# Bytemark Symbiosis

**COLLABORATORS**

| | *TITLE* :<br><br>Bytemark Symbiosis | |
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**REVISION HISTORY**

| NUMBER | DATE | DESCRIPTION | NAME |
|---|---|---|---|
| 0.1 | 2009-11-12 | Initial release. | PJC |
| 0.2 | 2010-04-26 | Renamed the project, and updated the documentation to match. | SKX |

# Contents

# Preface

The Bytemark Symbiosis system makes it easy to manage website and email hosting without much prior technical knowledge. After installing a connection program, setting up a website or an email account is as easy as creating folders and files on your hard drive.

The system is based on the stable version of Debian GNU/Linux, with a few light touches here and there to make things easier to use.

We have written a comprehensive user guide to help people get started with their Symbiosis install.

The complete specification is documented in the reference guide.

# Part I

# User guide

# Chapter 1

# The Bytemark Symbiosis system

Symbiosis is a system that helps in the day to day tasks involved in administration of a typical web and email server. Its goal is to simplify running web and email hosting across multiple, separate domains, along with all their associated services.

Specifically, Symbiosis handles

- Web server configuration, including uploading content via FTP,
- DNS hosting using the Bytemark content DNS system,
- Email server configuration, including web mail,
- Database access,
- Automatic daily backups which are synchronised to your Bytemark backup space, and
- A firewall and the automatic installation of security updates.

Symbiosis is supported on any platform that is capable of running Debian GNU/Linux.

## 1.1 Is there a web interface?

No. All typical day-to-day jobs, such as adding new web sites, or email addresses, or uploading content, can be done using SFTP, i.e. FTP over SSH, by creating files and directories. FileZilla is the recommended program for this.

This should not be viewed as a disadvantage; any confident computer user should be able to manage a Symbiosis system with the help of this documentation and the cost and security concerns of panel based systems are avoided altogether.

## 1.2 What about command-line access?

Unlike other control-panel systems, one of the aims of the Symbiosis system is to keep configurations for the various services as close to the Debian default as possible. This allows users to tailor these configurations as they need.

Although it is possible to access a Symbiosis system comand line as root (the equivalent of administrator on a Windows system), that is not recommended. Where it is necessary to run commands with root privileges, that should be done by prefacing them with **sudo** and supplying the admin password when prompted to do so. Most operations on a Symbiosis system must in any case be done by admin (or another limited user), not by root.

## 1.3 Is Symbiosis open-source?

Yes! Symbiosis is released under the GNU General Public Licence, version 2 or later. All the source code is available for scrutiny on the Symbiosis project site. There is also a issue tracker to report any problems encountered, or to request improvements.

This documentation is released under the GNU Free Documentation Licence or later. It also has a project site, and issue tracker.

## 1.4 What software does Symbiosis come with?

Symbiosis uses the following software, all of which is open-source:

- Apache 2.2 web server,
- Exim 4 mail transport agent,
- Dovecot 1.0 IMAP and POP3 server,
- MySQL 5.0 database server,
- PHP 5 scripting language, with the following modules
  - mysql,
  - curl,
  - imagemagick,
  - mcrypt,
  - mhash,
  - xmlrpc,
  - gd,
- SpamAssassin spam filtering, and ClamAV anti-virus,
- Pure-FTPd FTP server,
- SquirrelMail webmail program

## 1.5 About this documentation

What follows is step by step instructions to get up and running with controlling your server and setting up core services. The screen shots are taken from a Windows system, but all the programs used are also available for Mac OS X and GNU/Linux desktop systems.

Throughout the documentation, the example server used is **example.vm.bytemark.co.uk**. The example domain used is **my-brilliant-site.com**. These should be substituted as appropriate.

# Chapter 2

# Connecting to your server with FileZilla and SFTP

**Before you start this chapter**

1. Install FileZilla on your computer; it is freely available from its project website for Windows, Mac OS X, and GNU/Linux.

In this chapter you'll learn how to connect to your server ready to transfer files using the FileZilla program. It has been assumed that you have a working copy of this program installed on your desktop computer.

## 2.1 Connection details

A server installed with Symbiosis will be running *SSH*, and will have had the **admin** user account created. This allows you to connect via *SFTP* to administer the machine.

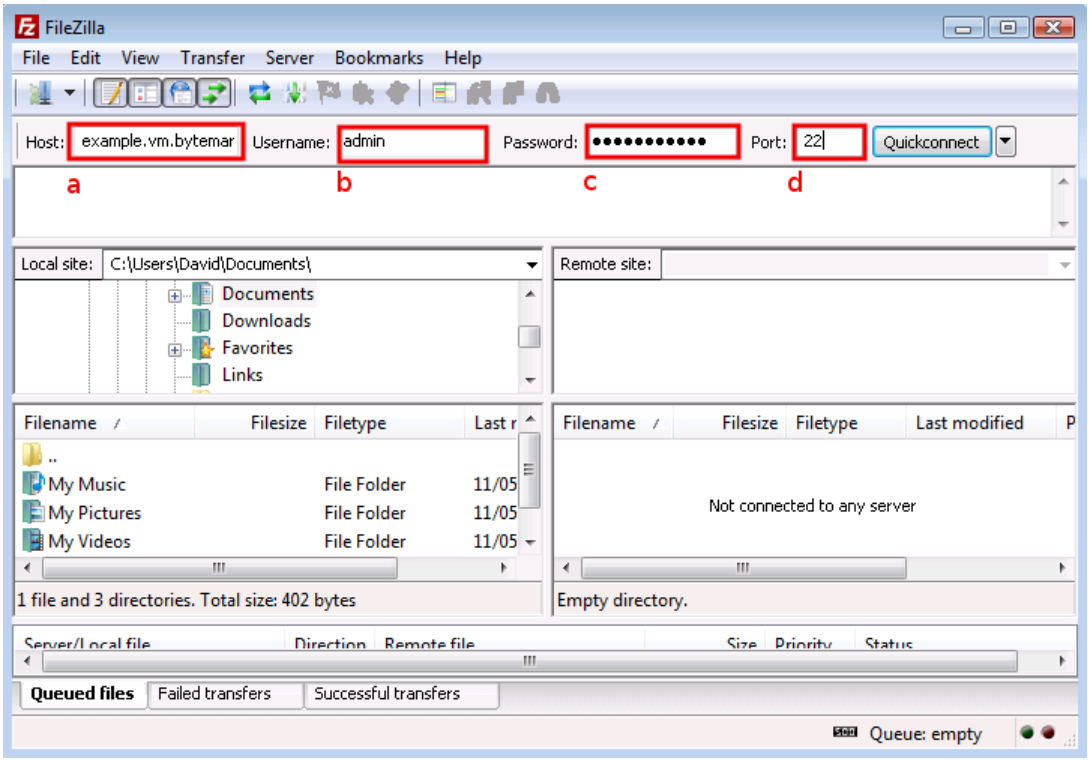
The **admin** account should be used when administering a Symbiosis system to ensure that files and directories have the correctcode-sign.co.uk permissions.

Usage of SFTP is mandated for administrating the machine, as all data are passed over the network encrypted.

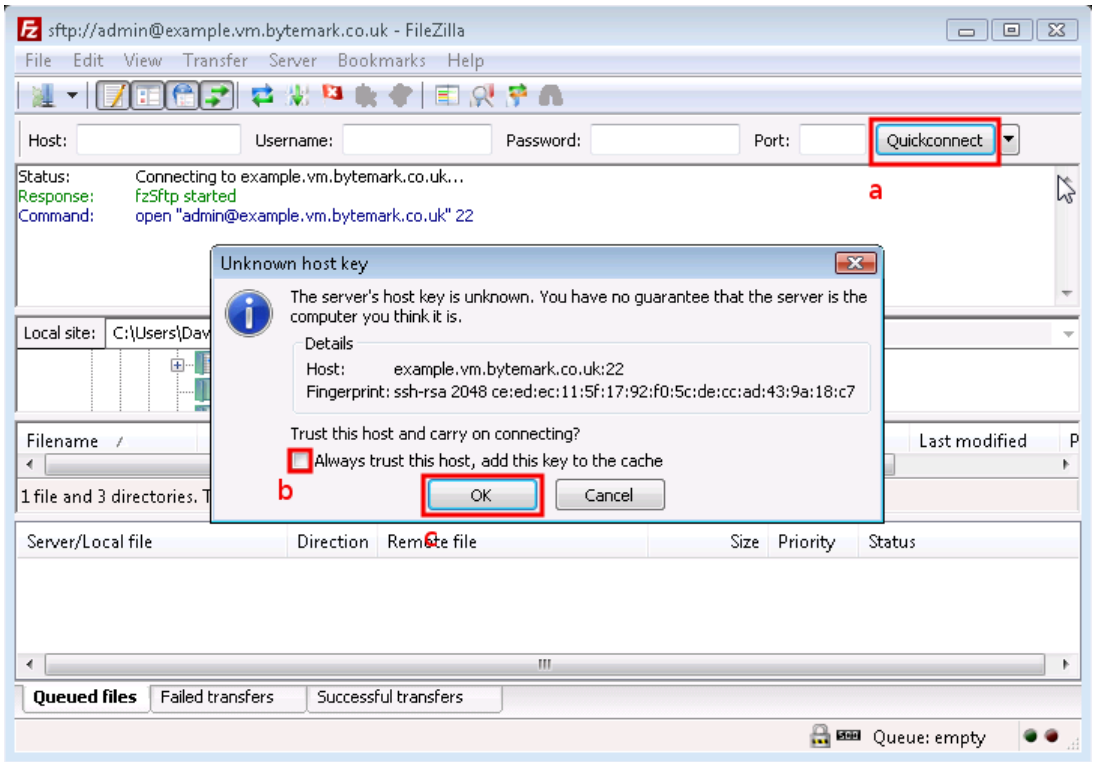
## 2.2 Connecting using FileZilla

Throughout the documentation the example server name **example.vm.bytemark.co.uk** should be substituted for your own server name.

1. Start FileZilla and enter the details in the text fields below the program's toolbar. The name of your server goes in the Host text field **a** and **admin** in the Username field **b**.
2. Complete the connection details by filling in the Password field **c** with the password for the **admin** user, and the standard SSH port number, **22** in the Port field **d**.



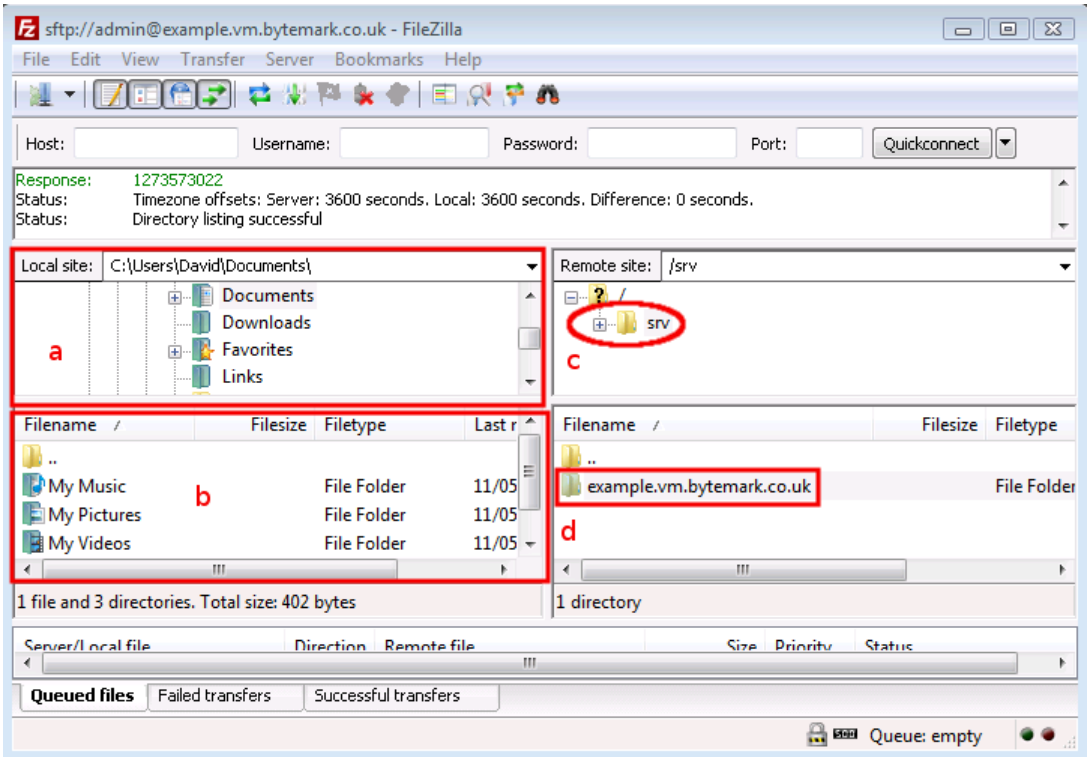

3. Click the Quickconnect button **a** to the right of the text fields; the first time you do this you'll get a warning message that is safe to ignore, so check it's Always trust . . . box **b** and click the OK button **c**.




4. In the text area immediately below the Quickconnect bar you'll see messages scroll by as the connection to the server is made.

**Tip**
You won't need to enter those details each time you connect. Click the small button to the right of the Quickconnect button to reveal the sftp://admin@example.vm.bytemark.co.uk as a history item. In future simply select that link.

The following figure shows FileZilla's layout after successfully logging in. The display is divided into four main sections, the top left pane shows a directory tree, with the directories on your local computer, labelled **a**. Beneath that is a listing showing the contents of the currently selected local directory, labelled **b**. Then the top right pane shows the directory tree of the remote machine. When logging in as **admin** this will show `/srv` (**c**). Finally beneath that is the contents of that directory. Initially this will only contain one directory named after the machine. In this case `example.vm.bytemark.co.uk/` is shown (**d**).




Once you've been able to successfully connect to your server, via FileZilla, you may proceed to configure email, or setup your website.

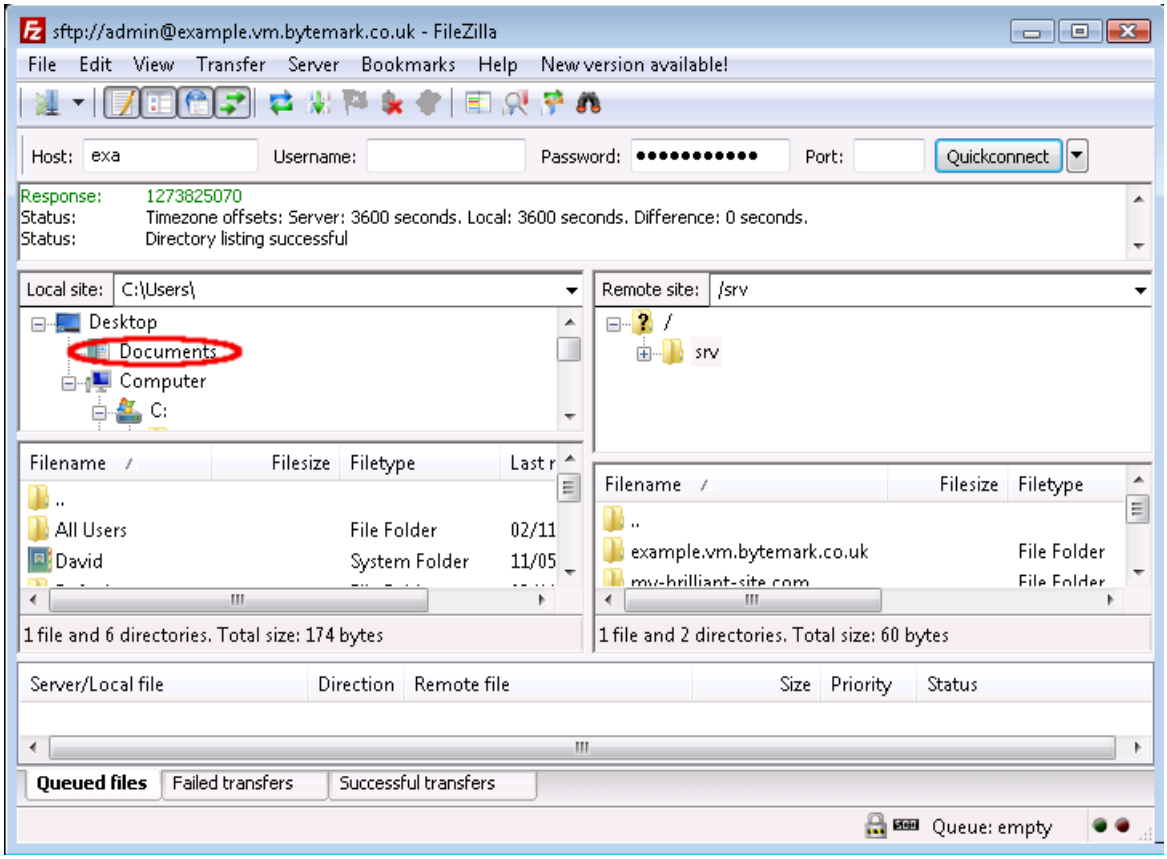
## 2.3 Common FileZilla recipes

This section demonstrates how to carry out some common tasks with the FileZilla client:

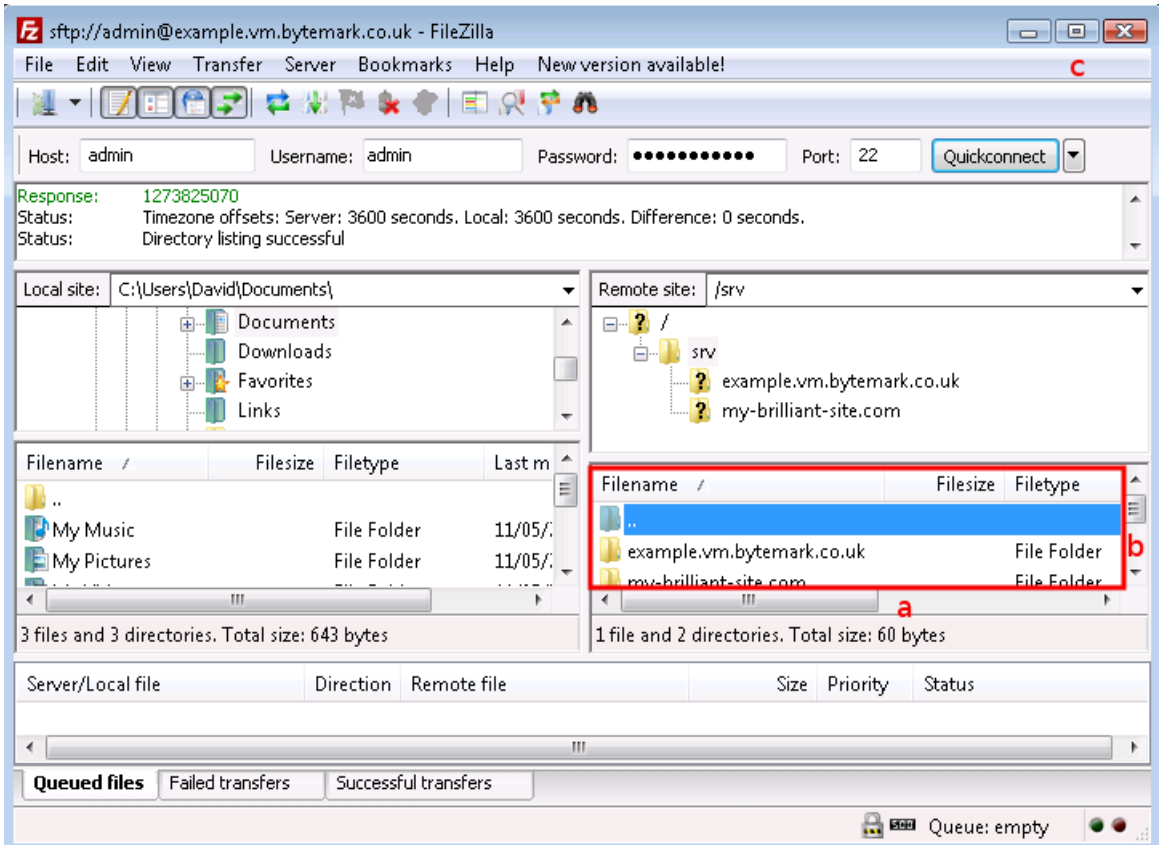
- Navigating local and remote filesystems
- Creating a remote directory
- Creating a remote file
- Deleting files and directories

### 2.3.1 Navigating local and remote filesystems

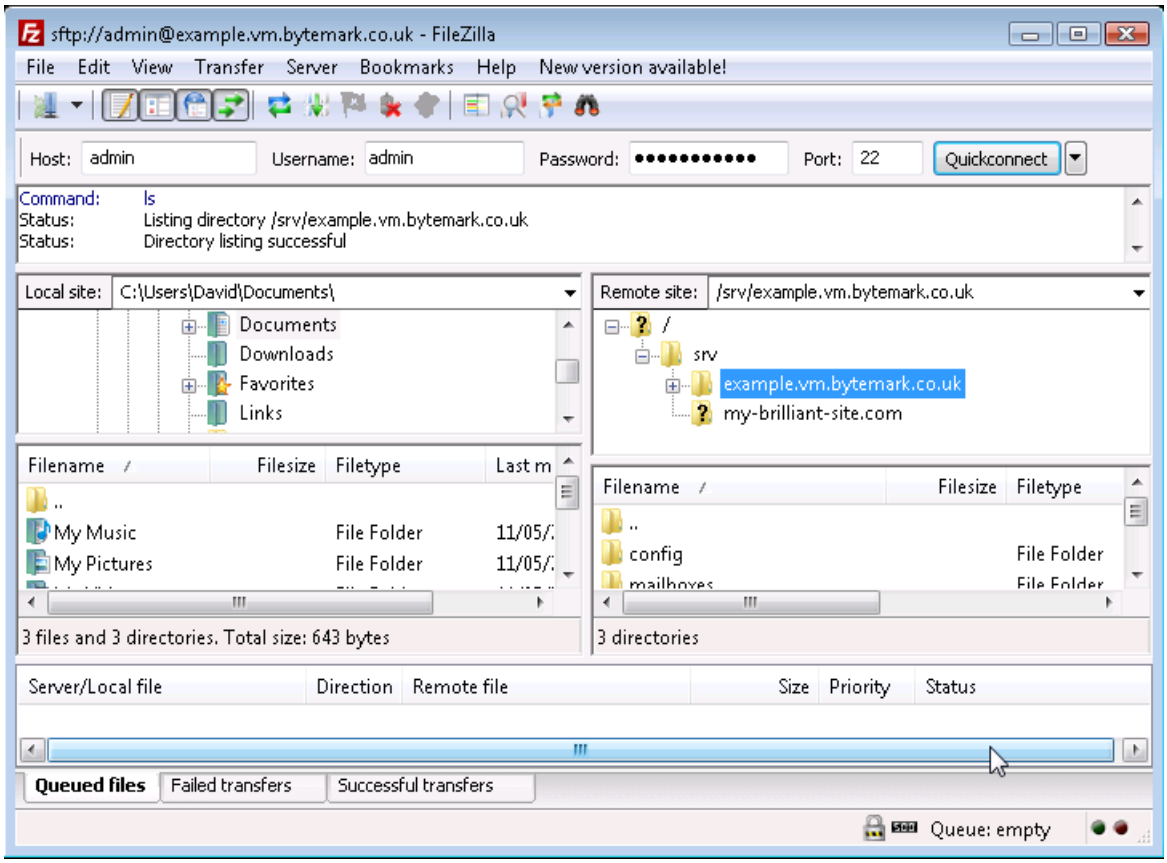
1. To open the `/srv` directory on the server, click the + icon.



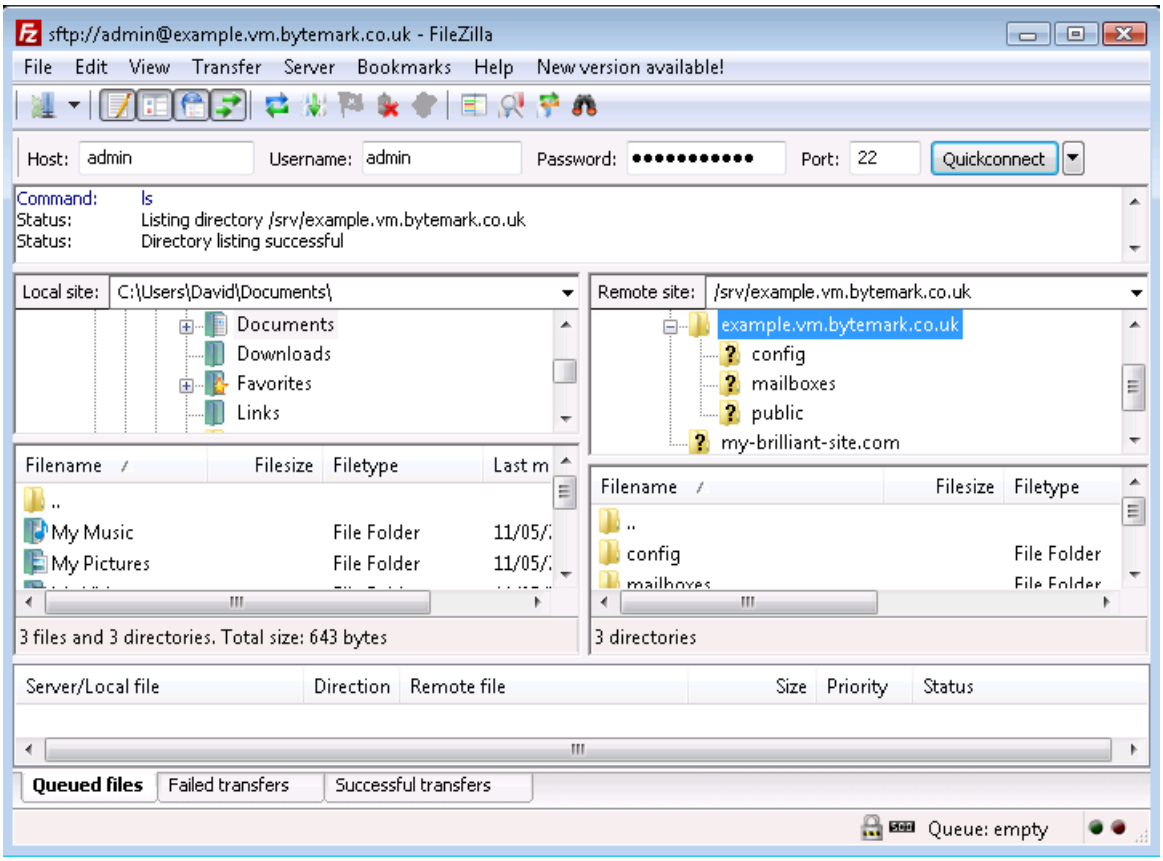

2. Notice that the folders that appear in the tree display are already displayed in the Filename window. You can use the scrollbars **a** and **b** to adjust the view; as in any desktop window you can also use the Control **c** to expand the Filezilla display to full screen or just drag it's corners in the usual way.



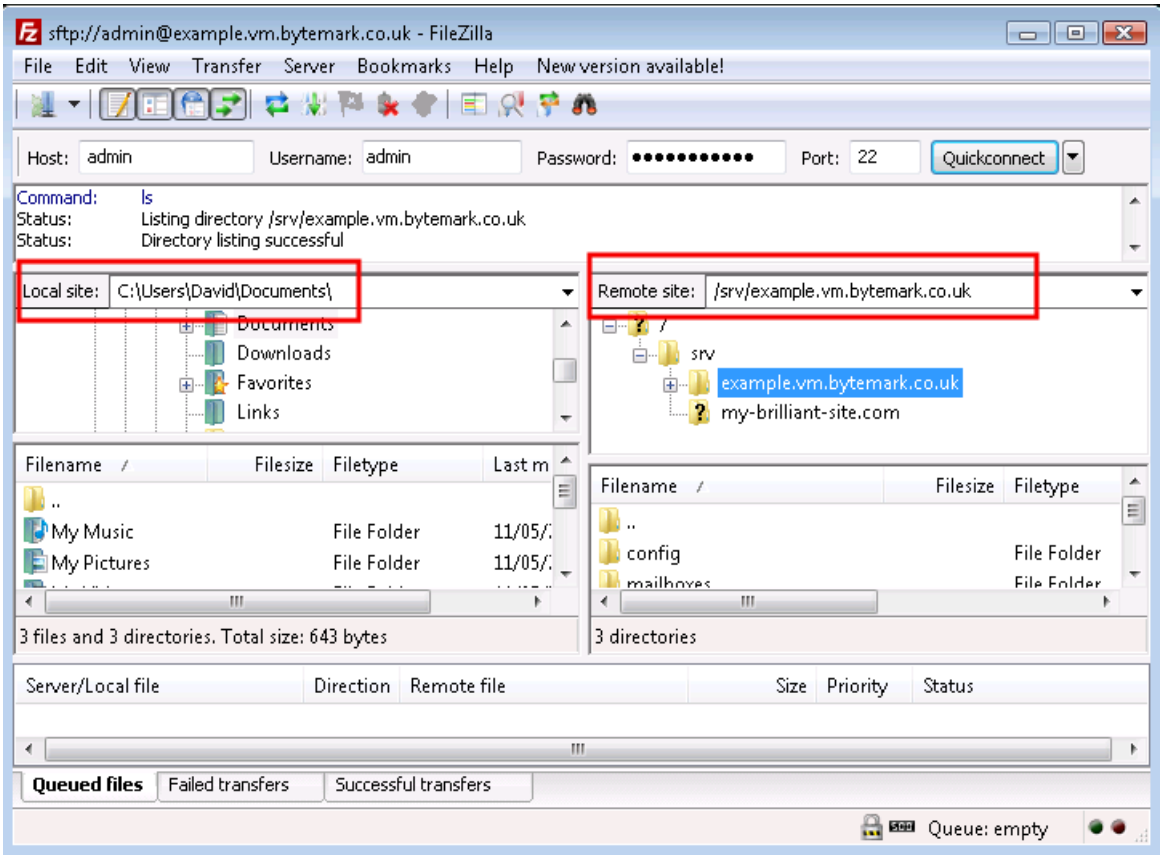

3. When you click on the example.vm.bytemark.co.uk label (not the directory icon), the + control appears. The contents of the directory are already displayed in the Filename window.



4. Click the + control to see those contents as part of a tree view and notice that you now have a - control, which could be used to close this detail of the file system structure.



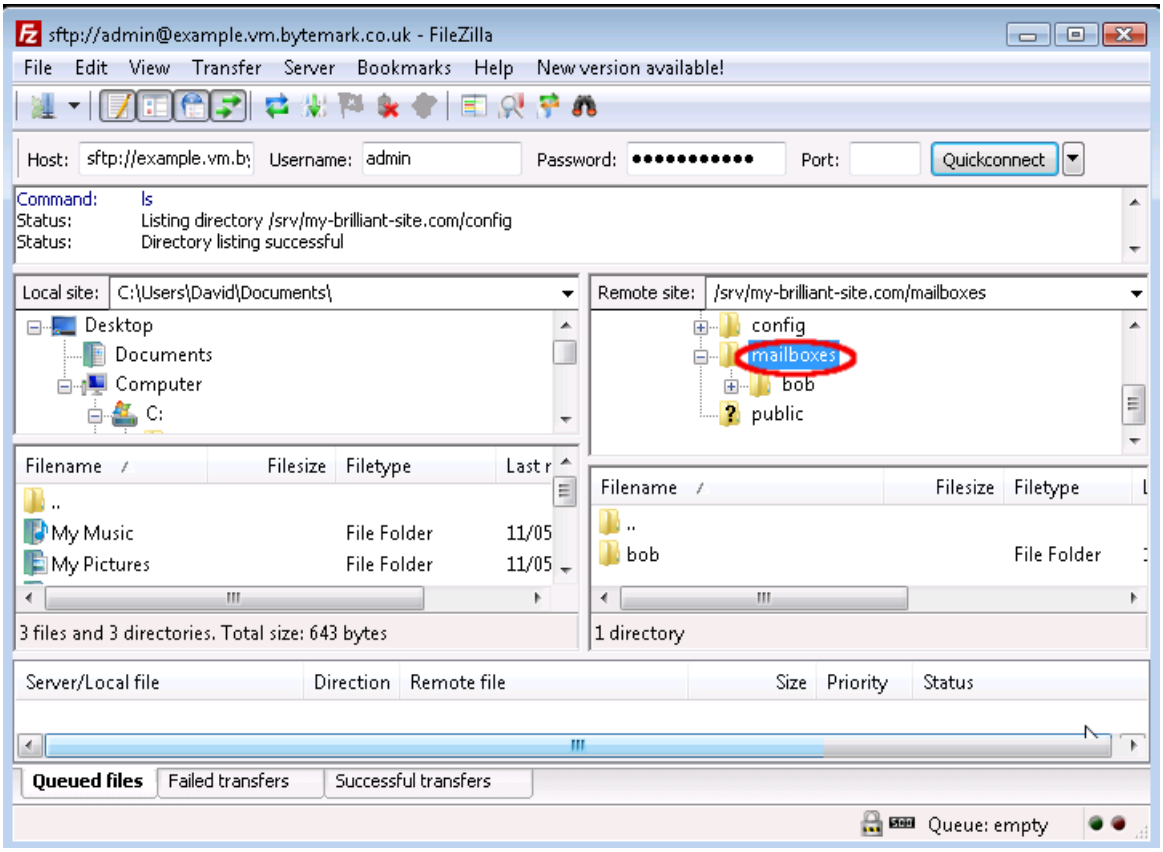

5. Those operations were all carried out on the right side of the screen where the Remote site:, in this case the server **example.vm**, is represented. Comparable operations can be carried out on the left side of the screen, where the Local site:. represents the file system on the desktop machine.



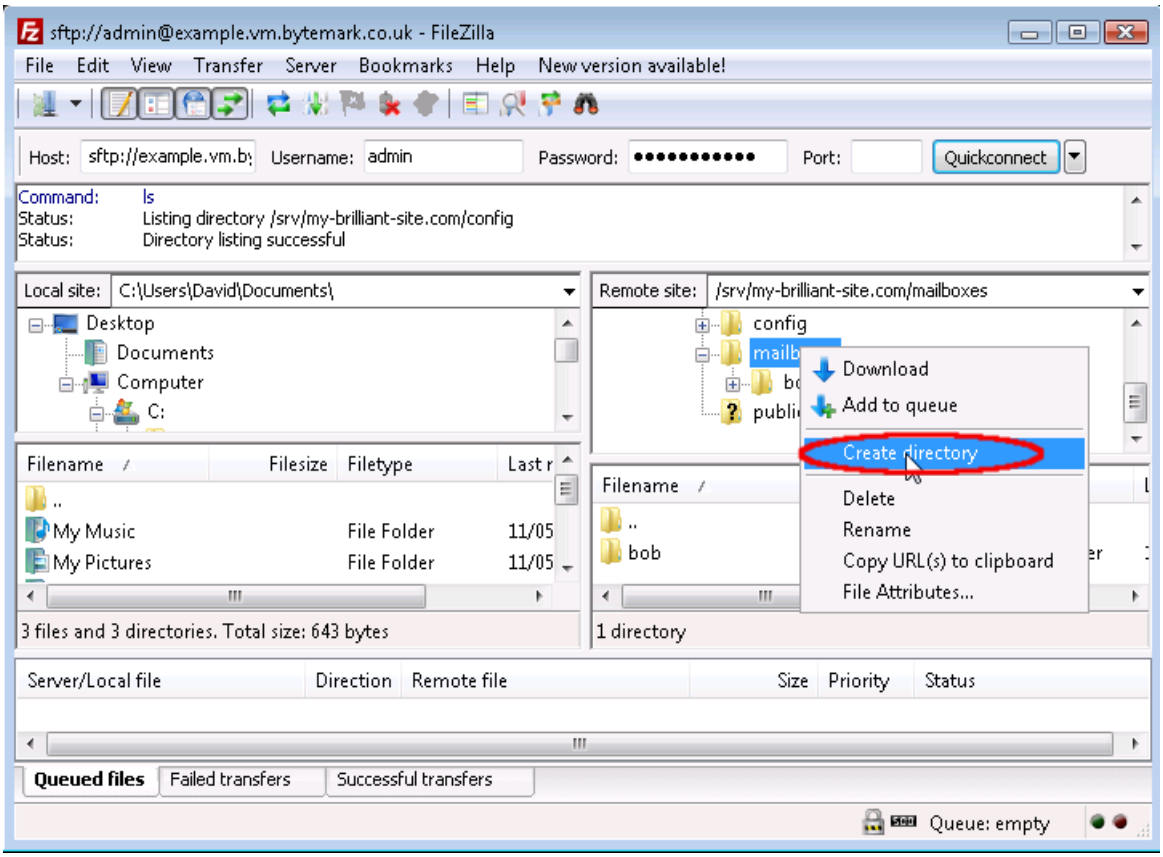

### 2.3.2 Creating a remote directory

In this walkthrough, a mailbox will created for a user **alice**. That is done by creating a directory under the `/srv/my-brilliant-site.com/mailboxes` directory. (The configuration of email is described fully in Chapter 4.)

1. Highlight the parent directory by pointing at the mailboxes label (not the icon) and left-clicking.

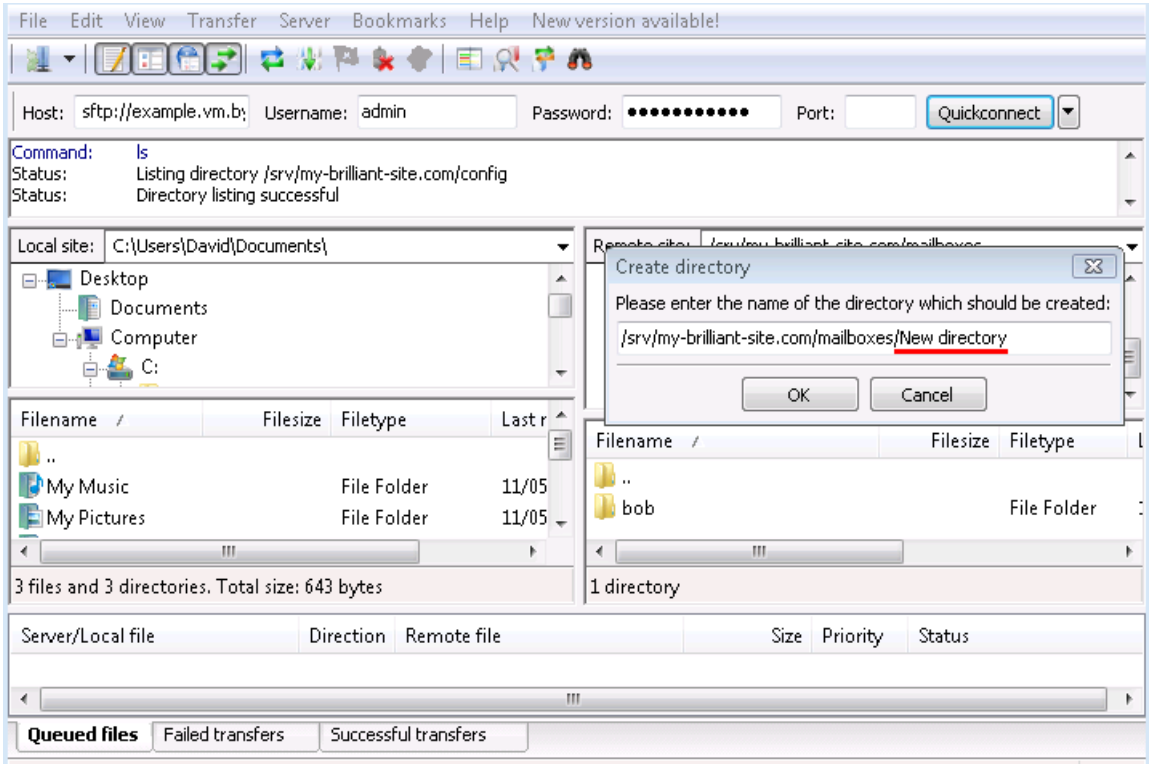



2. Right click to bring up the menu and select Create directory.

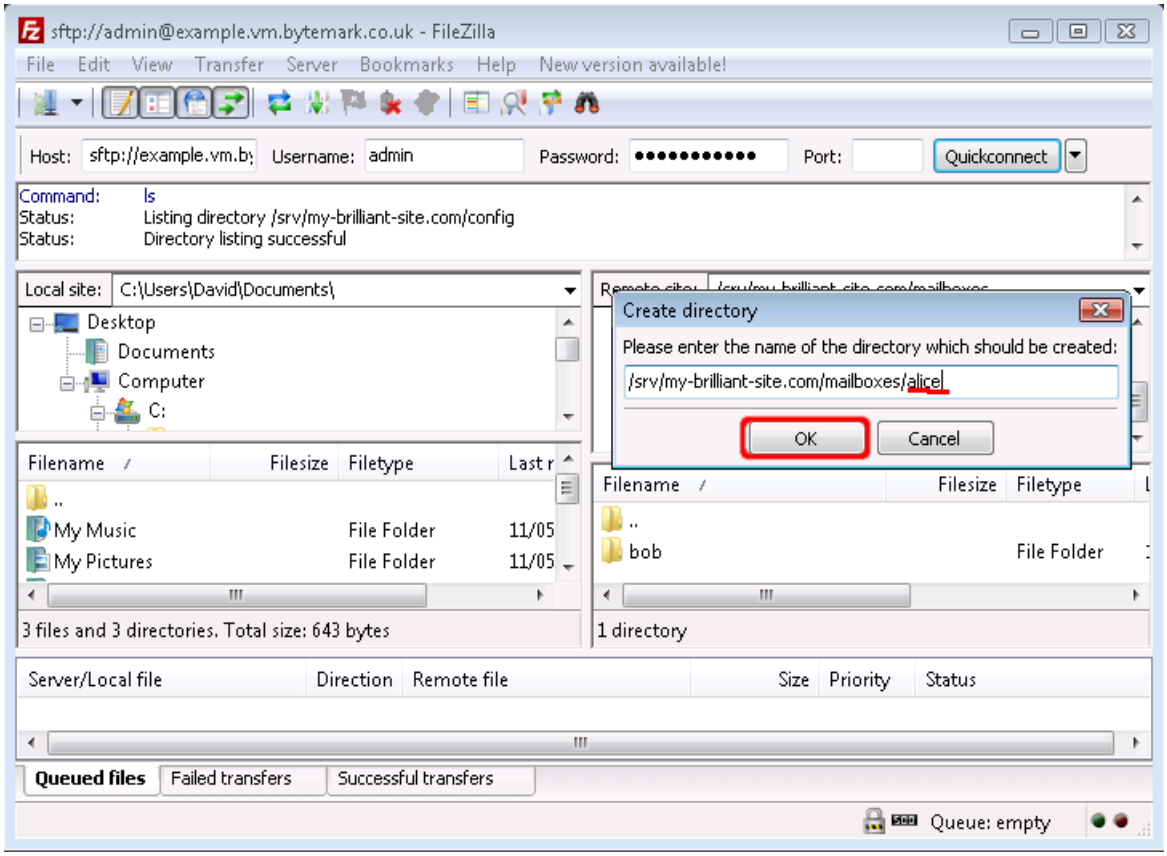



3. The Create dialog starts; the default path `/srv/my-brilliant-site.com/mailboxes`. is as we

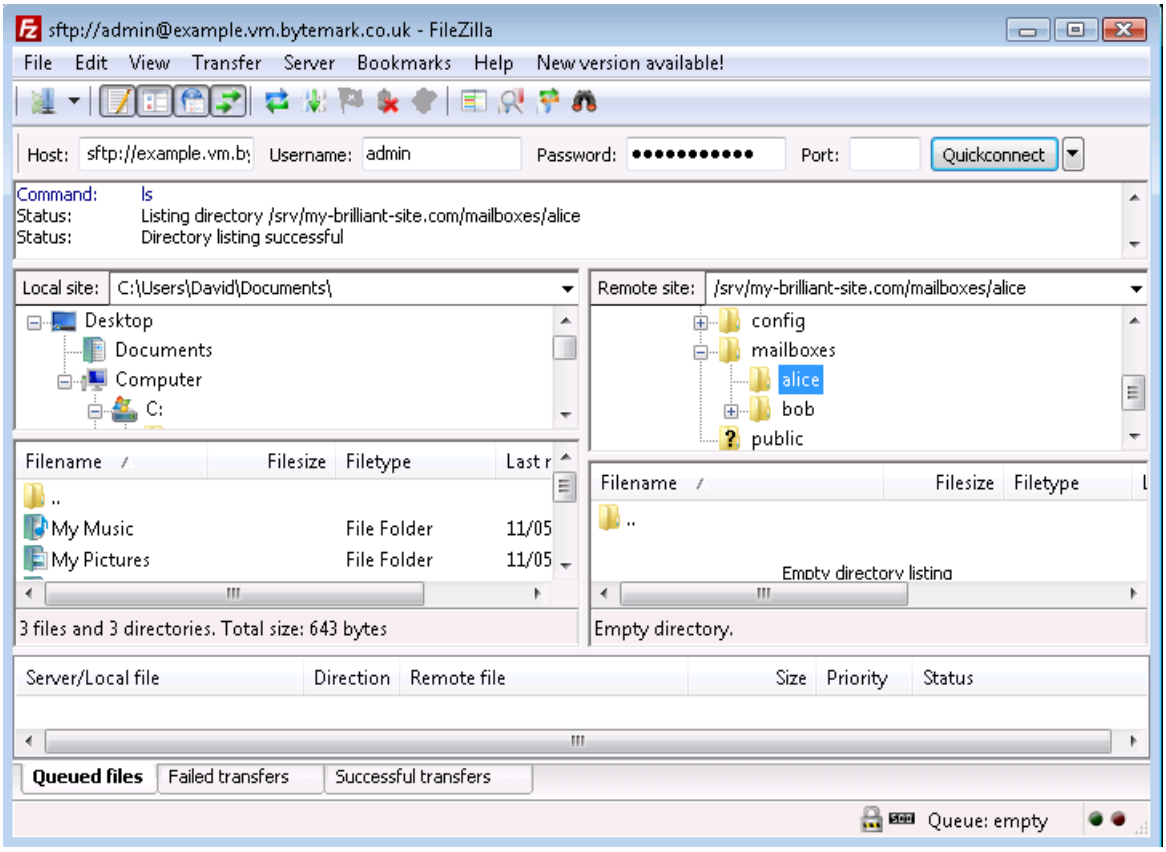
want it, but not the default name `New directory`.




4. Edit that, replacing `New directory` with `alice`, then click the OK button.




5. The `/srv/my-brilliant-site.com/mailboxes/alice` has been created.



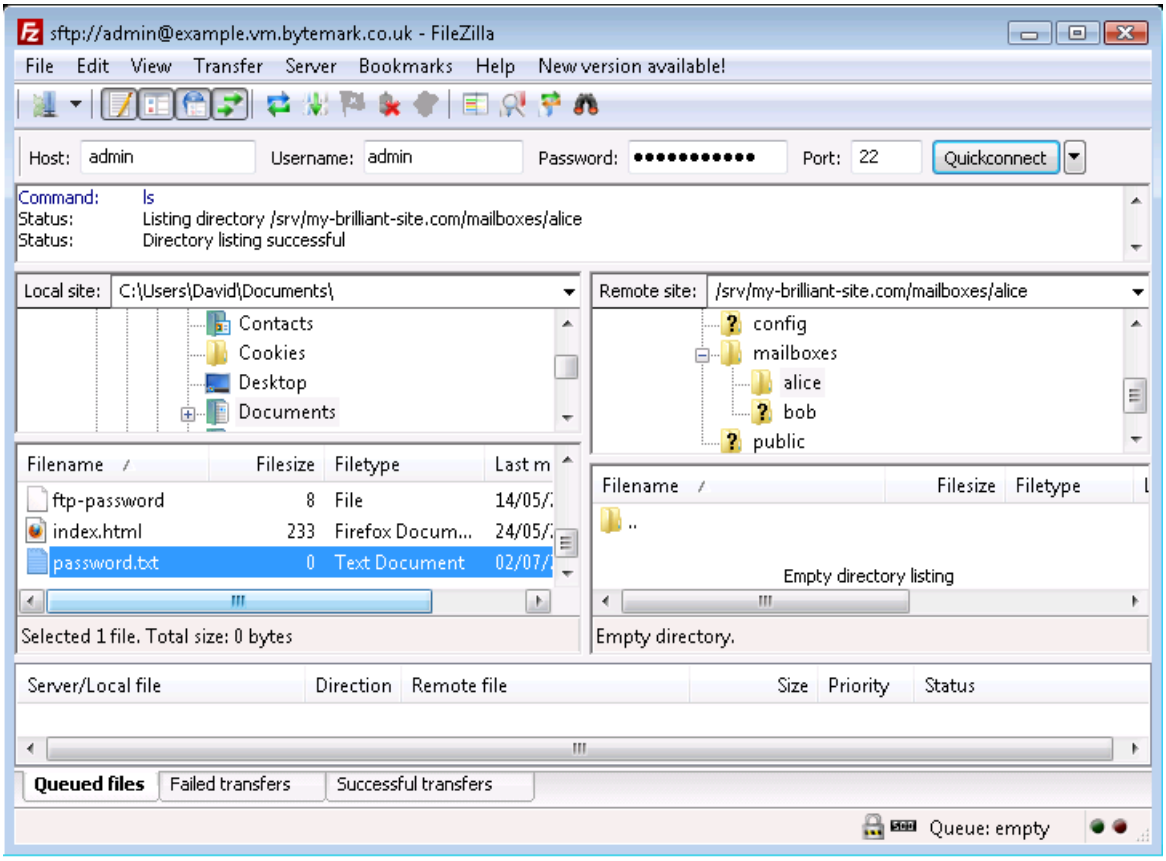

### 2.3.3 Creating a remote file

Unfortunately creating a file upon the remote server cannot be completed *directly* within Filezilla, but that limitation can be skirted around by creating the file on your local machine and then uploading it to the correct location on the server.

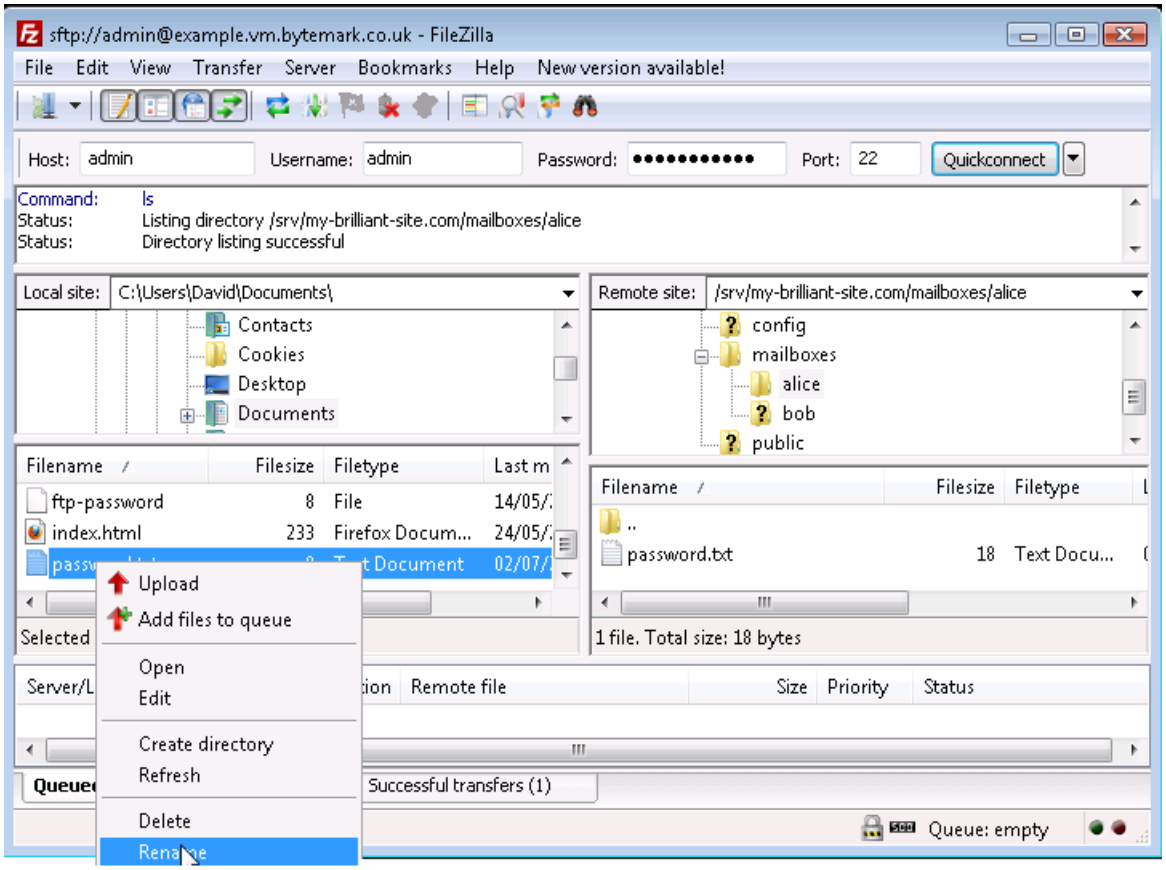
**Note**
Windows desktop systems tend to silently add the .txt extension when you create a plain text file; that makes necessary the additional step of renaming the file.

This walkthrough demonstrates the procedure for allowing the user alice to logon to the mailbox at the my-brilliant-site.com domain; in doing so, it covers the creation, upload and rename operations.

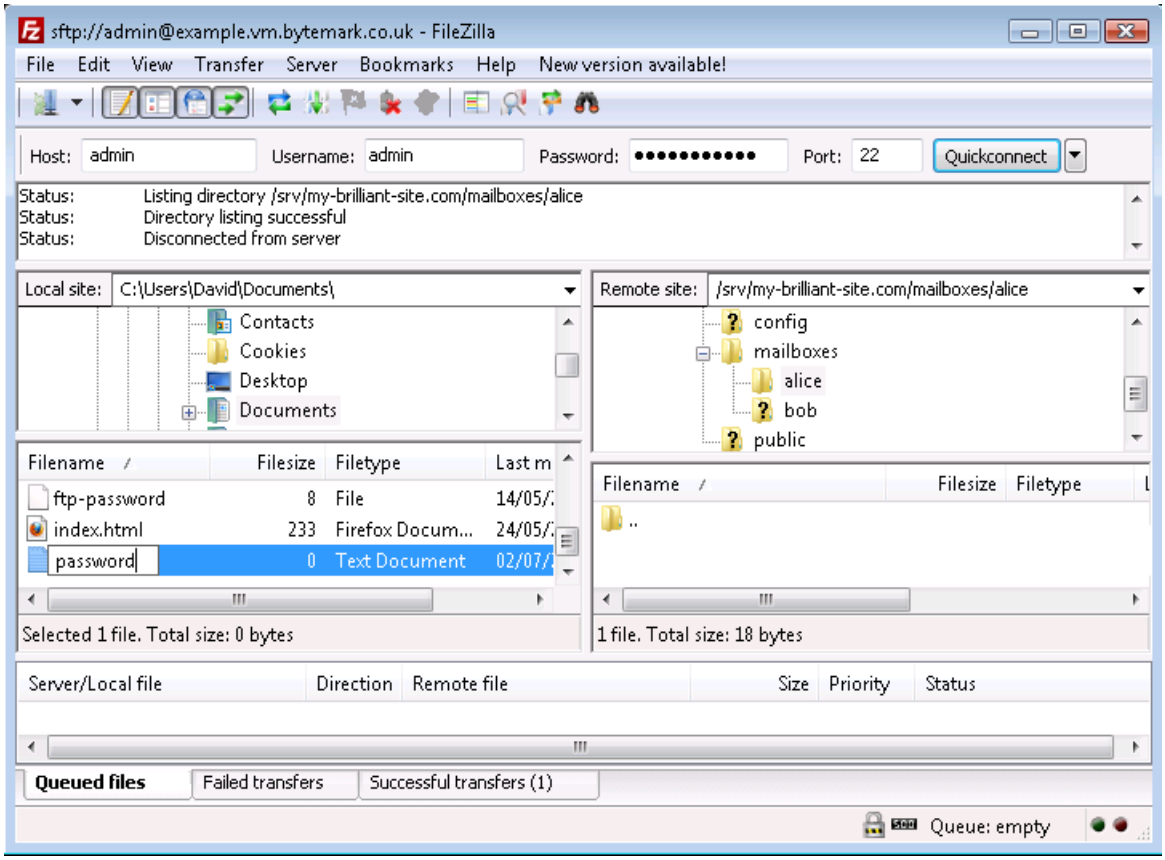
1. The Notepad program has been used to create a plain text document that contains a secure password on a single line. Although the name "password" was specified as the filename, Filezilla reveals that the ".txt" extension has been silently added to that.



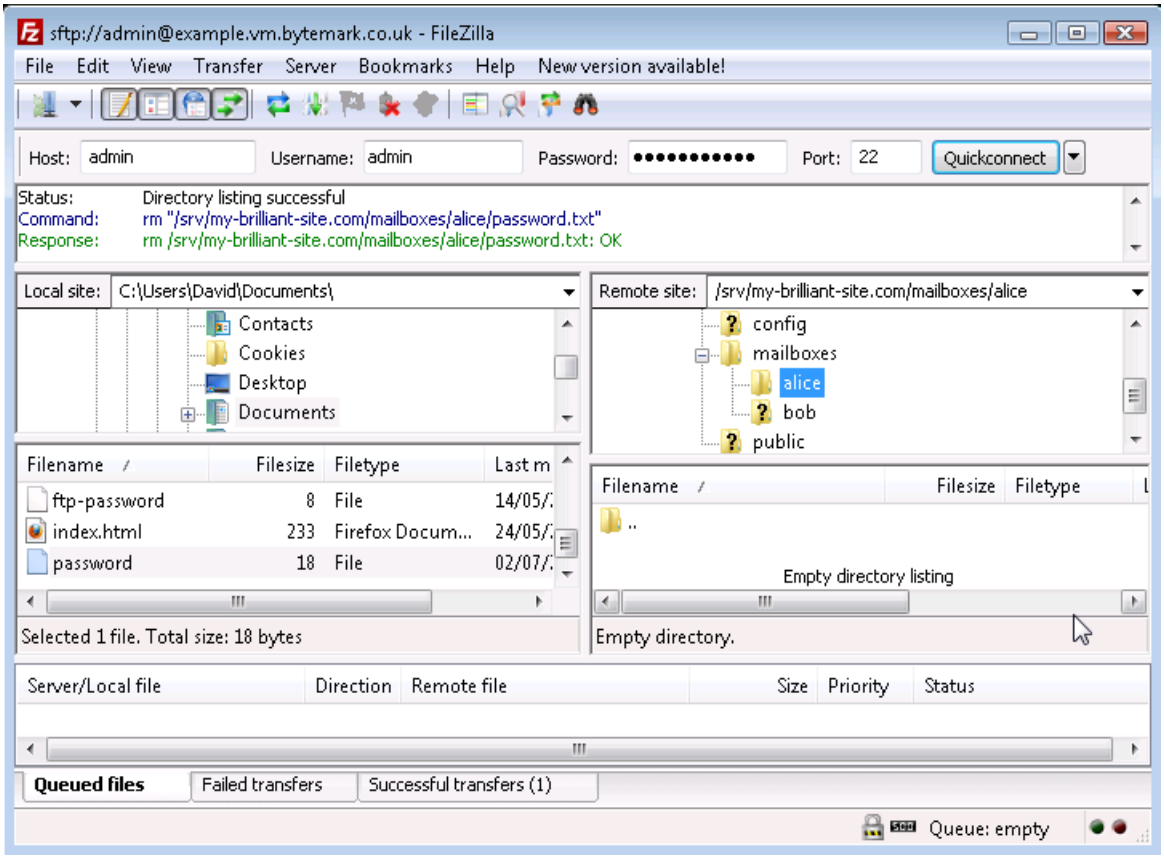

2. Right click on the `password` file to bring up the menu and select the Rename option.



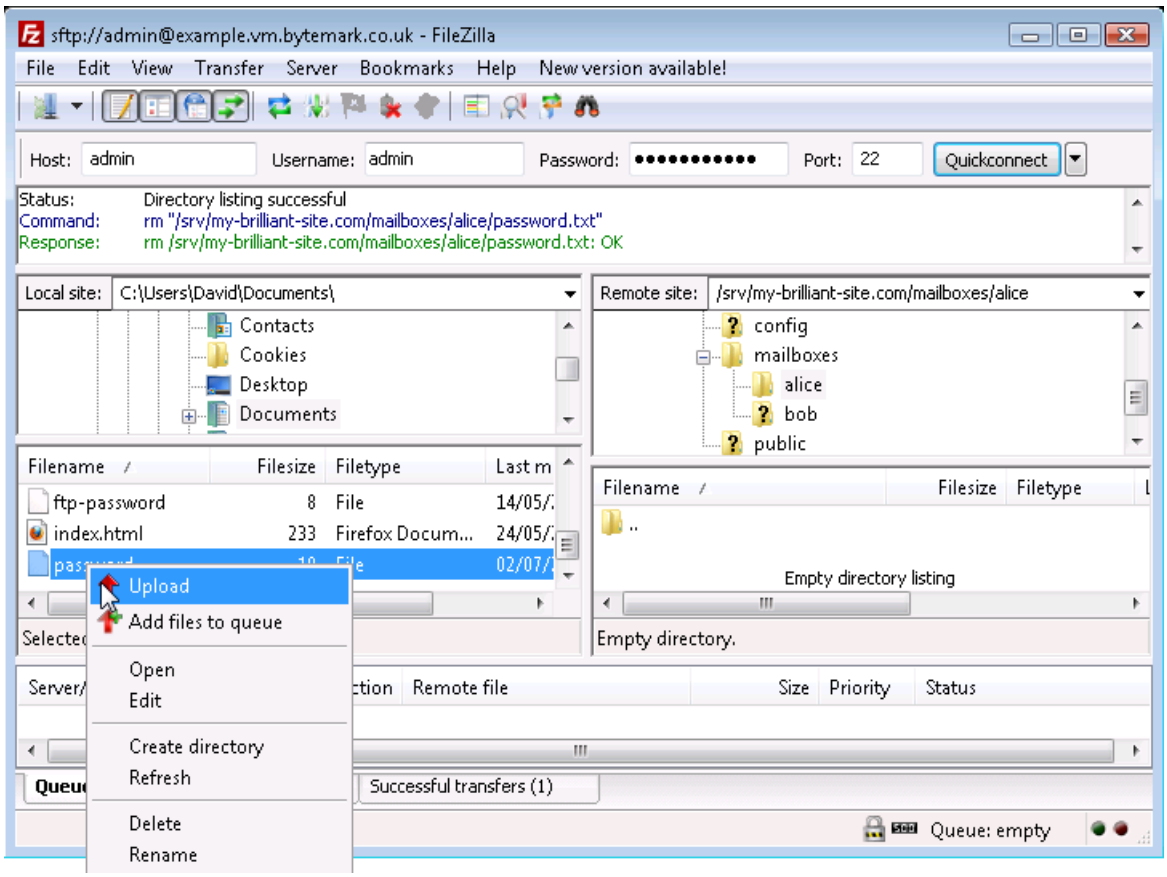
3. Rename the file by removing the unwanted .txt extension.



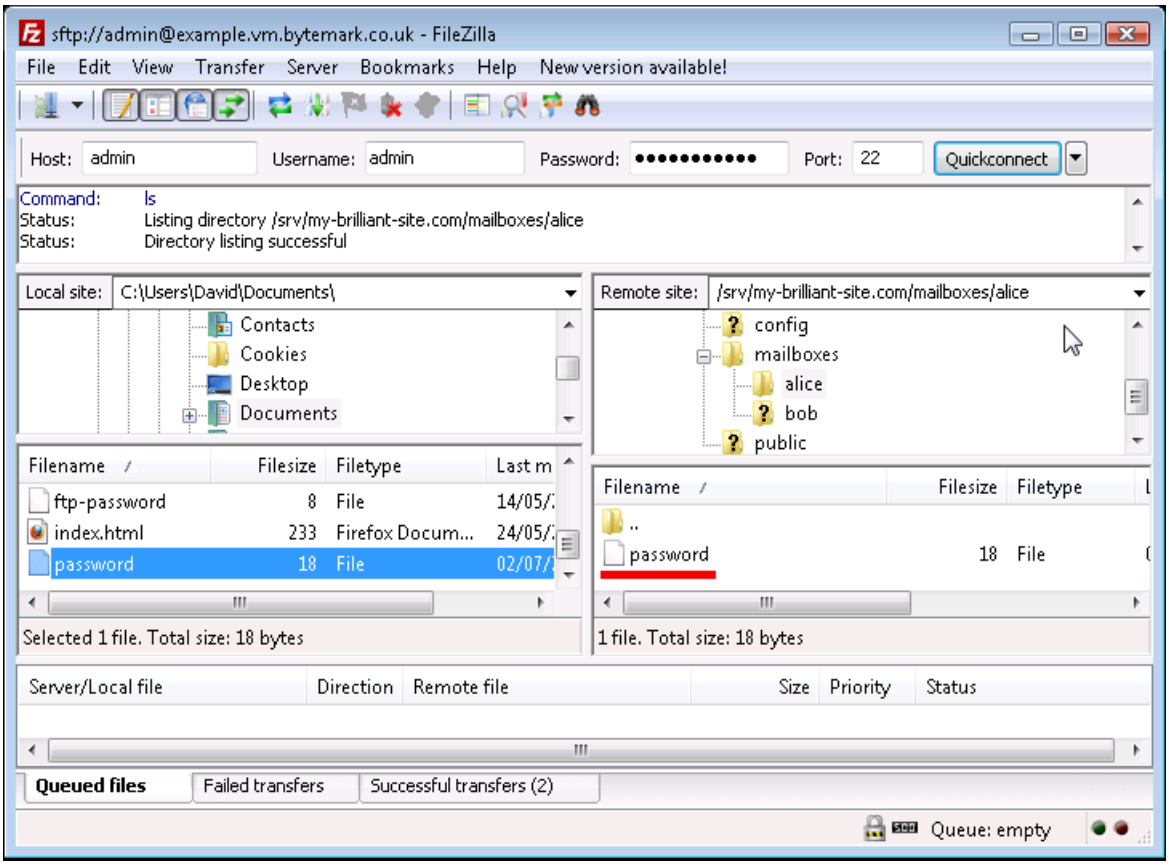

4. Press your Enter key to complete that; the file has been renamed from `password.txt` to `password`. Move to the Remote site: area on the right side of the Filezilla display and navigate to the `/srv/my-brilliant-site.com/mailboxes/alice` directory




5. Moving back to the left side of the Filezilla display, again highlight the `password` file and right click to bring up the menu. This time select the Upload option.

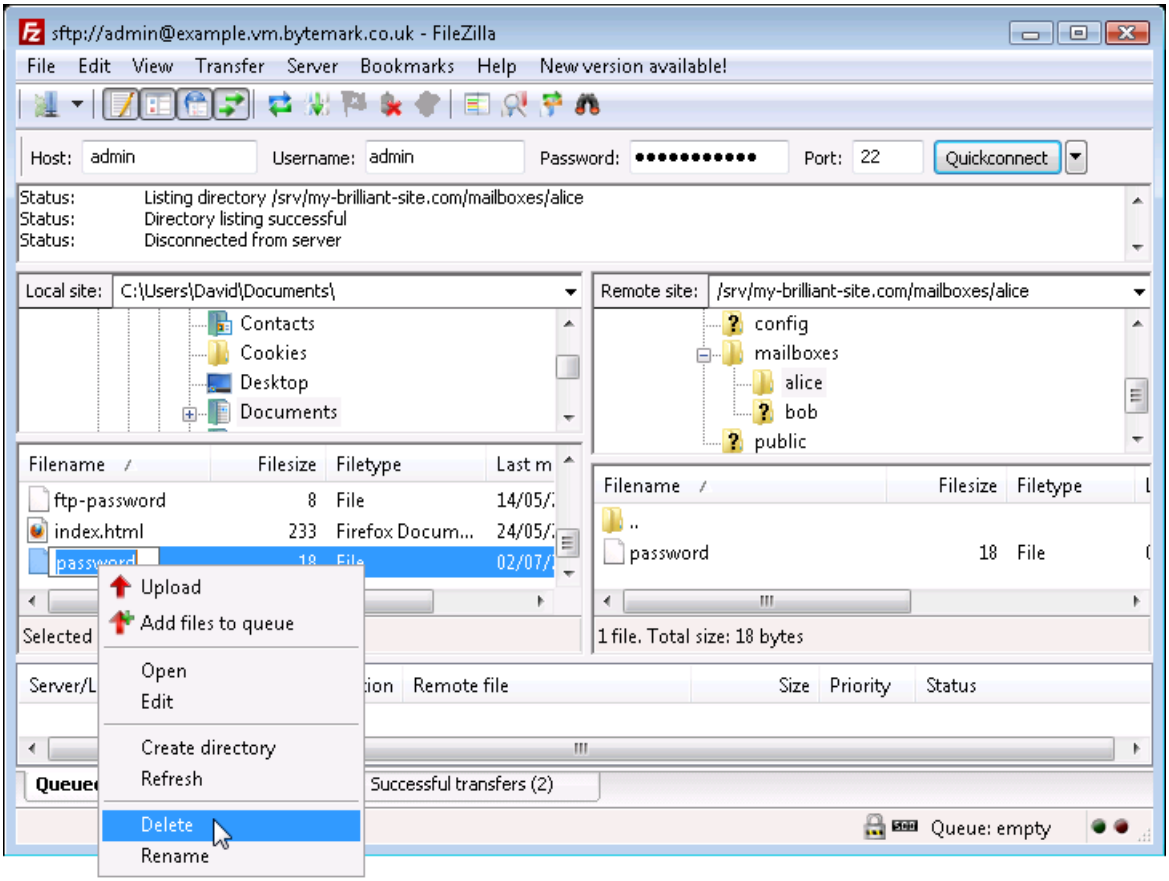


6. The `password` file has been created on the server in effect, by uploading it from the local desktop machine. An alternative method of achieving this is to select the file and in the local Filename area and drag it to the Filname area of the server.

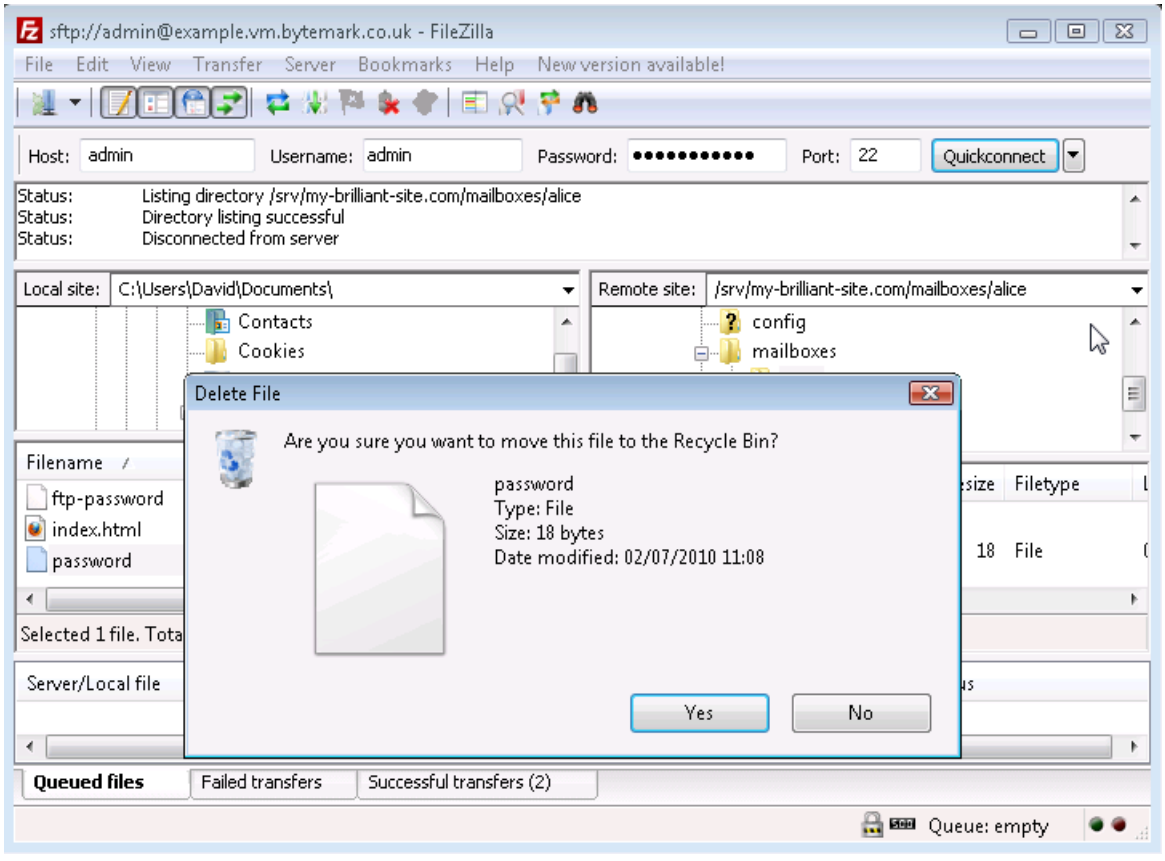



### 2.3.4 Deleting files and directories

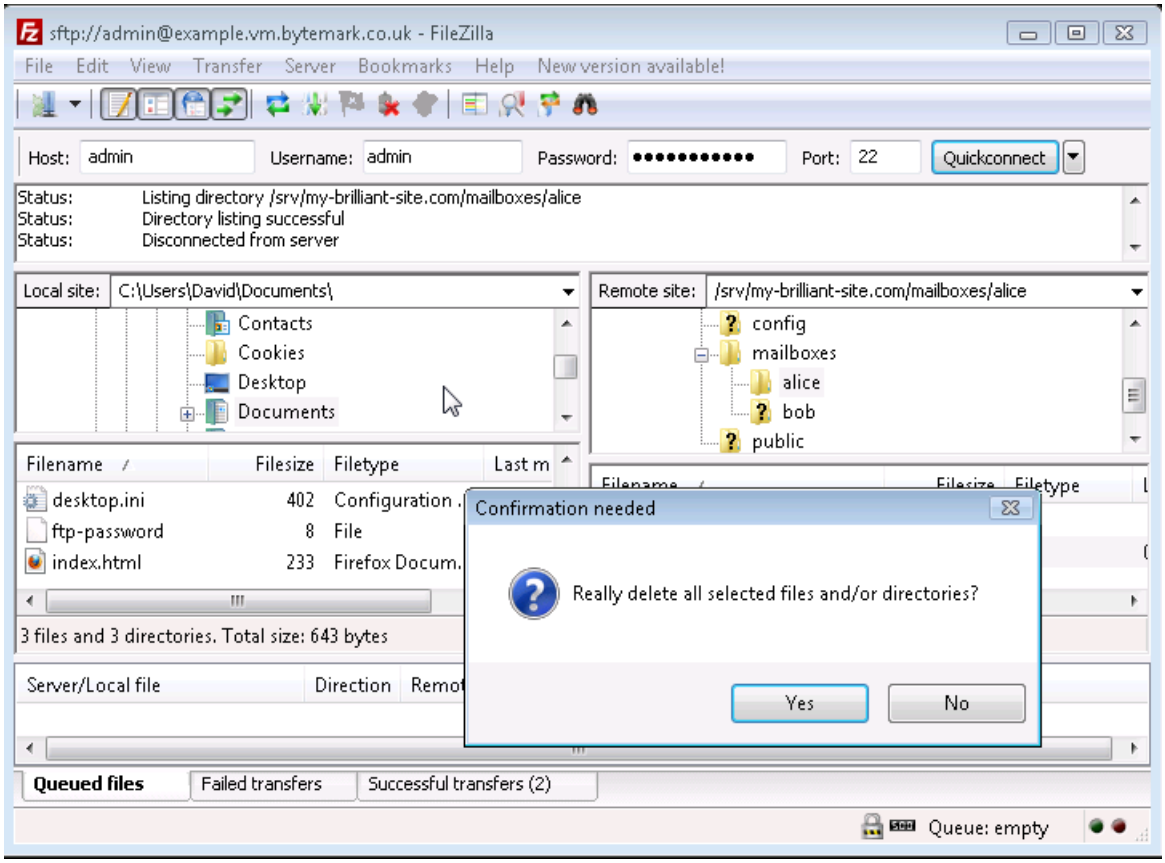
1. The `password` file on the local machine is no longer needed; select and right click then choose the Delete option.



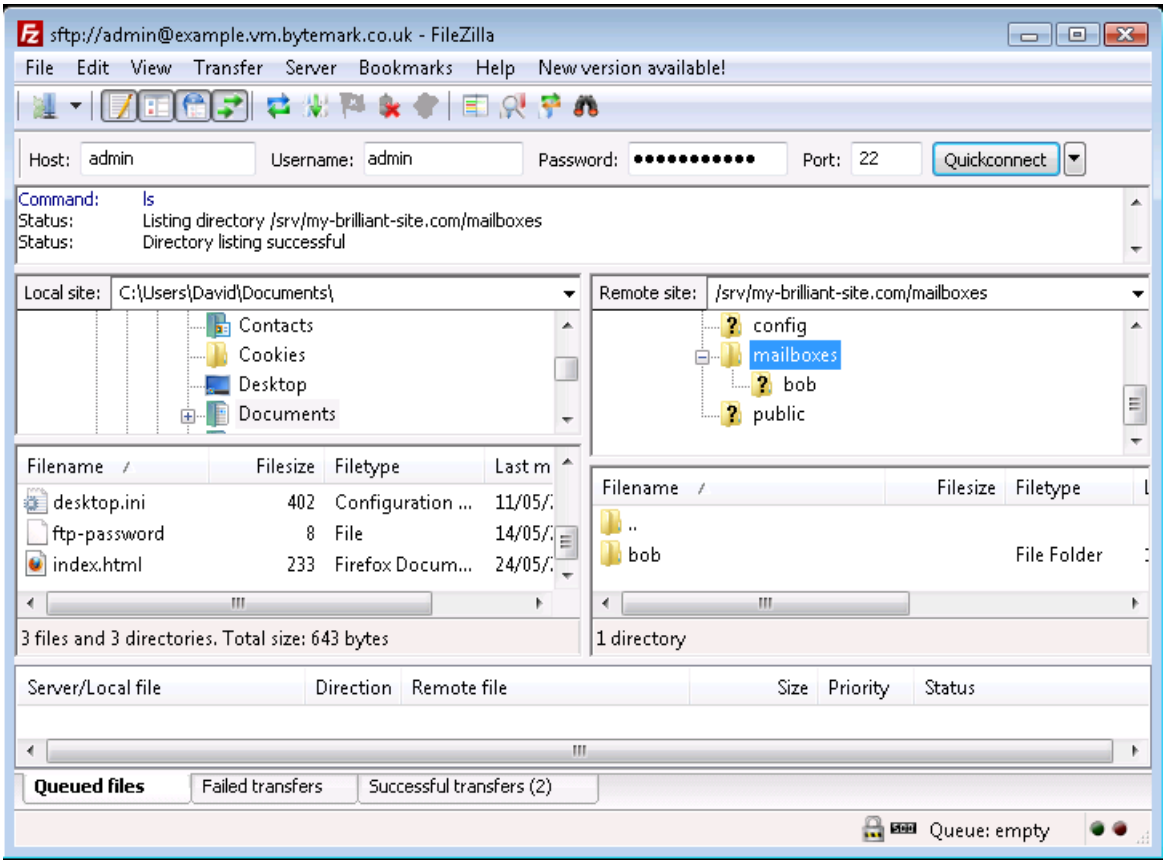

2. Confirm that you do want to delete the file by pressing the Yes button in the Delete file dialog.



3. The local `password` file has been deleted. In the same way files and also directories can be deleted from the server, the only diffence being that the Confirmation needed dialog that comes up is less detailed than the local Delete file dialog. Below is what would be seen if user alice was to be removed; the `alice` directory and the Delete option have been selected.




4. The Yes button in the Confirmation needed dialog was selected and the `alice` directory has been removed.


sftp://admin@example.vm.bytemark.co.uk - FileZilla
File Edit View Transfer Server Bookmarks Help New version available!
Host: admin Username: admin Password: •••••••••••• Port: 22 Quickconnect
Command: ls
Status: Listing directory /srv/my-brilliant-site.com/mailboxes
Status: Directory listing successful
Local site: C:\Users\David\Documents\
Contacts
Cookies
Desktop
Documents
Remote site: /srv/my-brilliant-site.com/mailboxes
config
mailboxes
bob
public
Filename Filesize Filetype Last m
desktop.ini 402 Configuration ... 11/05/
ftp-password 8 File 14/05/
index.html 233 Firefox Docum... 24/05/
3 files and 3 directories. Total size: 643 bytes
Filename Filesize Filetype
..
bob File Folder
1 directory
Server/Local file Direction Remote file Size Priority Status
Queued files Failed transfers Successful transfers (2)
Queue: empty

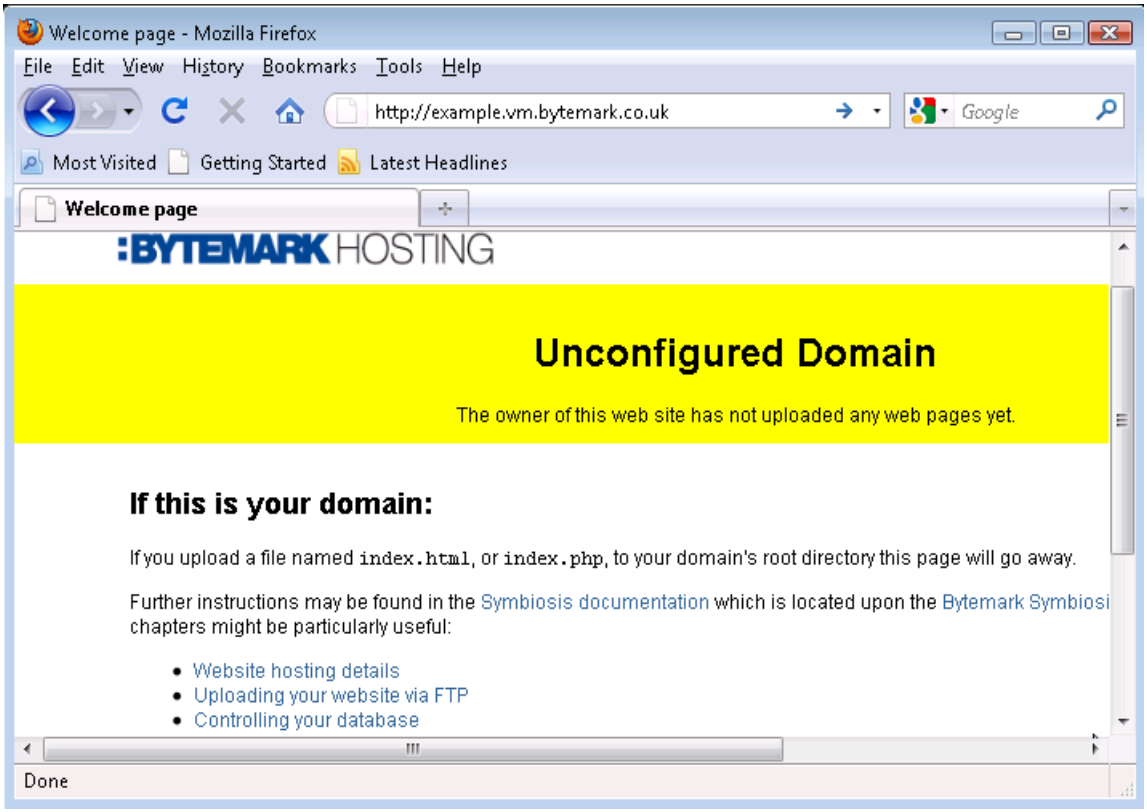
# Chapter 3

# Website setup

**Before you start this chapter**

1. Connect to your server over *SFTP* using FileZilla (see Chapter 2).

Start up your web browser and enter the machine's name in the location bar, e.g. http://example.vm.bytemark.co
As you can see, your machine is already hosting a default page.

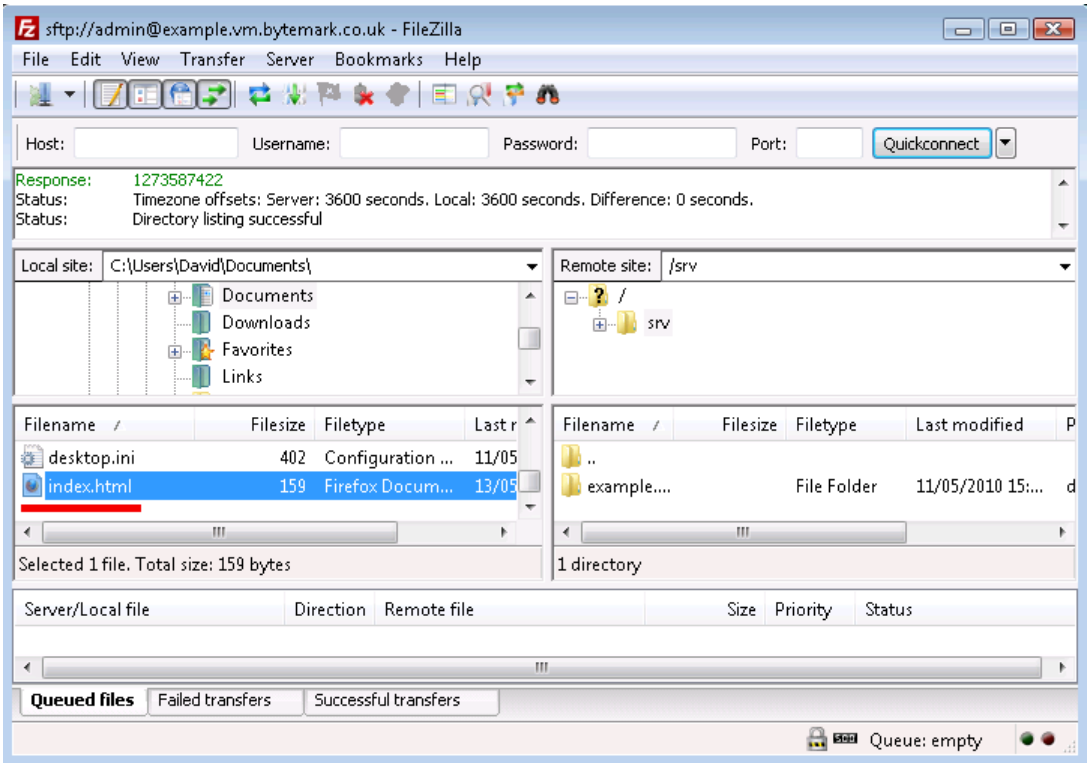



The procedure for replacing this default page with a new one is as follows.

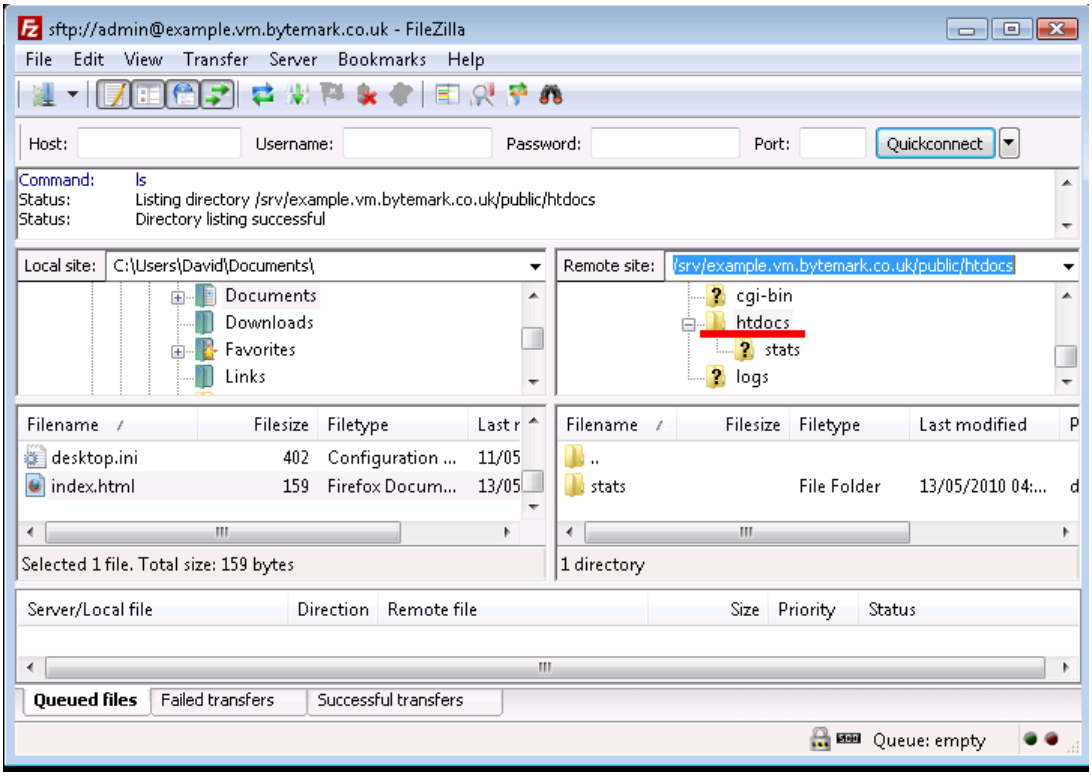
1. Create a simple *HTML* file named `index.html`. It has been assumed that it has been saved in the directory called `My Documents`.

2. Start up FileZilla and connect to your server.

3. The file `index.html` should show up in the lower left-hand pane. In the right-hand pane the `/srv` directory will be shown.

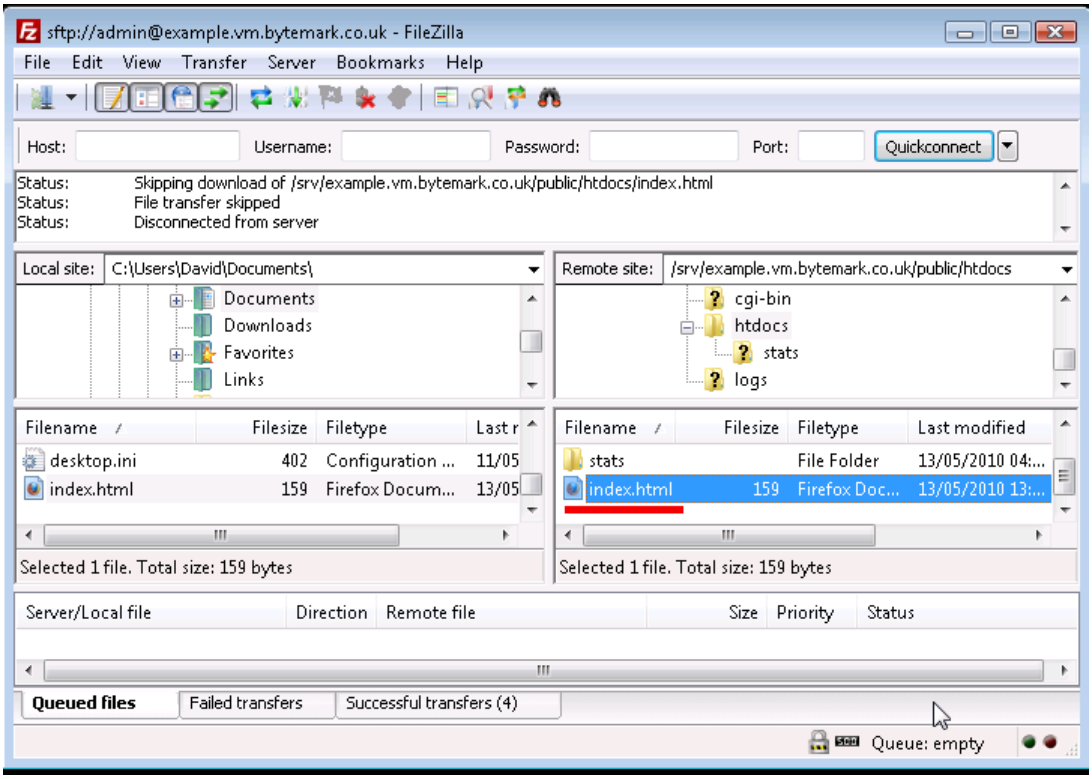



4. HTML files should be uploaded to the `public/htdocs/` directory. This can be found by revealing the contents of `srv/` by clicking the + to its left in the top-right hand pane.

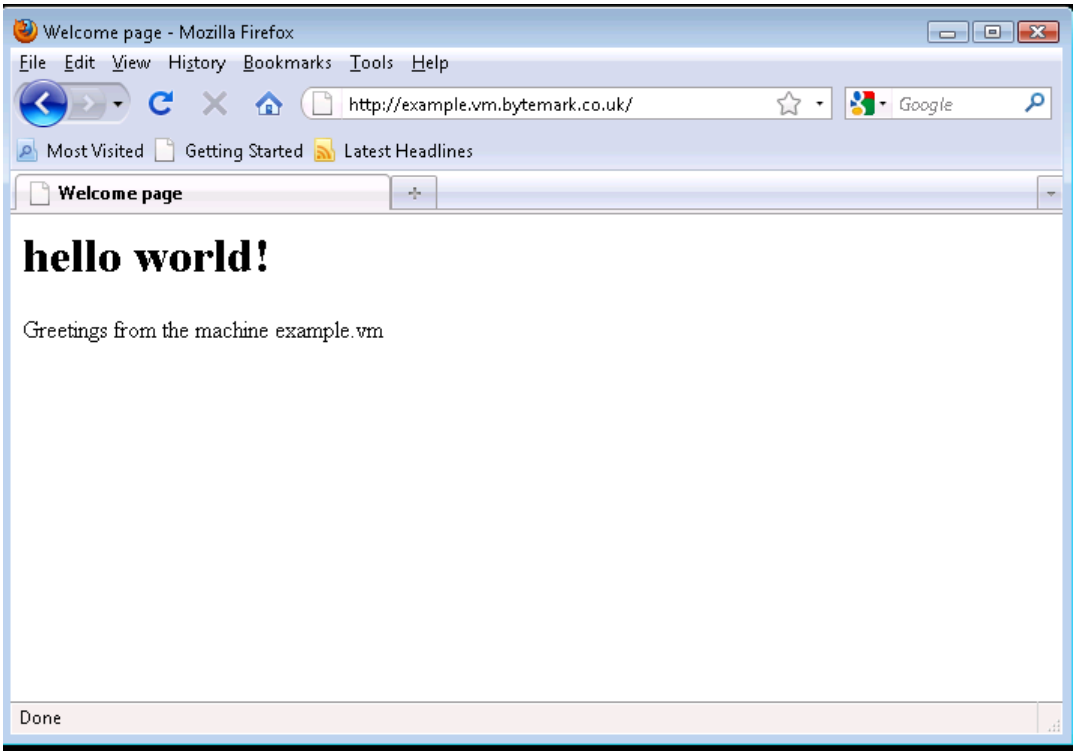



5. Now **right-click** on `index.html` in the lower left-hand pane, and select Upload from the menu.

The file is uploaded to the `htdocs/` directory on the server.




6. Refresh your web browser to see the result.




**Note**

This example shows uploading a web page written in HTML, called `index.html`. This file could also be written in *PHP*, in which case the file should be called `index.php`.

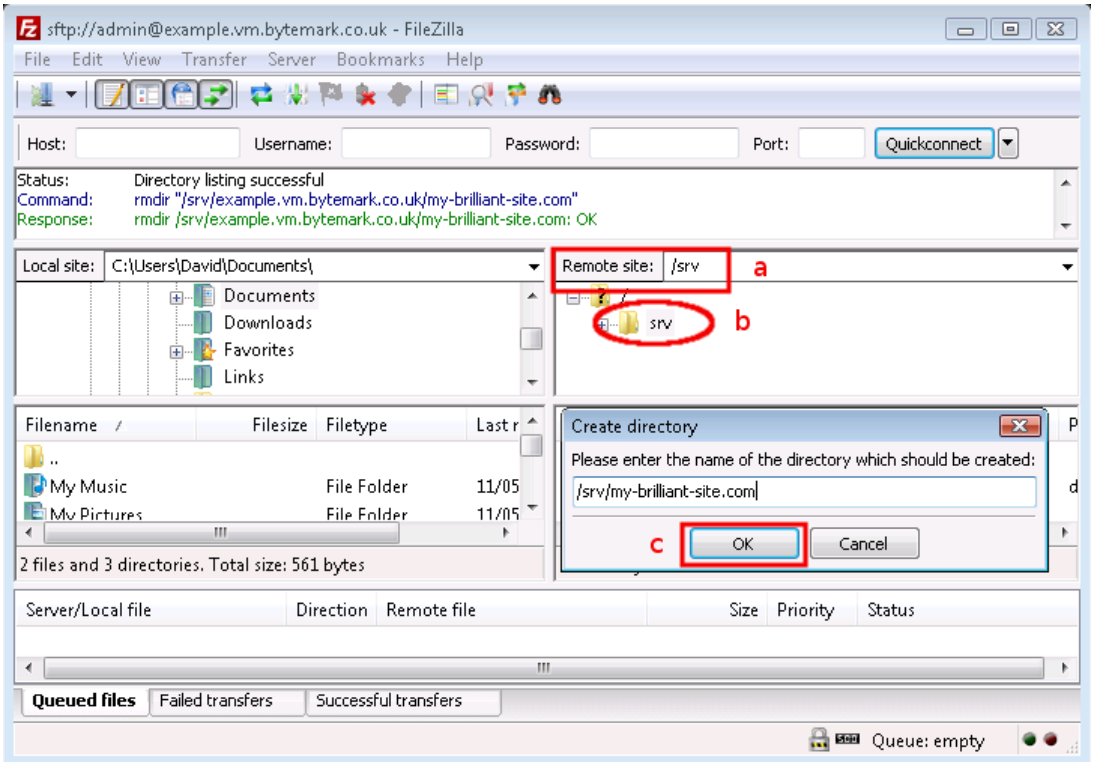
## 3.1 Hosting a web page using your own domain

The previous section dealt with setting up a web page using the default domain associated with the machine. A Symbiosis system can host many domains without any extra configuration. This section deals with configuring a second domain.

It has been assumed that both your server is hosted at Bytemark, and that this second domain is using the Bytemark name servers. If this is not the case, then Section 15.1 sets out the DNS records needed for the following procedure to work.

For the purposes of this tutorial, the domain **my-brilliant-site.com** is being hosted on the machine **example.vm.bytemark.co.uk**.

1. With FileZilla connected to the server, make sure the Remote site text field is pointed at the `/srv` directory **a**. Right click on the folder icon **b**.
2. From the right-click menu select Create directory and in the Create directory popup enter `/srv/my-brilliant-site.com`.




3. Click the OK button **c** to create the directory
4. Repeat this step to complete the domain tree with the directories `/srv/my-brilliant-site.com/public` and `/srv/my-brilliant-site.com/public/htdocs`
5. Create another `index.html` file.
6. Upload it as before, but this time into the `htdocs` directory in the `my-brilliant-site.com` directory tree.

Within a hour, the DNS records for **my-brilliant-site.com** will be generated and uploaded to the Bytemark domain name servers. Navigating to that site will then show our new index page.

At this point, the site will also be visible at both http://my-brilliant-site.com and http://www.my-brilliant-site.com. This is part of the Symbiosis setup; if different pages were required at **www.my-brilliant-site.com**, a separate directory tree should be created for **www.my-brilliant-site.com**, with a different content as needed.

## 3.2 Handling wildcard domains

As we've previously noted if there is a directory present upon your machine with the name `/srv/my-brilliant-com/public/htdocs` the contents of that directory will be served for both:

- http://my-brilliant-site.com/
- http://www.my-brilliant-site.com/

This works because although the prefix, "www.", is missing the actual domain is still found on your machine beneath the `/srv` prefix.

In the general case you can also direct your users to:

- http://any.name.my-brilliant-site.com/
- http://site.my-brilliant-site.com/

In short - the sub-domain used as a prefix is silently removed if the appropriate directory cannot be found upon your machine. The only additional step you'll need to perform is to create the appropriate DNS entry, which is discussed in Section 15.2.

## 3.3 Testing a new domain

It is possible to test the content associated with a new domain before it has been registered or had any DNS configuration done. This is done using the **testing** prefix.

If your machine is not hosted at Bytemark, or your machine name does not end in **bytemark.co.uk** then a wild-card DNS record is needed for this to work. This is discussed in Section 15.2.

For example, to view the site **my-brilliant-site.com** which is hosted on the machine **example.vm.bytemark.co.u** simply head to http://my-brilliant-site.com.testing.example.vm.bytemark.co.uk/.

This testing URL is immediately available following the upload of the `index.html` or `index.php` files.

Note that there is no **www** at the start of the testing URL.

**Note**
This facility does not play well with certain directives that can be used in Apache `htaccess` files, especially rewrite rules.

# Chapter 4

# Configuring email

**Before you start this chapter**

1. Connect to your server via SFTP (see Chapter 2).

This chapter deals with configuring email for a domain, namely setting up mailboxes to receive email. The Symbiosis system makes this very simple, as the process of creating a new mailbox, or email account, is a simple matter of creating a few files and directories.

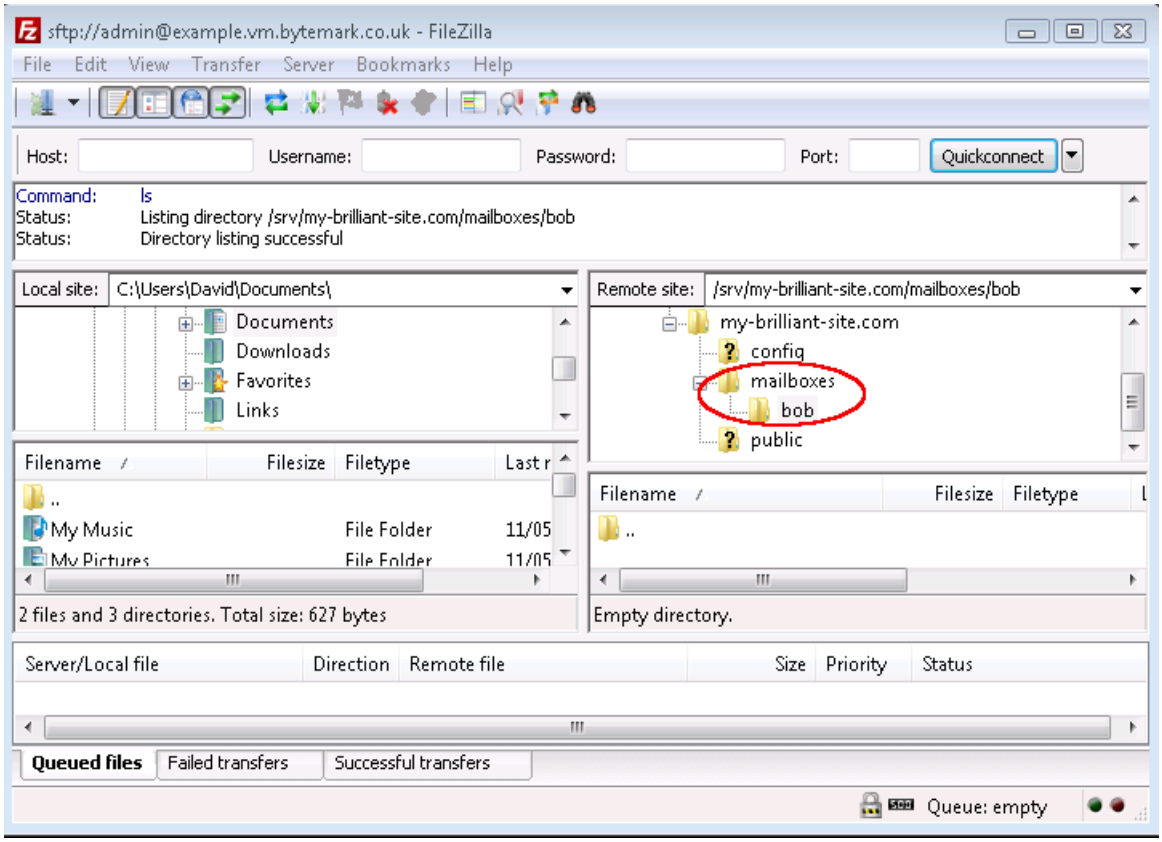
As with our previous examples we'll be using the **my-brilliant-site.com** domain for demonstration purposes, but you should substitute your own domain.

Again for example purposes we'll be demonstrating the creation of a new email account, for the user "bob", which will correspond to the email address bob@my-brilliant-site.com - you should change the name "bob" to the username(s) you desire.

## 4.1 Creating a new mailbox

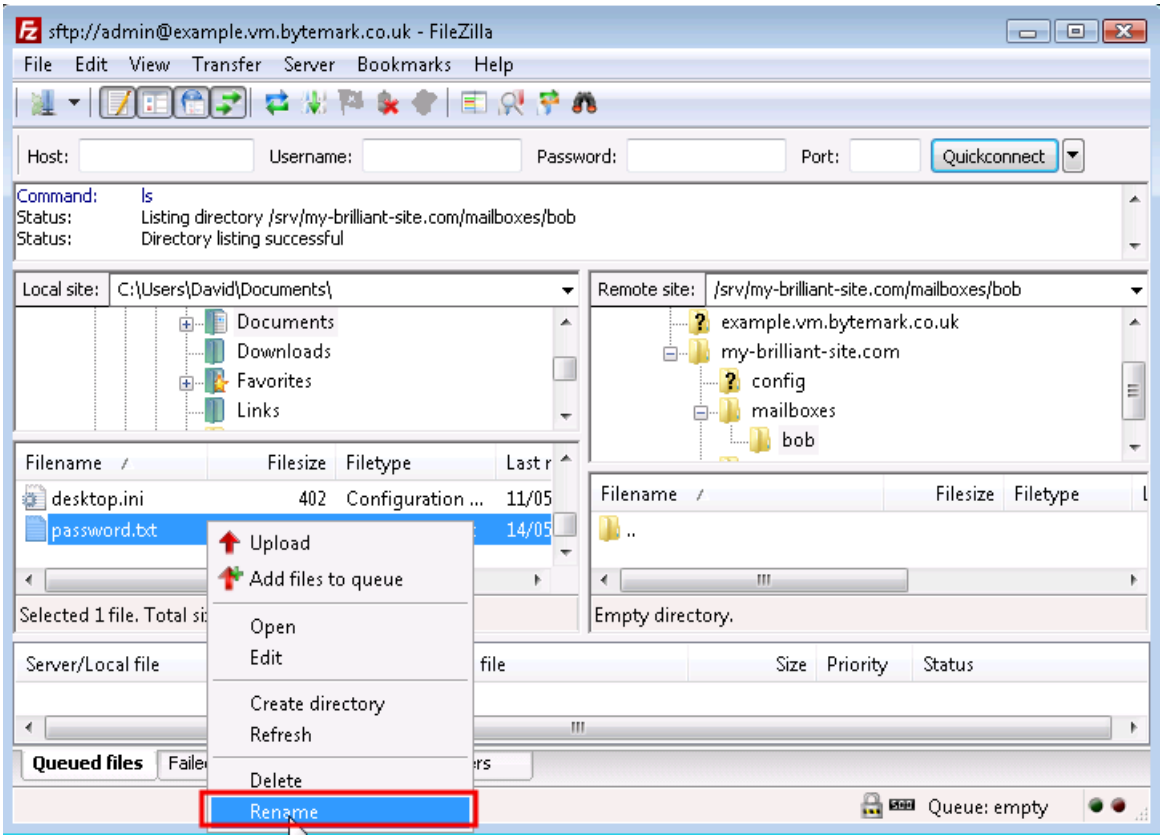
It has been assumed that the first few steps in Section 3.1 have been followed, i.e. that a directory has been created under `/srv/` for the domain **my-brilliant-site.com**.

1. Start FileZilla and connect to your machine.
2. Then **right click** on the `/srv/my-brilliant-site.com/` directory and select Create directory from the menu. Set the new directory name to be `mailboxes` and press the OK button.
3. Repeat this step to create the directory `mailboxes/bob` which makes a mailbox for the address bob@my-brilliant-site.com.

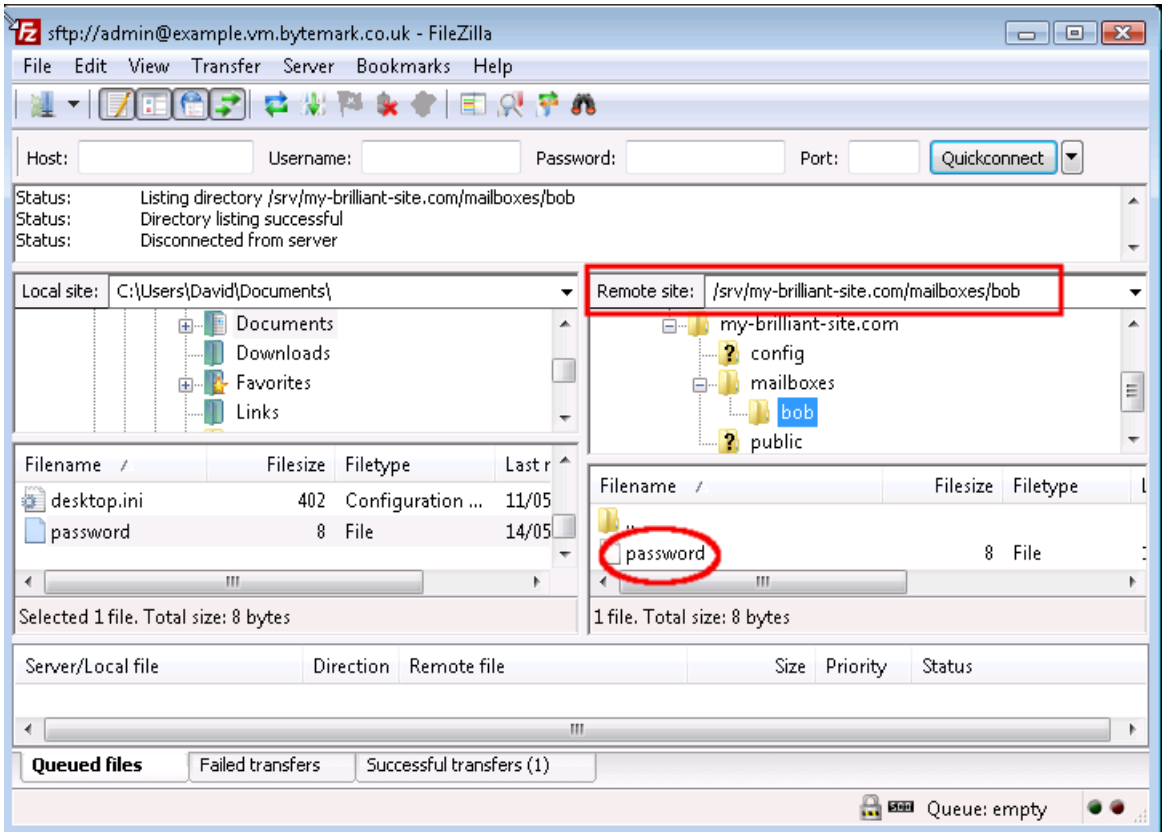



4. Use a text editor such as Notepad to create a file `password` on your desktop machine which contains a secure password.

5. Under **Windows** a `.txt` extension will be added to the filename which is not wanted. So before you upload the file use FileZilla to rename it from `password.txt` to `password`. That is done by clicking with the right mouse button on the file in the lower right hand pane, and selecting Rename from the menu that appears.




6. To upload, **right click** on the filename and select Upload from the menu, making sure that the directory `/srv/my-brilliant-site.com/mailboxes/bob/` is shown in the Remote site: text area.



That is all that is needed to set up a new mailbox. To test we can immediately use the webmail application, SquirrelMail, supplied with Symbiosis.

## 4.2 Additional Email Configuration

We've seen in the previous section the basic steps required to configure a new email account upon a domain. For most users this is all the configuration that is required, however an advanced user might wish to take advantage of some more optional configuration.

### 4.2.1 Forwarding Email

If you would prefer to have emails to a new address sent on to, create a file named `/srv/my-brilliant-site.com/mailboxes/bob/forward`. In this file just enter the name of the account that mail should be forwarded to; this might be something like dave@example.com.

This file can do many other things than just forwarding email, as explained in its reference section.

### 4.2.2 Scanning email to prevent spam and viruses

Symbiosis comes with in-built virus and spam detection, however it is not enabled by default. There are two principal aspects to this, namely

- The use of SpamAssassin to scan each email to determine if a message is unwanted;
- The use of ClamAV to detect viruses in emails.

Each of these is configured separately, on a per-domain basis, giving choice as to which preventative measures are applied to your email.

#### 4.2.2.1 Using SpamAssassin to detect and reject or tag SPAM

Email can be rejected or tagged, based on its SPAM score determined by SpamAssassin. This is not enabled by default, but can be enabled in much the same way as the blacklists above.

The default action is to reject, i.e. bounce, email that is determined by SpamAssassin to be SPAM. This can be changed to accept all email, but tag it with a header field to allow users to filter it themselves. This header is detailed in Section 13.10.

To enable SPAM scanning:

1. Connect to your machine using FileZilla
2. On the remote directory tree, navigate to `/srv/my-brilliant-site.com/config`.
3. On your local machine create a file called `antispam`. If you want to reject email, i.e. bounce email, that is classified as spam, this file should be empty. If you'd rather accept all email, but tag it as spam, this file should contain the word `tag`.
4. Having created the file, right click on it and select upload to transfer it to the remote system. Make sure that the remote file has the correct name, i.e. no extra `.txt` extension.

#### 4.2.2.2 Using ClamAV to detect and reject, or tag, emails with viruses

ClamAV is activated in a similar way to SpamAssassin. It can also be set to tag or reject. Again, a header is added to message that has been scanned. This is detailed in Section 13.10.

To enable virus scanning:

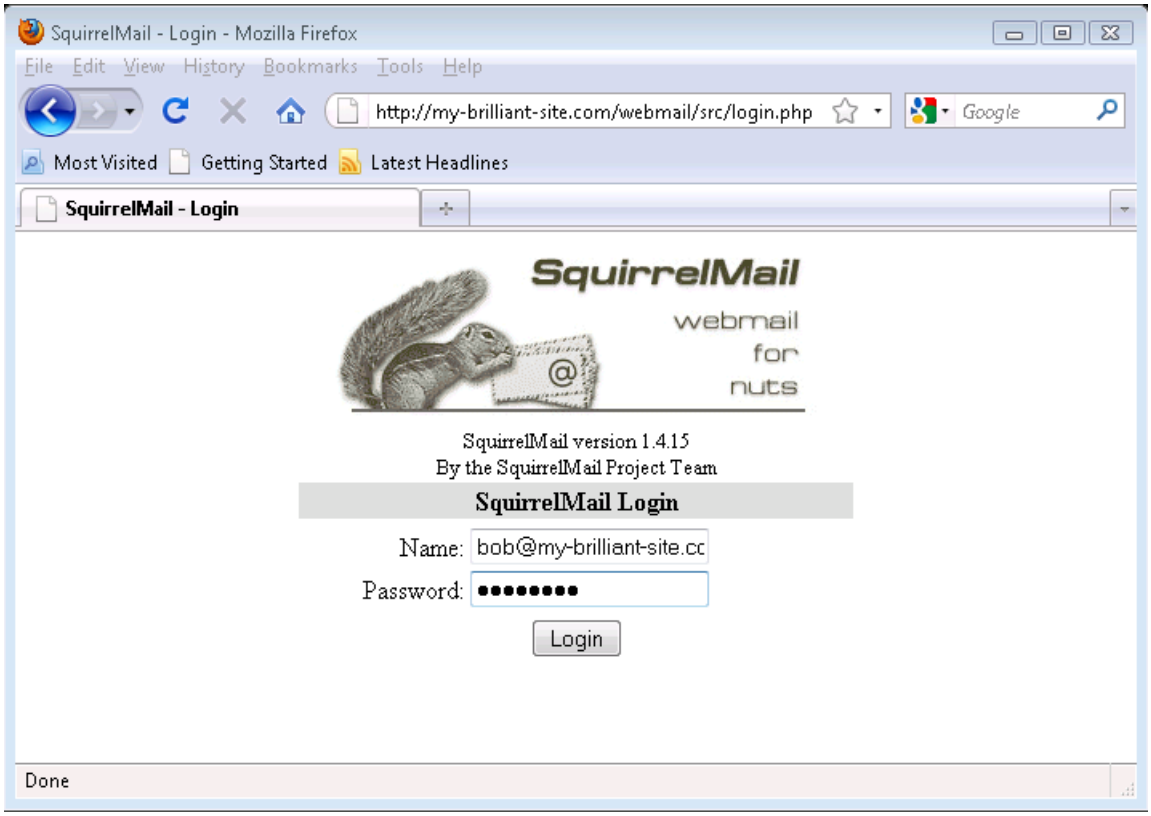
1. Connect to your machine using FileZilla
2. On the remote directory tree, navigate to `/srv/my-brilliant-site.com/config`.
3. On your local machine create a file called `antivirus`. If you want to reject email, i.e. bounce email that has viruses in, this file should be empty. If you'd rather accept all email, but tag it to show that it has a virus in, this file should contain the word `tag`.
4. Having created the file, right click on it and select upload to transfer it to the remote system. Make sure that the remote file has the correct name, i.e. no extra `.txt` extension.

## 4.3 Testing a new mailbox, via webmail

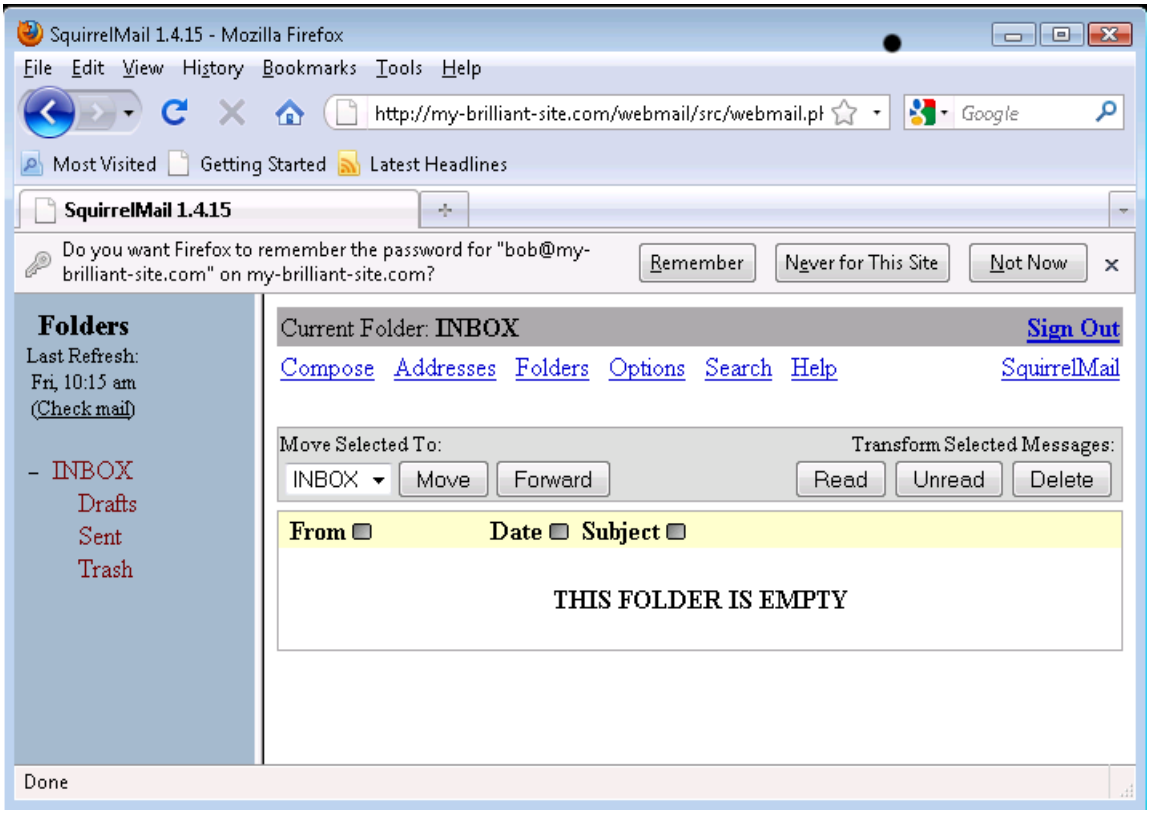
Although most users will prefer to receive and write their emails using a dedicated client (such as ThunderBird, or Microsoft Outlook) the Symbiosis system includes a mail client you can access with nothing more than a web-browser.

This section briefly documents using the Squirrelmail webmail system.

1. To log in to webmail, start your browser and head to http://my-brilliant-site.com/webmail.
2. Enter your email address in the Name field, and your password in the Password field.



3. Click the Login button, and assuming the Name and Password fields were correct, you will be presented with your Inbox where you can read and send email.




## 4.4 Configuring email clients

The following details might be needed when setting up a mail client to use an email account. The user of bob@my-brilliant-site.com on the machine example.vm.bytemark.co.uk has been chosen for these worked examples.

It is recommended that all communication with the mail server is conducted over encrypted connections, either using *SSL*, or *TLS*.

Incoming email can be collected using either the *IMAP* or *POP3* protocols. IMAP is generally recommended over POP3 as it can handle folders, push notification, can selectively download message parts, and the email remains on the server enabling back-ups to be made.

Outgoing email is sent using *SMTP*. It is good practice to send any outgoing email via the Symbiosis server, rather than any relay service provided by your ISP.

For both sending and receiving email, the following login information would be used.

**Username** bob@my-brilliant-site.com

**Password** (contents of `/srv/my-brilliant-site.com/mailboxes/bob/password`)

**Server name** example.vm.bytemark.co.uk

The default ports are used for all protocols. For further details see Section 13.1.

It is common for Internet service providers to block the standard outgoing email port, i.e. port 25. If your email client complains that it cannot connect to your server on this port, then port 587 is provided as an alternative.

**Push notification**
The IMAP server fully supports **push** notification, which is useful for immediate notification of email arrivals.

# Chapter 5

# Setting up FTP Access

**Before you start this chapter**

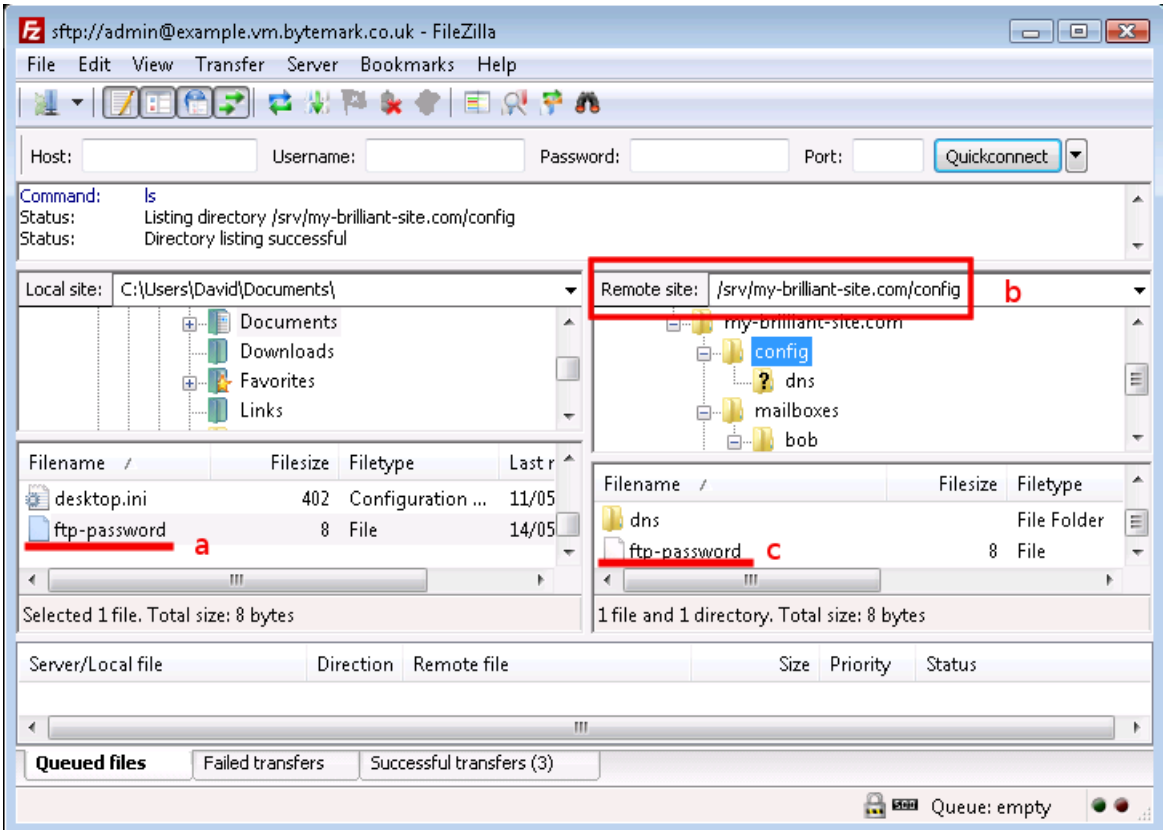
1. Connect to your server over *SFTP* using FileZilla (see Chapter 2).
2. Set up a website (see Chapter 3).

Fast forwarding to the scenario where you have a web hosting client who has designed their own site and would like to upload it themselves. However it is not necessary to grant them access to all domains on the machine, or even the config or mailboxes section of their own domain.

This is typical for a shared hosting client, and the solution is to give them *FTP* access. This limits them to the files inside the `public/` directory, i.e. only those associated with the website.

In this example, access to the content of the **my-brilliant-site.com** site is being given to another user, but they are only to have access to `/srv/my-brilliant-site.com/public/`. To set this up, an FTP password is being created.

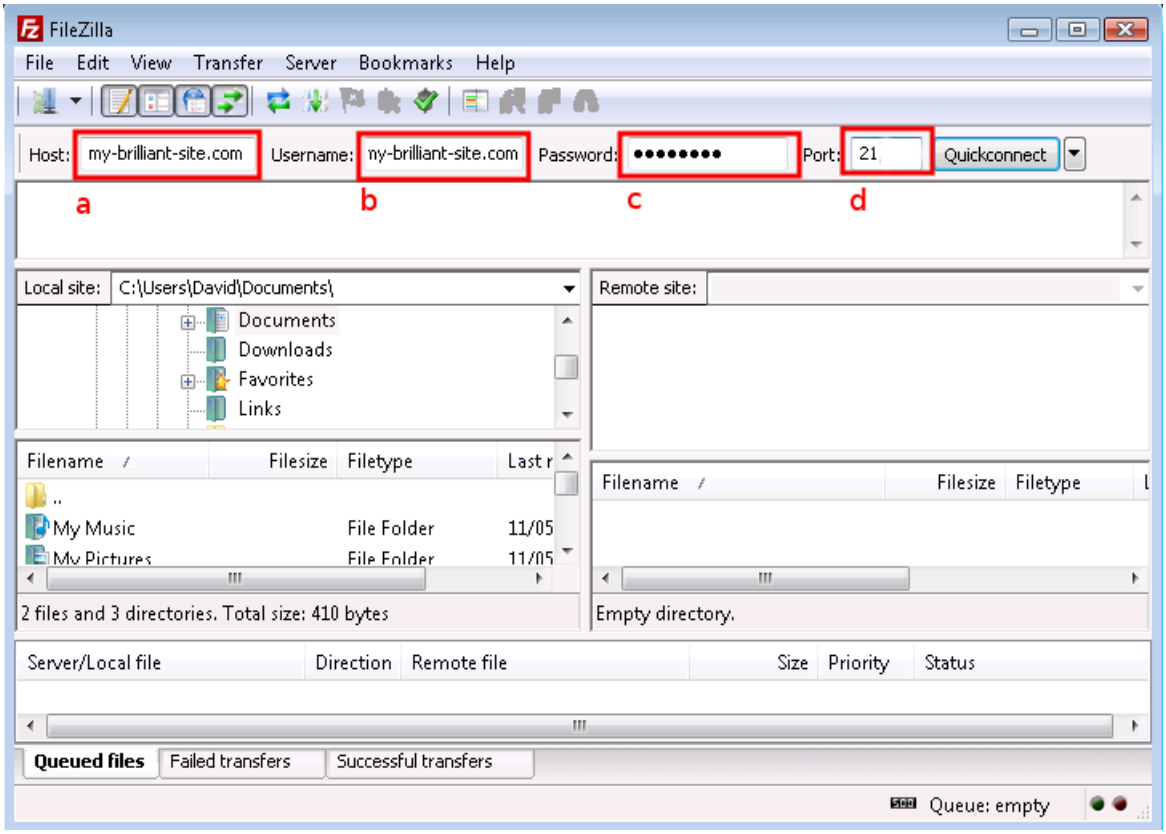
1. Connect to your machine using FileZilla.
2. Navigate to `/srv/my-brilliant-site.com/config/`
3. Create a file `ftp-password` **a** that contains a secure password your shared hosting client will use, ensure that the `config` directory is selected **b** and upload the file, **c**. Make sure that there is no **txt** extension on this file.



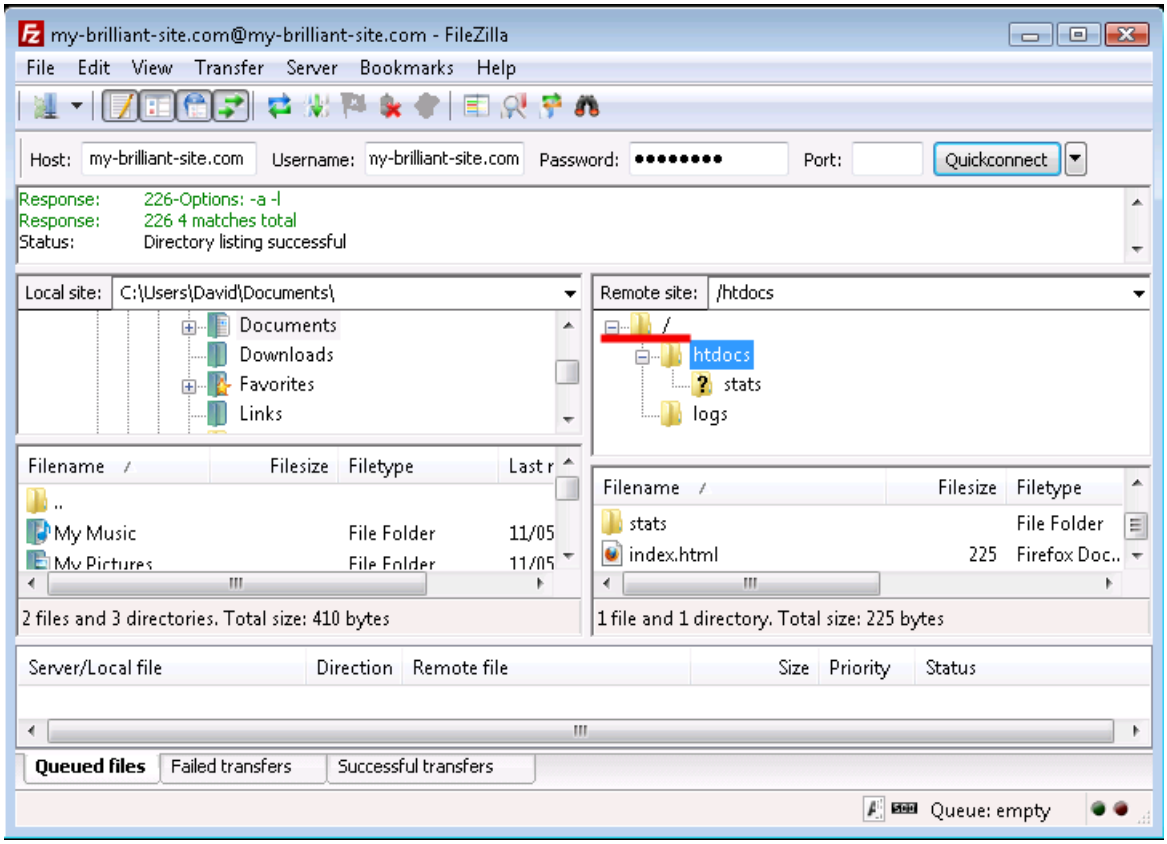

Now that is all that is needed. Access to the machine can now be granted over FTP using the username **my-brilliant-site.com** and the password being the contents of `/srv/my-brilliant-site.com/config/ftp-password`.

We will now test the connection to make sure it works, also using FileZilla, since it can be used to connect via FTP as well as SFTP.

1. Make sure FileZilla has disconnected from the machine.
2. The host **a** and the user **b** are both the domain name, in this case **my-brilliant-site.com**. The password **c** is the contents of the `ftp-password` file and for FTP the port number must be set to 21, **d**.




3. Once you connect you'll notice that you only have access to directories beneath the `public` directory (here represented as "/") of the `my-brilliant-site.com` directory tree, which is all you'd need if your role was limited to maintaining or setting up a web site.



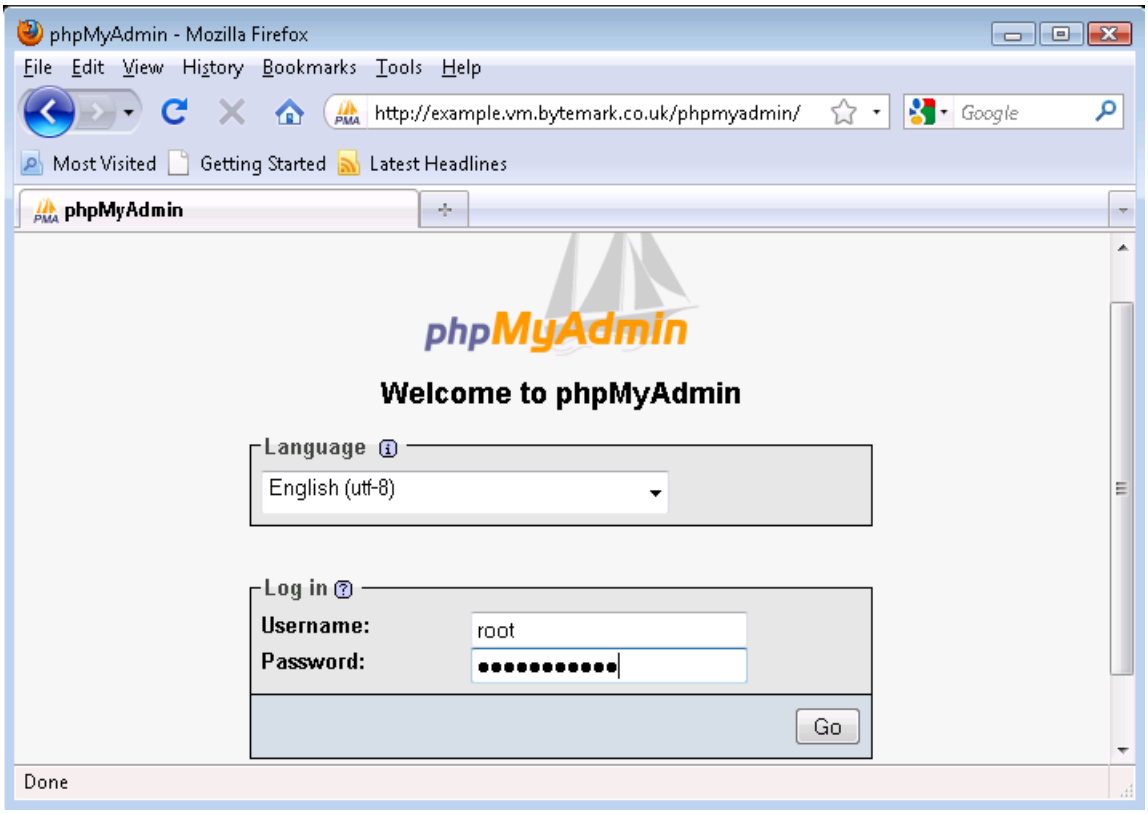
**Note**
If you created a sub domain such as fantastic.my-brilliant-site.com, for FTP access the user would be **fantastic.my-brilliant-site.com** as you might expect, but the host would be the domain, not the sub domain, in this case **my-brilliant-site.com**

# Chapter 6

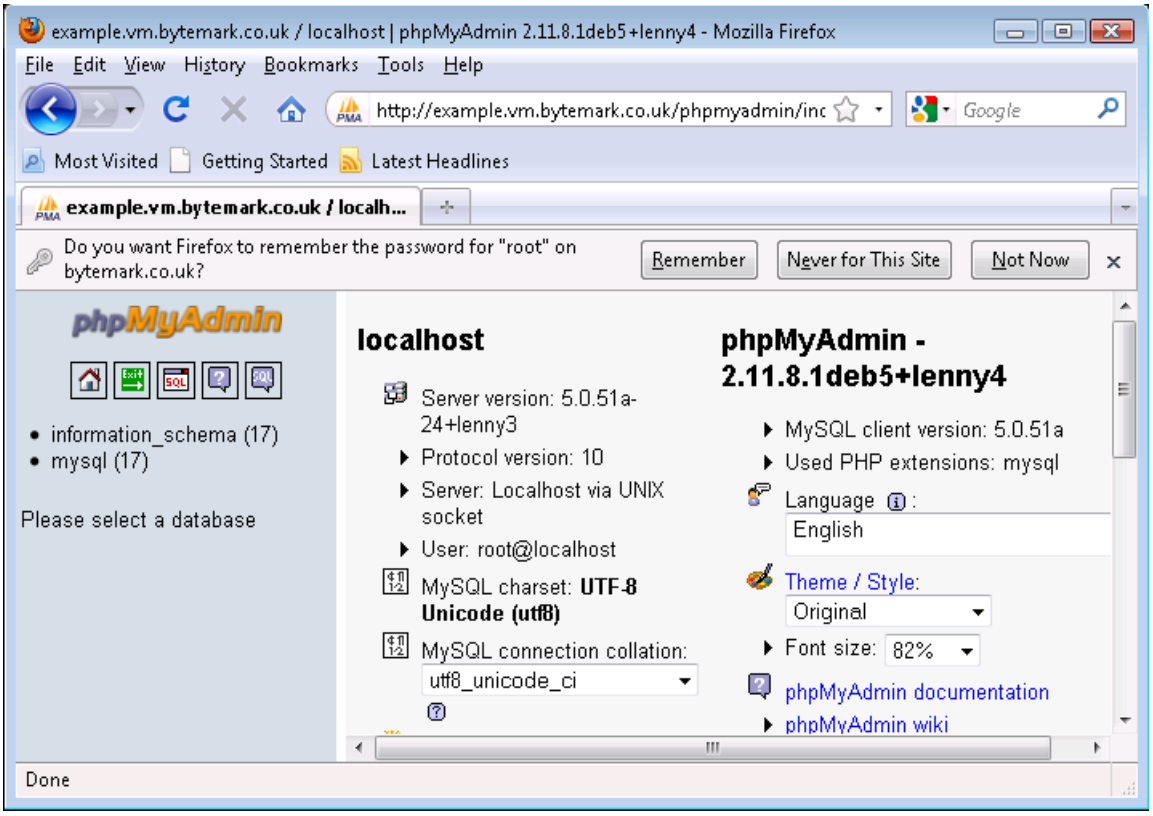
# Managing the MySQL database

The Symbiosis system comes with the MySQL database installed and running. It can be managed by use of the phpMyAdmin program. The following instructions show how to connect to the database on the machine **example.vm.bytemark.co.uk**.

1. Start your web browser.
2. Navigate to http://example.vm.bytemark.co.uk/phpmyadmin/ and enter the authentication details. The user is **root** and the password is the same as that of the **admin** user.




3. Press the Go button to be log in.




From here new databases and database users can be created as needed. phpMyAdmin is further documented on its home page.

# Chapter 7

# Scheduled tasks

Each domain has the ability to run its own scheduled tasks via a file known as a **crontab**. This file enables jobs to be run on at specific times on specific days.

The format is the same as the well-known **crontab** file used on many Linux systems.

A domain's crontab is found at `config/crontab`. For example, the crontab for **my-brilliant-site.com** would be found at `/srv/my-brilliant-site.com/config/crontab`.

## 7.1 The crontab format

The file is a list of jobs, one per line. Each line specifies first the times and days at which a job should run, followed by the command to run.

The first five fields, which are separated by spaces, specify the time and date at which the job should run. The rest of the line is interpreted as the command.

| Field | Allowed values |
|---|---|
| minute | 0-59 |
| hour | 0-23 |
| day of month | 1-31 |
| month | 1-12 (or names, see below) |
| day of week | 0-7 (0 or 7 is Sunday, or use names) |

In addition an asterisk can be used to indicate for every allowed value. For example, to execute the command **echo Hello Dave.** at 18:40 every day, the crontab line would read as follows.

```
40 18 * * * echo Hello Dave.
```

Three-letter names can also be specified for use in instead of numbers for days of the week and months.

**Weekdays** Sun, Mon, Tue, Wed, Thu, Fri, Sat

**Months** Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

Any output generated by a command will be sent to the **root** account, unless specified otherwise. If no output is generated, no email will be sent.

The fields can be specified in the following ways:

- As a comma separated list, e.g. `1,2,3,6`
- As a range, e.g. `1-3` would mean 1, 2, 3
- As a range with a step, e.g. `0-30/2`, would mean 0, 2, 4, 6 and so on until 30.
- Or any combination of the above three, e.g. `1,2,10-12,20-24/2` would mean 1, 2, 10, 11, 12, 20, 22, 24.

Ranges can also be specified across "boundaries". For example `22-2` in the hour field will be interpreted as 22, 23, 0, 1, 2; `Nov-Feb` in the month field will mean 11, 12, 1, 2.

There is also a selection of shortcuts available:

- `@hourly` — every hour, on the hour,
- `@daily` or `@midnight` — every day at midnight,
- `@weekly` — every week at midnight on Sunday,
- `@monthly` — every month, at midnight on the first day of the month,
- `@yearly` or `@annually` — every year, at midnight on 1st January.

The full crontab format is explained in more detail in the crontab (5) manual page.

## 7.2 Mailing the output

The output can be emailed to any recipient by specifying the **MAILTO** parameter at the top of the file.

For example, we would like to mail any output from our commands to bob@my-brilliant-site.com.

```
#
# send any output to Bob
#
MAILTO=bob@my-brilliant-site.com
#
# run at 9am every Monday - Friday
#
0 9 * * 1-5 wget http://www.my-brilliant-site.com/cron.php
```

# Chapter 8

# Automated backups

The automated backup system contained in the Symbiosis system protects against accidental deletion or corruption of file. These backups are designed to run once per day and archive the contents of a number of important system directories.

Having backups stored locally is not sufficient to provide real protection from accidents though, as they might be removed or deleted. Therefore your local backups should be archived to a remote machine.

For **Bytemark customers** the backup script is configured to attempt to do this, using the remote backup space provided by Bytemark, as documented upon the Bytemark support site.

Your system will maintain full backups of the following locations:

- `/root`
- `/home`
- `/etc`
- `/usr/local`
- `/srv`

Additionally every MySQL database you have upon your system will also be exported and backed up.

The backup system uses the backup2l program, which is configured to backup the files in the above locations into the directory `/var/backups/localhost`. For more information about backup2l, please refer to its manual page.

## 8.1 Offsite backups

As mentioned above, the backup script will attempt to ensure that your local backups are uploaded to a remote server, to protect against data loss if your system fails catastrophically.

For **Bytemark customers** this location *should* be determined automatically.

If this process fails, or you are not a Bytemark customer, you can specify the correct location in `/etc/symbiosis/dns.d/backup.name`. This should be a fully-specified rsync path.

## 8.2 Backup reporting

Every day, when runs it generates output saying what has been backed up, and if there were any errors during the backup process. This email will get sent to the **root** account of the local hostname.

**Note**
It's important to realize that the automated backups, especially their transfer to the remote backup space, is done on a best effort basis. You should carefully check the backup2l report for errors and from time to time practise recovering files at random from the remote server, to ensure that there are recoverable backups.

# Chapter 9

# Keeping Your System Secure

This chapter describes the features we provide to help increase your system security, and offer tips and suggestions on what you can do to help ensure your system remains secure.

## 9.1 Checking system notifications

The Symbiosis system is comprised of many components, each working together to deliver a complete solution to your hosting needs. Different systems and components of your server will generate email notifications to alert you of important events and warnings. It is important that such emails are read.

By default all system-generated emails will be delivered to the root user of your primary domain. (This is the first domain which is configured when your machine is setup, and will probably be a name such as **example.vm.bytemark.co.uk**.)

Rather than make it mandatory that you read the root mailbox it is suggested that you configure email forwarding such that mail sent to **root@example.vm.bytemark.co.uk** is delivered to your personal email address.

## 9.2 Avoiding weak passwords

A common means of compromising machines is known as a "dictionary attack", this involves a remote user (or computer) trying to connect to a server with a collection of thousands of usernames and passwords.

This dictionary of usernames and passwords will include common choices such as a username of "test" and a password of "test", along with many other less-likely looking candidates. Detecting these attempts is very straightforward, and is something that our system manages as documented in Section 14.2.

**Note**
This important security measure can catch you out if you repeatedly attempt to access the server using incorrect credentials, as you're likely to find your own IP address becomes blacklisted. See Section 20.2 for help with this situation.

The best defense is to ensure that when you add users, or change system passwords, that you never ever choose simple passwords which might be liable to be guessed, or included in an attackers' dictionary.

There is a regular test on all the passwords used to access email and FTP under Symbiosis, the output of which will get sent to the **root** email account, please see the note in earlier in this chapter regarding email notifications.

## 9.3 Keep your software current

Over time security bugs can be found in software packages, and if such a problem is discovered in a package you're using then your machine is at risk until it has been updated.

The Symbiosis system is configured to automatically download and install appropriate security updates to the packages in the base operating system and from the Symbiosis repository itself.

However if you've chosen to install additional, external, applications such as Wordpress you **must** ensure that you look for updates regularly. Often this can be done by subscribing to the application's announcements mailing list.

# Chapter 10

# Connecting to your server via SSH

So far we have looked at making connections and transfer files using the *SFTP* proctocol. For certain operations it is also necessary to connect using the *SSH* protocol. This is used to gain command-line access to the machine.

There are two connection programs are documented, depending on your desktop environment, and your preference.

## 10.1 Why SSH access?

So far connecting using *SFTP* has been documented. This is used to manage files on the machine. From time to time it can be necessary to have to run commands on the machine itself. This is where SSH comes in.

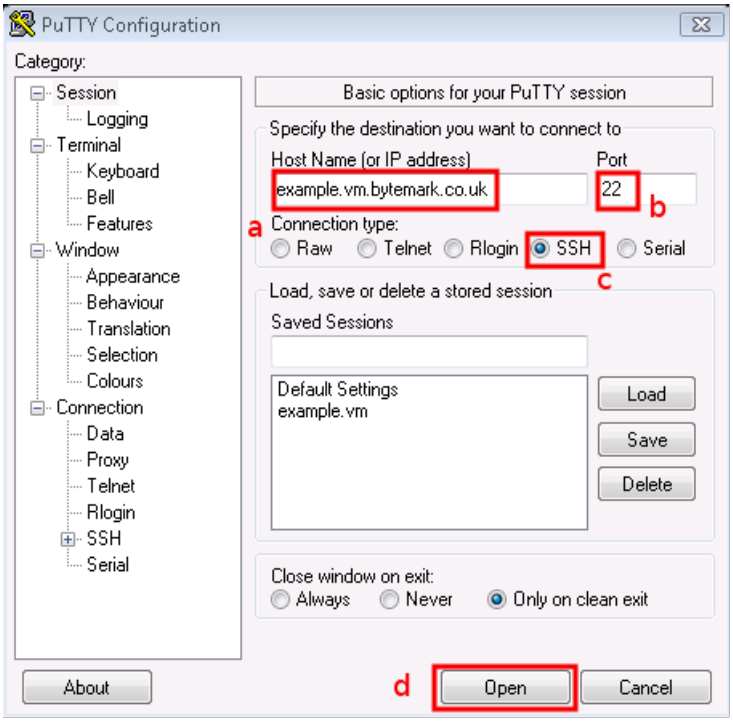
SSH allows *shell* access to a machine, which provides the ability to run commands directly on that machine. Shell access is the equivalent of the MS-DOS or **cmd** prompt on Windows PCs, or the terminal on machines running Mac OS X or Linux. SSH is an encrypted protocol, like SFTP, ensuring that all commands and passwords pass between your computer and the server are protected against eavesdroppers.

For Bytemark customers, SSH is also used to access the Console Shell of the machine.

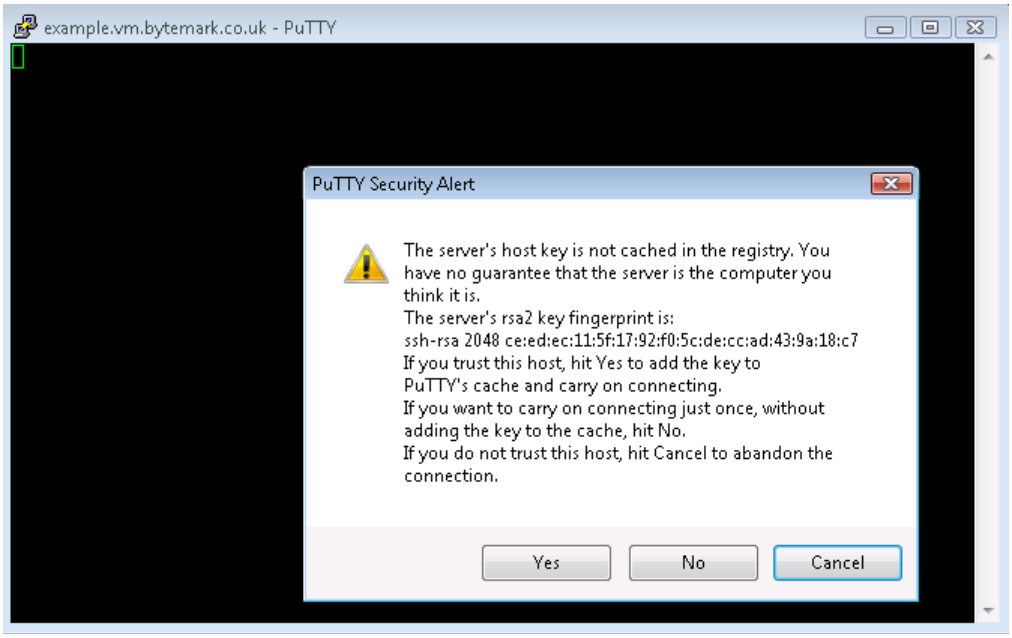
## 10.2 Using PuTTY to connect via SSH

PuTTY is a free and open-source SSH application, and available for download from its homepage. It is available for both Windows and Linux desktop machines.

1. Start PuTTY; Under Windows you may get a Security Warning — if so you need to click the Run button.
2. Enter your server's name in the Host Name field **a**; the Port field **b** should read *22*, and the SSH radio button **c**. Click Open **d** to start the connection.

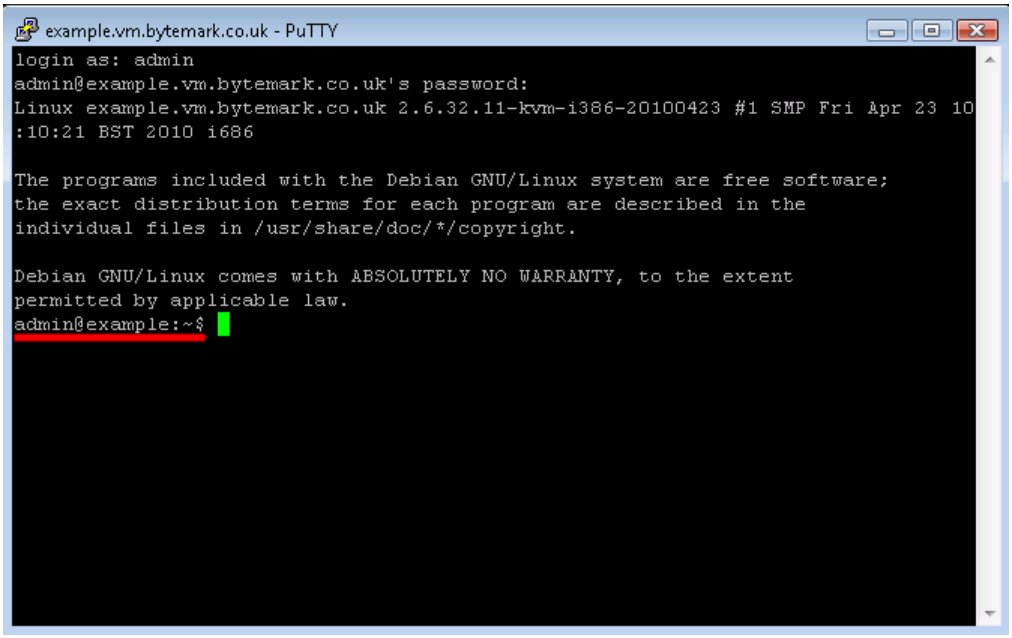



3. The PuTTY command window will open; the first time you do this, as with FileZilla, you get a Security Alert, warning that the key is untrusted. It is safe to say *Yes* the first time you connect to your machine.




4. At the Login as prompt type **admin** and press enter. Then the [label]admin@example.vm.bytemark.co.uk's password| prompt appears. Enter the password followed by enter. Nothing is displayed when the password is entered.

5. You'll log in and get presented with the `admin@example:~$` prompt, ready to accept commands.

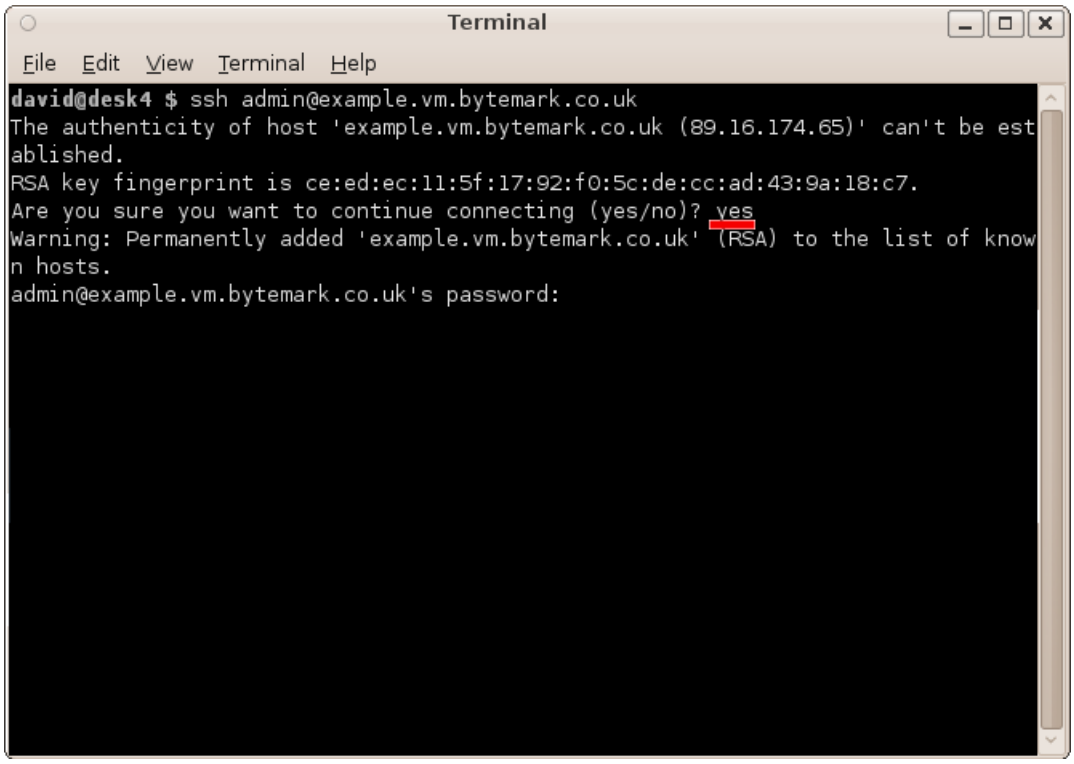



**Tip**
When the machine is setup, the **root** and **admin**, as well as the mysql database **root** passwords are all the same.

## 10.3 Using a terminal program to connect via SSH

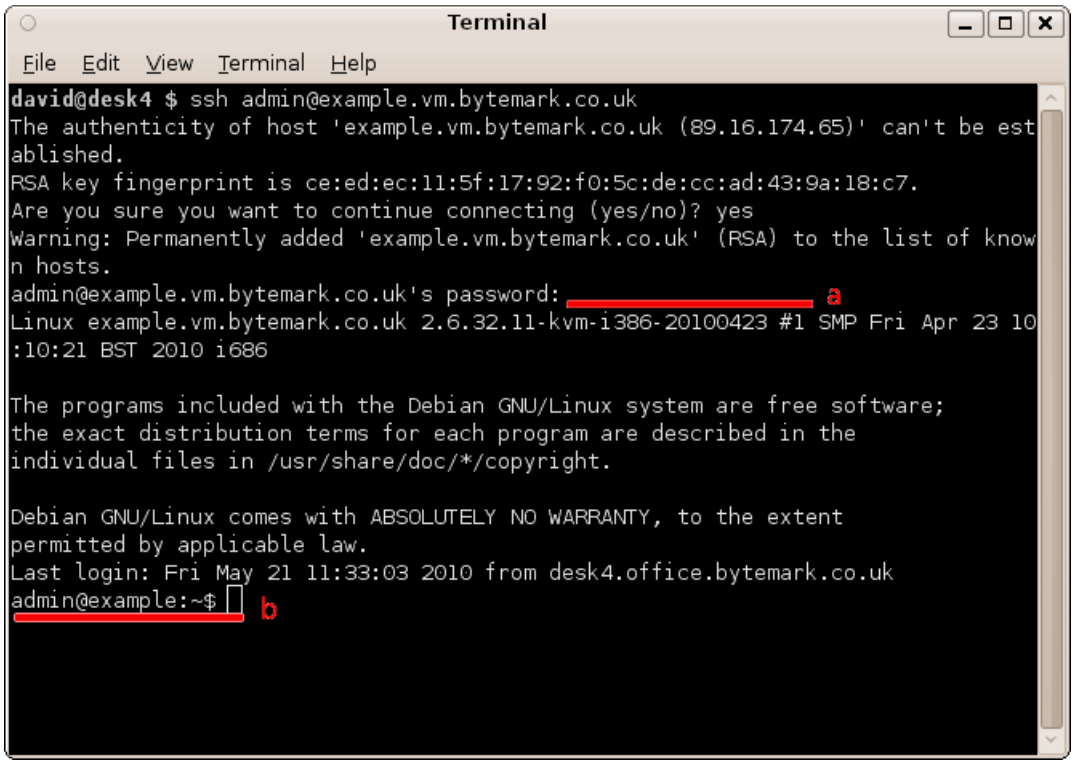
Both Linux and Mac OS X desktop machines tend to come with the **ssh** command available.

1. Open a terminal emulator and enter the command **ssh admin@example.vm.bytemark.co.uk**.



2. The first time you connect to your machine a warning message about the authenticity of the host will appear. The **first time** you connect to the machine, we can assume the host is authentic. So enter "yes", to accept the key and to continue connecting.

3. The connection has been made as user **admin**, so enter the admin user password , **a**; that does not get echoed to the screen. At the end of the dialogue you see the prompt, `admin@example:~$`, **b**.



# Chapter 11

# Configuring SSL Hosting

**Before you start this chapter**

1. Connect to your server via SSH (see Chapter 10).

Each time you need to add a new *SSL* site to your Symbiosis system you need to:

1. Acquire an additional dedicated *IP address*.
2. Configure the site to use that IP address
3. Generate an SSL key and certificate request.
4. Buy or generate an SSL certificate.
5. Upload the new certificate

One IP address is needed per SSL certificate. This means that every time you wish to add an SSL certificate to an existing site, it will need to be run under its own IP address.

## 11.1 Adding an additional IP address

First you must have an additional IP address routed to your machine. Your ISP should be able to do this.

Once your machine has been allocated an additional IP Address, you must tell your machine to accept traffic addressed to both your original and new IP addresses

This is a standard Debian procedure rather than something specific to Symbiosis, but for convenience it's described here.

1. Make an SSH connection to your server as detailed in Chapter 10, connecting as **admin**.
2. Run **sudo nano /etc/network/interfaces**, and add the following lines to the bottom of the file. You will be prompted for the **admin** password, and you should type it in to gain the ability to edit the file.

```
auto eth0:0

iface eth0:0 inet static
  address 1.2.3.4
  netmask 255.255.255.255
```

You should substitute your new IP address for **1.2.3.4**. If there is already an entry for **eth0:0**, you can use **eth0:1** and so on. The **netmask** should always be 255.255.255.255.

3. Save the file and leave the editor by typing **ctrl+x**.
4. To activate the new interface run **sudo ifup eth0:0**.

## 11.2 Configure the site to use the new IP address

It has been assumed that the site requiring the new IP address is already configured as described in Section 3.1.

1. Use FileZilla to connect to the machine as **admin**.
2. Create the file `/srv/my-brilliant-site.com/config/ip` with the new IP address in it. In our case it will be **1.2.3.4**.

Within an hour Symbiosis will include this change in your DNS data and upload the new data to the name servers. This will ensure that the system knows that your machine should listen upon an additional IP address, and it will also ensure that the DNS entries for the domain are updated to point to the dedicated IP address, and not the default IP of your machine.

## 11.3 Generating an SSL certificate key and request

In order to purchase an SSL certificate, you need to generate an SSL key and a certificate request on the Symbiosis machine.

1. Connect to your machine over SSH as **admin** (see Chapter 10)
2. Change to the `config/` directory of the site that needs the SSL certificate. In our example, we run **cd /srv/my-brilliant-site.com/config**.
3. First we generate the key. To do this run **openssl genrsa -out ssl.key 1024**. This generates a 1024-bit key with no passphrase.
4. Next we generate the certificate request. We run **openssl req -new -key ssl.key -out ssl.csr**. This produces a series of prompts. It is important that the correct information is entered at each prompt. In our case the exchange runs as follows.

```
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or
a DN.  There are quite a few fields but you can leave some blank For
some fields there will be a default value, If you enter '.', the field
will be left blank.
```

```
 -----
Country Name (2 letter code) [AU]:GB
State or Province Name (full name) [Some-State]:North Yorkshire
Locality Name (eg, city) []:York
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Bytemark Hosting
Organizational Unit Name (eg, section) []:.
Common Name (eg, YOUR name) []:www.my-brilliant-site.com (1)
Email Address []:bob@my-brilliant-site.com

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []: (2)
An optional company name []:
```

(1) This is the name of the website that the SSL certificate is for. This **must** be correct. We've put **www.my-brilliant-site.com** because that is the name of the site we're going to advertise and use.

(2) Do not enter a challenge password.

With that request, you can buy a new certificate. To view the request, run **cat ssl.csr**. It will look like

```
-----BEGIN CERTIFICATE REQUEST-----
AIIB4zCCAUwCAQAwgaIxCzAJBgNVBAYTAkdCMRMwEQYDVQQIEwpNYW5jaGVzdGVy
MRMwEQYDVQQHEwpNYW5jaGVzdGVyMQ0wCwYDVQQKEwRCbGFoMQ8wDQYDVQQLEwZU
aGluZ3kxHjAcBgNVBAMTFW15LWJyaWxsaWFudC1zaXRlLmNvbTEpMCcGCSqGSIb3
DQEJARYacm9vdEBteS1icmlsbGlhbnQtc2l0ZS5jb20wgZ8wDQYJKoZIhvcNAQEB
BQADgY0AMIGJAoGBAMrTIaLKyvsxDz9WHhY5xJvHVKD+dmAuzpv2HichYejJQTTl
gXdfrrZjVWm45ZJy9TEcB5DM0qsQBSqseMner7YvAJJ3PlTd7o3Rkjztt1orP1e7
hAkpKLW2dQAvnr3RtK2w8mK+OdJYPSJfzoChCKlG64Un2VmgDfAiNMS4GCi1AgMB
AAGgADANBgkqhkiG9w0BAQUFAAOBgQBx1I52EXnKRL1YfPYIA8CXUeFRZzDbuVKQ
+fwP5Ig5BANBldMnRePY29RH7yJ2YRXTWHfo6erWT4DZVkJhLpWwBTqB/kGcjEjv
zN7D78VSSQzEb2fOcRcxd9fWmiIcIWINisjBv9gBbGH7L3UosOtdzEWyzpEjb+Or
nL4UrZV3JA==
-----END CERTIFICATE REQUEST-----
```

The entire output (including the `BEGIN` and `END` lines) should be copied and pasted into the appropriate part of the form when purchasing.

## 11.4 Purchasing a certificate

There are generally two types of SSL certificate: those that are self-signed, and those that are signed by a third-party. Self-signed certificates are free, but cause warnings to be produced in people's browsers. Third-party certificates are purchased, and hopefully generate no warnings.

For an example of what a warning might look like in your browser, go to https://example.vm.bytemark.co.uk.

Purchasing a certificate is straightforward. The first part is the hardest: picking a supplier. There are many available, for example RapidSSL, Verisign, or Comodo.

During the purchase process, you will be asked for the certificate request. Instructions on how to do this are shown in Section 11.3.

Once purchased, you should end up with a new certificate, and possibly a "bundle". These should be downloaded onto your local computer. Installation of these is described in Section 11.5.

## 11.5 Uploading your new certificate, and optional bundle

Now we have our certificate, we need to upload it on to our machine. If you've generated the certificate on the machine, you can safely skip this procedure.

1. Connect to your machine using FileZilla.
2. Navigate to the `config/` directory of your domain, using the directory tree in the top right pane. We navigate to `/srv/my-brilliant-site.com/config`.
3. Find your new certificate and bundle (if applicable) on the local machine, and upload both to the remote machine.
4. Once uploaded, we need to rename the files. This can be done by clicking on the filename in the lower right pane and selecting Rename from the menu.
   - The certificate should be renamed to `ssl.crt`.
   - The bundle (if applicable) should be renamed to `ssl.bundle`.

Once this procedure has been completed we can move on to the next section.

## 11.6 Combining the certificate and key

The final step is to combine our certificate and key, such that Apache can used them.

1. Log on to your machine as **admin** over SSH.
2. Change directory to the `config/` directory of your site. We run **cd /srv/my-brilliant-site.com/config** to do this.
3. To combine the two files into one, run the following

   ```
   symbiosis-combine-ssl
   ```

   This generates the file **ssl.combined**, which where Apache will look for the SSL certificate.

**Line-endings**
It is very important to be consistent with line-endings when joining files. The method documented above looks strange, but ensures that the line-endings are consistent.

This file **ssl.combined** will now contain something like this.

```
-----BEGIN RSA PRIVATE KEY-----
MIICXQIBAAKBgQDK0yGiysr7MQ8/Vh4WOcSbx1Sg/nZgLs6b9h4nIWHoyUE05YF3
X662Y1VpuOWScvUxHAeQzNKrEAUqrHjJ3q+2LwCSdz5U3e6N0ZI87bdaKz9Xu4QJ
KSi1tnUAL5690bStsPJivjnSWD0iX86AoQipRuuFJ9lZoA3wIjTEuBgotQIDAQAB
AoGAF7jD2VdgkCp3vw+iazUMcq/IjR/V1oAC+Ci79BWqbuCC+N3S25RcScaqabgP
hQesn6hnQZ8MZl7b4Lv1585mjwmf+Sw7PAa09EiArpy3cg2Em6LpBBekPZs+aPIU
StLQnEZ1pCb1E1TVeWECQQCrM4BrdC4FymXSuANe5YXYhNPksNcWeujdLKVdgGjs
uXdLGWRgiAGqJo4teB1HjvbEWxYadZ6Zspvvc5qd4d6s
```

```
-----END RSA PRIVATE KEY-----
-----BEGIN CERTIFICATE-----
MIICvTCCAiYCCQDKfqq7e9IUIzANBgkqhkiG9w0BAQUFADCBojELMAkGA1UEBhMC
R0IxEzARBgNVBAgTCk1hbmNoZXN0ZXIxEzARBgNVBAcTCk1hbmNoZXN0ZXIxDTAL
BgNVBAoTBEJsYWgxDzANBgNVBAsTBlRoaW5neTEeMBwGA1UEAxMVbXktYnJpbGxp
MQ8/Vh4WOcSbx1Sg/nZgLs6b9h4nIWHoyUE05YF3X662Y1VpuOWScvUxHAeQzNKr
EAUqrHjJ3q+2LwCSdz5U3e6N0ZI87bdaKz9Xu4QJKSi1tnUAL5690bStsPJivjnS
WD0iX86AoQipRuuFJ9lZoA3wIjTEuBgotQIDAQABMA0GCSqGSIb3DQEBBQUAA4GB
ABWXBGPKldcqJsVzB6KYIEv8jLa7iYIsB5rdhP5zviC1d4rT6U0jsCsCt/H/UQtf
6Y2Jl6nRKNBkvROVT28TfZjEe3AiBoB5MTt9P0hfxYzKoxUwaBLzClLUfaeWY/qT
GAt5kCtYlBgNxMIXkNPj2weODunfpELBJ7ARKAa3+uIu
-----END CERTIFICATE-----
```

## 11.7 Making SSL mandatory

Once you've configured the SSL certificate, as described in the previous sections, you'll find that your site is accessible to users over HTTP and HTTPS.

If you prefer to ensure that each visitor to your website uses the SSL-protected site you can make it mandatory by creating a `.htaccess` file inside your web directory root.

Continuing our example you might create the file `/srv/my-brilliant-site.com/public/htdocs/.htaccess` with the following contents:

```
RewriteEngine on
RewriteCond %{HTTPS} !=on
RewriteRule .* https://%{SERVER_NAME}%{REQUEST_URI} [R,L]
```

These contents use Apache's .htaccess file in combination with mod_rewrite to ensure that all visitors will be redirected to the secure version of your site.

# Part II

# Reference

# Chapter 12

# Website Configuration

This is a detailed break down of all the configuration options and files available when configuring website hosting for a domain.

Throughout this chapter, as with the rest of this documentation, the domain `my-brilliant-site.com` is used as an example.

All configuration for the domain `my-brilliant-site.com` will be performed inside the `/srv/my-brilliant-site.com` directory.

The Bytemark Symbiosis project uses the popular Apache2 software for serving your websites, and this comes complete with PHP5 along with many of the most popular PHP extensions.

## 12.1 Getting started

This is covered in more detail in Chapter 3.

All the files required for a website for the domain **my-brilliant-site.com** are kept in `/srv/my-brilliant-site.com/public/htdocs`.

- If this directory does not exist, a **404 Not Found** error will be returned.
- If this directory exists, but is empty, then a default page is shown.
- The index file can be written in *HTML* or *PHP*, and should be called `index.html` or `index.php` respectively.
- Once this directory is present, both http://my-brilliant-site.com and http://www.my-brilliant-site.com will show the same content, i.e. there is no need to name the site with a **www** prefix.
- If different content is required for http://www.my-brilliant-site.com then that should be put in `/srv/www.my-brilliant-site.com/public/htdocs`.

## 12.2 CGI scripts

If you wish to use CGI scripts for your domain, then simply copy them to a directory named `cgi-bin/` beneath the `public/` directory. They must all be marked as executable. This means setting the permissions to **755**. In FileZilla, right click the file and select File Permissions... from the menu. The file should have **Execute** set for the owner, group, and public permissions.

For example, for **my-brilliant-site.com** the scripts would live in `/srv/my-brilliant-site.com/public/cgi-bin`.

Any **executable** files in that directory will now be treated as CGI scripts for your domain. For example if you created the file `/srv/my-brilliant-site.com/public/cgi-bin/test.cgi` This would be referred to as: http://my-brilliant-site.com/cgi-bin/test.cgi

## 12.3 Statistics

Each hosted website will have visitor statistics automatically generated and accessible at http://my-brilliant-site.com/stats/. These statistics will be updated once per day, and the raw access logs will be made available as `/srv/my-brilliant-site.com/public/logs/`.

These daily statistics can be disabled by creating the file `config/no-stats`.

For example, for **my-brilliant-site.com**, creating the file `/srv/my-brilliant-site.com/config/no-stats` will ensure that statistics are no longer generated for that domain. If you wish to remove any existing statistics, remove the directory `/srv/my-brilliant-site.com/public/htdocs/stats/`.

It is also possible to customise the statistics generated by editing the file `public/htdocs/stats/webalizer.conf`. This file is documented at the Webalizer project website.

## 12.4 Testing new websites

You can view new websites before any DNS changes are made.

For example, if the virtual machine **example.vm.bytemark.co.uk** is hosting **www.my-brilliant-site.com**, i.e. the directory `/srv/my-brilliant-site.com/public/htdocs` has been created, then the website can immediately be viewed at http://my-brilliant-site.com.testing.example.vm.bytemark.co.uk.

There are some important things to note though: - There is no **www** part added to the domain name — it is just the directory name prepeneded to **.testing.example.vm.bytemark.co.uk**. - This testing alias isn't guaranteed to work in all cases, for complex site setups it might not work entirely as expected. - The testing alias only allows the testing of websites. Therefore FTP logins, email delivery, or checking is explicitly unsupported.

## 12.5 To have two domains display the same content

In this scenario, you have registered two domains for example **my-domain.com** and **my-domain.co.uk**, but you want the same content to be served at both addresses. There is no need to create two separate directory structures, you can just set up one directory structure and then create a soft link (aka symbolic link or symlink) to the second.

1. Once the my-domain.com directory structure has been completed, log on to your machine as admin over SSH.
2. Run the command `ln -s /srv/my-domain.com /srv/my-domain.co.uk`
3. A soft link of the entire my-domain.com directory is created, the top level directory being named my-domain.co.uk.

Browsing to my-domain.co.uk will show the same content that appears at my-domain.com.

## 12.6 Web configuration layout

Here is an example configuration layout for the domain `my-brilliant-site.com`.

**`/srv/my-brilliant-site.com/public/htdocs`** This is the directory from which content is served for the URLs http://my-brilliant-site.com/ *and* http://www.my-brilliant-site.com/. If this directory does not exist visitors will be shown an error page.

**`/srv/my-brilliant-site.com/public/cgi-bin`** This is the directory which may be used to hold CGI scripts for your domain.

**`/srv/my-brilliant-site.com/public/htdocs/stats`** This directory will be automatically created, if it isn't already present, and updated with statistics referring to the number of visitors to your website.

**`/srv/my-brilliant-site.com/public/logs`** This directory will be used to store the raw access.log files for your domain. These statistics will be updated once per day, and old logs will be pruned automatically.

## 12.7 SSL Configuration

*Secure Sockets Layer* is a technique used to encrypt communication between two machines on a network. It uses a system of public and private keys to encrypt and decrypt the connection — the public key is used by the sender to encrypt, and the private key is used by the receiver to decrypt. This protocol is used not only for transactions involving a web server and browser, but also by the email servers and their clients.

In addition to the public key encryption, there is a system of trust that validates that the certificate presented actually belongs to the server that is presenting it. This system involved having the certificate signed by a trusted authority. Web browsers and email clients tend to come with a selection of certificates from trusted authorities pre-installed, which allows them to verify a previously unseen certificate as valid.

Having a certificate signed by a trusted authority involves having varying degrees of identity checks made, and paying a fee. Vendors that are able to sell you a certificate include Rapid SSL and Comodo.

As standard, a Symbiosis machine will come with an SSL certificate installed. However it will be a "self-signed" certificate, i.e. one that has not been signed by a trusted authority. This means that whenever a program connects to your machine using SSL a warning will be shown saying something along the lines of *unable to verify certificate because the issuer is unknown*. This **does not** affect the security of the connection,

Verifying a self-signed certificate as trusted can be done using the certificate's *fingerprint*, on the machine using **openssl**. The default certificate on a Symbiosis machine is kept in `/etc/ssl/ssl.combined`. First, the fingerprint of the certificate needs to be determined. To do this run the following, as root:

```
openssl x509 -noout -in /etc/ssl/ssl.combined -fingerprint
```

That should output something similar to

```
SHA1 Fingerprint=B8:C7:1B:3F:EC:94:F2:9F:77:BC:09:60:CD:E3:EF:E0:04:F4:23:6A
```

Now that we have the fingerprint, we can compare it against that presented in a browser or email client. The fingerprint of a certificate should be shown in the application's certificate viewer, allowing a comparison to be made between the fingerprint on the machine, and the one being presented in the application.

The nature of *SSL* is such that only one certificate can be used per service per *IP address*. This typically means that a new *IP address* is needed for a website that needs a new SSL certificate.

### 12.7.1 Generating a self-signed certificate

If you do not wish to purchase a new certificate, you can use generate your own certificate as follows. This assumes you've completed the instructions for generating a key and certificate request in Section 11.3.

1. Log on to your machine as **admin** over SSH.
2. Change to the `config/` directory of your domain. In our example, we run **cd /srv/my-brilliant-site.com/config**.
3. Now run **openssl x509 -days 365 -req -in ssl.csr -signkey ssl.key -out ssl.crt**. This will produce output similar to the following. Note that the information entered in the certificate request is shown.

   ```
   Signature ok
   subject=/C=GB/ST=North Yorkshire/L=York/O=Bytemark Hosting/OU=/CN=www.my- ↩
      brilliant-site.com/emailAddress=bob@my-brilliant-site.com
   Getting Private key
   ```

   This has now generated the certificate, and saved it in **ssl.crt**. This certificate is valid for a year from the date generated.

Since we've run this on the machine, there is no need to upload anything. You can skip Section 11.5 and move on to Section 11.6.

# Chapter 13

# Email Configuration

This is a detailed break-down of all the configuration options and files available when configuring how email is handled for a domain. Throughout this chapter, the domain `my-brilliant-site.com` is used as an example. Thus all the configuration for `my-brilliant-site.com` will be inside the `/srv/my-brilliant-site.com` directory.

## 13.1 Port Configuration

The mail servers have been set up with standard port assignments as follows. These are all the standard ports for the protocols.

| Service | Port | Encryption |
|---|---|---|
| POP3 | 110 | TLS (optional) [1] |
| IMAP | 143 | TLS (optional) |
| SMTP | 25 or 587 | TLS (optional) |
| POP3 | 995 | SSL |
| IMAP | 993 | SSL |
| SMTP | 465 | SSL |

## 13.2 Accepting email for a domain

In order for a domain to be configured to accept email, one of two things must be present. Either the domain must have a `mailboxes/` directory present, or one of the files `config/default_forward` or `config/aliases` must be present.

For example, if the domain **my-brilliant-site.com** would like to host mail normally, i.e. one mailbox per user hosted on the same machine, then the directory `/srv/my-brilliant-site.com/mailboxes` should be created. Then in there, one directory per user should be created. If **bob@my-brilliant-site.com** would like to receive mail, then `/srv/my-brilliant-site.com/mailboxes/bob/` should be created.

Assuming that this is the only directory inside `/srv/my-brilliant-site.com/mailboxes` then only mail addressed to **bob@my-brilliant-site.com** will be accepted. Any other mail addressed to **my-brilliant-site.com** will be rejected.

[1] To use the optional encryption "TLS encryption, if available" should be checked in the mail client. See Section 4.4 for more information about this.

If you would like to accept all mail for **my-brilliant-site.com**, regardless of who it is addressed to, then create the file `/srv/my-brilliant-site.com/config/default_forward`. The contents of this file should be a single email address, or a comma-separated list of email addresses. For example, to forward all mail to **bob@my-brilliant-site.com**, regardless of who it is addressed to, then `/srv/my-brilliant-site.com/config/default_forward` should contain `bob@my-brilliant-site.com`.

If you would like the domain **nomail.my-brilliant-site.com** not to receive any mail at all, then remove the directory `/srv/nomail.my-brilliant-site.com/mailboxes` and ensure that the file `/srv/nomail.my-brilliant-site.com/config/default_forward` does not exist.

## 13.3 Password files

The password for a mailbox should be set by the contents of a file named `password` inside a user's mailbox directory. The contents of this file may be in plain text, or encrypted.

To encrypt a password on the command line, you can run the following command, substituting "my password" for your password. This encrypts the password using the SHA-512 algorithm.

```
echo -n "my password" | perl -e 'print crypt(<STDIN>,
                        "\$6\$".join("", (".", "/", 0..9, "A".."Z", "a".."z")
                        [rand 64, rand 64]));' > password
```

This just uses the standard `crypt` function available under most Linux platforms, as well as perl and PHP.

## 13.4 Suffixes

All email addresses can be used with a suffix. This allows people to filter their email by the To: address. The separator between the local part and suffix is the `+` sign.

For example, Bob signs up to a shopping site at http://example.com. He might use bob+example@my-brilliant-site.com his email address when signing up, such that he can filter all email from that shop.

## 13.5 Forward files

There are two methods of forwarding email. The first is a per-mailbox forwarding service, and the second is a per-domain service. For the per-user service, a file named `forward` should be put in a user's mailbox directory. The per-domain service uses the same file format as the per-user service, but the file should be uploaded to `config/default_forward` instead.

For example, **bob@my-brilliant-site.com** would set up a file called `/srv/my-brilliant-site.com/mailboxes/bob/forward`.

If all the mail for **my-brilliant-site.com** needed to be forwarded elsewhere, then the file would be called `/srv/my-brilliant-site.com/config/default_forward`.

Both of these files can be interpreted in two ways. Firstly they can be a comma separated list of email addresses. For example, if Bob wanted to forward his email onto Charlie and Dave, his forward file might read

```
charlie@example.com, dave@example.com
```

The second way these files are interpreted is as an Exim filter file. The full specification is documented at the Exim project site.

Here are some examples of what is possible.

To forward mail on, but keep a copy

```
# Exim filter
unseen deliver charlie@example.org, dave@example.com
```

To rewrite all mail for a domain to **example.com**. This is probably best used in `config/default_forward`.

```
# Exim filter
deliver $local_part@example.com
```

The Exim documentation has further examples of what is possible.

## 13.6 Vacation messages

It is possible to set a vacation message for a user by putting a message in file called `vacation` in the user's mailbox directory.

For example, for **bob@my-brilliant-site.com**, the message would go in `/srv/my-brilliant-site.com/mailboxes/bob/vacation`. On Bob's return, the people who received vacation messages are logged to `/srv/my-brilliant-site.com/mailboxes/bob/vacation.log`. Once he's read it, that file, along with `/srv/my-brilliant-site.com/mailboxes/bob/vacation` and `/srv/my-brilliant-site.com/mailboxes/bob/vacation.db` should **all** be removed.

**Important**
Vacation messages can cause irritate other email users by replying to mailing lists, email bounces, and so on. Every effort is made to stop this from happening, but it is by no means fool-proof.

## 13.7 Email alias lists

Each domain can have a list of aliases. This is just a file that contains a list of local parts, and a list of places they should be sent on to. This file should be in the `config` directory and is named `aliases`.

For example, **my-brilliant-site.com** has a list of dummy addresses that should be sent on to Bob. So the aliases file would be kept at `/srv/my-brilliant-site.com/config/aliases` and contains the following.

```
webmaster   bob@my-brilliant-site.com
chairman    charlie@example.com
staff       bob@my-brilliant-site.com, charlie@example.com, dave@example.com
```

This ensures that webmaster@my-brilliant-site.com is sent to bob@my-brilliant-site.com; chairman@my-brilliant-site.com is sent to charlie@example.com; staff@my-brilliant-site.com is sent to bob@my-brilliant-site.com, charlie@example.com, and dave@example.com.

## 13.8 Configuration layout

Here is an example configuration layout for the domain `my-brilliant-site.com`. All the following files are kept in `/srv/my-brilliant-site.com/`.

**`/mailboxes`** This is where individual mailboxes are defined. If this directory does not exist, then mail will not be accepted for `my-brilliant-site.com`, unless a default forwarding address or filter has been set up.

**`/mailboxes/bob`** Mail will be accepted for the email address bob@my-brilliant-site.com.

**`/mailboxes/bob/Maildir`** This is where the email for bob@my-brilliant-site.com will be delivered. It will be **created automatically** upon receipt of the first message to that address.

**`/mailboxes/bob/password`** File containing the password for bob@my-brilliant-site.com allowing him to collect his email over IMAP/POP3, and relay email using SMTP. His username is the same as his email address. See Section 13.3 for more information.

**`/mailboxes/bob/forward`** File containing either a comma-separated list of addresses, or an Exim filter. All mail addressed to bob@my-brilliant-site.com will be forwarded to the list of addresses, or processed by the filter. See Section 13.5 for more information.

**`/mailboxes/bob/vacation`** File containing a vacation message for Bob. See Section 13.6 for more information.

**`/config/aliases`** This file contains a list of aliases for a domain. The format is the local username followed by one or more spaces, and then comma separated list of email addresses which should receive the mail. See Section 13.7 for more information.

**`/config/default_forward`** File containing either a comma-separated list of addresses, or an Exim filter. All mail addressed to the domain my-brilliant-site.com for local parts without directories under mailboxes will be forwarded to this address or processed by this filter. See Forwarding Email for more information.

**`/config/bytemark-antispam`** If this file is present, then only email received via the Bytemark wholesale anti-spam service will be accepted. All other email will be temporarily deferred. See Section 15.3 for details on how to set this up.

**`/config/antispam`** If this file is present, then all email for the domain my-brilliant-site.com will be scanned by SpamAssassin to determine whether it is spam. If it is spam, it will be rejected. If that file begins with the word tag, mail will never be rejected, just tagged as usual. See the section called "Scanning email to prevent spam and viruses" more information.

**`/config/antivirus`** If this file is present, then all email for the domain my-brilliant-site.com will be scanned for viruses by ClamAV. A message is determined to contain a virus, it will be rejected. If that file begins with the word tag, mail will never be rejected, just tagged. See the section called "Scanning email to prevent spam and viruses" for more information.

**`/config/blacklists/sbl.spamhaus.org`** Reject mail for this domain if the sending machines's IP is listed in the Spamhaus Block List.

**`/config/blacklists/xbl.spamhaus.org`** Reject mail for this domain if the sending machines's IP is listed in the Spamhaus Exploits Block List.

**/config/blacklists/pbl.spamhaus.org** Reject mail for this domain if the sending machines's IP is listed in the Spamhaus Policy Block List.

**/config/blacklists/sbl-xbl.spamhaus.org** Reject mail for this domain if the sending machines's IP is listed in either the Spamhaus or the Exploits block lists.

**/config/blacklists/zen.spamhaus.org** Reject mail for this domain if the sending machines's IP is listed in the Spamhaus Zen Block List, which is a combination of the Spamhaus, Exploits, and Policy block lists.

## 13.9 Customising SpamAssassin

The configuration for SpamAssassin for the **admin** user is kept in `/srv/.spamassassin/user_prefs`. Here you can adjust what score is needed to reject spam, and which tests are used during scanning. This file will only appear after a mail has been received with spam detection turned on, but one can be created and configured before this occurs.

The file contains comments and instructions, and further tips can be found on the SpamAssassin wiki.

In brief, to cause **more mail** to be rejected, you need to reduce the threshold score. Therefore change the line reading `# required_score 5` should be changed to `required_score 4`. Notice that the `#` has been removed at the start of the line to un-comment it.

Similarly if mail is being rejected, you can increase the score.

Further instructions can be found on the SpamAssassin wiki.

There is no facility to train the SpamAssassin Bayesian learner yet.

## 13.10 Filtering mail using headers

Headers are added to messages when spam or virus scanning is enabled. These can be used by email clients to filter email, for example in to spam or quarantine folders.

With spam scanning enabled, any email that **is** accepted has the following headers added

- `X-Spam-Score`
- `X-Spam-Bar`
- `X-Spam-Status`

The score is determined by SpamAssassin, and is the basis for acceptance or rejection. The higher the score, the more certain SpamAssassin is that the message is unwanted. The default threshold for rejection is 5.

The bar is a length of pluses or minuses that provide an easy-to-parse representation of the score. A positive score is given pluses, a negative score minuses. For example a score of 5.6 would be represented as `++++++`; a score of -2.2 would be represented as `--`.

The status is always either `innocent` or `spam`, depending on the score.

When virus scanning is enabled, the header `X-Anti-Virus` is added to messages that have been scanned. This is set to either `infected` or `clean`.

## 13.11 Using real-time blacklists from Spamhaus

There are three lists from Spamhaus that can be used to reject email based on the sender's IP address, namely

**The Spamhaus Block List (SBL)** a list of addresses from which Spamhaus does not recommend receiving email.

**The Exploits Block List (XBL)** a list of hijacked computers infected by third party exploits and viruses.

**The Policy Block Lust (PBL)** a list of addresses that should not be sending unauthenticated email at all.

These lists are combined to form the Zen list.

The following instructions will enable use of these lists on our example domain **my-brilliant-site.com**.

1. Connect to your machine using FileZilla
2. On the remote directory tree, navigate to `/srv/my-brilliant-site.com/config`.
3. In this directory, create another directory called `blacklists`. This is done by clicking the right mouse button on the `config` directory, and selecting Create directory from the menu that pops up.
4. On your local machine create a file called `zen.spamhaus.org`. This is just an empty file.
5. Once this is done, navigate to the `blacklists` directory on the remote file system, and select `zen.spamhaus.org` from the local file system, and upload it. Make sure that the remote file has the correct name, i.e. no extra `.txt` extension.

That is all that is needed to start using the Spamhaus Zen blacklist. If you'd rather use a combination of lists create one or more of the following files:

- `sbl.spamhaus.org` to enable the SBL list
- `xbl.spamhaus.org` to enable the XBL list
- `pbl.spamhaus.org` to enable the PBL list
- `sbl-xbl.spamhaus.org` to enable the combined SBL and XBL list
- `zen.spamhause.org` to enable the combined SBL, XBL, and PBL list

# Chapter 14

# Firewall Reference

The firewall component of the Symbiosis system serves three functions:

- Restricting the incoming connections which are permitted to reach your machine.
- Controlling which outgoing connections your machine is permitted to make.
- Blocking connections from remote hosts engaging in abusive behaviour.

## 14.1 Files & directories which the firewall uses

All configuration of the firewall is conducted via the presence or absence of files in a number of directories beneath the prefix of `/etc/symbiosis/firewall`.

| Directory | Purpose |
|---|---|
| `blacklist.d/` | A persistent record of IP addresses which are blacklisted, such that no connections will be permitted from them. |
| `incoming.d/` | Settings related to the incoming connections your machine will receive. |
| `local.d/` | The place to add local customisations. |
| `outgoing.d/` | Settings related to the outgoing connections your machine is permitted to initiate. |
| `whitelist.d/` | A persistent record of IP addresses which are always allowed to connect to your server. |

In short to allow an incoming connection to arrive at your machine, and be accepted, on port 22, you would create the file `/etc/symbiosis/firewall/incoming.d/10-ssh`. In this example there are two things that we've done:

- Created the file beneath the `/etc/symbiosis/firewall/incoming.d` to reference the fact that the restriction applies in the *incoming* direction.
- Named the file 10-ssh, where "10" is a number which is useful for sorting the rules in the generated firewall, and "ssh" refers to the protocol and has an implicit relationship to the port the service uses of 22.

There are two ways the files in the `incoming.d` and `outgoing.d` directories are used:

- If the files are empty then connections are globally accepted for that service.
- If the file contains a list of hostnames, or IP addresses, then only connections to/from those hosts will be allowed.

If you were wishing to ensure that your host would only accept incoming SSH requests from your office you might run something like this:

```
echo "office.my-brilliant-site.com" > /etc/symbiosis/firewall/incoming.d/10-ssh
```

This would ensure that when the firewall was generated incoming connections on the SSH port would be accepted from the host `office.my-brilliant-site.com` but not from anywhere else.

## 14.2 Blocking abusive remote hosts

The `firewall-blacklist` tool runs once per hour, and is designed to scan your server's logfiles for abusive behaviour from malicious remote hosts. Malicious activity which is detected will result in the remote host being denied further access to your server.

Currently we regard malicious activity as:

- Invalid SSH logins.
- Invalid FTP logins.
- Invalid SMTP relay attempts.

## 14.3 Disabling the blacklist functionality

Disabling the firewall completely will disable the blacklisting behaviour, but you might also wish to disable that seperately.

To do so run the following two commands:

```
touch /etc/symbiosis/firewall/disabled.blacklist
firewall
```

**TODO** Refer to the FileZilla touching recipe instead.

(The first will ensure the blacklisting is disabled, and the second will ensure that this setting is honoured immediately.)

## 14.4 Whitelisting "known-good" IP addresses

The `firewall-whitelist` tool runs once per hour, and is designed to perform the opposite task to the `firewall-blacklist` script - in short it is designed to ensure that any remote host which has successfully connected to your server in the past isn't (accidentally) blacklisted in the future.

Every hour the script will examine the successful logins which have been observed within the past month. Each IP address which has successfully been the source of a login attempt will be permitted access to the system on a global basis, and will thus not be locked out.

## 14.5 Allowing web applications to make remote connections

By default outgoing connections by the web server have been disabled. This prevents many ways of infecting a machine with malicious software following a compromise in a web application.

However there are legitimate cases when a web application might need to make such a connection.

By default the firewall contains the rule:

```
/etc/symbiosis/firewall/outgoing.d/50-www-data
```

This rule is designed to prevent your webserver from making outgoing HTTP connections - if you have a PHP application which needs to make outgoing HTTP connections you will need to remove this file:

```
rm /etc/symbiosis/firewall/outgoing.d/50-www-data
```

Then rerun the firewall to make the changed configuration live:

```
firewall
```

## 14.6 Making custom additions to your firewall

The Symbiosis firewall package should allow you to carry out the most common tasks, simply by creating files named after the services you wish to permit or deny.

However there are times when you might wish to make your own custom additions, and for this purpose the firewall package allows you to run an unlimited number of custom scripts/programs once it has loaded the rules - these scripts may perform arbitrary actions, but will be most typically used to update the firewall rules, via the `iptables` command.

**Executing local scripts**

- By default every single executable located in `/etc/symbiosis/firewall/local.d` is executed, in turn, after the firewall has finished loading.

## 14.7 Disabling the firewall

If you wish you may disable the firewall completely, allowing remote users to connect to any service you have running upon your machine.

We'd not recommend that you disable the firewall, because it does provide a increase in system security, but if you wish it is possible by executing the following two commands:

```
touch /etc/symbiosis/firewall/disabled
firewall
```

# Chapter 15

# DNS Hosting

To take full advantage of the Symbiosis system, your domain needs to be configured to have Bytemark's name servers as authority for it.

What follows only applies if our name servers are used; if that is not the case you will need to manage your DNS data outside of the Symbiosis system. Section 15.1 gives a listing of the records needed for the correct functioning of the system.

All domains which are hosted upon a Symbiosis system will have their DNS records automatically uploaded to the Bytemark Content DNS servers.

By default a set of typical records is created for each hosted domain with MX records pointing to the local system, and aliases such as *www.* and *ftp.* for convenience. If you wish you may edit the records to make custom additions or otherwise make changes to those defaults.

For the domain "my-brilliant-site.com" you will find the auto-generated DNS records in `/srv/my-brilliant-s` `com/config/dns/my-brilliant-site.com.txt`

The DNS files are uploaded to the Bytemark content DNS service every hour, and allow you to use the full range of available TinyDNS options. These options are documented upon the Bytemark Website and in the TinyDNS documentation.

## 15.1 Default DNS records

The default records generated are listed in `/etc/symbiosis/dns.d/template` in format used by TinyDNS. In the template given below, `$domain` should be substituted for domain, and `$ip` for an IP address. A brief explanation of each line is given.

If your domain is hosted elsewhere it would be prudent to create the records explained in notes 2, 3, and 4 in the listing below in order for everything to work as advertised.

**DNS records template**

```
#
#  Nameserver records. (1)
#
.$domain::a.ns.bytemark.co.uk:300
.$domain::b.ns.bytemark.co.uk:300
.$domain::c.ns.bytemark.co.uk:300

#
```

```
#  The domain name itself ❷
#
=$domain:$ip:300

#
#  Useful aliases. ❸
#
+ftp.$domain:$ip:300
+www.$domain:$ip:300

#
#  MX record ❹
#
@$domain:$ip:mx.$domain:15:300
```

❶ These lines create *NS* and *SOA* records for `$domain` pointing at a.ns.bytemark.co.uk, b.ns.bytemark.co.uk and c.ns.bytemark.co.uk. The time-to-live for these records is 300 seconds. Note that the double colons in these records are deliberate.

❷ This creates an *A* record pointing `$domain` to the IP address `$ip`, and a *PTR* record for the reverse. Again, the TTL is 300 seconds.

❸ These two lines add *A* records to direct ftp.`$domain`, and www.`$domain` to the IP address `$ip`. Once again, the TTL for these records is 300 seconds.

❹ This last record creates an *MX* record directing mail for `$domain` to mx.`$domain`, with a distance of 15. It also creates an *A* record pointing mx.`$domain` to The IP address `$ip`. The TTL for these records is also 300 seconds.

If you would rather have a different template to be created for your domains, feel free to edit `/etc/symbiosis/dns.d/template`. Ensure that the pattern of `$domain` and `$ip` is followed for the generation to work.

## 15.2 Adding a wild-card hostname record

In addition to these records for each domain, a wild-card *A* record is needed for the hostname such that the `.testing.` prefix works. If your machine is at Bytemark, this has already been setup for your machine's Bytemark alias, for example *example.vm.bytemark.co.uk*.

If your machine is not hosted at Bytemark, or your hostname does not end in `bytemark.co.uk` then you will need to set this alias up. Adding the following line to your DNS file will work, assuming the domain is hosted at Bytemark. This assumes that your machine is called `host.example.com` and that your machine's IP address is 1.2.3.4.

```
*.host.example.com:1.2.3.4
```

## 15.3 Using the Bytemark anti-spam system

Bytemark Hosting offer wholesale spam protection for their hosting customers.

Of course this can be integrated into the Symbiosis system. For the domain *my-brilliant-site.com* the DNS file at `/srv/my-brilliant-site.com/config/dns/my-brilliant-site.com.txt` would need to be changed as follows.

Please note that this is a **chargeable service**.

1. Connect to your machine using FileZilla, as detailed in Chapter 2.
2. Navigate to `/srv/my-brilliant-site.com/config/dns/` and select the file `my-brilliant-site.com.txt` for editing.
3. Change the line reading `@my-brilliant-site.com:1.2.3.4:mx.my-brilliant-site.com:15:300` to read `@my-brilliant-site.com:1.2.3.4:mx.my-brilliant-site.com:15::300::nospam`
4. Add in the following two lines

```
@my-brilliant-site.com::a.nospam.bytemark.co.uk:5:300::world
@my-brilliant-site.com::b.nospam.bytemark.co.uk:10:300::world
```

5. Save the file

Now within the next hour, mail will be routed via the Bytemark anti-spam machines.

The final step is to make sure that **only** mail from the Bytemark anti-spam machines will be accepted. To do this for a domain, create the file `/srv/my-brilliant-site.com/config/bytemark-antispam`. This will cause mail sent directly to your machine to be temporarily rejected, ensuring spammers cannot circumvent the anti-spam protection.

## 15.4 Moving domains between machines using the Bytemark content DNS service

If you wish to move your domains between two machines running Symbiosis and using the Bytemark content DNS service, you must contact Bytemark Support to arrange the domain to be moved between content DNS accounts.

This results from the necessity for ensuring that only people with the proper authorisation can change live DNS data. Once a domain has been hosted on our network, a content DNS account will have sole authority for it.

If you purchase a second server and move some of your domains onto it, or purchase a domain from another Bytemark customer you must contact us to move authority for the domain into the correct account.

Until this is done, although the Symbiosis system will be creating and uploading data it will not be to the account with the authority to make the data live.

# Chapter 16

# Scheduled tasks

Reference chapter.

## 16.1 Testing the crontab

A crontab can also be tested. To do this you have to SSH to the machine, usually as **admin** to run the command.

For example, to test the **my-brilliant-site.com** crontab navigate to `/srv/my-brilliant-site.com/config/` and run **symbiosis-crontab --test crontab**.

The **my-brilliant-site.com** crontab reads

```
# Send any output to Bob
#
MAILTO=bob@my-brilliant-site.com

#
# run at 18:40 every day
#
40 18 * * *       echo Hello Dave.

#
# run at 9am every Monday - Friday
#
0   9 * * mon-fri wget http://www.my-brilliant-site.com/cron.php

#
# Run once a month
#
@monthly          /usr/local/bin/monthly-job.sh
```

Therefore the output generated is

```
 Environment
 ---------------------------------------------------------------------------
 HOME = /srv
 LOGNAME = admin
 PATH = /usr/local/bin:/usr/bin:/bin
 MAILTO = bob@my-brilliant-site.com
```

```
=============================================================================

Jobs next due -- Local time 2010-06-17T17:57:37+01:00
-----------------------------------------------------------------------------
Date                        Command
-----------------------------------------------------------------------------
2010-06-17T18:40:00+01:00  echo Hello Dave.
2010-06-18T09:00:00+01:00  wget http://www.my-brilliant-site.com/cron.php
2010-07-01T00:00:00+01:00  /usr/local/bin/monthly-job.sh
=============================================================================
```

**Note**
The only environment variables that can be set within your crontab are PATH and MAILTO. All the rest are set automatically, and cannot be altered.

# Chapter 17

# Database configuration

Initially the **root** password for the database is the same as that of the **admin** user used to to connect to your machine via SSH or SFTP. To change this you can use the phpMyAdmin interface.

As a general rule, each application should have its own username and access rights, to make sure that there is a degree of separation between all the applications on a server. This can all be done through the phpMyAdmin interface.

## 17.1 Enabling remote MySQL access

As a security measure, your MySQL server is not opened to the world. However you might wish to access it remotely for performing queries, or allowing other hosts to otherwise communicate with it.

Your MySQL server should be configured already to listen upon your external IP addresses. Therefore only two steps are needed to configure remote access: opening the firewall, and adding a user with remote privileges to the database.

### 17.1.1 Opening the firewall for MySQL

To open a hole in the firewall to the whole internet, you should create the file `/etc/symbiosis/firewall/incoming.d/55-mysql`. It is a good idea to restrict access to the database to a list of known IP addresses. To do this simply add IP addresses to the above file, one per line.

Chapter 14 gives full details of how the firewall works.

### 17.1.2 Adding a user with remote privileges

There are two ways to do this, either using the MySQL command line tool, or via phpMyAdmin. This section will cover doing it with the latter.

1. In phpMyAdmin, select the Privileges link from the front page, once you've logged in to it as **root** — see Chapter 6 for details on how to do this.
2. The privileges section will present a **User Overview**, at the bottom of which there is a link to Add a new user.

3. In the **Add a new user** screen, fill out the details in the form as needed, making sure that the Host field is set to **Any host**.

   The privileges tick boxes lower down should be selected carefully. Most applications will need at least those in the Data section, and some of those in the Structure section. Check the documentation of the software you're using to see what it requires.

   If you want an account with all privileges, select check all.

4. Once you're satisfied with everything, click Go. This will confirm that a user has been created.

5. Now return to the home screen by clicking the phpMyAdmin logo at the top left of the screen.

6. Finally, on the front page click the Reload privileges link to make sure MySQL knows about this new user.

You should now be able to access the MySQL database remotely, using this new username and password.

# Chapter 18

# Backup Reference

The Symbiosis system includes a component designed to handle backups, using the flexible backup2l software.

backup2l was selected due to its simplicity and flexibility, which allows it to be used easily. By default the backup software executes once per day and archives the contents of significant directories to a local directory.

## 18.1 Configuration

backup2l is controlled via configuration file `/etc/backup2l.conf`, this file is well documented, but in brief it contains three important pieces of information:

- The local directories to backup (`/etc`, `/srv`, etc).
- The destination to which the backups should be stored (`/var/backups/localhost`)/
- The number of backups to keep.

The Bytemark Symbiosis system will replace the static file `/etc/backup2.conf` with a symbolic link to a generated file, which is produced by concatenating the contents of the `/etc/symbiosis/backup.d` directory.

## 18.2 Advanced Configuration

Additionally we've configured the backup software to easily execute a number of scripts before and after the backup is performed:

**`/etc/symbiosis/backup.d/pre-backup.d`** Any executable script located in this directory is executed, prior to a backup execution.

**`/etc/symbiosis/backup.d/post-backup.d`** Any executable script located in this directory is executed after a backup has completed.

## 18.3 Listing Backup Contents

To list the contents of your backup area you need to run backup2l with the "-l" flag:

```
~# backup2l -l
all.1: /etc/.pwd.lock
all.1: /etc/GeoIP.conf.default
all.1: /etc/X11/Xresources/x11-common
all.1: /etc/X11/Xsession
all.1: /etc/X11/Xsession.d/20x11-common_process-args
all.1: /etc/X11/Xsession.d/30x11-common_xresources
all.1: /etc/X11/Xsession.d/40x11-common_xsessionrc
all.1: /etc/X11/Xsession.d/50x11-common_determine-startup
...
```

Here you will see the contents of the `/etc` directory which have been archived.

If you'd like to restrict this view you can apply a regular expression to filter the results. For example we can list the files which match the pattern *passwd* with this command:

```
~# backup2l -l passwd
Listing locations...
all.1: /etc/exim4/passwd.client
all.1: /etc/passwd
all.1: /etc/passwd-
all.1: /etc/phpmyadmin/htpasswd.setup
all.1: /etc/pure-ftpd/pureftpd.passwd
...
```

## 18.4 Restoring From Backup

To illustrate how this works, an example is used. We're looking for a backup of the file `/etc/passwd`.

1. First log in to your machine over SSH (see Chapter 10) as **admin**.
2. To find the available versions of the file, run **sudo backup2l -l '/etc/passwd$'**. The dollar sign is there to show that you want an exact match of `/etc/passwd`. The first time you run **sudo** you will be prompted for the **admin** password. The following output will be generated by backup2l.

   ```
   backup2l v1.4 by Gundolf Kiefer

   Active files in <all.1101>: 1
     found in all.1101:       0   (    1 left)
     found in all.11:         1   (    0 left)

   Listing locations...
   all.11: /etc/passwd
   ```

   This shows the latest available version of the file
3. To recover it you should run **sudo backup2l -r '/etc/passwd$'**. The following output will be generated

```
backup2l v1.4 by Gundolf Kiefer

Active files in <all.1101>: 1
  found in all.1101:       0   (    1 left)
  found in all.11:         1   (    0 left)

Restoring files...
  all.11.tar.gz: 1 file(s) using 'DRIVER_TAR_GZ'
```

That has restored the file to `etc/passwd` in the current directory. It is **not recommended** to run this program in the `/` directory, as any existing files will get overwritten.

## 18.5 Recovery From Earlier Backups

It is also possible to pick which version of a file you wish to restore.

1. First login to your machine over SSH as **admin**
2. Then, to show all available versions of a file, run **sudo backup2l -a '/etc/passwd$'**. Again, the first time you run **sudo** you will be prompted for a password. The following output is generated.

   ```
   backup2l v1.4 by Gundolf Kiefer

   Listing available files...
   all.101   -     1067 06/18/08 13:59:47 0000.0000 0644 /etc/passwd
   all.101   +     1118 06/19/08 11:29:10 0000.0000 0644 /etc/passwd
   all.108   -     1118 06/19/08 11:29:10 0000.0000 0644 /etc/passwd
   all.108   +     1153 08/27/08 10:25:45 0000.0000 0644 /etc/passwd
   all.11    -     1067 06/18/08 13:59:47 0000.0000 0644 /etc/passwd
   all.11    +     1153 08/27/08 10:25:45 0000.0000 0644 /etc/passwd
   all.1     +     1067 06/18/08 13:59:47 0000.0000 0644 /etc/passwd
   ```

   Note that the versions are not shown in date order, and that the dates are in the US `mm/dd/yy` format. In that list the `+` indicates that the file is new and thus contained in the archive file. A `-` indicates that the file has been removed (or replaced). Choose which backup you wish to recover from.

3. To recover the file dated 19th June 2008, you need backup number 101 — remember the `+` indicates that it is present in that archive. To recover that file, run **sudo backup2l -t 101 -r '/etc/passwd$'**

   ```
   backup2l v1.4 by Gundolf Kiefer

   Active files in <all.101>: 1
     found in all.101:        1   (    0 left)

   Restoring files...
     all.101.tar.gz: 1 file(s) using 'DRIVER_TAR_GZ'
   ```

   Notice the -t 101 argument which specifies which backup we want to restore from.

We have now successfully restored the file to `etc/passwd` in the current directory. We can check by running **ls -la etc/**

```
total 16
drwxr-xr-x  2 root  root  4096 2008-09-09 09:56 .
drwxr-xr-x 14 root  root  4096 2008-09-09 09:51 ..
-rw-r--r--  1 root  root  1118 2008-06-19 11:29 passwd
```

## 18.6 Offsite backup storage

The Symbiosis system assumes that it is running upon a host provided by Bytemark, with access to an associated external storage area.

As documented every executable located in the directory `/etc/symbiosis/backup.d/post-backup.d` is executed at the conclusion of a successful backup.

By default only a single script is included, which attempts to determine the name of the remote backup space associated with your machine and copy the local backup directory of `/var/backups` to this remote location.

## 18.7 Recovering from offsite backup archive

**TODO** The daily offsite backup will protect you - document retrieval, via a script.

# Chapter 19

# Symbiosis Service Monitoring

The Symbiosis system is comprised of several distinct components, which we've documented throughout the course of this reference:

- The MySSQL database server.
- Exim & Dovecott servers for handling email.
- Apache for serving websites.
- The FTP server, proftpd

Each of these services runs in an independent fashion, and it is possible under certain circumstances that these services might fail, or stop themselves.

To handle the case of services failing to execute normally we've included an automated service checker as part of the Symbiosis system. The service checker will check upon the health of your system, by default once every two minutes, and it will automatically restart any services which have failed.

## 19.1 Symbiosis Service Testing

The **symbiosis-monit** command is responsible for testing each of the available services, and restarting the failed ones. By default it is executed every two minutes, such that it may respond quickly to failures.

At any time you wish to check upon the health of your system you may launch it manually, when connected to your server via SSH.

```
kvm4:~# symbiosis-monit
= Bytemark Virtual Hosting service test report ========================

 * Host: kvm4.vm.bytemark.co.uk
 * Tests started at: Fri, 11 Jun 2010 15:55:45 +0100

 * apache2: PASS
 * clamav-daemon: PASS
 * clamav-freshclam: PASS
 * cron: PASS
 * dovecot: PASS
 * exim4: PASS
```

```
 * mysqld: PASS
 * pure-authd: PASS
 * pure-ftpd: PASS
 * spamassassin: PASS
 * sshd: PASS

 * 11/11 tests passed on first attempt.
 * Tests finished at: Fri, 11 Jun 2010 15:55:46 +0100

= End of service test report ================================================
```

In this case all services are working correctly, so "PASS" was reported instead of the failing "FAIL". The possible output status are:

**FAIL** The service failed.

**PASS** The service appears to be running correctly.

# Part III

# Support Guide

# Chapter 20

# Troubleshooting Symbiosis

We're happy to accept bug reports via our usual support system. But you can make it easier for us to assist you if you check the common things first.

We have produced an FAQ which might answer the questions you're asking.

If none of the suggestions on this help it would aid us if you were very specific about the problem you're experiencing.

## 20.1 Database problems?

If you already had a password configured for the MySQL database prior to installing our packages it will be unchanged. The password for the root user is only changed if it is unset when the packages are installed or updated for the first time.

The Debian MySQL packages create a local user for automated use, so if you're unsure of your MySQL password you may this login to reset it. You may find details of the Debian login contained in the file /etc/mysql/debian.cnf.

## 20.2 Firewall problems?

You, or a customer with FTP or SFTP/SSH access, may become locked out of the machine if repeated attempts are made to access the machine incorrectly

If you believe you've become locked out, via the firewall, it is possible to fix this if you have another means of connecting to your server.

**Note**
Users who have their hosting with Bytemark will be able to use the Console Shell] to gain access to their machine, even if the network is disabled, or the firewall is refusing direct connections.

1. Using your fall-back connection method connect to your server.
2. Navigate to the `/etc/symbiosis/firewall/blacklist.d` directory with the command **cd /etc/symbiosis/firewall/blacklist.d**

3. Check the contents of the directory with the command **ls /etc/symbiosis/firewall/blacklist.d**; the presence of the file `<ip address>.auto` confirms the problem.
4. remove the file, **rm /etc/symbiosis/firewall/blacklist.d/<ip address>.auto** and restart the firewall with the command **firewall**

**Tip**
You can whitelist an IP address to ensure it is never blocked by the Symbiosis firewall. Create the directory `/etc/symbiosis/firewall/whitelist.d/` and the file `/etc/symbiosis/firewall/whitelist.d/<ip address>`. Note that you do not add ".auto" to that filename.

## 20.3 Package problems?

Every evening your system will be configured to update itself. This ensures that you'll have any Debian-provided security updates applied to your system. It will also update your system to the latest available collection of the Bytemark Symbiosis packages.

If your system fails to update you may correct this by running, as root:

```
apt-get update
apt-get dist-upgrade
apt-get -f install
```

## 20.4 Permission problems?

The mail-server and FTP-server we're running will refuse to work with directories which are owned by the root user.

If you find that you've added a new site/mailbox to your system and it doesn't work but existing ones do then this is most likely the source of the problem.

Unless you're handling ownership in a special way you may reset the permissions to avoid this problem by running the following command:

```
chown -R admin.admin /srv/
```

## 20.5 SSL problems?

If you run into problems with the configuration of SSL-based sites please get in touch, this support is still very new and there might be a couple of kinks to work out of the process.

The most common problem is that you need to install a "bundle" or keychain file.

If the missing keychain/bundle is the problem you'll see this logged in the Apache SSL error file beneath /var/log/apache2. Each generated SSL-site will use its own logfile - rather than the global access.log and error.log file. So taking a look at that could be useful with the shell command:

```
tail /var/log/apache2/*ssl*.log
```

You should be able to validate the combined SSL private key and certificate via the use of the openssl tool; run the shell command:

```
openssl verify /srv/my-brilliant-site.com/config/ssl.key
..
error 18 at 0 depth lookup:self signed certificate
OK
```

You're looking for the "OK" at the end, rather than the error message which is harmless.

# Chapter 21

# FAQ

**Q:** *My new website shows only the "Bytemark Unconfigured Host" page.*

**A:** Simply upload a file to the root of your website directory, i.e. `/srv/my-brilliant-site.com/public/htdocs/`, with the name of `index.html`, or `index.php`.

Your new index will override our default one.

**Q:** *I want http://my-brilliant-site.com/ and http://www.my-brilliant-site.com/ to show different content.*

**A:** When we've created websites so far we've created directories without the **www** prefix, for example /srv/my-brilliant-site.com. These directories are served when clients request both http://www.my-brilliant-site.com and http://my-brilliant-site.com. If you'd like different content simply create a new directory with the **www** prefix .

**Q:** *What is the password for the admin user?*

**A:** When the packages are installed a new local admin user is created. The password for that account will be same as for your existing **root** account. For all work with Symbiosis we recommend you connect and login as user **admin**.

**Q:** *How do I redirect one domain to another?*

**A:** We'll use a redirection of **my-brilliant-site.com** to **example.com**, so that when users go to **www.my-brilliant-site.com**, they are redirected to **www.example.com**.

1. Firstly, create the my-brilliant-site.com htdocs directory as usual, i.e. `/srv/my-brilliant-site.com/public/htdocs/`.
2. Now inside that directory, create a file .htaccess with the following line inside:

   ```
   Redirect 301 / http://www.example.com/
   ```

   and the redirection should start working.

See the Apache documentation for a full description of the Redirect directive.

**Q:** *Help! My browser issues a big warning when I try to connect to my Webmail.*

**A:** This is because the SSL certificate is self-signed. We've provided the following step-by-step guides to accepting this certificate permanently in some of the more popular browsers.

- Apple Safari

- Mozilla Firefox (version 2)
- Mozilla Firefox (version 3)
- MS Internet Explorer (version 6)
- MS Internet Explorer (version 7)

**Q:** *I've set up the* ftp-password *as instructed, but I can't log in*

**A:** The first thing to check is permissions. These need only be checked if you've created domains with the root user.

By default the Bytemark Symbiosis package installs a new user **admin** which owns the `/srv` directory, and can create domains inside that directory. If you've set up the `/srv` directory by hand, it is probably owned by **root**, and any domains inside that directory will also be owned by **root**. This will prevent both the email services and FTP services from running correctly.

To fix this, you need to create a user to own all the /srv/ directories. It is suggested that you create a user called admin, as this will fit into the Bytemark scheme.

```
adduser --home /srv --no-create-home admin
```

This command will prompt you for all sorts of information, including a password, and it will create a group called **admin** too. Once you've created this user, you will need to change the ownership of the `/srv` directory.

```
chown -R admin.admin /srv
```

**Q:** *How do I modify the firewall, where is it located?*

**A:** Please see Chapter 14.

**Q:** *How do I enable remote access to MySQL?*

**A:** Please see Section 17.1.

**Q:** *I have a PHP script that sends emails or tries to make an external connection via http and it is not responding.*

**A:** This has fallen foul of the firewall which says that web servers cannot make outbound connections. Please see Section 14.5.

# Chapter 22

# Reporting issues

The Symbiosis project, and its documentation both have issue trackers. Before these are explained, however, we have a few tips on how to help us help you.

Firstly, make sure that no-one else has reported the same problem. The issue trackers are public, and there is a search box to help you through them.

Secondly, please use the following guidelines to make sure we have as much information as we need to diagnose, and hopefully fix the problem. We'd like to know the following:

**Tracker** There are two broad types of issue, each with its own tracker.

- Feature: a request for new functionality
- Bug: a problem with existing functionality

**Subject** It is very important to make this as descriptive, yet concise as possible. The following are examples of bad subjects

- help
- cannot login
- bug
- new feature Good subjects include
- Expected firewall update didn't occur
- Backups are failing to take place
- Add functionality to automatically white-list IPs in the firewall

**Description** nlahaasdad

# Part IV

# Appendicies

# Appendix A

# Email client setup

**TODO**

`Document a client or two:`

- Thunderbird
- Outlook

## A.1 Generic client configuration.

The following details might be needed when setting up a mail client to use an email account. The user of bob@my-brilliant-site.com on the machine example.vm.bytemark.co.uk has been chosen for these worked examples.

It is recommended that all communication with the mail server is conducted over encrypted connections, either using *SSL*, or *TLS*.

**Note**
By default a self-signed certificate is used during the secure transactions. Some mail clients may warn you about this certificate being invalid. If you are at all unsure about the validity of the certificate is would be prudent to double-check it.
A self-signed certificate is one that has not been purchased from a company that specializes in certificate verification; it is quite adequate for the purpose of passing encrypted passwords over the network.
Bob would expect to see something similar to this at the top of her self-signed certificate:- Subject: EMAILADDRESS=root@example.vm.bytemark.co.uk, CN=example.vm.bytemark.co.uk, OU=example.vm.bytemark.co.uk, O=Dovecot mail server Signature Algorithm: SHA1withRSA, OID = 1.2.840.113549.1.1.5

Incoming email can be collected using either the *IMAP* or *POP3* protocols. IMAP is generally recommended over POP3 as it can handle folders, push notification, can selectively download message parts, and the email remains on the server enabling back-ups to be made.

Outgoing email is sent using *SMTP*. It is good practice to send any outgoing email via the Symbiosis server, rather than any relay service provided by your ISP.

For both sending and receiving email, the following login information would be used.

**Username** bob@my-brilliant-site.com

**Password** (contents of `/srv/my-brilliant-site.com/mailboxes/bob/password`)

**Server name** example.vm.bytemark.co.uk

The default ports are used for all protocols. For further details see Section 13.1

**Tip**
It is common for Internet service providers to block the standard outgoing email port, i.e. port 25. If your email client complains that it cannot connect to your server on this port, then port 587 is provided as an alternative.

## A.2 Configuring Mozilla Thunderbird

Mozilla Thunderbird is a popular open source mail client, that runs on a variety of platforms. In this program we can use the Create New Account link on the home screen to create our new account. Alternatively select File New... Account. In this worked example, Bob Example, who has the email address bob@my-brilliant-site.com will set up his email account on example.vm.bytemark.co.uk.

1. New Account Setup: Choose Email Account
2. Identity: Enter your name as you would like it to appear in the From: header in the Your Name box. Enter your email address in the Email Address box. Bob uses bob@my-brilliant-site.com.
3. Server Information

- Choose IMAP as the incoming server type
- Set the Incoming Server to the name of the machine you want to use. In this case Bob would put example.vm.bytemark.co.uk.
- Set the Outgoing Server to the same name.

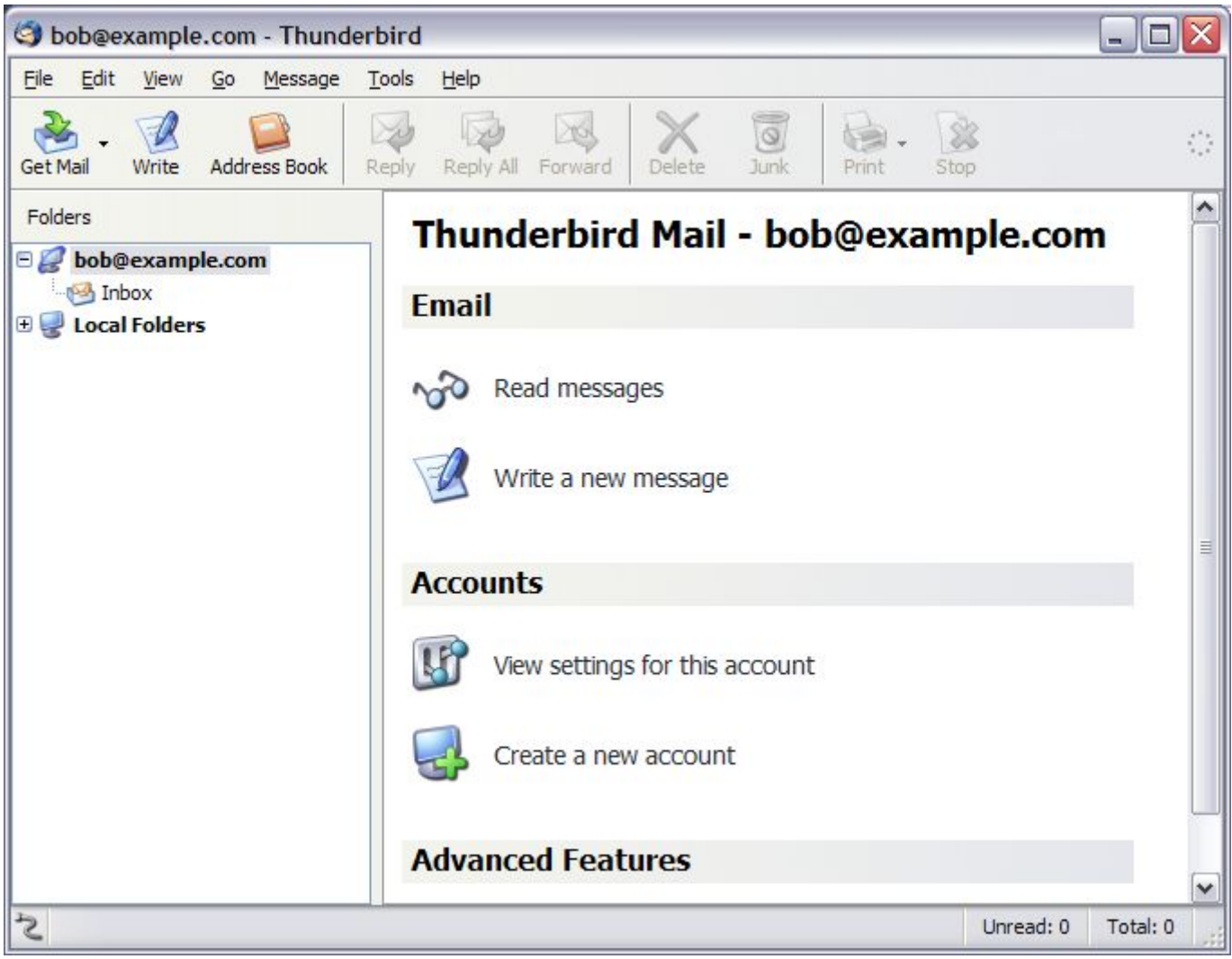
4. User Names


- Set the Incoming User Name to your email address. Bob uses bob@my-brilliant-site.com.

5. **Account Name**: This is the name of the account as it is known to Thunderbird. Bob chooses bob@my-brilliant-site.com for this.

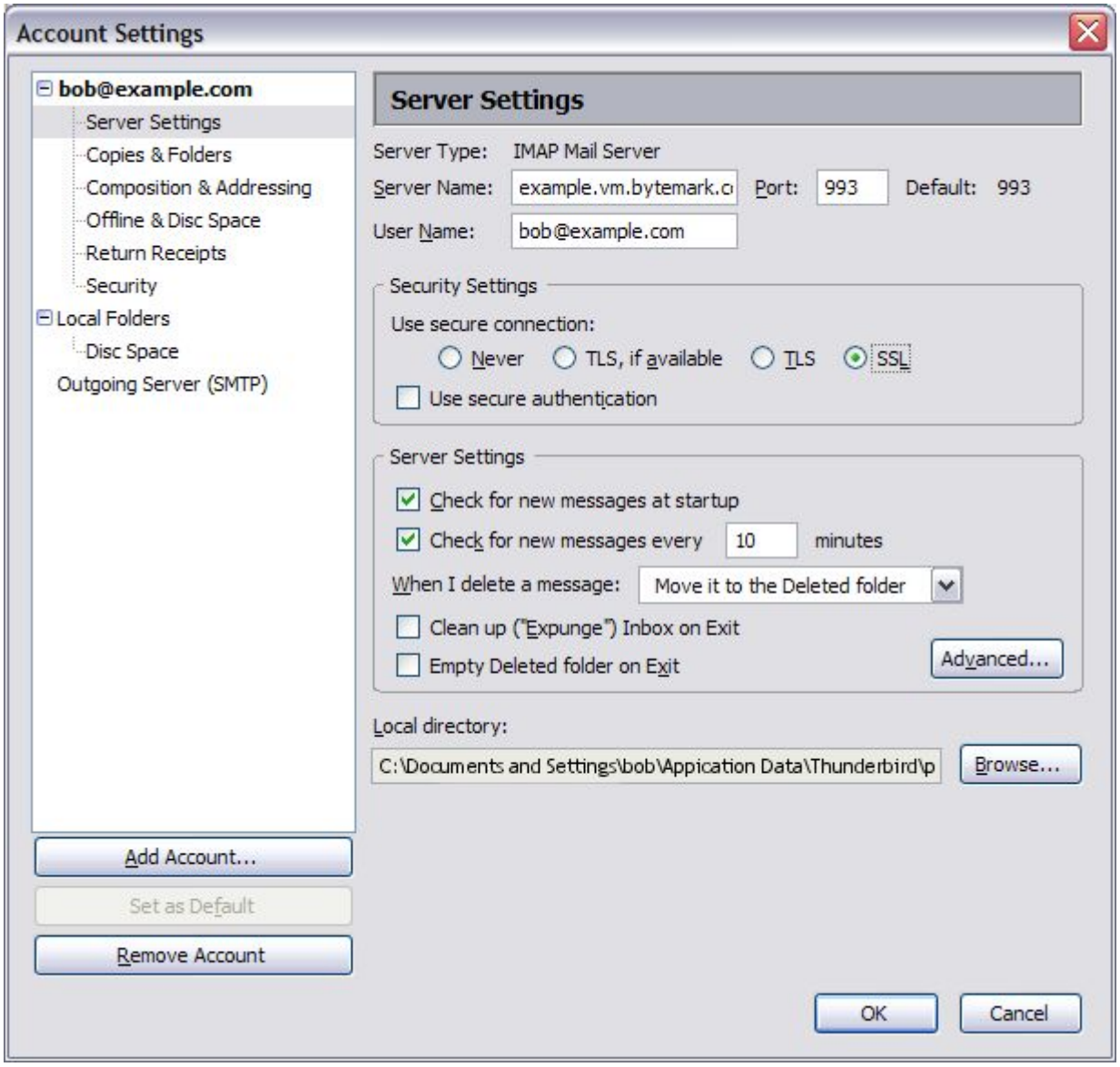
6. **Congratulations!**: This just shows a summary of the information you've given Thunderbird. Click Finish to create the account.

7. You should now be presented with a screen like the one below.




### A.2.1 Securing incoming (IMAP) access

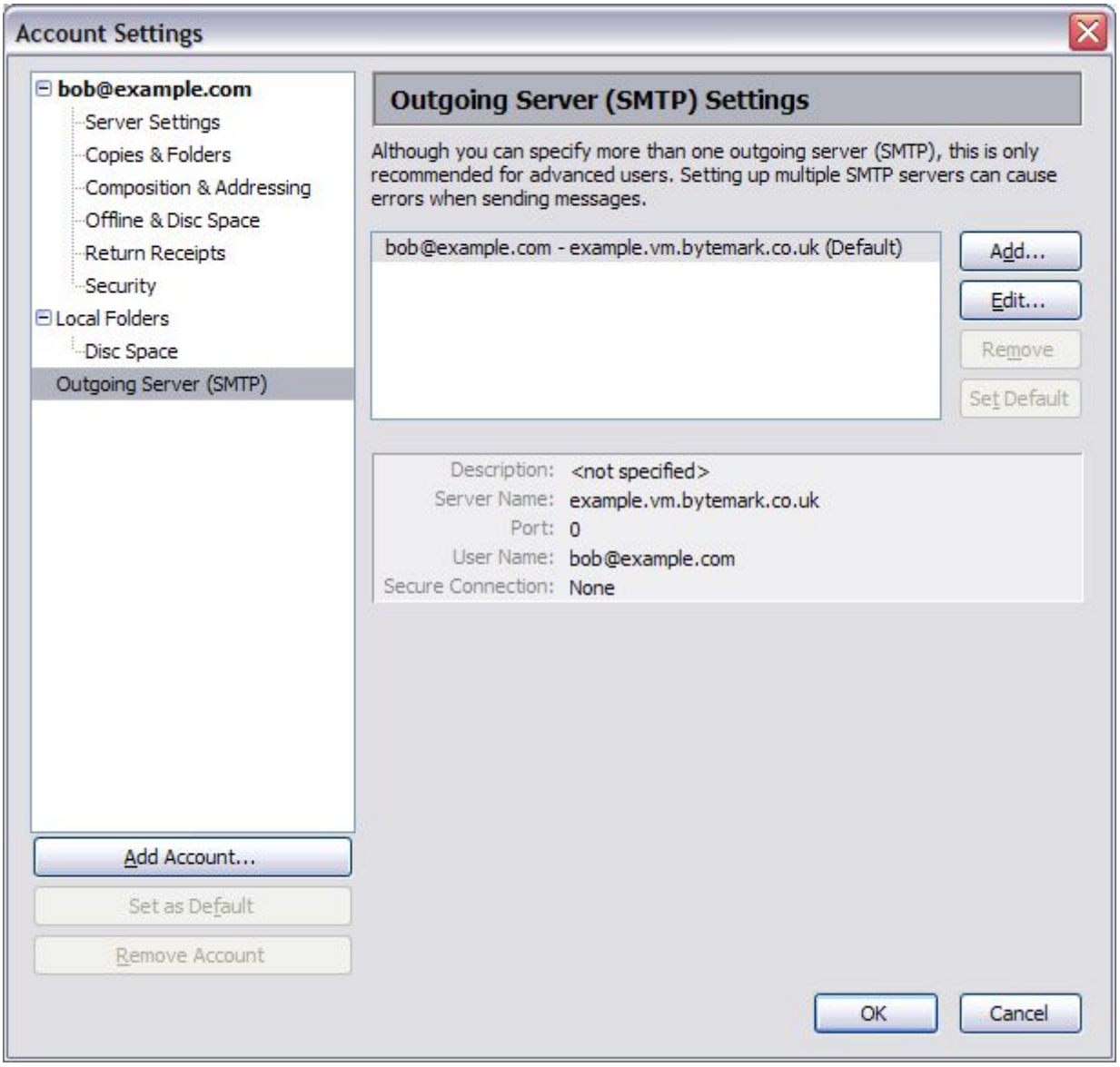
- It is highly recommended that this next step is carried out to prevent passwords and other sensitive data being transmitted over the internet in plain text.
- Click on View settings for this account in the home screen (as shown above) and you should be presented with the screen below.



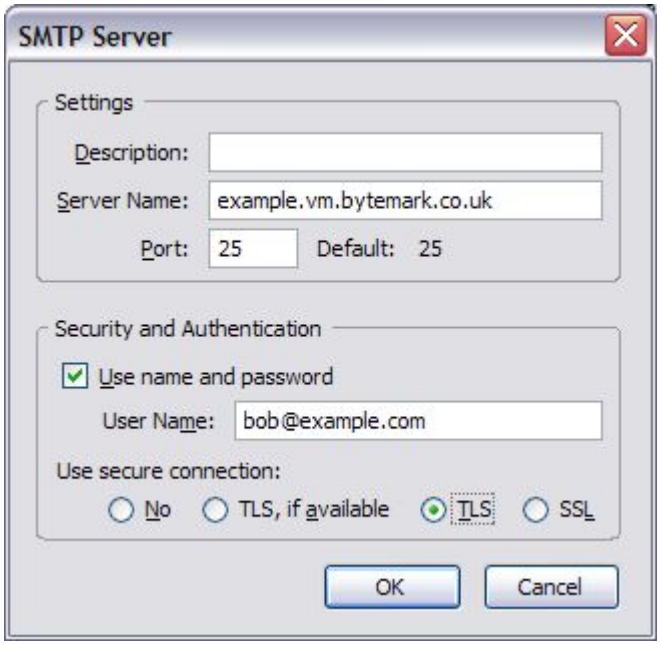

- Simply click the SSL radio button in the Security Settings box. Click OK at the bottom of the screen to apply the change.
- Next time your mail is checked, Thunderbird might present a screen like the one below, warning that the certificate is invalid. This can be accepted permanently.


### A.2.2 Enabling and securing outgoing (SMTP) access

1. In order to relay email via your server you need to click on View settingsfor this account again, whereupon you should choose Outgoing Server (SMTP) from the list of items of the left of the new screen, changing it to a screen similar to the one below.




2. Select the name of your mail server in this box. Bob would choose example.vm.bytemark.co.uk. Then click Edit. . . . A further screen should appear, like the one below.




3. On this screen, make sure the User name and password box is checked in the Security and Authorisation box. The User Name field should contain your email address. Bob would use bob@my-brilliant-site.com.

4. Finally make sure that the TLS radio button is selected to ensure a secure connection between your computer and the server, and click OK to apply the changes.

5. Click OK again in the Account Settings window to apply the changes.

You are now all set up!

## A.3 Configuring Outlook Express

Firstly a new account needs to be added. If you've not used Outlook Express before, a wizard will automatically appear when you start the program for the first time. If you have used it before, go to the Settings menu and choose the Accounts item. From there you can add a new account by clicking on the Add... button on the right-hand side of the Accounts window.

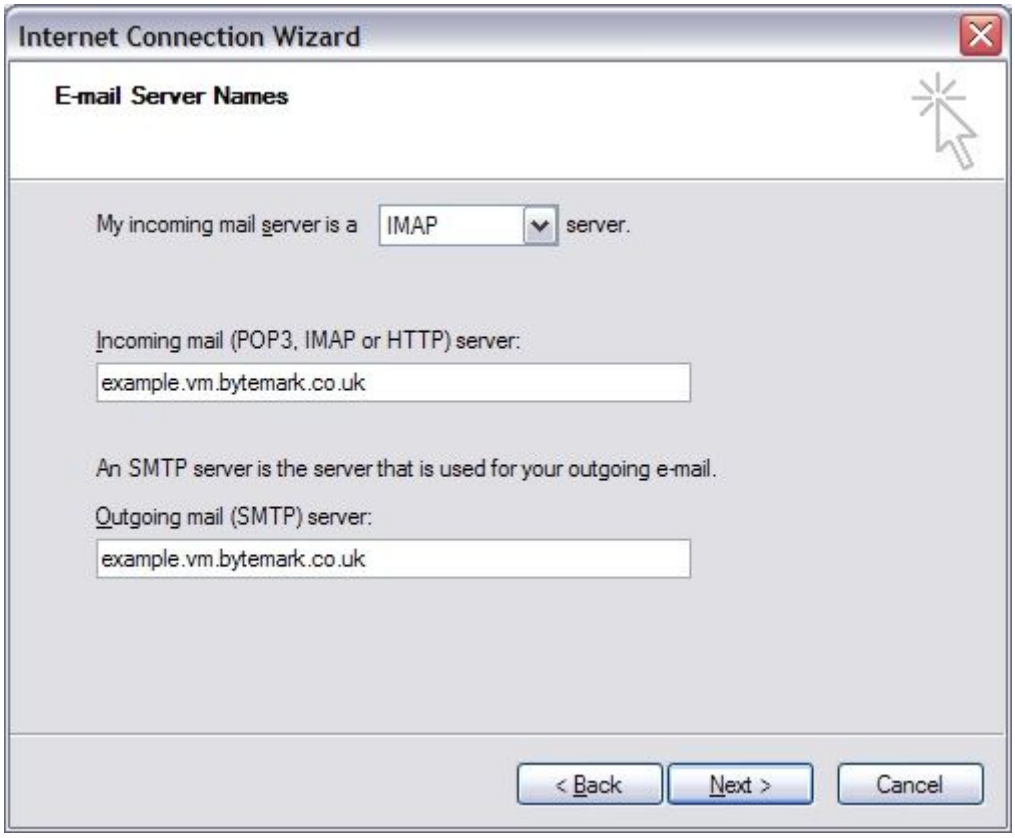
### A.3.1 Basic configuration using the Wizard

This walk-through uses the example person Bob Example, with the email address bob@my-brilliant-site.com on his virtual machine example.vm.bytemark.co.uk.

1. Your Name: Fill in your real name, as you would like to see it in the From: field in emails. In this case, Bob would put Bob Example.

2. Internet E-Mail Address: Fill in your email address. For this example, Bob would put bob@my-brilliant-site.com.

3. E-Mail Server Names



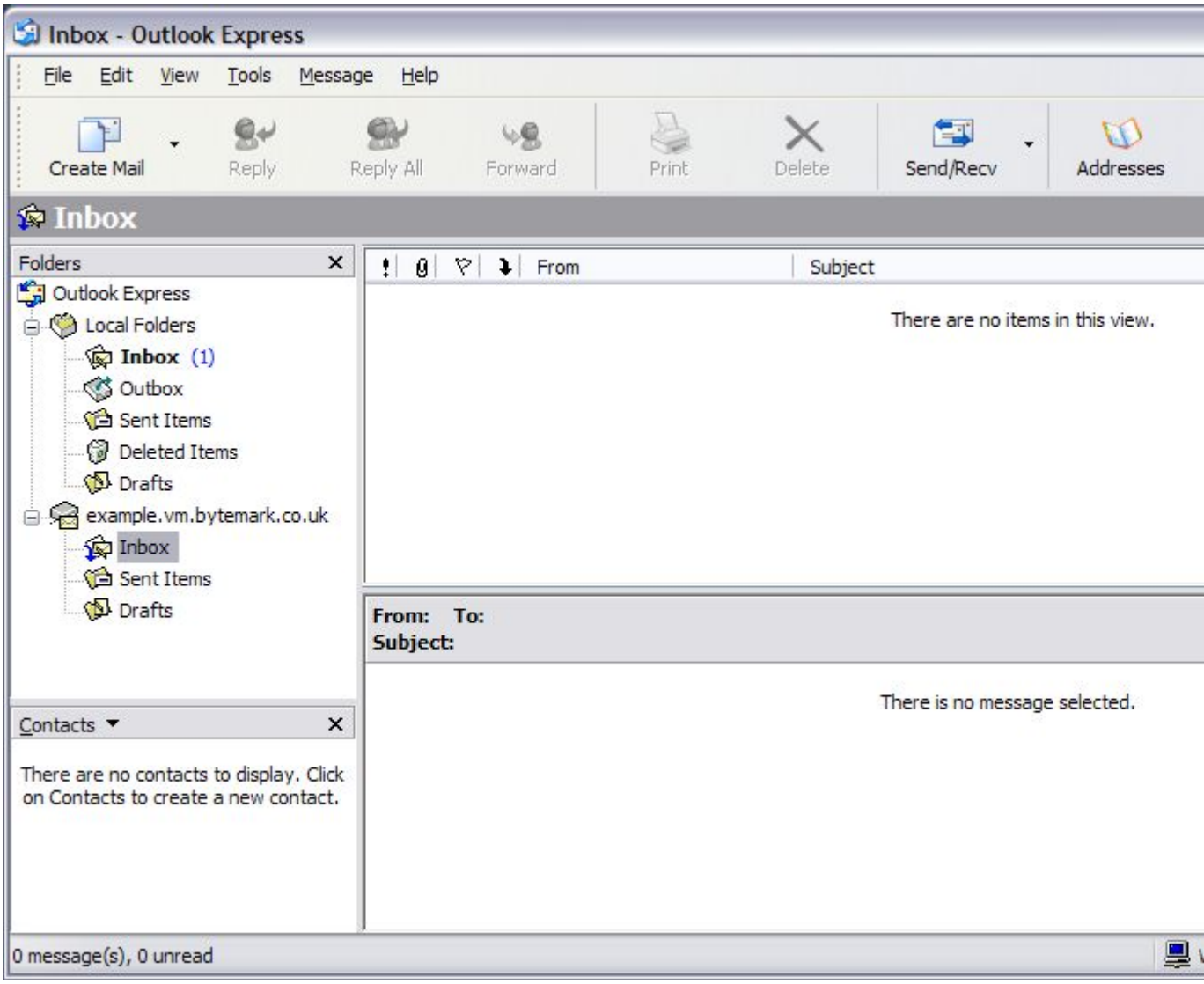

4. Select IMAP from the drop-down box at the top.
5. Fill in the name of the server in the both the incoming and outgoing mail server boxes. In this case, Bob would use example.vm.bytemark.co.uk for both.
6. Internet Mail Logon:


7. Fill in your email address as the Account Name box. Bob would put bob@my-brilliant-site.com.
8. Fill in the Password box with your password. Please note that the password is case-sensitive, so it is best to copy and paste it from another email if possible.
9. Tick the Remember Password box, if you wish the program to remember the password indefinitely.
10. Leave the Logon using Secure Password Authentication box unchecked.
11. Congratulations: The last step is a confirmation box, detailing all the settings you have entered. Click OK to create the account.

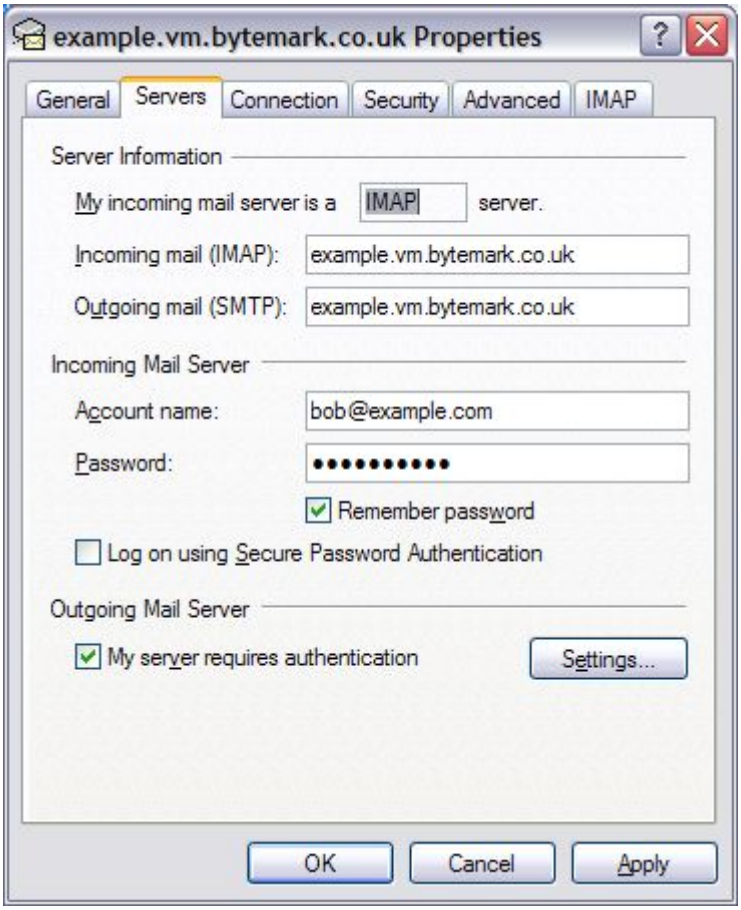
### A.3.2 Enabling outgoing e-mail

To send outgoing email you need to tell Outlook to use authentication. This is done by bringing up the Properties for your new account.

1. Click your right mouse button on the name of the account in the main Outlook Express window, and select the Properties entry on the menu that appears.




2. A new window will appear. Choose the Servers tab at the top of the window.
3. Towards the bottom of this page, under the Outgoing Mail Server heading, tick the box labelled My Server requires authentication.
4. Now to double check the correct username and password are being used, click the Settings... button to the right of this check box, and a new, smaller window appears.

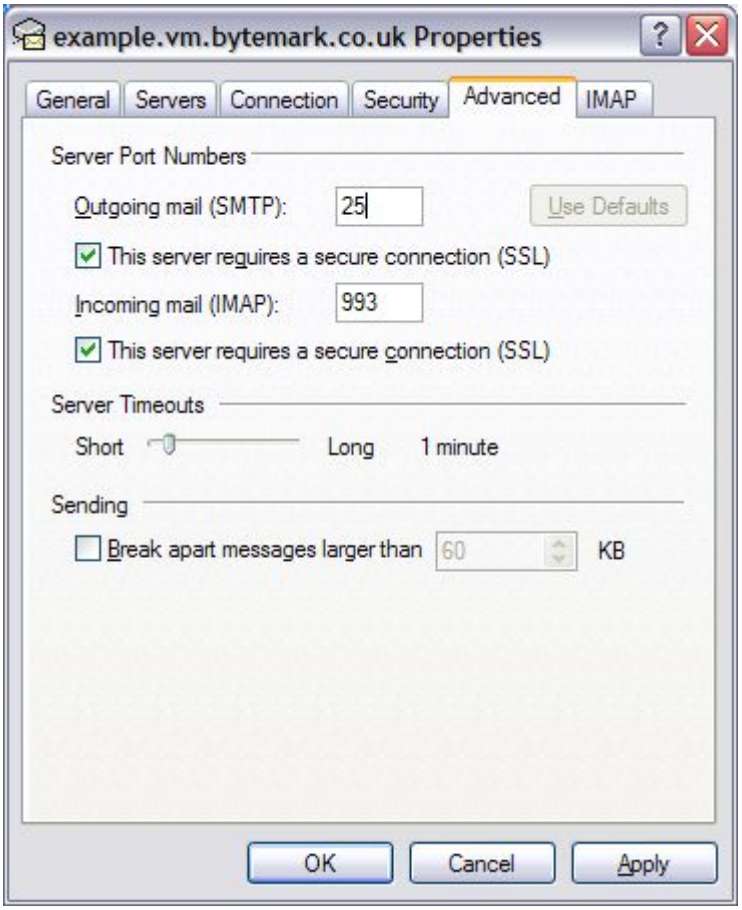



5. In this window, make sure that the radio button Use same settings as my incoming mail server is chosen.
6. Click OK in this smaller window, returning you to the Properties window.
7. Click OK again to save the settings.

### A.3.3 Securing incoming and outgoing e-mail

It is strongly recommended to use secure connections to collect and send email. If you do not use secure connections, your login details are passed in plain text between your computer and the server.

- Once again, access the Properties for the account by right-clicking on the account name in the main Outlook Express window, and selecting the Properties entry.
- A new window will appear. Select the Advanced tab at the top of the window.




- Now check the boxes labelled This sever requires a secure connection (SSL), under both Outgoing mail (SMTP) and Incoming mail (IMAP). -The number in the box labelled Outgoing mail (SMTP) should stay the same. -The number in the box labelled Incoming mail (IMAP) should change to 993 when the box underneath is ticked. If it doesn't, you should change it by hand.
- Now click OK to save these changes.

## A.4 Configuring Apple-Mail

Apple Mail is the standard email client that comes with an Apple's Mac OS X computer.

Step 1: Add account


Step 2: Incoming Mail Server

Step 3: Outgoing Mail Server


Step 4: Account Summary


Add Account
Account Summary
Account Description: Example
Full Name: Bob Example
Email Address: bob@example.com
User Name: bob@example.com
Incoming Mail Server: example.vm.bytemark.co.uk
SSL: on
Outgoing Mail Server: example.vm.bytemark.co.uk
SSL: on
Take account online
Cancel
Go Back
Create

# Appendix B

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# Chapter 23

# Glossary

**BSD, Berkeley System Distribution**

A family of Unix versions developed by Bill Joy and others at the University of California at Berkeley, originally for the DEC VAX and PDP-11 computers, and subsequently ported to almost all modern general-purpose computers. BSD Unix incorporates paged virtual memory, TCP/IP networking enhancements and many other features [FOLDOC].

**DNS, Domain Name System**

This system is used to convert IP Addresses into hostnames. It is also used to determine where mail should be routed for a domain.

**FTP, File Transfer Protocol**

FTP used to be used to transfer large files over the internet. It is an archaic protocol.

**HTML, Hypertext Markup Language**

A system to mark up documents. It is the most common format used for documents on the world-wide web, and is the format that web browsers display.

**HTTP, Hypertext Transfer Protocol**

This protocol was originally used to transfer HTML documents between machines connected to the internet. It has become the standard protocol for transferring all types of documents over the world-wide web.

**IMAP, Internet Message Access Protocol**

The Internet Message Access Protocol (IMAP) is one of the two most prevalent Internet standard protocols for e-mail retrieval, the other being the Post Office Protocol (POP). Virtually all modern e-mail clients and mail servers support both protocols as a means of transferring e-mail messages from a server.

**IP, Internet Protocol**

The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.

+ IPv4 is the version in widespread use and IPv6 was just beginning to come into use in 2000 but is still not widespread by 2008 [FOLDOC].

**IP Address**

Unless IPv6 is specified, at present, IPv4 is assummed. An IPv4 address is a 4 byte number generally represented as a dotted quad e.g. 89.16.174.65.

**ISP, Internet Service Provider**

A company which provides other companies or individuals with access to, or presence on, the Internet. Most ISPs are also Internet Access Providers; extra services include help with design, creation and administration of World-Wide Web sites, training and administration of intranets and domain name registration [FOLDOC].

**MTA, Mail Transfer Agent**

A mail transfer agent is a computer process or software agent that transfers electronic mail messages from one computer to another, in single hop application-level transactions. A MTA implements both the client (sending) and server (receiving) portions of the Simple Mail Transfer Protocol.

**NTP, Network Time Protocol**

A protocol built on top of TCP/IP that assures accurate local timekeeping with reference to radio, atomic or other clocks located on the Internet. This protocol is capable of synchronizing distributed clocks within milliseconds over long time periods.[FOLDOC].

**PHP**

PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML. [PHPNET]

**POP3, Post Office Protocol 3**

Version 3 of the Post Office Protocol. POP3 is defined in RFC 1081, written in November 1988 by Marshall Rose, which is based on RFC 918 (since revised as RFC 937). POP3 allows a client computer to retrieve electronic mail from a POP3 server via a (temporary) TCP/IP or other[?] connection. It does not provide for sending mail, which is assumed to be done via SMTP or some other method [FOLDOC].

**Secure File Transfer Protocol, SFTP**

SFTP is a file transfer protocol which involves using an SSH server to manage the file uploads. It is secure in the sense that file contents are encrypted during transfer, and that plain-text passwords are never sent over the internet. SFTP is the logical successor to FTP, which is less secure, and more complex to firewall.

**SMTP, Simple Mail Transfer Protocol**

A protocol defined in STD 10, RFC 821, used to transfer electronic mail between computers, usually over Ethernet. It is a server to server protocol, so other protocols are used to access the messages [FOLDOC].

**SSH, Secure Shell**

A Unix shell program for logging into, and executing commands on, a remote computer. ssh is intended to replace rlogin and rsh, and provide secure encrypted communications between two untrusted hosts over an insecure network. X11 connections and arbitrary TCP/IP ports can also be forwarded over the secure channel [FOLDOC].

**SSL, Secure Sockets Layer**

A protocol designed by Netscape Communications Corporation to provide secure communications over the Internet using asymmetric key encryption. SSL is layered beneath application protocols such as HTTP, SMTP, Telnet, FTP, Gopher and NNTP and is layered above the connection protocol TCP/IP. It is used by the HTTPS access method [FOLDOC].

**TCP, Transmission Control Protocol**

The most common transport layer protocol used on Ethernet and the Internet. It was developed by DARPA.

TCP is the connection-oriented protocol built on top of Internet Protocol (IP) and is nearly always seen in the combination TCP/IP (TCP over IP). It adds reliable communication and flow-control and provides full-duplex, process-to-process connections.

TCP is defined in STD 7 and RFC 793 [FOLDOC].

**TLS, Transport Layer Security**

A protocol designed to allow client/server applications to communicate over the Internet without eavesdropping, tampering, or message forgery.

TLS is defined in RFC 2246 [FOLDOC].

**UDP, User Datagram Protocol**

Internet standard network layer, transport layer and session layer protocols which provide simple but unreliable datagram services. UDP is defined in STD 6, RFC 768. It adds a checksum and additional process-to-process addressing information [to what?]. UDP is a connectionless protocol which, like TCP, is layered on top of IP.

UDP neither guarantees delivery nor does it require a connection. As a result it is lightweight and efficient, but all error processing and retransmission must be taken care of by the application program [FOLDOC].

**URL, Uniform Resource Locator**

A Uniform Resource Locator (URL) is a Uniform Resource Identifier (URI) that specifies where an identified resource is available and the mechanism for retrieving it. In popular usage and in many technical documents and verbal discussions it is often incorrectly used as a synonym for URI. The best-known example of a URL is the "address" of a web page e.g. http://www.example.com [WIKIPEDIA_URL].

# Chapter 24

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# Chapter 25

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