

IBM Proventia Intrusion Prevention System Protection Engine

Highlights

- ***Stop threats before they impact your networks***
- ***Protect your network and the assets on your network such as servers, desktops and network infrastructure***
- ***Protect the systems that run your business such as VoIP, Data Storage, Databases, Server Farms and virtualized environments***
- ***Protects Web servers and Web applications including Web 2.0 technology***
- ***Protects end users against exploits hidden in seemingly innocuous documents, such as spreadsheets, presentations and PDFs and media files, like JPEG, GIF, ANI, QuickTime, Flash and ASF***
- ***Preserve network bandwidth by blocking worms, attacks and the misuse (abuse) of the network by blocking Skype, instant messaging and peer-to-peer file sharing***
- ***Help prevent the loss of information by hardening your network against attacks and identifying and monitoring confidential data traversing the network.***

Staying ahead of the threat – the protection engine inside the IBM Proventia Intrusion Prevention System technologies.

The IBM Proventia® Intrusion Prevention System (IPS) technologies stop Internet threats before they impact business and delivers protection to all three layers of IBM Proventia Intrusion Prevention System (IPS): core, perimeter and remote segments.

The basis for Proventia IPS unique form of security lies in its engine, which enables preemptive protection against a wide variety of Internet threats. Proventia's protection engine is built upon years of security intelligence gathered by the IBM Internet Security Systems™ X-Force® research and development team. The X-Force is a world-renowned security research organization dedicated to proactive examination of threats and the underlying software vulnerabilities they seek to exploit.

As a result, Proventia's protection engine can stop entire classes of attack – including new and unknown threats – without updates. Other solutions can only hope to match individual protection signatures with exploits – a process that is too slow to stop evolving threats and results in higher rates of false positives and false negatives.

The Proventia IPS protection engine has the ability to monitor, detect or prevent the following classes of network threats:

- *Application attacks*
- *Attack obfuscation*
- *Cross-site scripting attacks*
- *Data leakage*
- *Database attacks*
- *DoS and DDoS attacks*
- *Drive-by downloads*
- *Insider threats*
- *Instant messaging*
- *Malicious document types*
- *Malicious media files*
- *Malware*
- *Operating system attacks*
- *Peer-to-peer*
- *Protocol tunneling*
- *SQL injection attacks*
- *Web browser attacks*
- *Web server attacks*

In order to address these attack categories, Proventia's protection engine employs multiple intrusion prevention technologies working in tandem, including:

- *Port assignment*
- *Port following*
- *Protocol analysis*
- *Protocol tunneling*
- *Pattern matching*
- *IBM Proventia Content Analyzer*
- *Injection Logic Engine*
- *Heuristics*
- *RFC compliance checking*
- *Statistical analysis*
- *TCP reassembly*
- *Flow assembly*

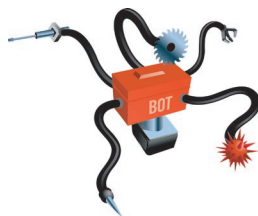
Primary Network Threats Stopped by the Proventia Protection Engine

While Internet threats continue to evolve, older attack methods cannot be discounted and many attackers build upon known intrusion techniques to evade detection. The Proventia protection engine is dedicated to stopping the following list of Internet threats:

Backdoors – provide system entry points that bypass traditional login verification.



Botnets – collections of compromised computers that perform tasks at the behest of a controller – usually with malicious intent to spread spam and/or malware.



Client side attacks – Web browser exploits used to install drive-by downloads and suspicious browser obfuscation.



Cross-site scripting (XSS) – a Web-based exploit used to embed malicious code into a supposedly legitimate link that can execute on a user's computer, typically in an attempt to steal information.



Distributed Denial of service (DDoS) – utilizes a multitude of compromised systems to attack a single target with a flood of messages to shut the target system down.



Insider threats – can introduce viruses, worms and Trojans into a network, or attempt to steal proprietary data.



Instant messaging – can be used to introduce Trojans, viruses and other malware into the network.



Malicious Email – a common carrier for spyware and phishing scams that entice users to visit malicious Web sites, and then potentially introduce malware to the network.



Peer-to-peer (P2P) networks – facilitate the transfer of files infected with Trojans and viruses designed to introduce denial of service attacks and corrupt data.



Protocol tunneling – layers malicious data usually within a higher level protocol, allowing it to traverse network segments where lower level protocols might be blocked.



Reconnaissance – a collection of threats including brute force, enumeration, password guessing and port scans.



Rootkits – a collection of tools or programs that provide hackers with administrator level privileges or root access to a network or system.



Malicious Content – malicious multimedia and shellcode embedded in documents.



SQL injection – piggybacks malicious SQL code on intended commands through the dynamic logic layer of a Web application in order to trick the application into providing database access.



Trojans – harbor dangerous code inside apparently harmless programming or data.



Worms – a virus that self-replicates by resending itself as an e-mail attachment or part of a network message.



Multi-layered prevention technologies within the Proventia protection engine

The Proventia protection engine combines the power of multiple threat prevention technologies – all working in concert to stop Internet threats. The Proventia protection engine utilizes the following attack prevention methods:

IBM Proventia Content Analyzer – inspects and blocks unencrypted data in your network using predefined and custom signatures. This technology provides the ability to create compound data-set search inspections and inspect compound documents including Microsoft Office documents, PDFs and Zip files over ten different protocols.

Port assignment – IPS' should not assume that a particular type of traffic will appear on a particular TCP/IP port. If they do and the traffic type matches the assumed port, and is allowed through, attackers could gain access. Proventia inspects all traffic regardless of the port that traffic is destined to.

Port following – tracks communication sessions to ensure that the port initially used to

establish a connection is the only one used. This prevents hackers who access an open port with authentic credentials from connecting to another open port to transfer data unnoticed. Proventia's port following works in conjunction with other port-aware protection technologies to stop information theft.

Injection Logic Engine – heuristically identifies malicious injection attempts such as SQL injection and shell command injection. Covers current and future vulnerabilities without signature updates.

Protocol analysis – examines network traffic for deviant behavior that does not match accepted norms and can decode protocols down to Layer 2 of the OSI model. Protocol analysis enables Proventia to detect anomalous behavior without relying on signatures.

Protocol tunneling – sometimes used in conjunction with port assignment, Proventia detects and prevents protocol tunneling to find malicious and/or proprietary data embedded in higher level protocols that could be allowed to traverse network segments where lower level protocols might be blocked. Protocol tunneling prevents hackers from bypassing firewalls to gain uncontested network access and prevents both insiders and hackers from establishing and using tunnels to extract data from within a corporation.

Stateful pattern matching – uses advanced algorithms to detect attack patterns – but only in particular portions of traffic where an attack could

actually exist – greatly reducing false positives. Proventia uses stateful pattern matching in conjunction with heuristics to prevent evolving threats that change their patterns to evade detection.

Heuristics – identifies and stops malicious code based on its behavior, rather than matching a particular attack signature or pattern. Heuristics can prevent evolving threats which will change minor aspects of their signatures to bypass traditional IPS solutions.

RFC compliance checking – compares traffic against RFC standards for network communications between hosts, and between applications and the network stack. If the traffic does not conform, Proventia blocks it.

Statistical analysis – creates a baseline of network activity over time and then constantly compares current activity to the baseline to identify and prevent deviations. Proventia uses statistical analysis to stop attacks without breaking down network traffic.

TCP reassembly – reassembles network packets, examining them for potential threats.

Flow assembly – analyzes the entire network connection – not just the individual packets – to block malicious traffic that may have been inserted into the communication stream to take advantage of an open connection. Flow assembly complements TCP reassembly by analyzing traffic at a higher level to prevent advanced threats.

The Proventia Protection Engine
Advantage – Multi-layered Prevention
Technologies Working in Concert

The protection engine within the Proventia IPS technologies is the result of continuous research into the nature of vulnerabilities and attack methods. As threats continue to evolve, but older exploits never truly become extinct, IBM ISS constantly strengthens the Proventia protection engine with technologies designed to block entire classes of threat – both new and old.

Learn More

For more information about the Proventia IPS technologies and preemptive protection, please visit ibm.com/services/us/iss.



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Somers, NY 10589
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