



# Sourcefire 3D System IPv6 Capabilities



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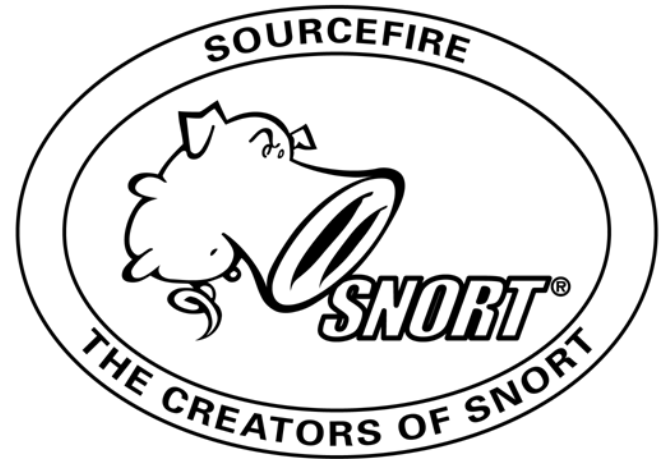
# About Sourcefire

- Sourcefire was founded in January 2001 by Martin Roesch, author of open source Snort®, the world's most downloaded intrusion detection and prevention technology with nearly 4 million downloads to date.
- In response to increased demand for a commercial version of the popular software, the company developed the Sourcefire 3D® System—a systematic network defense system built on Snort and designed to adapt to dynamic networks and threats in real time.
- Leader, Gartner IPS Magic Quadrant, for four consecutive years
- The Sourcefire Web Site: [www.sourcefire.com](http://www.sourcefire.com)



# About Snort

- Snort® is an open source network intrusion prevention and detection system (IDS/IPS) developed by Sourcefire.
- Combining the benefits of signature, protocol, and anomaly-based inspection, Snort is the most widely deployed IDS/IPS technology worldwide. With millions of downloads and approximately 300,000 registered users, Snort has become the de facto standard for IPS.
- The Snort Web Site: [www.snort.org](http://www.snort.org)
- The Snort Blog: <http://blog.snort.org/>





# About the Sourcefire VRT

- The **Sourcefire Vulnerability Research Team (VRT)** is a group of leading-edge network security experts working around the clock to proactively discover, assess, and respond to the latest trends in hacking activities, intrusion attempts, malware and vulnerabilities. Some of the most renowned security professionals in the industry are members of the Sourcefire VRT. This team is supported by the vast resources of the open source Snort and ClamAV communities, making it the largest group dedicated to advances in the network security industry.
- The VRT develops and maintains the official rule set of Snort.org. Each rule is developed and tested using the same rigorous standards VRT uses for Sourcefire customers. The VRT also maintains shared object rules that are distributed for many platforms in binary format.
- The VRT blog: <http://vrt-blog.snort.org/>
- The VRT advisory RSS feed: <http://www.snort.org/vrt/advisories.xml/>

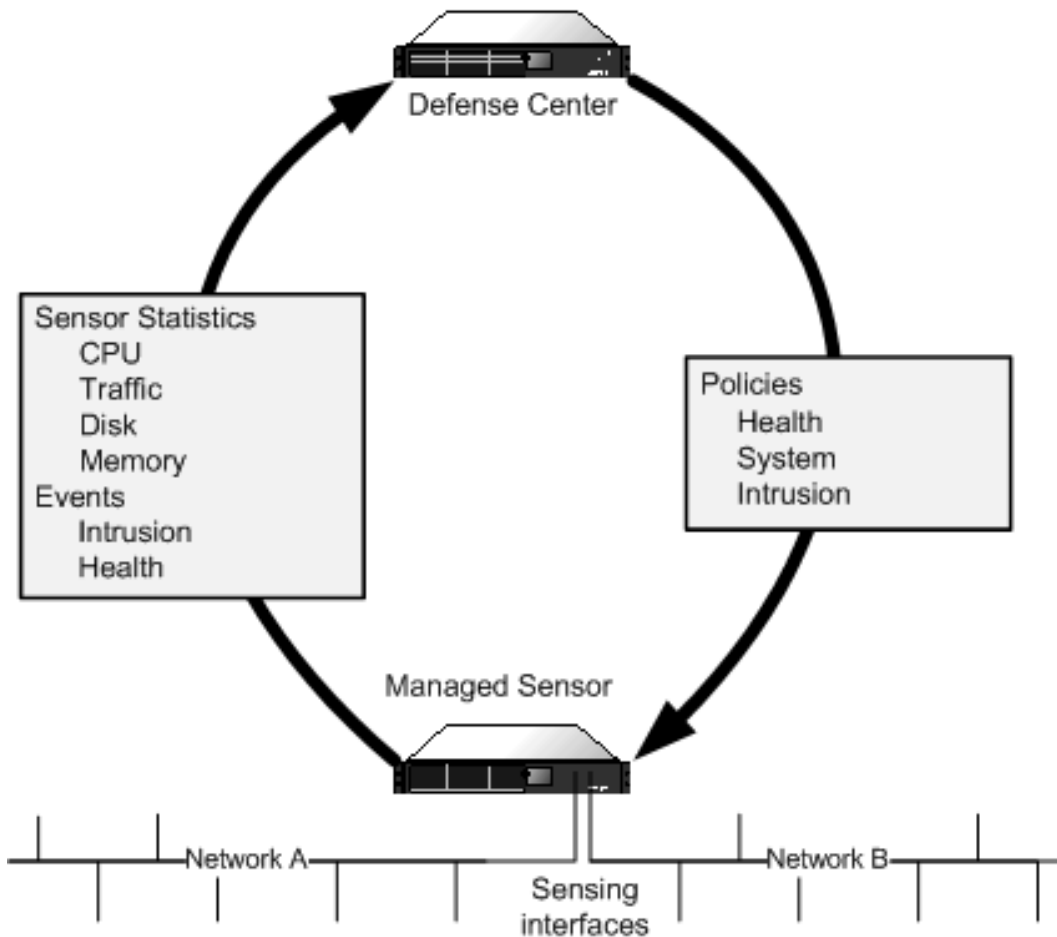


# About the Sourcefire 3D System

- 3D Sensors:
  - ▶ 3D500
  - ▶ 3D1000
  - ▶ 3D2000
  - ▶ 3D2100
  - ▶ 3D2500
  - ▶ 3D3500
  - ▶ 3D4500
  - ▶ 3D6500
  - ▶ 3D9800
  - ▶ 3D9900
  - ▶ Sourcefire Virtual Sensor
- Defense Centers:
  - ▶ DC500
  - ▶ DC1000
  - ▶ DC3000
  - ▶ Sourcefire Virtual Defense Center
- Master Defense Center: MDC3000
- ICSA Labs Network IPS Certification (requires 100% detection of tested threats)
- NSS Labs, Inc. highest rating of “Recommend”, two consecutive years



# Sourcefire 3D System



Sourcefire Proprietary & Confidential



## Sourcefire Product Support for IPv6

- Sourcefire 3D System currently meets the requirements in the IPv6 protection profile for hosts and for IDS/IPS network protection devices
- Sourcefire 3D System in USGv6 testing at ICSA:
  - ▶ Host testing successfully completed, waiting for report to create Supplier Declaration of Conformance
  - ▶ NPD testing in process, expect to be able to create declaration of conformance in 2011





# Support for Basic IPv6 Network Protection Device Requirements

- Allows dual-stack, IPv4 only, and IPv6 only
- Provides a full UI for configuration of protection functionality, logging and alerting, and administrative functions
- Provides an administrator role, as well as a variety of other user roles, to control access to all functionality
- Retains device settings if appliance loses and regains power
- Meets all auditing and logging requirements for an IDS/IPS



# Support for IPv6 connectivity

- IPv6 connections between management console and sensor
- IPv6 connections to auxiliary servers such as LDAP, email, syslog, SNMP, SSHFS (backup), and NTP (time server)
- Access control for connections from IPv6 addresses
- HTTP, peer, and SSH IPv6 client connections
- IPv6 connection to proprietary Sourcefire 3D System clients such as our host input and eStreamer clients



# Assignment and Resolution of IPv6 addresses

- Resolution of IPv6 addresses via DNS
- Support for automatic assignment via DHCPv6 server or via IPv6 network router
- Manual assignment of IPv6 addresses also supported



# IPv6 Operating System Support

- All Sourcefire 3D System appliances use the same operating system and IP stack
- The IP stack complies with the mandatory IPv6 host requirements in the USGv6 protection profile



# IPv6 Sensing: Performance Under Load

- Health Monitoring facility provides alerts on process health, event rates, and traffic status
- Rule keywords that require established TCP sessions and rate-based detection options prevent SYN floods and other connection-intensive attacks



# IPv6 Sensing: Fragmentation Handling

- For both IPv4 and IPv6 traffic, several preprocessors defragment traffic, perform stateful analysis of packets, and normalize traffic to allow analysis of different kinds of traffic as it will be received by the target host
- Inline normalization of IPv6 and ICMPv6 packets removes anomalies and prepares traffic for analysis
- IP Defragmentation preprocessor supports both IPv4 and IPv6 traffic



# IPv6 Sensing: Fragmentation Handling

- IPS always inspects IPv6 traffic when it is present
- By default, IPS IPv6 inspection includes the following tunneling schemes:
  - ▶ 4in6
  - ▶ 6in4
  - ▶ 6to4
  - ▶ When the UDP header specifies port 3544, Teredo tunneling
- You can enable inspection of all UDP payloads for Teredo tunneling



# IPv6 Sensing: Malformed Packet Detection

- Alerts Based on Address or Encapsulation
- Alerts Based on Header Values
- Alerts for ICMPv6 packets

Rules																																											
Rule Configuration	Filter: <input type="text"/>																																										
<ul style="list-style-type: none"><li>+ Rule State</li><li>+ Recommendation</li><li>+ Threshold</li><li>+ Suppression</li><li>+ Dynamic State</li><li>+ Alert</li><li>  Comment</li></ul>	<p>▶ ⚙ ⏸ ⚠ 💬</p> <p>Rule State   Event Filtering   Dynamic State   Alerting   Comments</p> <table border="1"><thead><tr><th>Rule ID</th><th>Rule Name</th></tr></thead><tbody><tr><td><input type="checkbox"/></td><td>GID SID Message ▲</td></tr><tr><td><input type="checkbox"/></td><td>116 432 DECODE_ICMP6_DST_MULTICAST</td></tr><tr><td><input type="checkbox"/></td><td>116 427 DECODE_ICMP6_HDR_TRUNC</td></tr><tr><td><input type="checkbox"/></td><td>116 431 DECODE_ICMP6_TYPE_OTHER</td></tr><tr><td><input type="checkbox"/></td><td>116 288 DECODE_ICMPV6_ADVERT_BAD_CODE</td></tr><tr><td><input type="checkbox"/></td><td>116 290 DECODE_ICMPV6_ADVERT_BAD_REACHABLE</td></tr><tr><td><input type="checkbox"/></td><td>116 287 DECODE_ICMPV6_SOLICITATION_BAD_CODE</td></tr><tr><td><input type="checkbox"/></td><td>116 289 DECODE_ICMPV6_SOLICITATION_BAD_RESERVED</td></tr><tr><td><input type="checkbox"/></td><td>116 285 DECODE_ICMPV6_TOO_BIG_BAD_MTU</td></tr><tr><td><input type="checkbox"/></td><td>116 286 DECODE_ICMPV6_UNREACHABLE_BAD_CODE</td></tr><tr><td><input type="checkbox"/></td><td>116 280 DECODE_IPV6_BAD_MULTICAST_SCOPE</td></tr><tr><td><input type="checkbox"/></td><td>116 281 DECODE_IPV6_BAD_NEXT_HEADER</td></tr><tr><td><input type="checkbox"/></td><td>116 295 DECODE_IPV6_BAD_OPT_LEN</td></tr><tr><td><input type="checkbox"/></td><td>116 279 DECODE_IPV6_BAD_OPT_TYPE</td></tr><tr><td><input type="checkbox"/></td><td>116 275 DECODE_IPV6_DGRAM_GT_IPHDR</td></tr><tr><td><input type="checkbox"/></td><td>116 274 DECODE_IPV6_DGRAM_LT_IPHDR</td></tr><tr><td><input type="checkbox"/></td><td>116 292 DECODE_IPV6_DSTOPTS_WITH_ROUTING</td></tr><tr><td><input type="checkbox"/></td><td>116 278 DECODE_IPV6_DST_RESERVED_MULTICAST</td></tr><tr><td><input type="checkbox"/></td><td>116 276 DECODE_IPV6_DST_ZERO</td></tr><tr><td><input type="checkbox"/></td><td>116 271 DECODE_IPV6_IS_NOT</td></tr></tbody></table>	Rule ID	Rule Name	<input type="checkbox"/>	GID SID Message ▲	<input type="checkbox"/>	116 432 DECODE_ICMP6_DST_MULTICAST	<input type="checkbox"/>	116 427 DECODE_ICMP6_HDR_TRUNC	<input type="checkbox"/>	116 431 DECODE_ICMP6_TYPE_OTHER	<input type="checkbox"/>	116 288 DECODE_ICMPV6_ADVERT_BAD_CODE	<input type="checkbox"/>	116 290 DECODE_ICMPV6_ADVERT_BAD_REACHABLE	<input type="checkbox"/>	116 287 DECODE_ICMPV6_SOLICITATION_BAD_CODE	<input type="checkbox"/>	116 289 DECODE_ICMPV6_SOLICITATION_BAD_RESERVED	<input type="checkbox"/>	116 285 DECODE_ICMPV6_TOO_BIG_BAD_MTU	<input type="checkbox"/>	116 286 DECODE_ICMPV6_UNREACHABLE_BAD_CODE	<input type="checkbox"/>	116 280 DECODE_IPV6_BAD_MULTICAST_SCOPE	<input type="checkbox"/>	116 281 DECODE_IPV6_BAD_NEXT_HEADER	<input type="checkbox"/>	116 295 DECODE_IPV6_BAD_OPT_LEN	<input type="checkbox"/>	116 279 DECODE_IPV6_BAD_OPT_TYPE	<input type="checkbox"/>	116 275 DECODE_IPV6_DGRAM_GT_IPHDR	<input type="checkbox"/>	116 274 DECODE_IPV6_DGRAM_LT_IPHDR	<input type="checkbox"/>	116 292 DECODE_IPV6_DSTOPTS_WITH_ROUTING	<input type="checkbox"/>	116 278 DECODE_IPV6_DST_RESERVED_MULTICAST	<input type="checkbox"/>	116 276 DECODE_IPV6_DST_ZERO	<input type="checkbox"/>	116 271 DECODE_IPV6_IS_NOT
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Microsoft Vulnerabilities																																											
Microsoft Worms																																											
Platform Specific																																											
Preprocessors																																											





# IPv6 Sensing: Known Attack Detection

- Detects suspicious IPv6 traffic based on known attack patterns
- Offers over 10000 rules, combined, for detection of IPv4 and IPv6 attacks
- VRT responds to new threats by creating additional rules or updating existing ones
- Detects the following types of portscans in either IPv4 and IPv6 traffic:
  - ▶ Portscans
  - ▶ Port sweeps
  - ▶ Decoy portscans
  - ▶ Distributed scans



# Example: Detecting a Packet Anomaly in Teredo Traffic on a Non-Standard Port

- An IPv6 packet with an anomalous TTL value, encapsulated within an IPv4 UDP datagram, arrives via a non-standard port
- Detect Teredo on Non-Standard Ports and Detect Invalid IP Options are enabled
- All UDP payloads are checked for IPv6 traffic, regardless of port
- Decoder rule 116:270 is set to drop traffic and generate an event, detecting that the TTL value for the packet exceeds the limit
- The anomaly is detected, an alert is generated, and the traffic is dropped



## Example: Detecting a Port Sweep in 6in4 Traffic

- A IPv6 host outside of your network performs TCP port scans on several hosts in your network via an IPv4 router
- The packet decoder detects the 6in4 pattern and analyzes the traffic in the encapsulated IPv6 packet
- The portscan detector is enabled and Rule 122:3 is set to drop and generate events
- The port sweep pattern is detected, alerts are generated, and the packets are dropped
- The attacker fails to obtain the reconnaissance information he was seeking



# Summary

- The Sourcefire 3D System is currently IPv6 capable
- The Sourcefire 3D System Defense Center has passed host testing at ICSA
- The Sourcefire 3D System IPS is currently in Network Protection Device testing at ICSA
- Sourcefire provides comprehensive detection coverage for both IPv4 and IPv6 traffic