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StormWatch™

Policies for Dedicated SQL Servers Group

The sample policies shipped with StormWatch address both application-specific and environment-specific needs for servers and clients. In most cases, you'll want to use an application-specific policy in combination with an environment-specific policy to lock down a system with rules that are as restrictive or permissive as your network requires. You should note that all networks are not alike. It is recommended that you do not edit these policies, but instead add new policies for any changes you might require.

This document describes the combination of policies shipped with the StormWatch Management Console to protect Microsoft SQL Servers that are not running any other server applications. You can deploy these policies to protect your SQL server without making any changes to the policies themselves. Use this document to understand what the policies currently do.

Policy Name	Policy Description
Common Security Module	V2.1 base policy module for all systems
Network Lockdown Module	V2.1 policy module to restrict ALL network access
Required Windows System Module	V2.1 policy module to allow critical Windows functions
Restrictive MS SQL Server Module	V2.1 restrictive policy module for Microsoft SQL Server 2000
Server Module	V2.1 base policy module for servers

Policy Descriptions

The combined policies that are recommended for the protection of SQL server systems consist of rules which work in order of precedence. Access control rules, in particular, depend upon each other to lock down access to certain resources while providing specific open channels to allow access to other resources. The following section breaks out the combined access control rules by rule type in an attempt to help you understand how file access control rules (FACLs), for example, from each policy, work together once they are combined. Some FACLs allow access to certain files while others restrict access to other files. The same can be said about network access control rules and other access control rule types.

The following rule types are combined from the Common Security Module, Network Lockdown Module, Required Windows System Module, Restrictive MS SQL Server Module, and Server Module to protect MS SQL servers.

File Access Control:

- High Priority Deny - SQL server and descendents, read/write SQL mgt Apps
- Allow - System bootstrap applications, read/write System executables, libraries and drivers
- Allow –(Disabled) Backup applications, read all files
- Allow - SQL server, read/write SQL server data files
- Allow - SQL server and descendents, read SQL server and MSSearch resources
- Allow - MS Search application, read/write SQL Full Text data
- Allow - MS Management applications, read/write SQL Server directories
- Allow - All Applications, read System libraries, drivers and data files
- Allow - Ensure access to DOS command line
- Query User - Installers, write System executables, libraries and drivers
- Query User - Virus scanners, write all files
- Query User - All applications, write privileged applications
- Query User - Installers, read/write user invoked executables and command shells
- Query User - All applications, write System executables, libraries and drivers
- Query User - Prevent access to system objects from downloaded scripts
- Query User - All applications, write SQL Server executable files
- Deny - vulnerable applications, read/write Cmd Shells
- Deny - SQL Server and descendents, read/write all files
- Deny - Remote applications, read/write all files (file access via network share)
- Deny - vulnerable applications, write SQL Server data files

Network Access Control:

- Allow - All applications, server for SMB services (for Named Pipes)
- Allow - SQL Server, server for Microsoft SQL service
- Allow - SQL Server, client for Microsoft SQL service
- Allow - All applications, client for basic services

- Allow - All applications, server for basic services
- Allow - All applications, client for TCP and UDP service to Local Host
- Allow - All applications, server for TCP and UDP service from Local Host
- Allow - MS Security applications, client for TCP and UDP services
- Allow - MS Security applications, server for TCP and UDP services
- Deny - All applications, server for TCP and UDP services
- Deny - All applications, client for TCP and UDP services

Registry Access Control:

- Allow - System applications, write keys typically targeted by viruses
- Allow – MS Management applications, write IIS keys
- Query User - vulnerable applications, write keys typically targeted by viruses
- Deny - All applications, write SQL Server keys

Refer to the next section for descriptions of each individual rule and the purpose it serves in the policy in which it appears.

The rules that comprise these policies merge seamlessly and work in order of precedence. Policies should be combined (application-specific with environment-specific policies) to achieve the desired effect. They are broken out into separate categories so that they can be merged in various combinations and be used multiple times in multiple places.

This section contains descriptions of the rules included in the sample policies recommended for deployment on a SQL server.

Common Security Module	V2.1 base policy module for all systems
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This policy enforces site-wide security practices. In general, security is either system-specific or application-specific. This policy is generic enough to be applied across your organization for protecting both systems and applications.

NOTE: This policy is applied to all StormWatch groups. However, it was not made “Mandatory” because it is up to administrators to determine whether this is a suitable corporate security policy or if it requires changes to meet more specific needs.

Also note that “vulnerable applications” defined in various rules are network-aware applications. These application types are much more vulnerable than others.

1. File Access Control – Allow, System bootstrap applications, write System executables, libraries and drivers

Generally, writing to these resources should only occur when installing or uninstalling software. If StormWatch detects this action and you are not installing or uninstalling, this action is suspect. A wide variety of attacks try to compromise resources of this type. This rule is meant to allow targeted common actions denied by other restrictive rules in this policy.

2. Registry Access Control – Allow, System applications, write keys typically targeted by viruses

This rule allows system applications to write to particular registry keys. Generally, writing to the registry keys specified in this rule should only occur when installing or uninstalling software. If StormWatch detects this action and you are not installing or uninstalling, this action is suspect. This rule is meant to allow targeted actions denied by other restrictive rules in this policy

3. File Access Control – Query User (Default Allow), Installers, write System executables, libraries and drivers

This rule queries the user if known installation applications attempt to write to specified system resources. Generally, writing to these resources should only occur when installing or uninstalling software. If an installation is not taking place, this action should be denied.

4. File Access Control – Query User (Default Allow), Virus scanners, write all files

This rule queries the user if known virus scanner applications are probing system files. Generally, writing to these resources should only occur when the system is being scanned for viruses. If this is not the case, this action should be denied.

5. File Access Control – Query User (Default Allow), All applications, write privileged applications

This rule queries the user any if any applications are attempting to write to virus scanner applications or PDA applications. Generally, writing to these resources should only occur when these applications are being upgraded. If this is not the case, this action should be denied.

6. File Access Control – Query User (Default Allow), Installers, user invoked executables and command shells

This rule queries the user if known installation applications attempt to write to specified user-invoked system resources. Generally, writing to these resources should only occur when installing or uninstalling software. If an installation is not taking place, this action should be denied.

7. File Access Control – Query User (Default Deny), All applications, write System executables, libraries and drivers

This rule queries the user if any application attempts to write to system executables and specified libraries and drivers. Generally, writing to these resources should only occur when installing or uninstalling software. If StormWatch detects this action and you are not installing or uninstalling, this action is suspect. A wide variety of attacks try to compromise resources of this type. This rule is meant to maintain the integrity of the operating system.

8. File Access Control – Query User (Default Deny), Prevent access to system objects from downloaded scripts

This rule queries the user if vulnerable applications attempt to write to the system disk.

9. Registry Access Control – Query User (Default Deny), vulnerable applications, write keys typically targeted by viruses

This rule queries the user if any defined vulnerable applications attempt to write to particular registry keys. Generally, writing to the registry keys specified in this rule should only occur when installing or uninstalling software. If StormWatch detects this action and you are not installing or uninstalling, this action is suspect. This rule stops applications from being invoked or registering services, which is how viruses attempt to make themselves persistent.

10. File Access Control – Deny, vulnerable applications, read/write Cmd Shells...

This rule prevents Web browsers and TCP and UDP-based applications from invoking commands shells which should generally only be invoked by users directly. (Web browsers and TCP and UDP-based applications are vulnerable to buffer-overflow attacks.)

11. NT Event Log – All security related events

This rule provides added system security monitoring capabilities, causing all “security” NT event log messages to also appear in the StormWatch Management Console Event Log.

12. Sniffer and protocol detection – Detect non-IP based protocols

This rule detects protocol stacks or drivers that interface with the network. You can modify this rule to detect any other network applications. This lets you monitor what is running on your network, such as packet sniffers that should not be running. If you have systems running sanctioned packet sniffer applications, you might want to exempt those applications from this rule or not apply this rule to that system to avoid false positive log messages.

Network Lockdown Module	V2.1 policy module to restrict ALL network access
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This policy controls network accessibility.

1. Network Access Control – Deny, All applications, client for TCP and UDP services

This rule locks down the system, preventing it from acting as a client for specified services. This prevents unauthorized applications from acting as a network client and making outgoing connections from your machine.

2. Network Access Control – Deny, All applications, server for TCP and UDP services

This rule locks down the system, preventing it from acting as a server for specified services. This prevents unauthorized servers from accepting incoming connections. This stops unauthorized applications from talking on the network.

Required Windows System Module	V2.1 policy module to allow critical Windows functions
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This mandatory policy ensures that servers and desktops function properly and that StormWatch rules do not interfere with required system operations.

1. File Access Control – Allow, All Applications, read System libraries, drivers and data files

This rule ensures that necessary applications can access system libraries and configuration files needed for startup purposes and other general operations.

2. File Access Control – Ensure access to DOS command line

This rule ensures that the DOS prompt does not become a restricted application as a result of receiving a downloaded content designation.

3. Network Access Control – Allow, MS Security applications, server for TCP and UDP services

This rule lets Microsoft's security subsystem communicate on the network, allowing for authentication and authorization services, e.g. Kerberos and LDAP.

4. Network Access Control – Allow, All applications, server for TCP and UDP service from Local Host

This rule allows various applications running on the same system to talk to each other while still denying access to these services from other non-localhost applications. This improves system performance by allowing all local applications to attempt to access all needed local resources as a server.

5. Network Access Control – Allow, MS Security applications, client for TCP and UDP services

This rule lets Microsoft's security subsystem communicate on the network, allowing for authentication and authorization services, e.g. Kerberos and LDAP.

6. Network Access Control – Allow, All applications, client for basic services

This rule ensures that applications can perform functions such as name resolution and endpoint mapping.

7. Network Access Control – Allow, All applications, server for basic services

This rule ensures that applications can act as a server for functions such as WINS and endpoint mapping.

8. Network Access Control – Allow, All applications, client for TCP and UDP service to Local Host

This rule allows various applications running on the same system to talk to each other while still denying access to these services from other non-localhost applications. This improves system performance by allowing all local applications to attempt to access all needed local resources as a client.

Restrictive MS SQL Server Module	V2.1 restrictive policy module for Microsoft SQL Server 2000
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This policy protects the SQL server application, both granting permissions and imposing restrictions.

1. File Access Control – High Priority Deny, SQL server and descendents, read/write SQL mgt Apps

This rule takes precedence over all other rules in this policy. It stops the SQL server application and all processes spawned by it from reading or writing any of its own management applications. This rule blocks SQL server from invoking local SQL server administrator management tools.

2. File Access Control – Allow, SQL server, read/write SQL server data files

This rule allows the SQL server application read and write to its own data files. This access is locked down by other deny rules in this policy. This rule opens a targeted channel for SQL server to access the resources it requires.

3. File Access Control – Allow, SQL server and descendents, read SQL server and MSSearch resources

This rule allows the SQL server application and its descendents read its own data files and the libraries needed to run the MS Search service. This access is locked down by other deny rules in this policy. This rule opens a targeted channel for SQL server to access the resources it requires.

4. File Access Control – Allow, MS Search application, read/write SQL Full Text data

This rule allows the MS Search service to perform full text SQL server data queries.

5. File Access Control – Allow, MS Management applications, read/write SQL Server directories

This rule allows local management of the SQL server using Microsoft Management Console.

6. Network Access Control – Allow, SQL server, client for Microsoft SQL service

This rule allows the SQL server application to act as a client for the SQL service. (Note that the Sample Network Restrictive policy blocks the access this rule is allowing. This rule, in effect, opens one specific channel and allows others to remain locked down.)

7. Network Access Control – Allow, SQL server, server for Microsoft SQL service

This rule allows the SQL server application to act as a server for the SQL service. (Note that the Sample Network Restrictive policy blocks the access this rule is allowing. This rule, in effect, opens one specific channel and allows others to remain locked down.)

8. Network Access Control – Allow, All applications, server for SMB service (for Named Pipes)

This rule allows the share mounting required by the SQL service. (Note that the Sample Network Restrictive policy also blocks the access this rule is allowing. This rule, in effect, opens one specific channel for named pipes and allows others to remain locked down.)

9. File Access Control – Allow, MS Management applications, write SQL Server keys

This rule allows a local Microsoft Management Console to write to specified SQL server application registry key settings.

10. File Access Control – Query User (Default Deny), All applications, write SQL server executable files

This rule protects the SQL server application executables, querying users to prevent applications from overwriting the SQL server executables themselves. This would prevent a Trojan from posing as the SQL server. (This rule will also trigger when you are upgrading SQL server software. In that case, you would answer Yes to the query to allow the upgrade.)

11. File Access Control – Deny, SQL server service, read/write all files

This rule locks down the application by placing restrictions on file operations. Other allow rules in this policy open up some of the restrictions we're placing on the application here. If an application becomes compromised (buffer-overflow attack), this rule limits what types of files can be accessed by the application.

12. File Access Control – Deny, Remote applications, read/write all files (file access via network share)

This rule prevents all file read and write access to data available through established network shares. Having this rule in place restricts read and write access to the disk where the shares are offered.

13. File Access Control – Deny, vulnerable applications, write SQL server data files

This rule stops various network associated applications from writing to specified SQL server data files.

14. Registry Access Control – Deny, All applications, write SQL server keys

This rule protects the application's registry keys, stopping all applications from writing to them and attempting to change the SQL server configuration.

15. Service Restart – MS SQL Server

This rule prevents the MS SQL server from going down for any reason, automatically restarting it if it does not respond to the Service Control Manager.

16. NT Event Log – MS SQL Server events

This rule provides extra SQL server monitoring capabilities, causing any "warning" or "error" NT event log messages to also appear in the StormWatch Management Console Event Log.

Server Module	V2.1 base policy module for servers
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This policy provides system hardening features for servers.

1. File Access Control - (Disabled) Allow, Backup applications read all files

This rule is included in the Base Server policy, but it is disabled by default. Enable and use this policy to allow file backups. If you are backing up files over the network, you will have to add a Network Access Control rule as well.

2. Syn flood protection

SYN flooding is a type of denial of service attack. It occurs in TCP/IP communications when connection requests are received from forged addresses (non-existing machines). This results in half open connections on the server. An abundance of half open states on a server can prevent legitimate connections from being established. Using SYN flood protection in a policy prevents this attack from succeeding. You should apply SYN flood protection to servers within your enterprise, keeping them up and running and able to provide resources should a SYN flood attack occur.

3. Portscan detection - Detect network portscans

Portscanning is a common method for finding weaknesses at a site by determining what network services are being run. An attacker attempts to connect to port after port on a target system until a vulnerable service is found. Using portscan detection in a policy causes the intelligent agent on a protected system to log an event (one per minute) when an attempt is made to scan the system for an open port. This can warn you if someone is mapping out your system in preparation for an attack. The intelligent agent also gathers information on the number of different source IP addresses perpetrating the scan and it reveals the source address of the latest scan attempt. If scans are detected across several machines, StormWatch correlates these events and generates an additional event to warn of this correlation.

4. Trojan detection - Detect and terminate potential application Trojans

Trojans are a form of malicious programming code that runs undetected on a machine and can allow an attacker to steal information or control the system in some manner. Use StormWatch's Trojan detection rule in a policy to detect and prevent Trojans from performing malicious acts on individual systems and networks.