

SPM Installation Manual

Installation of the SPM Licensing Software

Document version 3.0.3

July 29, 2005

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Introduction

NOTE

The installation of the SPM licensing software must be performed with administrator privileges since it involves changing of system files.

The Software Protection Manager (SPM) protects an application from unauthorized use. While executing, the application (SPM client) communicates with the SPM License Server to verify authorization. The SPM License Server may not necessarily run on the same machine as the protected application, but there must always run at least one SPM License Server in the network even if you have nodelocked licenses. The protected application communicates with the License Server via TCP. So in any case TCP/IP must be installed as well on the client machine as on the machine where the SPM License Server is running. The License Server is listening on port **mi-spm**. The mi-spm port must be registered on all client machines where you want to start the protected application and of course on the machine where the SPM License Server runs. The SPM License Server must be able to respond quickly on (maybe a lot of) client requests. So it is recommended to choose a fast machine with a reasonable network connection as SPM License Server.

The SPM License Server must be known to all machines where the SPM client application runs. The SPM client looks first for the environment variable **SPM_HOST** and then for hosts with the names (nicknames) **spmhost0, spmhost1,..... spmhost9**. If the client uses DNS for host name resolution the DNS database has to be changed instead of the local hostdatabase.

It is strongly recommended to install the SPM software in

`/var/spm` on UNIX

and in

`%SystemRoot%\system32\spm` on NT.

The SPM software consists of 5 executables and a configuration file:

`spmd` - the SPM License Server (NT: `spmd.exe`)

`spmd_ib` - the SPM License Server for iButton dongles (NT: `spmd_ib.exe`)

`spm_key` - the license key management tool (NT: `spm_key.exe`)

`spm_key_ib` - the license key management tool for iButton dongles (NT: `spm_key_ib.exe`)

`spmstat` - show status of SPM License Server(s) (NT: `spmstat.exe`)

`spm-config` - the configuration file (NT: `spm-config.ini`)

Dongles

The SPM License Server needs a dongle if running on NT, Linux, TRU64 or MacOS X. The dongle must be directly connected to that machine. If the License Server runs on IRIX, HP-UX, Solaris or AIX no dongle is needed.

We are currently supporting the following dongle types:

- The serial Sentinel dongle from Rainbow Technologies
- iButton from Maxim/Dallas Semiconductor Inc.

Rainbow dongles:

The female side of the dongle has to be plugged into the **serial port** of your machine. FLEXIm dongles are parallel dongles and cannot be used for SPM. It may be necessary to use the adapter cable shipped with the dongle if you have a 9 pin port only. If there was a device attached to the serial port before (e.g. modem, mouse, tablet) make sure that the device driver is stopped, before plugging in the SPM dongle. Dongles of different vendors have different colors.

Vendor	color
mental images	blue dongle
Alias	green dongle
Softimage	grey dongle
Autodesk	yellow dongle

iButton dongles:

The iButton itself is a small metallic button looking like a battery. It is housed in a holder. There are 3 different types of holders available, which must be connected to the appropriate port of your machine. The 9 pin serial adapter must be plugged into one of the serial ports. The (25 pin) parallel adapter belongs into the printer port and the USB adapter into the USB port of your machine.

For Windows NT an additional 1-Wire driver is needed. The installation is straight forward by clicking on the `Install_1_Wire_Drivers_v320b.exe` executable in the distribution.

In the SPM configuration file (`spm-config`) the correct dongle type has to be specified. The `DONGLE.TYPE` is abbreviated with two vendor specific letters and a number.

Vendor	type
mental images	MI2
Alias	AW0
Softimage	SI0
Autodesk	AD0

The `DONGLE.PORT` depends on the dongle and the operating system.

operating system	serial Rainbow	iButton		
		serial	parallel	USB
Windows NT	COM1,COM2	IBS	IBP	IBU
Linux x86	/dev/ttyS0	IBS	-	IBU
MacOS X	-	-	-	IBU
TRU64	/dev/tty01	-	-	-

Examples:

If you have a mental images (blue) Serial Rainbow dongle connected to serial port 1 of a Linux system.

`DONGLE.TYPE = MI2`

`DONGLE.PORT = /dev/ttyS0`

If you have a USB iButton dongle connected to a Mac with MacOS X.

`DONGLE.TYPE = MI2`

`DONGLE.PORT = IBU`

Installation of the SPM License Server

In the most common cases the installation procedure of the protected application will hide the following steps and you won't need to perform any of them manually.

1. An Internet service number has to be assigned by adding a line like

```
mi-spm      7050/tcp # mental images SPM
```

to the `/etc/services` file on UNIX and to `%SystemRoot%\system32\drivers\etc\services` on NT. If your site is running NIS (formerly called Yellow Pages), the local `/etc/services` could be never consulted; the `services` NIS map must be updated instead. If port 7050 is already used, any number is fine, but it must be kept consistently on all machines that needs to communicate with the SPM daemon. Most SPM protected applications use port 7050/tcp for `mi-spm`.

2. Kernel modules are not required anymore since version 1.1.11 #1300. If an older version was installed and upgraded now make sure to remove the kernel loading (`insmod spmkmmod.o`) from the SPM startup script.

2. A key has to be installed to get the protected software running. The key request has to be created on that computer where the SPM License Server will be running on. It is recommended to stop the SPM License Server before creating a key request. There exists a command line version of `spm_key` for all platforms and a graphical user interface for NT. Note that graphical user interface does not support iButton dongles yet. To generate a key request type at the command prompt:

```
# spm_key -c rqcode
```

If you have a iButton dongle use:

```
# spm_key_ib -c rqcode
```

Send the resulting file `rqcode` to your license issuer.

If you want to have a license extended, or if you want to get additional ones, the request code must contain the information that you already have licenses from a certain manufacturer. This is necessary to differentiate between software manufacturers, since the protection software is a product on its own and available to third parties.

Create the license request now

```
# spm_key -c rqcode -m manufacturer
```

Substitute 'manufacturer' by your actual manufacturer.

3. When you received the validation code (e.g. a file `vcode`) from the license issuer extract it with

```
# spm_key -x vcode
```

Use "`spm_key_ib`" for iButton dongles.

If the SPM License Server (`spmd`) was already running restart it with

```
# spmstat -Cr
```

The SPM License server will reread the license data base. It will perform a "gentle restart", meaning it will cease to accept new connections, and after the last existing connection is closed by the applications (or after 24 hours), it will reread the key database and accept connections again.

4. If the SPM License Server was not running start it now.

UNIX:

Start the SPM License Server `spmd` from the root account. Do not make it `set-user-id!`

Once the SPM system works correctly, you should make the SPM daemon `spmd` start automatically on later reboots. The **rcspmd** script from the installation CD can be used. If you have a iButton dongle run `spmd_ib` instead.

NT:

The SPM License Server must be installed as a service. You can use the `instsrv` utility from the NT Resource Kit.

```
% instsrv SPM License Server %SystemRoot%\system32\spm\spmd.exe
```

Start the service from the Service Control Applet. Startup type should be set to `Automatically`. If you install another license later restart the SPM Daemon from the Service Control Applet.

There can only run one SPM License Server per machine, but it may serve licenses for multiple vendors.

Installation of SPM client application

1. The `mi-spm` service must be registered on all hosts running the SPM client application.

2. The SPM License Server must be made known to the clients. There exist 2 different mechanisms to achieve that.

a) Add a nickname to the SPM License Server's hostname. For the nickname solution administrator rights are required. You should be familiar with the name resolution mechanism in your network.

Most sites use DNS for name resolution and the DNS host database has to be updated. This solution is recommended if a lot of clients have to know about the SPM License Server.

If local name resolution is active instead of DNS

```
/etc/hosts (on UNIX)
```

or

```
%SystemRoot%\system32\drivers\etc\hosts (on NT)
```

has to be changed.

Here is an example line how the entry of host 'master' could look like:

```
172.16.0.1      master      spmhost0 #SPM License Server
```

Up to 10 SPM License Servers can be nicknamed in a network with (`spmhost0`, `spmhost1`, ..., `spmhost9`).

b) Alternatively the `SPM_HOST` environment variable can be set by any user running the SPM protected client application.

3. Check if the SPM License Server is reachable and running with:

```
spmstat -KD spmhost0
```

or if `SPM_HOST` was used

```
spmstat -KD $SPM_HOST (%SPM_HOST% on NT)
```

SPM 1.2

SPM 1.2 implements only changes on server side of SPM. The client side, the protected application, can remain unchanged.

The SPM License Server version 1.2 works with iButton dongles only. Rainbow Sentinel dongles are no longer supported.

SPM version 1.2 is incompatible with all older versions of SPM. That means that old key databases cannot be understood by SPM License Server 1.2.

If you upgrade you will have to perform the following steps:

1. remove the old key database
 `/var/spm/.spm-kf` on UNIX
 and
 `%SystemRoot%\system32\spm\spm-kf` on NT.
2. create a new key request using the 1.2 version of `spm_key_ib` and send this new key request to your license issuer.
3. install the new license and start the SPM License Server as usual.

Note, that it is not possible to have two instances of the SPM License Server on one machine. So if you need to keep old 1.1 licenses you will need another machine to run the SPM 1.2 License Server for 1.2 licenses.

pre-keyed dongles

With SPM 1.2 it is possible to create dongles which are pre-keyed with a validation code. You don't need to request a license for such dongles. The validation code gets installed with:

```
spm_key_ib -p
```

Such dongles can still be used in normal operation mode.

Tips & Tricks

FAQ - SPM License Server

This machine is too slow or too loaded to be a good SPM server

The most common source for this error message is DNS. If the machines needs to much time to resolve e.g. invalid hostnames. Other possiblities are :

- a heavy loaded system (hence the error message)
- machine is a NFS server which invisibly increases the system load
- changed system clocks
- automatically adjusted clock by time synchronization daemons (you can check for backwards running times in the spm logfile)

Do you really want to irrevocably adjust time in dongle?

Don't be worried about this question if your system clock is set correctly. The SPM software leaves a timestamp in the dongle. If the dongle wasn't used for more than 3 days, it will ask you to adjust the time to protect you agains accidental tikme changes. Before answering this question with 'yes' check your system time. If the system time is past the expiration date of your licenses - all licenses will expire irrevocably. It is impossible to adjust the internal dongle time backwards. If the internal dongle time is not properly adjusted the *SPM License Server* will not run.

can't access dongle at COM1:

Check the dongle type and dongle port in the spm-config file:

```
DONGLE_TYPE = MI2
DONGLE_PORT = COM1:
```

If the dongle is connected to COM2 instead - change it. Dongle types can be identified by their colors. Currently the following dongle types are supported:

```
MI2 - blue dongle
AW0 - green dongle
SI0 - grey dongle
AD0 - yellow dongle
```

dongle at COM1: is not initialized in a known format

This dongle is defective and has to be reinitialized. Send it back to your Software reseller.

can't open port COM1:

Where COM1 can be IBU, IBZ0, IBP or whatever is specified for DONGLE_PORT in the SPM configuration file. If you have a iButton dongle attached check if the iButton version of the key management tool (*spm_key_ib*) or the SPM License Server (*spmd_ib*) was used (where *spmd_ib* should be renamed to *spmd*).

can't open port COM1: for dongle type "MI2" Access is denied

If you have a Rainbow Sentinel dongle this message indicated that the COM port is already used by an other application (modem, serial mouse, tablet) or that the mentioned COM port is not functional.

SPM_ERROR in At_check_syslog_setup() while executing RegOpenKeyEx() Access is denied.

spm_key must be run with administrator privileges, otherwise you get this (NT only).

FATAL ERROR (./spm_key_ib) : can't open port IBU for dongle type "MI2"

Although a USB iButton dongle is attached it cannot be detected. First check if the `spmd` is stopped.

For NT and Linux there exist two different versions of `spm_key` and `spmd`. Only `spm_key_ib` and `spmd_ib` work with iButton dongles. The executables without the extension `_ib` are for serial Rainbow dongles.

Dongle subsystem is not responding.

If you start `spm_key` and the SPM License Server is still running. This is a known problem on TRU64 and Linux. Stop the SPM License Server first. Run `spm_key` and restart the SPM License Server afterwards.

the time in the dongle cannot be updated with `spm_key`.

Please check that the SPM License Server is not running, before calling `spm_key`. The problem exists on TRU64 and Linux.

Wrong SYSTEM-ID for validation code:

```
SPM_FATAL ERROR (./spm_key):  
Wrong SYSTEM-ID for validation code: KeyDataBase:  
dongle_host -107ABC1234DEADBABE10-MI0 != validation code: deaf 000000000000
```

This happens if in the `spm-config` file the line

```
DONGLE_PORT = /dev/tty01
```

is commented out (with #). Remove the `#` sign.

If the second number is not 000000000000 but any different number, the attached dongle may have changed or the SysID in the dongle changed accidentally. In the first case simply put the old dongle back on the system. In the second case you probably have some kind of 'flaky' serial port on your system. You can either choose still to trust the port and request a new validation code for the changed SysID or send the dongle back to the software reseller.

The described problems can occur on all systems where dongles are needed (NT, Linux and TRU64).

Check for correct keyfile/machine or keyfile/dongle combination

If a different dongle is attached to the machine, the keydatabase does not fit to the current dongle. Remove the keydatabase and install new licenses valid for this dongle. If the dongle mode is 'MI2' this error message will appear too if the hostname or the IP-address changed.

dongle lock at port COM1 tampered (probably by a second SPMD)

This can happen on NT with versions of the SPM License Server older than SPM.1.1.11 #1207. Sometimes the installation procedures of different software vendors choose different names as service name for the SPM License Server. So it could happen that two of them are installed and started at the same time. Check the service applet and disable the additional services. They all refer to the same binary.

ALERT: dongle last access date is ahead of system time.

This happens if the system clock was set back. Possible causes could be:

- automatically adjusted clock by time synchronization daemons
- the system clock was adjusted manually.
- Looking at the clock application and changing the date or time (even without clicking on 'OK' changes the system time, while the clock application is opened). This is the most common reason for this error. The 'look only and change' behaviour happens on NT4 only.

FAQ - protected application

mi-spm/tcp and mi-spm11/tcp: are no services

On the client machine there is no `mi-spm` port registered. `mi-spm` must be registered with the portnumber

where the SPM License Server is listening. The port is registered if there is an entry in the local services file `/etc/services` on UNIX or `%SystemRoot%\system32\drivers\etc\services` on NT.

spm daemon not running on <hostname>

Check if the SPM License Server is running on host `hostname`.

Can't connect to spm daemon on <hostname>

Probably the SPM License Server is performing a gentle restart. During this time no new client can connect. Gentle restart means it will restart when all licenses are returned.

accept(): Too many open files

The default file descriptor limit on IRIX is very low. Increase the file descriptor limit and restart the SPM License Server.

```
# limit descriptors 2500
```

Don't forget to change to insert this line into the boot scripts for the SPM License Server too.

FAQ - key management

SPM_WARNING (spm_key): validation-code version 0.0 is from an old SPM version

Lines in the validation code starting with `>` or `*` are required. Above error message appears if one of those lines was forgotten.

SPM_FATAL ERROR (spm_key) : illegal character in code while reading

Usually the whole mail with the validation code was put into `spm_key`. The mail header is not part of the validation code. The first evaluated line is starting with the `'*'` sign.

FAQ - spmstat

I am root on host "idefix" and I am not allowed to restart the SPM License Server, although I gave the permission to root@idefix in the configuration file.

`spmstat` uses the hostname found out by the `gethostbyname()` call. If the hostname is set to "idefix" but the host uses DNS for primary name resolution instead it could find out the fully qualified hostname instead (e.g. `idefix.mydomain.com`). In this case change the `SPM_STAT_PERMISSION` in `spm-config` to:

```
SPM_STAT_PERMISSION: root@idefix.mydomain.com
```

FAQ error codes

Errorcode 0x0002

The system usually has problems with the name resolution. Try to ping the SPM License Server. `ping hostname` must work (localhost is not enough).

Errorcode 0x1101

If on Linux the kernel module isn't installed this error will appear. Check with `'lsmod -a'` if a module with `spmkmmod` in its name is installed. If it is and the error still exists, you are probably working on a non-supported Linux distribution. If you get this error while running `spm_key` check if there is a SPM License Server daemon (`spmd`) running and stop it. Both processes compete in accessing the dongle device.

On IRIX check the processor type with:

```
% hinv
```

If the processor type is R5000 with Processor Chip Revision: 1.0' a special patch must be applied to the protected application. Only very old machines have this processor mask failure and we hope this error will die out soon. The patch program can be fetched from the mental images ftp server:

```
ftp://ftp.mental.com/private/r5k.gz
```

Errorcode 0x1130

If 'hostname' returns a different hostname than 'uname' this error code may occur. This is a known problem on HPUX.

Errorcode 0x1160

This sometimes happens when the SPM License Server was restarted with 'kill -HUP'. This is a known bug on IRIX 6.5.

FAQ - debug tools

To check the content of the keydatabase use

```
# spm_key -t
```

It will tell you which keys are installed in the keydatabase. In order to check the status of the running SPM License Server use

```
# spmstat -KD
```

Other useful "spmstat" options for troubleshooting are -sD or -d.

The default logfile location for the SPM License Server is

```
/var/spm/spm.log
```

on UNIX and

```
%SystemRoot%\system32\drivers\spm\spm.log
```

on NT. This default behaviour can be changed by editing the spm-config file.

```
LOG_ACTIVE=TRUE
```

enables logging.

```
LOG_FILENAME = /var/spm/spm.log
```

gives the logfile location and name.