User manual

Simple Failover

Version 1.21

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1 Welcome to Simple Failover

by JH Software

Simple Failover

website: http://www.simplefailover.com
support: support@simplefailover.com

Program & design   ***Jesper G. Høy & Ilánguak Olsen***

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or send e-mail to support@simplefailover.com

3 Introduction

Simple Failover is a new, simple, efficient, and in-expensive approach to ensuring that your web site is always on-line and ready for business.

24/7 continuous operation is critical when doing business on the Internet.
Every minute your web site is not available, you loose sales and your good reputation!

Unfortunately, web-servers are vulnerable to all kinds of disasters. Everything from simple power outages and disk drive failures to floods and earthquakes can quickly bring down your web site (and ruin you day).

Failover systems can be used to protect against such outages.

The definition of **failover** is when a user is automatically and transparently transferred from a failed system to a backup system, thereby ensuring uninterrupted operations.
For example, when a web-server fails, and web-site visitors are automatically served by another standby web-server.

Traditionally, failover functionality is performed on the network hardware level with specialized routers. Network data flow is switched between identical server computers (each configured with the same IP address).
One serious limitation to this approach is that these server computers must be in the same physical location (within cabling range of the router), potentially making them vulnerable to the same disasters.
Of course, the failover router itself also represents a potential single point of failure.

Simple Failover is a software-based solution that uses a new and different approach to achieve the same goal. Instead of working on the network hardware level, it operates on the higher DNS level.

All professional web sites today use domain names – such as http://www.simpledns.com.
DNS servers are used to point each domain name to the numeric network address (IP address) of the corresponding web-server.
Whenever you visit a web site, your computer must first consult with DNS to translate the domain name into an IP address, which is then used to communicate with the web-server.
Simple Failover works by continuously testing the web-servers and dynamically updating DNS, so that a web-server domain name directs visitors to the IP address of a functional web-server.
The web-server computers involved in this do not need to be in the same location, reducing vulnerability considerably.
Multiple DNS server and *Simple Failover* installations can easily be setup for the same domain name eliminating any single point of failure.
In fact, two simple computers in different locations, each running web-server software, DNS server software, and *Simple Failover* would practically eliminate the risk of any one disaster bringing down the web site.
It is also entirely feasible to use a generic low-cost web-service as the backup, finally making failover protection available even to those with limited IT budgets.

Simple Failover also provides basic server monitoring and status notification. This is similar to other "server monitoring" software solutions, with one significant difference:
With monitoring-only software, you might get a message at 3AM reading:
    "Web server 3 is down - do something now!"
With *Simple Failover* the message would read:
    "Web server 3 is down - but relax - I have temporarily re-routed traffic to server 7".

4   What's New

Version 1.21

New "Server Set Copy" function
This new function makes it quick and easy to setup many similar Server Sets.

New Server Set "Notes" field
Convenient for recording comments, history, account information, etc.

Miscellaneous
This update also includes a few bug fixes and several minor adjustments to the GUI interface.

Version 1.20

HTTP API interface
It is now possible to create/update server sets, retrieve status information, and control most other functions in Simple Failover via HTTP.
This opens the possibility of creating your own web-interface to Simple Failover, and/or integrating it with your existing hosting solutions.
All data is exchanged in XML format, and the commands and data formats are described in detail in the updated documentation.

New server monitoring method - Generic TCP connect
This type of monitoring can be used to check any type of service that uses the TCP protocol (which includes most software communicating via the Internet protocol) by checking if the services accepts TCP connections.
As opposed to the existing monitoring methods (HTTP, FTP, etc.), this method does not check for any specific response or greeting from the service.

New server monitoring method - PING
PING is different than the other monitoring methods in that it does not check the status of a specific service, but rather checks the general availability of the server computer.
The advantage of this monitoring method is that it is very light weight (no TCP connection overhead), it uses very little bandwidth (PING packets are very small), and it can be used for any type of Internet service.
However, it can only detect if a server computer is running or not. Unlike the other monitoring methods, PING cannot determine if a specific service on that computer is running and functioning correctly.
Please note that some firewalls are configured to filter out PING packets (ICMP protocol), in which case this monitoring method cannot be used (check this by pinging your server IP from a command prompt first).

Default DNS servers
Instead of having to enter all the DNS server settings for each individual server set, you can now simply select "Use default DNS servers".
This is a real time saver if you have many server sets using the same DNS servers.
You can of course still specify unique DNS servers for some or all server sets.

Update DNS for alias domain names
Sometimes a single Internet service can be accessed via several different domain names. The service provides the exact same contents/functionality no matter which domain name is used.
A typical example of this is a web-site which can be accessed both with and without the 'www' domain name prefix (which are technically two different domain names).
There is usually no reason for testing such a service with more than one of the domain names, yet in case of a failure, you still want to update DNS for all the domain names so that they all point to the functional server IP address.
This new option lets you specify additional domain names to be updated for a server set.
Please note: we do not recommend using DNS CNAME-records for alias domain names because DNS responses containing such records are cached differently by Internet Explorer (typically for a fixed period of 30 minutes).

Right-click on server to ping
When a server appears to be down, for many, the first trouble shooting step is to open a command prompt and ping the server IP address.
You can now ping an individual server listed in Simple Failover simply by right-clicking on it, and selecting "Ping" from a popup menu.
The resulting ping dialog gives you instant ping statistics, and continues pinging the server IP address until you close the dialog.

Monitor service protocols on non-standard port numbers
Simple Failover can now poll servers using HTTP, FTP, SMTP, POP3, NNTP, and IMAP service protocols on non-standard port numbers.
For example a web server on port 8080 (or any other port number) instead of the standard port 80.

Configurable server response status codes
When Simple Failover polls an HTTP, FTP, SMTP, or NNTP server, it looks for a 3 digit status code in the response (for example "200" for HTTP servers).
These status codes are now configurable, so that you can specify other or additional status codes to accept.

Option to skip polling backup servers when primary server is up
This behavior, which was standard in version 1.00, is now an option.
In version 1.20 the default is to always poll all servers in a server set.

Miscellaneous
- New replacement tag DOM for domain name in DNS update URL when updating DNS via HTTP.
- The "sfo.config.xml" file is now automatically saved every 5 minutes (if any changes have been made).
- The Problem Knowledge Base function now sends additional data to better narrow down a solution (code exit point, and program version).

Several of the new features in 1.20 have been included in unofficial interim releases made available to individual users, which explains the version number jump from 1.00 to 1.20

Version 1.00

The first official release of Simple Failover
Thanks to everybody who encouraged us to develop this new product and helped us with the beta testing.

5   Sample scenarios

The following examples will give you a good idea of how Simple Failover can help you.

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5.1   Basic web-server setup

In a typical single web-server setup, there is always the risk the that server or the connection to it may fail:
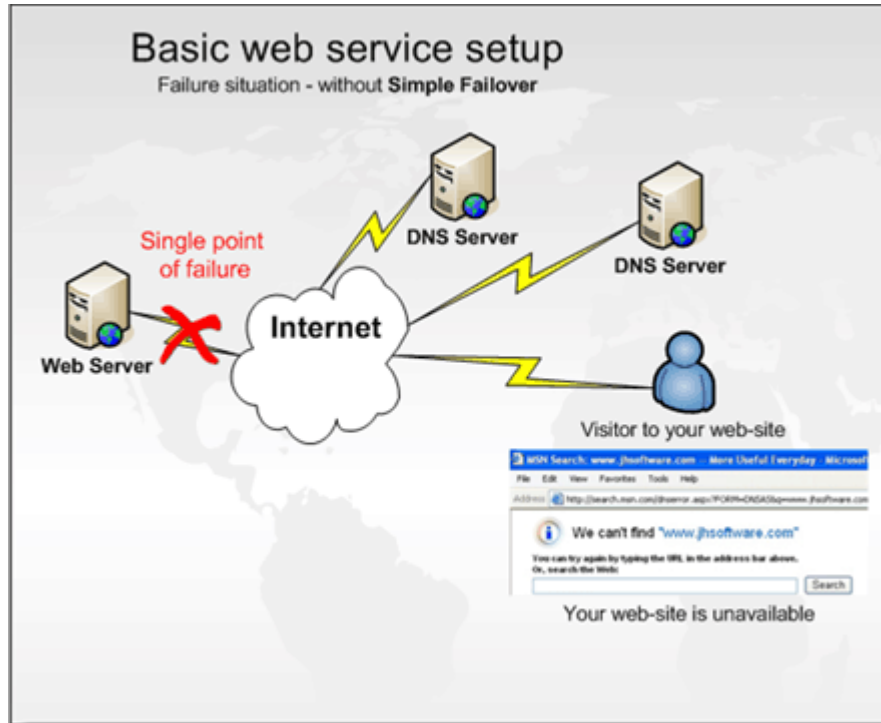
Running Simple Failover, and DNS server, and a backup web-server for example on a residential ISDN or DSL line, it is possible to redirect web site visitors to a temporary web-page (on the residential backup web-server) in case of a failure of the main web-server:
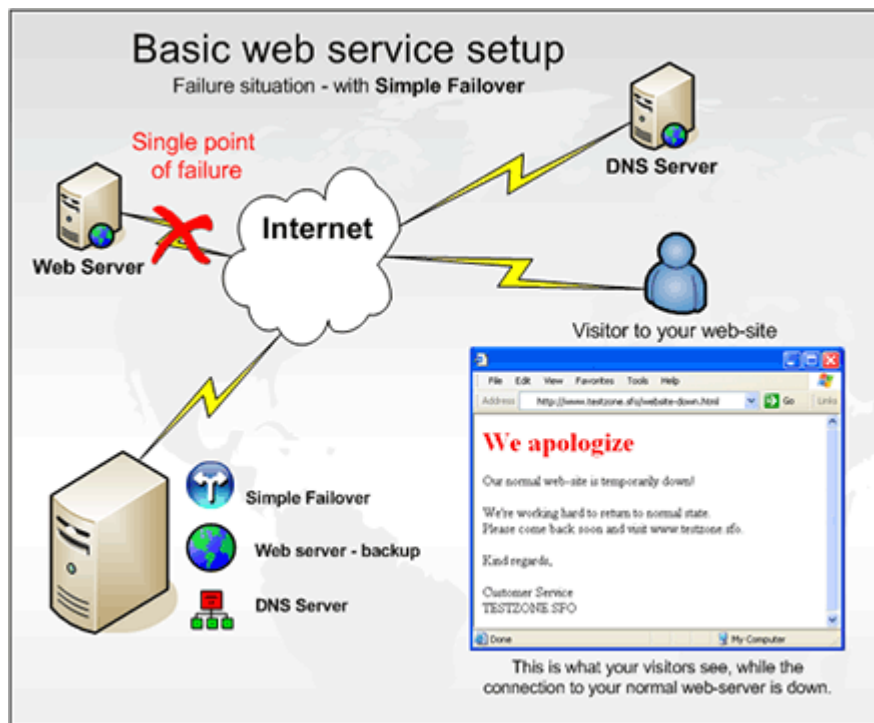
Unfortunately many residential Internet connection providers do not allow (and even block) running web-servers on such a connection.

In this case, another option would be to run Simple Failover on the residential connection to redirect traffic to a temporary web-page on an in-expensive web-host:
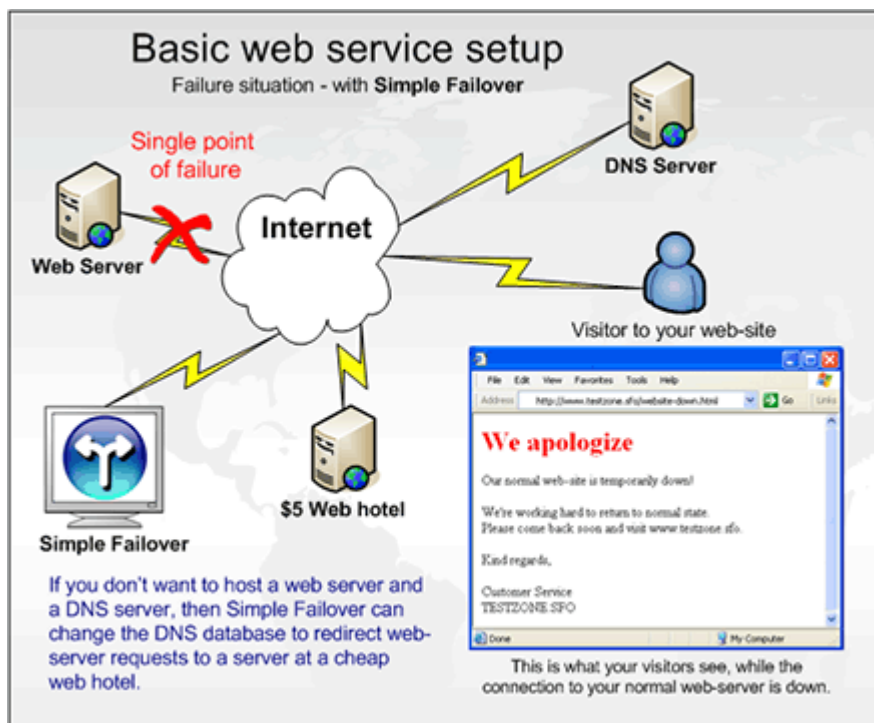
5.2   Redundant setup

A very failsafe and simple setup would be to have two servers in different geographical locations, each running web-server software, DNS-server software, and Simple Failover.
Simple Failover on each server would be configured to monitor both web-servers, and to update both DNS-servers.

If one of the servers fails, Simple Failover on the other will update DNS to point the domain name to itself only:
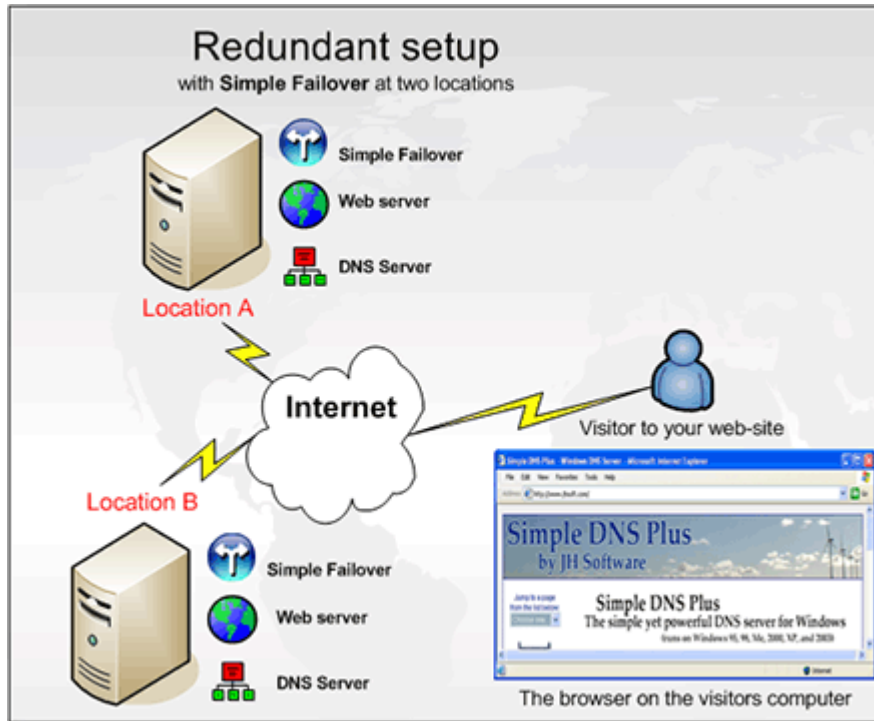
5.3   DNS Round Robin load balancing

Busy web-sites often use multiple web-servers in order to handle traffic load.
Traffic can be distributed (load balanced) between such web-servers using DNS round robin.
The DNS server simply rotates the DNS records for each incoming DNS request, resulting in each
visitor being served by a different web-server.
However, DNS round robin in itself does not provide any failover functionality.
If one of the web-servers fail, some visitors will still be directed to the failed server:
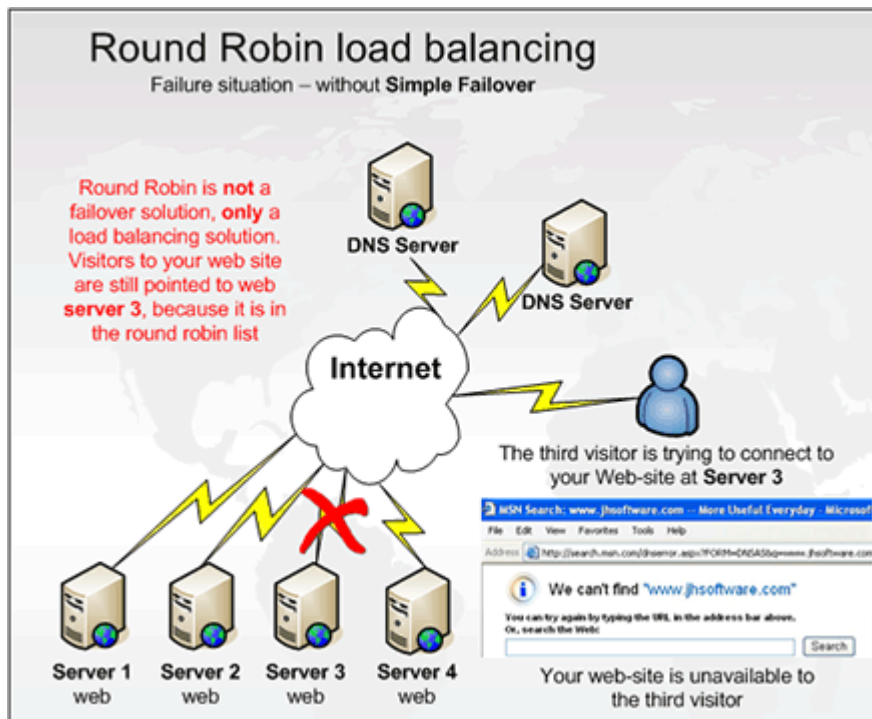
Simple Failover can correct this situation by removing the failed web-server from the DNS round
robin set:
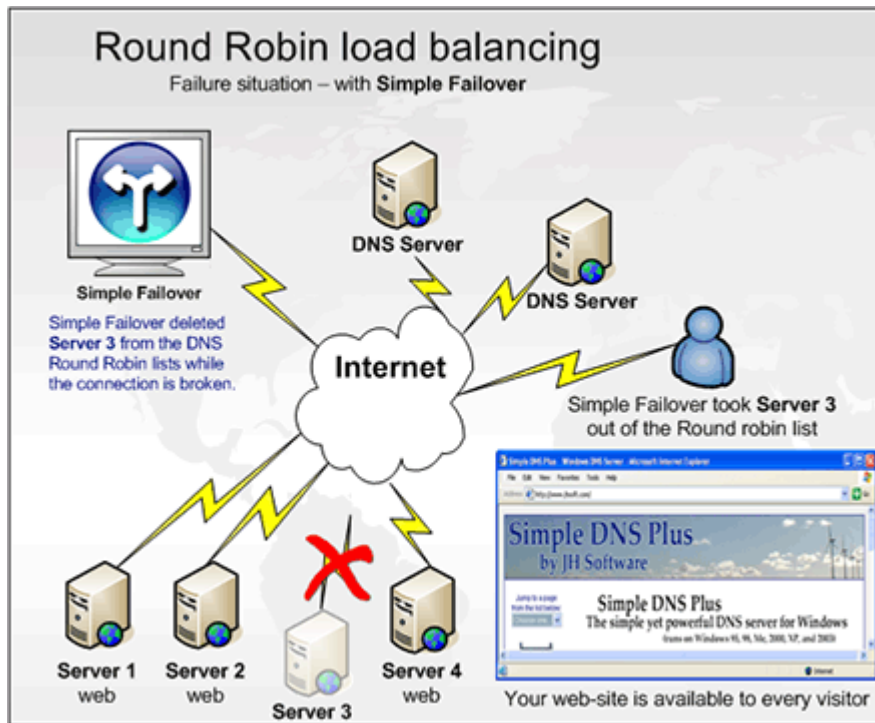
5.4 Internal failover router

Some larger web-sites use advanced hardware routers internally to distribute load between web-servers, and to provide failover functionality (the router detects failed web-servers, and does not route traffic to them).

The only problem is that this router is in itself a vulnerability.
If the router or the connection to it fails - the web-site is effectively down, no matter how many servers are on the inside of the router.
And since the router and the servers are all in one geographical location, everything is still vulnerable to the same disasters (floods, fires etc.):
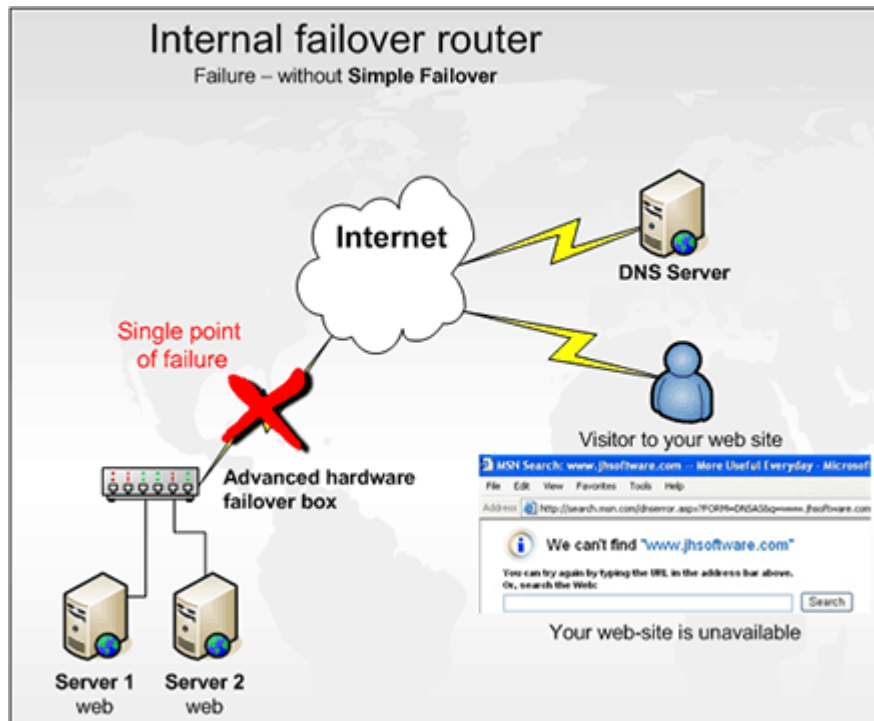

Simple Failover can correct this by re-routing traffic to an external web-server if the primary location should be down:
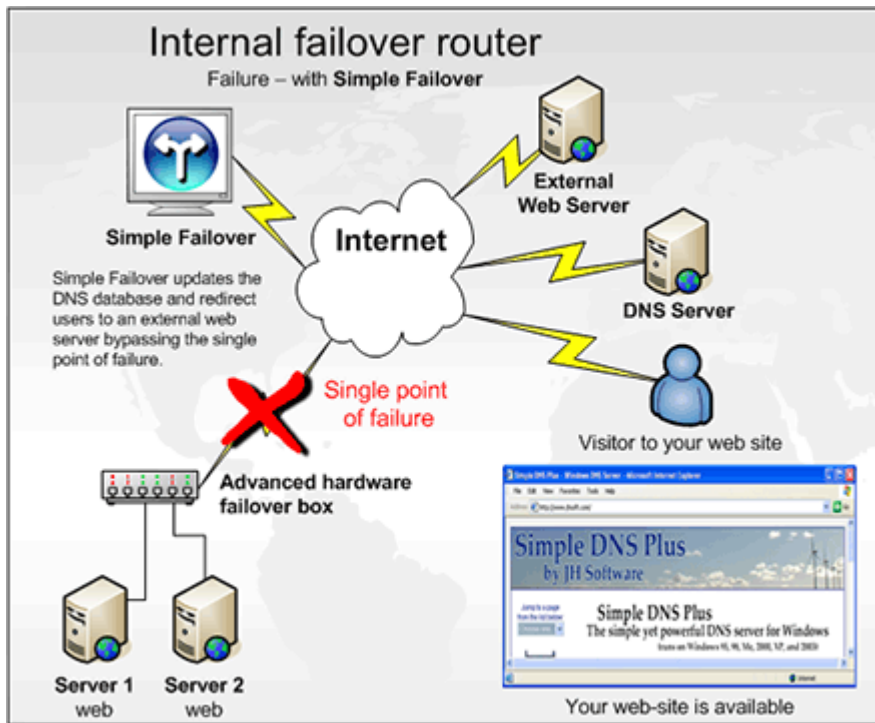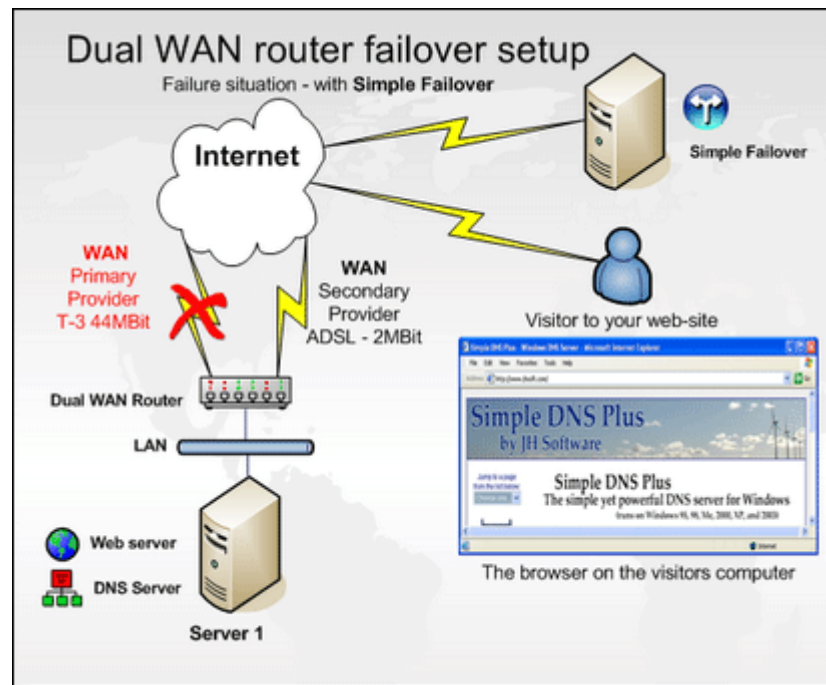
5.5 Dual WAN router

In this scenario, you have two separate Internet connections and use a dual WAN router (in either load balancing or failover mode) to route inbound traffic from either connection to the same web server on the local network.
This setup does ensure better outbound connectivity, however if one of the connections fail, and your DNS records are pointing to the IP address of that connection, inbound connections to your web site will still fail:
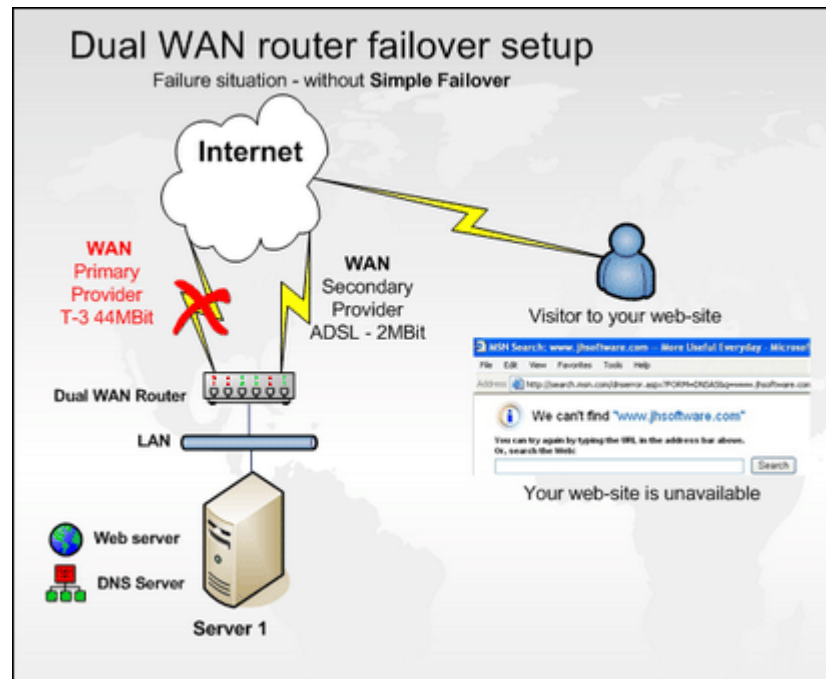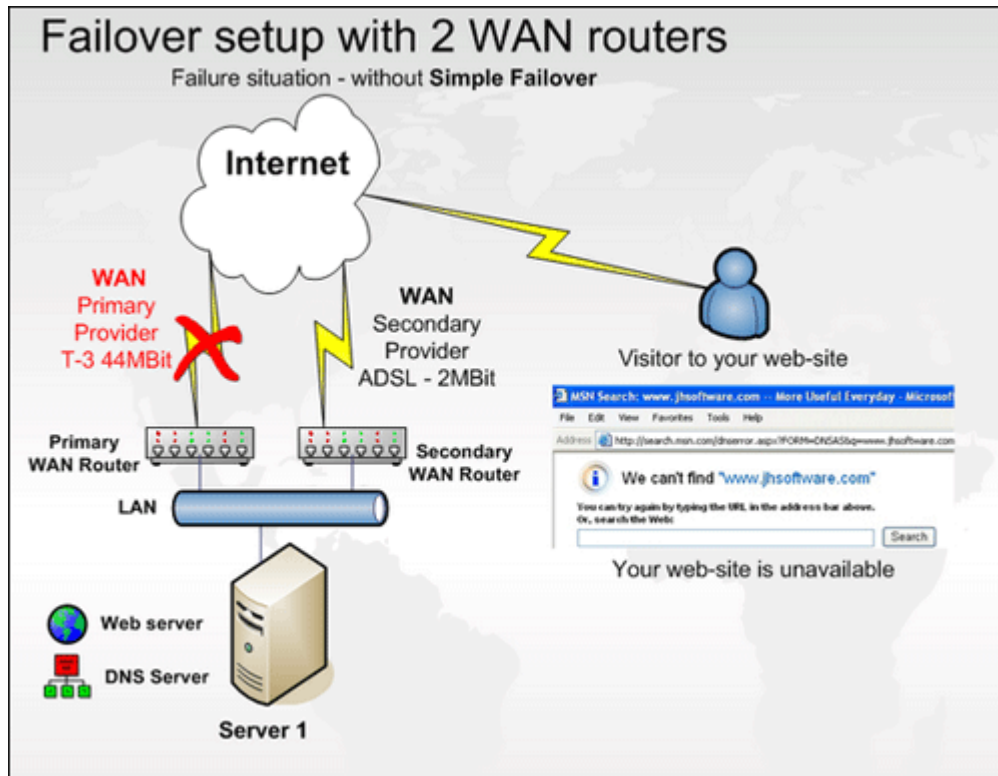

By placing Simple Failover somewhere else on the Internet, and have it monitor the server connections, it can correct the DNS records when needed, and visitors will still reach your web-site:

By configuring Simple Failover to update DNS via both server connections, the DNS server can be on the same server as the web-server.

5.6   Two WAN routers

In this scenario, you have two separate Internet connections and use two WAN routers to route inbound traffic from either connection to the same web server on the local network. However if one of the connections fail, and your DNS records are pointing to the IP address of that connection, inbound connections to your web site will still fail:

By placing Simple Failover somewhere else on the Internet, and have it monitor the server connections, it can correct the DNS records when needed, and visitors will still reach your web-site:
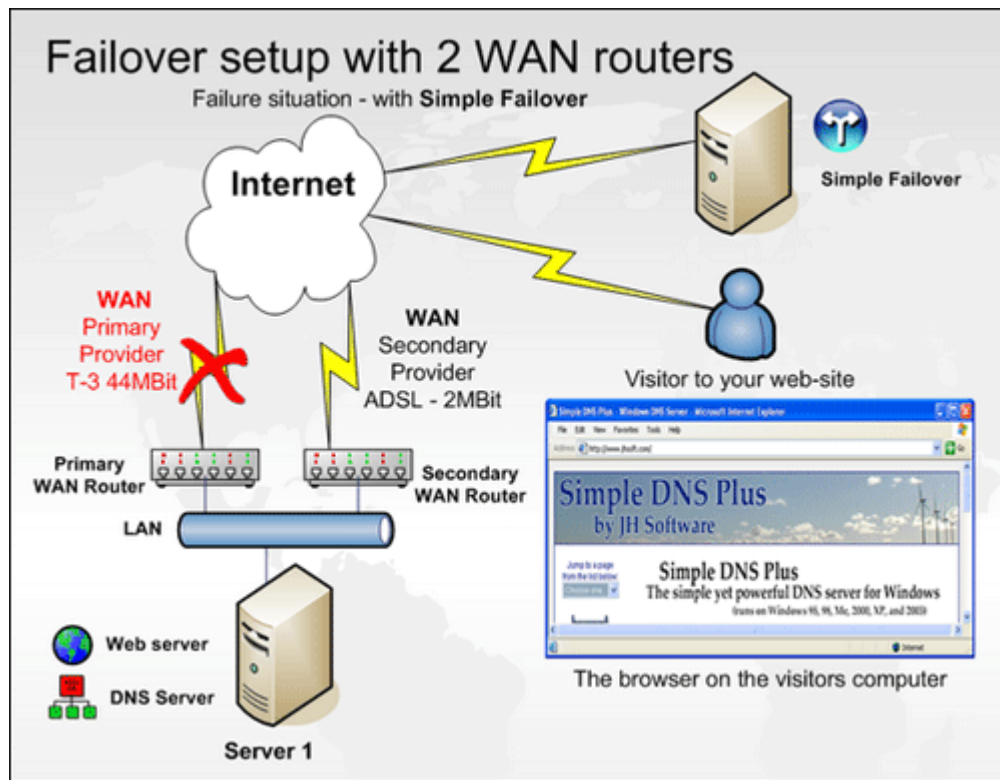
Failover setup with 2 WAN routers

By configuring Simple Failover to update DNS via both server connections, the DNS server can be on the same server as the web-server.

6   Download, installation & activation

6.1   Download Simple Failover

Tryout Simple Failover for free - download a full-featured 14 day evaluation version.
This same software becomes the full version when licensed.

Download and run the *sfo-setup.exe* (10 MB) file to install Simple Failover version 1.21:

Download Simple Failover from http://www.simplefailover.com/download.asp.

6.2 Minimum system requirements

The following hardware and software requirements should be met to ensure a smooth operation of Simple Failover:

- CPU: Intel Pentium 200MHz or 100% compatible
- RAM: 20 MB + operating system requirements
- Hardisk: 20 MB free space available
- Any version of Windows 95, 98, Me, NT4, 2000, XP, or 2003
- Internet Explorer version 5 or later
- An Internet connection

On Windows NT4, Simple Failover requires NT Service Pack 6a or later.
You can download the latest NT Service Pack from:
http://www.microsoft.com/ntserver/nts/downloads/

You can download the latest Internet Explorer from:
http://www.microsoft.com/ie

Note: Before you can use the e-mail notification functions in Simple Failover, you must have a running SMTP service (an e-mail server).

6.3 Install the software

Before you install Simple Failover, there are a number of preparations to take to ensure optimal operation of the program.

For a new installation, the following should be done:
- Download the software from http://www.simplefailover.com/download.asp.
- Meet the system requirements 24
- Collect information about your DNS server, the web services you want to monitor and the information about the system you want Simple Failover to redirect DNS requests to.
- Set up security on you DNS systems if applicable

Use the following instructions to install Simple Failover to your computer.

❶ Run the installation program by double-clicking on the *sfo-setup.exe* file from the directory where you saved the downloaded file.
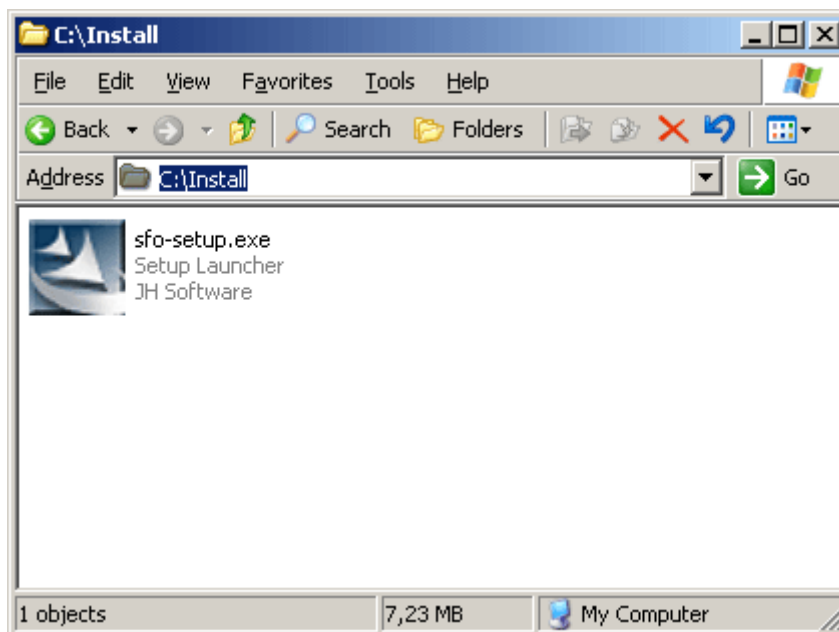

Figure 1: Select the sfo-setup.exe file.

❷ Click *Next* in the Simple Failover Splash Screen.

❸ Continue after you have read the Welcome Screen by clicking the *Next >* button. Otherwise click the *Cancel* button.

❹ If you want to change the default path which is set to C:\Program Files\Simple Failover, then click the *Change…* button and browse to a path of your own choice. Otherwise you should click the *Next >* button to continue.

❺ Read the License agreement and select the radio button *I accept the terms in the license agreement* and click the *Next >* button.

The installation program continues with the setup.

❻ Click the *Finish* button to end the installation process. Simple Failover is now installed.

The installation folder now contains all the files related to Simple Failover that is needed to run for the first time.
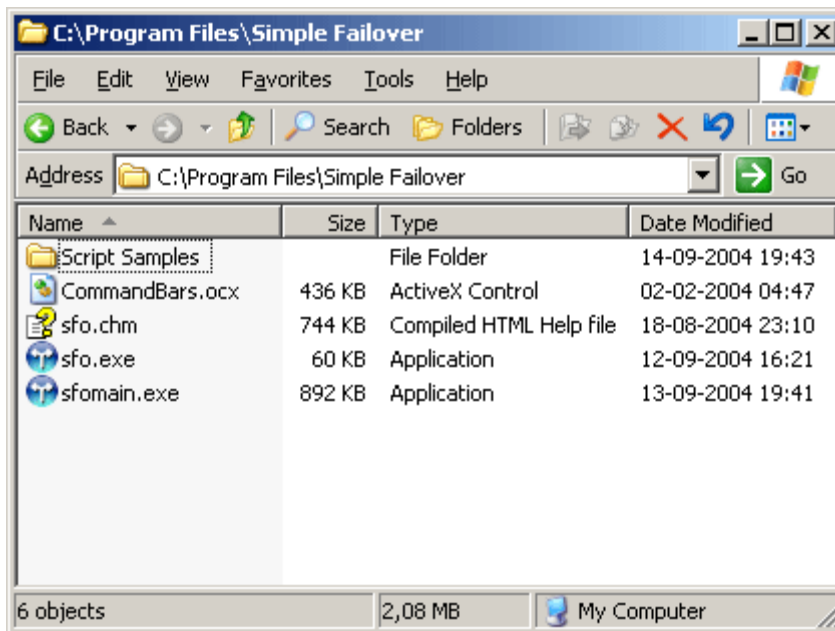

Figure 2: The installation folder before any Server Set is configured and before activation of Simple Failover.

7 Once the installation is complete, further configuration is required. Start Simple Failover by double-clicking the **SFO.EXE** file from the directory where you installed Simple Failover, e.g. **C:\Program Files\Simple Failover**.

Please use the following instructions to further set up and configure Simple Failover:

* Activate the software[28] at Simple Failover's web site at http://activate.simplefailover.com.
* Configure Simple Failover settings[88].
* Configure Server Sets[95] you want to poll.
* Provide e-mail addresses where notifications[99] should be send to.

8 After the configurations of Simple Failover performed in the previous step, the installation folder now contains to extra files:
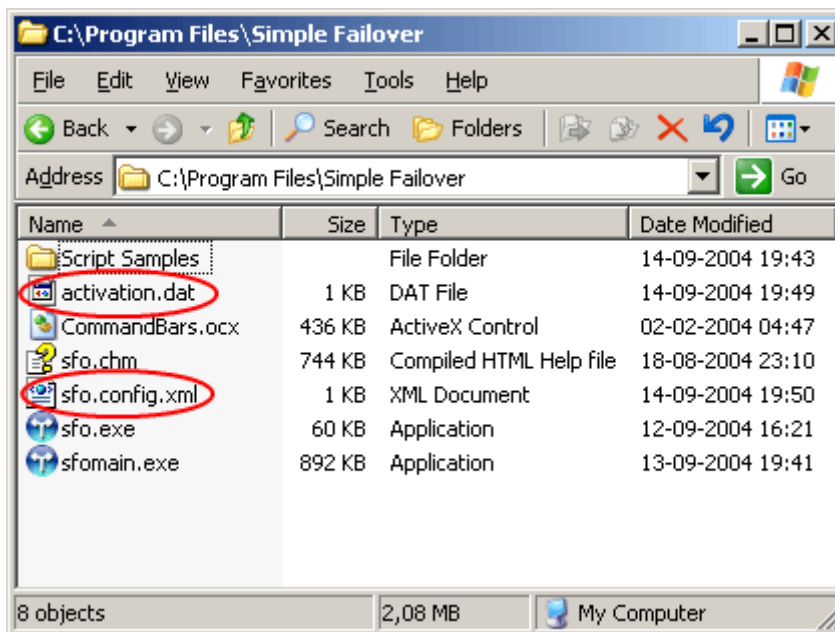
Figure 3: The two new files after the activation process and after you've configured Simple Failover.

6.4   Activate Simple Failover

Simple Failover is fully functional for a 14 day evaluation period. From the 15th day and forward Simple Failover runs in pause mode and if you want to continue using the unique features of Simple Failover beyond the evaluation period, then you will have to purchase a license and activate the software to re-enable the full capabilities.

JH Software requires that you activate its software to verify that you have a valid license for using it.

During activation, only the *License Key* (provided when license purchased) and a *System Key* (a non-unique hardware identification) are sent to JH Software.

The *License Key* identifies the product, the license level and type purchased, as well as the license serial number.

The *System Key* represents the configuration of your PC at the time of activation. The System Key does not include any information about other software or data that may reside on your PC, or any information about the specific make or model of your PC. The System Key identifies only the PC and is used solely for the purpose of activation.

However, JH Software can and may identify the license owner based on the License Key. Thus, activation is not anonymous.

The software can detect and accept changes to your PC configuration. Minor upgrades will not require re-activation. If you completely overhaul your PC, you may be required to activate the software again.

The activation process will finally conclude into an activation.dat fil.

This *activation.dat* file is checked each time the software is subsequently started to make sure the activation is valid and that the software is still running on the same computer.
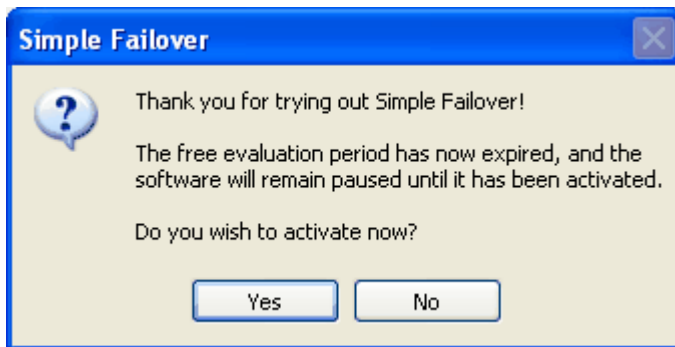
Activation Process

If you have used the free trial-version of the Simple Failover, you will get this dialog box after 14 days from the day you installed the software:
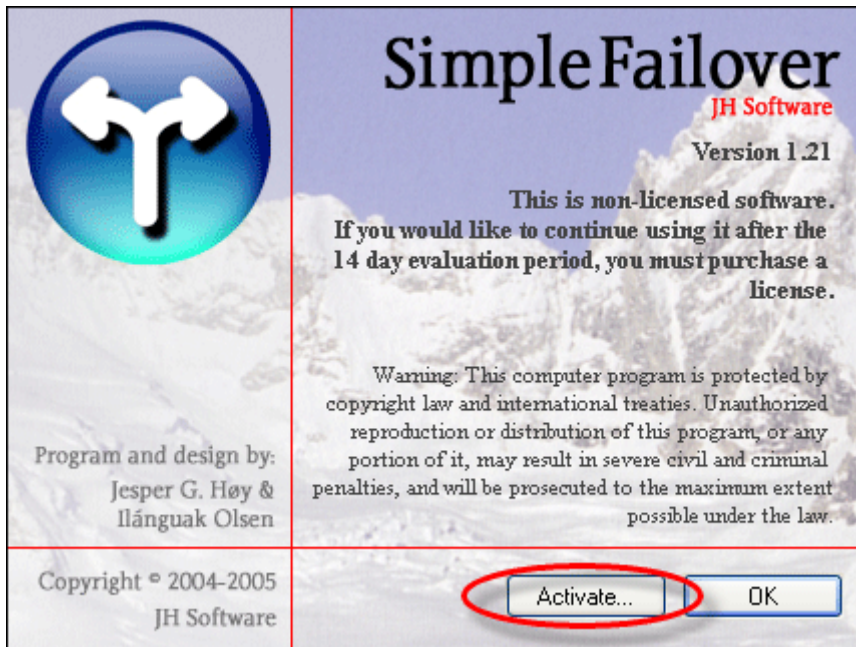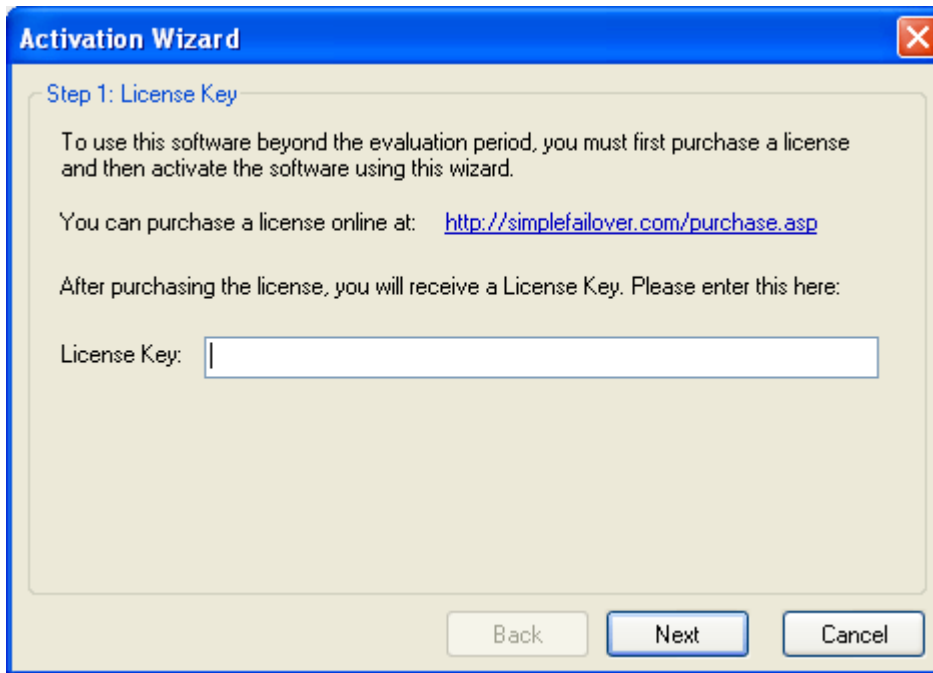
All of the Server Sets you've created and tested during the free evaluation period are now in a paused state and can only return to the monitoring/update state after you've activated Simple Failover.
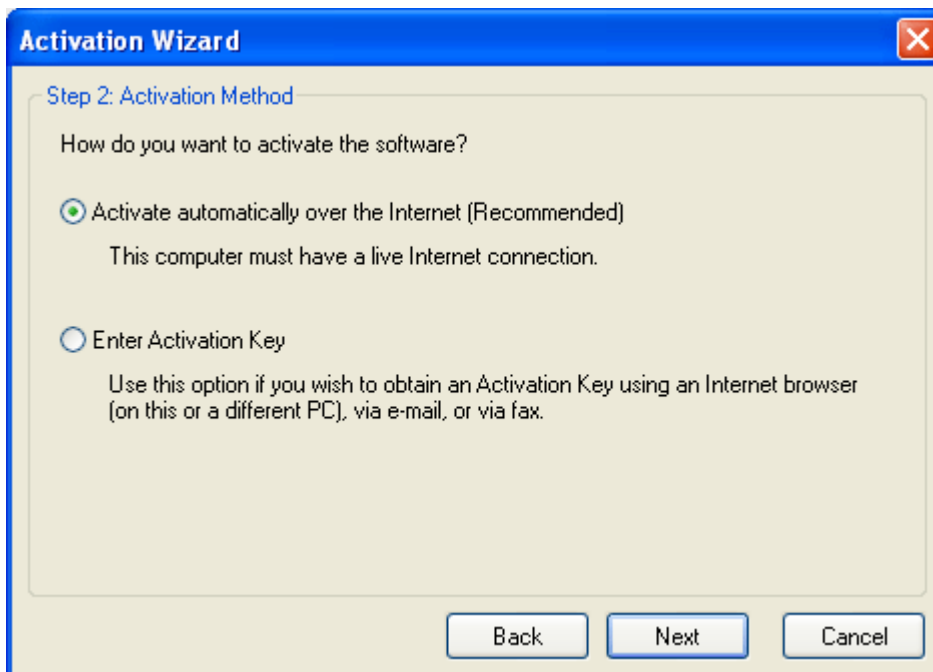
❶ To activate Simple Failover you must click the *Yes* button or either select the menu item: Help, Activate Software... [71] or Help, About Simple Failover... [71]

❷ In the first step of the activation process you need to enter the License Key which you have received when you purchased the program. You can purchase a license online at http://simplefailover.com/purchase.asp.

Activation Wizard

Step 1: License Key

To use this software beyond the evaluation period, you must first purchase a license and then activate the software using this wizard.

You can purchase a license online at: http://simplefailover.com/purchase.asp

After purchasing the license, you will receive a License Key. Please enter this here:

License Key: [   ]

[Back]   [Next]   [Cancel]

❸ The License Key can be entered directly into the *License Key* field. The string is not case sensitive and you do not have to include the *hyphen* characters in the string. Click the *Next* field to continue.

Activation Wizard

Step 2: Activation Method

How do you want to activate the software?

⦿ Activate automatically over the Internet (Recommended)

    This computer must have a live Internet connection.

◯ Enter Activation Key

    Use this option if you wish to obtain an Activation Key using an Internet browser (on this or a different PC), via e-mail, or via fax.

[Back]   [Next]   [Cancel]

❹ Step 2 of the activation process gives you two options.

a. One is automatic and uses an Internet connection to deliver the License Key to our Activation server at JH Software. Using this automatic method the keys are transfered between your computer and our activation server. This is simplest and quickest method. Select the radio button *Activate over the Internet (Recommended)* and click the *Next* button. The software is now activated.

The rest of this section only applies to the second activation method.

b. The other method is available if you want to activate Simple Failover via either e-mail, fax, from another PC, or if you don't have a live Internet connection. Select the radio button ***Enter Activation Key*** and click the ***Next*** button.
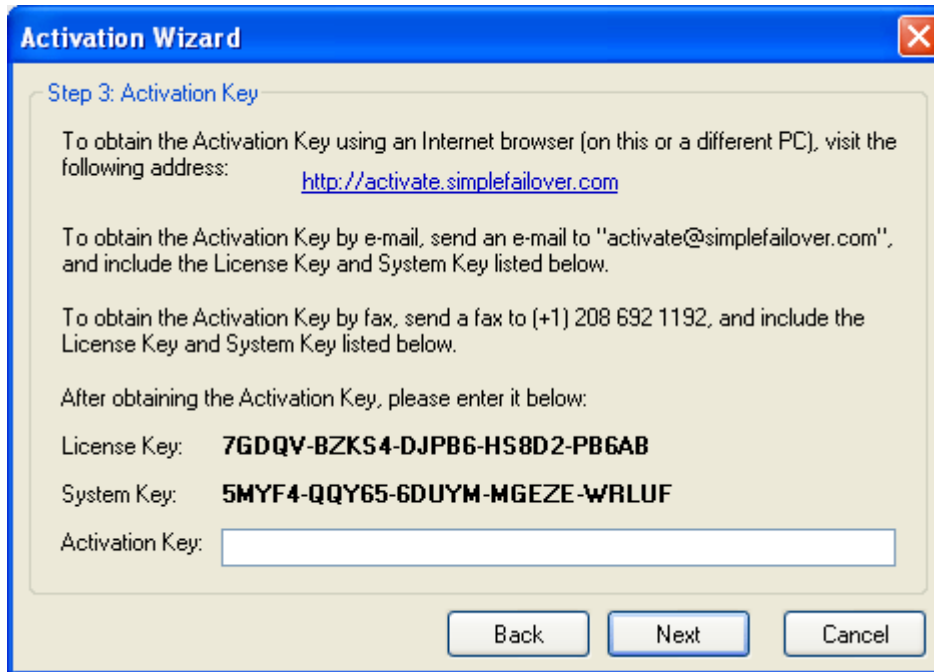

❺ Before you can enter the Activation Key you must send the correct information to the Activation server at JH Software. We provide several different options for your convinience to obtain an Activation Key. You can use the Internet Browser from any computer by visiting the following address: http://activate.simplefailover.com or you can send an e-mail to activate@simplefailover.com or you can send an fax to *(+1) 208 692 1192*. We handle e-mails and faxes as fast as we can. If you use the Internet method you'll receive the Key immediately.

Regardless of the way you prefer to obtain your Activation Key, you must provide the ***License Key*** and the ***System Key*** to our registration system. You can copy-paste the License and System keys from the Activation Wizard window to any electronic media of your choice.
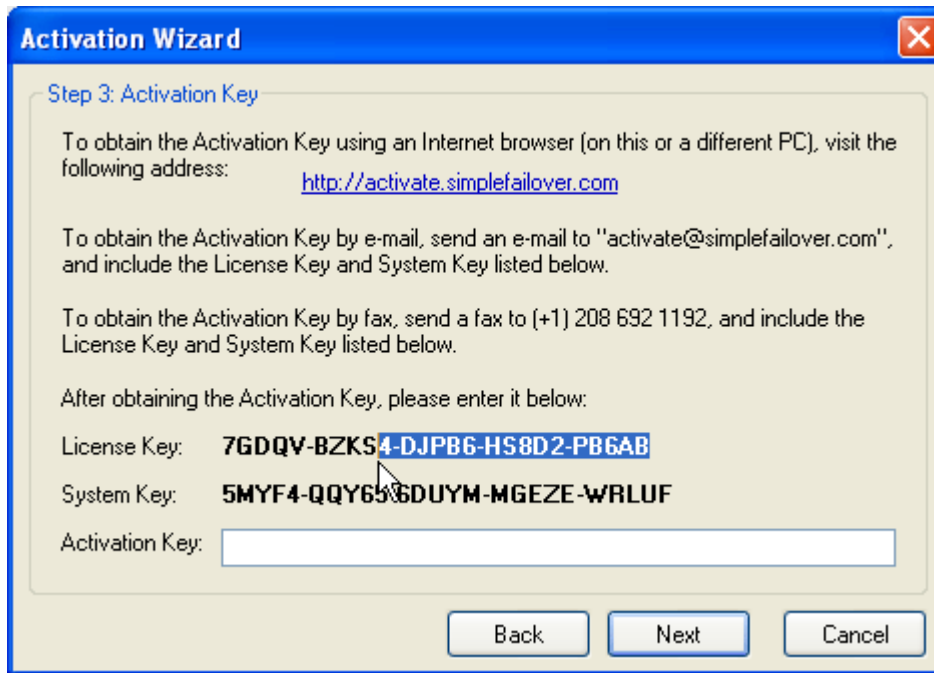
❻ The web page contains two fields where you have to type the correct information that you found in the activation dialog box.
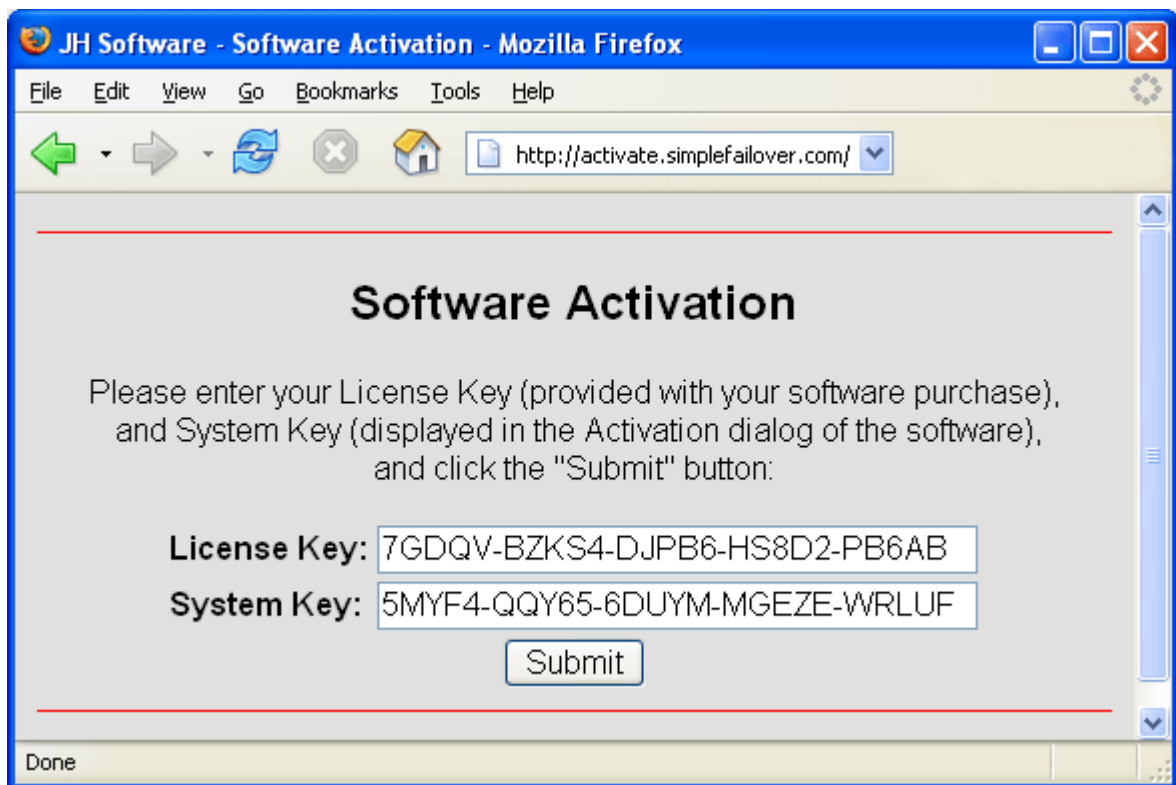

❼ When you press the *Submit* button on the web page a verification and registration process on our server begins and the result - if cleared, is a new web page with your *Activation Key*. This key is also sent to you by e-mail.
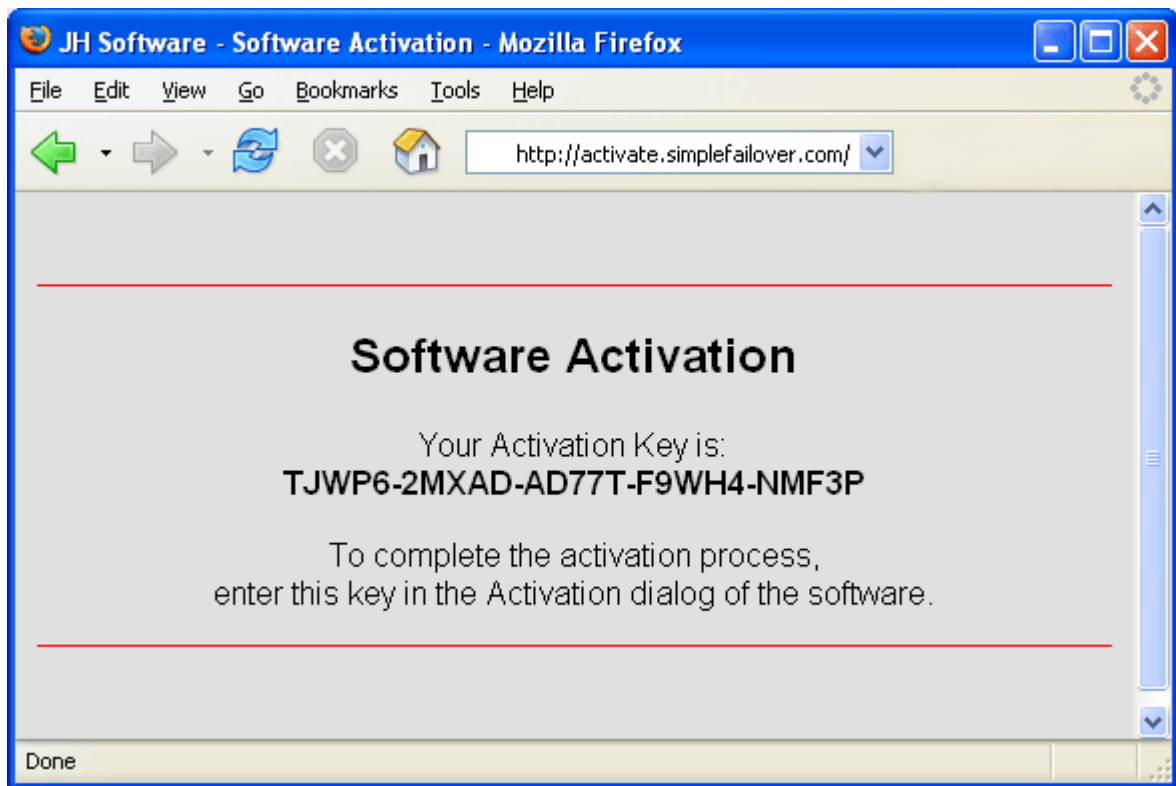
8 Once again, it is possible to copy-paste the information between the different program sessions. You can therefore copy the Activation Key on the web page to your clipboard and then paste it into the ***Activation Key*** field in Simple Failover.
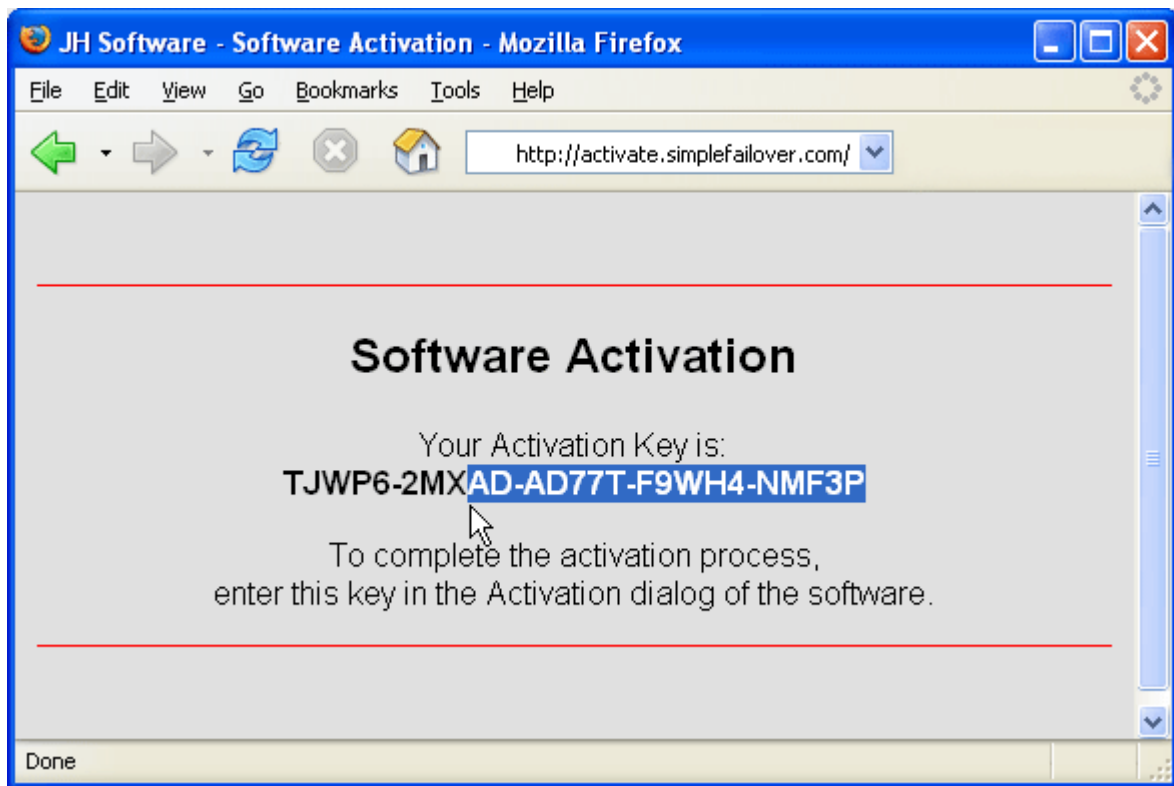
**❾** The last step in the Activation Process is to enter the Activation Key you have received. The Activation Key can be entered directly into the *Activation Key* field. Again this string is not case sensitive and you do not have to include the *hyphen* characters in the string.
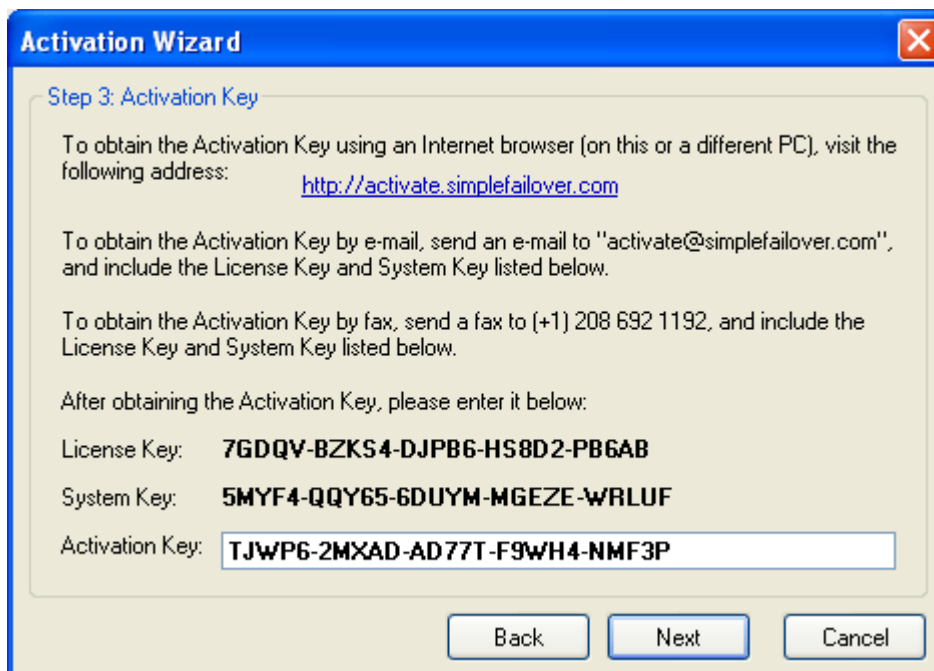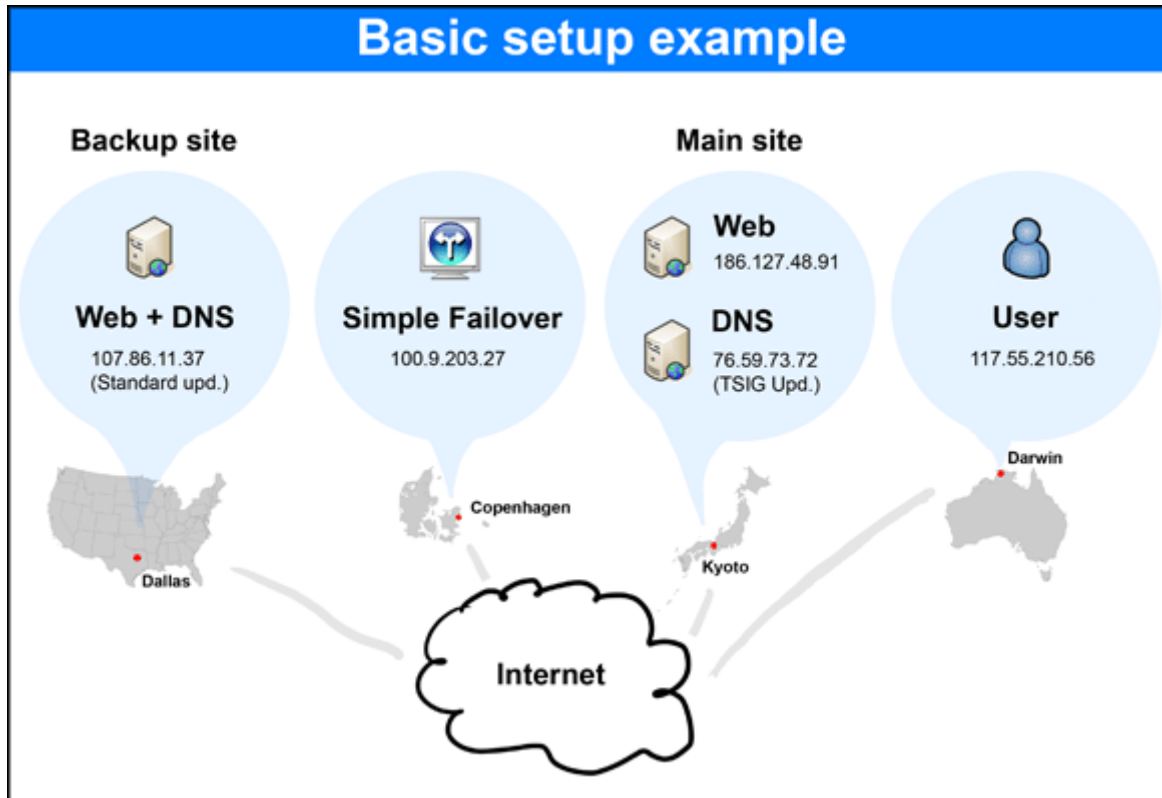

Providing you entered the correct information, when you press the *Next* button your version of Simple Failover will be activated and it is now fully-featured and fully-functional.

Congratulations!
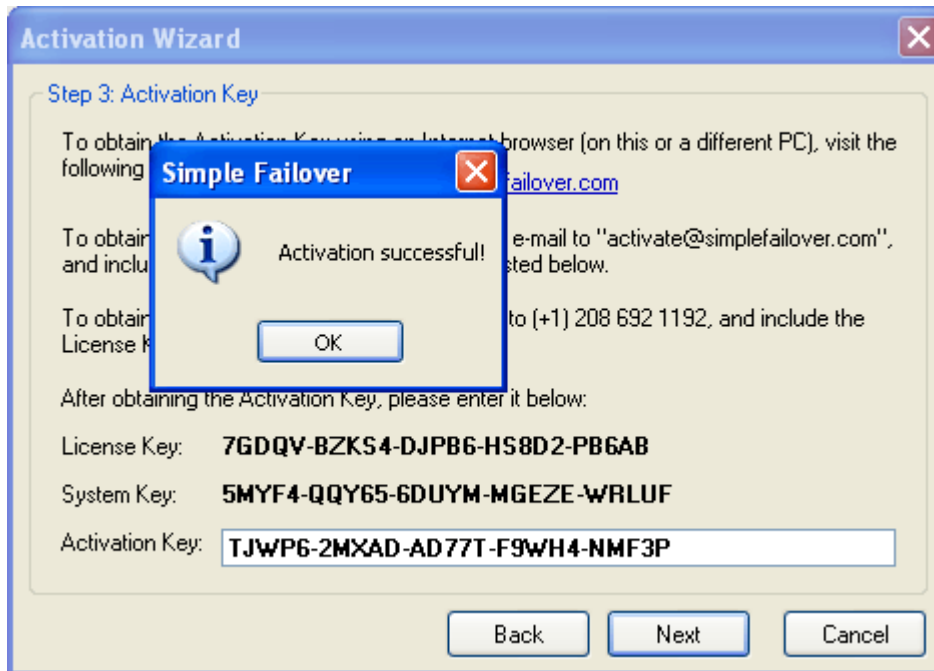
7 Basic setup example

To describe what happens behind the scenes when Simple Failover performs its failover actions, we can use this example.

❶ Your company has an Internet web-server placed at your main site in Kyoto, Japan. Also in Kyoto is a DNS server on a separate computer running Simple DNS Plus from JH Software. You can find more information on Simple DNS Plus at http://www.simpledns.com. This Simple DNS Plus is configured to allow updates via TSIG dynamic DNS updates⌐110⌐ only.

❷ You have invested in a backup site in Dallas, Texas in case of failures. The web-server and DNS server run on the same hardware box. The DNS server is Simple DNS Plus using standard dynamic updates⌐109⌐.

Both DNS servers have the DNS zone for the company domain name *simplefailover.com* configured as primary.

❸ Simple Failover is placed on a computer in Copenhagen, Denmark. Simple Failover is continually polling your web-servers testing the availability of your web-servers and perform the failover updating if a disaster strikes. Simple Failover runs on a Windows XP Professional PC.

❹ The user in Darwin, Australia is representing a random visitor to your web-site.

Obviously all the elements in the setup could be placed anywhere in the world.
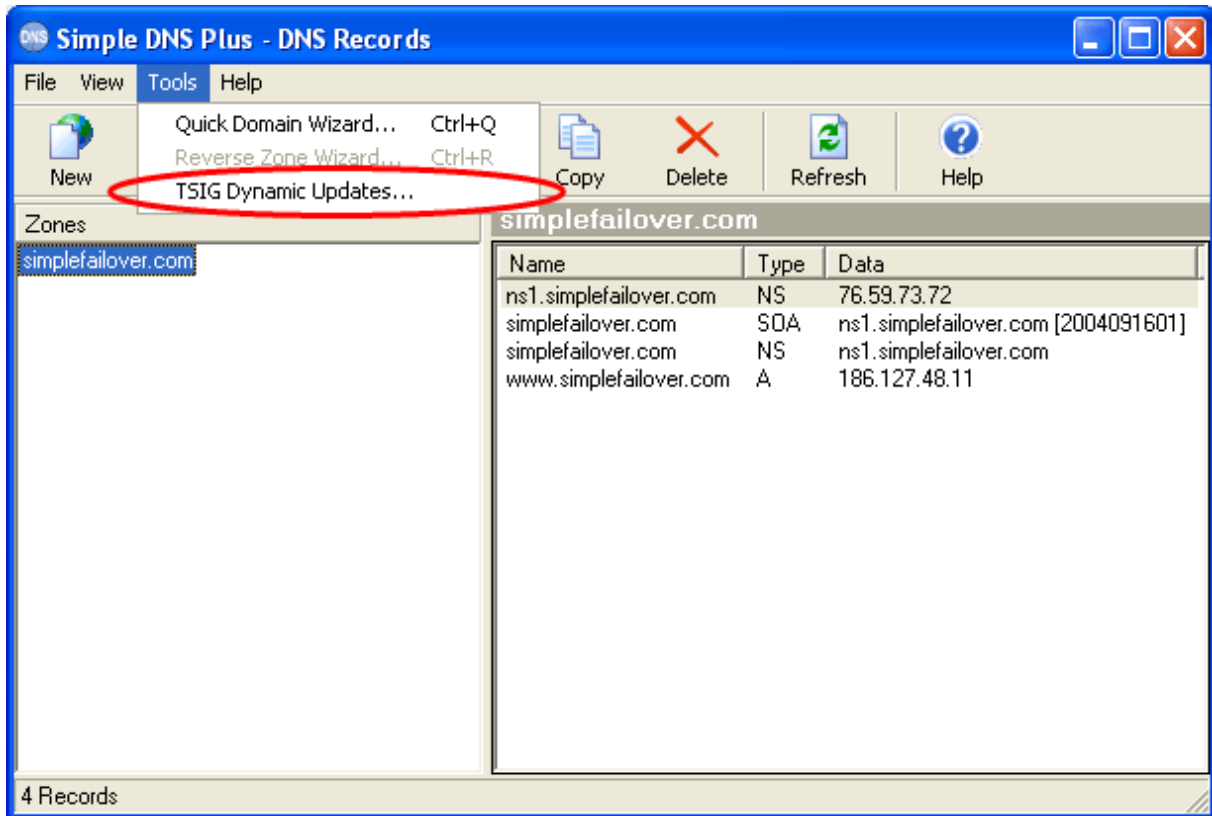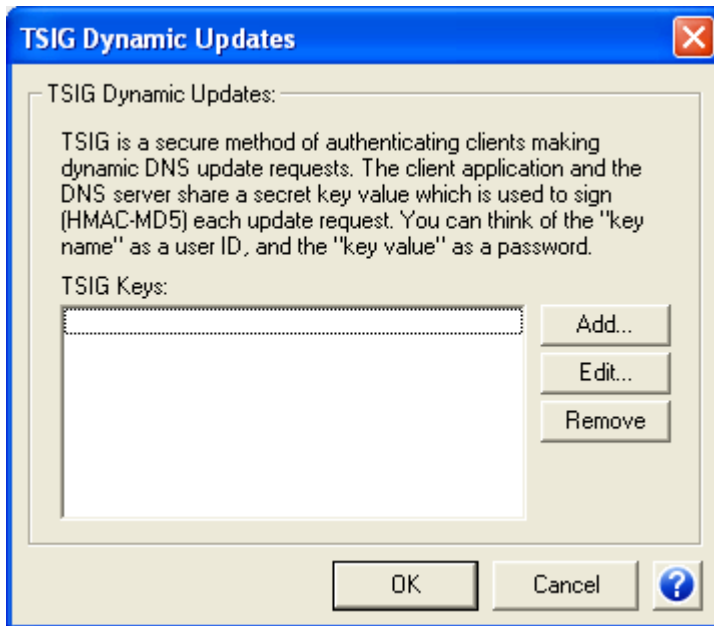
The following describes the setup in each location.

Kyoto
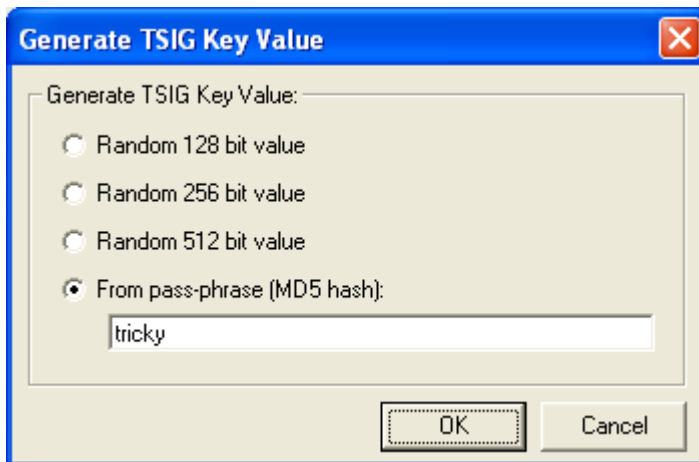**Configure DNS server to accept only TSIG Dynamic Updates.**

Open Simple DNS Plus, click the *Records* button on the toolbar, select *Tools*, *TSIG Dynamic Updates…*,

Click the *Add…* button.

Enter the *Key name* and use the *Generate* button to create a *Key value*. In this example the pass-phrase *tricky* is provided. Click the *OK* button to generate and transfer the value to the *Key value* field.

Click the *Add…* button and enter the company domain name.
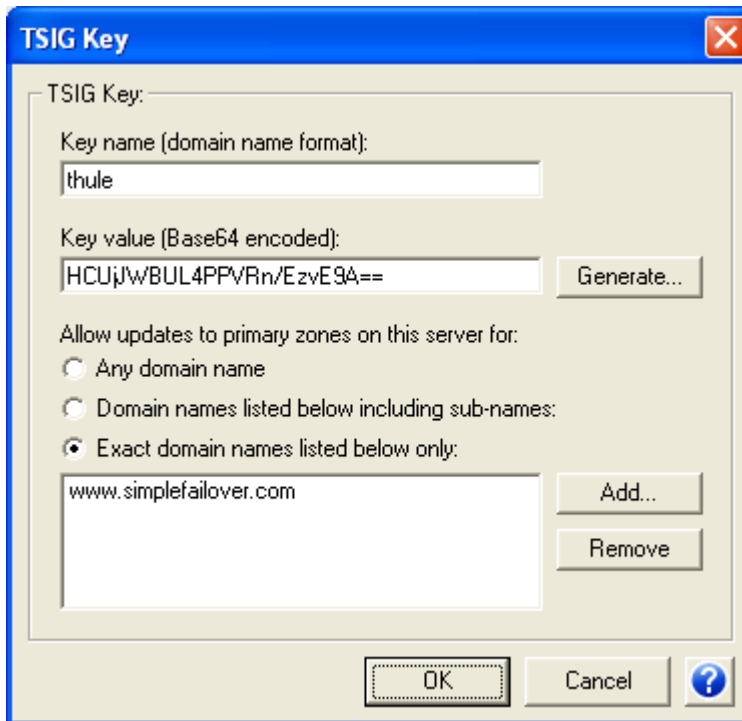
Click *OK* and continue with the preparation of the other DNS server in the setup.

DALLAS
Configure DNS server to accept standard updates from a specific computer.

Note: This update method is **not recommended** when performing updates over the Internet. This is for demonstration purposes only.
Open Simple DNS Plus, click the *Records* button on the toolbar, right-click the *zone name*, select *Properties…* menu item.
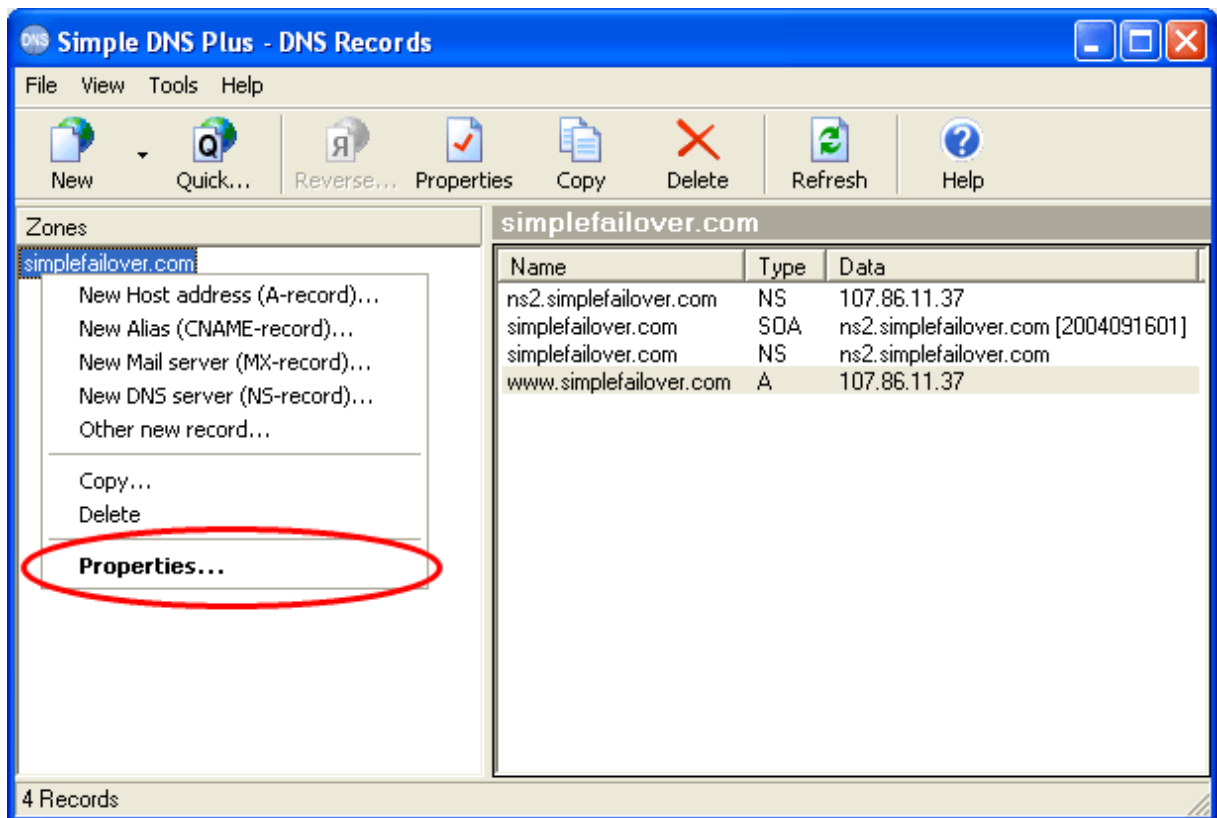
Select the ***Dynamic Updates*** tab.
Insert a check-mark in the ***Accept Standard Dynamic Update Requests:*** field and select the radiobutton: ***Only from the following IP addresses / subnets:***
Click ***Add…*** and enter the ***IP address*** and ***255.255.255.255*** of the computer that runs Simple Failover.
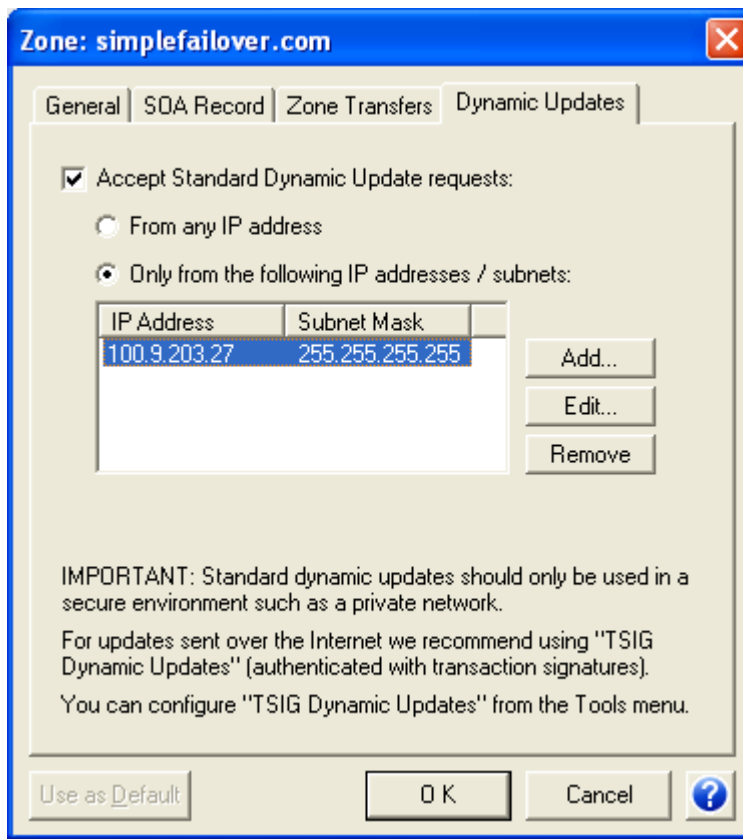
Click **OK** and continue the configuration in Simple Failover.

COPENHAGEN
Configure Simple Failover.

Click on the **New Server Set** icon on the toolbar 76 and enter the necessary information in the appropriate fields. This example checks the connectivity to the two web-servers.

❶ Select **HTTP (port 80)** in the **Server Type** field. This tells Simple Failover to check a Web server.

❷ Type **www.simplefailover.com** in the **Domain name** field. This must be a unique value in Simple Failover.

❸ Click the **Add…** button and enter the **IP address** of the web server in Kyoto.
Click the **Add…** button again and enter the **IP address** of the web server in Dallas.
Leave the default values in the rest of the fields on the Servers tab.

---

❹ Select the *Update DNS* tab.
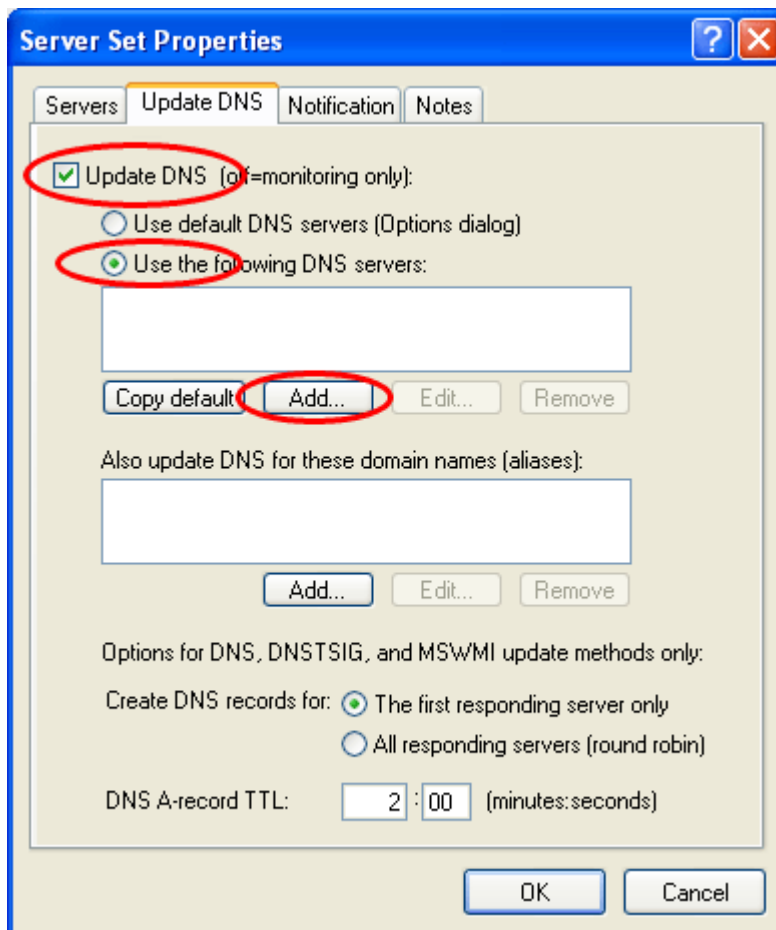
Insert a check-mark in the field *Update DNS (off=monitoring only)*.

❺ Click the *Add…* button to configure the information for the DNS server in Kyoto.
In this example the Simple DNS Plus server is requiring authentication before performing the dynamic DNS updates.

Read more in the section Simple DNS Plus - TSIG Signed Dynamic DNS Updates 110 to setup the correct information at http://www.simpledns.com.
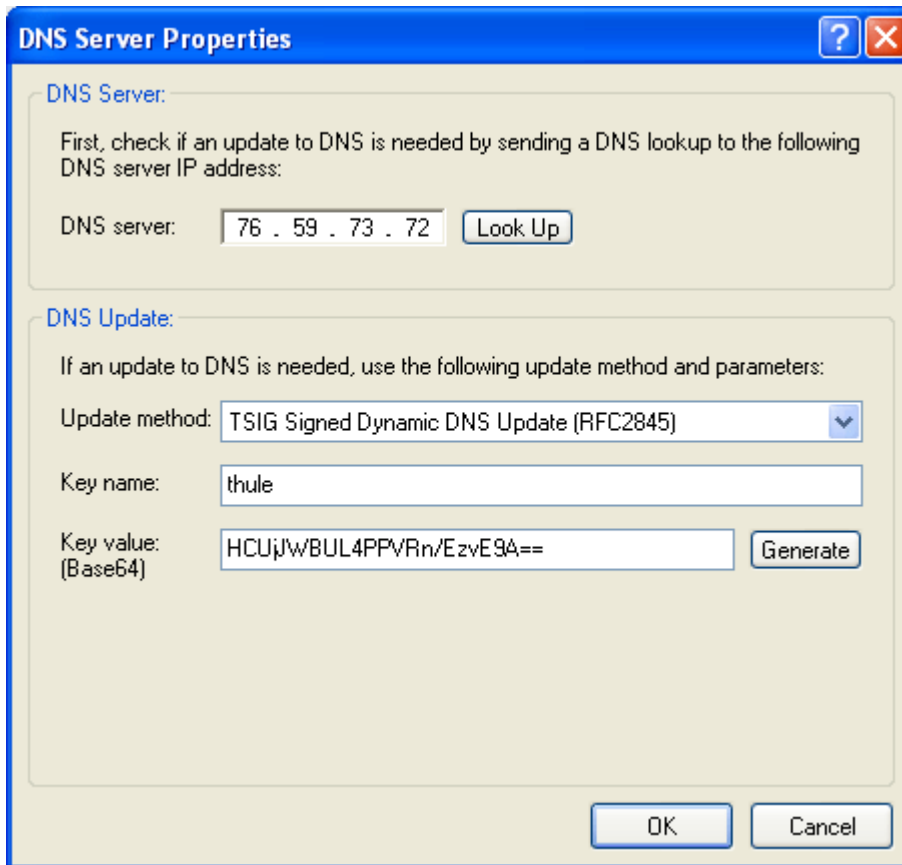
⑥ Enter *IP address* of the *DNS server* in Kyoto. You can use the *Look Up* button to resolve the name of the server into an IP address.

⑦ Select *TSIG Signed Dynamic DNS Update (RFC2845)* in the *Update method* field.

⑧ The DNS server in Kyoto only perform dynamic DNS updates when the request is TSIG authenticated.
Enter *thule* in the *Key name* field, and enter the *Key value* as on the Simple DNS Plus server.
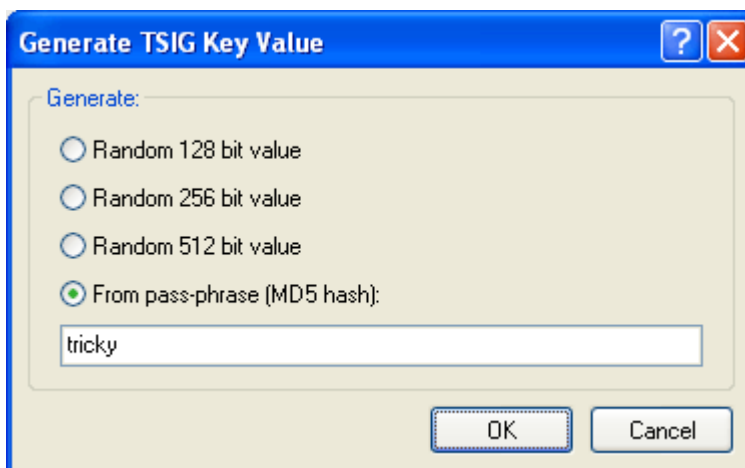
⑨ Add the record for the Dallas DNS server.

Back in the Server Set Properties / Update DNS dialog, click the **Add…** button again. In this example the DNS server on the Backup Site in Dallas uses standard dynamic DNS updates.
Enter the **IP address** of the **DNS server** in Dallas, and select the **Standard Dynamic DNS Update (RFC2136)** in the **Update method** field.
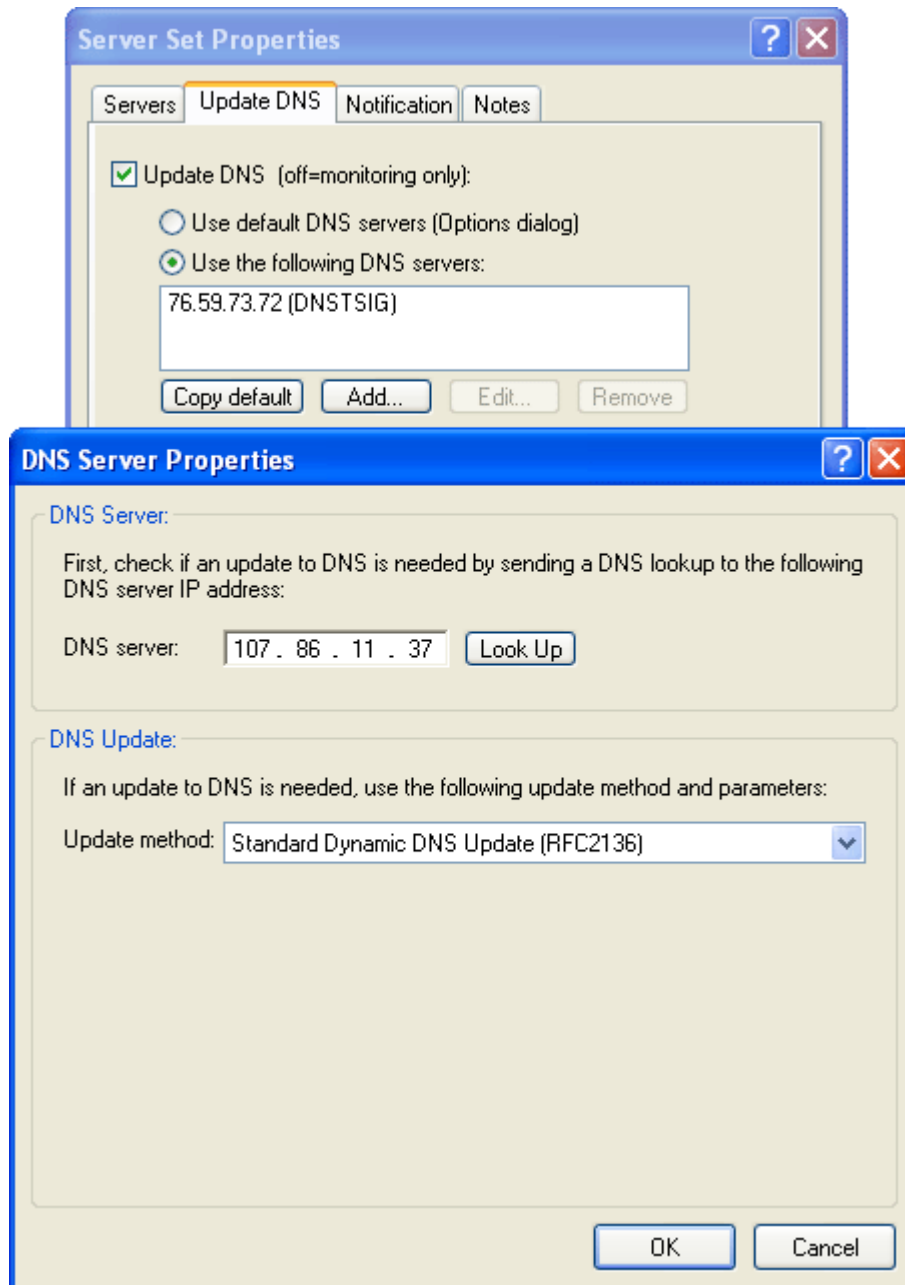
Click **OK** and Simple Failover begins monitoring.

Status

❶ The connection to the Kyoto web server is fully functional. The result of the polls Simple Failover performs looks like this:
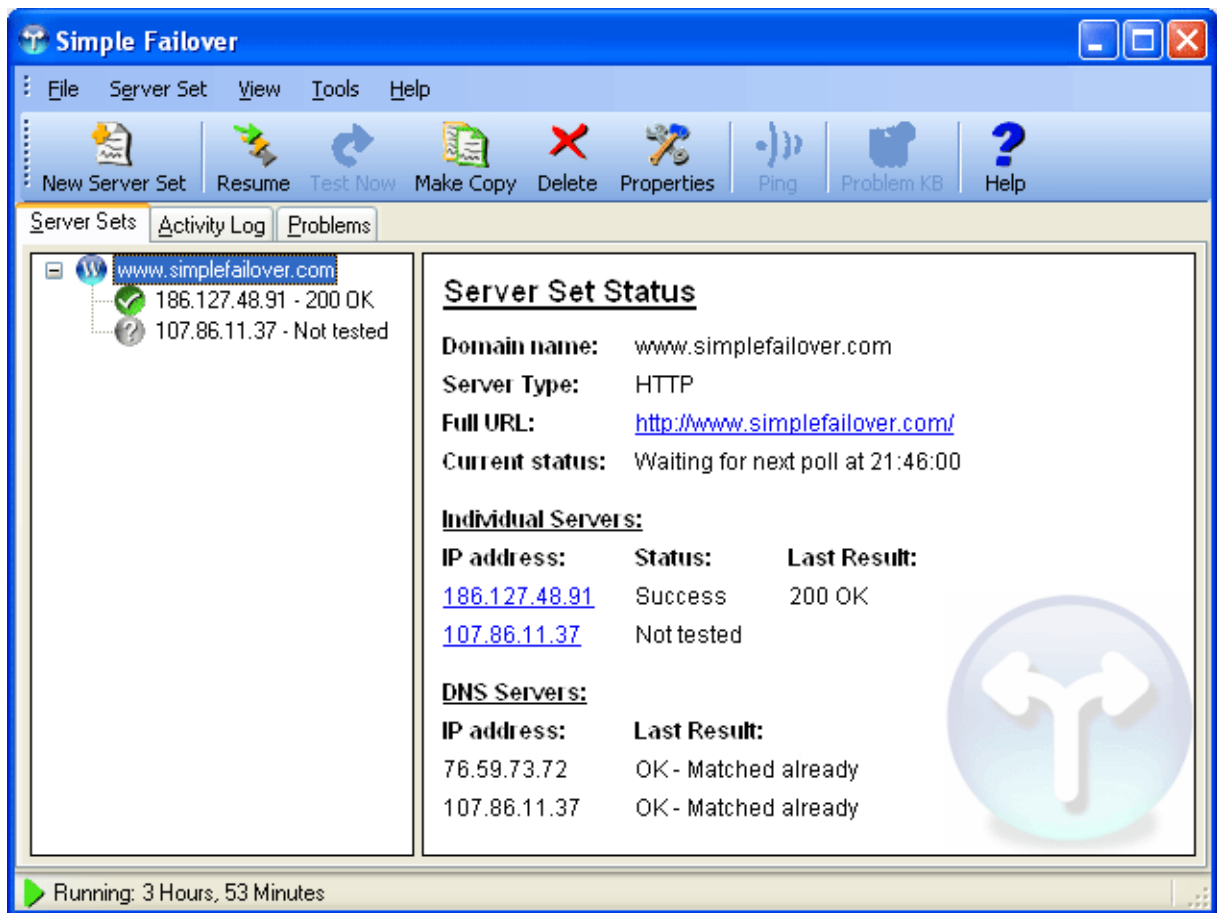
The Explorer pane[78] shows that only the first responding server[98] is tested. The last result was **200 OK** and that the DNS servers already have the correct record to the web-server.

When you click on the individual server, specific information is displayed in the Status pane[78] about that server.
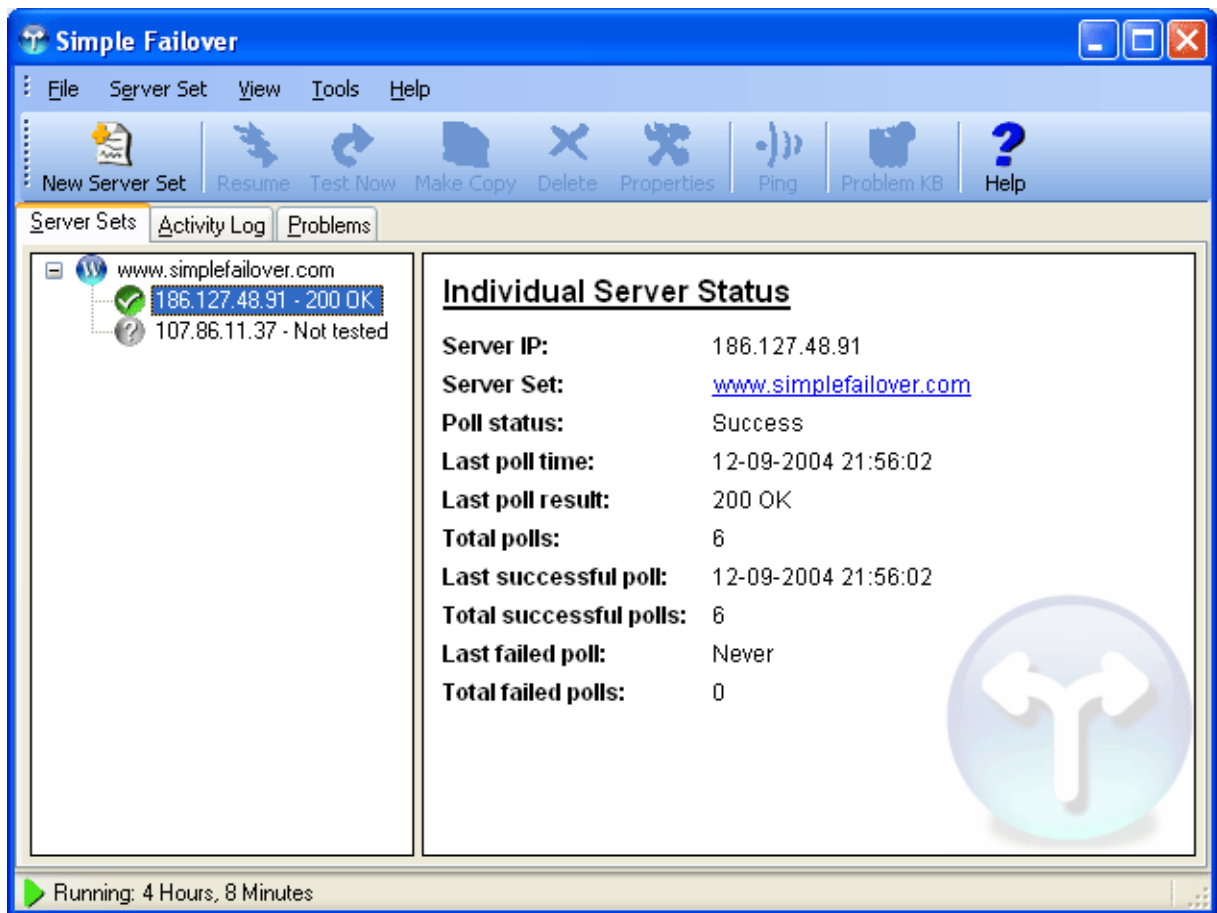
The Activitivy Log 82 tab shows what happens behind the scenes:
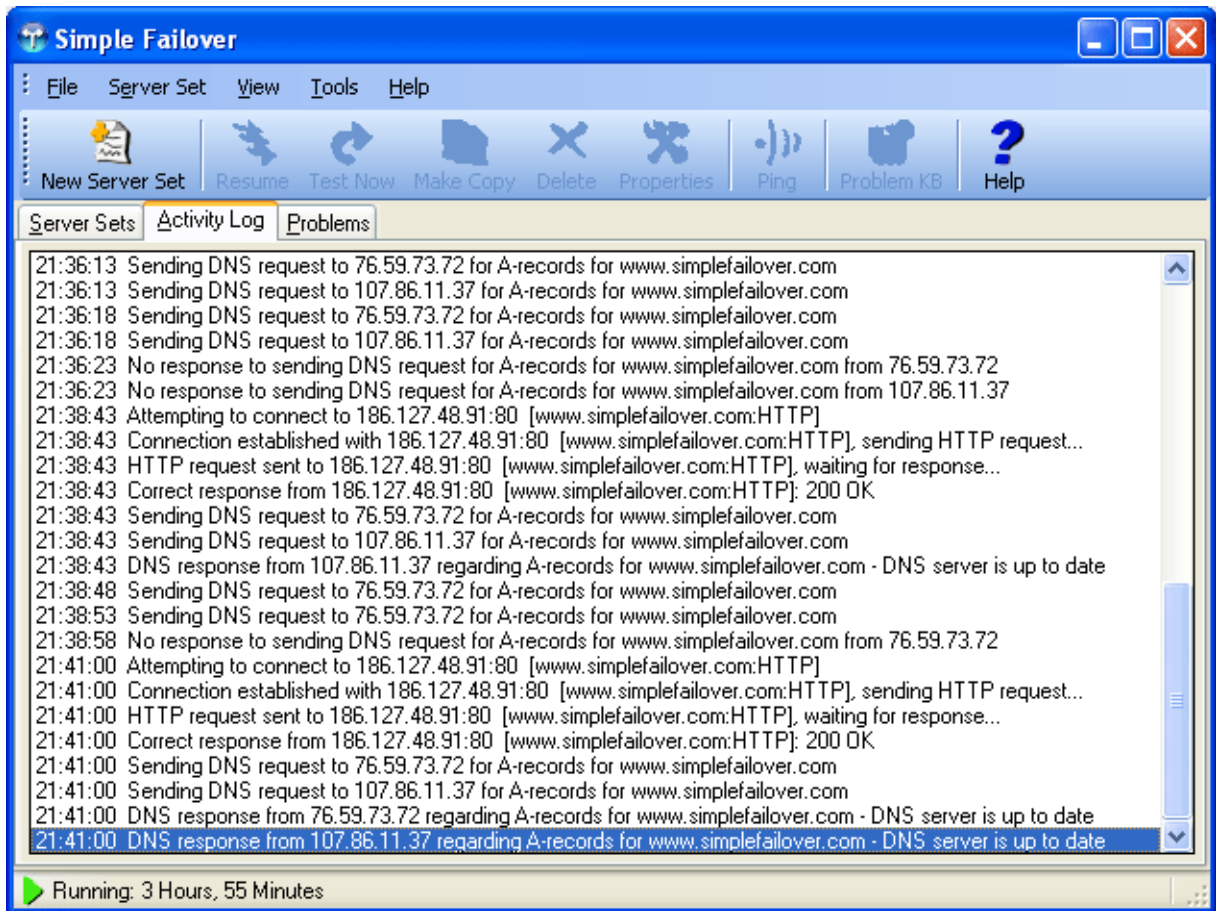
Simple Failover has detected no failures with your systems for the moment. The result is an empty Problems tab 83 .
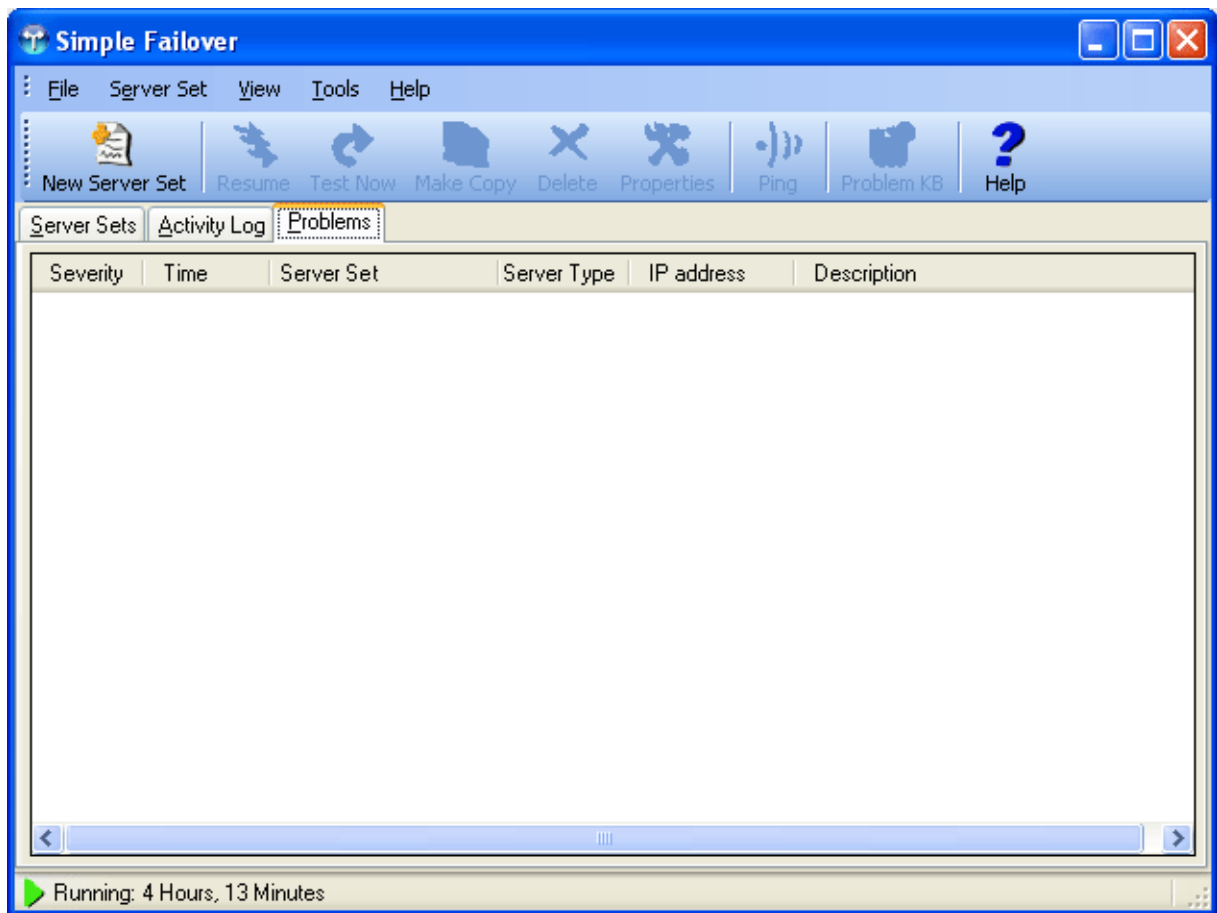
Connection failure

❷ The connection to the Kyoto web server is lost. Perhaps a mouse have chewed on and cut the network cable. The result of the polls Simple Failover performs now look like this :
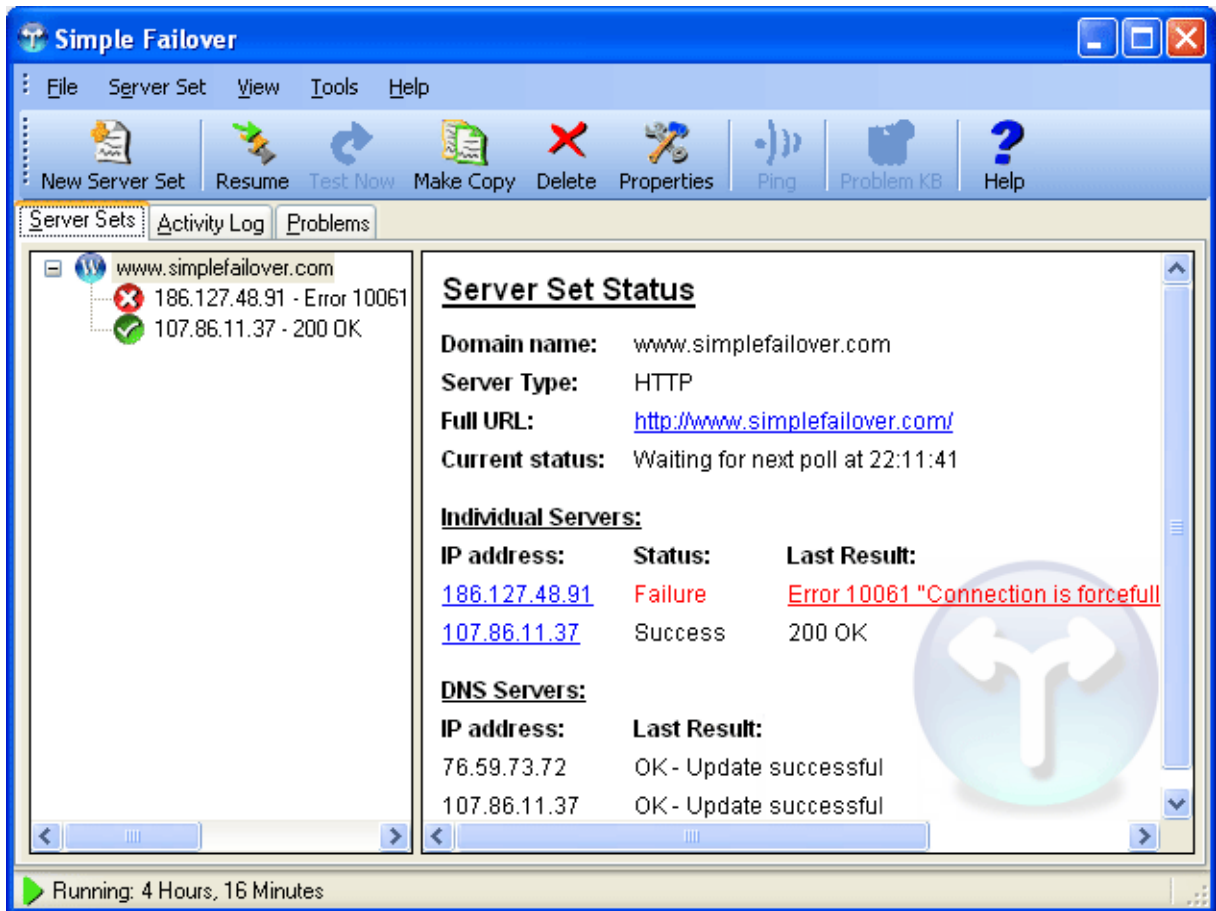
Please note: The web server in Kyoto is in **_Failure_** state and the web server in Dallas is now responsible for the handling the users requests to your web-site. The status of the two DNS servers are **_Update succesful_**.

The individual Server for the failing web server in Kyoto now displays the state:
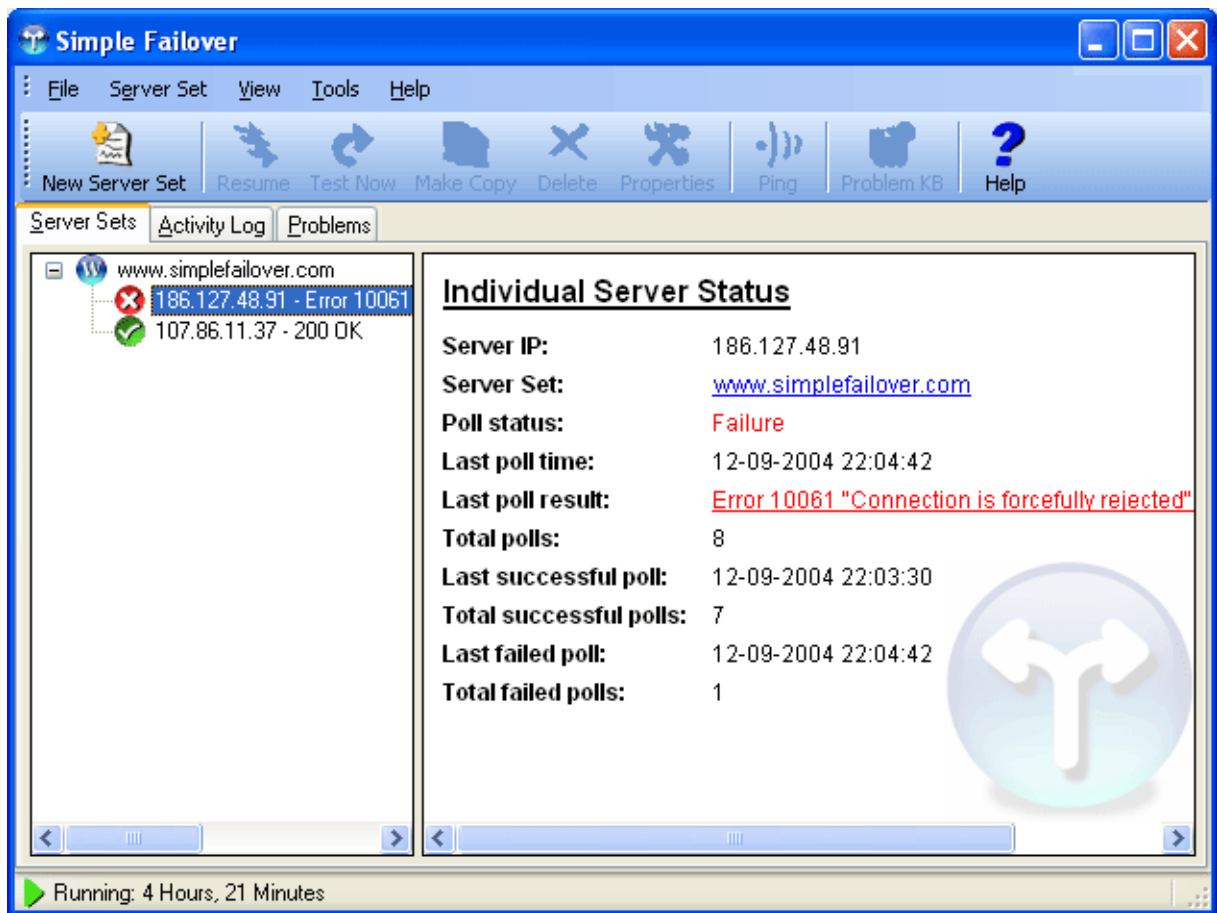
The Activitivy Log 82 tab shows what happens behind the scenes. :
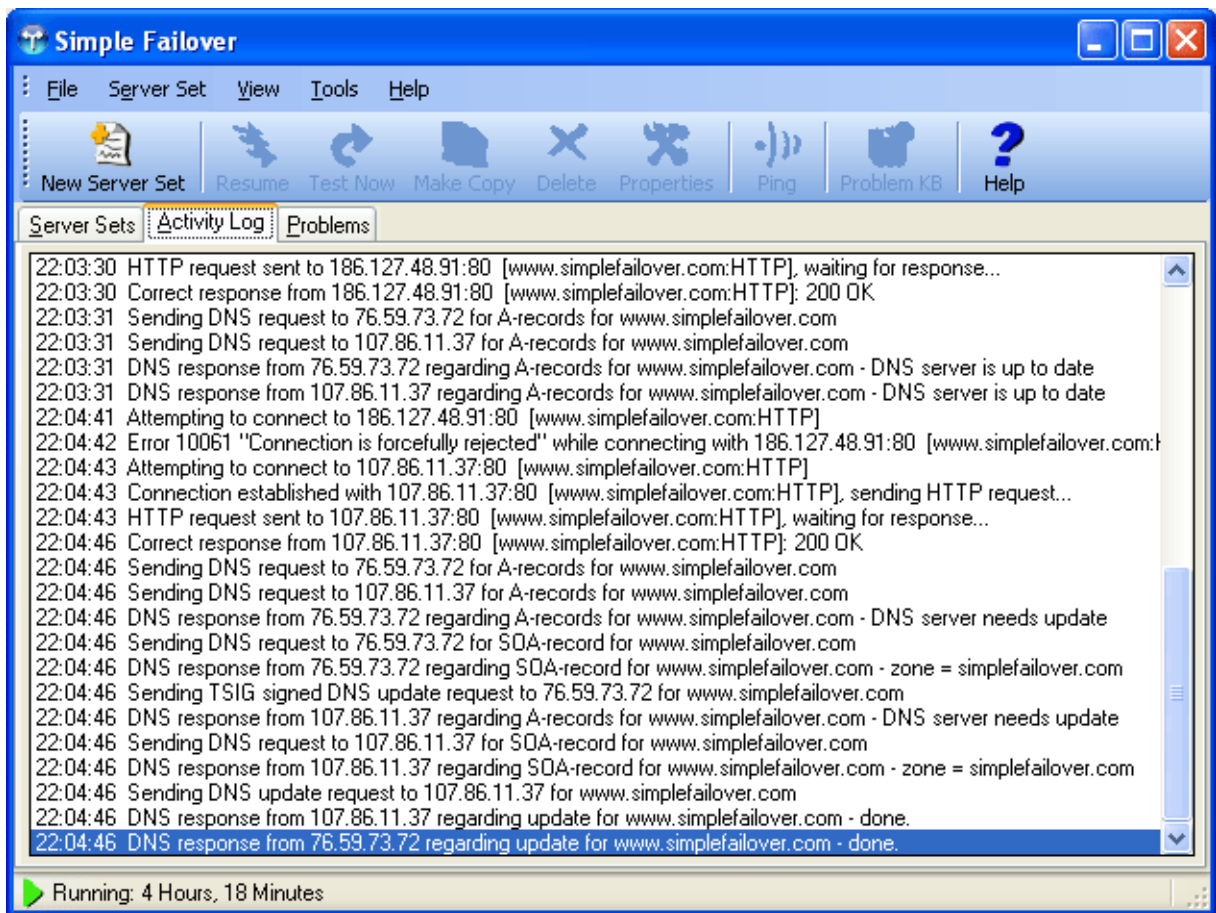
And finally the Problems tab [83] displays the problem. To get more information, you can right-click on the problem and receive more information from our Online Problem Knowledge-base on the Internet:
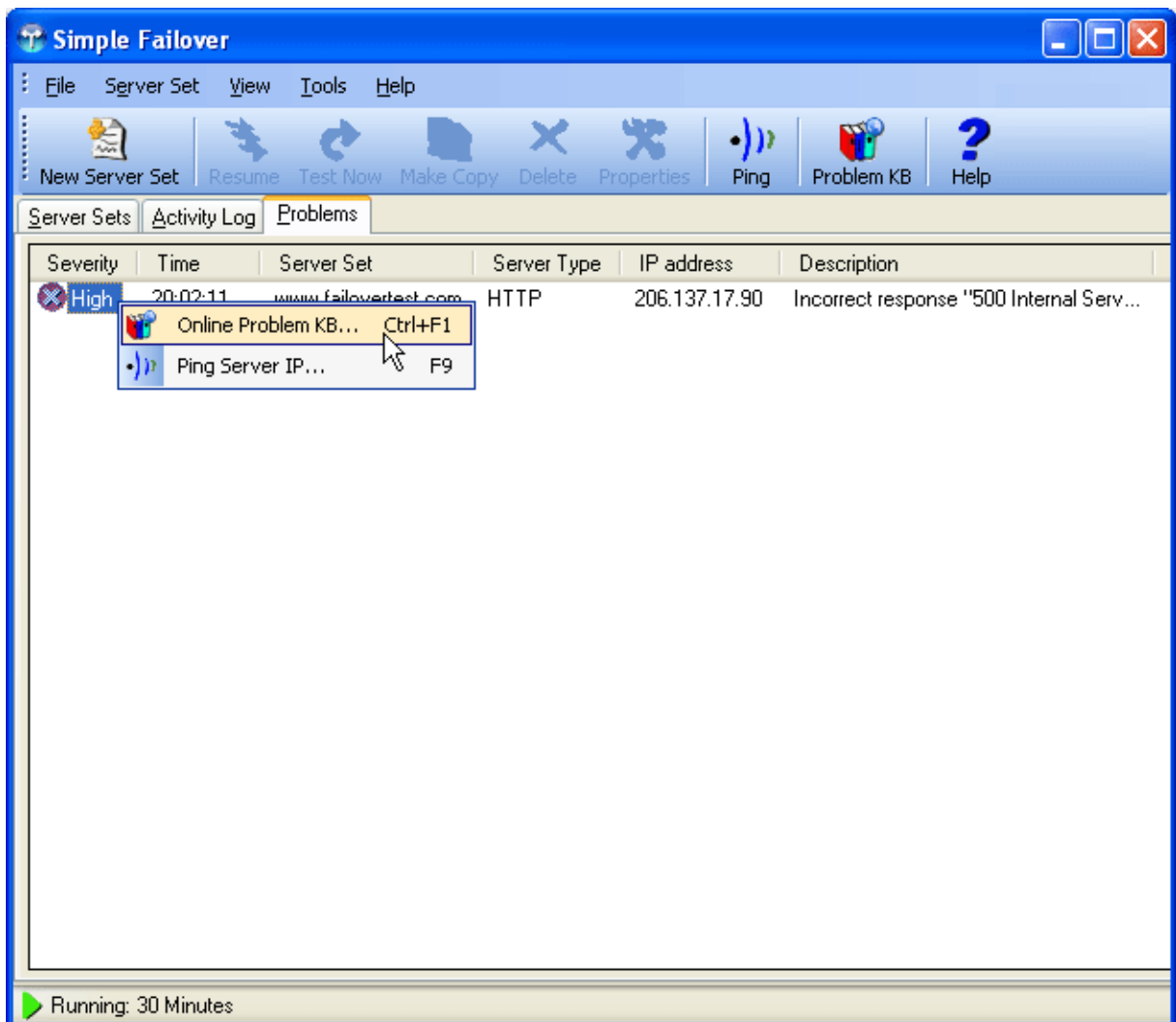
8   How it works

Simple Failover is built around the concept of *Server Sets*.
A *Server Set* represents 2 or more servers which host the same Internet service (for example a web site) for the same domain name.
A *Server Set* also defines various properties of the service, such as the domain name, the service type (HTTP, FTP, etc.), the DNS servers, etc.

Simple Failover basically does three things:

❶ At defined intervals, it monitors the status (polls) of each individual server in the Server Set.
All the settings for server monitoring are configured individually for each Server Set in the Servers tab 95 of the *Server Set Properties* dialog.
For details on how different server types are monitored, see Server monitoring methods 55.
All servers in the server set will be polled unless the option *Skip polling lower priority server when higher priority server respond correctly* is enabled in the Advanced Server Set Properties 95 dialog.

❷ Based on the results of the monitoring (1), it updates your DNS servers so that the domain name for the Server Set always points to the IP address of a functional server.
All the settings for updating DNS are configured individually for each Server Set and for each DNS server in the Update DNS tab 98 of the *Server Set Properties* dialog. For some or all Server Sets, you can also select to use the *Default DNS servers* configured in the Options 90 dialog.
For details on the different methods available for updating DNS, see DNS update methods 64.
For instructions and recommendation for specific DNS servers, see Specific DNS servers 108.

❸ It optionally notifies you about any problems detected. It can do so in several ways:
a) By e-mail.
The general settings for e-mail notification are configured in the E-mail notification tab 90 of the *Options* dialog.
You can enable e-mail notification and define a unique *To* e-mail address for each Server Set in the Notification tab 99 of the *Server Set Properties* dialog.
b) The Problem tab 83 of the main dialog always contain a list of current problems.
c) Balloon tips from the tray icon 105.
This can be enabled in the General tab 88 of the *Options* dialog.
d) Through the Windows Event Log.
This can be enabled in the General tab 88 of the *Options* dialog.
e) Via customizable scripts.
Scripting is configured in the Scripting tab 92 of the *Options* dialog.

9   Server monitoring methods

Selecting a server type to use in the Server Set Properties dialog.

```
HTTP (Hyper Text Transfer)       ∨
HTTP (Hyper Text Transfer)
FTP (File Transfer)
SMTP (Simple Mail Transfer)
POP3 (Post Office)
NNTP (Network News Transfer)
IMAP (Inter Message Access)
TCP (Generic TCP connect)
PING (ICMP Echo)
```
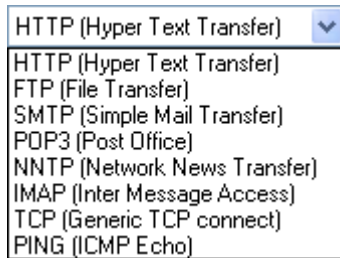
The monitoring method is slightly different for each server type:

- HTTP ⌐56⌐   Hyper Text Transfer (Web site)
- FTP ⌐57⌐   File Transfer
- SMTP ⌐58⌐   Simple Mail Transfer
- POP3 ⌐59⌐   Post Office
- NNTP ⌐60⌐   Network News Transfer
- IMAP ⌐61⌐   Inter Message Access
- TCP ⌐62⌐   Generic TCP connection servers
- PING ⌐63⌐   ICMP Echo

Please note: depending on your license type the number of Server Types may be limited.

9.1 Monitoring HTTP servers

When polling the status of an HTTP server, the following steps are taken:

❶ A TCP connection is established with the server IP address on *port 80* (*).
❷ An HTTP request is sent to the server.
❸ If a HTTP response with status code *200* (*) is received, then the HTTP server is considered functional.
With any other status code, the server is considered non-functional.
❹ The TCP connection is closed.

In step 2, Simple Failover uses the HTTP *HEAD* method instead of the more common *GET* and *POST* methods.
HEAD works the same as GET, except the web-server will only return the HTTP headers and not the entire web-page.
Simple Failover only needs to see the header, so using the HEAD method significantly reduces the amount of data needed to be transferred.

Also in step 2, a *Host* header with the Server Set domain name is included in the HTTP request.
This means that Simple Failover can also be used with web-servers utilizing "name based virtual hosting" (multiple web-sites for different domain names on a single IP address).
Modern web-browsers also include this *Host* header in all HTTP requests.

While performing above steps, Simple Failover may also encounter a communications error (winsock error), or that the TCP connection is unexpectedly closed by the remote server, or it may time out waiting for the TCP connection to be established or a response to be received.
In any of these cases, the server is considered non-functional.

For details on the HTTP protocol, please see RFC1945 164 .
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

(*) Alternate port number can be specified in the Port 95 field. Alternate status codes can be specified in the Advanced Server Set Properties 95 dialog.

9.2 Monitoring FTP servers

When polling the status of an FTP server, the following steps are taken:

❶ A TCP connection is established with the server IP address on *port 21* (*).
❷ Simple Failover waits for a "greeting".
❸ If the greeting begins with *220…*, (*), then the FTP server is considered functional.
With any other greeting, the server is considered non-functional.
❹ The TCP connection is closed.

While performing above steps, Simple Failover may also encounter a communications error (winsock error), or that the TCP connection is unexpectedly closed by the remote server, or it may time out waiting for the TCP connection to be established or a response to be received.
In any of these cases, the server is considered non-functional.

For details on the FTP protocol, please see RFC959 164 .
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

(*) Alternate port number can be specified in the Port 95 field. Alternate status codes can be specified in the Advanced Server Set Properties 95 dialog.

9.3   Monitoring SMTP servers

When polling the status of an SMTP server, the following steps are taken:

❶ A TCP connection is established with the server IP address on *port 25* (*) or a port number you select that represents your setup.
❷ Simple Failover waits for a "greeting".
❸ If the greeting begins with *220…,* (*), then the SMTP server is considered functional.
With any other greeting, the server is considered non-functional.
❹ The TCP connection is closed.

While performing above steps, Simple Failover may also encounter a communications error (winsock error), or that the TCP connection is unexpectedly closed by the remote server, or it may time out waiting for the TCP connection to be established or a response to be received.
In any of these cases, the server is considered non-functional.

Please note: It is not necessary to use Simple Failover for SMTP servers handling incoming e-mail. You can setup an MX-record for each of your SMTP servers in DNS. Other e-mail servers will then try each one of your SMTP servers in turn (according to the preference values in the MX-records) until a successful delivery is made.
However, you may wish to use Simple Failover for SMTP servers handling outgoing e-mail.
E-mail client software (such as Outlook) does not use MX-records.

For details on the SMTP protocol, please see RFC821 164 .
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

(*) Alternate port number can be specified in the Port 95 field. Alternate status codes can be specified in the Advanced Server Set Properties 95 dialog.

9.4   Monitoring POP3 servers

When polling the status of an POP3 server, the following steps are taken:

❶ A TCP connection is established with the server IP address on *port 110* (*).
❷ Simple Failover waits for a "greeting".
❸ If the greeting begins with *+OK…*, (*) then the POP3 server is considered functional.
With any other greeting, the server is considered non-functional.
❹ The TCP connection is closed.

While performing above steps, Simple Failover may also encounter a communications error (winsock error), or that the TCP connection is unexpectedly closed by the remote server, or it may time out waiting for the TCP connection to be established or a response to be received.
In any of these cases, the server is considered non-functional.

For details on the POP3 protocol, please see RFC1939⌐164⌐.
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

(*) An alternate port number can be specidifed in the Advanced Server Set Properties⌐95⌐ dialog.

9.5 Monitoring NNTP servers

When polling the status of an NNTP server, the following steps are taken:

❶ A TCP connection is established with the server IP address on *port 119* (*).
❷ Simple Failover waits for a "greeting".
❸ If the greeting begins with *200…* or *201…,* (*) then the NNTP server is considered functional.
With any other greeting, the server is considered non-functional.
❹ The TCP connection is closed.

While performing above steps, Simple Failover may also encounter a communications error (winsock error), or that the TCP connection is unexpectedly closed by the remote server, or it may time out waiting for the TCP connection to be established or a response to be received.
In any of these cases, the server is considered non-functional.

For details on the NNTP protocol, please see RFC977 164.
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

(*) Alternate port number can be specified in the Port 95 field. Alternate status codes can be specified in the Advanced Server Set Properties 95 dialog.

9.6   Monitoring IMAP servers

When polling the status of an IMAP server, the following steps are taken:

❶ A TCP connection is established with the server IP address on ***port 143*** (*).
❷ Simple Failover waits for a "greeting".
❸ If the greeting begins with ***OK…,*** (*) then the IMAP server is considered functional.
With any other greeting, the server is considered non-functional.
❹ The TCP connection is closed.

While performing above steps, Simple Failover may also encounter a communications error (winsock error), or that the TCP connection is unexpectedly closed by the remote server, or it may time out waiting for the TCP connection to be established or a response to be received.
In any of these cases, the server is considered non-functional.

For details on the IMAP protocol, please see RFC3501 ⌷164⌷.
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

(*) An alternate port number can be specidifed in the Advanced Server Set Properties ⌷95⌷ dialog.

9.7 Monitoring other server types (Generic TCP connect)

This type of monitoring can be used to check any type of service that uses the TCP protocol (which includes most software communicating via the Internet protocol). As opposed to the existing monitoring methods (HTTP, FTP, etc.), this method does not check for any specific response or greeting from the service.

When polling a server using this method, Simple Failover attempts to establish a TCP connection with the server.
If the connection is successfully established, then the server is considered functional, and the connection is immediately closed again.
No request/data is sent to the server, and any greeting/data received from the server is simply ignored.

While attempting to establish the TCP connection, Simple Failover may encounter a communications error (winsock error), or it may time out waiting for the TCP connection to be established.
In any of these cases, the server is considered non-functional.

Please note: this monitoring method is only available with the Professional license type.

9.8 Monitoring other server types (PING)

PING is different than the previously discussed server monitoring methods (HTTP, FTP, etc.) in that it does not check the status of a specific service and does not establish a TCP connection, but rather checks the general availability of the server computer by pinging it.

The advantage of this monitoring method is that it is very light weight (no TCP connection overhead), it uses very little bandwidth (PING packets are very small), and it can be used for any type of Internet service.
However, it can only detect if a server computer is running or not. Unlike the other monitoring methods, PING cannot determine if a specific service on that computer is running and functioning correctly.

Please note that some firewalls are configured to filter out PING packets (ICMP protocol), in which case this monitoring method cannot be used (check this by pinging your server IP from a command prompt first).

When polling the status of a server, the following steps are taken:

❶ An ICMP Echo Request (PING) is sent to the server IP address.
❷ If the server responds with a matching ICMP Echo Reply, then the server is considering functional.
❸ If a negative response (for example "destination unreachable") is received from a router somewhere in between Simple Failover and the server, then the server is considered non-functional.
❹ If no response is received within one second, then step 1 is repeated 2 more times, and after that the server is considered non-functional.

For details on the ICMP protocol, please see RFC792 164 .
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

Please note: this monitoring method is only available with the Professional license type.

10   DNS update methods

After checking the status of the individual servers in a Server Set (see Server monitoring methods⁵⁵), Simple Failover will check, and if needed, update DNS on each DNS server listed in the Server Set.

The steps taken to check and update DNS are different for each update method:
- Standard Dynamic DNS update⁶⁵
- TSIG Signed Dynamic DNS Update⁶⁷
- MS DNS via WMI⁶⁸
- HTTP based DynDNS service⁶⁹
- Scripting⁷⁰

You can select each of these update methods in the DNS Server Properties dialog¹⁰².

10.1 Standard Dynamic DNS update

Standard Dynamic DNS updates are supported by most modern DNS servers including Simple DNS Plus|109|, BIND |113|, Microsoft DNS|115|, and Novell DNS|117|.

Important: However, because there is no authentication built into this update method, it should only be use within a safe environment such as a local intranet.
You obviously don't want to allow everyone on the Internet access to updating your DNS records.

With Simple DNS Plus|109|, BIND|113|, and Novell|117| DNS servers, you can limit access to Standard Dynamic DNS updates by client IP address.
If your DNS server is accessible from the Internet, make sure to use that option to limit access to local IP addresses only.
Keep in mind that even if you limit access to a specific Internet IP addresses, network packets from anywhere on the Internet can be spoofed to appear to come from that address (of course the hacker would have to know or guess that IP address first).
This should not be an issue with local IP addresses, as spoofed network packets from the Internet claiming to be from your local IP addresses should be filtered out by your own router and/or your ISP.

Caution: Microsoft DNS|115| servers do not have any options to limit access to Standard Dynamic DNS updates, so this update method is not appropriate for Microsoft DNS servers connected to the Internet.

Updates can **only** be performed on primary DNS servers for a DNS zone.
To ensure that DNS can always be updated (with any one of the DNS servers unavailable), you must configure the DNS zone as *primary* on all DNS servers.
This also means that you will have to keep the DNS servers synchronized manually by always making all zone/record updates on both servers.

Simple Failover performs the following steps to check and update DNS:

❶ First, based on the monitoring|55| results, it figures out what the DNS records should be for the Server Set domain name:
- If the Server Set is configured to use DNS round robin (load balancing), then it will configure one A-record for each of the functional servers.
- If the Server Set is not configured to use DNS round robin, then it will configure a single A-record for the first functional server.
- If none of the servers were functional, then Simple Failover will assume that the problem must be local, and it will configure A-records as if the first/all servers did respond correctly.
- If the Server Set *Failed Polls Accepted* setting is greater than zero, then each server is considered functional, until it has been found non-functional more times than this number.

❷ Then it sends a DNS request to the DNS server to check the **current DNS A-records** for the Server Set domain name.
If this is already what it should be (1), then the process stops here as there is no need to update anything.

❸ Next it sends a DNS request to the DNS server to get the **SOA-record** for the Server Set domain name.
This will return the DNS zone name that the domain name belongs to (needed for the update process).

❹ And finally it sends **an update request** to the DNS server saying:
a) Delete any existing A- and CNAME-records for the Server Set domain name.
b) Add new A-records as per the monitoring results (1).

While communicating with the DNS server, Simple Failover may encounter communication errors (winsock error), time outs, or unexpected responses from the DNS server. Such problems will be logged, listed in the problems list, and invoke e-mail and script notifications.

For details on standard dynamic DNS updates, please see RFC2136 [164].
This and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

10.2   TSIG Signed Dynamic DNS update

The TSIG Signed Dynamic DNS update method is basically the same as the Standard Dynamic DNS update‹⁶⁵› method, only with encrypted authentication added, making it safe to use across the Internet.

TSIG Signed Dynamic DNS updates are supported by the Simple DNS Plus‹¹⁰⁹› and BIND‹¹¹³› DNS servers.

When using this update method, you must specify a key name and a key value (similar to user name / password).
These must be setup on your DNS server with permissions to update DNS records for the Server Set domain name.

Update can **only** be performed on primary DNS servers for a DNS zone.
To ensure that DNS can always be updated (with any one of the DNS servers unavailable), you must configure the DNS zone as *primary* on all DNS servers.
This also means that you will have to keep the DNS servers synchronized manually by always making all zone/record updates on both servers.

Simple Failover performs the following steps to check and update DNS:

❶ First, based on the monitoring‹⁵⁵› results, it figures out what the DNS records should be for the Server Set domain name:
  - If the Server Set is configured to use DNS round robin (load balancing), then it will configure one A-record for each of the functional servers.
  - If the Server Set is not configured to use DNS round robin, then it will configure a single A-record for the first functional server.
  - If none of the servers were functional, then Simple Failover will assume that the problem must be local, and it will configure A-records as if the first/all servers did respond correctly.
  - If the Server Set *Failed Polls Accepted* setting is greater than zero, then each server is considered functional, until it has been found non-functional more times than this number.

❷ Then it sends a DNS request to the DNS server to check the **current DNS A-records** for the Server Set domain name.
  If this is already what it should be (1), then the process stops here as there is no need to update anything.

❸ Next it sends a DNS request to the DNS server to get the **SOA-record** for the Server Set domain name.
  This will return the DNS zone name that the domain name belongs to (needed for the update process).

❹ And finally it sends an **TSIG signed update request** to the DNS server saying:
  a) Delete any existing A- and CNAME-records for the Server Set domain name.
  b) Add new A-records as per the monitoring results (1).

While communicating with the DNS server, Simple Failover may encounter communication errors (winsock error), time outs, or unexpected responses from the DNS server. Such problems will be logged, listed in the problems list, and invoke e-mail and script notifications.

For details on TSIG Signed Dynamic DNS updates, please see RFC2136‹¹⁶⁴› and RFC2845‹¹⁶⁴›.
These and other RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

10.3   Update DNS via WMI

This update method uses *WMI* (Windows Management Instrumentation) to communicate with Microsoft DNS |115| servers on Windows 2000 Server and Windows 2003 Server.

Simple Failover performs the following steps to check and update DNS:

❶ First, based on the monitoring|55| results, it figures out what the DNS records should be for the Server Set domain name:
   - If the Server Set is configured to use DNS round robin (load balancing), then it will configure one A-record for each of the functional servers.
   - If the Server Set is not configured to use DNS round robin, then it will configure a single A-record for the first functional server.
   - If none of the servers were functional, then Simple Failover will assume that the problem must be local, and it will configure A-records as if the first/all servers did respond correctly.
   - If the Server Set *Failed Polls Accepted* setting is greater than zero, then each server is considered functional, until it has been found non-functional more times than this number.

❷ Then it sends a DNS request to the DNS server to check the **current DNS A-records** for the Server Set domain name.
   If this is already what it should be (1), then the process stops here as there is no need to update anything.

❸ Next it sends a DNS request to the DNS server to get the **SOA-record** for the Server Set domain name.
   This will return the DNS zone name that the domain name belongs to (needed for the update process).

❹ And finally it performs the **following via WMI**:
   a) Delete any existing A- and CNAME-records for the Server Set domain name.
   b) Add new A-records as per the monitoring results (1).

While communicating with the DNS server, Simple Failover may encounter communication errors (winsock errors), time outs, or unexpected responses. Such problems will be logged, listed in the problems list, and invoke e-mail and script notifications.

For specific instructions for using this update method, see the Microsoft DNS|115| section.

10.4   Update DNS via HTTP

This update method can be used to send DNS updates via HTTP to a dynamic IP services such as dyndns.org or WebReactor Networks.

When using this update method, you must specify an update URL, and optionally a user ID and password for HTTP authentication. A success text can also be specified evaluating the response from the dynamic IP service.

Simple Failover performs the following steps to check and update DNS:

❶ First, based on the monitoring 55 results, it figures out what the DNS records should be for the Server Set domain name:
 - It will configure a single A-record for the first functional server (round robin is not available for this DNS update method).
 - If none of the servers were functional, then Simple Failover will assume that the problem must be local, and it will configure an A-record as if the first server did respond correctly.
 - If the Server Set *Failed Polls Accepted* setting is greater than zero, then each server is considered functional, until it has been found non-functional more times than this number.

❷ Then it sends a DNS request to the DNS server to check the **current DNS A-records** for the Server Set domain name.
If this is already what it should be (1), then the process stops here as there is no need to update anything.

❸ And finally it sends a **HTTP request** for the update UURL - replacing any *IP* tag with the server IP address as per the monitoring results (1), and any *DOM* tag with the domain name. The result from your dynamic IP service provider might come as a web-page with status information on the update request. Simple Failover let you specify a case-sensitive *Success text* string. Simple Failover will read the status reply from your provider and see if it can find the exact information on the page. You may also include HTML tags to ensure an exact match.

While communicating with the DNS and HTTP servers, Simple Failover may encounter communication errors (winsock error), time outs, or unexpected responses from the DNS server. Such problems will be logged, listed in the problems list, and invoke e-mail and script notifications.

10.5   Update DNS via scripting

If you choose this DNS update method, Simple DNS plus will simply call a procedure in your script file each time a DNS update is required.
You specify the script file and script language in the *Options* dialog (Tools menu / Options) on the Scripting tab 92 .

Simple Failover performs the following steps to check and update DNS:

❶ First, based on the monitoring 55 results, it figures out what the DNS records should be for the Server Set domain name:
- It will configure a single A-record for the first functional server (round robin is not available for this DNS update method).
- If none of the servers were functional, then Simple Failover will assume that the problem must be local, and it will configure an A-record as if the first server did respond correctly.
- If the Server Set *Failed Polls Accepted* setting is greater than zero, then each server is considered functional, until it has been found non-functional more times than this number.

❷ Then it sends a DNS request to the DNS server to check the **current DNS A-records** for the Server Set domain name.
If this is already what it should be (1), then the process stops here as there is no need to update anything.

❸ Next it sends a DNS request to the DNS server to get the **SOA-record** for the Server Set domain name.
This will return the DNS zone name that the domain name belongs to (needed for the update process).

❹ And finally it executes the script procedure *SFOUpdateDNS* with the following 4 parameters:
- *DNSServerIP* - The IP address of the DNS server.
- *ZoneName* - The DNS zone which the Server Set domain name belongs to.
- *DomainName* - The Server Set domain name.
- *IPAddress* - The server IP address as per the monitoring results (1).
It is then up to your script to make the appropriate updates to the DNS server.

While communicating with the DNS server, Simple Failover may encounter communication errors (winsock error), time outs, or unexpected responses. Such problems will be logged, listed in the problems list, and invoke e-mail and script notifications.

11   User interface

11.1   Main dialog
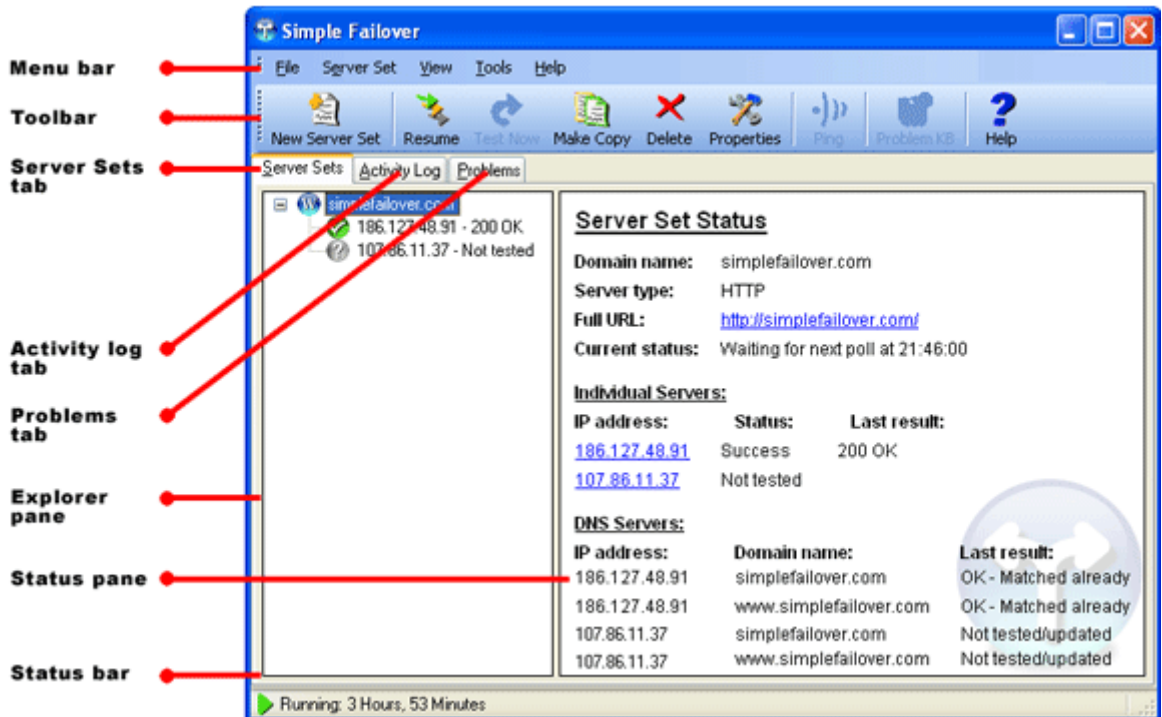
The main dialog consists of:
- The Menu bar 71
- The Tool bar 76
- The Server Sets tab 78
- The Activity Log tab 82
- The Problems tab 83
- The Status bar 85.

11.1.1   Main dialog - Menu bar
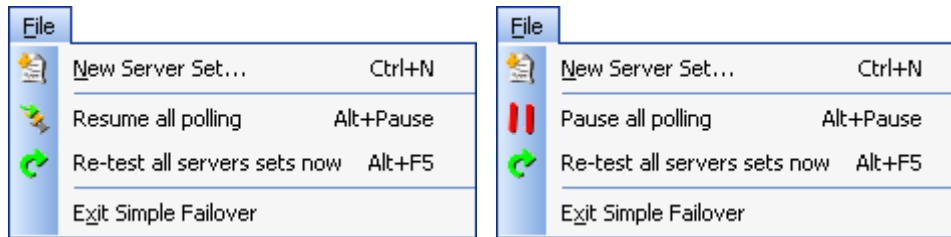
The main dialog menu bar:
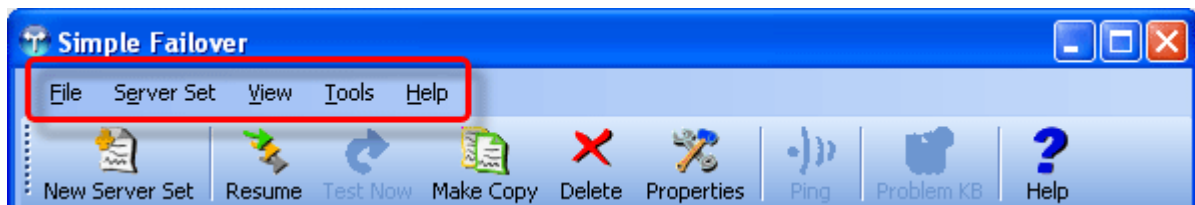
File menu

Figure 1: File menu when polling is active and when all polling is paused.

File menu / New Server Set…

Use to create a New Server Set. Opens the Server Set Properties dialog⌐95⌐.
This function is also available via the Toolbar⌐76⌐, the keyboard shortcut⌐86⌐ *Ctrl+N*, and from a pop-up menu when you right-click anywhere in the Explorer pane of the Server Sets tab⌐78⌐.

File menu / Pause all polling

File menu / Resume all polling

Use to pause or resume the polling of all Server Sets.
This function is also available via the keyboard shortcut⌐86⌐ *ALT+Pause*, by double clicking the status bar, and from the tray icon⌐105⌐ pop-up menu.

File menu / Re-test all Server Sets now

Use to initiate polling of all Server Sets immediately.
This function is also available via the keyboard shortcut⌐86⌐ *ALT+F5*.

NO × ICON File menu / Exit

Use to terminate Simple Failover.
This function is also available via the tray icon⌐105⌐ pop-up menu.

Server Set menu
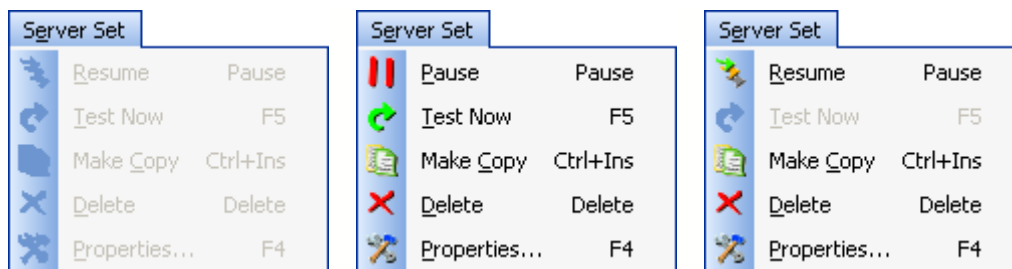
Figure 2: Server Set menu with No Server Set is selected (all functions disabled), with an active Server Set select, and with a paused Server Set selected.

The Server Set menu functions are only available when the Server Sets tab⌐78⌐ is selected, and a Server Set is currently selected.

These functions are also available on the Tool bar⏍76⏎ and from a pop-up menu when you right-click on a Server Set in the Explorer pane of the Server Sets tab⏍78⏎.
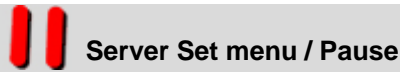
Server Set menu / Pause

Server Set menu / Resume

Use to pause or resume polling of the currently selected Server Set.
This will not influence the polling of any other Server Sets in the Server Set list.
This function is also available via the keyboard shortcut⏍86⏎ *PAUSE*.

Server Set menu / Test Now

Use to immediately poll the currently selected Server Set.
This function is also available via the keyboard shortcut⏍86⏎ *F5*.

Server Set menu / Make Copy

Use to make a copy of the currently selected Server Set. Opens the Server Set Properties dialog⏍95⏎ where you can enter only the necessary information for the new Server Set without having to enter all the other information.
This function is also available via the keyboard shortcut⏍86⏎ *CTRL+INS*.

Server Set menu / Delete

Use to delete the currently selected Server Set.
This function is also available via the keyboard shortcut⏍86⏎ *DELETE*.

Server Set menu / Properties

Use to edit the properties of the currently selected Server Set. Opens the Server Set Properties dialog⏍95⏎.
This function is also available via the keyboard shortcut⏍86⏎ *F4*.

View menu
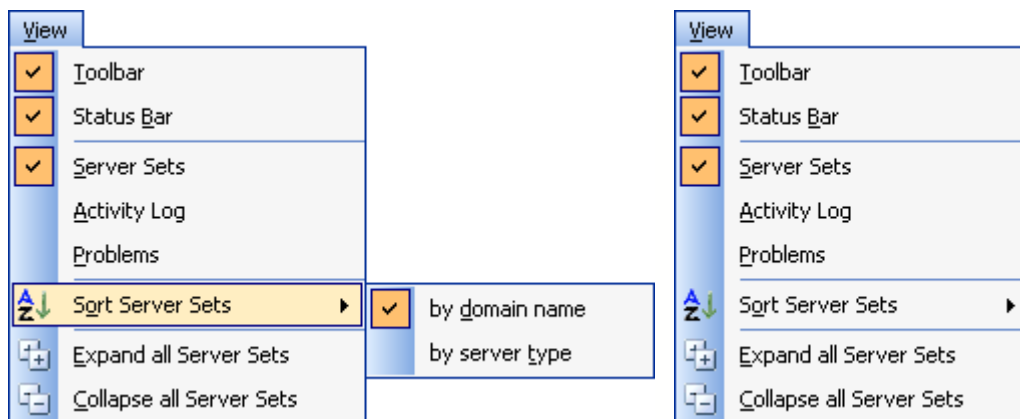
Figure 3: View menu with a selected Server Set on the Server Sets tab, and the View menu when the

Activity Logs or Problems tab is selected.

NO×
ICON View menu / Toolbar

Toggles the tool bar⌐76⌐ on/off.

NO×
**ICON View menu / Status Bar**

Toggles the status bar⌐85⌐ on/off.

NO× View menu / Server Sets
ICON View menu / Activity Log
        View menu / Problems

Toggles between the Server Sets tab⌐78⌐, Activity Log tab⌐82⌐, and Problems tab⌐83⌐.
You can also switch between the tabs using the keyboard shortcuts⌐86⌐ **CTRL+TAB** and
SHIFT+CTRL+TAB, and of course by clicking on the tabs.

View menu / Sort Server Sets

Sorts the Server Sets (on the Explorer pane of the Server Sets tab⌐78⌐) either by **domain name** or by
server type.
This function is also available from a pop-up menu when you right-click anywhere in the Explorer
pane of the Server Sets tab⌐78⌐.

View menu / Expand all Server Sets

All Server Sets (on the Explorer pane of the Server Sets tab⌐78⌐) are expanded (+) revealing the
individual servers in each Server Set.
This function is also available from a pop-up menu when you right-click anywhere in the Explorer
pane of the Server Sets tab⌐78⌐.

View menu / Collapse all Server Sets

All Server Sets (on the Explorer pane of the Server Sets tab⌐78⌐) are collapsed (-) hiding the individual
servers.
This function is also available from a pop-up menu when you right-click anywhere in the Explorer
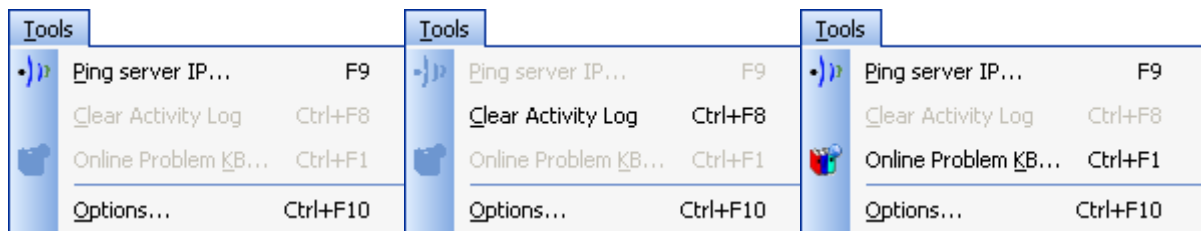pane of the Server Sets tab⌐78⌐.

Tools menu

*Figure 4: Tools menu. The menu changes depending on which main dialog tab is in focus. The first
screen shot of the Tools menu is selected from the Server Sets tab, the second from the Activity Log*

tab and the third is only available if you have selected a specific problem on the Problems tab.

Tools menu / Ping server IP...

When a server appears to be down, for many, the first trouble shooting step is to open a command prompt and ping the server IP address.

You can ping an individual server listed in Simple Failover simply by selecting the Tools menu, and selecting *Ping server IP…* from the menu. The resulting ping dialog gives you instant ping statistics, and continues pinging the server IP address until you close the dialog.
This function is also available via the keyboard shortcut 86 *F9*.

Tools menu / Clear Activity Log

The entries on the Activity Log tab 82 are cleared.
This is handy if you're going to perform a controlled re-test of a single or all of the Server Sets in your list.
This function is also available via the keyboard shortcut 86 *CTRL+F8*, and from a pop-up menu when you right-click anywhere in the Activity Log tab 82.

Tools menu / Online Problem KB…

The menu item is only available when a problem has occured and the Main dialog is placed on the Problems tab 83. In this case you can either right-click on a specific problem on the tab or select this menu item. If you have an Internet connection open it will bring you to our Problem Knowledge database on our web-site.

The Problem Knowledge Base function sends additional data (code exit point, and program version) to better narrow down a solution.
This function is also available via the keyboard shortcut 86 *CTRL+F1*.

Tools menu / Options…

Opens the Options dialog 88 where you can edit the general options of Simple Failover.
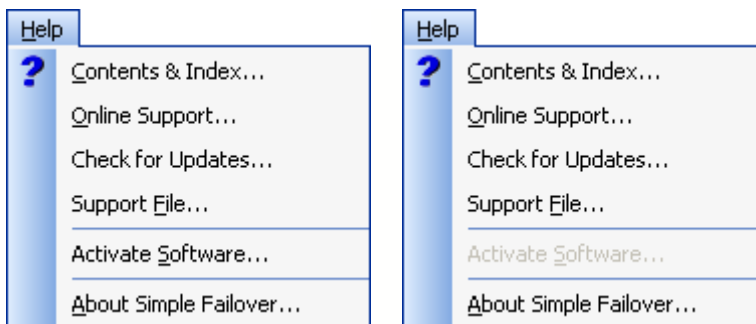This function is also available via the keyboard shortcut 86 *CTRL+F10*.

Help menu

Figure 5: Help menu before and after you have activated Simple Failover.

Help menu / Contents & Index…

Opens this help file.
This function is also available via the keyboard shortcut▯86▯ *F1* or you can receive context-sensitive help by clicking the keyboard shortcut▯86▯ *Ctrl+F1*.

NO ✕ ICON Help menu / Online Support…

Opens the online support page (http://www.simplefailover.com/support.asp) in your default web-browser.
From there you can submit a support request.

NO ✕ ICON Help menu / Check for updates…

Checks if you are running the latest version of Simple Failover.
This is done by submitting the software's version number to a dynamic web-page at http://www.simplefailover.com.
The result is displayed in your default web-browser.
No data other than the software version number is transmitted.

NO ✕ ICON Help menu / Support File

This generates a text file (*support.txt*) in the directory where Simple Failover is installed.
This file contains various information about your setup and the state of Simple Failover on your computer which can be helpful for trouble shooting by JH Software support staff.

NO ✕ ICON Help menu / Activate Software…

Opens the Activation Wizard dialog. This menu item is not available after you have performed the activation proces.

NO ✕ ICON Help menu / About Simple Failover…

Opens the About dialog showing the version number and license/activation status of Simple Failover.

11.1.2 Main dialog - Toolbar

The main dialog toolbar:
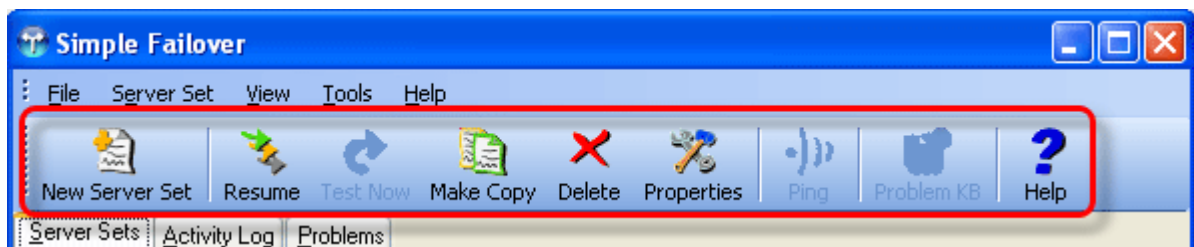
You can select to display the Tool bar or not using the View menu▯7▯ *Toolbar* function.

New Server Set

Use to create a New Server Set. Opens the Server Set Properties dialog⌐95⌐.
This function is also available via File menu⌐71⌐, the keyboard shortcut⌐86⌐ *Ctrl+N*, and from a pop-up menu when you right-click anywhere in the Explorer pane of the Server Sets tab⌐78⌐.

Pause

Resume

Use to pause or resume polling of the currently selected Server Set.
This will not influence the polling of any other Server Sets in the Server Set list.
This function is also available via the Server Set menu⌐71⌐, the keyboard shortcut⌐86⌐ *PAUSE*, and from a pop-up menu when you right-click on a Server Set in the Explorer pane of the Server Sets tab⌐78⌐.
Only available when the Server Sets tab⌐78⌐ is selected, and a Server Set is currently selected.

Test now

Use to immediately poll the currently selected Server Set.
This function is also available via the Server Set menu⌐71⌐, the keyboard shortcut⌐86⌐ *F5*, and from a pop-up menu when you right-click on a Server Set in the Explorer pane of the Server Sets tab⌐78⌐.
Only available when the Server Sets tab⌐78⌐ is selected, and a Server Set is currently selected.

Make Copy

Use to make a copy of the currently selected Server Set. This opens the Server Set Properties dialog⌐95⌐ with almost all values from the source already filled into the fields in the new server set..
This function is also available via the Server Set menu⌐71⌐, the keyboard shortcut⌐86⌐ *CTRL+INS*, and from a pop-up menu when you right-click on a Server Set in the Explorer pane of the Server Sets tab⌐78⌐.
Only available when the Server Sets tab⌐78⌐ is selected, and a Server Set is currently selected.

Delete

Use to delete the currently selected Server Set.
This function is also available via the Server Set menu⌐71⌐, the keyboard shortcut⌐86⌐ *DELETE*, and from a pop-up menu when you right-click on a Server Set in the Explorer pane of the Server Sets tab⌐78⌐.
Only available when the Server Sets tab⌐78⌐ is selected, and a Server Set is currently selected.

Properties

Use to edit the properties of the currently selected Server Set. Opens the Server Set Properties dialog⌐95⌐.
This function is also available via the Server Set menu⌐71⌐, the keyboard shortcut⌐86⌐ *F4*, and from a pop-up menu when you right-click on a Server Set in the Explorer pane of the Server Sets tab⌐78⌐.
Only available when the Server Sets tab⌐78⌐ is selected, and a Server Set is currently selected.

Ping

When a server appears to be down, for many, the first trouble shooting step is to open a command prompt and ping the server IP address.

You can ping an individual server listed in Simple Failover simply by clicking *Ping* from the Toolbar. The resulting Ping dialog 78 gives you instant ping statistics, and continues pinging the server IP address until you close the dialog.

Problem KB

The menu item is only available when a problem has occured and the problem is selected in the Problems tab 83 in the main dialog. You can either right-click on a specific problem on the tab or select this menu item. If you have an Internet connection open it will bring you to our Problem Knowledge database on our web-site.

Help

Opens this help file. You can receive help information by entering either *F1* for this help file or to receive context-sensitive help when in a dialog - as an example Options dialog.

11.1.3 Main dialog - Server Sets tab

The Server Sets tab consists of two panes:

❶ The *Explorer pane* (left) shows all the configured Server Sets and associated server IP addresses, giving you an instant status overview. The Server Sets and the individual servers are each represented by an icon reflecting the current state of the item.
You can sort the Server Sets by domain name or by server type using the View menu 77 / *Sort Server Sets* function (also available from a pop-up menu by right-clicking anywhere in this pane).
You can right-click on an individual server and perform a PING test.

❷ The *Status pane* (right) displays detailed status information for the Server Set or individual server IP currently selected in the Explorer pane.
You can click on the hyperlinks in the Status pane to jump to the corresponding selections.
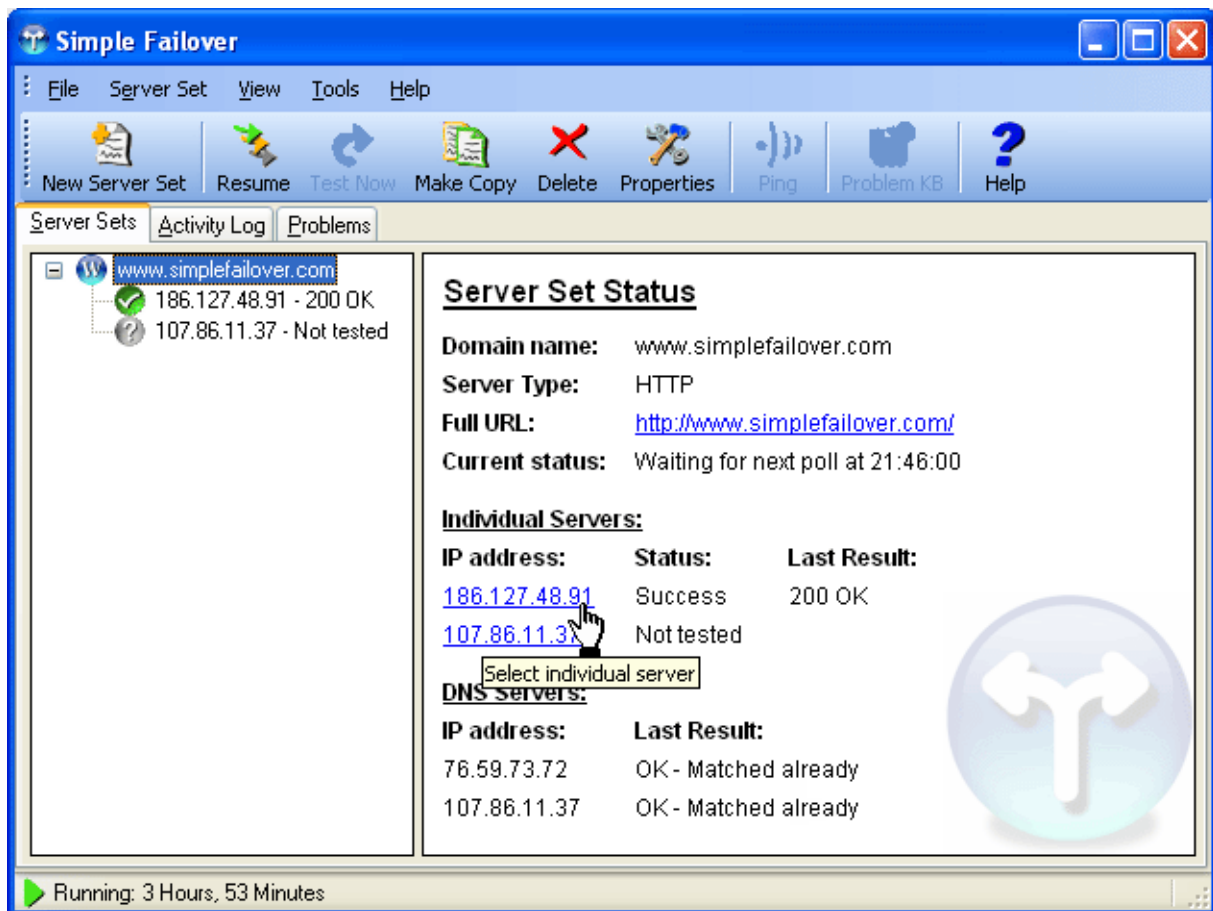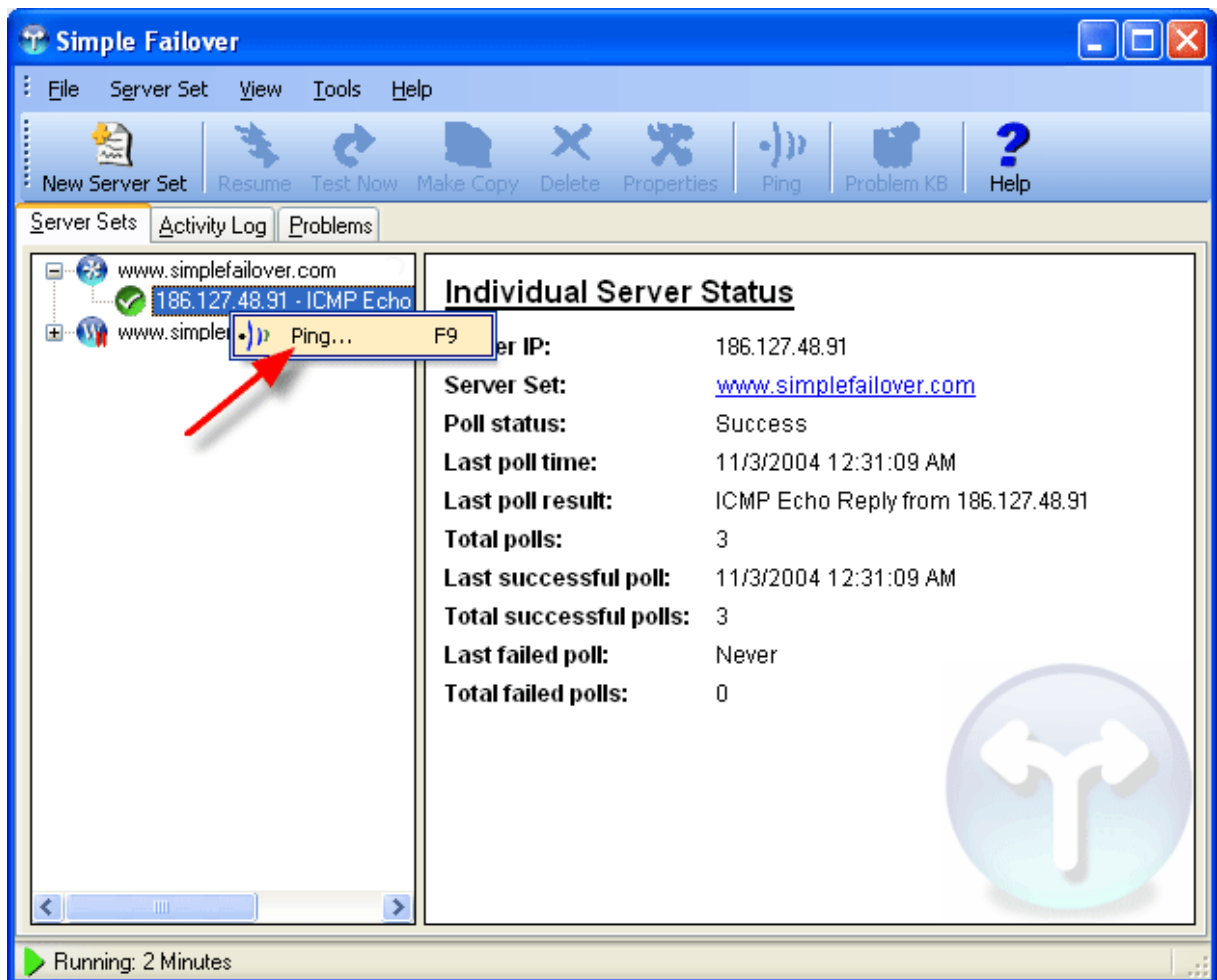
Figure 1: When a Server Set or an individual server IP is selected in the Explorer pane, associated status information is displayed in the Status pane.

Right-click on server to ping
When a server appears to be down, for many, the first trouble shooting step is to open a command prompt and ping the server IP address.

You can now ping an individual server listed in Simple Failover simply by right-clicking on it, and selecting *Ping…* from a popup menu. The resulting ping dialog gives you instant ping statistics, and continues pinging the server IP address until you close the dialog.

Figure 2: If you have selected an individual server in a Server Set, the right click menu enables a Ping dialog box.

Select **Ping…** from the popup menu. Simple Failover begins to ping the selected server.
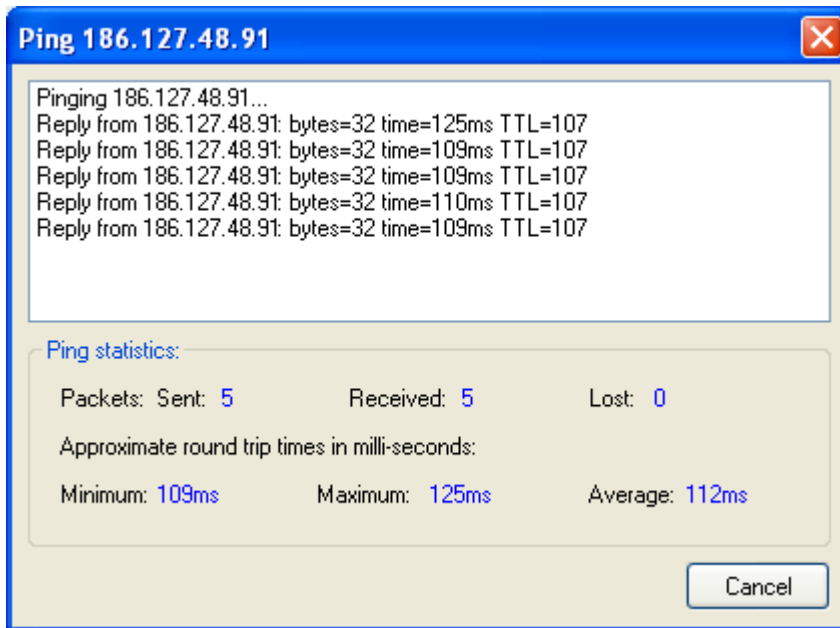
Figure 3: The resulting Ping dialog box of the selected server in a Server Set.

Icon	Description
	Server Sets
	FTP The Server Set is checking a FTP-connection.
	IMAP The Server Set is checking an IMAP-connection.
	NNTP The Server Set is checking a NNTP-connection.
	POP3 The Server Set is checking a POP3-connection.
	SMTP The Server Set is checking a SMTP-connection.
	HTTP The Server Set is checking a HTTP-connection.
	TCP The Server Set is checking a generic TCP server-connection.
	PING The Server Set is checking a PING-connection.
	Paused Server Set

IMAP Paused (example)
> Each Server Set icon has two red vertical lines added to indicate a paused state, when the Server Set is paused.

Server Sets status

OK
> The IP address or the Server Set is resolved and no changes are made to the DNS database by Simple Failover.

Warning
> Simple Failover indicates a server IP address is failing, but have not yet reached the limit value in *Failed polls accepted* on General tab in the Server Set Properties.

Problem
> Simple Failover indicates an IP address is failing and the failover solutions provided in the Server Set is triggered. Depending on the configuration you provided in the Server Set a notification is also sent to the e-mail recipients.

Not tested
> Simple Failover have not yet tested the Server Set to find out if the configured IP address(es) is resolvable.

11.1.4 Main dialog - Activity Log tab

The Activity Log tab shows everything Simple Failover is doing - live.

You can clear all entries from this view using the Tools menu $\boxed{71}$ / *Clear Activity Log* function (also available from a pop-up menu by right-clicking anywhere in the log view).
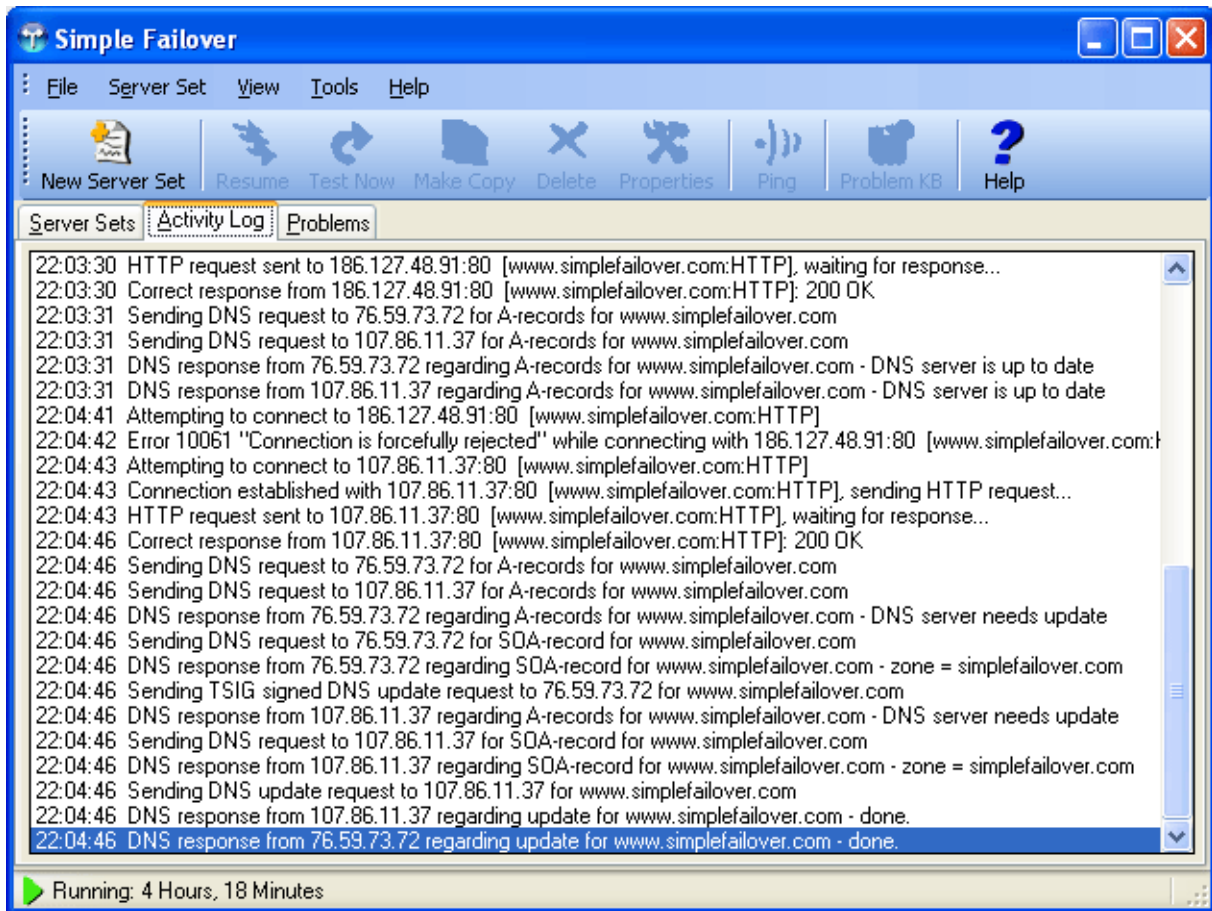
Figure 1: Activity Log tab. This is an example of an successful update.

Note: You can using scripting 92 to record the activity log data to a file.

11.1.5 Main dialog - Problems tab

The Problems tab gives you detailed information about any problems Simple Failover has detected.

The *Problems tab* contains the following columns:

Column	Description
Severity	Either High or Low
Time	When is the problem encountered
Server Set	The Server Set name (Domain name)
Server Type	The Server Type (HTTP, FTP, SMTP, POP3, NNTP, IMAP, TCP, or PING) or DNS.
IP address	The failed server IP address
Description	Description of the problem Simple Failover detected.

Table 1: Columns name and description of the information from the Problems tab.

If you click on a column header, the list will be sorted by the items in that column.
Clicking the same column header again will change the sort order (ascending / descending).

Note: You can use scripting 92⌐ to record this data to a file or database as it happens.
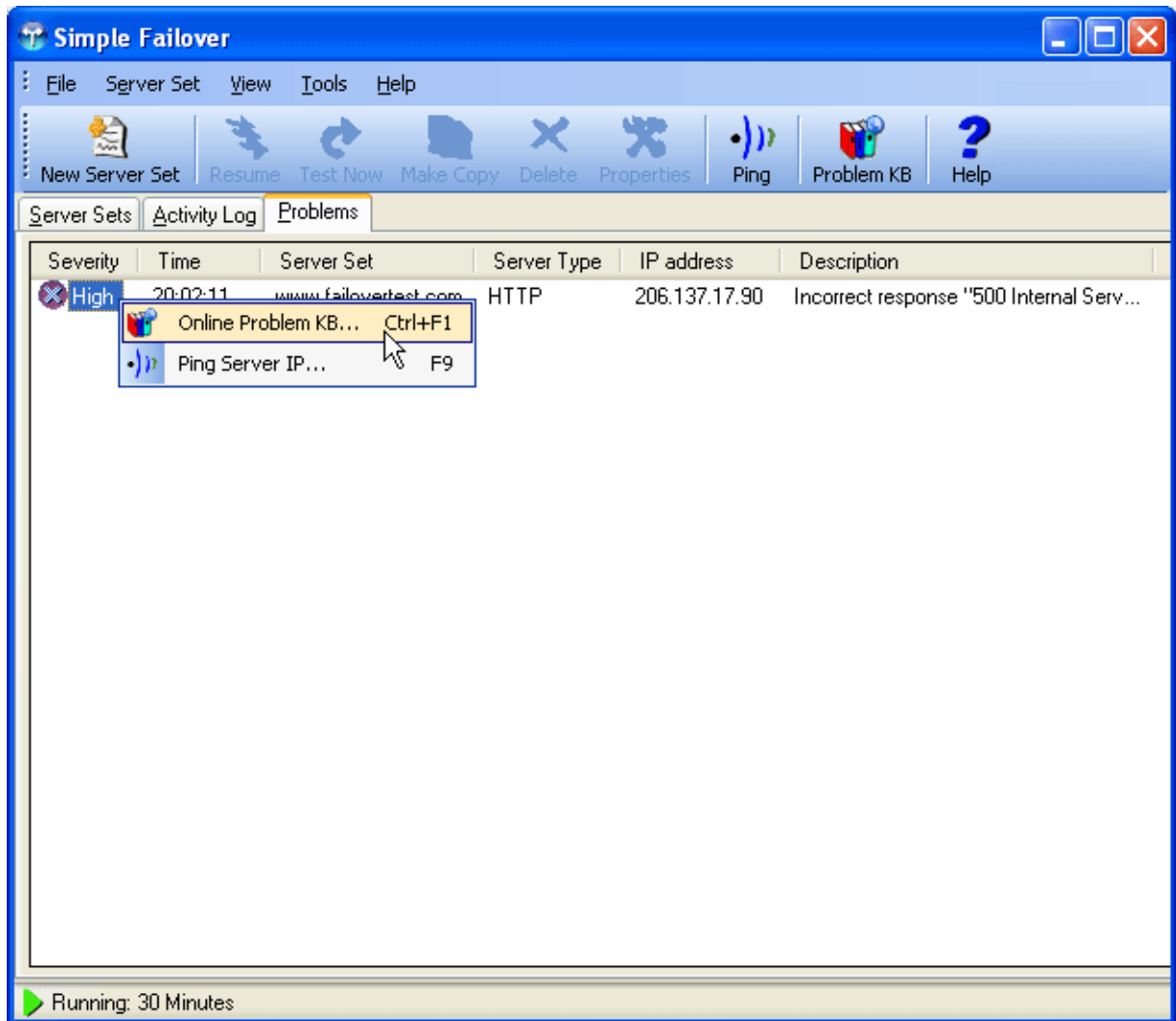
Figure 1: The Problems tab

You can right click on a highlighted item on the Problems tab. The pop-up menu item will open a web-page with advice regarding this problem from our online problem knowledge-base database.

11.1.6 Main dialog - Status bar

The status bar is located at the bottom of the main dialog. It shows the current state of Simple Failover.

You can select to display the status bar or not using the View menu[71] / *Status Bar* function.

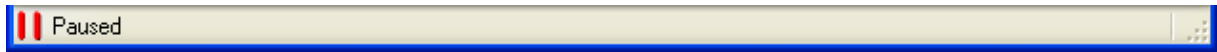*Figure 1: The status bar in run mode.*

Figure 2: The status bar in pause mode.

You can pause/resume Simple Failover by double-clicking anywhere on the status bar.
This function is also available via the keyboard shortcut[86] *ALT+PAUSE*, from the File menu[71], and from the tray icon[105] pop-up menu.

11.1.7 Main dialog - Keyboard shortcuts

Keyboard shortcuts available in Simple Failover.

Shortcut	Description
CTRL+N	*New Server Set* Use to create a New Server Set. Opens the Server Set Properties dialog[95].
Pause	*Server Set Pause / Resume* Use to pause or resume polling of the currently selected Server Set. This will not influence the polling of any other Server Sets in the Server Set list. Only available when the Server Sets tab[78] is selected, and a Server Set is currently selected.
Alt+Pause	*Pause all polling / Resume all polling* Use to pause or resume the polling of all Server Sets.
F5	*Server Set Test now* Use to immediately poll the currently selected Server Set. Only available when the Server Sets tab[78] is selected, and a Server Set is currently selected.
Alt+F5	*Re-test all Server Sets now* Use to initiate polling of all Server Sets immediately.
CTRL+INS	*Make Copy* Use to copy the properties of the currently selected Server Set. Opens the Server Set Properties dialog[95] with allmost all of the values from the source Server Set and a few empty fields to be filled out to create a new target Server Set. Only available when the Server Sets tab[78] is selected, and a Server Set is currently selected.
Delete	*Delete Server Set* Use to delete the currently selected Server Set. Only available when the Server Sets tab[78] is selected, and a Server Set is currently selected.

F4	*Server Set Properties*
	Use to edit the properties of the currently selected Server Set. Opens the Server Set Properties dialog 95 .
	Only available when the Server Sets tab 78 is selected, and a Server Set is currently selected.

F9	*Ping*
	When a server appears to be down, for many, the first trouble shooting step is to open a command prompt and ping the server IP address.
	Only available when the Server Sets tab 78 is selected, and a server in a Server Set is currently selected.

| **CTRL+F1** | *Problem KB* |
| | The keyboard shortcut is only available when a problem has occured and the problem is selected in the Problems tab 83 in the main dialog. |

Ctrl+F8	*Clear Activity Log*
	The entries on the Activity Log tab 82 are cleared.
	This is handy if you're going to perform a controlled re-test of a single or all of the Server Sets in your list.

| **Ctrl+F10** | *Options* |
| | Opens the Options dialog 88 where you can edit the general options of Simple Failover. |

| **Alt+S** | *Server Sets tab* |
| | Selects the Server Sets tab 78 . |

| **Alt+A** | *Activity Log tab* |
| | Selects the Activity Log tab 82 . |

| **Alt+P** | *Problems tab* |
| | Selects the Problems tab 83 . |

| **CTRL+TAB** | *Move forward through tabs* |

| **SHIFT+CTRL+TAB** | *Move backwards through tabs* |

| **F1** | *Help* |
| | Opens this help file. |

11.2   Options dialog

To access the Options dialog, use the Tools menu⌐71⌐ / *Options…* function, or use the keyboard shortcut⌐86⌐ *CTRL+F10*.

The options dialog consists of 4 tabs:
- General tab⌐88⌐
- Default DNS servers tab⌐90⌐
- E-mail notification tab⌐90⌐
- Scripting tab⌐92⌐

11.2.1   Options dialog - General tab

To access the Options dialog, use the Tools menu⌐71⌐ / *Options…* function, or use the keyboard shortcut⌐86⌐ *CTRL+F10*.

Use settings on the General tab to specify general program options:
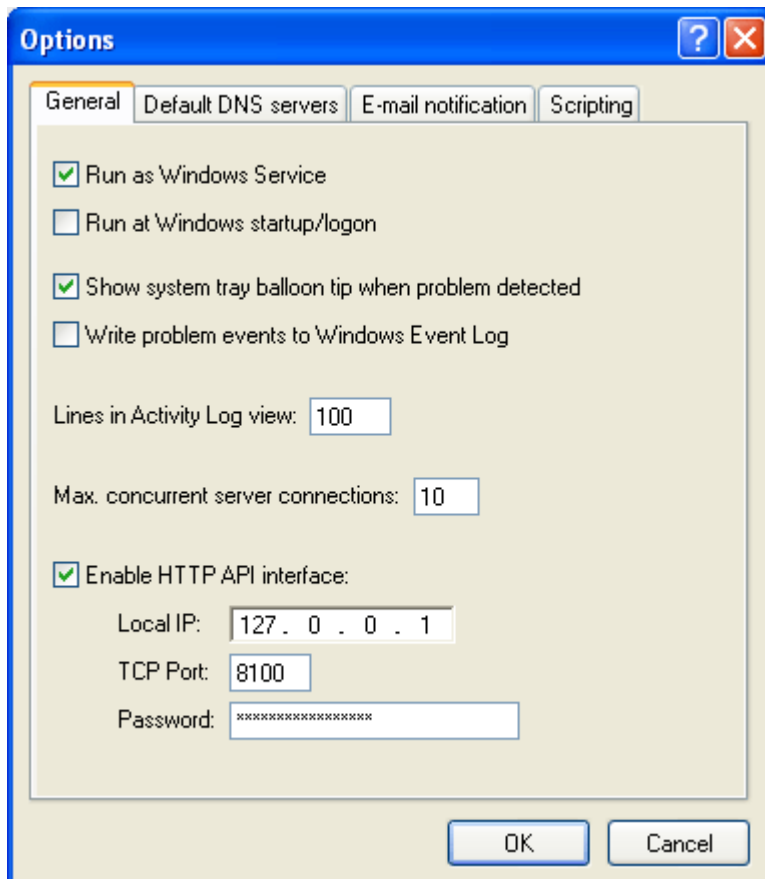
Figure 1: General tab.

Run as Windows Service
Simple Failover can run as a Windows Service. This means you can have Simple Failover running without being logged into the computer.
Please note: that the Simple Failover service runs under the *SYSTEM* user account, so all scripts and other actions taken by Simple Failover will be performed with that security context.
As with other Windows services, you can start and stop the Simple Failover service using the

Services management console (See Windows Control Panel / Administrative Tools / Services).
And you can start and stop it from a command prompt using *NET START sfo* and *NET STOP sfo*.

Note: This option is not available on Windows 95, 98, and ME computers.

When you first select this option, Simple Failover must be restarted before it runs as a Windows Service.
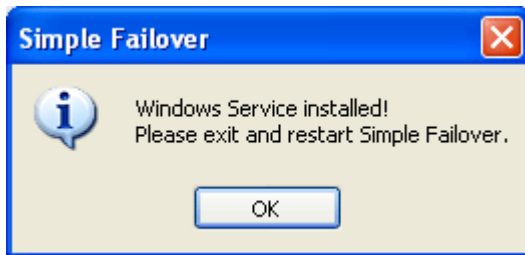
Run at Windows startup/logon
With this option enabled, Simple Failover will automatically be started when you startup Windows (if no logon is used) or as soon as you logon to Windows.

Note: Only one of the two options *Run as Windows Service* or *Run at Windows startup/logon* can be enabled.

Show system tray balloon tip when problem detected
With this option enabled, Simple Failover will show a balloon tip notification from the system tray icon 105 whenever a problem is detected.
Note: This option only works on Windows ME, 2000, and later.

Write problem events to Windows Event Log
With this option enabled, Simple Failover will record problems detected to the Windows Event Log (see Windows Control Panel / Administrative Tools / Event Viewer).
Note: This option is not available on Windows 95, 98, and ME computers.

Lines in activity log view
This number specifies the number of log lines available in the Activity Log tab 82.
When this number of lines is exceeded, the oldest entries are removed to make room for new.
The default setting is 100.

Max. concurrent server connections
This number defines the maximum number of Server Sets that may be polled at the same time.
The default and recommended value is 10, but you may wish to adjust this depending on the number of server sets you have and the computer/network resources available.

Enable HTTP API interface
Use this setting to enable / disable the HTTP API interface.

Local IP
Specify the local IP address (on the computer running Simple Failover) that you wish Simple Failover to serve HTTP connections on.
If you only want to enable access from the same computer, you can use *127.0.0.1*.

TCP Port
Specify the TCP port number that you wish Simple Failover to serve HTTP connections on.
Make sure to specify a port number that is not used by any other application or service on the

computer.

Note: To access the HTTP API interface, you must use the URL ***http://ip-address:port-number*** where ip-address is the ***Local IP*** field, and port-number is the ***TCP-port*** field from above.
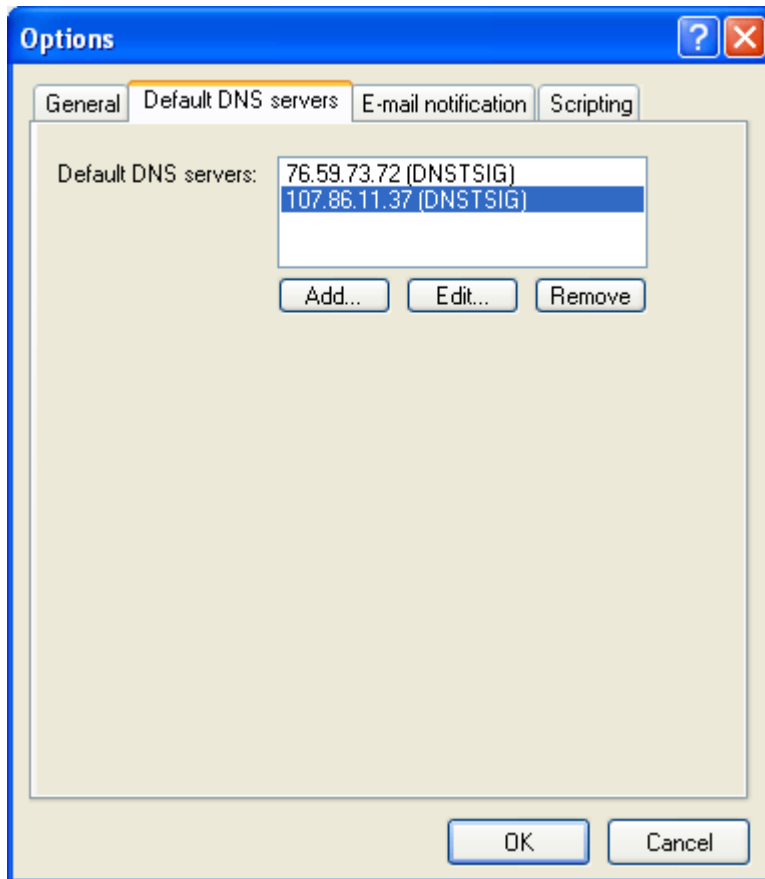
Password
Here you can specify a password for the HTTP API interface (the user name is always ***admin*** or just blank).
Leave the password field blank if you do not wish to password protect the HTTP API interface.

Please note: the HTTP API interface is only available with the Professional license type.

11.2.2 Options dialog - Default DNS servers tab

Default DNS servers
Instead of having to enter all the DNS server settings for each individual server set, you can simply select ***Use default DNS servers (Options dialog)*** on the Update DNS tab ⟨98⟩ tab in the Server Set Properties dialog.
This is a real time saver if you have many server sets using the same DNS servers.

11.2.3 Options dialog - E-mail notification tab

To access the Options dialog, use the Tools menu ⟨71⟩ / ***Options…*** function, or use the keyboard shortcut ⟨86⟩ ***CTRL+F10***.

The settings on the E-mail notification tab apply to all e-mail notifications sent.

Note: The e-mail *"To"* field is specified in the individual Server Sets - see the Server Set Properties dialog - Notification tab ⟨99⟩.
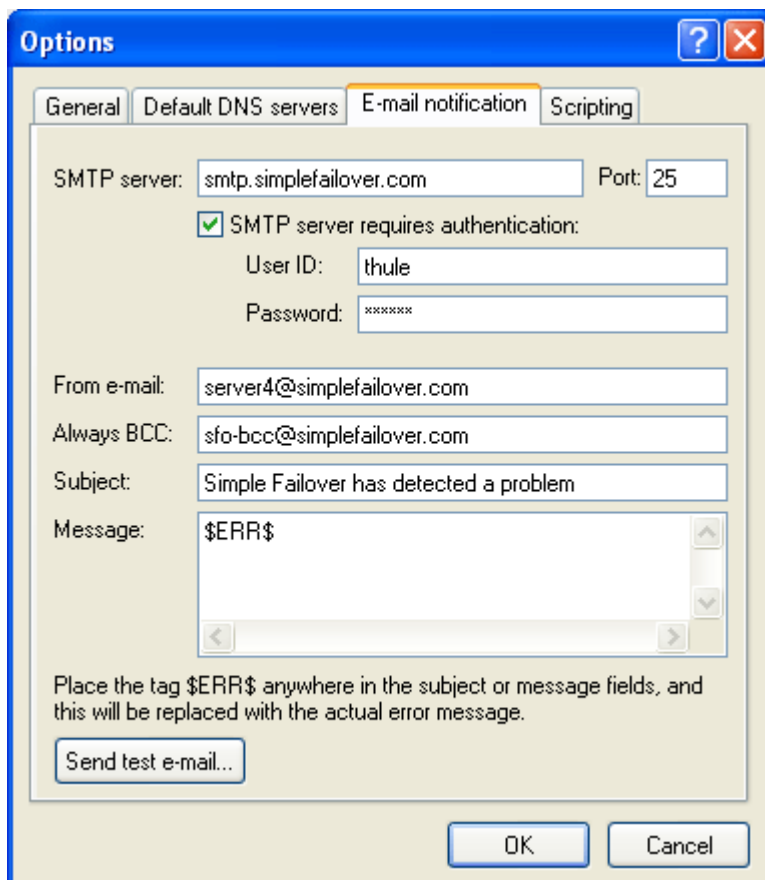

Figure 1: E-mail notification tab.

SMTP Server
Specify the SMTP server *domain name* or *IP address* that you wish Simple Failover to send e-mail notifications through.

Port
Specify the *TCP port number* of the SMTP server.
The default port used by most SMTP servers is 25. Enter the port number used by your system.

SMTP server requires authentication
To block spam and viruses, many e-mail servers require authentication for outgoing e-mail.
Check this option and enter your *User ID* and *Password* as required by the SMTP server.
Make sure to use the *Send test e-mail* button to ensure that Simple Failover can successfully authenticate before relying on this feature.

From e-mail
Enter the *e-mail address* that will appear as the *From* address in all e-mail notifications.
You may wish to use a unique e-mail address for this to allow recipients to create special processing rules for this in their e-mail client software.

Always BCC
Enter an *e-mail address* to receive a copy of all e-mail notifications.
The main recipient of the e-mail will not see this BCC (Blind Carbon Copy) e-mail address.

Subject
Enter the subject text that will appear in all e-mail notification messages.
You may wish to use a unique subject text to allow recipients to create special processing rules for this in their e-mail client software.
Place an *ERR* tag anywhere in this text, and this will be replaced by the error notification text produced by Simple Failover in actual notification e-mails.

Message
Enter the message body text that will appear in all e-mail notification messages.
Place an *ERR* tag anywhere in this text, and this will be replaced by the error notification text produced by Simple Failover in actual notification e-mails.

Send test e-mail button
Click this button to test the settings above.
A test e-mail where the ERR are replaced with *<<TEST-PROBLEM>>* will be sent.
For trouble-shooting purposes, the actual communication with the SMTP server will be displayed in a new window:
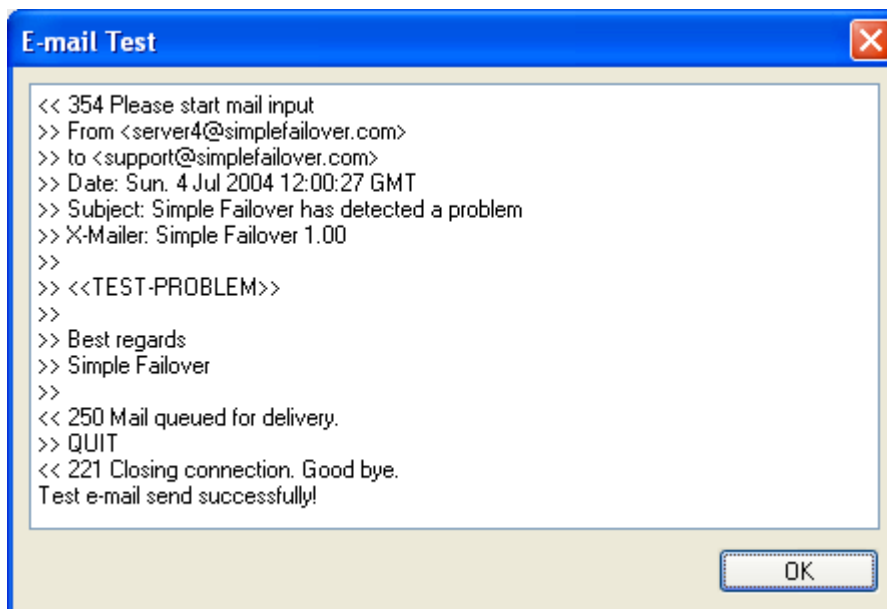
Figure 2: Communicating with the SMTP server while sending a test e-mail.

11.2.4   Options dialog - Scripting tab

To access the Options dialog, use the Tools menu⌐71⌐ / *Options…* function, or use the keyboard shortcut⌐86⌐ *CTRL+F10*.

Simple Failover can be extended through scripting.
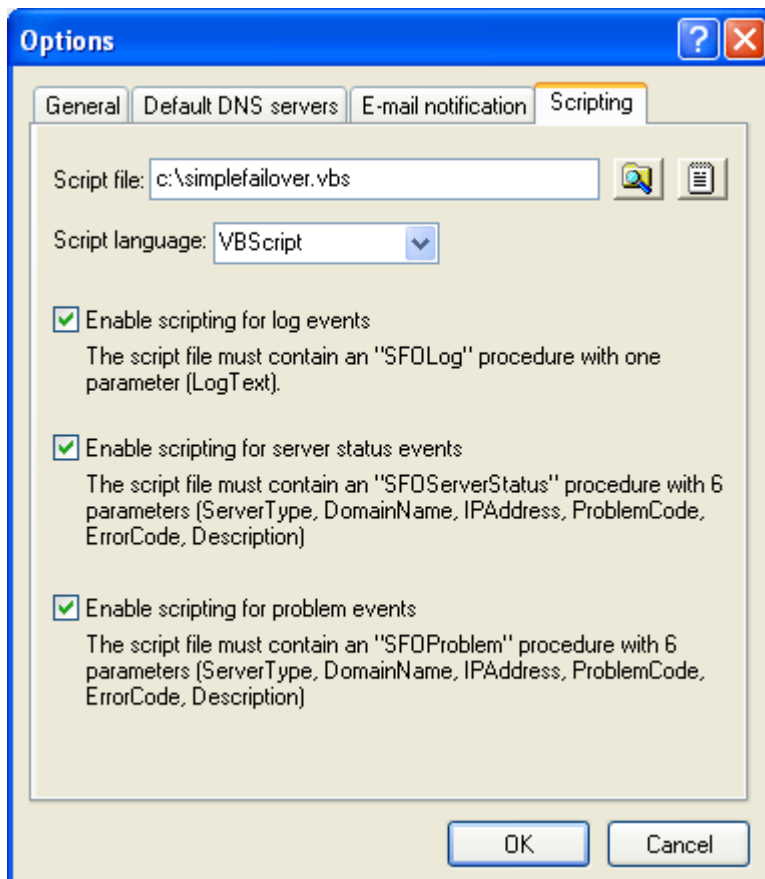Any scripting language that works with the *WSH* (Windows Scripting Host) can be used.

Figure 1: The scripting tab.

Script File
Specify the *Script file* that contains the script procedures you will be using.

Please note that in addition to the procedures enabled below, this script file must also contain the *SFOUpdateDNS* procedure if any Server Set uses scripting to update DNS (see Update DNS via Scripting 70).

Script Language
Enter the ID of the scripting language that you will be using (as recognized by the WSH).
You can select one of the default languages *VBScript* or *JScript* using the drop-down box, or type in any other language ID.

Enable scripting for log events
Each line that appears in the Activity Log tab 82 will also be sent to the *SFOLog* script procedure with a single parameter containing the line of text which was logged.

A very simple use of this would be to write the log entries to the hard disk.
A sample script doing this is provided in the *sfo-log-script.vbs* file in the *Script Samples* directory.
Please note that the sample script is kept very simple for demonstration purposes. For production use, proper error handling should be added.

Enable scripting for server status events
Whenever Simple Failover has polled a server, it will execute the *SFOServerStatus* script procedure with the following 6 parameters:
❶ *ServerType*: Type of server polled (HTTP, FTP, etc.).

❷ *DomainName*: The Server Set domain name.
❸ *IPAddress*: The IP address of the individual server polled.
❹ *ProblemCode*: Zero if the server responded correctly, otherwise a problem code [150] classifying the problem detected.
❺ *ErrorCode*: Any error number associated with the problem detected.
❻ *Description*: A text description of the server status.

One possible use of this would be to record server status events in a database, making it possible to create long term statistics on server availability etc.
A sample script doing this is provided in the *sfo-status-script.vbs* file in the *Script Samples* directory.
The *sql-layout.gif* image file in the same location shows the SQL database layout used with the sample.
Please note that the sample script is kept very simple for demonstration purposes. For production use, proper error handling should be added.

Enable scripting for problem events
Whenever Simple Failover detects a problem, it will execute the *SFOProblem* script procedure with the following 6 parameters:
❶ *ServerType*: Type of server polled (DNS, HTTP, FTP, etc.).
❷ *DomainName*: The Server Set domain name.
❸ *IPAddress*: The IP address of the individual server polled or the DNS server.
❹ *ProblemCode*: A problem code [150] classifying the problem detected.
❺ *ErrorCode*: Any error number associated with the problem detected.
❻ *Description*: A text description of the problem.

A possible use of this would be to provide customized problem notification - such as pager, SMS, AOL Messenger, etc.

11.3 Server Set Properties dialog

The Server Set Properties dialog is used to create a new Server Set, or to edit the properties of an existing Server Set.

Create a new Server Set using the keyboard shortcut 86 **Ctrl+N**, or use the **New Server Set** function available on the Toolbar 76, in the File menu 71, and on the pop-up menu when you right-click anywhere in the Explorer pane of the Server Sets tab 78.

Edit the properties of an existing Server Sets by first selecting the Server Set in the Explorer pane of the Server Sets tab 78, and then use the keyboard shortcut 86 **F4**, or use the **Properties** function available on the Toolbar 76, in the Server Set menu 71, and on the pop-up menu when you right-click on the Server Set.

The Server Set Properties dialog consists of 3 tabs:
- Servers Tab 95
- Dynamic DNS update 98
- Notification 99
- Notes 100

11.3.1 Server Set Properties dialog - Servers tab

On the Servers tab, you can specify the server type, the domain name, the individual servers, and the polling timers for the Server Set:
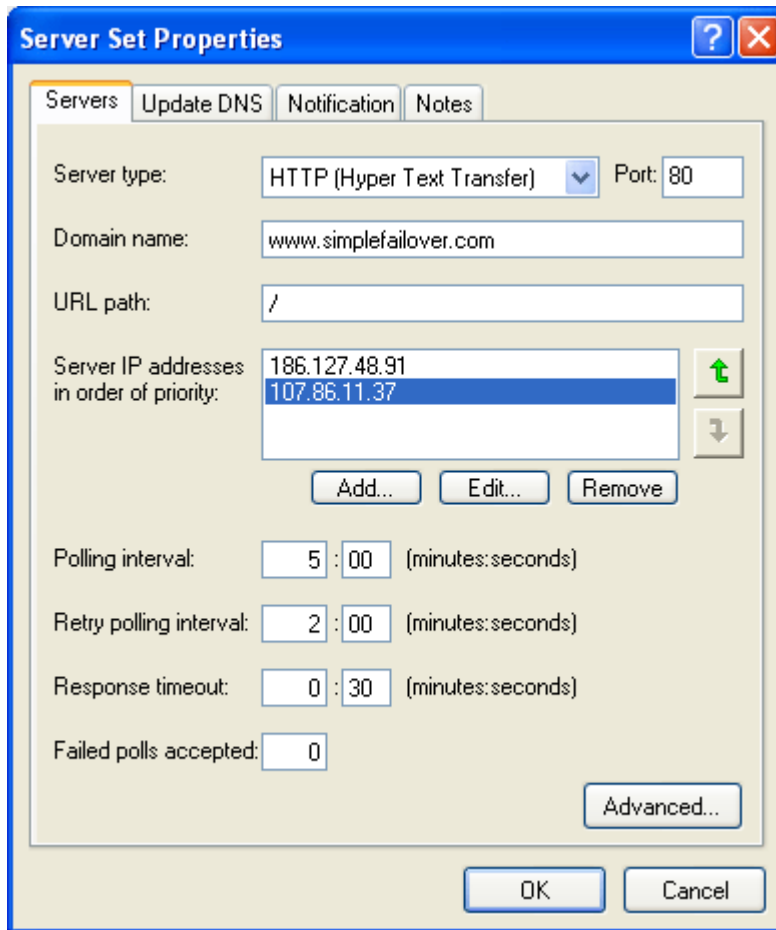
Figure 1: The Servers tab in Server Set Properties dialog.

Server Type
Select the type of service you want to monitor. You can choose between the 6 supported server types in the drop-down list:
See monitoring methods $\boxed{55}$ for details on each server type.

Please note: depending on your license type the number of Server Types may be limited.

Server TCP Port
If you wish to monitor a service on an alternate TCP port number (for example a web-server on port *8080* instead of the default port 80), enter that port number in this field here.

Domain Name
Enter the domain name of this Server Set.
This is the domain name that users access the servers in this Server Set with.

URL Path (HTTP server type only)
Enter a path and / or web-page that you want Simple Failover to request when polling servers in this Server Set.
For example if you want to check the availability of the URL
"http://www.yourdomain.com/intra/budget.html", choose server type *HTTP*, enter domain name "www.yourdomain.com", and enter the URL path "/intra/budget.html".

Server IP addresses in order of priority

Enter the IP addresses of the individual servers in this Server Set.
Unless you are using DNS round robin for load balancing traffic between these servers, the servers should be listed in order of priority (primary server first, backup server last). Use the arrow buttons on the right to change the order.

Polling interval
How often this Server Set is polled.
You should balance this between how quickly you want problems detected, and how much traffic you want Simple Failover to cause.
Note: Polling too often may be flagged as a DOS attack by some firewalls.
The default setting is 5 minutes.

Retry polling interval
After a problem first is detected, subsequent polls will use this interval.
The default setting is 2 minutes.

Response timeout
Specifies the amount of time that Simple Failover will wait for a response from the remote server.
The default setting is 30 seconds.

Failed polls accepted
This threshold determines how many failed polls are accepted before the state of the server is reported as a failed.
The default setting is 0 (zero).

Advanced Server Set Properties
When you select the *Advanded…* button Simple Failover opens a dialog where you can change additional settings for the server set.
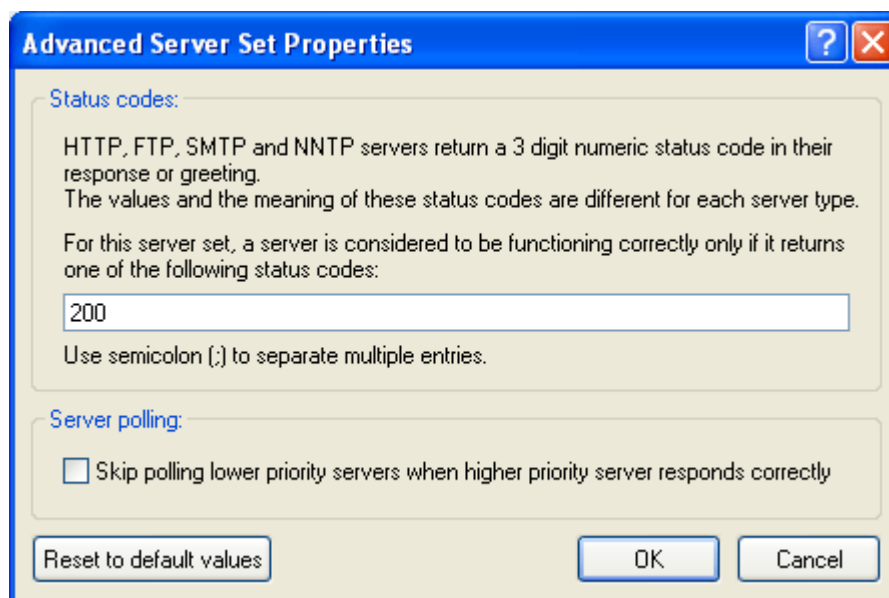
Figure 2: The Advanced Server Set Properties dialog with default values.

Status codes
Here you can specify the server response codes accepted by Simple Failover. For example if, for an HTTP server, you wish to accept the status code 401 in addition to the default code, enter *200;401*.

This field is only available for HTTP, FTP, SMTP, and NNTP servers.

Skip polling lower priority servers when higher priority server responds correctly
The default for Simple Failover is to always check every server in a Server Set. If you do not want
this to happen, you can enable this option which stops Simple Failover from polling lower prioritized
servers as soon as it encounters an higher prioritized server responding.

11.3.2 Server Set Properties dialog - Update DNS tab

On the Update DNS tab, you can enable / disable DNS updating for the Server Set, specify the DNS
servers to update, and specify settings for the DNS records updated.
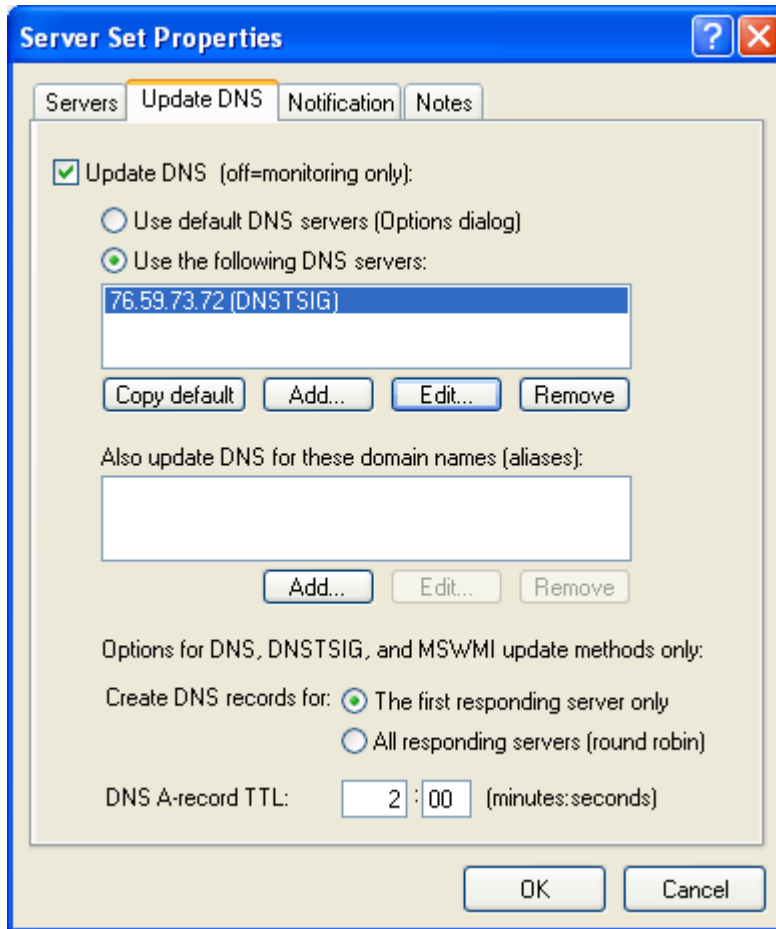
Figure 1: The Update DNS tab on Server Set Properties.

Update DNS (off=monitoring only)
Use to enable / disable DNS update for this Server Set.
The main purpose of Simple Failover is to provide failover protection by monitoring your servers and
updating DNS accordingly.
However, you can also using Simple Failover just for simple server monitoring by leaving this option
off.

Use default DNS servers (Options dialog)
Instead of entering specific DNS servers for this server set, you can select this option to use the
default DNS servers specified in the Options⌐90⌐ dialog.

Use the following DNS servers:
Specify the DNS Servers that you want Simple Failover to update for this Server Set.

When you add or edit a DNS server, you can specify the DNS update method and associated properties in the DNS Server Properties dialog ⌐102⌐.

Also update DNS for these domain names (aliases)
Sometimes a single Internet service can be accessed via several different domain names.
The service provides the exact same contents / functionality no matter which domain name is used.
A typical example of this is a web-site which can be accessed both with and without the *www* domain name prefix (which are technically two different domain names).
There is usually no reason for testing such a service with more than one of the domain names, yet in case of a failure, you still want to update DNS for all the domain names so that they all point to the functional server IP address.
This option lets you specify additional domain names to be updated for a server set.

Please note: we do not recommend using DNS CNAME-records for alias domain names because DNS responses containing such records are cached differently by Internet Explorer (typically for a fixed period of 30 minutes).

Please note: depending on your license type the number of DNS Alias domain name may be limited.

Options for DNS servers using the DNS, DNSTSIG or MSWMI update methods only:

Create DNS records for
You can choose to either create DNS records for *The first responding server only* or *All responding servers (round robin)*.
Use the first option if you always want traffic to be directed to the first server (on the Servers tab ⌐95⌐) unless there is a problem with this server.
Use the second option if you want traffic to be rotated between all the available servers (make sure to also enable the *round robin* option on the DNS servers).

DNS A-record TTL
Defines the *TTL* (Time To Live) of the DNS records created by Simple Failover.
Generally this should be set very low to avoid caching on other DNS servers.
However setting it too low may cause excessive DNS traffic.
We recommend a value of half the Server Set polling interval or less.
The default setting is 30 seconds.

11.3.3   Server Set Properties dialog - Notification tab

On the Notification tab you can enable e-mail notification for this Server Set.

Please note that general e-mail settings must first be configured in the Options dialog / E-mail notification tab ⌐90⌐.
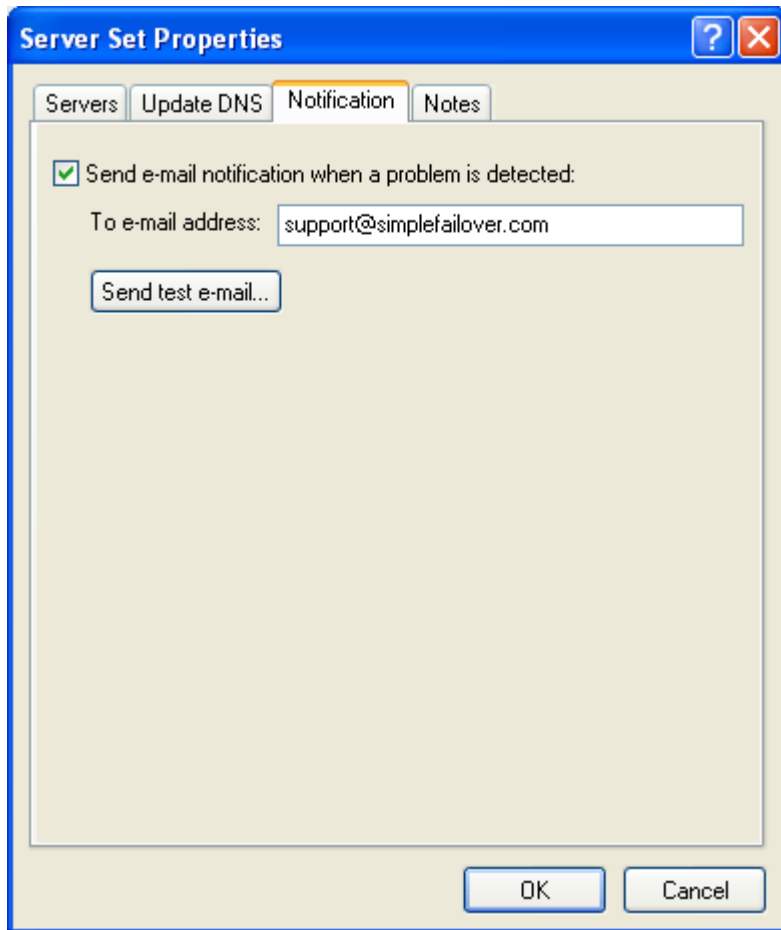
Figure 1: Notification tab in the Server Set Properties dialog.

Send e-mail notification when a problem is detected
Check this to enabled e-mail notifications for this Server Set.

To e-mail address
Enter the e-mail address of the person who should received e-mail notifications for this Server Set.
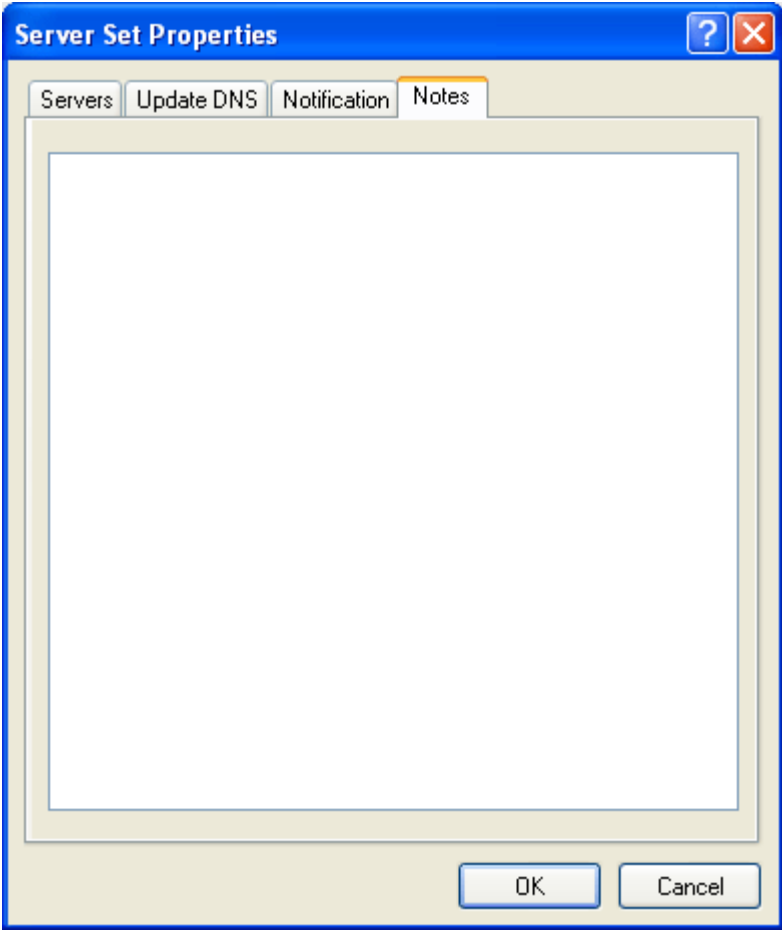
Send test e-mail…
Use to test the e-mail setup.

11.3.4 Server Set Properties dialog - Notes tab

On the Notes tab you can enter information about the Server Set.

As an example you can use it as a change log, an information about location and special configuration, hardware, or customer ID.

11.4 DNS Server Properties dialog

To access the DNS Server Properties dialog, add or edit a DNS server in the Server Set Properties dialog / Update DNS tab [98], or in the Options dialog / Default DNS Servers tab [90].

In the DNS server Properties dialog, you can specify the DNS server IP address, the DNS update method and related settings:
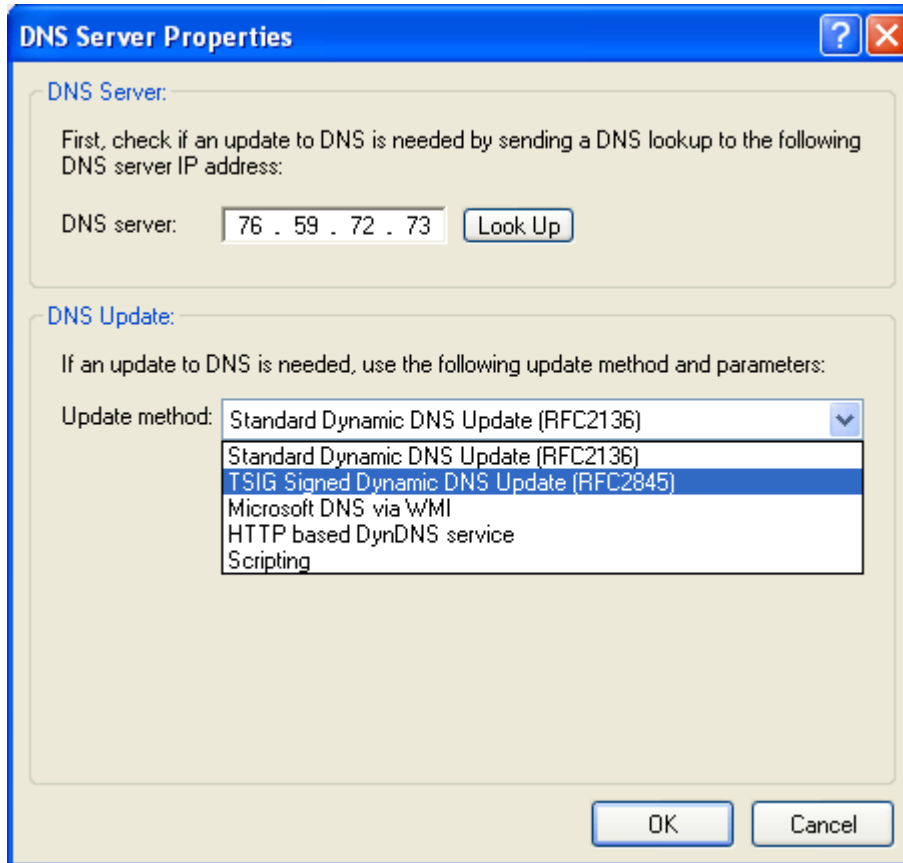
DNS server
Enter the *IP address* of the DNS server.
You can click the *Look Up* button to find the IP address of a DNS server domain name.

Update method
Select one of the 5 available DNS update methods:
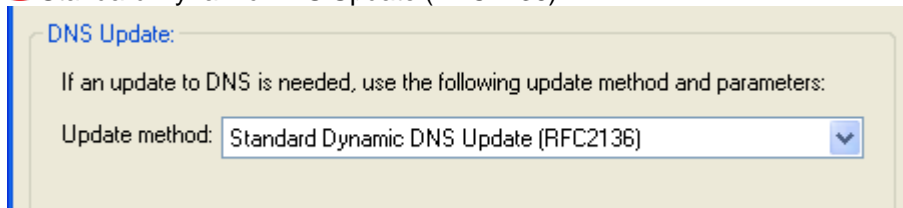
❶ Standard Dynamic DNS Update (RFC2136):

No additional settings are needed for this method.
For details about this update method, see Standard Dynamic DNS update [65].

❷ TSIG Signed Dynamic DNS Update (RFC2845):

This method requires a key name and a key value.
IMPORTANT: These values should match those on the DNS server.
The key name should be entered in domain name format, but can otherwise be anything you choose.
The key value is a base64 encoded binary value - click the **Generate** button to generate a new value.
For details about this update method, see TSIG Signed Dynamic DNS update 67.

❸ Microsoft DNS via WMI:

This method requires a user ID and a password.
This user ID must be allowed access to delete and add records in the DNS zone on the DNS server.
The user ID may need to include a Windows domain name or computer name - for example **server1\administrator**.
Use the **Test WMI connection** button to make sure Simple Failover can communicate with the DNS server.
For details about this update method, see Update DNS via WMI 68 and Microsoft DNS 115.

❹ HTTP based DynDNS service:

This method requires an update URL for the DynDNS service.
Optionally a user ID and password can be specified for basic HTTP authentication.
Simple Failover lets you specify a case-sensitive *Success text* string. Simple Failover will read the status reply from your provider and see if it can find this exact information on the page. You may also include HTML tags to ensure an exact match.
For details about this update method, see Update DNS via HTTP [69].

5 Scripting:

DNS Update:

If an update to DNS is needed, use the following update method and parameters:

Update method: Scripting

The script file (specified in the Options dialog / Scripting tab) must contain an "SFOUpdateDNS" procedure with 4 parameters (DNSServerIP, ZoneName, DomainName, IPAddress).

No additional settings are needed for this method.
For details about this update method, see Update DNS via Scripting [70].

11.5 Tray Icon

Simple Failover is represented by an icon in the system tray of your Windows desktop area.
This provides several useful features as follows:

Double-clicking on the icon will open the main dialog⁷¹.

You can access a pop-up menu by right-clicking on the icon:
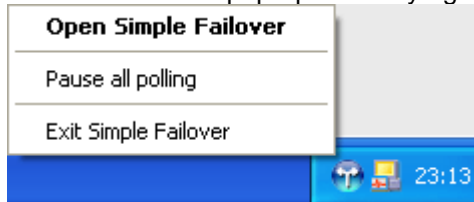
From this menu, you can either ***Open Simple Failover*** (opens the main dialog⁷¹), Pause / Resume
all polling, or Exit Simple Failover.

When all polling is paused, this will be indicated by two red vertical lines on the tray icon:

The tray icon will also show balloon tips to inform you of any problems detected (when enabled in the
Options dialog / General tab⁸⁸):

Hidden tray icon

Windows XP (and later) has an option to ***hide inactive icons*** in the tray.
This option is enabled by default, and so the Simple Failover icon may not always be shown:

You can click the left-arrow button to temporarily reveal the hidden icons:

You can configure Windows to always show the Simple Failover icon as follows:

Right-click anywhere on the task-bar and select ***Properties***:
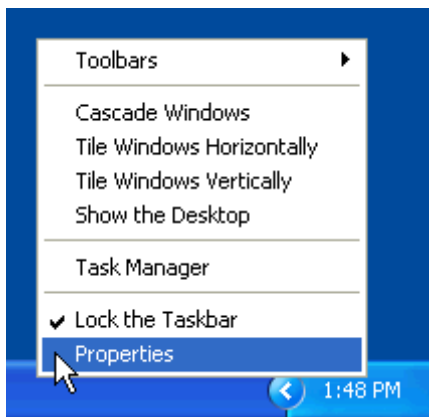
In the "Taskbar and Start Menu Properties" dialog, click the **Customize button** (or un-check **Hide inactivate icons** to always show all tray icons):
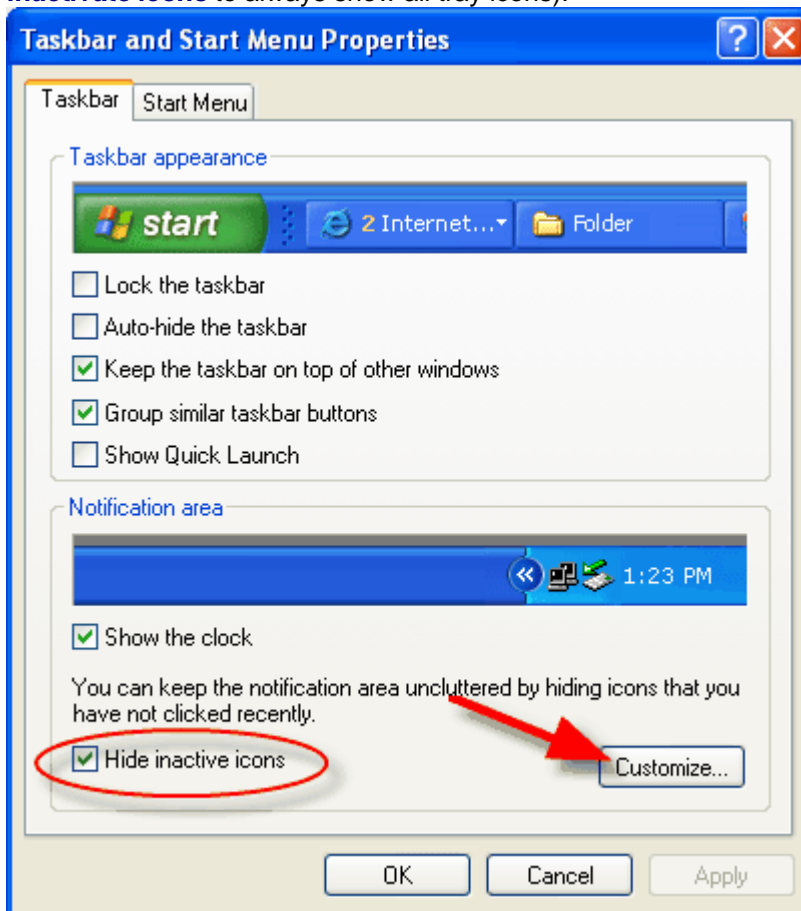
In the "Customize Notifications" dialog, next to the line containing the Simple Failover icon and name, select **Always show** from drop-down list:
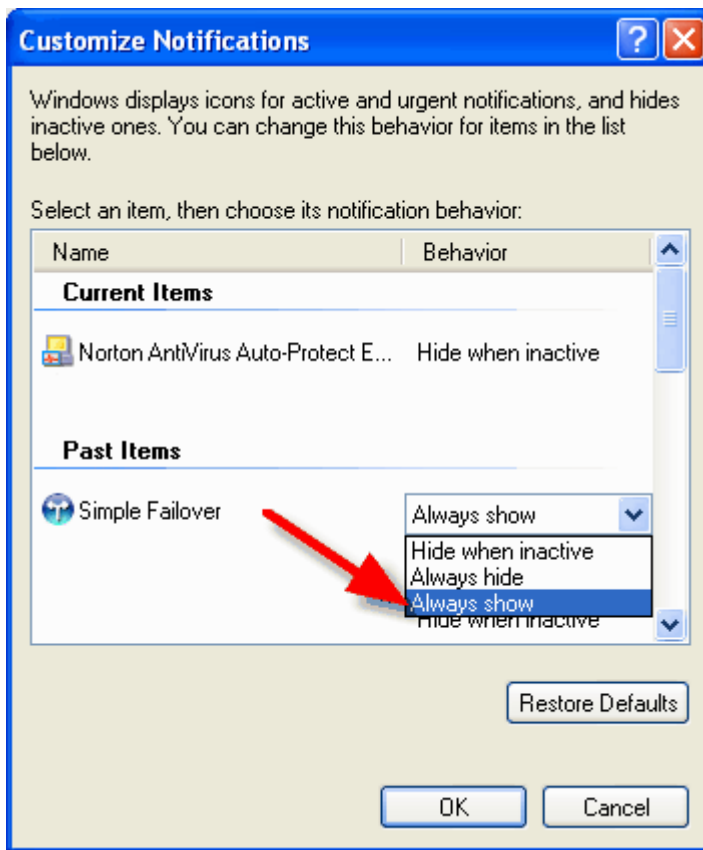
Click the **OK** button to save your changes.

12   Specific DNS server software

Instructions and recommendations are available for the following DNS servers:

- Simple DNS Plus[109]
- BIND[113]
- Microsoft DNS[115]
- Novell DNS[117]

We have only tested Simple Failover with the above mentioned DNS servers, but you should also be able to use it with most DNS servers though at one or more of the available DNS update methods[64].

12.1 Simple DNS Plus

Simple DNS Plus is a DNS server software package for desktop and server versions of Windows (95/NT4 and later).
For more information on this product see www.simpledns.com.

Simple DNS Plus version 3.60 and later:

Standard dynamic DNS updates 65, TSIG signed dynamic DNS updates 67, and updates via HTTP 69 are supported.

If using standard dynamic DNS updates, you can limit access to this by client IP address in each zone.

If using updates via HTTP, you can limit access to this with a password (basic HTTP authentication), and / or by client IP address.

For the strongest security, we recommend using TSIG signed dynamic DNS updates.

Simple DNS Plus version 3.20 and later:

Standard dynamic DNS updates 65, and updates via HTTP 69 are supported.

If using standard dynamic DNS updates, you can limit access to this by client IP address in each zone.

If using updates via HTTP, you can limit access to this with a password (basic HTTP authentication), and / or by client IP address.

For detailed instructions for enabling DNS updates in Simple DNS Plus, see the following sections:
Simple DNS Plus - Standard Dynamic DNS Updates 109.
Simple DNS Plus - TSIG Signed Dynamic DNS Updates 110.

12.1.1 Simple DNS Plus - Standard Dynamic DNS Updates

In Simple DNS Plus (version 3.20 and later), standard Dynamic DNS updates are configured individually for each DNS zone.

In the main dialog in Simple DNS Plus, click the *Records* button:
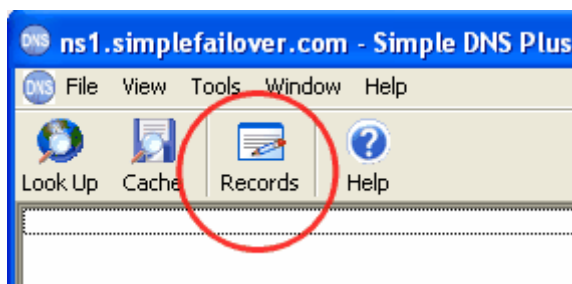
In the *DNS Records* dialog, select the zone you want to update with Simple Failover in the Explorer pane, and click the *Properties* button:
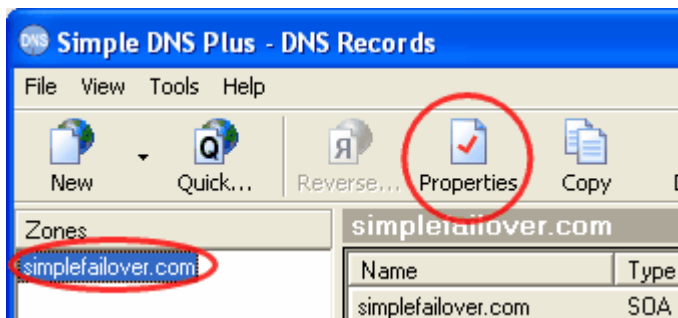
In the zone properties dialog under the *Dynamic Updates* tab, check *Accept Standard Dynamic Update requests* and specify that only the IP address of the computer running Simple Failover is allowed to do this (subnet mask 255.255.255.255 means one IP only):
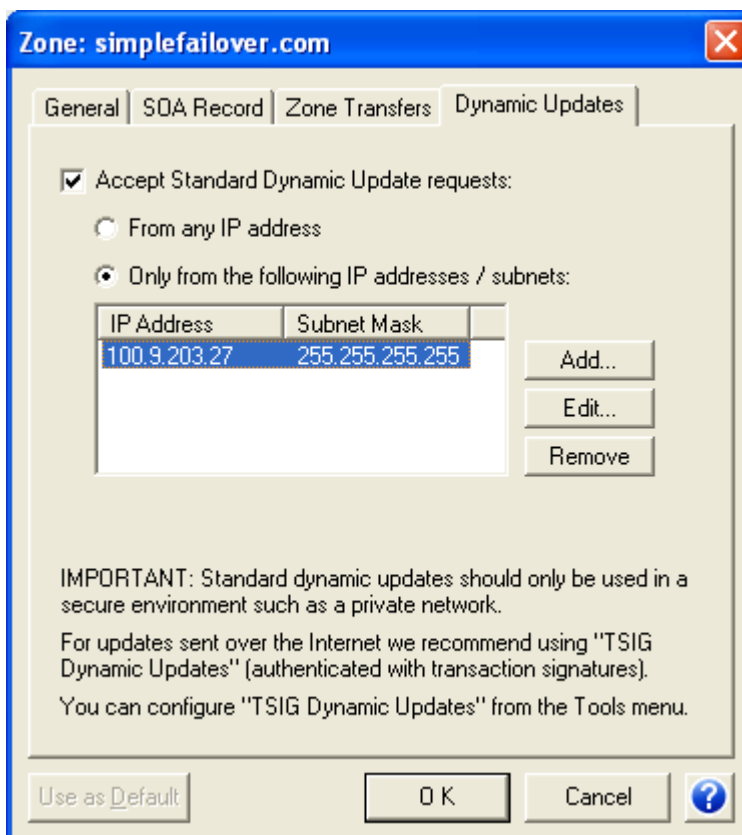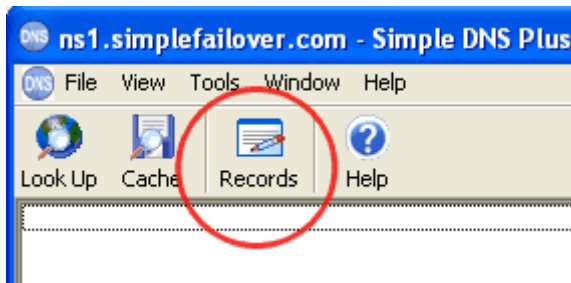

See the Standard Dynamic DNS update 65 section for more details on this update method.

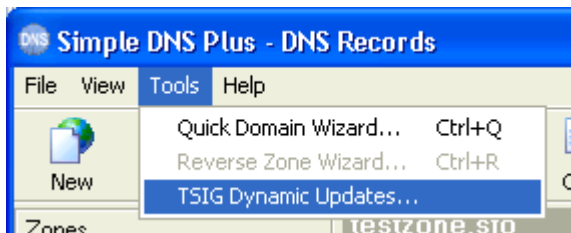### 12.1.2 Simple DNS Plus - TSIG Signed Dynamic DNS Updates

Simple DNS Plus (version 3.60 and later):

To enable TSIG Signed Dynamic DNS Updates in Simple DNS Plus (version 3.60 and later), follow these steps:

In the main dialog of Simple DNS Plus, click the *Records* button:

In the **DNS Records** dialog, select **TSIG Dynamic Updates…** from the **Tools** menu:

In the **TSIG Dynamic Updates** dialog, click the **Add…** button:
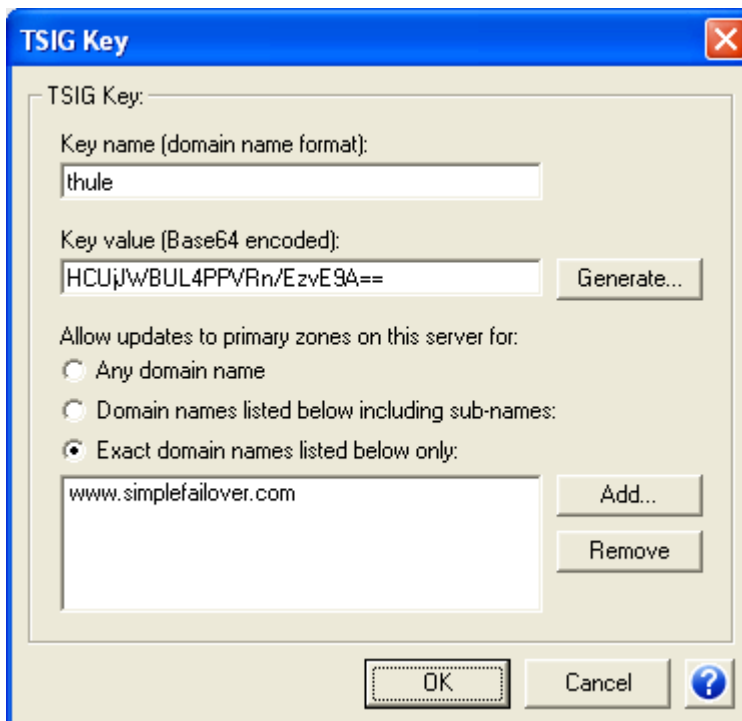
In the **TSIG Key** dialog, enter a key name, a key value (you can use the **Generate…** button to create one), and specify the **domain name** that Simple Failover may update:
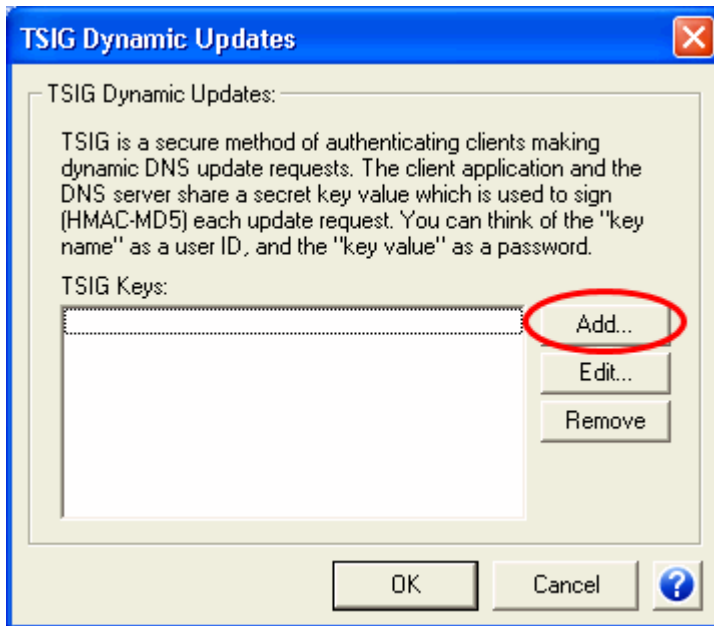
You need to use the same *Key name* and *Key value* in Simple Failover in the DNS Server Properties dialog 102.

Note: A zone for the domain name (or parent domain name) to be updated must exist in Simple DNS Plus.

See the TSIG Signed Dynamic DNS update 67 section for more details on this update method.

12.2   BIND

BIND (Berkeley Internet Name Domain) is a DNS server software package available for various operating systems.
For more information on this product see http://www.isc.org.

BIND version 9.x.x and later:

Standard dynamic DNS updates⌐65¬, and TSIG signed dynamic DNS updates⌐67¬ are supported.

If using standard dynamic DNS updates, you can limit access to this by client IP address in each zone.

For the strongest security, we recommend using TSIG signed dynamic DNS updates.

BIND version 8.x.x and later:

Standard dynamic DNS updates⌐65¬ are supported.

You can limit access to this by client IP address in each zone.

For detailed instructions for enabling DNS updates in BIND, see the following sections:
BIND - Standard Dynamic DNS Updates⌐113¬.
BIND - TSIG Signed Dynamic DNS Updates⌐114¬.

12.2.1   BIND - Standard Dynamic DNS Updates

In BIND (version 8.x.x and later), standard dynamic DNS updates are configured individually for each DNS zone.

To enable standard dynamic DNS updates in BIND, follow these steps:

Open the *named.conf* file in a text editor, and add an *allow-update* statement to the zone you want Simple Failover to update:

```
// General Options
options {
   pid-file "named.pid"; // Put pid file in working
};

// Root server hints
zone "." { type hint; file "root.hint"; };

// Zones
zone "simplefailover.com" {
   type master;
   file "simplefailover.com.zone";
   allow-update { 100.9.203.27; };
}
```

The IP address between the curly-brackets must be the IP address of the computer running Simple Failover.

After editing and saving the *named.conf* file, you must restart BIND for the changes to take effect.

See the Standard Dynamic DNS update⌐65¬ section for more details on this update method.

12.2.2 BIND - TSIG Signed Dynamic DNS Updates

In BIND (version 9.x.x and later) TSIG signed dynamic DNS updates are configured individually for each DNS zone.

To enable TSIG signed dynamic DNS updates in BIND follow these steps:

Open the *named.conf* file in a text editor, and add a *key* section in the top of the file, and add a matching *allow-update* statement to the zone you want Simple Failover to update:

```
// General Options
options {
    pid-file "named.pid"; // Put pid file in working
};

// Root server hints
zone "." { type hint; file "root.hint"; };

// TSIG Keys
key thule.key. {
    algorithm hmac-md5;
    secret "HCUjJWBUL4PPVRn/EzvE9A==";
};

// Zones
zone "simplefailover.com" in {
    type master;
    file "dyn/simplefailover.com.zone";
    allow-update { key thule.key.; };
}
```

IMPORTANT: make sure to add a *period (.)* after the key name (following the word *key*) in both sections.
The *algorithm* must always be *hmac-md5*.
The *secret* corresponds to the *key value* field in Simple Failover.
The zone file must be placed in a directory where dynamic updates are allowed. In the screen shot you can see, that we have placed the *simplefailover.com.zone* file in the *dyn* directory.

Command line tools are available with BIND to create key values (secrets).
However, it is easier (and just as secure) to use the *Generate* button in the Simple Failover DNS Server Properites dialog 102 for this.

After editing and saving the *named.conf* file, you must restart BIND for the changes to take effect.

You need to use the same key name and value (secret) in Simple Failover in the DNS Server Properties dialog 102 .

See the TSIG Signed Dynamic DNS update 67 section for more details on this update method.

12.3 Microsoft DNS

Microsoft's DNS server software is included with the server versions of Windows NT4, 2000, and 2003.
For more information on this product see http://www.microsoft.com.

Windows 2000 and 2003 Server:

Microsoft DNS on Windows 2000 and 2003 Server supports dynamic updates using standard dynamic DNS updates ⌐65¬, GSS-TSIG Kerberos authenticated DNS updates (See RFC3645 ⌐164¬), and via WMI ⌐68¬.

IMPORTANT: We do **NOT** recommend using standard dynamic DNS updates, as there are no options to limit access to this in Microsoft DNS (which is probably why Microsoft refers to this as "non-secure dynamic updates").

GSS-TSIG Kerberos authenticated DNS updates (what Microsoft refers to as "secure dynamic updates") is a Microsoft extension to the TSIG signed dynamic DNS update method.
This update method is not supported by Simple Failover (WMI offers the same functionality).

WMI (Windows Management Instrumentation) is the recommended method of updating Microsoft DNS servers:

When using this update method, you must specify a user ID and password recognized by the DNS server in the DNS Server Properties dialog ⌐102¬.
If the DNS zone that you want Simple Failover to update is "Active Directory integrated", then this user ID must belong to the "dnsadmin" group in Active Directory.

The *Allow dynamic updates* setting the zone properties dialog in Microsoft DNS does not affect updates via WMI. You can set this to *no* / *none*.

Note: Updates can only be performed on "Standard Primary" and "Active Directory Integrated" DNS zones - not on secondary zones.
To ensure that DNS can always be updated (with any one of the DNS servers unavailable), you must configure the zone as "Standard Primary" or as "Active Directory Integrated" on all DNS servers.
IMPORTANT: This also means that unless you are using an "Active Directory Integrated" zone, you will have to keep the DNS servers synchronized **manually** by always making all zone / record updates on both servers.

Note: Please note that the TCP/IP ports used by WMI (NetBios) are almost always blocked on Internet firewalls. So Simple Failover may have to be located on the same LAN as the DNS server, or have access to it via a VPN connection or similar.

See the Update DNS via WMI ⌐68¬ section for details on how WMI updates are performed.

Specifics for Windows 2000 Server:

To update via WMI, you must first install the *DNS WMI Provider* on the Windows 2000 Server.
You can download *dnsprov.zip* from our web-site at
http://www.simplefailover.com/outbox/dnsprov.zip.
This file includes a "readme.txt" file with instructions for installing the provider.
You can also search for *dnsprov.zip* at http://www.microsoft.com.

If you are running Simple Failover on a Windows 95, 98, or NT4 computer, you will need to install WMI on this computer (later Windows versions have this pre-installed).

You can download the WMI installer **wmicore.exe** from our web-site at
http://www.simplefailover.com/outbox/wmicore.exe.
Or search for **wmicore.exe** at http://www.microsoft.com.

Specifics for Windows 2003 Server:

Windows 2003 Server comes with the **DNS WMI Provider** pre-installed.

Simple Failover must be running on a computer with Windows ME, 2000 (SP3 or later), XP, 2003, or later. WMI on earlier Windows versions cannot communicate with Windows 2003 Server.

Notice: You do not need to install anything additional on the server or on the computer running Simple Failover for this to work.

Windows NT4 Server:

Microsoft's DNS server on Windows NT4 Server does not support any type of dynamic DNS updates. However, it should be possible to programmatically update DNS records by first using the NT4 resource kit **dnscmd.exe** utility to delete the zone, then re-write the zone file to disk, and finally use **dnscmd.exe** to re-add the zone.
This version of Simple Failover does not have any direct support for updating like this, but it can be done via scripting 70.

12.4   Novell DNS

Novell's DNS server software is included with recent versions of Novell Netware.
For more information on this product see http://www.novell.com.

Novell NetWare 6.5 server:

Standard dynamic DNS updates [65] are supported.

You can limit access to this by client IP address in each zone.

To enable standard dynamic DNS updates in Novell DNS, follow these steps:

Open Novell iManager 2.x in an Internet browser and login with a user ID that has access rights to configure the system. See the Novell documentation for accessing Novell iManager.
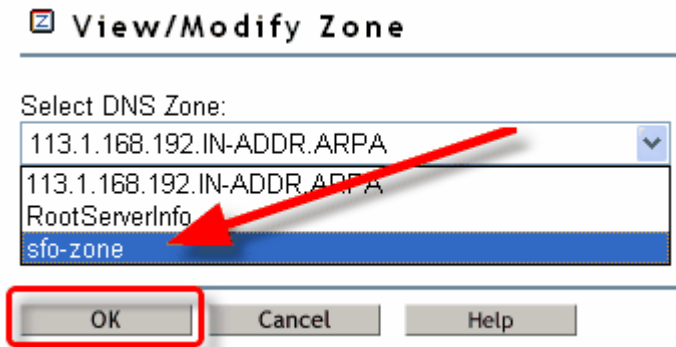
Under *Roles and Tasks*, expand the *DNS* section, and click *Zone Management*:
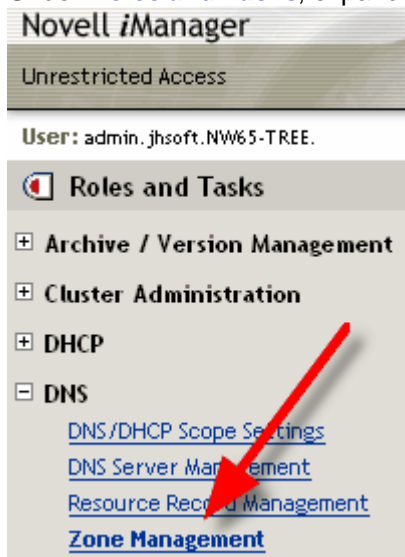
Select *View/Modify Zone* from the drop-down list and click the *OK* button:
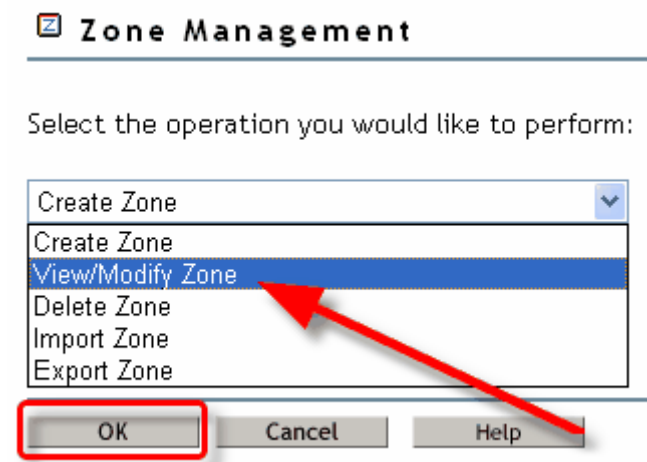
Select the DNS zone that you want Simple Failover to update, and click the *OK* button:
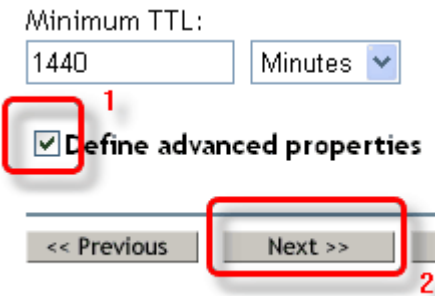
Click the *Next >>* button twice:

Make sure *Define advanced properties* is checked, and click the *Next >>* button:

Click the "*+"* button next to the *Update Filter* list:

Un-check **Predefined match-list** and enter the IP address of the computer running Simple Failover, and click the **OK** button:

The **Update Filter** list should now contain the entered IP address:

The zone is configured now and iManager displays a dialog box showing the successful state. Click **OK** to end the configuration of the zone:

✔ **Complete: The Modify DNS Zone request succeeded**

DNS Zone Modified : sfo-zone

OK

13   HTTP API functions

It is possible to create/update server sets, retrieve status information, and control most other functions in Simple Failover via HTTP.
This opens the possibility of creating your own web-interface to Simple Failover, and/or integrating it with your existing hosting solutions.

The data is provided in XML format for easy integration with other applications.

These HTTP functions can be accessed via the URL:
http://<IP>:<PORT>/<FUNCTION>
Replace *<IP>* with the Local IP address entered in the Options⌐88⌐ dialog / General⌐88⌐ tab.
Replace *<PORT>* with the port number entered in the Options⌐88⌐ dialog / General⌐88⌐ tab.
Replace *<FUNCTION>* with a function name from below (extensions such as ".html" must not be added)

All functions can be accessed using either HTTP methods *GET* or *POST*.
When using GET, all parameters must be specified in the URL.
When using POST, all parameters must be specified as form data (not in the URL).
We recommend using POST for the *UpdateSS* function, and GET for *all other* functions.

For testing purposes, all HTTP functions are also listed and linked to from a simple web page accessible in a browser using the same URL as above, but without any function name.

General functions

Function	Description	Parameters	Returns
PauseAll	Pause all server polling (same as Pause all polling⌐7⌐ from the File⌐7⌐ menu).	-none- *(*)*	Text string *OK…*
ResumeAll	Resume all server polling (same as Resume all polling⌐7⌐ from the File⌐7⌐ menu).	-none- *(*)*	Text string *OK…*
TestAll	Re-test all server sets now (same as Re-test all Server Sets now⌐7⌐ from the File⌐7⌐ menu).	-none- *(*)*	Text string *OK…*
SSList	Returns a simple server set list.	-none- *(*)*	XML <SSList>⌐145⌐
StatusList	Returns a list containing the status for each server set and each individual server.	-none- *(*)*	XML <StatusList>⌐147⌐
Log	Returns a list containing the most recent log entries.	-none- *(*)*	XML <Log>⌐133⌐
ProblemList	Returns a list of all current problems detected.	-none- *(*)*	XML <ProblemList>⌐138⌐

Individual Server Set Functions

Function	Description	Parameters	Returns
PauseSS	Pause polling of a server set (same as Pause⌐7¬ from the Server Set⌐7¬ menu)	**ss** = server set domain name **(*)**	Text string **OK…**
ResumeSS	Resume polling of a server set (same as Resume⌐7¬ from the Server Set⌐7¬ menu)	**ss** = server set domain name **(*)**	Text string **OK…**
TestSS	Re-test a server set immediately (same as Test now⌐7¬ from the Server Set⌐7¬ menu).	**ss** = server set domain name **(*)**	Text string **OK…**
SSStatus	Returns the status of a server set.	**ss** = server set domain name **(*)**	XML <SSStatus>⌐146¬
SSProperties	Returns the settings for a server set.	**ss** = server set domain name **(*)**	XML <ServerSet>⌐141¬
DeleteSS	Delete a server set.	**ss** = server set domain name **(*)**	Text string **OK…**
UpdateSS	Updates the settings for a server set or create a new server set.	**data** = XML <ServerSet>⌐141¬ **(*)**	Text string **OK…**
ServerStatus	Returns the status of an individual server.	**ss** = server set domain name **server** = server IP address **(*)**	XML <ServerStatus>⌐143¬

(*)
An additional **logpt** (log pass through) parameter can be used with all the HTTP functions.
The value of this parameter will simply be passed through to the Simple Failover log (including scripting) and can be anything you wish.
This can be used for example to track user IP addresses, to identify the client application, or to add comments about why certain actions were taken.
For example:
http://127.0.0.1:8201/PauseSS?ss=client.com?logpt=acct+suspended

Please note: This feature is only available with the Professional license type.

14   Reference

14.1   Configuration file

Simple Failover has a configuration file - ***sfo.config.xml***, where all the programs options and Server Sets are stored. The file is located in the same directory as the Simple Failover software, typically in the directory; ***C:\Program Files\Simple Failover***. The sfo.config.xml file is automatically saved every 5 minutes (if any changes have been made if you edit the file directly for example with Notepad).

How to use
Simple Failover of course maintains the configuration file automatically based on the data entered in the GUI interface and through the HTTP API.
However, if you have a lot of server sets to configure or for example if you want to synchronize the Simple Failover with other systems on a regular basis, then you may want to update or create this configuration file yourself. This can be done using various types of scripting.
An XML schema file will be available from our web-site.

If you want to read the file you can open it in a web browser, in a text editor or you can use a more specialized XML editor like the freeware software **CookTop 2.5** from http://xmlcooktop.com/ or **XMLSpy** from http://www.altova.com/.

With CookTop you can format the XML file with the option ***indent of attributes - Tidy***, which will give you a nice and easily readable color-coded file. Here's a sample of a sfo.config.xml file:

```
<?xml version="1.0"?>
<!--Simple Failover configuration file-->
<SimpleFailover
 version="1.20">
    <Options
     WinService="False"
     RunAtStartup="True"
     TrayBalloon="True"
     WinEventLog="True"
     ALogSize="117"
     CCPolls="22"
     EnableHTTP="True"
     HTTPIP="127.0.0.1"
     HTTPPort="8201"
     HTTPPW="YWFhYWFh">
        <DefaultDNS>
            <DNSServer
             IP="76.59.73.72"
             UpdateMethod="DNSTSIG"
             KeyName="thule"
             KeyValue="HCUjJWBUL4PPVRn/EzvE9A==" />
            <DNSServer
             IP="107.86.11.37"
             UpdateMethod="MSWMI"
             UserID="thule"
             Password="YWFhYWFh" />
        </DefaultDNS>
        <EmailNotification
         SMTPServer="smtp.simplefailover.com"
         SMTPPort="27"
         UserID="support@simplefailover.com"
         Password="YWFhYWFh"
         From="sfo-1.20@simplefailover.com"
         BCC="support@simplefailover.com"
         Subject="Simple Failover has detected a problem">$ERR$</EmailNotification>
        <Scripting
         File="C:\Program Files\Simple Failover\Script Samples\sfo-log-script.vbs"
         Language="VBScript"
         LogEvents="True"
         ServerStatusEvents="False"
         ProblemEvents="False" />
    </Options>
    <ServerSet
     Domain="www.simplefailover.com"
     ServerType="HTTP"
     URLPath=""
     PollingIV="30"
     RetryIV="15"
     ResponseTimeout="30"
     AcceptFailed="0"
     Port="8080"
     StatusCodes="200;401"
     SkipLow="True"
     Paused="True">
        <Server
         IP="186.127.48.91" />
        <Server
         IP="107.86.11.37" />
        <DNSUpdate
         RRobin="False"
         RecTTL="30">
            <DNSServer
             IP="76.59.73.72"
             UpdateMethod="DNSTSIG"
             KeyName="thule"
             KeyValue="HCUjJWBUL4PPVRn/EzvE9A==" />
            <DNSServer
             IP="107.86.11.37"
             UpdateMethod="DNS" />
            <DNSAlias>simplefailover.com</DNSAlias>
        </DNSUpdate>
        <EmailNotify
         Address="support@simplefailover.com" />
    </ServerSet>
</SimpleFailover>
```

Options section.
All of your general settings are
saved in this section of the
XML-file.

Server Set Section.
Every Server Set has its
own section in the
XML-file.

Figure 1: Sample sfo.config.xml-file, that is color-coded by CookTop 2.5.

Notice: If a string includes special characters it must be HTML encoded - e.g. ampersand (&) and is written as ***&***.

Follow the W3C special character guidelines at http://www.w3.org/MarkUp/html-spec/html-spec_13.html to see other examples.

For a description of the elements and attributes making up the *sfo.config.xml* file, please see the <SimpleFailover>￼144￼ element in the XML Elements￼126￼ section, and follow the link to child elements from there.

14.2 XML Elements

The following pages are a list of the XML elements used by Simple Failover in either the sfo.config.xml [123] file or in HTTP API functions [121].

14.2.1 <DefaultDNS>
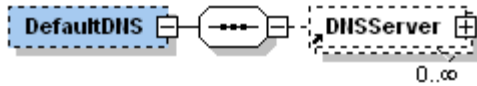
XML Element

<DefaultDNS>	
Use	Child element under <Options> [135].
Description	Contains list of default DNS servers (Options dialog / Default DNS servers [90] tab).
Data	-none-
Child elements	One <DNSServer> [127] element per default DNS server.

Attributes

Name	**Data type**	**Description**	**GUI reference**
-none-	-none-	-none-	The Default DNS servers [90] tab in the Options dialog.

14.2.2 <DNSAlias>
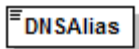
XML Element

<DNSAlias>	
Use	Child element under <DNSUpdate> [130].
Description	Contains a domain names that will be updated with the same data as the server set domain name.
Data	The alias domain name.
Child elements	-none-

Attributes

Name	**Data type**	**Description**	**GUI reference**

-none-	-none-	-none-	Also update DNS for these domain names (aliases) |98| in the DNS Server Properties dialog on the Update DNS tab in the Server Set Properties dialog.

14.2.3 <DNSServer>
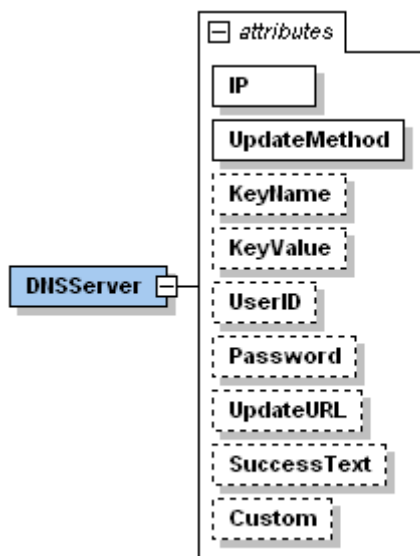
XML Element

<DNSServer>	
Use	Child element under <DNSUpdate> |130| Child element under <DefaultDNS> |126|.
Description	Contains the IP address and the update settings for a DNS server (DNS Server Properties |102| dialog).
Data	-none-
Child elements	-none-

Attributes

Name	**Data type**	**Description**	**GUI reference**

IP	string	IP address of the DNS server.	DNS Server 98 in the DNS Server Properties dialog on the Update DNS tab in the Server Set Properties dialog or Default DNS Server 90 on the Default DNS servers in the Options dialog.
UpdateMethod	string	An identifier for the update method used (DNS, DNSTSIG, MSWMI, HTTP, or SCRIPT).	Update method 102 in the DNS Server Properties dialog on the Update DNS tab in the Server Set Properties dialog or Update method 102 in the DNS Server Properties dialog on the Default DNS servers tab in the Options dialog.
KeyName	string	The key name should be entered in domain name format, but can otherwise be anything you choose. (only if DNSTSIG update method).	Key name 102 in the DNS Server Properties dialog.
KeyValue	base64Binary	The key value is a base64 encoded binary value. (only if DNSTSIG update method).	Key value 102 in the DNS Server Properties dialog.
UserID	string	Optionally a user ID and password can be specified for basic HTTP authentication. (Only if MSWMI or HTTP update method).	User ID 102 in the DNS Server Properties dialog.
Password	string	Optionally a password along with a UserID can be specified for basic HTTP authentication. (Only if MSWMI or HTTP update method).	Password 102 in the DNS Server Properties dialog.
UpdateURL	string	The URL used to update your DNS server with a Internet-based dynamic DNS service. (only if HTTP).	Update URL 102 in the DNS Server Properties dialog.

SuccessText	string	Simple Failover will read the status reply from your provider and see if it can find this exact information on the page. You may also include HTML tags to ensure an exact match. (only if HTTP update method).	Success text⌐102⌐ in the DNS Server Properties dialog.
Custom	string	This attribute can be used to store any additional string data you wish. For example a client account number or any other data you wish to associate with this <DNSServer>.	-none-

14.2.4 <DNSStatus>
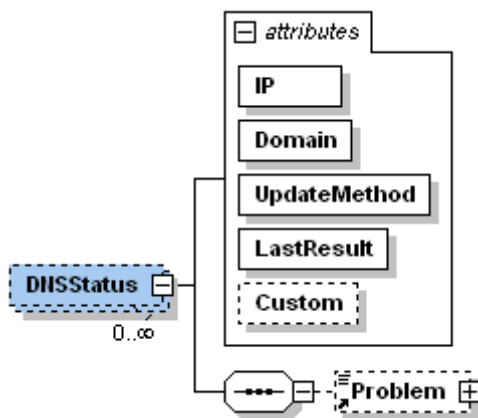
XML Element

<DNSStatus>	
Use	Child element under <SSStatus>⌐146⌐.
Description	Contains status information for a DNS server.
Data	-none-
Child elements	One <Problem>⌐138⌐ element if there currently is a problem (If *LastResult* = -1).

Attributes

Name	**Data type**	**Description**	**GUI reference**
Domain	string	The server set domain name or the DNS alias domain name.	Also update DNS for these domain names (aliases)⌐98⌐ on the Update DNS tab in the Server Set Properties dialog.

IP	string	IP address of the DNS server.	IP address⌐95⌐ in the Server IP address dialog on the Servers tab in the Server Set Properties dialog.
UpdateMethod	string	An identifier for the update method used (DNS, DNSTSIG, MSWMI, HTTP, or SCRIPT).	Update method⌐102⌐ in the DNS Server Properties dialog on the Update DNS tab in the Server Set Properties dialog
LastResult	integer	-1=fail, 0=pending, 1=matched, 2=updated.	-none-
Custom	string	The *Custom* attribute value from the associated <NDSServer>⌐127⌐ element.	-none-

14.2.5 <DNSUpdate>

XML Element

<DNSUpdate>	
Use	Child element under <ServerSet>⌐141⌐.
Description	Contains a server set DNS update properties (Server Set Properties dialog / Update DNS tab⌐98⌐).
Data	-none-
Child elements	One DNSServer⌐127⌐ element per DNS server to be updated.
	One DNSAlias⌐126⌐ element per DNS alias in your server set.

Attributes

Name	Data type	Description	GUI reference
UseDefault	boolean	True if server set updates default DNS servers, False if server set updates specific DNS servers.	Use default DNS servers 90 on the Update DNS tab in the the Server Set Properties dialog.
RRobin	boolean	Specifies if DNS records should be created for all responding servers (DNS round robin) or not.	Create DNS records for: All responding server (DNS round robin) 98 on the Update DNS tab in the the Server Set Properties dialog.
RecTTL	integer	DNS record TTL in seconds.	DNS A-record TTL 98 on the Update DNS tab in the the Server Set Properties dialog.

14.2.6 <EmailNotification>

XML Element

<EmailNotification>
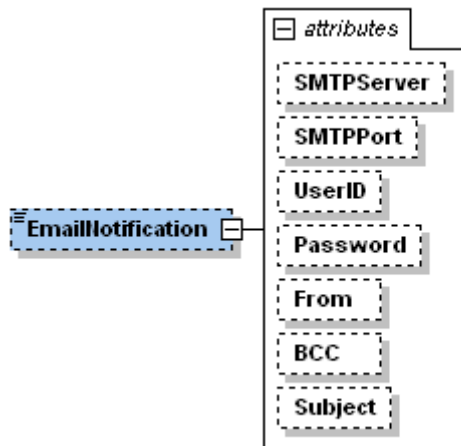
Use	Child element of <Options>⟨135⟩.
Description	Contains general properties for e-mail notification (Options dialog / E-mail notification tab⟨90⟩).
Data	The body of the e-mail message.
Child elements	-none-

Attributes

Name	Data type	Description	GUI reference
SMTPServer	string	Defines which server handles the e-mail traffic.	SMTP Server⟨90⟩ on the E-mail notification tab in the Options dialog.
SMTPPort	unsignedShort	E-mail notification uses the port your SMTP server handles e-mail traffic.	Port⟨90⟩ on the E-mail notification tab in the Options dialog.
UserID	string	The name of a user in the mail system authorized to send outgoing mails.	User ID⟨90⟩ on the E-mail notification tab in the Options dialog.
Password	string	The password of the specified user with authorization to send outgoing e-mails from your mail system. Notice: *Encoded*	Password⟨90⟩ on the E-mail notification tab in the Options dialog.
From	string	Defines the sender of the e-mail that Simple Failover uses when notifying.	From⟨90⟩ on the E-mail notification tab in the Options dialog.
BCC	string	defines the recipient of Blind Carbon Copies of the e-mails Simple Failover sends.	Always BCC⟨90⟩ on the E-mail notification tab in the Options dialog.
Subject	string	Subject of the message Simple Failover send to a recipient.	Subject⟨90⟩ on the E-mail notification tab in the Options dialog.

14.2.7 <EmailNotify>
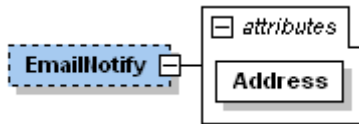
XML Element

<EmailNotify>	
Use	Child element under <ServerSet>⌐141⌐.
Description	Contains a server set e-mail notification properties (Server Set Properties dialog / Notification tab⌐99⌐).
Data	-none-
Child elements	-none-

Attributes

Name	Data type	Description	GUI reference
Address	string	E-mail address to be notified	To e-mail address⌐99⌐ on the Notification tab in the Server Set Properties dialog.

14.2.8 <Log>
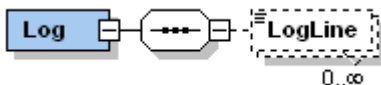
XML Element

<Log>	
Use	Root element response to *Log* HTTP function.
Description	Contains a list of the most recent events (Main dialog / Activity Log tab⌐82⌐).
Data	-none-
Child elements	One <LogLine>⌐133⌐ element per line in the log.

Attributes

Name	Data type	Description	GUI reference

-none-	-none-	-none-		-none-

14.2.9 <LogLine>
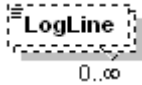
XML Element

<LogLine>	
Use	Child element under <Log> [133].
Description	Contains an individual line from the log (Main dialog / Activity Log tab [82]).
Data	The text of the log line.
Child elements	-none-

Attributes

Name	**Data type**	**Description**	**GUI reference**
-none-	-none-	-none-	-none-

14.2.10 <Notes>
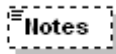
XML Element

<Notes>	
Use	Child element under <ServerSet> [141].
Description	Contains the information entered in the field (Server Set Properties dialog / Notes tab [100]).
Data	Variable text.
Child elements	-none-

Attributes

Name	**Data type**	**Description**	**GUI reference**
-none-	-none-	-none-	-none-

14.2.11 <Options>
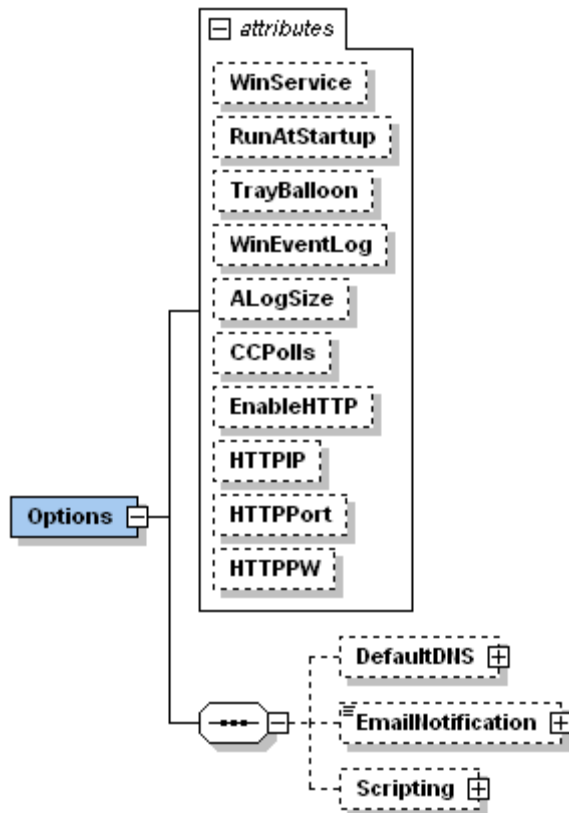
XML Element

<Options>	
Use	Child element under <SimpleFailover> |144|.
Description	Contains general program options (Options |88| dialog).
Data	-none-
Child elements	One <DefaultDNS> |126| element.
	One <EmailNotification> |131| element.
	One <Scripting> |135| element.

Attributes

Name	**Data type**	**Description**	**GUI reference**
WinService	boolean	Simple Failover will run as Windows Service.	Run As Windows Service |88| on the General tab in the Options dialog.

RunAtStartup	boolean	Simple Failover run at Startup of your computer.	Run at Windows startup/logon [88] on the General tab in the Options dialog.
TrayBalloon	boolean	Shows encountered problems in a balloon-tip in the System Tray.	Show system tray balloon tip when problem detected [88] on the General tab in the Options dialog.
WinEventLog	boolean	Writes events to the Windows Event Log.	Write problem events to Windows Event Log [88] on the General tab in the Options dialog.
ALogSize	integer	Defines the number of log lines displayed in the Activity Log [82] tab.	Lines in Activity Log view [88] on the General tab in the Options dialog.
CCPolls	integer	Defines how many Server Sets are polled at the same time.	Max. concurrent server connections [88] on the General tab in the Options dialog.
EnableHTTP	boolean	Defines if you want to enable the HTTP interface.	Enable HTTP/XML API interface [88] on the General tab in the Options dialog.
HTTPIP	string	IP address of the computer running Simple Failover where your are going to use the HTTP interface.	Local IP [88] on the General tab in the Options dialog.
HTTPPort	unsignedShort	Defines the port on which you communi-cate with the Simple Failover computer via the HTTP interface.	TCP Port [88] on the General tab in the Options dialog.
HTTPPW	string	The password you have to use when you want to communicate with the HTTP interface on the computer running Simple Failover.	Password [88] on the General tab in the Options dialog.

14.2.12 <Problem>
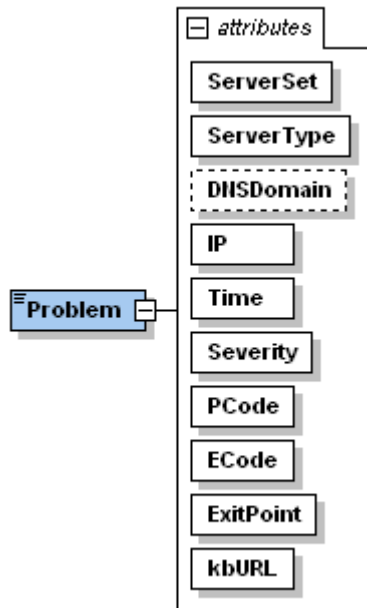
XML Element

<Problem>	
Use	Child element under <ProblemList> 138 . Child element under <DNSStatus> 129 . Child element under <ServerStatus> 143 .
Description	Describes a problem detected by Simple Failover.
Data	A textual description of the problem.
Child elements	-none-

Attributes

Name	Data type	Description	GUI reference
ServerSet	string	Domain name of the server set for which the problem was detected.	-none-
ServerType	string	the 3 or 4 characther service type (such as HTTP).	Server Type 95 on the Servers tab in the Server Set Properties dialog.
DNSDomain	string	Simple Failover has a problem when updating the domain name of the server set or the DNS alias domain name. (only if ServerType=DNS).	-none-

IP	string	The IP address of the server.	IP address ⌐95⌐ in the Server IP address dialog on the Servers tab in the Server Set Properties dialog.
Time	dateTime	Date / time when the problem was detected.	-none-
Severity	byte	Number indicating the severity of the problem (1=low, 2=high).	-none-
PCode	short	A 3 digit code classifying the problem.	Problem Codes ⌐150⌐
ECode	integer	An associated error code.	-none-
ExitPoint	short	The numerical representation of the point in the Simple Failover code where the problem was detected.	-none-
kbURL	anyURI	This will link directly to you Online Problem Knowledge Database on the Internet.	-none-

14.2.13 <ProblemList>
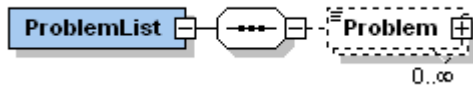
XML Element

<ProblemList>	
Use	Root element in response to *ProblemList* HTTP function.
Description	Contains a list of the current problems detected by Simple Failover.
Data	-none-
Child elements	One <Problem> ⌐138⌐ element per current problem detected.

Attributes

Name	**Data type**	**Description**	**GUI reference**
-none-	-none-	-none-	-none-

14.2.14 <Scripting>
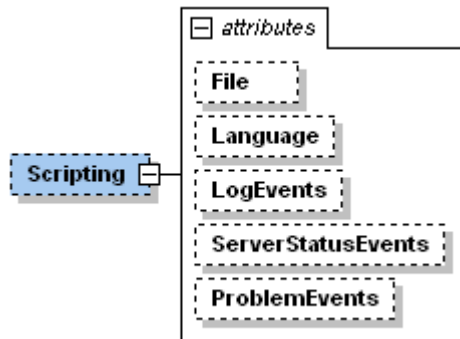
XML Element

<Scripting>	
Use	Child element of <Options> 135 .
Description	Contains general properties scribting (Options dialog / Scribting tab 92).
Data	-none-
Child elements	-none-

Attributes

Name	Data type	Description	GUI reference
File	string	Defines the drive, path and file name of the script file.	Script File 92 on the Scripting tab in the Options dialog.
Language	string	Any scripting language that works with the *WSH* (Windows Scripting Host) can be used.	Script Language 92 on the Scripting tab in the Options dialog.
LogEvents	boolean	Defines if the script file includes a procedure for saving the log events.	Enable scripting for log events 92 on the Scripting tab in the Options dialog.
ServerStatusEvents	boolean	Defines if the script file includes a procedure for saving the server status events.	Enable scripting for server status events 92 on the Scripting tab in the Options dialog.

ProblemEvents	boolean	Defines if the script file includes a procedure for saving problem events.	Enable scripting for problems events[92] on the Scripting tab in the Options dialog.

14.2.15 <Server>
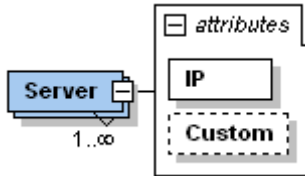
XML Element

<Server>	
Use	Child element under <ServerSet>[141].
Description	This element represents an individual server in a server set. The soft order defines the priority of the servers.
Data	-none-
Child elements	-none-

Attributes

Name	**Data type**	**Description**	**GUI reference**
IP	string	IP address of the server	Server IP address in order of priority[95] on the Servers tab in the Server Set Properties dialog.
Custom	string	This attribute can be used to store any additional string data you wish. For example a client account number or any other data you wish to associate with this <Server>.	-none-

14.2.16 <ServerSet>
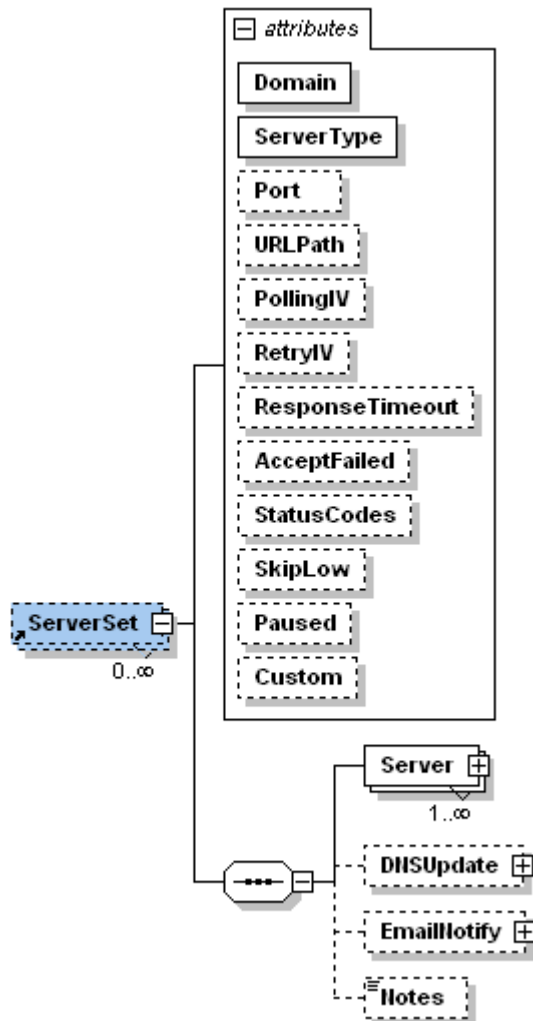
XML Element

<ServerSet>	
Use	Child element under <SimpleFailover> 144 Used for <UpdateSS> 121
Description	Contains the properties of a Server Set (Server Set Properties 95 dialog).
Data	-none-
Child elements	One of more <Server> 140 elements. One <DNSUpdate> 130 if updating DNS. One <EmailNotify> 133 if notifying by e-mail. One <Notes> 134 if information is entered.

Attributes

Name	Data type	Description	GUI reference
Domain	string	Domain name of the server set.	Domain name 95 on the Servers tab in the Server Set Properties dialog.
ServerType	string	The 3 or 4 characther service type (such as HTTP).	Server type 95 on the Servers tab in the Server Set Properties dialog.
Port	unsignedShort	Server TCP port number (only if alternate port number used).	Port 95 on the Servers tab in the Server Set Properties dialog.
URLPath	string	Url path / page to poll (only if HTTP server type).	URL Path 95 on the Servers tab in the Server Set Properties dialog.
PollingIV	integer	Polling interval in seconds.	Polling IV 95 on the Servers tab in the Server Set Properties dialog.
RetryIV	integer	Retry interval in seconds.	Retry IV 95 on the Servers tab in the Server Set Properties dialog.
ResponseTimeout	integer	Timeout interval in seconds.	Response timeout 95 on the Servers tab in the Server Set Properties dialog.
AcceptFailed	integer	How many failed polls Simple Failover accepts before it changes the state of a server to failed.	Failed polls accepted 95 on the Servers tab in the Server Set Properties dialog.
StatusCodes	string	Accepted server response status codes (only if different from default).	Status codes 95 on the Servers tab in the Advanced Server Set Properties dialog.

SkipLow	boolean	Defines if Simple Failover should poll lower priority servers or skip to them.	Server Polling [95] on the Servers tab in the Advanced Server Set Properties dialog.
Paused	boolean	Indicates if this server set is currently paused or not.	-none-
Custom	string	This attribute can be used to store any additional string data you wish. For example a client account number or any other data you wish to associate with this <ServerSet>.	-none-

14.2.17 <ServerStatus>
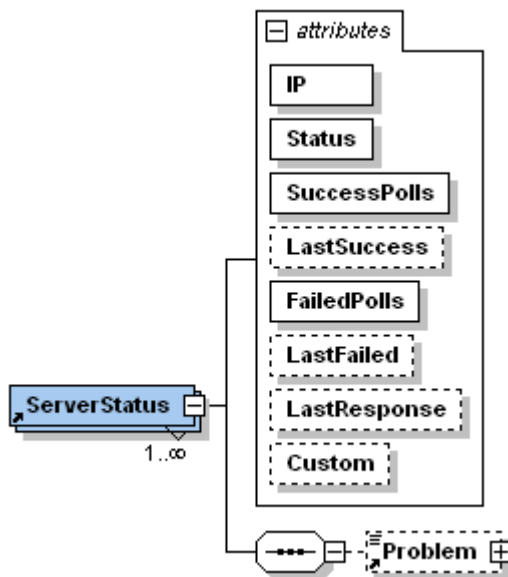
XML Element

<ServerStatus>	
Use	Child element under <SSStatus> [146].
Description	Describes the current status of a Server Set.
Data	-none-
Child elements	<Problem> [137] (only if found in last poll. If *Status* = 1 or 2).

Attributes

Name	**Data type**	**Description**	**GUI reference**

IP	string	The IP address of the server.	IP address⌐95⌐ in the Server IP address dialog on the Servers tab in the Server Set Properties dialog.
Status	short	Number indicating current status of server (-1=not tested, 0=Success, 1=Retrying, 2=Failed).	-none-
SuccessPolls	integer	Total number of successful polls of this server.	-none-
LastSuccess	dateTime	Date/time of the last successful poll.	-none-
FailedPolls	integer	Total number of failed polls of this server.	-none-
LastFailed	dateTime	Date/time of the last failed poll.	-none-
LastResponse	string	The last response from the server (f.ex. *200 OK*)	-none-
Custom	string	The *Custom* attribute value from the associated <Server>⌐140⌐ element.	-none-

14.2.18 <SimpleFailover>
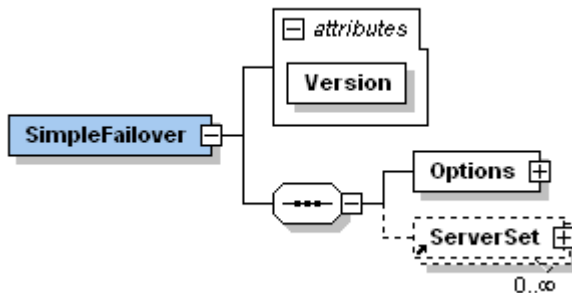
XML Element

<SimpleFailover>

Use	In sfo.config.xml |123| as document element.
Description	The document element of the Simple Failover configuration file.
Data	-none-
Child elements	<Options> |135|
	One <ServerSet> |141| per server set defined in Simple Failover.

Attributes

Name	Data type	Description	GUI reference
Version	String	The current version of Simple Failover.	-none-

14.2.19 <SSList>
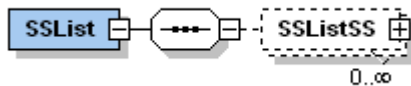
XML Element

<SSList>	
Use	Root element in response to *SSList* HTTP function.
Description	Contains a simple list of all the server sets configured in Simple Failover.
Data	-none-
Child elements	One <SSListSS> |145| element per server set defined in Simple Failover.

Attributes

Name	Data type	Description	GUI reference
-none-	-none-	-none-	-none-

14.2.20 <SSListSS>
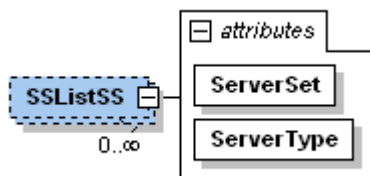
XML Element

<SSListSS>

Use	A child element under <SSList>⌐145⌐.
Description	Contains a reduced version of the properties of an individual server set.
Data	-none-
Child elements	-none-

Attributes

Name	Data type	Description	GUI reference
ServerSet	string	The domain name of the server set.	-none-
ServerType	string	The 3 or 4 characther service type (such as HTTP).	Server type⌐95⌐ on the Servers tab in the Server Set Properties dialog.

14.2.21 <SSStatus>

XML Element

<SSStatus>

Use	Root element in response to *SSStatus* HTTP function.
Description	Describes the current status of an individual server set.
Data	-none-
Child elements	One <ServerStatus>⌐146⌐ element per server defined for the server set.
	One <DNSStatus>⌐146⌐ element per DNS server updated by the server set.

Attributes

Name	Data type	Description	GUI reference
ServerSet	string	The domain name of the server set.	-none-
ServerType	string	The 3 or 4 character service type (such as HTTP).	Server Type⌐95⌐ on the Servers tab in the Server Set Properties dialog.
Port	unsignedShort	Server TCP port number (only if alternate port number used).	Port⌐95⌐ on the Servers tab in the Server Set Properties dialog.
URLPath	string	Url path / page to poll (only if HTTP server type).	URL Path⌐95⌐ on the Servers tab in the Server Set Properties dialog.
Paused	boolean	Indicates if this server set is currently paused or not.	-none-
Status	string	Short description of the status in a readable format.	-none-
Custom	string	The *Custom* attribute value from the associated <ServerSet>⌐14?⌐ element.	-none-

14.2.22 <StatusList>

XML Element

<StatusList>
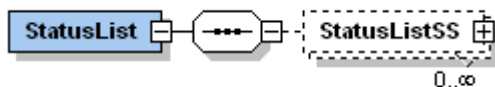
Use	Root element in response to *StatusList* HTTP function.
Description	Contains a list of the reduced status information of each server set configured in Simple Failover.
Data	-none-
Child elements	One <StatusListSS>|147⟩ element per server set defined in Simple Failover.

Attributes

Name	Data type	Description	GUI reference
-none-	-none-	-none-	-none-

14.2.23 <StatusListServer>
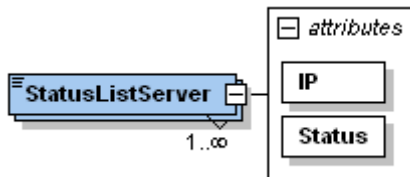
XML Element

<StatusListServer>	
Use	Child element under <StatusListSS>|149⟩.
Description	Reduced status information for an individual server.
Data	{string} A textual description of the last response receive (or not) from the server.
Child elements	-none-

Attributes

Name	Data type	Description	GUI reference
IP	string	The IP address of the server.	-none-
Status	short	Number indicating current status of sever (-1=not tested, 0=Success, 1=Retrying, 2=Failed).	-none-

14.2.24 <StatusListSS>
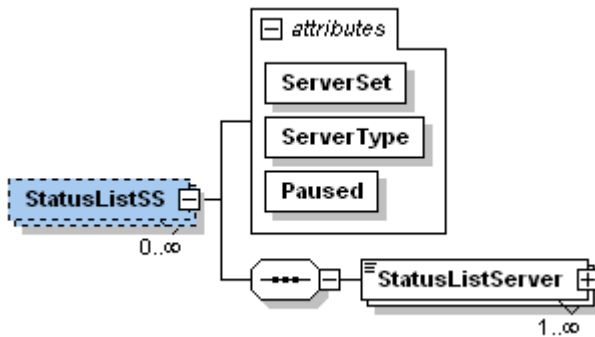
XML Element

<StatusListSS>	
Use	Child element under <StatusList> [147].
Description	Reduced status information for a server set.
Data	-none-
Child elements	One <StatusListServer> [147] element per server IP defined for the server set.

Attributes

Name	Data type	Description	GUI reference
ServerSet	string	The domain name of the server set.	-none-
ServerType	string	The 3 or 4 character service type (such as HTTP).	-none-
Paused	boolean	Indicates if this server set is currently paused or not.	-none-

14.3   Problem Codes

Any problem detected by Simple Failover is categorized with a 3 digit code as follows:

The first digit indicates server polling or DNS problem:
1xx = Server polling problem
2xx = DNS checking / update problems

The second digit indicates the general type of problem encountered:
x**1**x = Error encountered - usually an TCP/IP communication error (Winsock error)
x**2**x = Timeout waiting for connection or response
x**3**x = The connection was untimely closed by other side
x**4**x = Invalid / unexpected response received

The third digit indicates at what stage in the process the problem was encountered (different for polling / DNS):
1x**1** = Initializing connection
1x**2** = Waiting other side to complete connection
1x**3** = Sending request
1x**4** = Waiting for the sent request to get through
1x**5** = Waiting for a response
1x**6** = While receiving the response
1x**7** = When processing the full response
2x**1** = Requesting A-records from DNS server
2x**2** = Requesting SOA-record from DNS server (to obtain zone name)
2x**3** = Sending DNS update request

As an example, problem code *125* means that the polled server did not respond to a request within a reasonable time period.

These codes are used when calling script procedures 92 .

14.4 Dynamic IP Internet services examples

HTTP-based Dynamic IP providers on the Internet offer the handling of the DNS databases and let you update your own records by sending update requests through a web-page.

We have used two different providers to give you an idea on how Simple Failover works with some of the providers you can find on the Internet.

Note: As of this writing, these two services are free. We are not in any way afiliated with these services.

DynDNS.org 151
WebReactor Networks 156

14.4.1 DynDNS.org

Before you can begin to use the services provided by DynDNS.org you must create a user account on their web site.

Open the http://www.dyndns.org website and select the option to create your own account. Finish the process and study the DynDNS.org documentation on how to setup your account, password, hosts and the URL-string to use in Simple Failover. You can find this information in the *Update Syntax* section.
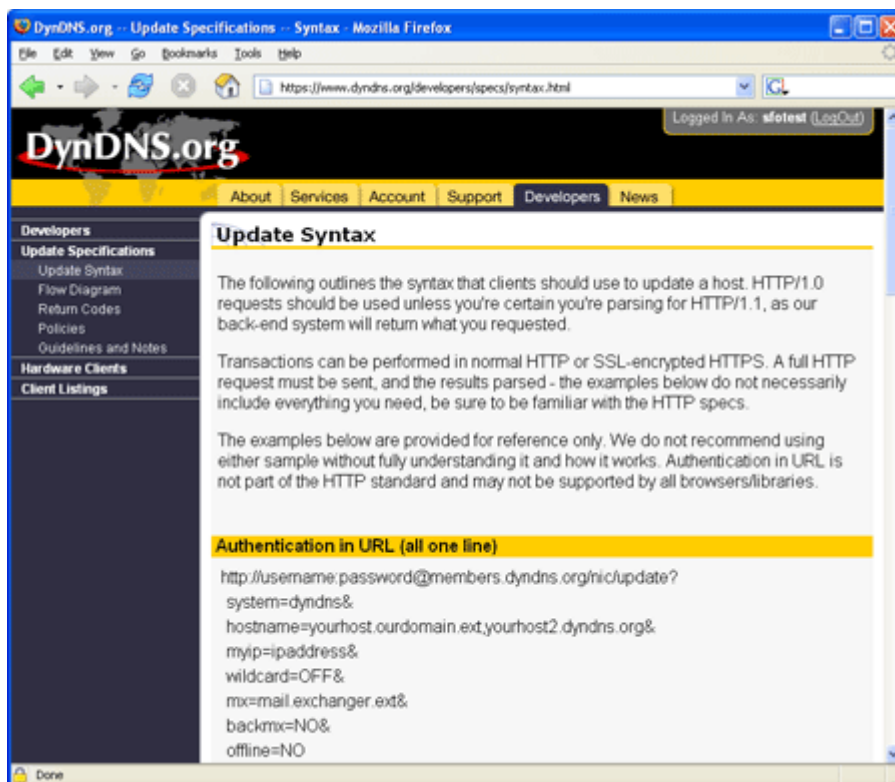
Write down this information and later in this example we will substitute the information with our own example details.

Add a host to your account.
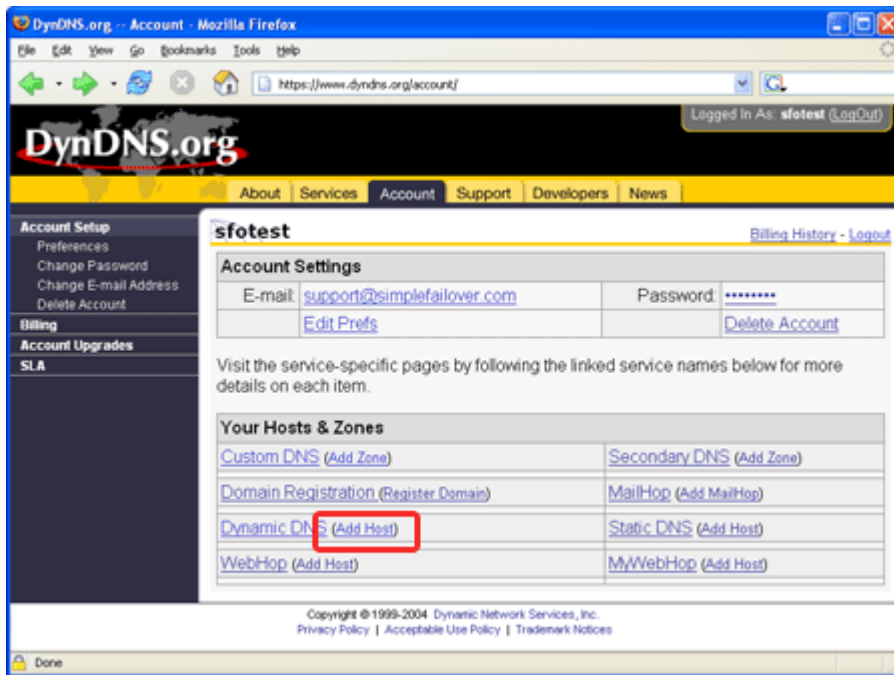
Add your domain name to the list.
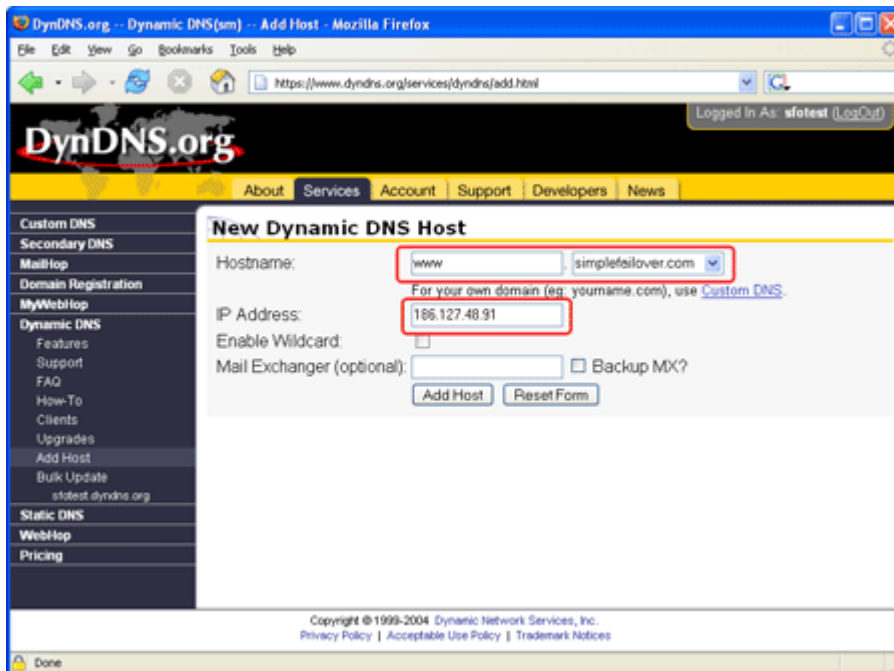
In Simple Failover insert a new Server Set.

Follow the instructions from the Server Set Properties ⁹⁵ section to setup the information on the Servers tab ⁹⁵ on the Server Set Properties dialog.
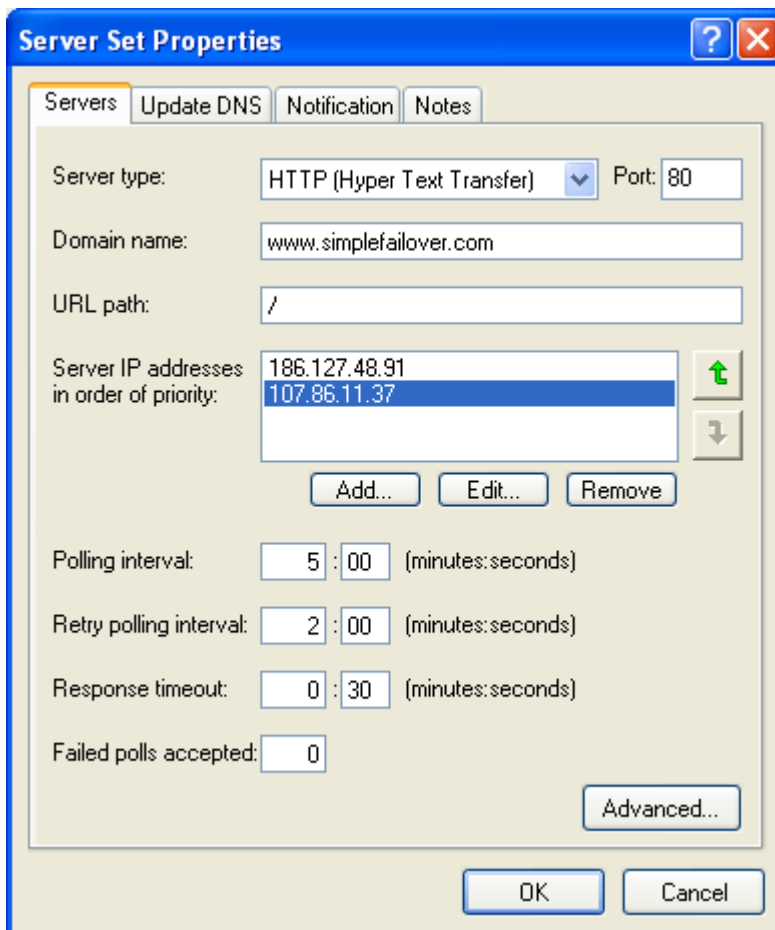
To identify the Name Server you are going to update from Simple Failover, first execute the command ***nslookup -type=NS dyndns.org*** from a command prompt:

Remember: Only resolve the parent domain name i.e. ***dyndns.org***. You should not resolve child domain names e.g. the web-server name or the FTP server name.

Select the "primary" Domain Name Server. In this example it is *ns1.dyndns.org* with the IP address *63.208.196.90*.

Select the Update DNS tab⌐98⌐, and check-mark the field: *Update DNS (off=monitoring only)*. Click the *Add…* button to enter the DNS server properties.

The following information has to be entered into the DNS Server Properties⌐102⌐ dialog:

Note: You are only able to see part of the *Update URL* string as displayed in this screen shot.
The DNS server is found by clicking the *Look Up* button and in the field write: *ns1.dyndns.org* as
found earlier via the *nslookup* command and click *OK*. Simple Failover resolves the DNS server
name into an IP address.

Now it is time to use the information you found on the Update Syntax page of DynDNS.org. Fill the
correct formatted information into the *Update URL* field.
The string is entered on one line with no line breaks.
*https://members.dyndns.org/nic/update?system=dyndns&hostname=DOM&myip=IP&wild
card=OFF&offline=NO*

IMPORTANT: The IP address is normally entered in the string *myip=ipaddress&* in clear text but it is
now substituted with the string *myip=IP&* where the IP address is provided by Simple Failover
through the variable IP. Simple Failover insert the correct IP address found on the Servers tab 95 .

Enter the *User ID* and *Password*. These are equivalent to your DynDNS.org account.

The string to enter into the *Success text* field is found in the DynDNS.org documentation or by
performing an update test from a browser and then look for a recognizable string. This is the resulting
page from DynDNS.org:
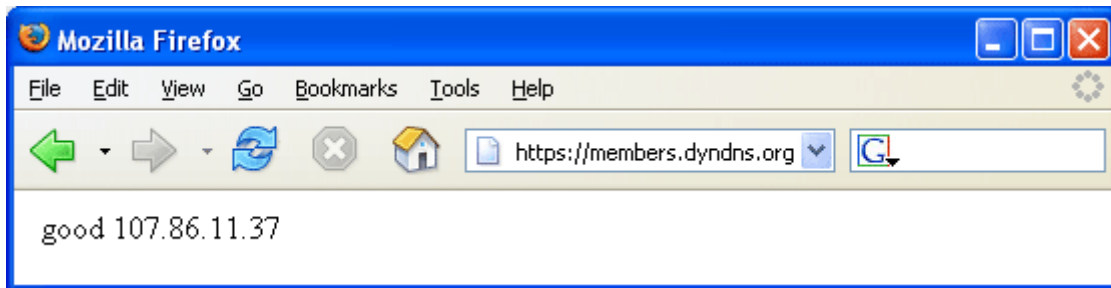
In this example the string you want to look for is the string *good*.

The Server Sets tab might look like this after you have configured the Server Set.
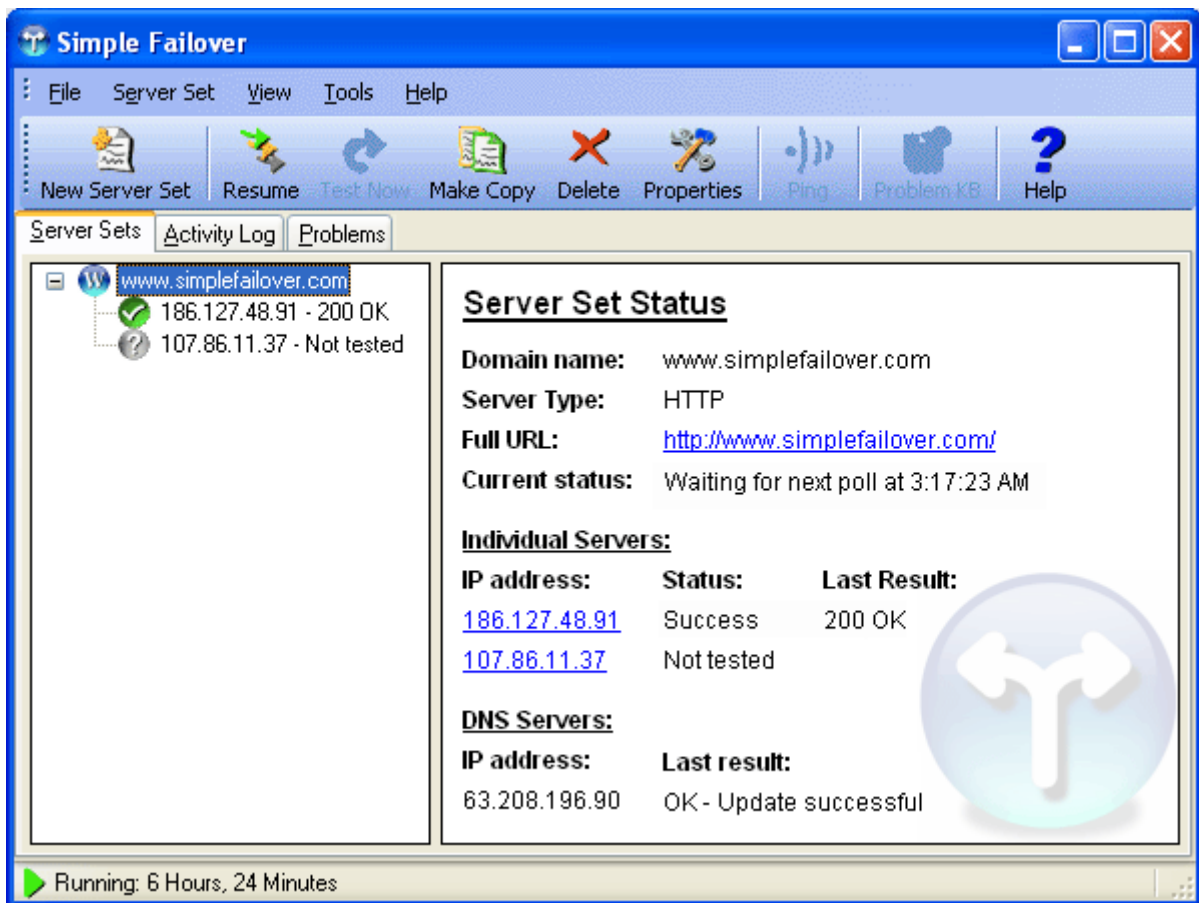
In case of an update request performed by Simple Failover then DynDNS.org returns a web page (in the background) with the result of an update request of the HTTP-based DNS database now pointing to the Web server at IP address 107.86.11.37.
The update is acknowlegded because Simple Failover found the string *good* in the response from DynDNS.org.

14.4.2 Web Reactor Networks

Before you can begin to use the services provided by WebReactor Networks you must create a user account on their web site.

Open the http://www.webreactor.net website and select the option to create your own account. Finish the process and study the WebReactor Networks documentation on how to setup your account, password, hosts and the URL-string you should use in Simple Failover. You can find the information in the *Support* / *Getting Started* / *Step 4 Activate your domain* section.
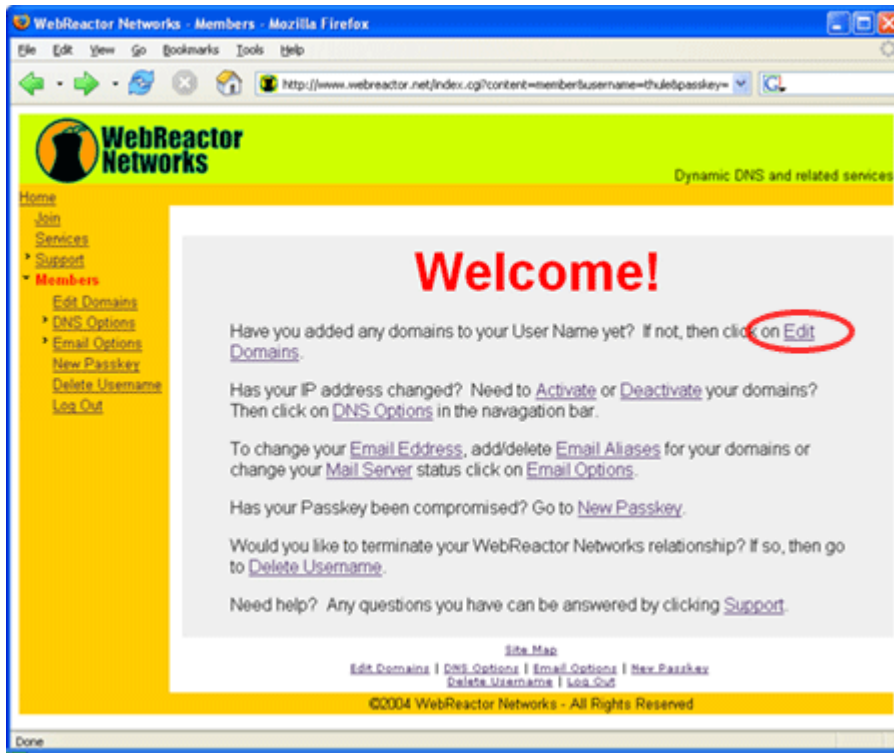
Click on the *Activate / Update* section under the Members, DNS Options menu and enter the IP address to the web-service you want to monitor and dynamically update.
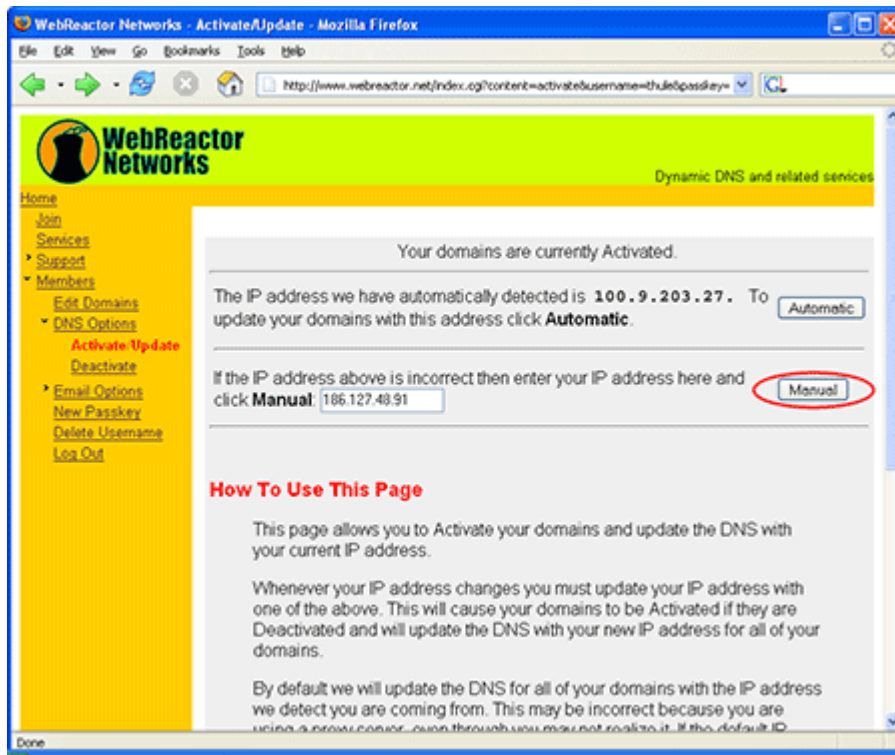
When you click on the *Manual* button on the web page, then WebReactor performs the initial setup of your IP address. A web page with the result is displayed. In the browsers URL-field is the string you need to perform the updates via Simple Failover. Write down the URL-string. The string is used later in this example.

Continue the configuration in Simple Failover.
Create a new Server Set by clicking on the *New Server Set* icon on the Toolbar.
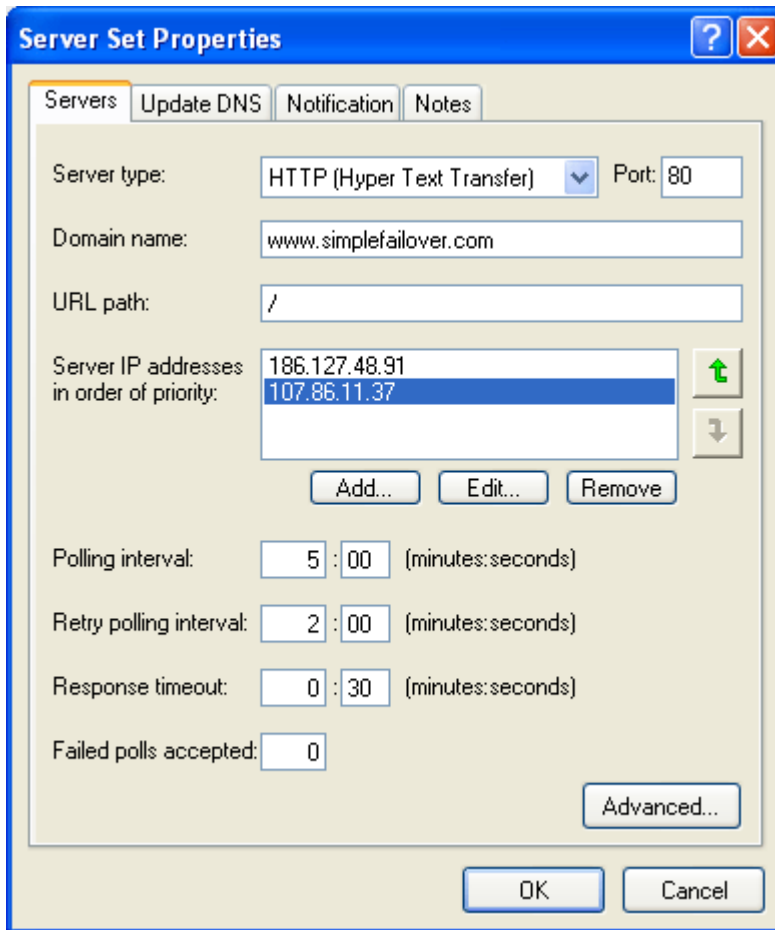
To identify the Name Server you are going to update from Simple Failover, first execute the command *nslookup -type=NS webreactor.net* from a command prompt:

Remember: Only resolve the parent domain name i.e. *webreactor.net*. You should not resolve child domain names e.g. the web-server name or the FTP server name.

Select the "primary" Domain Name Server. In this example it is *ns1.webreactor.net* with the IP address *63.195.55.114*.

Select the Update DNS tab 98, and check-mark the field: *Update DNS (off=monitoring only)*. Click the *Add…* button to enter the DNS server properties.

The following information has to be entered into the DNS Server Properties [102] dialog:

Note: You are only able to see part of the *Update URL* string as displayed in this screen shot.
The DNS server is found by clicking the *Look Up* button and in the field write: *ns1.webreactor.net*
as found earlier via the *nslookup* command and click *OK*. Simple Failover resolves the DNS server
name into an IP address.

Enter the URL string in the *Update URL* field that you saved earlier.
The string is entered on one line with no line breaks. In this example the string we saved was:
*http://www.webreactor.net/index.cgi?content=activate&username=thule&passkey=tricky&actio
n=activate&ip_address=IP&manual_ip=Manual*

IMPORTANT: The IP address is normally entered in the string in the section
ip_address=186.127.48.91 but it is now substituted with the string *ip_address=IP&* where the IP
address is provided by Simple Failover through the variable IP. Simple Failover insert the correct
IP address found on the Servers tab ⁹⁵.

The string to enter in the *Success text* field is found by performing an update test from a browser and
then look for a recognizable string. This is the resulting page from WebReactor Networks:
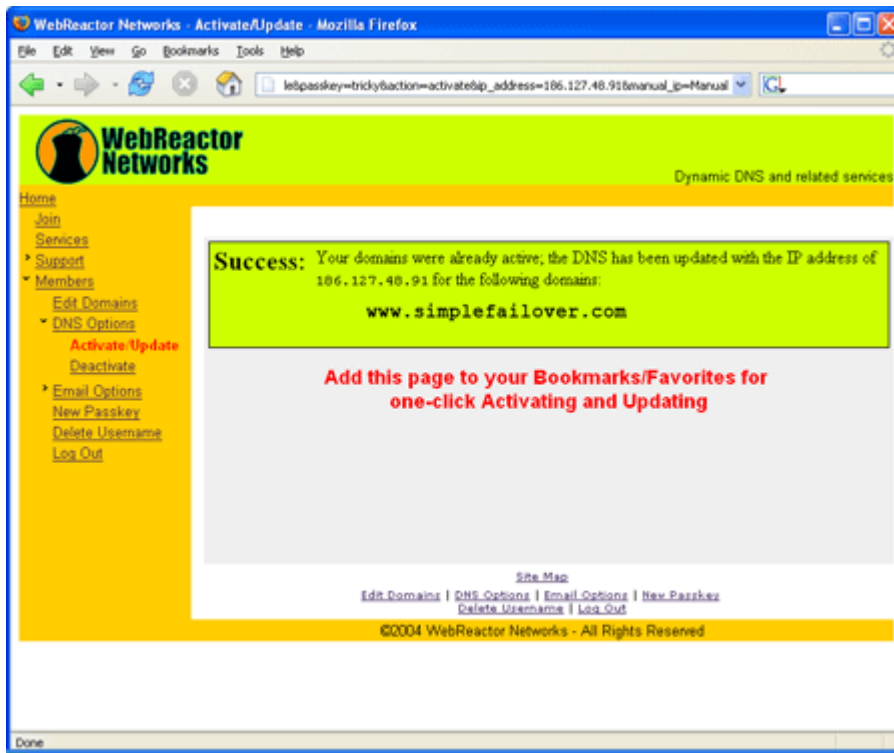
In this example the string you want to look for is *Success:*.

Add the string *Success:* to the *Success text* field.

The Server Sets tab might look like this after you have configured the Server Set.
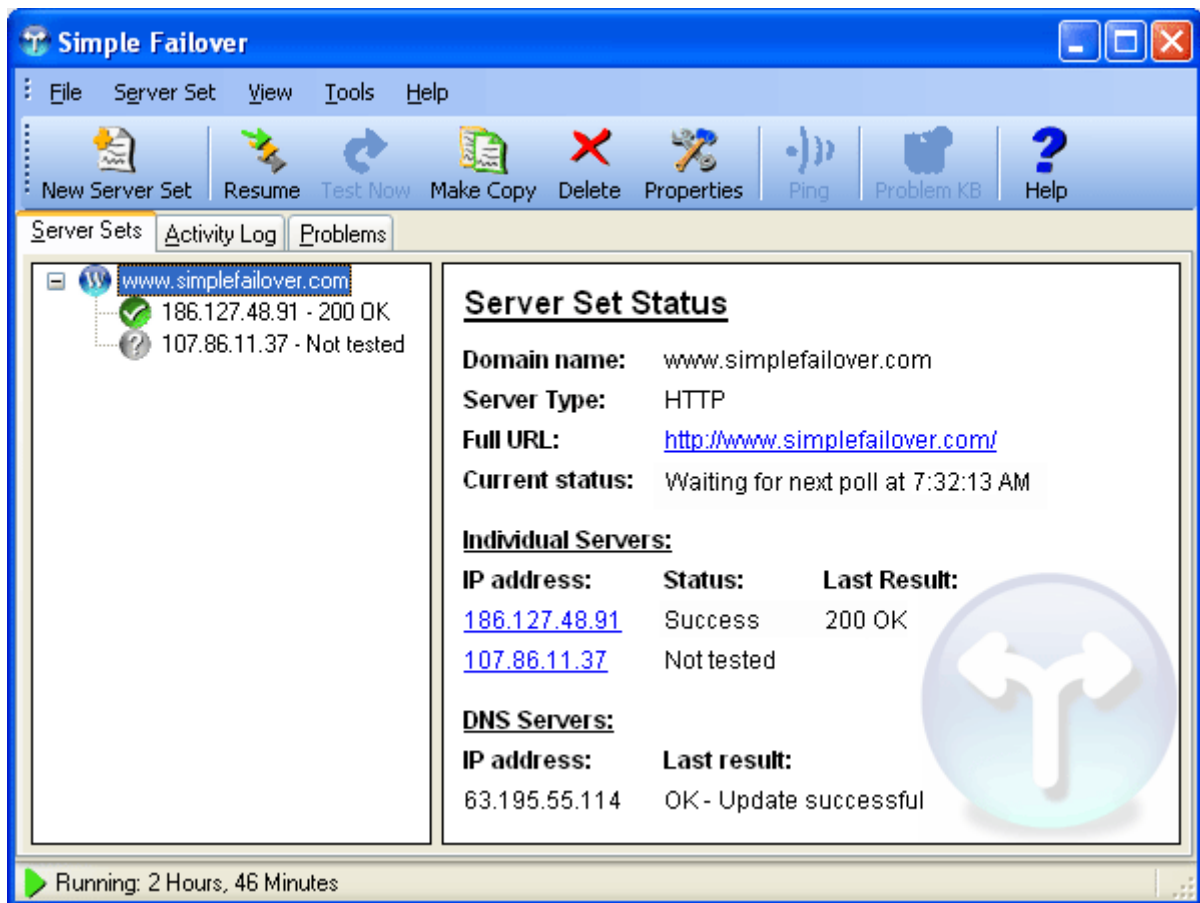
In case of an update request performed by Simple Failover then WebReactor Networks returns a web page (in the background) with the result of an update request of the HTTP-based DNS database now pointing to the Web server at IP address 107.86.11.37.
The update is acknowlegded because Simple Failover found the string *Success:* in the response from WebReactor Networks.

14.5 RFCs

The Request for Comments (RFCs)

The Requests for Comments (RFC) documents are papers specifying different aspects of the Internet. They can be technical and even funny. They describe how to define computer networking such as protocols, programs and concepts. When a new internet-related functionality emerges a RFC is written and after debate, trials and thorough investigation the functionality is elevated into an official internet standard.

This following list shows the corresponding RCFs that Simple Failover uses to probe for available web server functionality.

RFC	Name	Description
RFC792	ICMP	*Internet Control Message Protocol*
RFC821	SMTP	*Simple Mail Transfer Protocol*
RFC959	FTP	*File Transfer Protocol*
RFC977	NNTP	*Network News Transfer Protocol*
RFC1035	A-records	*Domain names - implementation and specification*
RFC1939	POP3	*Post Office Protocol - Version 3*
RFC1945	HTTP	*Hypertext Transfer Protocol - HTTP/1.0*
RFC2136	DNS Update	*Dynamic Updates in the Domain Name System (DNS UPDATE)*
RFC2845	TSIG	*Secret Key Transaction Authentication for DNS (TSIG)*
RFC3501	IMAP	*Internet Message Access Protocol - Version 4rev1*
RFC3645	GSS-TSIG	*Generic Security Service Algorithm for Secret Key Transaction Authentication for DNS (GSS-TSIG)*

Table 1: A list of RFCs found in the documentation of Simple Failover.

Additional RFCs can be obtained from http://www.rfc-editor.org/rfcsearch.html.

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