Configuring Symantec AntiVirus™ for IBM Scale Out Network Attached Storage (SONAS)
Configuring Symantec AntiVirus™ for IBM Scale Out Network Attached Storage (SONAS)

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Operating system
Version and patch level
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Problem description:
Error messages and log files
Troubleshooting that was performed before contacting Symantec
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- Latest information about product updates and upgrades
- Information about upgrade assurance and support contracts
- Information about the Symantec Buying Programs
- Advice about Symantec's technical support options
- Nontechnical presales questions
- Issues that are related to CD-ROMs or manuals
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If you want to contact Symantec regarding an existing support agreement, please contact the support agreement administration team for your region as follows:

<table>
<thead>
<tr>
<th>Region</th>
<th>Email Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia-Pacific and Japan</td>
<td><a href="mailto:customercare_apac@symantec.com">customercare_apac@symantec.com</a></td>
</tr>
<tr>
<td>Europe, Middle-East, and Africa</td>
<td><a href="mailto:semea@symantec.com">semea@symantec.com</a></td>
</tr>
<tr>
<td>North America and Latin America</td>
<td><a href="mailto:supportsolutions@symantec.com">supportsolutions@symantec.com</a></td>
</tr>
</tbody>
</table>
Configuring Symantec AntiVirus™ for IBM Scale Out Network Attached Storage (SONAS)

This document includes the following topics:

■ About software components
■ How Symantec Scan Engine works with IBM Scale Out Network Attached Storage (SONAS)
■ How files are scanned
■ How caching works
■ About specifying which file types are scanned
■ About specifying file types on IBM Scale Out Network Attached Storage (SONAS)
■ About specifying file types on Symantec Scan Engine
■ About specifying the scan policy
■ About handling infected files on IBM Scale Out Network Attached Storage (SONAS)
■ About preparing for installation
■ About configuring Symantec Scan Engine
Symantec AntiVirus for Network Attached Storage provides virus scanning and repair capabilities for the IBM Scale Out Network Attached Storage (SONAS) network-attached storage (NAS) system.

The SONAS system supports antivirus solutions from Symantec that are installed, configured, maintained, and operated by the customer. The SONAS configuration options control actions taken by the SONAS system, either before or after submitting a request to the Symantec Scan Engine to scan the file, while the Symantec Scan Engine configuration options independently control actions taken by the Symantec Scan Engine during the process of scanning the file. Therefore, both the SONAS system and the Symantec Scan Engine must each be configured appropriately for an option to operate as intended.

To use antivirus scanning with SONAS, configure Symantec Scan Engine, which provides the virus scanning and repair services. For more information, see the *Symantec Scan Engine Implementation Guide*.

Virus scanning is an integral part of SONAS starting with SONAS version 1.2. No separate code installation or license is required. See “About configuring IBM Scale Out Network Attached Storage (SONAS)” on page 20.
How Symantec Scan Engine works with IBM Scale Out Network Attached Storage (SONAS)

Symantec AntiVirus for Network Attached Storage (SAV for NAS) provides virus scanning and repair capabilities for IBM Scale Out Network Attached Storage (SONAS) version 1.2 and later. The minimum supported level of SAV for NAS for use with SONAS is 5.2.8. Virus scanning and repair is provided for files that are accessed from SONAS using the Common Internet File System (CIFS) protocol.

The Internet Content Adaptation Protocol (ICAP) is used to communicate with Symantec Scan Engine. For load balancing, you can configure a pool of scan engines. The SONAS selects a scan engine from the pool list at scan time. If a scan engine cannot be reached, it is temporarily removed from the pool of available scan engines. In this case, the SONAS system selects a different scan engine that is available from the pool, and periodically attempts to reinstate the removed scan engine.

How files are scanned

The IBM Scale Out Network Attached Storage (SONAS) initiates the scan of a file in real-time when a file is opened. SONAS can optionally be configured to scan a file in real-time when the file is closed, if the file has been modified. You can also define and submit on-demand scans, and configure scheduled bulk scans.

When a user attempts to access a file from SONAS, SONAS opens a connection with Symantec Scan Engine. The SONAS then passes the file to the scan engine for scanning. When scanning is complete, the SONAS closes the connection with the scan engine.

The Symantec Scan Engine indicates the scanning results to SONAS after a file is scanned. The scan engine also returns the repaired file if a file is infected and can be repaired.

After the SONAS receives the scanning results, the file is handled in the following manner:

Only clean files are passed to the requesting user. If a file is infected and can be repaired, the repaired file is passed to the requesting user. The stored version of the infected file is replaced with the repaired file. Parameters can be set to control whether to deny access to a file if scanning is not possible at the time, and in the case where a virus is detected and repair is not possible, whether to quarantine or delete a file. A permission denied type of error notifies the end user attempting to access an unrecoverable file. Optionally, the path by which the file was opened for the current scan can be moved to a subdirectory created for that purpose and accessible only by the root user.
How caching works

The timestamp of a scan and the antivirus definition file signature are saved as extended attributes for each file scanned. Cached antivirus scan information is checked when a file is opened to determine whether a file must be scanned. After an update of a virus definition, which provides a new signature, each file must be re-scanned before it can be read again. A bulk re-scan can be initiated on demand to run asynchronously to proactively re-scan files during a convenient time window rather than waiting for the next read of each file. The SONAS caches scanning results for each clean file. The cached information includes the date and revision number of the virus definitions that were used to perform the scan, so that if a second user requests access to a file that has already been scanned and the virus definitions have not changed, a redundant scan is avoided.

About specifying which file types are scanned

To specify the file types to be scanned for viruses, configure settings on both the IBM Scale Out Network Attached Storage (SONAS) and the Symantec Scan Engine.

About specifying file types on IBM Scale Out Network Attached Storage (SONAS)

Based on file extensions, the IBM Scale Out Network Attached Storage (SONAS) initially determines whether it should pass a file to Symantec Scan Engine for scanning. You can control which files are scanned by using an exclusion list or an inclusion list, or you can scan all files regardless of extension. SONAS antivirus parameters can be set at the export, file system, file set or path level to specify which file extensions to include in, and exclude from, a scan. The exclusion list specifies extensions of files to be excluded from scanning because they are not likely to contain viruses.

If the include list is empty or not specified, the default is that all extensions are included in scans. In this case, the exclude list can be used to create exceptions. If a file extension is currently explicitly specified in the include list, removing that extension from the include list results in that extension not being scanned once the update occurs, just as though the extension had instead been added to the exclude list.

See “About configuring virus scanning on IBM Scale Out Network Attached Storage (SONAS)” on page 21.
About specifying file types on Symantec Scan Engine

You can configure Symantec Scan Engine so that selected file types and file extensions are excluded from scanning. The setting on Symantec Scan Engine is as important as the IBM Scale Out Network Attached Storage (SONAS) setting. The setting on the scan engine determines which files to scan upon receiving a file from the SONAS. The scanned files are those contained in archive or container file formats. You can control which embedded files are scanned by using the file type and extension exclusion list, or you can scan all files regardless of extension.

Note: Exclusion lists ensure that all file types are not scanned; therefore, new types of viruses might not be detected. Scanning all files regardless of extension and type is the most secure setting, but it imposes the heaviest demand on resources. During virus outbreaks, you might want to scan all files even if you normally control the file types that are scanned with the exclusion list.

For more information, see the Symantec Scan Engine Implementation Guide. See “Specifying which file types to scan on the scan engine” on page 15.

About specifying the scan policy

You configure the scan policy through the Symantec Scan Engine administrative interface. When an infected file is found, the scan engine can do any of the following:

- **Scan only**: Scan files for viruses, but do nothing to infected files
- **Scan and delete**: Scan files for viruses, and delete any infected files that are embedded in archive or container files without trying to repair
- **Scan and repair files**: Try to repair infected files, but do nothing to unrepairable files (that is, do not delete the files from archive or container files)
- **Scan and repair or delete**: Try to repair infected files, and delete unrepairable files from archive or container files
About handling infected files on IBM Scale Out Network Attached Storage (SONAS)

When an unrepairable infected file is found, optional parameters at the export, file system, file set and path level specify whether to quarantine or delete a file. Optionally, the path by which the file was opened for the current scan can be moved to a subdirectory created for that purpose and accessible only by the root user. For more information, see the appropriate IBM SONAS documentation.

About preparing for installation

The computer on which you plan to install Symantec Scan Engine must meet the system requirements that are listed in the *Symantec Scan Engine Implementation Guide*.

After you have installed the Symantec Scan Engine, configure the virus scanning functionality on the IBM Scale Out Network Attached Storage (SONAS) system.

About configuring Symantec Scan Engine

You must configure several settings on each Symantec Scan Engine that is used to support scanning for IBM Scale Out Network Attached Storage (SONAS).

**Note:** The configuration settings on each scan engine must be identical if you use multiple scan engines to support scanning for a SONAS system. LiveUpdate and Rapid Release should be scheduled to occur at the same time on all scan engines so that virus definitions are consistent at all times.

The scan engine must be configured to use ICAP as the communication protocol. ICAP is the default protocol at installation. After you have selected ICAP, you can configure ICAP-specific options.

Configuring ICAP-specific options

After you install Symantec Scan Engine, you can configure several settings that are specific to the ICAP protocol through the Symantec Scan Engine administrative interface. If Symantec Scan Engine has already been configured to use another protocol, you also can change the protocol through the administrative interface; however, you must manually restart the Symantec Scan Engine.
For more information about accessing the administrative interface, see the Symantec Scan Engine Implementation Guide.

Table 1-1 describes the protocol-specific options for ICAP.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bind address</td>
<td>Symantec Scan Engine detects all of the available IP addresses that are installed on the host. By default, Symantec Scan Engine accepts scanning requests on (binds to) all of the scanning IP addresses that it detects. You can configure up to 64 IP addresses as scanning IP addresses. You can specify whether you want Symantec Scan Engine to bind to all of the IP addresses that it detects, or you can restrict access to one or more interfaces. If you do not specify at least one IP address, Symantec Scan Engine binds to all of the scanning IP addresses that it detects. If Symantec Scan Engine fails to bind to any of the selected IP addresses, an event is written to the log as a critical error. Even if Symantec Scan Engine is unable to bind to any IP address, you can access the console; however, scanning functionality is unavailable.</td>
</tr>
<tr>
<td>Port number</td>
<td>The port number must be exclusive to Symantec Scan Engine. For ICAP, the default port number is 1344. If you change the port number, use a number greater than 1024 that is not in use by any other program or service.</td>
</tr>
</tbody>
</table>
### Table 1-1  Protocol-specific options for ICAP (continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan policy</td>
<td>When an infected file is found, Symantec Scan Engine can do any of the following:</td>
</tr>
<tr>
<td></td>
<td>■ Scan only: Scan files for viruses, but do nothing to infected files.</td>
</tr>
<tr>
<td></td>
<td>■ Scan and delete: Scan files for viruses, and delete any infected files that are embedded in archive or container files without trying to repair.</td>
</tr>
<tr>
<td></td>
<td>■ Scan and repair files: Try to repair infected files, but do nothing to unrepairable files (that is, do not delete the files from archive or container files).</td>
</tr>
<tr>
<td></td>
<td>■ Scan and repair or delete: Try to repair infected files, and delete unrepairable files from archive or container files.</td>
</tr>
</tbody>
</table>

#### To configure ICAP-specific options

1. On the Symantec Scan Engine administrative interface, in the left pane, click **Configuration**.

2. Under Views, click **Protocol**.

3. In the right pane, under Select Communication Protocol, click **ICAP**. The configuration settings are displayed for the selected protocol. If you change the protocol setting from RPC to ICAP through the Symantec Scan Engine administrative interface, you must manually stop and start the service.

4. Under ICAP Configuration, in the Bind address box, select the scanning IP addresses that you want to bind to Symantec Scan Engine. Check **Select All** to select every IP Address in the Bind address table. By default, Symantec Scan Engine binds to all interfaces.

5. In the Port number box, type the TCP/IP port number that the IBM Scale Out Network Attached Storage (SONAS) uses to pass files to Symantec Scan Engine for scanning. The default setting for ICAP is port 1344.
6 In the Scan policy list, select how you want Symantec Scan Engine to handle infected files. The default setting is Scan and repair or delete, which is the recommended setting.

7 On the toolbar, select one of the following:

- **Save**
  - Saves your changes.
  - You can continue to make changes in the administrative interface until you are ready to apply them.

- **Apply**
  - Applies your changes.
  - Your changes are not implemented until you apply them.

---

### Specifying which file types to scan on the scan engine

The settings on Symantec Scan Engine must be configured to specify the types of files to be scanned for viruses. This setting on the scan engine determines which files to scan on receiving a file from IBM Scale Out Network Attached Storage (SONAS). The scanned files are those contained in archive or container file formats.

You can control which embedded files are scanned by using an extension or type exclusion list, or you can scan all files regardless of extension and type. A pre-populated extension and type exclusion list exists that you can modify. The Symantec Scan Engine is configured by default to scan all files.

**Note:** Symantec Scan Engine examines the first few bytes of every file to determine whether the file could contain a virus. This action occurs even if the file extension is not one that was identified for scanning. Based on this examination, the scan engine may scan a file even though it has not been identified for scanning.

For more information, see the *Symantec Scan Engine Implementation Guide*.

See “About configuring virus scanning on IBM Scale Out Network Attached Storage (SONAS)” on page 21.

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### Specify which file types to scan

You can control which file types are scanned by specifying those extensions that you want to exclude from scanning, or you can scan all files regardless of extension.
To scan all files except for those that are in the file extension exclusion list:

1. On the Symantec Scan Engine administrative interface, in the left pane, click **Policies**.
2. Under Views, click **Scanning**.
3. In the right pane, under Files to Scan, click **Scan all files except those in the extension or type exclude lists**. When you enable this option, both the file extension exclude list and the file type exclude list are activated automatically.
4. Type each file extension that you want to add to the list on a separate line. Use a period with each extension in the list.
5. To remove a file extension from the list, select it and delete it from the File extension exclude list.
6. To restore the default file extension exclude list, in the left pane, under Tasks, click **Reset Default List**. This option restores the default file-type exclude list and the file-extension exclude list.
7. On the toolbar, select one of the following:

   **Save**
   
   Saves your changes.
   
   You can continue to make changes in the administrative interface until you are ready to apply them.

   **Apply**
   
   Applies your changes.
   
   Your changes are not implemented until you apply them.

To scan all file types except those in the file type exclusion list:

1. On the Symantec Scan Engine administrative interface, in the left pane, click **Policies**.
2. Under Views, click **Scanning**.
3. In the right pane, under Files to Scan, click **Scan all files except those in the extension or type exclude lists**. When you enable this option, both the file type exclude list and the file extension exclude list are activated automatically.
4. Type each file type you want to add to the list on a separate line. To include all subtypes for a file type, use the wildcard character `/*`. For more information on how to write the file types, see the **Symantec Scan Engine Implementation Guide**.
5. To remove a file type from the list, select it and delete it from the File type exclude list.
6 To restore the default file type exclude list, in the left pane, under Tasks, click **Reset Default List**. This option restores the default file-type exclude list and the file-extension exclude list.

7 On the toolbar, select one of the following:

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Save</strong></td>
<td>Saves your changes. You can continue to make changes in the administrative interface until you are ready to apply them.</td>
</tr>
<tr>
<td><strong>Apply</strong></td>
<td>Applies your changes. Your changes are not implemented until you apply them.</td>
</tr>
</tbody>
</table>

**To scan all files regardless of extension or type**

1 On the Symantec Scan Engine administrative interface, in the left pane, click **Policies**.

2 Under Views, click **Scanning**.

3 In the right pane, under Files to Scan, click **Scan all files**.

4 On the toolbar, select one of the following:

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Save</strong></td>
<td>Saves your changes. You can continue to make changes in the administrative interface until you are ready to apply them.</td>
</tr>
<tr>
<td><strong>Apply</strong></td>
<td>Applies your changes. Your changes are not implemented until you apply them.</td>
</tr>
</tbody>
</table>

### Specifying container handling limits

File attachments that consist of container files can overload the system and cause denial-of-service attacks. They can be overly large, contain large numbers of embedded, compressed files, or be designed to maliciously use resources and degrade performance. Symantec Scan Engine can be configured to impose limits on how container files are handled. This reduces the network’s exposure to denial-of-service attacks.
You can specify the following limits for handling container files:

- The maximum amount of time, in seconds, that is spent decomposing a container file and its contents; this setting does not apply to .hqx or .amg files
- The maximum file size, in megabytes, for the individual files that are in a container file
- The maximum number of nested levels to decompose for scanning
- The maximum number of bytes that are read when determining whether a file is MIME-encoded

You can specify whether to allow or deny access to the file if any of these specified limits is met or exceeded.

Symantec Scan Engine blocks container files based on their type, because only certain file types contain virus or malicious code. You can configure Symantec Scan Engine to block partial container files, malformed container files, and encrypted container files as well.

For more information on container handling limits, see the *Symantec Scan Engine Implementation Guide*.

**Scheduling LiveUpdate to update virus definitions automatically**

Scheduling LiveUpdate to occur automatically at a specified time interval ensures that the Symantec Scan Engine always has the most current virus definitions. If you use multiple scan engines to support virus scanning, schedule LiveUpdate to occur at the same time for each scan engine. This scheduling ensures that all scan engines have the same version of virus definitions. Having the same version of virus definitions is necessary for proper functioning of virus scanning on IBM Scale Out Network Attached Storage (SONAS).

You must schedule LiveUpdate on each Symantec Scan Engine. When LiveUpdate is scheduled, LiveUpdate runs at the specified time interval relative to the LiveUpdate base time. The default LiveUpdate base time is the time that the scan engine was installed.

You can change the LiveUpdate base time. If you change the scheduled LiveUpdate interval, the interval adjusts based on the LiveUpdate base time.

For more information on changing the base time, see the *Symantec Scan Engine Implementation Guide*. 
To schedule LiveUpdate to update virus definitions automatically:

1. On the Symantec Scan Engine administrative interface, in the left pane, click System.
2. Under Views, click LiveUpdate Content.
3. In the right pane, under LiveUpdate Content, check Enable scheduled LiveUpdate. This option is enabled by default.
4. In the LiveUpdate interval drop-down list, choose an interval. You can select from 2, 4, 8, 10, 12, or 24-hour intervals. The default LiveUpdate interval is 2 hours.
5. On the toolbar, select one of the following:

   - **Save** Saves your changes.
     You can continue to make changes in the administrative interface until you are ready to apply them.
   - **Apply** Applies your changes.
     Your changes are not implemented until you apply them.

### Configuring Rapid Release updates to occur automatically

You can configure Symantec Scan Engine to obtain uncertified definition updates with Rapid Release. You can configure Symantec Scan Engine to retrieve Rapid Release definitions every 5 minutes to every 120 minutes.

Rapid Release definitions are created when a new threat is discovered. Rapid Release definitions undergo basic quality assurance tests by Symantec Security Response. However, they do not undergo the intense testing that is required for a LiveUpdate release. Symantec updates Rapid Release definitions as needed to respond to high-level outbreaks.

**Warning:** Rapid Release definitions do not undergo the same rigorous quality assurance tests as LiveUpdate and Intelligent Updater definitions. Symantec encourages users to rely on the full quality-assurance-tested definitions whenever possible. Ensure that you deploy Rapid Release definitions to a test environment before you install them on your network.
If you use a proxy or firewall that blocks FTP communications, the Rapid Release feature does not function. Your environment must allow FTP traffic for the FTP session to succeed.

You can schedule Rapid Release updates to occur automatically at a specified time interval to ensure that Symantec Scan Engine always has the most current definitions. Scheduled Rapid Release updates are disabled by default.

**Configuring Rapid Release updates to occur automatically**

1. On the Symantec Scan Engine administrative interface, in the left pane, click **System**.
2. Under Views, click **Rapid Release Content**.
3. In the content area under Rapid Release Content, check **Enable scheduled Rapid Release** to enable automatic downloads of Rapid Release definitions. This option is disabled by default.
4. In the Rapid Release interval box, to specify the interval between which you want Symantec Scan Engine to download Rapid Release definitions, you can select any number between 5 minutes and 120 minutes. The default value is 30 minutes. Perform one of the following two steps:
   - Type the interval.
   - Click the up arrow or down arrow to select the interval.
5. On the toolbar, select one of the following:
   - **Save**: Saves your changes.
   - **Apply**: Applies your changes. Your changes are not implemented until you apply them.

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**About configuring IBM Scale Out Network Attached Storage (SONAS)**

You must register at least one Symantec Scan Engine for each IBM Scale Out Network Attached Storage (SONAS) for which you provide virus scanning. You also must configure the virus scan functionality in accordance with the IBM SONAS...
documentation. For more information, see the appropriate IBM SONAS documentation.

Registering Symantec Scan Engine

You must register at least one Symantec Scan Engine to provide the virus scanning for each IBM Scale Out Network Attached Storage (SONAS) system. In a typical environment, a minimum of two scan engines is recommended for increased availability and load balancing. Having one scan engine can cause denial-of-file access, if it does not respond. Multiple scan engines are supported per SONAS system. The SONAS handles load balancing across multiple scan engines automatically.

**Note:** You are not required to register the same scan engines for every SONAS system. You can register different scan engines to different SONAS systems. However, all of the scan engines registered with a particular SONAS system must have identical configurations.

You register Symantec Scan Engine through the `--add-scanner` option of the SONAS command-line interface (CLI) `cfgav` command. For each scan engine that is used for scanning, you must provide the IP address and the port number, and you can optionally use the `--timeout` option to set the timeout value in seconds for a scan node response. The default value is 10 seconds. The port number must match the port number that was selected during the installation of Symantec Scan Engine.

About configuring virus scanning on IBM Scale Out Network Attached Storage (SONAS)

You must configure virus scanning for each IBM Scale Out Network Attached Storage (SONAS) system. The SONAS command-line interface (CLI) is used for configuring and displaying SONAS antivirus parameters. The CLI is also used for starting and stopping bulk scans and for viewing bulk scan status. The SONAS antivirus configuration can be changed dynamically and does not require shutdown or restart.

**Note:** The virus scan functionality for each SONAS system that is accessing a scan engine must be configured identically to avoid inconsistency. The scan results and repair results for infected files will be inconsistent if the settings differ among SONAS systems using the same scan engine.
The `cfgav` command is used to configure virus scanning on the SONAS and operates on a scope. A scope is a subtree of the file namespace identified by the path to the root of the subtree, such that all file accesses within that subtree share a set of antivirus settings. You can specify the scope by using the `--fsys`, `--fset`, `--export`, or `--path` options for a file system, file set, export or path respectively. The argument to each scope option is a space-separated list, and you can specify multiple scopes within a single `cfgav` CLI command by repeating these options multiple times in any combination. Local parameters specified for an export, file set, or file system are translated to the corresponding file namespace path and not the actual object used to identify the scope, because the association of a file namespace path to a SONAS object is not unique. For example, multiple exports can refer to the same file namespace path, and an export can refer to the same file namespace path as a file set or a file system.

If no settings are specified for a scope, the settings for the closest enclosing scope are used. When a configuration parameter is initially set for a particular scope, the unspecified settings for the new scope are copied from the closest enclosing scope. Subsequent updates to scopes are completely independent of each other so that changing a scope's settings does not affect the settings of either its enclosed or enclosing scopes. You can explicitly apply an enclosing scope's settings to an enclosed scope by using the `--force` option of the `cfgav` command. Alternatively, you can use the `--erase` option of the `cfgav` command to restore an enclosed scope's settings to its enclosing scope's settings.

Use the `--scan` and `--noscan` options to respectively enable or disable scanning for a specified scope.

To create an include list, add an extension to, or remove an extension from, an include list use the `cfgav` command with the `--set-include`, `--add-include` and `--rem-include` options, respectively. To create an exclude list, add an extension to, or remove an extension from, an exclude list use the `cfgav` command with the `--set-exclude`, `--add-exclude` and `--rem-exclude` options, respectively.

You can use the `--onwrite` and `--noonwrite` options, respectively, to enable or to disable scanning when a protected file is written. You can use the `--denyonerror` and `--nodenyonerror` options, respectively, to deny or to allow users’ access to files that cannot be scanned at file open.

You can use the `--qdel` and `--noqdel` options, respectively, to enable or to disable file deletion as the action to be taken when a file is determined to be compromised. You can use the `--qmove` and `--noqmove` options, respectively, to enable or to disable moving a file to the quarantine subdirectory as the action to be taken when a file is determined to be compromised.
When a virus signature is updated, a protected file must be re-scanned before it is opened. This could result in significant performance degradation during normal use of the SONAS system subsequent to a signature update. The bulk scan feature allows an administrator to re-scan files after antivirus signatures have been updated during a convenient time window in order to minimize SONAS system performance issues. A bulk scan performs antivirus scanning of files in the background after a virus signature update without waiting for an application to open a file to perform a scan. Use the SONAS command-line interface (CLI) `ctlavbulk` command to submit a bulk scan, stop a bulk scan or display the status of a bulk scan. To schedule a bulk scan, use the `mktask` command and specify `CtlAvBulk` as the task name. On demand and scheduled bulk scans use the same customer supplied external scan engines, SONAS interface nodes and configuration settings as on demand scans before a file is opened. A bulk scan can be submitted on any subset of SONAS interface nodes, and multiple processes for a single bulk scan can be submitted to run simultaneously on each node, subject to the limits of I/O capacity, network capacity, and scan node capacity. If no scope is specified, by default a bulk scan examines all protected files. You can specify the `--fsys`, `--fset`, `--export`, and `--path` options to limit the bulk scan scope. Each bulk scan runs simultaneously on all interface nodes that have a normal status. Multiple simultaneous instances of a bulk scan can run against the same file system, in which case the instances are coordinated to avoid scanning the same file more than once. Use the `--processes` option to specify how many instances of a bulk scan process you want to run on an interface node. If the `--processes` option is not specified, the default is one process for each interface node.

All significant antivirus events are documented in the syslog, which is viewable using the SONAS graphical user interface (GUI). Important antivirus events are also displayed in the alert log. The default basic level information logging includes startup and shutdown as well as periodic performance summary data.

The default log level includes brief startup and shutdown notification entries, periodic one-line performance summaries that can be used to create performance models and to assess performance, and a one-line entry each time that a scan engine updates a virus signature that requires files to be re-scanned on a subsequent open.

The impact of antivirus scanning on the file access latency of the SONAS system depends on such factors as the number of registered scan engines, scan engine CPU performance, customer IP bandwidth, workload mix including file sizes and read/write ratios, content of files to be scanned, and efficiency of scan result caching. Because scan results are invalidated whenever the antivirus vendor updates signatures, the frequency of virus signature updates could also have a significant impact on performance. Which files and file types are configured to be scanned also affects performance significantly.
Recommendations while integrating multiple scan engines

Do the following when multiple scan engines are used to support a particular IBM Scale Out Network Attached Storage (SONAS) system:

- Configure the settings on each Symantec Scan Engine to be identical.

- Schedule LiveUpdate and Rapid Release to occur at the same time on all of the scan engines that are used by a particular SONAS system. This ensures that virus definitions are consistent.

- Configure the virus scan functionality to be identical for each SONAS system that uses a particular scan engine to avoid inconsistency. The scan results and repair results for infected files will be inconsistent if the settings differ among SONAS systems using the same scan engine.
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