cause of problems.

Once it' s working, you can move on to installing Exiscan and/or SA-Exim.

5.1.4. Security reminder

Before you start the daemon (we' ll come to that later, after configuration), whichever way you installed SpamAssassin, ensure that your firewall is blocking port 783/tcp from the world at large.

5.2. Installing Exiscan

Skip this section if you're only doing spam scanning (not virus scanning), and you've chosen to use SA-Exim to handle things.

Exiscan is a patch to Exim, and integrates heavily with it (for the technically-minded, it keeps clear of local_scan(), instead patching Exim to create similar, custom, interface for itself). You' ll need a version of Exiscan designed specifically for the version of Exim that you' re running, and you can download Exiscan from http://duncanthrax.net/exiscan/ .

You may be confused by references on the website and mailing lists to Exiscan, because there are two different Exiscan types:

- ' Original' Exiscan – this was the only option until Exim 4.14. It uses custom Exim configuration options starting with exiscan_*. This is now deprecated, and unless you have a good reason, you should use Exiscan-ACL for new installations.
- Exiscan-ACL – introduced publically with the release of Exim 4.20, this is an overhauled version of Exiscan which generalises much of the configuration so that it integrates neatly into the Exim ACL system. This is a very slick idea which provides maximum configuration flexibility and familiar rules (if you' re used to Exim ACL' s).

Just be aware that discussions and other documentation you may find on the Internet might be referring to either version!

5.2.1. Installing as part of an Exim RPM

If you want to compile Exim (with Exiscan included) as an RPM, you can do this with my unified Exim spec file; see the chapter entitled "Compiling Exim as an RPM".

5.2.2. Installing without using RPMs

To install Exiscan without using RPM, untar the source file, and use the "patch" command to patch the Exim source tree. You' ll then need to recompile Exim.

5.3. Installing SA-Exim

Skip this section if you're not doing spam scanning, or you have chosen to use Exiscan to handle your spam scanning.

SA-Exim uses Exim' s local_scan interface to scan messages as they are received, which is what we want to do. You can download it at http://marc.merlins.org/linux/exim/sa.html.

SA-Exim can be used in two ways:

- As a simple local_scan.c replacement
- As a loadable module, using Derek ' dman'   Hudson' s dl_open patch for Exim

We' ll discuss the simple case, which is the former (simple local_scan replacement). If you' d like to have SA-Exim as a loadable module using the dl_open patch, please see the SA-Exim documentation.

SA-Exim provides a file to replace the (dummy) src/local_scan.c in the default Exim source tree, so you' ll need to replace this and recompile Exim. You' ll also need sa-exim.h (do "make sa-exim.h" in the SA-Exim source directory). If you' re installing Exim as an RPM, you can do all this automatically with my unified Exim spec file; see the chapter entitled "Compiling Exim as an RPM".

5.4. Installing Clam Antivirus

If you want to install Clam Antivirus as your scanner, you'll need to firstly download the source from
http://clamav.elektrapro.com/ and then compile and install. If you're doing this without using RPMs, follow
the instructions given in the Clam AV documentation. If you want to compile it as an RPM, read on.

These instructions apply to ClamAV 0.60, and have changed slightly since 0.54.

5.4.1. Compiling as an RPM

The PLD (Polish Linux Distribution) includes an RPM of Clam Antivirus, so if you're using that distribution
you can go ahead and install the RPM as supplied. If you're using another distribution, you may need to
recompile. I downloaded the PLD spec file and made some modifications, to work under Red Hat, and you
can download my version at http://www.timj.co.uk/linux/rpms.php. Note that you should read the spec file
and make any appropriate changes if you're not using Red Hat 7.3 on an i386 machine. In particular, you
need to adjust the first line ("%define rh73 X") and set X to 0 or 1 depending on what version of Red Hat you
are compiling on (if indeed you are using Red Hat). Set to '1' for Red Hat 7.3 or earlier (not tested with
earlier than 7.3) or '0' for later versions.

When you install the RPM, an unprivileged user 'clamav' will be created, which is the user that we will set
ClamAV up to run as. You will need to add 'clamav' as an additional user in the 'mail' group or whichever
group Exim runs as, in /etc/group.

5.4.2. Security reminder

Before you start the daemon (we'll come to that later, after configuration), whichever way you installed
ClamAV, ensure that your firewall is blocking port 3310/tcp from the world at large.

5.4.3. Virus database updates

ClamAV includes 'freshclam', a utility to automatically download virus database updates. If you installed as
an RPM, this should set it up to run once a day as a cron job (by putting a script in /etc/cron.daily). If you
didn't use RPMs, check your installation.

5.5. Installing Sophos Antivirus/sophie

Sophos Antivirus itself consists primarily of three parts:

- Virus database
- Command-line scanner
- libsavi shared library

The virus database itself is of course the most important part and what you are (primarily) paying for.
Beyond that, however, you have a choice: you can either use the command line scanner directly, or you can
use some third party software (e.g. a daemon), interfaced via the SAVI interface using the libsavi shared
library.

In this documentation, I'll focus on using a third party daemon (sophie) with the libsavi library, since this is
the most efficient way of scanning, though it's perfectly possible to use the command line scanner with
Exiscan – see other documents for details.

The most common daemon used with Sophos is the 'sophie' daemon, which is free software and available
from http://www.vanja.com/tools/sophie/ .

To install sophie without using RPMs, follow the instructions with the package. To install it as an RPM, read
on.

5.5.1. Installing as RPM

To install sophie and Sophos Antivirus as RPMs, you can use my spec files found at
http://www.timj.co.uk/linux/ .

5.5.2. Virus database updates

Either way, you may find the sophos-update script from http://englanders.cc/~jason/patches.php useful to auto-download updates to the antivirus database.

5.6. Compiling Exim as an RPM

If you're a fan of RPMs, you may wish to compile Exim, together with any associated patches (Exiscan and/or SA-Exim), as an RPM. To do so, there are a variety of spec files available. I'll focus here on the spec file I have created, which includes (optional) support for Exiscan (both 'original' and ACL versions) and SA-Exim.

Before you start, you'll need to have decided whether you're using SA-Exim, Exiscan or both, since both of them are effectively compiled into Exim and therefore form part of the Exim RPM. (N.B. this needn't necessarily be strictly true if you want to install SA-Exim as a shared object using the dl_open patch (which allows 'pluggable' local_scan objects), but I'm not covering that here).

You can download my 'universal' spec file from http://www.timj.co.uk/linux/exim.php .

If you're going to use SA-Exim, depending on what link you followed to download it, you may need to rename your SA-Exim downloaded file to "sa-exim-*x.y*.tar.gz" (where *x.y* is the version number). This isn't normal practice when building RPMs from spec files, but in this case SA-Exim downloads from Marc Merlin's front page don't usually have a version number in the filename which can be confusing when you've got multiple versions hanging around, so my spec file specifies the use of a version number in the filename.

If you have no idea what to do with a spec file, first read Appendix A to find out how to build an RPM from spec and sources.

5.6.1. Setting up the Makefile

The first thing you need to do is to open for editing the downloaded file "exim-4.*xx*.Makefile", (where *xx* is the Exim minor revision you're using) or just take the default one from the Exim source distribution and rename it to exim-4.*xx*.Makefile. (The version supplied on my site is a fairly simple and 'clean' base configuration, with just a few simple changes from the default to make it match standard settings on Red Hat and include a couple of commonly used options).

Now edit the Makefile to suit your needs, referring to the comments in it and the Exim documentation where necessary

5.6.2. Setting the spec file build options

You now need to set some options in the spec file based on whether you are going to build SA-Exim and/or Exiscan, and whether you opted to include Eximon in the Makefile. Follow the instructions in the spec file, namely:

```
# Set this to 1 if you have enabled eximon in your Makefile
%define eximon 0

# Set this to 1 if you want to compile in the SA-Exim patch
%define build_saexim 1

# Exiscan options. Set one of these options to '1' to compile in the Exiscan
# mail scanning patch. ( http://duncanthrax.net/exiscan-acl/ )
# Don't try to build both Exiscan versions!
```

```
# Build Exiscan (ACL version)
%define build_exiscan_acl 1

# Build Exiscan patch (original version; deprecated)
%define build_exiscan 0
```

You should ensure that the downloaded source files for Exiscan and/or SA-Exim are in place in your SOURCES directory, then ensure the versions in the spec file correspond:

```
# Versions of SA-Exim and Exiscan to use
%define sa_exim_ver 3.0
%define exiscan_rel 09
```

Now issue "rpmbuild -ba exim4*xx*.spec" and, if all goes well, you should have an RPM of Exim with your selected options compiled in, in the ' RPMS' directory of your RPM build tree.

6. Configuring the software

Before you start, bear in mind that what I give here is very much a 'quick start' guide to important/common options, and is **not a substitute for reading the documentation** for the various pieces of software. The options provided are examples and the appropriate settings may vary significantly depending on your particular environment.

6.1. Configuring SpamAssassin

SpamAssassin itself works pretty well 'out of the box', although you'll need to configure Exiscan/SA-Exim properly. However, there is one option you'll probably need/want to change. You do this in the local config file, /etc/mail/spamassassin/local.cf:

```
report_safe 0
```

as this is not currently supported as part of SA-Exim or Exiscan.

There are also few options within SpamAssassin which you might want to change.

- rewrite_subject – default 0, if set to 1 this adds " **** SPAM..." at the start of the subject line for messages found to be spam. Otherwise, the spam reports will only be found in the message headers. This is useful if your users are using mail clients that can't check the headers. Unfortunately, many common but useless clients such as Micros*** Lookout and Lookout Express can't do this, so you may need to set this option to 1 if those users want to be able to filter 'possible spam' into a separate folder. **NOTE: this setting is ignored and you need to configure this separately if you're using Exiscan-ACL!**
- use_terse_report – default 0, if set to 1 this keeps the verbosity of the spam report down. Recommended.
- required_hits – default 5, this sets the number of points which a mail must score to be *marked* as spam. Note that this *isn't* the score at which mail will be rejected outright; that is set separately in SA-Exim or Exiscan, depending on which you are using.

You should also note that there are many more useful things you can put in the global configuration file, including black/white lists and your own rules.

You should ensure that the SpamAssassin daemon is started using the options '-d -a'*not* the '-c' option. If you installed from RPM, the easiest way to do this and make sure it happens each time you start SpamAssassin is by creating the file /etc/sysconfig/spamd and putting this line in it:

```
OPTIONS="-d -a"
```

Furthermore, if you want to take advantage of SpamAssassin's auto-whitelist and Bayesian auto-learning features (please read the SpamAssassin documentation for more information about these), you'll probably need to set up the directory where this is stored. Find out the UNIX user that Exim runs as (typically mail, uid 12) and locate the home directory for that user (from /etc/passwd). This is typically /var/spool/mail. Then, in the home directory, do:

```
mkdir .spamassassin
chown mail.mail .spamassassin
chmod 700 .spamassassin
```

Substitute the Exim user/group for "mail.mail" if it's not mail/mail. SpamAssassin's auto-whitelist database file will be stored in this directory once you start using it.

6.2. Configuring Exiscan

You need to enter some Exiscan options into your Exim config file (normally /etc/exim/exim.conf if you installed using my RPM specs). What options you'll need depends on whether you're using the 'original' Exiscan or Exiscan-ACL. Make sure you know which you have, and follow the appropriate section below:

6.2.1. Exiscan-ACL

The ACL version of Exiscan requires you to set up a DATA ACL and insert rules in there. If you haven' t already, define an ACL to be used (I' ll call it ' acl_check_data' here) in the main part of your Exim config:

```
acl_smtp_data = acl_check_data
```

and, down in the ACL section of your config file (somewhere after the "begin acl" line), start that ACL:

```
acl_check_data:
```

Now, the beauty of Exiscan-ACL is that you can customise the exact rules to suit your own circumstances. However, that means that there are an infinite number of possibilities for configuring it. I' ll outline here some common rules to get you started, but you' re going to need to make sure you understand how ACLs work if you want to go beyond these (and it' s worth doing, because you' ll appreciate the amazing flexibility!)

6.2.1.1. MIME checking settings

You can configure Exiscan to check whether a message contains invalid MIME. Exiscan can give you a number indicating the severity of MIME errors in the message and you can use this to reject badly malformed messages (which usually indicates malicious content). For example:

```
deny    message      = This message contains malformed MIME ($demime_reason).
        demime       = *
        condition    = ${if >{$demime_errorlevel}{2}{1}{0}}
```

This will reject messages with severe (>=level 2) MIME errors.

6.2.1.2. File attachment blocking settings

It' s generally considered prudent to block certain types of file attachment which are rarely used ' for real' but are often used as virus carriers, as a first line of defence against new viruses. Such attachments are identified by their file extension and a simple subset to block might be .bat/.com/.exe/.pif/.scr/.vbs .

To set up Exiscan to block the above extensions, use something like the following:

```
deny    message      = This message contains an attachment of a type which we
do not accept (.$found_extension)
        demime       = bat:com:exe:pif:prf:scr:vbs
```

6.2.1.3. Spam scanning settings

Skip this if you' re not doing spam scanning, or are doing it with SA-Exim

First, you need to define your spam scanner' s TCP socket location. Assuming it' s on the local machine and listening on port 783, add the following option in the *main part of the Exim config (not the DATA ACL!):*

```
spamd_address = 127.0.0.1 783
```

Back in the DATA ACL, there are a wide variety of options available for spam scanning. Let' s assume you want the following:

* All mails (whether or not they are spam) should have an X-Spam-Score header , containing the SpamAssassin score for that mail
* All mails (whether or not they are spam) should have an X-Spam-Report header, containing SpamAssassin' s report on the mail

Assuming that' s the case, add your first spam ACL rule in the DATA ACL:

```
warn  message = X-Spam-Score: $spam_score
```

```
        spam = nobody:true
warn    message = X-Spam-Report: $spam_report
        spam = nobody:true
```

If you want to add a "**** SPAM ****" marker to the start of subject lines if a mail contains spam (see the discussion above about rewrite_subject in the SpamAssassin configuration for more info) then add this ACL rule:

```
warn    message = Subject: **** SPAM **** $h_Subject
        spam = nobody
```

Now, to do our SMTP-time rejection, we need to add a ' deny' ACL rule. Decide the score at which you wish to reject and multiply it by 10 to find the rejection threshold. Assuming you choose 12 (a reasonable starting value), you should add a rule similar to the one below: (the ' 120' is the rejection threshold as calculated above)

```
deny    message = This message scored $spam_score spam points.
        spam = nobody:true
        condition = ${if >{$spam_score_int}{120}{1}{0}}
```

6.2.1.4. Virus scanning settings

Skip this if you' re not doing virus scanning

You need to configure Exiscan to pass messages to your virus scanner. First, in the *main part of the Exim config (not the DATA ACL!)* define your virus scanner using the av_scanner option. The Exiscan manual details how to use this, but here are common settings:

For Clam Antivirus:
```
av_scanner = clamd:127.0.0.1 3310
```
(You could also use clamd' s UNIX socket – use: av_scanner = clamd:/path/to/socket).

For Sophos with sophie:
```
av_scanner = sophie:/tmp/sophie
```

Now you need to set up your DATA ACL rule to do the virus scanning. Something such as the following rule should work well:

```
deny    message     = This message contains a virus or other harmful content
($malware_name)
        demime      = *
        malware     = *
```

The ' demime' line here is only necessary if you want Exiscan to unpack (separate out) the different parts of MIME messages (that is, messages with attachments) before passing to your virus scanner. If your virus scanner is MIME-aware (Sophos is, Clam AV isn' t), you may not need to do this but it' s probably a good idea to give it a go anyway - "belt and braces".

6.2.1.5. Ending the ACL

Finally, close the acl_check_data ACL with a final ' accept'   line:

```
accept
```

so that if mails don' t contain viruses/spam, they will be accepted. Don' t forget this, or you will end up rejecting everything!

6.2.2. 'Original' Exiscan

6.2.2.1. General settings

These are the core options that you'll need, assuming you're using Exiscan 4.12-26:

```
exiscan_condition = 1
exiscan_crypt_salt = xx

exiscan_timeout = 1m
```

Pick a couple of random characters in place of 'xx' in exiscan_crypt_salt.

6.2.2.2. MIME checking settings

First, you need to decide if you want Exiscan to unpack (separate out) the different parts of MIME messages (that is, messages with attachments) before passing to your virus scanner. If your virus scanner is MIME-aware (Sophos is, Clam AV isn't), you may not need to do this but it's probably a good idea to give it a go anyway - "belt and braces". Assuming you want to do some kind of MIME unpacking, set:

```
exiscan_demime_condition = 1
```

You can decide how "picky" Exiscan is about the MIME being strictly correct by using the exiscan_demime_pickyness option, but you can probably just leave it set to the default (1) for now.

Finally, you'll need to set an option "exiscan_demime_action" and decide what you want to do if unpacking fails. This will depend on your security paranoia. The default is "reject", but you may wish to set this to "pass" for a more lenient approach, i.e.:

```
exiscan_demime_action = pass
```


6.2.2.3. File attachment blocking settings

It's generally considered prudent to block certain types of file attachment which are rarely used 'for real' but are often used as virus carriers, as a first line of defence against new viruses. Such attachments are identified by their file extension and a simple subset to block might be .bat/.com/.exe/.pif/.scr/.vbs .

To set up Exiscan to block the above extensions, use the following code:

```
exiscan_extension_condition = 1
exiscan_extension_action = reject
exiscan_extension_data = bat:com:exe:pif:scr:vbs
```


6.2.2.4. Spam scanning settings

Skip this if you're not doing spam scanning, or are doing it with SA-Exim

```
exiscan_spamd_condition = ${if and {{def:sender_host_address} {!eq
{$sender_host_address}{127.0.0.1}} } {1}{0}}
exiscan_spamd_action = reject
exiscan_spamd_treshold = 12
exiscan_spamd_header_style = full
```

Note the mis-spelling for "threshold" in Exiscan!

The condition given here (exiscan_spamd_condition) will scan all messages, except those originating on the local machine. You could just set it to '1' to scan all messages. Change exiscan_spamd_treshold to match the SpamAssassin score at which you wish to reject spam (12 is a sensible default).

6.2.2.5. Virus scanning settings

Skip this if you're not doing virus scanning

You need to configure Exiscan to pass messages to your virus scanner. Use something like the following options:

- exiscan_av_condition = 1 (This turns on virus scanning. You can conditionally scan mail by using an expression of some sort here)
- exiscan_av_action = reject (This tells Exiscan to reject at SMTP time any viruses. You can do other
- things if you prefer, like re-route to an administrator – see the Exiscan documentation)

Now, you need to add some settings which will vary according to the scanner you're using:

6.2.2.5.1. For Clam Antivirus

```
exiscan_av_scanner = clamav
exiscan_av_clamd_socket = 127.0.0.1 3310
```

(You can also use clamd's UNIX socket – use: exiscan_av_clamd_socket = /path/to/socket).

6.2.2.5.2. For Sophos with sophie

```
exiscan_av_scanner = sophie
exiscan_av_sophie_socket = /var/run/sophie
```

6.2.2.5.3. For other virus scanners (e.g. Sophos commandline 'sweep')

See the Exiscan documentation.

6.2.2.6. Logging

If you want to increase the amount of information logged by Exiscan, you can increase the log level with the exiscan_loglevel option, for example:

```
exiscan_loglevel = 2
```

6.3. Configuring SA-Exim

SA-Exim is a highly configurable piece of software, and has an exceptionally well-commented config file. The exact options that you want will very much depend on your personal preferences and environment. However, I'll give you some pointers here towards options you may typically want to look at.

6.3.1. The SA-Exim Config File

The SA-Exim config file can normally be found in /etc/exim/spamassassin.conf

The most important 'basic' options are:

- SAEximRunCond – equivalent to Exiscan's exiscan_spamd_condition, this determines when and if SA-Exim will scan a message. You could just set it to '1' to scan all messages, but there are some circumstances when you might not want to – see below.
- SAEximRejCond – this determines whether mails are actually rejected if they are found to be spam. You don't really want to reject messages addressed to postmaster@yourdomain/abuse@yourdomain, so the default configuration for this option checks some flags which can be set in an Exim ACL to avoid this – see below.

- SApermreject – this is the ' threshold' spam score. If a message scores higher than this, it will be rejected. You might be a bit nervous about this setting, so if you like you might set it higher and slowly reduce it. 12.0 (the default) is unlikely to catch any real mail, though.
- SApermrejectSavCond – this determines whether messages that have been rejected as spam are saved anywhere. If you want to save them, set this to 1 (or use some kind of condition) and then set SApermrejectsave to the location where you want to save messages.
- SAmsgpermrej – this is the message used to reject spam with if it exceeds the threshold. If a real mail is inadvertently bounced as spam, the sende r should see this message in the bounce which they get.

6.3.2. Setting Exim ACLs

To avoid rejecting messages to postmaster@/abuse@, you should add the following ACL to Exim' s config file, somewhere near the top:

```
warn    message      = X-SA-Do-Not-Rej: Yes
        local_parts  = postmaster:abuse
```

This will add a header "X-SA-Do-Not-Rej: Yes" to any messages addressed to postmaster@/abuse@, and then (according to the default SA-Exim config in /etc/exim/spamassassin.conf), suppress rejection of spam to these addresses. Messages that are classed as spam will still receive the spam headers, however, which is a good compromise – the mail can be filtered into a separate folder in your mail client, but in the event that it' s actually a genuine mail (typically a spam report), you will get to read it.

6.4. Configuring Clam Antivirus

You' ll probably need/want to change quite a few of the default settings for Clam Antivirus. I' ve set up a config file which works well with Exiscan. If you use my RPM packaging as supplied, this will be used by default and you should fine ClamAV is ready to go. If not, you can download my ClamAV config file at http://www.timj.co.uk/linux/sources/clamav.conf.

For reference, the key changes are outlined below:

1. Commented out the line which has "Example" on it.
2. LogVerbose and LogTime enabled. You' ll find these useful if trying to track down problems.
3. Set "DataDirectory /usr/share/clamav" as this is where the RPM normally installs the virus database files. Check, if you' re not installing from RPM.
4. Comment out the "LocalSocket" option. These instructions assume interfacing to ClamAV over a TCP socket, though Exiscan now supports interfacing over a UNIX socket too.
5. Enable the "TCPSocket 3310" option (see 4 above)
6. Enable the "User clamav" option – better not to run Clam Antivirus as root.
7. Enable the "AllowSupplementaryGroups" option, to give ClamAV the required access to the temporary scan files created by Exiscan.
8. Enable the ' ScanMail' option. (NOTE: this was omitted in a previous version of this document)

7. Getting it all running/Testing

Assuming you've followed this document through, you should now be ready to start your chosen combination of software and get things working.

7.1. Starting the daemons

7.1.1. SpamAssassin

Execute "/etc/rc.d/init.d/spamassassin start". You should then have a process called 'spamd' running, hopefully with the '-d' and '-a' options enabled.
Execute "chkconfig spamassassin on" just to make sure it will start on reboot.

7.1.2. Clam Antivirus

Execute "/etc/rc.d/init.d/clamd start". You should then have a process called "clamd" running.
Execute "chkconfig clamd on" just to make sure it will start on reboot.

7.1.3. Sophie

Execute "/etc/rc.d/init.d/sophie start". You should then have a process called "sophie" running.
Execute "chkconfig sophie on" just to make sure it will start on reboot.

7.1.4. Exim (!)

Start Exim the normal way (typically "service exim start" if you installed using an RPM)

7.2. Testing

7.2.1. Spam scanning

The first test is to check that your spam scanning is working. Assuming that you've followed the instructions here, there are three possibilities for what happens to a mail when it comes in:

- It scores less than SpamAssassin's *required_hits* value, and is accepted as normal
- It scores more than SpamAssassin's *required_hits* value, but less than the rejection threshold set in SA-Exim/Exiscan, in which case it is marked as spam (either in the headers, or in the subject, depending on how you configured SpamAssassin) but accepted
- It scores more than the rejection threshold set in SA-Exim/Exiscan, and is rejected at DATA time.

You therefore need to test these three circumstances. Before you do this, temporarily disable virus scanning (exiscan_av_condition = 0) if you have this enabled, just so we can eliminate one source of possible problems.

First, telnet to your mailserver on port 25 and send yourself a plain 'test' e-mail:

```
telnet your.server 25
```
[Wait for connection and the server banner, e.g. "220 your.server.name ESMTP Exim 4.20 ..."]
```
HELO test
```
[Server should respond: 250...]
```
MAIL FROM: <you@your.address>
```
[Server should respond: 250...]
```
RCPT TO: <you@your.address>
```
[Server should respond: 250...]
```
DATA
```
[Server should respond: 354...]
```
From: you@your.address
To: you@your.address
```

```
Subject: a test mail

test
.
```
[Server should respond: 250, possibly after a short pause whilst scanning takes place]

With a bit of luck, you should now have a message in your mailbox. Look at the source. It should have one or two additional headers (varying according to your software and options), possibly something like this:

```
X-Spam-Status: No, hits=0.8 required=5.0
          tests=NO_REAL_NAME
          version=2.54
X-Spam-Level:
```

If so, excellent! If not, or you got a temporary error (4xx) when you sent your mail, check your Exim main and reject logs to find out what happened.

Assuming that worked, now try sending a mail that' s a bit spammy. Telnet to your server again, as before, but use something like this as the mail:

```
From: test@test
Subject: MAKE MONEY FAST!!! $$$         34fs4

viagra
```

The mail should be accepted, and if you look at the headers when you receive it, you should find something like this (again, will vary depending on whether you are using SA-Exim or Exiscan):

```
X-Spam-Status: Yes, hits=6.0 required=5.0
          tests=CASHCASHCASH,MISSING_HEADERS,NO_REAL_NAME,PLING_PLING,
              SUBJ_HAS_SPACES,SUBJ_HAS_UNIQ_ID
          version=2.54
X-Spam-Level: *********
X-Spam-Checker-Version: SpamAssassin 2.54 (1.174.2.17-2003-05-11-exp)
X-Spam-Report:    ---- Start SpamAssassin results
  6.00 points, 5 required;
  *  0.8 -- From: does not include a real name
  *  1.7 -- Subject contains lots of white space
  *  1.3 -- Subject contains a unique ID
  *  0.5 -- Missing To: header
  *  0.0 -- Contains at least 3 dollar signs in a row
  *  1.7 -- Subject has lots of exclamation marks
  ---- End of SpamAssassin results
X-Spam-Flag: YES
```

You' ll notice the X-Spam-Flag header, which can be useful to filter "possible spam" into a separate folder in your mail client. (The X-Spam-Level header can also be useful for this; it contains a number of asterisks corresponding to the spam rating of the mail).

If you are using SA-Exim, you may also get additional headers useful for debugging such as:

```
X-SA-Exim-Mail-From: you@your.address
X-SA-Exim-Version: 3.0 (built Sat May 31 17:50:12 BST 2003)
X-SA-Exim-Scanned: Yes
```

If you don' t like these headers, you can get rid of them – see Appendix B.

Finally, let' s try to get a message rejected. Telnet in again, but use this as your message:

```
From: test@test
Subject: MAKE MONEY FAST!!! $$$        34fs4
MiME-Version: 1.0

VIAGRA!!!!
AS SEEN ON NATIONAL TV, WORK FROM HOME!!!
GUARANTEED 100% THIS IS NOT SPAM!!!
```

This should get rejected, so instead of a final 250 code from the server, you should receive a 550. The message is rejected, and won' t end up in your mailbox. If you' re using SA-Exim and you' ve enabled saving of rejected messages, you should be able to see it in the save directory.

Note that there is also a ' magic' test phrase which, if used in a mail, will trigger SpamAssassin to reject it (rather like the widely-used ' EICAR' test string for virus engines:

```
/XJS\*C4JDBQADN1\.NSBN3\*2IDNEN\*GTUBE-STANDARD-ANTI-UBE-TEST-EMAIL\*C\.34X/
```

7.2.2. Virus scanning

Assuming your spam scanning is now working (if you' re doing it), it' s time to test virus scanning. Re-enable the exiscan_av_condition (set to 1) if you temporarily disabled it earlier.

Before you start, you' ll need something to test for. A good test is the Eicar test signature, which is a ' pretend' virus recognised by most anti-virus software. You can download it from http://www.eicar.org/anti_virus_test_file.htm, or just paste the next line into a file (this is the ' virus'):

```
X5O!P%@AP[4\PZX54(P^)7CC)7}$EICAR-STANDARD-ANTIVIRUS-TEST-FILE!$H+H*
```

First, try sending yourself the file by telnet. Telnet in as before, and send the above line after DATA. Hopefully, you' ll get a response something like this:

```
550 This message contains a virus or other harmful content (Eicar-Test-
Signature).
```

If so, great! Looks good. Now use an e-mail client to send yourself viruses (through your server) using different forms such as enclosing in a ZIP file etc. It should all be detected and rejected.

7.2.2.1. Manual testing with Clam Antivirus

If you' re having problems, and are using Clam Antivirus, you can test if it' s working generally by placing a file somewhere and telnetting to port 3310 on the machine running Clam AV. Type "SCAN /path/to/eicar.com" and hopefully you' ll get a response something like "/path/to/eicar.com: Eicar-Test-Signature FOUND". If not, you' ll need to dig deeper. If you do, then try putting the Eicar file in /var/spool/exim/scan and scanning it then. If that fails, you' ve got a permissions problem.

8. Appendix A – Building RPMs from source

If you want to build an RPM from source, you need three things: the source to the program (typically a .tar.gz file), an RPM 'specification' (spec) file, and (possibly) any ancillary external scripts/patches which are needed to build the software.

The command to build an RPM is "rpmbuild" on recent versions of RPM, or "rpm" on older versions. You may need to install the package "rpm-build" from your distribution, if it isn't already installed.

There are two primary ways to build an RPM from source:

8.1. Using tarballs (the quick way)

If the piece of software you're using provides a spec file within it's tarball, in the standard way, and this is all OK and no external files are needed, you may be able to build an RPM directly from the tarball, like so:

```
rpmbuild -tb <file>.tar.gz
```

Often, this isn't the case, and you'll need to use a build tree.

8.2. Using a build tree (the conventional way)

To build things the 'proper' (conventional) way, you'll first need an RPM build tree. Typically, you'll have an example one installed which is writeable by the root user, in /usr/src/redhat. It's not recommended to build things as root, however, so it's best to reproduce this tree somewhere else and make it writeable by an unprivileged user. Then, in the home directory of the unprivileged user you're going to use to compile things, create an ".rpmmacros" file, containing a single line with this in: "%_topdir /path/to/your/rpm/build/tree".

Now, to build an RPM, you need to first place the program sources and any ancillary files in the SOURCES directory of your RPM build tree. Next, put the spec file in the SPECS directory of your RPM build tree and change into that directory. Then type:

```
rpmbuild -ba <specfile>
```

where <specfile> is the name of the spec file for the program that you want to build. Remember this may be "rpm -ba <specfile>" on older systems.

If all goes well and there are no errors, the finished RPM should be in the RPMS directory of your build tree, in the i386 directory if you're building on an i386 machine (or possibly the 'noarch' directory if it's non-native; not the case for Exim). You'll also have a source RPM, which includes all the source files and the spec file itself, in the SRPMS directory of your build tree.

8.3. More Information

For more information about RPMs/spec files etc., please visit http://www.rpm.org/ .

9. Appendix B – Removing headers

This advice applies generally if you wish to remove specific headers from an e-mail, but is mainly applicable if you wish to remove headers such as SA-Exim's X-SA-Exim-Mail-From header.

The best way is to add a system filter rule. Outlined below are methods for if you do or don't already have a system filter. These assume you just want to blanket remove headers from all e-mails; you could use conditions etc. to remove them form only certain mails.

9.1. If you don't already have a system filter

First, you need to create a filter file. You can put this wherever you like, but a good place might be /etc/exim/system.filter. Put the following lines in it (note in particular the '#Exim filter' line which is crucial):

```
# Exim filter
headers remove X-SA-Exim-Scanned:X-SA-Exim-Mail-From
```

The above example removes the X-SA-Exim-Scanned and X-SA-Mail-From headers; adjust to your taste.

Now you need to tell Exim to use your filter as the 'system filter'. Add this to the main (top) part of your Exim configuration file:

```
system_filter = /etc/exim/system.filter
```

You should now find that messages passed through your system will have the headers you defined in the system.filter file removed.

9.2. If you already have a system filter

Just add the following line to the start of your filter (the following example removes X-SA-Exim-Scanned and X-SA-Exim-Mail-From; adjust to your taste).

```
headers remove X-SA-Exim-Scanned:X-SA-Exim-Mail-From
```

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Version 1.2, November 2002

```
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