



# **GROUP.Sandbox**

## **GROUP.Sandbox Principle, Parameters and Configuration. For Use in iQ.Suite for Lotus Domino**

**Document Version 2.0**

*Think Lotus Think GROUP*

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## 1 Task and Solution

*GROUP.Sandbox* is an iQ.Suite solution designed to fully integrate auxiliary components such as converters, unpackers, virus scanners or spam analyzers into iQ.Suite. For each component to be integrated, a separate *GROUP.Sandbox* serves as interface to the MailGrabber or DatabaseGrabber.

Using *GROUP.Sandbox* allows to increase the stability of the system environment by separating critical systems such as virus scans or file analysis processes from the Grabber processes. Thus, a virus scanner crash or deadlock will not fatally affect the stability of the Domino server.

iQ.Suite provides an integrated sandbox solution for the following components:

Component	iQ.Suite Module
Virus scanner - integration and pattern update	iQ.Suite Watchdog
Spam analyzer - integration and pattern update	iQ.Suite Wall
Converter	iQ.Suite Wall
Unpacker (tk_unpack2.dll)	iQ.Suite Wall / iQ.Suite Watchdog
S/MIME	iQ.Suite Crypt
Text analyzer	iQ.Suite Wall
Image analyzer	iQ.Suite Wall
Integration with iQ.Suite Store (tk_archive.dll)	iQ.Suite Bridge

The *GROUP.Sandbox* implementation and functionalities differ according to the type of component. This document provides a description of the sandbox principle for virus scanners and virus pattern updates.

## 2 Manual Configurations

### 2.1 Enabling the Sandbox

By default, the sandboxes are enabled by the iQ.Suite installation process, and the Sandbox files are located in the iQ.Suite data directory, e.g. %ExecDir%\<virus scanner>.

The virus scanners are addressed by way of the GROUP Interface DLL. Typically, no modifications are required, except for:

- Components that require periodical pattern updates or engine updates (virus scanner/spam analyzer). Refer to [Automatic Virus Pattern Update](#).
- Partitioned environments. Refer to [Particularities for Partitioned Servers Under Unix](#).

### 2.2 Disabling the Sandbox

Normally, the configuration documents of sandbox components such as virus scanners should not be disabled, as this means the virus scanner itself is switched off as well. To be able to disable a sandbox for a short period of time (e.g. for test purposes) without disabling the virus scanner, proceed as follows:

1. Open iQ.Suite.
2. Copy the configuration document of the sandbox component to be disabled. For instance, to disable the Trend Micro virus scanner sandbox, select **Watchdog --> Utilities --> Virus scanner** and copy the "Trend Micro (scan engine)" configuration document.
3. In the copy, under **Settings --> Scan call**, change the sandbox client DLL path, e.g. from %ExecDir%\trend\soap.ntk\_trend.dll to %ExecDir%\trend\ntk\_trend.dll.
4. Enable the copy and disable the original configuration document.

The sandbox can now be enabled or disabled by switching the configuration documents.

### 3 Sandbox Principle for Virus Scanners

The following sections describe the working principle and the processing sequence of each sandbox element using the example of the Trend micro virus scanner (<trend>).

#### 3.1 Sandbox Elements

A virus scanner sandbox includes at least the files described in the table below:

	Files - Windows	Files - Unix	Purpose
1	ntk_<trend>.dll		GROUP Interface DLL; interface to third-party product
2	soap.ntk_<trend>.dll	soap.tk_<trend>.dll	Sandbox client DLL
3	ntk_<trend>.dll.exe	soap.tk_<trend>.dll.srv	Sandbox server EXE
4	soap.ntk_<trend>.dll.defaults.ini	soap.tk_<trend>.dll.defaults.ini	SOAP.Defaults.INI; GROUP configuration file with the sandbox default settings
5	soap.ntk_<trend>.dll.ini	soap.tk_<trend>.dll.ini	SOAP.INI (optional); customizable version of the SOAP.Defaults.INI file that allows to adjust the sandbox default settings
6	ntk_<trend>_ref.cfg	tk_<trend>_ref.cfg	Component-specific configuration file called by the sandbox server EXE through an update program (optional)

#### 3.2 Processing Sequence

The sandbox server EXE runs the engine updates automatically:

1. When the Watchdog job required for the virus scanner is started, the sandbox client DLL **(2)** is addressed by the Grabber and automatically loaded.
2. The sandbox client DLL ensures the sandbox server EXE **(3)** is started. The communication between both files is performed via TCP/IP using the gSOAP implementation of the SOAP protocol<sup>1</sup>. During the process, the sandbox server EXE acts as sandbox server and the sandbox client DLL as sandbox client.
3. When the sandbox server EXE is started, the GROUP Interface DLL **(1)** is loaded, e.g. GAPI (**G**ROUP **A**pplication **P**rogramming **I**nterface), GAVI (**G**ROUP **A**nti**V**irus **I**nterface), unpacker etc. The interface ensures the communication with the third-party product.
4. The sandbox server EXE **(3)** and the sandbox client DLL **(2)** load the SOAP.Defaults.INI **(4)** and SOAP.INI **(5)** files and apply the sandbox settings saved

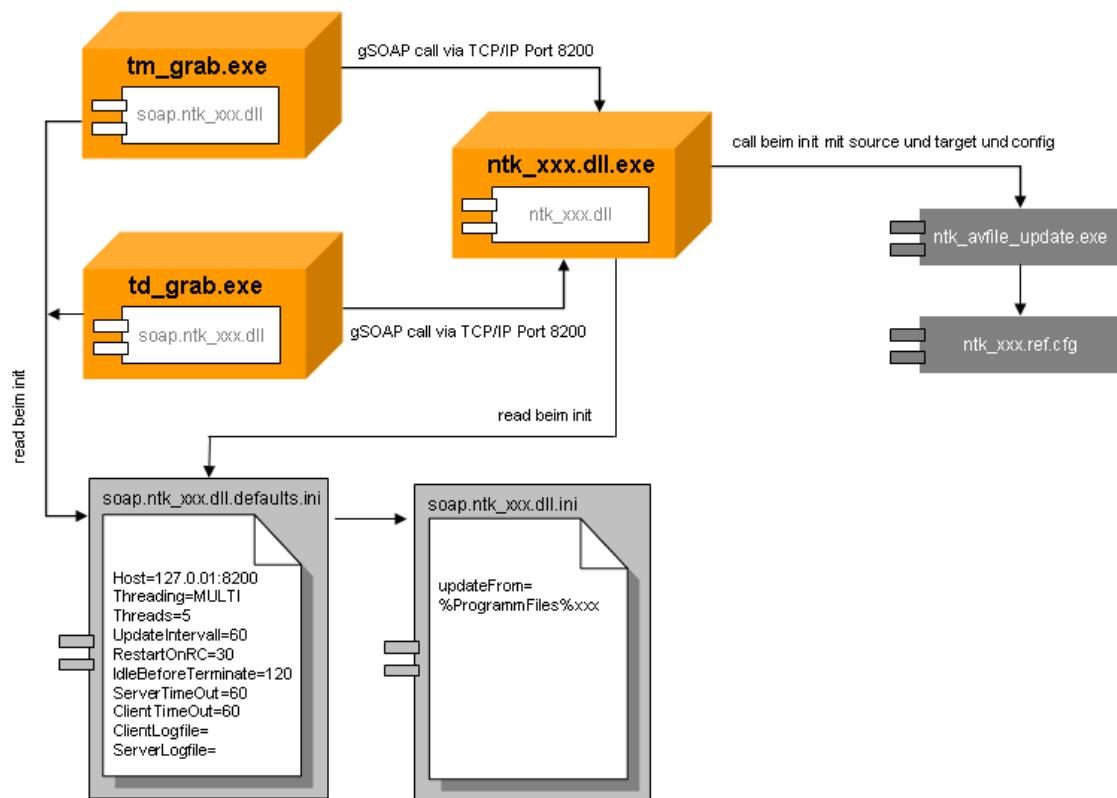
<sup>1</sup> For details on gSOAP refer to <http://gsoap2.sourceforge.net>

in these files. (4) contains preset configurations, which are automatically overwritten by new default values every time iQ.Suite is updated, whereas (5) can be customized to use specific settings for your environment. The settings in (5) have priority over those in (4).

5. If a configuration file (6) is included (here: *(n)tk\_trend\_ref.cfg*), it is also called by the sandbox server EXE through an update program.

Regardless of the number of iQ.Suite jobs configured, only one sandbox server EXE is started per sandbox. In the context of an iQ.Suite configuration including, for instance, both a mail job and a database job for a virus scanner, the sandbox server EXE is started only once and jointly used by the MailGrabber and DatabaseGrabber processes. On the other hand, the sandbox client DLL is loaded separately by both the MailGrabber and the DatabaseGrabber.

**Note:** If *n* different virus scanners are used on the same system, *n* sandbox server EXE instances will be started. To this end, the sandbox default configurations include *n* preconfigured TCP ports, e.g. Port 8200 for Trend Micro, Port 8210 for McAfee VirusScan etc.



### 3.3 SOAP.Defaults.INI and SOAP.INI Parameters

The SOAP.Defaults.INI (*soap.ntk\_<xxx>.dll.defaults.ini*) and SOAP.INI (*soap.ntk\_<xxx>.dll.ini*) files are used to configure the sandbox behavior.

The SOAP.Defaults.INI file contains default sandbox settings, including the default port number. To change the sandbox behavior, enter appropriate settings in the SOAP.INI file rather than the SOAP.Defaults.INI file. Otherwise your changes will be overwritten with the SOAP.Defaults.INI default values by the next iQ.Suite update.

The settings in the SOAP.INI file have priority over those in the SOAP.Defaults.INI file. The parameters described below can be set in both of the files.

**Note:** For file or directory name parameters, you can specify an absolute path or a relative one. Relative names are interpreted as relative to the parameter file.

**Example:**

Relative path: %ExecDir%\trend\soap.ntk\_trend.dll.ini

Log file specified: ..\logs\trendmicro.log

Result: The log file is saved under %ExecDir%\logs\trendmicro.log.

#### 3.3.1 General Parameters

Depending on whether the sandbox is used to address an unpacker, a virus scanner or an analyzer, different parameters will be available in this file. Typically, the following parameters are always available in each SOAP.Defaults.INI or SOAP.INI file:

- Host=<IP address>:<TCP port number>  
IP address and TCP port number used by the sandbox. The IP address is 127.0.0.1, as only local connections are to be permitted. Different TCP ports have to be set for different sandboxes to avoid interference between them. Refer to [Particularities for Partitioned Servers Under Unix](#).
- Threading=[MULTI | SINGLE]
- Threads=<Number of possible threads for multi-threading>  
Sets the parallel processing level in the sandbox server EXE. Default: 5
- ClientLogFile=<Name of the log file>  
Used to log messages from the sandbox client DLL.
- ServerLogFile=<Name of the log file>

Used to log messages from the sandbox server EXE. If no absolute filename is set, both parameters are created in the directory that also contains the other sandbox files.

Relative filenames refer to the storage location of the INI file.

For troubleshooting purposes, you can use the %ID% metasymbol in the filename parameter, which is later replaced with a timestamp when the log file is created. This ensures that any existing log files will not be overwritten when the sandbox client DLL and sandbox server EXE are started. Please note that, in this case, the log files need to be deleted manually.

**Example 1:**

```
ClientLogFile=tk_trend_client_%ID%.log
ServerLogFile=tk_trend_server_%ID%.log
```

**Example 2:**

To disable logging, simply leave the filename empty:

```
ClientLogFile=
ServerLogFile=
```

- `ServerDirectory=<Name of the sandbox server EXE directory>`

(optional parameter) As certain files need to be stored in the same directory, the server and client files are stored in the same directory by default. To be able to separate the server and client components, we recommend using the `ServerDirectory` parameter. If you set this parameter in one of the INI files, the INI files only need to be located in the same directory as the sandbox client DLL.

**Note:** Files including their own configuration parameters, e.g. log files, are not affected by this parameter. Where required, they need to be individually stored in the server directory. All other files are expected to be available in the server directory specified. More specifically, these include the GROUP Interface DLL (to be run in the sandbox) and the sandbox server EXE.

Please note that the path settings may have to be changed in other parameters as well.

- `LibraryPath=<Path to desired directory>`

(Unix systems only) Allows to use additional directories in the library search path.

Under Linux/Solaris: `LD_LIBRARY_PATH`, under AIX: `LIBPATH`. The default directory where the `SOAP.Defaults.INI` or `SOAP.INI` file is stored (`LibraryPath=.`). Enter the path to the directory as required.

**Example:**

LibraryPath=/opt/<Virus scanner>/lib

Multiple directories are separated by a colon.

■ EnvVar=<Name>=<Value>

Sets the environment variable "Name" in the sandbox server EXE to the value "Value".

■ EnvPath=<Name>=<Path>

Sets the environment variable "Name" in the sandbox server EXE to the value "Path". If no absolute path is specified, it is assumed to be relative to the SOAP.Defaults.INI or SOAP.INI file and transformed into an absolute path.

**Example:**

EnvPath=MyDir=.

in C:\lotus\domino\data\iQ.Suite\subdir

corresponds to EnvVar=MyDir=C:\lotus\domino\data\iQ.Suite\subdir

### 3.3.2 Parameters for Temporary Directories

- **TmpDir=<Name of the new temporary directory of the sandbox>**  
This parameter complements the sandbox environment variables TEMP, TMP and TMPDIR. No on-access virus scanner should be scanning this directory.  
Default=Empty string  
**Example:** TmpDir=
- **CleanTmpDir=<Value>**  
Each time the sandbox server EXE is started, the content of the directory specified under <TmpDir> is deleted. This requires that the name of directory specified under <TmpDir> is "tmp" or "temp" or the extension is ".tmp".  
Possible values: "yes", "no"; default: "no"  
**Note:** To avoid data loss configure your own exclusive directory under <TmpDir>.
- **ExtraTmpVariable=<Name of the environment variable>**  
(for exceptional cases only) This parameter allows to specify a further environment variable, to be set in addition TEMP, TMP and TMPDIR.  
For instance, if using the Sophos AntiVirus virus scanner, you can set this parameter as follows: ExtraTmpVariable=SAV\_TMP.  
Default=Empty string
- **OnAccessScanCheck=<Value>**  
When used with on-access virus scanners, this parameter causes the directory set under <TmpDir> to be checked. Possible values: "yes", "no"; Default: "yes"

### 3.3.3 Sandbox Client DLL Time Response Parameters

Timeouts of the sandbox client DLL occur when the configured period of time allocated for the processing of sandbox server EXE actions is exceeded. The sandbox server EXE actions include virus checks, spam checks, unpacking, initializing virus scanners and analyzers, etc.

Normally, the following parameters are used to configure the sandbox client DLL time response:

- `ClientTimeoutIO=<Number of seconds until timeout by the client>`  
If the sandbox server EXE exceeds the time period set here while performing an action, the sandbox client DLL stops and then restarts the sandbox server EXE.  
**Note:** By experience, the initialization of virus scanners or analyzers can be quite time-consuming. Therefore, we recommend setting the calculated initialization as time interval. With the default setting, the operation is aborted after 120 seconds.
- `ClientTimeoutMin=<Number of seconds until the client assumes an error>`  
If any actions cannot be performed, e.g. due to a timeout caused by the `ClientTimeoutIO` parameter, due to a crash of the sandbox server EXE or due to a fatal server error, the system attempts to repeat the action.  
The two parameters `ClientTimeoutMin` and `ClientTimeoutMax` can be used to set the time interval for this attempt. With the default setting, the system attempts to perform the action for a period of 360 seconds.  
**Note:** When this period of time expires, the sandbox client DLL signals an error, which is recorded in the Notes Log. Temporary problems that do not occur again when the action is repeated, are only recorded in the sandbox client DLL and sandbox server EXE log files.
- `ClientTimeoutMax=<Number of seconds until the client assumes an error>`  
Default: 360 seconds. By default, `ClientTimeoutMin` and `ClientTimeoutMax` are set to the same value.

To have the three parameters above set automatically, use the following parameters:

- `ClientTimeout=<Value>`  
The `ClientTimeoutIO` parameter is set to the specified `<Value>`.  
`ClientTimeoutMin` and `ClientTimeoutMax` are set to three times the value of `ClientTimeoutIO`.  
**Note:** With both the `ClientTimeout` parameter and one of the other parameters set, the last parameter specified in the file applies. In other words, if the last parameter in the file is `ClientTimeout`, all other parameters are ignored.

### Special configuration

In certain cases, it may be useful to set `ClientTimeoutMin` to a smaller value than `ClientTimeoutMax`. In this case, the following will happen:

- When the sandbox is started, the system assumes that the sandbox server EXE is working properly (Mode 1). The timeout value used is the one specified under `ClientTimeoutMax`.
- Whenever this timeout interval is exceeded due to an action that cannot be performed, the system switches to Mode 2.
- In Mode 2, the timeout value used is the one specified under `ClientTimeoutMin`. Accordingly, if an error occurs while performing the next action, the action will be timed out sooner in case of delays.
- On the other hand, if the action is completed successfully, the system switches back to Mode 1. Successful actions include a successful virus or spam check. However, a successful initialization alone is **not** sufficient to switch back to Mode 1.

### Sample configurations

**Example 1:** Timeout after 1 minute (individual action).

```
ClientTimeout=60
```

**Example 2:** Timeout after 1 minute (individual action) or 3 minutes (for repeated attempts).

```
ClientTimeoutIO=60  
ClientTimeoutMin=180  
ClientTimeoutMax=180
```

**Example 3:** Timeout after 20 minutes (individual action) or 3 minutes (for repeated attempts). Setting a very long timeout for individual actions and a short one for repeats can be useful when using the CORE Analyzer. As the analyzer requires more time for certain actions (such as initialization, teaching etc.), this allows to reduce the waiting time.

```
ClientTimeoutIO=1200  
ClientTimeoutMin=180  
ClientTimeoutMax=180
```

### 3.3.4 Sandbox Server EXE Time Response Parameters

The following parameters are used to configure the sandbox server EXE time response:

- `IdleBeforeTerminate`=<Number of seconds until the sandbox is terminated>  
If no actions need to be performed during the period of time set here, the sandbox server EXE is automatically terminated. Default: 120 seconds.

- `ServerTimeout`=<Number of seconds until the server times out>  
During the period of time set here, the sandbox server EXE checks whether or not it is still being used by a sandbox client DLL and the value set under `IdleBeforeTerminate` has been exceeded. Default: 60 seconds.

**Note:** If the following error message is recorded in the server log file, the server timeout interval has been exceeded.

*SOAP FAULT: SOAP-ENV:Server*

*"Timeout"*

*Detail: TCP accept failed in soap\_accept()*

The configured period of time has elapsed without any action started by the sandbox server EXE. This message does not cause any malfunction of the sandbox server EXE and can be ignored.

- `TimeLimit`=<Number of minutes until the sandbox server EXE is terminated>  
After the period of time specified here has elapsed, the sandbox server EXE is terminated and restarted, regardless of the workload.
- `CallLimit`=<Max. number of sandbox requests>  
After the number of calls specified here has been reached, the sandbox server EXE is terminated and restarted, regardless of the workload. Depending on the type of the sandbox, one or more sandbox requests may be necessary for an email or document to be processed.

### 3.4 Automatic Virus Pattern Update

The periodical virus pattern updates required for virus checks represent a major issue, as the update procedure depends on the virus scanner used. Where required, certain virus scanner installation files are copied to the iQ.Suite directory of the corresponding virus scanner. This ensures that the original files of the virus scanner are not blocked by iQ.Suite at their original storage location. The update procedure included in the virus scanner software – or another appropriate procedure – thus ensures the files are updated as required.

Whenever new files are found while the iQ.Suite directory is periodically checked by *GROUP.Sandbox*, the update process is triggered and the virus scanner files in the sandbox are replaced. This process does not require restarting iQ.Suite Watchdog nor the MailGrabber or DatabaseGrabber.

The parameters required for the automatic virus pattern update are preset and usually do not have to be adjusted. Please observe the information on the particularities of each virus scanner in the sections below.

#### 3.4.1 Particularities of McAfee, Norman and Trend Micro

The virus pattern update parameters are also included in the SOAP.Defaults.INI and SOAP.INI files, in addition to the regular parameters. Refer to [SOAP.Defaults.INI and SOAP.INI Parameters](#) on Page 6.

In Windows systems, the following parameters are relevant for the update process:

- `UpdateFrom` = <Source directory for the update>  
The path may vary according to the platform and the scanner version used and also depends on the installation directory of the virus scanner.
- `UpdateInterval` = <Update interval in minutes>  
The virus pattern update is performed when the period of time set here has elapsed.  
Default: 60 minutes.
- `UpdateProgram` = <Program that runs the update>  
Check the path settings to the update program.
- `UpdateConfig` = <Name of the configuration file>  
If you want to use another configuration file (.cfg) than the one stored in the virus scanner directory, enter this parameter manually in the SOAP.INI file and specify the name of the desired configuration file.

For the virus scanners dealt with in this section, the following files are additionally required for the automatic update:

- *ntk\_<Virus scanner name>\_ref.cfg*  
The files listed in this configuration file are copied from the virus scanner directory. If you need to modify this file, please contact GROUP Support for further instructions.
- *ntk\_avfile\_update.bat* (Windows) or *tk\_avfile\_update.sh* (Unix)  
Program that calls the *ntk\_avfile\_update.exe* program.
- *ntk\_avfile\_update.exe*  
Update program located in the `bin` directory under the iQ.Suite program directory, which copies the files from the virus scanner directory.

**Note:** All of the files needed for virus scanner must be located in the subdirectory of the corresponding virus scanners under the iQ.Suite program directory, e.g. <iQSuite Program>\trend.

### 3.4.2 Particularities of Avira AntiVir (SAVAPI3)

In Windows systems, the following parameters for the virus pattern update are set in the SOAP.Defaults.INI and SOAP.INI files:

- `UpdateFrom =<Source directory for the update>`  
The path may vary according to the installation directory of the virus scanner.
- `UpdateInterval=<Update interval in minutes>`  
The virus pattern update is performed when the period of time set here has elapsed.  
Default: 60 minutes.
- `UpdateProgram =<Program that runs the update>`  
Check the path settings to the update program.
- `UpdateConfig =<Name of the configuration file>`  
If you want to use another configuration file (.cfg) than the one stored in the virus scanner directory, enter this parameter manually in the SOAP.INI file and specify the name of the desired configuration file.
- `DownloadFrom=<Target address of the Avira Internet Update Manager>`  
If you want to control the updates from a central server, you can use the *Avira Internet Update Manager*. A central server downloads the updates from the Internet and

makes them available to each of the client computers as web server. The client computers download the updates from the central server. <sup>2</sup>

### 3.4.3 Particularities of Norton (Symantec Scan Engine)

For the Norton Symantec virus scanner, the virus pattern update is run without active interaction by iQ.Suite. The new virus patterns are automatically downloaded and used by iQ.Suite. A configuration of the update process is not required.

### 3.4.4 Particularities of Sophos AntiVirus under Windows

The parameters for the virus pattern update are also set in the SOAP.Defaults.INI and SOAP.INI files, in addition to the regular parameters. Refer to [SOAP.Defaults.INI and SOAP.INI Parameters](#) on Page 6.

Under Windows, to modify the *GROUP.Sandbox* update process, copy the following parameters from the SOAP.Defaults.INI file to the SOAP.INI file:

- UpdateFrom =<Source directory for the update>  
The path may vary according to the installation directory of the virus scanner.
- UpdateInterval=<Update interval in minutes>  
The virus pattern update is performed when the period of time set here has elapsed.  
Default: 60 minutes.
- RestartonRc =<Return value of the virus scanner>  
Value: 547; this return value is used to restart the sandbox.
- DependsOnService =<Service name>  
Name: SAVSERVICE; used for Sophos AntiVirus (Win32 platforms only) to be able to check the status of the update service.

**Note:** All of the files needed for the Sophos AntiVirus virus scanner can be stored in the <iQSuite>\sophos directory.

### Running the update

---

<sup>2</sup> For further information on the installation and setup of *Avira Internet Update Manager* please visit the Avira website under: [www.avira.com](http://www.avira.com) .

As no virus check must be run during the update process, the **SavService.exe** Sophos service is stopped and not restarted before the update process is complete. Under Win32 platforms, the status of the service is periodically checked and the Sophos Scan Engine is only initialized (started) when the service is available.

In addition, the software checks a specific return code. When an update has been performed, the Sophos scan engine returns the value 547 to indicate that the sandbox server EXE using the virus scanner needs to be restarted. This is controlled through the `RestartOnRc` parameter in the `SOAP.Defaults.INI` file. Whenever this value is returned by the virus check, the sandbox server EXE is terminated and automatically restarted when the next virus check is performed.

### 3.4.5 Particularities of Sophos AntiVirus under Unix

The parameters for the virus pattern update are set in the `SOAP.Defaults.INI` and `SOAP.INI` files. To modify the update procedure, refer to the instructions provided under [Particularities of McAfee, Norman and Trend Micro](#).

The following parameters are used to control the update process:

- `UpdateFrom` =<Source directory for the virus scanner update>  
This parameter must be set otherwise no update will be possible. The path may vary according to the installation directory of the virus scanner.
- The Sophos AntiVirus library directory must not be included in the `LD_LIBRARY_PATH` (Linux/Solaris) or `LIBPATH` (AIX) environment variables.

**Note:** All of the files needed for the Sophos AntiVirus virus scanner can be stored in the `<iQSuite>\sophos` directory.

#### Running the update

Under Unix, the virus pattern update is performed through shell scripts rather than the Sophos service. The virus patterns are automatically updated by Sophos AntiVirus and stored in the Sophos installation directory. The configuration file `ntk_sophos_ref.cfg` copies the `libsavi.so.3` (Linux/Solaris) or `libsavi.a` (AIX) file to the iQ.Suite program directory. In addition, the software checks the directory for updated virus patterns. If that is the case, the sandbox is restarted and the new virus patterns are used for virus checking.

## 4 Particularities for Partitioned Servers under Unix

If several server instances with different Unix User IDs are run on a Unix system, the sandbox server EXE runs with the User ID of the sandbox client DLL that started the sandbox server EXE. As the sandbox server EXE can be started by any sandbox client DLL, the User ID may vary.

On the other hand, a User ID may also be assigned to temporary files, if they contain emails or parts of an email and are checked by a DLL running in the sandbox server EXE. Together, these two factors result in the following requirements and restrictions:

- All server instances must have write access to the directories where the sandbox log files and temporary files are stored.
- All server instances must have read access to the temporary files of all other server instances.
- Depending on the implementation of the cleaning function, it may be necessary that all server instances have write access to the temporary files of all other server instances.
- In case a sandbox server EXE freezes, it can only be terminated by the sandbox client DLL it was started by.

To avoid these problems, allocate a separate sandbox to each server instance. Adjust the TCP port accordingly in each SOAP.INI file by setting the `Host` parameter to a consecutive number for each server instance. For instance, if `Host=127.0.0.1:8200` is preset in each SOAP.Defaults.INI file, enter `Host=127.0.0.1:8201` for the second server instance and `Host=127.0.0.1:8202` for the third server instance.

## About GROUP Technologies - A Division of GROUP Business Software AG

### *GROUP's Email, Archiving and Administration Department*

Organizational operations depend on highly-efficient modes of communication. Communication affects – more or less – all business processes. Email is heavily used for communication, in collaboration efforts and as a workflow engine. Email is a process which affects all aspects of internal and external information exchange. Following these facts, email is the number one business critical application and is burdened with internal and external risks, regulations, policies and standards.

GROUP Technologies focuses on delivering a process-controlled, centralized and easy-to-maintain email management solution for the Lotus Domino and the Microsoft Exchange markets.

### *GROUP Technologies Value Proposition*

**Expertise:** The company is a trusted advisor to its customers in the areas of email security, compliance or IT optimization and is capable of solving any business challenge in these areas through its centralized and rules-based email process management approach.

**Unified console/single point of administration:** Multi-level anti-virus and anti-spam, automated de-/encryption, rule-enforcement, regulatory enforcement and real time archiving through a single point of administration within the entire organization.

**Simplicity:** The company's email solution features easy-to-use interfaces and is efficient in solving email challenges. As a server-based solution, client/user interaction is limited and reduced to the absolute necessary minimum input by the email user. The organization-wide implementation for all users is done on the server and is easy to administer through our unified console.

**Email as a business process:** Company defined processes control email usage ensuring compliance with internal policies as well as regulatory requirements. Simple configuration tools allow the system to easily be adapted to satisfy the demands of growing companies and new regulations that have yet to be envisioned.

### *GROUP Facts*

**Customers:** GROUP's clients include many well-known companies such as Deutsche Bank, Ernst & Young, Honda, Heineken, Allianz and Miele. More than three million users and 3,000 companies worldwide protect and organize their systems with GROUP Technologies products.

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