



## CISCO IPS RISK RATING EXPLAINED

In contrast to simplistic alert rating models that are commonly used in the industry, Cisco IPS Version 5.0 Sensor Software delivers unique Risk Ratings that are assigned to alerts generated from IPS (Intrusion Prevention Systems) sensors. The intent of this risk rating is to provide the user with an indication of the relative risk of the traffic or offending host continuing to access the user's network. This rating can be used either to illuminate the events that require immediate administrator attention in the classic intrusion detection system (IDS) promiscuous mode, or to provide a means for developing risk-oriented event action policies when the sensor is employed in the inline intrusion protection system (IPS) mode.

The risk rating is realized as an integer value in the range from 0 to 100. The higher the value, the greater the security risk of the trigger event for the associated alert. The risk rating is a calculated number that has four primary components—Alert Severity Rating (ASR), Signature Fidelity Rating (SFR), Attack Relevancy Rating (ARR), and Target Value Rating (TVR).

The Risk Rating is calculated using the following formula:

$$RR = \frac{\text{Fidelity} * \text{Severity} * \text{Target-Value-Rating}}{100 * 100 * 100}$$

**Signature Fidelity Rating (SFR)** = Relative measure of the accuracy of the signature (predefined); 0–100 Set by Cisco Systems, Inc.

**Alert Severity Rating (ASR)** = Relative result or damage if the attack succeeds (predefined); 25—Information, 50—Low, 75—Medium, 100—High

**Target Value Rating (TVR)** = Value used to change the risk rating higher or lower based on the target of the attack (user defined); 75—Low Asset Value, 100—Medium Asset value, 150—High Asset Value, 200—Mission Critical Asset Value

The ASR is a user-modifiable weighted value that characterizes the damage potential of the suspect traffic. It is presented to the user in familiar, descriptive text tags—informational, low, medium, and high.

- An informational alert is based on commonly seen network traffic and has no particular security relevance when seen on most networks. It may be a violation of a policy on some networks, but it generally poses no immediate threat to network security.
- A low alert is also based on relatively benign network traffic, but is somewhat unusual on most networks. Also categorized as low would be overt scans, such as those commonly seen by network management devices. Although this type of scan could be a precursor to an attack, it is uncommon for an overt scan to be used for this purpose.
- A medium alert is based on traffic that generally should not be seen on the network. It is usually assigned to midlevel reconnaissance traffic, denial of service (DoS) attacks on self-healing services, and remote access of unexpected information or programs. This type of behavior warrants investigation or preventive actions, sometimes requiring policy decisions from the user.
- A high alert is based on traffic that is indicative of an active attack or an obvious precursor to an attack. This traffic should never be seen in a normal network. This rating is reserved for attacks that could result in serious compromise of the target, or for specific network traffic that is only seen in covert reconnaissance traffic.

The SFR is a user-modifiable weighted value that characterizes the fidelity of the signature that has detected the suspect activity. Several factors affect the fidelity of a signature. First, many vulnerabilities are only relevant for a particular OS, service, application, or even patch level. Without

this information, particularly in the classic IDS mode, the sensor may identify attempts that will ultimately fail as actual attacks, leading to wasted effort on the part of the security administrator investigating the alleged attack. Another issue that can cloud the fidelity of a signature is a legitimate application that produces traffic that mimics the behavior of an exploitation of a network vulnerability. The signature developer takes these factors into consideration when assigning the SFR for a particular signature.

The ARR is an internal weighted value that characterizes any additional knowledge that the sensor may have about the target of the event. This information is used to clarify some of the uncertainties related to signature fidelity. As the sensor builds a more definitive picture of the target host, the risk associated with the event can be better defined.

Finally, the TVR is a user-defined value that represents the user's perceived value of the target host. This allows the user to increase the risk of an event associated with a critical system and to de-emphasize the risk of an event on a low-value target.

In closing, risk rating provides the user with valuable insight into the overall risk of an event. This allows the user to develop policies for the prevention of network attacks or to better characterize events for prioritization of further investigation



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