



Operations and Intelligence Report INSPIRA HEALTH NETWORK

March 2016

BEST IN CLASS – INFORMATION SECURITY
INTELLIGENCE AND OPERATIONS

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1. About This Report

The purpose of this document is to report on the “state” of security for your organization. It must be noted that GLESEC bases its information analysis on the systems under contract. The information generated by these systems is then aggregated, correlated and analyzed. The more complete the set of systems under contract the more accurate and complete the results will be. The report is organized to provide an executive summary with recommendations (as necessary or applicable) followed by more detailed information.

We at GLESEC believe information security is a holistic and dynamic process. This process requires on-going research and follow up. Holistic since no single “device” can provide the security necessary for an organization. Technology alone cannot provide the security necessary, but people that understand the operations and information generated by the security devices are a key to proper security. The process is dynamic since due to the nature of Internet security given the constant discovery of new security vulnerabilities and exploits, the proliferation of hacking tools that make it easier for script-kiddies with minimal knowledge to cause damage. The increase in malware, phishing, insider threats, espionage, organized crime, intellectual property theft, and hacktivism are the very cause of information security exposure and are most commonly driven by financial gain.

2. Confidentiality

GLESEC considers the confidentiality of client’s information as a trade-secret. The information in this context is classified as:

- a) Client name and contact information
- b) System architecture, configuration, access methods and access control
- c) Security content

All the above information is kept secure to the extent in which GLESEC secures its own confidential information.

3. Scope of This Report

GLESEC Contracted Services

MSS: Managed Security Service (full outsourcing)

Service	Manufacturer	Model	Update Expiration	Service Expiration
MSS-APS	Radware	DefensePro 516 ODS2-S1(Bridgeton)	01/01/17	01/01/17
MSS-APS	Radware	DefensePro 516 ODS2-S1(Elmer)	01/01/17	01/01/17
MSS-VME	Beyond Security	AVDS	01/01/17	01/01/17

4. Executive Summary

This report corresponds to the period from March 1, 2016 to March 31, 2016.

This month we are seeing an increase of 20% in total number of attack activity from prior month and about 25% for critical attacks. The attacks this month are predominant of short duration and secondarily of less than 1 minute and 10 to 30 minutes in duration and most are targeting multiple ports. Unlike the prior month the attacks to Port 23 have decreased but still an important attack vector, we see an increase of attacks to port 3389. Over 30 percent of the attacks are coming from known threat sources that GLESEC gathers and correlates with the information produced by the protection systems (DefensePro). The attacks are mostly from the **USA, China, United Kingdom, Netherlands, Russian Federation, Germany, France, Iceland, Canada, Mexico**. A significant number of attacks are scanning which can be considered reconnaissance and is what precedes further attacks. The "access" category which is an aggregate of known attack sources (see above, as 5% of the total attack traffic is Access) is based on anomaly type. It is also notable that 2 million attacks came from scanning sources.

This month we see either more systems in the perimeter (total of 125) with 57 vulnerable systems with 310 vulnerabilities. Some systems have drastically increased their vulnerabilities from prior month. In particular we see Web Server with 122 detected vulnerabilities, Encryption & Authentication with 114, Preliminary analysis with 69 among the top categories. It is very important that the recommendations in this report are followed in order to decrease these vulnerabilities as soon as possible; starting with the High, then the medium and then the low.

On the Operations side, the systems were available 100% of the time with good response time (Bridgeton at 15.83 msec and Elmer at 15.18 msec) and no packet loss.

Risk Value

To provide a way to quantify the risk of a Company, GLESEC introduces a definition for a metric value to capture the exposure risk that allow to evaluate the objective vulnerabilities and also the record of change over time. This procedure to qualify can be used to evaluate the ROI in the security measures we have implemented.

It is important to mention that this metric considers a median value for the vulnerabilities classified as "high", "medium" and "low", given them a value of 100% 50% and 10% to each, so the factor of the total number of system that are vulnerable.

This takes into consideration all of the vulnerabilities, but is important to point out that this values (100, 50 and 10) are arbitrary chosen by us, so this measure can in time change as we understand more of the risk involved. We can use this metric to evaluate the progress in time and to compare one over the other using a common amount set.

Total IP's Scanned		IP's Vulnerable		
125		57		
Risk Distribution				
High	Medium	Low	Total	
1	37	272	310	
Risk Value		0.069		
Vulnerabilities Weighted Sum		0.151		

According to the metrics:

$$RV = 0.069$$

The following values are to clarify RV:

RV=1 Points to every IP address in the infrastructure that are susceptible to attacks

RV=0 Points to no IP address in the infrastructure aret susceptible to attacks

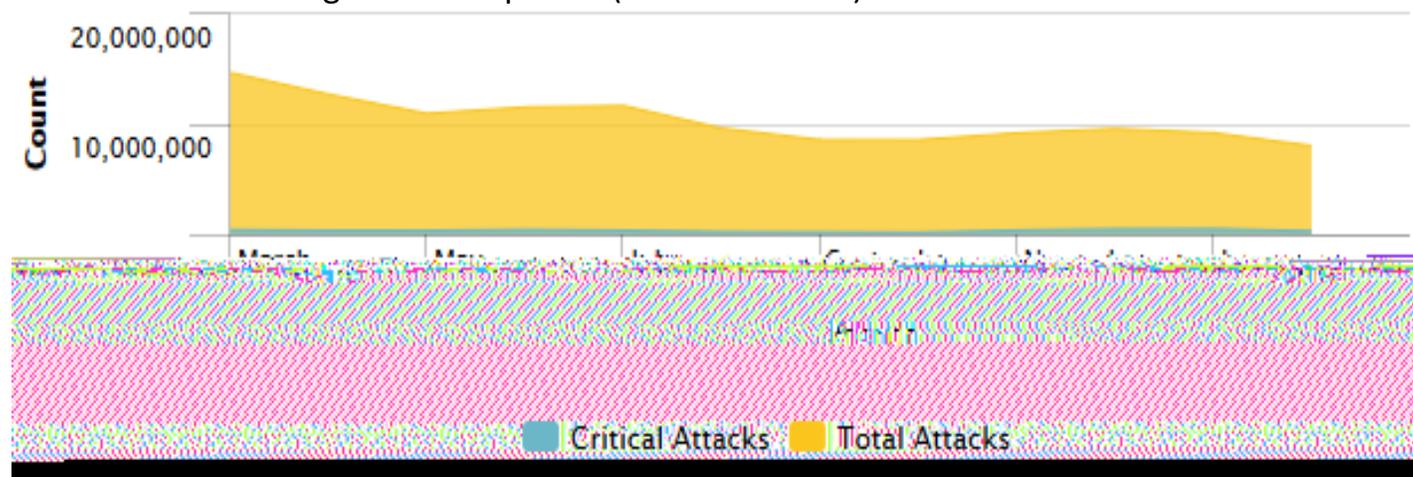
RV=0.1 Point to 1/10 IP address in the infrastructure that are susceptible to attacks

Attack Summary

Based on the information gathered from the DefensePro during this period **9,540,544** attacks on INSPIRA HEALTH NETWORK, **430,496** of which were considered critical were all stopped by the Radware devices.

INSPIRA HEALTH NETWORK receives an average of **10,370,149** total attacks and **340,005** critical attacks on a monthly basis which equates to an average of **338,113** total daily attacks and **11,086** critical daily attacks. As the graph illustrates total attack levels in relation to the previous report period totalled **8,039,362** total attacks and critical attacks in compared with a last period's total of **291,252**.

This statistical graph provides the count of critical and total attacks blocked per month calculated on a rolling 12 month period (Last 12 months)

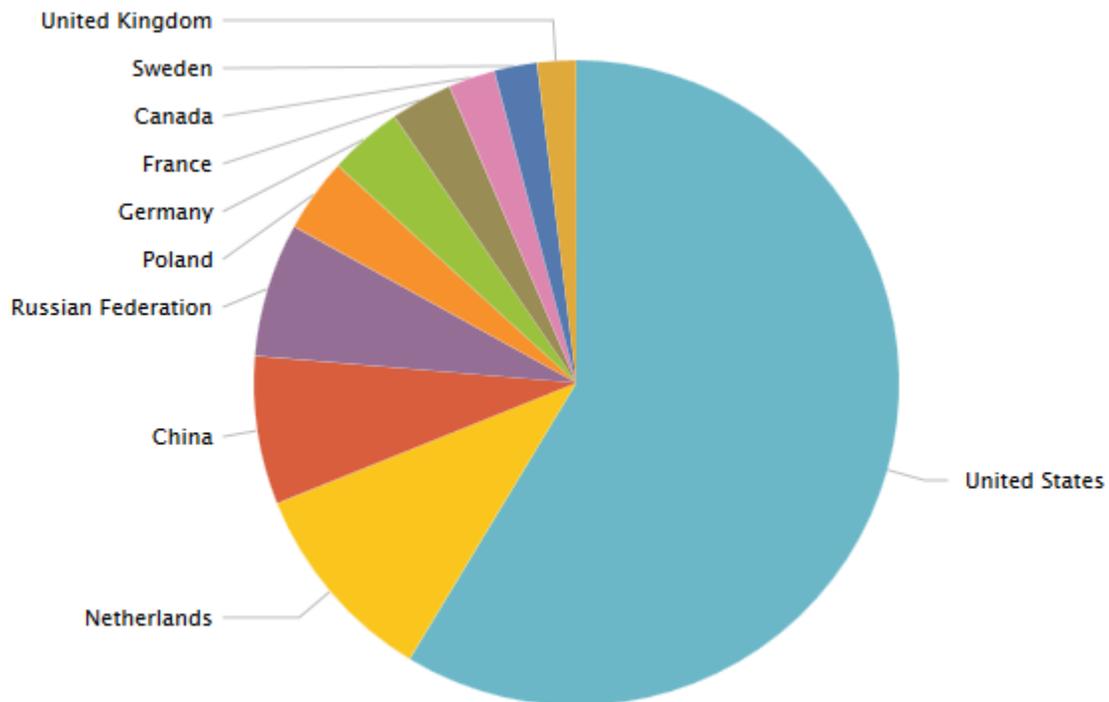


Comparison of previous month with current month.

Description	February	March
Total Attack	8,039,362	9,540,544
Critical Attacks	291,252	430,496
Monthly attack average	10,439,272	10,370,149
Daily Attack Average	331,838	340,005
Monthly Critical attack average	328,138	338,113
Daily Critical Attack Average	10,949	11,086

Geography

The vast majority of attacks on **INSPIRA HEALTH NETWORK** originated geographically from the following Top 10 countries: **USA, Netherlands, China, Russian Federation, Poland, Germany, France, Canada, Sweden, United Kingdom** listed in order of frequency. The attacks that we observed are happening to companies all around the world. Geographic borders offer little or no protection against cyber-attacks, in fact just the opposite is true offering more opportunity for anyone to carry out an attack.



*Please view the Maps, and [Graph: Top 10 Attacking Countries Blocked](#), [Graph: Top 10 Attacking Countries Blocked by Attack Type](#), [Graph: Top 10 Attacking Countries Blocked by Protocol](#) available in the Security Intelligence section of the report.

Category Distribution

Category distribution for this report period is illustrated and detailed below.

Scanning accounted for 47.82 % of attacks during this report period

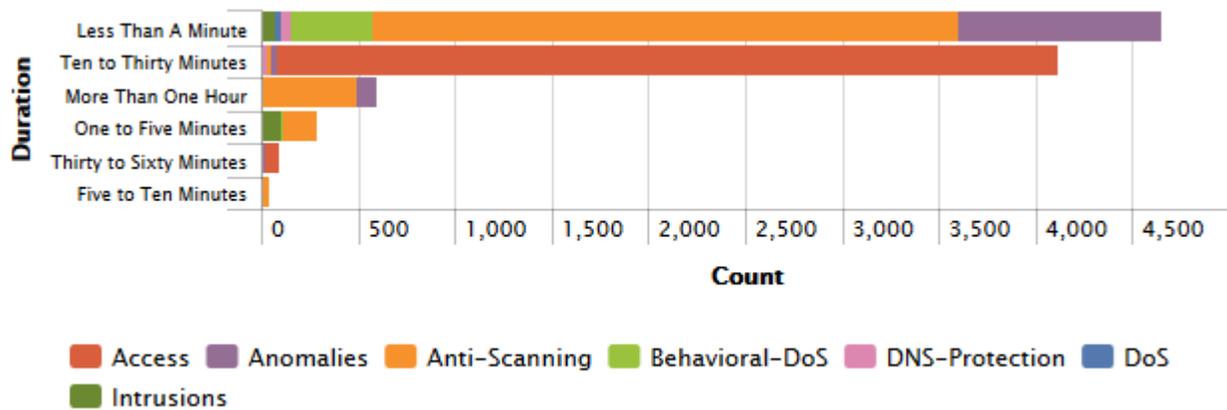
Network-wide Anti-Scanning protections dropped enumeration attempts which otherwise thwart any effort for threat modelling, commonplace after the information gathering phase of a targeted or planned attack.

Intrusions accounted for 1.62 % of attacks during this report period

These include vulnerability-based threats such as: Worms and Botnets; Trojan horses and the creation of backdoors; Vendor-specific exploitation vulnerabilities in products e.g., Microsoft, Oracle; Exploitation of vulnerabilities in a

Duration

Attack duration for specific categories for this report period is illustrated below.



Bandwidth

Access protection dropped **212.00 Gbps**, Anti-Scanning protection dropped **46.33 Gbps**, Dos Protection Dropped **0.07 Gbps**, Intrusion protection dropped **25.60 Gbps** of total traffic, Behavioral-DoS dropped **18.56 Gbps**, **9.80 Gbps** dropped by Packet Anomaly protection rules, DNS Protection dropped a total of **7.37 Gbps** of traffic, for a total of **319.74 Gbps** of malicious traffic was discarded this period.

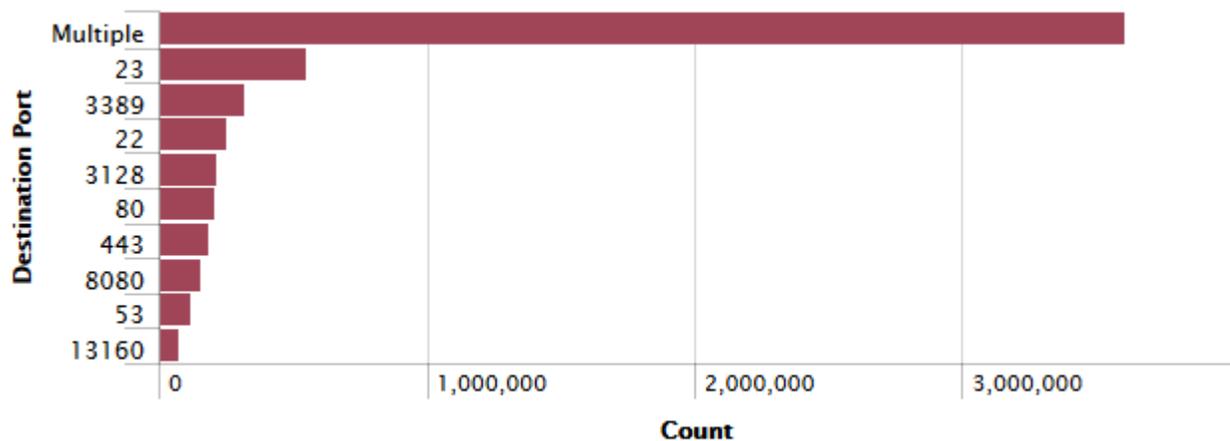
Category ↕	Gbps ↕	Mbps ↕
Access	212.00	217088.37
Anti-Scanning	46.33	47441.24
Intrusions	25.60	26214.01
Behavioral-DoS	18.56	19000.99
Anomalies	9.80	10039.98
DNS-Protection	7.37	7546.96
DoS	0.07	68.82
Cracking-Protection	0.01	13.90
HttpFlood	0.00	0.00
Total Bandwidth in Gbps/Mbps	319.74	327414.27

*Please view the [Bandwidth Information](#), and [Graph: Bandwidth by Blocked Threat Category by Hour of Day](#) and [Graph: Top Attacks Blocked by Bandwidth](#) and [Graph: Attack Categories Blocked by Bandwidth](#) available in the Security Intelligence section of the report.

Port Activity

The advanced intrusion detection and prevention capabilities offered by the DefensePro IPS NBA, DoS and Reputation Service provides maximum protection for network elements, hosts and applications. It is composed of different application-level protection features to prevent intrusion attempts such as worms, Trojan horses and single-bullet attacks, facilitating complete and high-speed cleansing of all malicious intrusions.

The DefensePro assisted in preventing attacks directed at network and server level which were directed at well-known port numbers: **80** (http), **1433** (ms-sql), **3389** (rdp), **8080** (http-alt), **4500** (ipsec-nat-t), **443** (https), **5060** (sip), **23** (telnet), **22** (ssh), **3306** (mysql) in order of frequency for this report period.

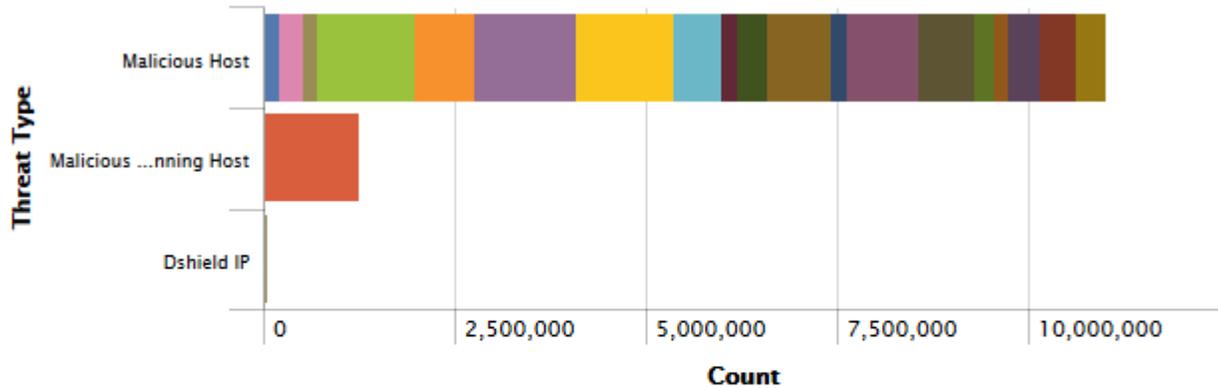


Port number information utilized is based on [IANA Service Name and Transport Protocol Port Number Registry](#) and additional outside sources are used to illustrate the relationship to commonly exploited attacks vectors.

*Please view the [Port Information](#), and [Graph: Attacks Blocked by Destination Port](#) and [Graph: Top Probed Applications Blocked](#) available in the Security Intelligence section of the report.

Known Threat Sources by Threat Type

3,431,528 attacks on INSPIRA HEALTH NETWORK are from known threat sources that have been compiled and correlated with attack source IPs gathered from the DefensePro attack logs and outside sources such honeypots, known malicious sources, vulnerability databases, relationships with CERT and CSIRT teams that GLESEC possesses, together with various other threat feeds.



- 185.94.111.1 188.68.224.62 193.105.134.220 193.106.30.210 198.20.69.74
- 198.20.69.98 198.20.70.114 198.20.87.98 198.20.99.130 209.126.116.147
- 218.246.0.97 46.161.40.120 66.240.192.138 66.240.236.119 71.6.135.131
- 71.6.165.200 71.6.167.142 80.82.79.104 82.221.105.6 85.25.43.94

Vulnerability Summary

The following network ranges for INSPIRA HEALTH NETWORK was scanned for vulnerabilities.
170.75.32.0/20 170.75.32.48.0/20

A total of **117** hosts were scanned **57** of which were found to be vulnerable.

Vulnerabilities were detected for the following host IPs:

Vulnerable Hosts ↕	High ↕	Medium ↕	Low ↕	Total ↕
170.75.48.20	0	0	1	1
170.75.48.3	0	0	1	1
170.75.48.2	0	0	1	1
170.75.48.1	0	0	1	1
170.75.33.217	0	1	2	3
170.75.33.216	0	1	2	3
170.75.33.190	0	0	6	6
170.75.33.163	0	0	10	10
170.75.33.162	0	0	9	9
170.75.33.142	0	1	8	9
170.75.33.141	0	1	7	8
170.75.33.140	0	1	6	7
170.75.33.138	0	1	2	3
170.75.33.137	0	1	2	3
170.75.33.135	0	1	2	3
170.75.33.134	0	1	2	3
170.75.33.133	0	0	6	6
170.75.33.132	0	1	8	9
170.75.33.131	0	1	7	8
170.75.33.130	0	0	2	2

170.75.33.129	0	1	6	7
170.75.33.128	0	0	6	6
170.75.33.127	0	1	7	8
170.75.33.125	0	1	8	9
170.75.33.124	0	1	8	9
170.75.33.123	0	1	5	6
170.75.33.122	0	0	7	7
170.75.33.121	0	0	2	2
170.75.33.120	0	0	2	2
170.75.33.119	0	1	9	10
170.75.33.118	0	1	8	9
170.75.33.117	0	1	7	8
170.75.33.116	0	1	4	5
170.75.33.115	0	0	2	2
170.75.33.113	0	2	8	10
170.75.33.112	0	0	6	6
170.75.33.111	0	1	8	9
170.75.33.110	0	3	10	13
170.75.33.109	0	1	7	8
170.75.33.108	0	1	7	8
170.75.33.106	0	0	3	3
170.75.33.105	0	0	3	3
170.75.33.104	0	0	3	3
170.75.33.98	0	0	2	2
170.75.33.97	0	1	6	7
170.75.33.95	1	0	2	3
170.75.33.58	0	1	4	5
170.75.33.55	0	2	4	6
170.75.33.53	0	1	2	3
170.75.33.51	0	1	5	6

170.75.33.35	0	1	9	10
170.75.33.4	0	2	8	10
170.75.32.15	0	0	5	5
170.75.32.10	0	0	1	1
170.75.32.3	0	0	1	1
170.75.32.2	0	0	1	1
170.75.32.1	0	0	1	1

Vulnerability –Current Month and Previous Month

A comparison of persistent vulnerabilities of the current month and previous month.

ip	Previous_Month	Current_Month
170.75.32.1	1	1
170.75.32.10	1	1
170.75.32.15	7	5
170.75.32.2	1	1
170.75.32.3	1	1
170.75.33.104	3	3
170.75.33.105	5	3
170.75.33.106	3	3
170.75.33.107	2	
170.75.33.108	8	8
170.75.33.109	8	8
170.75.33.110	10	13
170.75.33.111	8	9
170.75.33.112	8	6
170.75.33.113	9	10
170.75.33.114	15	
170.75.33.115	3	2
170.75.33.116	1	5
170.75.33.117	5	8
170.75.33.118	9	9

170.75.33.119	9	10
170.75.33.120	2	2
170.75.33.121	2	2
170.75.33.122	8	7
170.75.33.123	6	6
170.75.33.124	9	9
170.75.33.125	9	9
170.75.33.127	8	8
170.75.33.128	7	6
170.75.33.129	4	7
170.75.33.130	2	2
170.75.33.131	7	8
170.75.33.132	8	9
170.75.33.133	6	6
170.75.33.134	4	3
170.75.33.135	3	3
170.75.33.137	3	3
170.75.33.138	3	3
170.75.33.140	6	7
170.75.33.141	8	8
170.75.33.142	10	9
170.75.33.162	6	9
170.75.33.163	10	10
170.75.33.190	6	6
170.75.33.216	3	3
170.75.33.217	3	3
170.75.33.35	12	10
170.75.33.4	10	10
170.75.33.51	6	6
170.75.33.53	3	3

170.75.33.55	6	6
170.75.33.58	4	5
170.75.33.95	3	3
170.75.33.97	7	7
170.75.33.98	1	2
170.75.48.1	1	1
170.75.48.2	1	1
170.75.48.20		1
170.75.48.3	1	1

Please view [Recommendations](#) for more details.

Risk Distribution

Category distribution for this report period is illustrated and detailed below.

Based on the information gathered from the GLESEC Automated Vulnerability Detection System (AVDS) a total of **310 Vulnerabilities** were found which consisted of **1 High Risk Vulnerabilities** during this period, **37 Medium Risk Vulnerabilities** and **272 Low Risk Vulnerabilities**.

Scan Name	High	Medium	Low	Total
Inspira_Health_Network	1	37	272	310

High risk vulnerabilities accounted for 0.32 % of the discoveries during this report period

High are defined as being in one or more of the following categories: Backdoors, full Read/Write access to files, remote Command Execution, Potential Trojan Horses, or critical Information Disclosure (e.g. passwords).

Medium risk vulnerabilities accounted for 11.93 % of the discoveries during this report period

Medium describes vulnerabilities that either expose sensitive data, directory browsing and traversal, disclosure of security controls, facilitate unauthorized use of services or denial of service to an attacker.

Low risk vulnerabilities accounted for 87.74% of the discoveries during this report period

Low describes vulnerabilities that allow preliminary or sensitive information gathering for an attacker or pose risks that are not entirely security related but maybe used in social-engineering or similar attacks.

Vulnerability Categories

Most frequent type of vulnerabilities.

1	Preliminary Analysis	9	Firewalls	17	Network Devices
2	SMB/NetBIOS	10	SSH Servers	18	Malformed Packets
3	Simple Network Services	11	Mail Servers	19	Proxy Servers
4	Policy Checks	12	SQL Servers	20	Wireless AP
5	Web Servers	13	FTP Servers	21	Webmail Servers
6	RPC Services	14	Server Side Scripts	22	NFS Services
7	Backdoors	15	SNMP Services	23	Printers
8	Encryption and Authentication	16	DNS Servers		

The list below indicate your vulnerability most frequent:

Webserver vulnerabilities are the most prevalent vulnerability category with **122** detected vulnerabilities followed by Encryption and Authentication with **114** , Preliminary analysis with **69** , Mail Servers with **2** , Server Side Scripts with **2** and Simple Network Services with **1** for the report period.

Category	High	Medium	Low	Total
Web servers	1	3	118	122
Encryption and Authentication	0	33	81	114
Preliminary Analysis	0	0	69	69
Mail servers	0	0	2	2
Simple Network services	0	0	2	2
Server Side Scripts	0	1	0	1

Web Server vulnerabilities accounted for 39.35 % of the discoveries during this report period

Various high-profile hacking attacks have proven that web security remains the most critical issue to any business that conducts its operations online. Web servers are one of the most targeted public faces of an organization, because of the sensitive data they usually host. Securing a web server is as important as securing the website or web application itself and the network around it. If you have a secure web application and an insecure web server, or vice versa, it still puts your business at a huge risk. Your company's security is as strong as its weakest point.

Encryption and Authentication vulnerabilities accounted for 36.77 % of the discoveries during this report period

Authentication and encryption are two intertwined technologies that help to insure that your data remains secure. Authentication is the process of insuring that both ends of the connection are in fact who they say they are. This applies not only to the entity trying to access a service (such as an end user) but to the entity providing the service, as well (such as a file server or Web site). Encryption helps to insure that the information within a session is not compromised. This includes not only reading the information within a data stream, but altering it, as well.

While authentication and encryption each has its own responsibilities in securing a communication session, maximum protection can only be achieved when the two are combined. For this reason, many security protocols contain both authentication and encryption specifications.

Preliminary Analysis vulnerabilities accounted for 22.25 % of the discoveries during this report period

Preliminary Analysis vulnerabilities are primarily information or service disclosures that can be gathered during footprinting/enumeration. Information disclosure is the unwanted exposure of private data. For example, a user views the contents of a table or file he or she is not authorized to open, or monitors data passed in plaintext over a network. Some examples of information disclosure vulnerabilities include the use of hidden form fields, comments embedded in Web pages that contain database connection strings and connection details, and weak exception handling that can lead to internal system level details being revealed to the client. Any of this information can be very useful to the attacker/threat agent.

Mail Server vulnerabilities accounted for 0.64 % of the discoveries during this report period.

A mail server is the computerized equivalent of your friendly neighborhood mailman. Spammers sometimes send a flood of traffic that overwhelms an email server. The result is sluggish email delivery, delaying legitimate messages from reaching their intended recipients on your network.

Server Side script vulnerabilities accounted for 0.64 % of the discoveries during this report period.

Is a technique used in website design which involves embedding scripts in an HTML source code which results in a user's (client's) request to the server website being handled by a script running on the server-side before the server responds to the client's request.

Simple Network Service vulnerabilities accounted for 0.32 % of the discoveries during this report period

Simple Network vulnerabilities affect protocols like NTP, ICMP and common network applications like SharePoint among others. This is not meant to be a comprehensive list.

5. Recommendations

GLESEC recommends for INSPIRA HEALTH NETWORK to address the following vulnerabilities assigned a High Risk by the GLESEC AVDS.

Systems Affected

170.75.33.95, 170.75.33.142

Description

Microsoft Windows HTTP.sys Code Execution Vulnerability (MS15-034)

HTTP.sys in Microsoft Windows 7 SP1, Windows Server 2008 R2 SP1, Windows 8, Windows 8.1, and Windows Server 2012 Gold and R2 allows remote attackers to execute arbitrary code via crafted HTTP requests, aka "HTTP.sys Remote Code Execution Vulnerability."

Impact

Successful exploitation will allow remote attackers to cause a buffer overflow and potentially execute arbitrary code with SYSTEM privileges.

Possible Solution

See solution provided at: See solution provided at:

<https://technet.microsoft.com/library/security/ms15-034>

GLESEC recommends for INSPIRA HEALTH NETWORK to address the following vulnerabilities assigned a Medium Risk by the GLESEC AVDS.

Systems Affected

170.75.33.35, 170.75.33.51, 170.75.33.55, 170.75.33.58, 170.75.33.97 170.75.33.108, 170.75.33.109, 170.75.33.110, 170.75.33.111, 170.75.33.113, 170.75.33.116, 170.75.33.117, 170.75.33.118, 170.75.33.119, 170.75.33.123, 170.75.33.124, 170.75.33.127, 170.75.33.129, 170.75.33.131, 170.75.33.132, 170.75.33.134, 170.75.33.135, 170.75.33.137, 170.75.33.138, 170.75.33.140, 170.75.33.141, 170.75.33.142, 170.75.33.216, 170.75.33.217

Description

Deprecated SSL Protocol Usage

The remote service accepts connections encrypted using SSLv2 and/or SSLv3, which reportedly suffers from several cryptographic flaws and has been deprecated for several years. An attacker may be able to exploit these issues to conduct man-in-the-middle attacks or decrypt communications between the affected service and clients.

Possible Solution

Consult the application's documentation to disable SSL 2.0 and SSL 3.0, and use TLS 1.0 or newer

Systems Affected

170.75.33.110

Description

Default Web Server Configuration

The web server's default installation or "Welcome" page is installed on this server. This usually indicates a newly installed server which has not yet been configured properly and which may not be known about.

In many cases, a web server is installed by default and the user may not be aware that the web server is running. These servers are rarely patched and rarely monitored, providing hackers with a convenient target that is not likely to trip any alarms.

Possible Solution

Change the default page, or stop and disable the web server completely.

If this server is required to provide necessary functionality, then the default page should be replaced with relevant content. Otherwise, this server should be removed from the network.

Systems Affected

170.75.33.4

Description

HSTS Missing From HTTPS Server

The remote HTTPS server is not enforcing HTTP Strict Transport Security (HSTS). The lack of HSTS allows downgrade attacks, SSL-stripping man-in-the-middle attacks, and weakens cookie-hijacking protections.

Solution

Configure the remote web server to use HSTS.

Systems Affected

170.75.33.4, 170.75.33.53

Description

SSL Certificate Expiry

This test checks expiry dates of certificates associated with SSL-enabled services on the target and reports whether any have already expired or will expire within 60 days.

The SSL certificate of the remote service expired Dec 6 23:59:59 2015 GMT.

Solution

Generate a new certificate for the server, expired certificates pose a security threat as they prevent the user accessing your site from being able to properly evaluate the safety of your SSL certificates

Systems Affected

170.75.33.55

Description

SSL Suites Weak Ciphers

The remote host supports the use of SSL ciphers that offer either weak encryption or no encryption at all.

Solution

Reconfigure your SSL package to reject the use of weak ciphers.

Systems Affected

170.75.33.110

Description

Tomcat Documentation XSS Vulnerabilities/ Server Side Scripts

The remote web server includes an example JSP application that fails to sanitize user-supplied input before using it to generate dynamic content in an error page.

Impact

An unauthenticated remote attacker may be able to leverage this issue to inject arbitrary HTML or script code into a user's browser to be executed within the security context of the affected site.

Solution

Un-deploy the Tomcat documentation web application.

Systems Affected

170.75.33.113

Description

Microsoft IIS Tilde Character Information Disclosure Vulnerability/ Web servers

The remote host has Microsoft IIS installed and prone to information disclosure vulnerability. Microsoft IIS fails to validate a specially crafted GET request having a '~' tilde character, which allows to disclose all short-names of folders and files having 4 letters extensions.

File/Folder name found on server starting with letter(s): asp

Impact

Successful exploitation will let the remote attackers to obtain sensitive information that could aid in further attacks.

GLESEC recommends for INSPIRA HEALTH NETWORK to address the following vulnerabilities assigned a Low Risk by the GLESEC AVDS.

Systems Affected

170.75.32.1, 170.75.32.2, 170.75.32.10, 170.75.32.3, 170.75.48.1, 170.75.48.2, 170.75.48.3

Description

ICMP Timestamp Request

The remote host answers to an ICMP timestamp request. This allows an attacker to know the time and date on your host.

Impact

This may help attackers to defeat time based authentications schemes.

Possible Solution

See solution provided at: <http://www.beyondsecurity.com/faq/questions/54/how-can-i-mitigate-icmp-timestamp>

Systems Affected

170.75.32.15

Description

IPSEC IKE Detection

The remote host seems to be enabled to do Internet Key Exchange (IKE). This is typically indicative of a VPN server. VPN servers are used to connect remote hosts into internal resources.

Possible Solution

You should ensure that:

- 1) The VPN is authorized for your Companies computing environment
- 2) The VPN utilizes strong encryption
- 3) The VPN utilizes strong authentication

Systems Affected

170.75.32.15, 170.75.32.58, 170.75.32.97, 170.75.32.101, 170.75.32.102, 170.75.32.107, 170.75.32.108, 170.75.32.109, 170.75.32.110, 170.75.32.111, 170.75.32.112, 170.75.32.113, 170.75.32.114, 170.75.32.115, 170.75.32.116, 170.75.32.117, 170.75.32.118, 170.75.32.119, 170.75.32.122, 170.75.32.123, 170.75.32.124, 170.75.32.125, 170.75.32.127, 170.75.32.128, 170.75.32.129, 170.75.32.131, 170.75.32.132, 170.75.32.133, 170.75.32.134, 170.75.32.135, 170.75.32.137, 170.75.32.138, 170.75.32.140, 170.75.33.141, 170.75.33.142, 170.75.33.162, 170.75.33.163 170.75.32.190, 170.75.32.216, 170.75.32.217

Description

SSL Verification Test

This test connects to a SSL server, and checks its certificate and the available ciphers. Weak (export version) ciphers are reported as problematic.

Possible Solution

Usage of weak ciphers should be avoided.

Systems Affected

170.75.32.15, 170.75.33.97, 170.75.33.101, 170.75.33.102, 170.75.33.107, 170.75.32.108, 170.75.33.109, 170.75.33.110, 170.75.33.111, 170.75.33.112, 170.75.33.113, 170.75.33.114, 170.75.33.115, 170.75.33.116, 170.75.33.117, 170.75.33.118, 170.75.33.119, 170.75.32.122, 170.75.32.123, 170.75.32.124, 170.75.33.125, 170.75.32.127, 170.75.32.128, 170.75.33.129, 170.75.33.131, 170.75.33.132, 170.75.33.133, 170.75.33.134, 170.75.33.135, 170.75.33.137, 170.75.33.138, 170.75.33.140, 170.75.33.190, 170.75.33.216, 170.75.33.217, 170.75.33.141, 170.75.33.142, 170.75.33.162, 170.75.33.163

Description

Supported SSL Ciphers Suites

This test connects to a SSL server, and checks its certificate and the available ciphers. Weak (export version) ciphers are reported as problematic.

Possible Solution

<http://www.openssl.org/docs/apps/ciphers.html>

Systems Affected

170.75.32.15, 170.75.33.58, 170.75.33.95, 170.75.33.97, 170.75.33.98, 170.75.33.101, 170.75.33.102, 170.75.33.104, 170.75.33.105, 170.75.33.106, 170.75.33.107, 170.75.33.108, 170.75.33.109, 170.75.33.110, 170.75.33.111, 170.75.33.112, 170.75.33.113, 170.75.33.114, 170.75.33.115, 170.75.33.117, 170.75.33.119, 170.75.33.120, 170.75.33.121, 170.75.33.122, 170.75.33.123, 170.75.33.124, 170.75.33.125, 170.75.33.126, 170.75.33.127, 170.75.33.128, 170.75.33.129, 170.75.33.132, 170.75.33.133, 170.75.33.140, 170.75.33.142, 170.75.33.162, 170.75.33.1463 170.75.33.190, 170.75.33.141

Description

HTTP Packet Inspection

This test gives some information about the remote HTTP protocol - the version used, whether HTTP Keep-Alive and HTTP pipelining are enabled, etc.

Systems Affected

170.75.33.58, 170.75.33.95, 170.75.33.97, 170.75.33.98, 170.75.33.101, 170.75.33.102, 170.75.33.104, 170.75.33.105, 170.75.33.106, 170.75.33.107, 170.75.33.108, 170.75.33.109, 170.75.33.110, 170.75.33.111, 170.75.33.112, 170.75.33.113, 170.75.33.114, 170.75.33.115, 170.75.33.116, 170.75.33.117, 170.75.33.118, 170.75.33.119, 170.75.33.120, 170.75.33.121, 170.75.33.122, 170.75.33.123, 170.75.33.124, 170.75.33.125, 170.75.33.126, 170.75.33.127, 170.75.33.128, 170.75.33.129, 170.75.33.130, 170.75.33.131, 170.75.33.132, 170.75.33.133, 170.75.33.140, 170.75.33.190, 170.75.33.141, 170.75.33.142, 170.75.33.162, 170.75.33.163

Description

Identify Unknown Services via GET Requests

This test is a complement of Service test, as it tries recognize more banners and use an HTTP request if necessary.

Systems Affected

170.75.33.117, 170.75.33.131, 170.75.33.141

Description

Web Application Firewall Detection

By analysing error codes and messages returned from some web queries, we are able to determine that the remote web server is protected by a web application firewall.

Such protection may disrupt scan results. Countermeasures have been taken to make the scan as reliable as possible.

Possible Solution

To get a more comprehensive set of scan results, either whitelist the scanner's IP address or scan from an unprotected location.

Systems Affected

170.75.33.108, 170.75.33.110, 170.75.33.111, 170.75.33.112, 170.75.33.113, 170.75.33.118, 170.75.33.119, 170.75.33.124, 170.75.33.125, 170.75.33.127, 170.75.33.129, 170.75.33.132, 170.75.33.142

Description

IIS Content-Location HTTP Header

By default, in Internet Information Server (IIS), the Content-Location references the IP address of the server rather than the Fully Qualified Domain Name (FQDN) or Hostname.

This header may expose internal IP addresses that are usually hidden or masked behind a Network Address Translation (NAT) Firewall or proxy server.

Impact

If this contains internal IP address information, attackers may gain critical information about the host.

Possible Solution

See solution provided at: <http://support.microsoft.com/kb/218180>

Systems Affected

170.75.33.51, 170.75.33.114, 170.75.33.117, 170.75.33.119, 170.75.33.122, 170.75.33.123, 170.75.33.129,

Description

Directory Scanner

We found some common directories on the web server:

170.75.33.117:

The following directories were discovered:
/en-US

170.75.33.119:

The following directories were discovered:
/Log, /exec, /log, /scripts, /utils

170.75.33.122:

The following directories were discovered:
/obj

170.75.33.123:

The following directories were discovered:
/Templates, /images, /java, /templates

170.75.33.129:

The following directories were discovered:
/archive

170.75.33.163

The following directories were discovered:
/error

Impact

This is usually not a security vulnerability, only an information gathering. Nevertheless, you should manually inspect these directories to ensure that they are in compliance with accepted security standards.

Possible Solution

Check if those directories contain any sensitive information, if they do, prevent unauthorized access to them

Systems Affected

170.75.33.104, 170.75.33.105, 170.75.33.106, 170.75.33.125

Description

Microsoft IIS Default Page

The remote server appears to be an unconfigured IIS Server.

Systems Affected

170.75.33.109

Description

Non-compliant Strict Transport Security (STS)

The remote web server implements Strict Transport Security (STS). The goal of STS is to make sure that a user does not accidentally downgrade the security of his or her browser.

All unencrypted HTTP connections are redirected to HTTPS. The browser is expected to treat all cookies as 'secure' and to close the connection in the event of potentially insecure situations.

170.75.33.109 : https (443/tcp):

All connections to the HTTP site must be redirected to the HTTPS site.

Systems Affected

170.75.33.109

Description

Strict Transport Security (STS) Detection

The remote web server implements Strict Transport Security (STS). The goal of STS is to make sure that a user does not accidentally downgrade the security of his or her browser.

All unencrypted HTTP connections are redirected to HTTPS. The browser is expected to treat all cookies as 'secure' and to close the connection in the event of potentially insecure situations.

170.75.33.109 : https (443/tcp):

The STS header line is:

Strict-Transport-Security: max-age=31536000

Systems Affected

170.75.33.110

Description

HTTP Server Backported Security Patches

Security patches may have been 'back ported' to the remote HTTP server without changing its version number. Banner-based checks have been disabled to avoid false positives.

Systems Affected

170.75.33.4, 170.75.33.119

Description

robot(s).txt Detection

Some webmasters use a file called robot(s).txt to supply information to search engines and other indexing tools. This file exists on your server: make sure it doesn't contain sensitive information.

170.75.33.4:

'robots.txt' contains the following:

```
User-agent: *
```

```
Disallow: /
```

170.75.33.119:

'robots.txt' contains the following:

```
User-agent: *
```

```
Disallow: /
```

Impact

This file can be viewed by anyone, and it might contain sensitive information about the server. For example, specifying which directories shouldn't be indexed tells the attacker where the sensitive files are.

Possible Solution

Make sure the file doesn't contain any sensitive information

Systems Affected

170.75.33.122

Description

Microsoft .NET Handlers Enumeration

It is possible to obtain the list of handlers the remote ASP.NET web server supports.

170.75.33.122:

- .ashx
- .aspx
- .asmx
- .rem
- .soap

Possible Solution

<http://support.microsoft.com/kb/815145>

Systems Affected

170.75.33.141

Description

IIS Allows BASIC and/or NTLM Authentication

The remote host appears to be running a version of IIS which allows remote users to determine which authentication schemes are required for confidential webpages.

That is, by requesting valid webpages with purposely invalid credentials, you can ascertain whether or not the authentication scheme is in use. This can be used for brute-force attacks against known UserIDs.

170.75.33.141

- IIS Basic authentication is enabled
- IIS NTLM authentication is enabled

Possible Solution

Follow this procedure:

1. Open Internet Information Service Manager
2. Choose the server
3. Choose master properties
4. Choose WWW Service
5. Choose Edit
6. Choose Directory Security
7. Under Anonymous access, choose edit
8. Deselect Integrated Windows Authentication

Systems Affected

170.75.33.110

Description

Apache Tomcat Default Error Page Version Detection

Apache Tomcat appears to be running on the remote host and reporting its version number on the default error pages.

Possible Solution

Replace the default error pages with custom error pages to hide the version number. Refer to the Apache wiki or the Java Servlet Specification for more information.

Systems Affected

170.75.33.128, 170.75.33.141

Description

SharePoint Detection

The remote web server is running SharePoint, a web interface for document management. As this interface is likely to contain sensitive information, make sure only authorized personnel can log into this site.

Systems Affected

170.75.33.4, 170.75.33.53

Description

SMTP Service STARTTLS Command Support

The remote SMTP service supports the use of the 'STARTTLS' command to switch from a plaintext to an encrypted communications channel.

Systems Affected

170.75.33.110

Description

Apache Tomcat Servlet/JSP Container Default Files/ Web servers

The Apache Tomcat servlet/JSP container has default files installed. These files should be removed as they may help an attacker to guess the exact version of the Apache Tomcat which is running on this host and may provide other useful information.

Default files:

- * /tomcat-docs/index.html
- * /examples/servlets/index.html
- * /examples/servlet/SnoopServlet
- * /examples/jsp/snp/snoop.jsp
- * /examples/jsp/index.html

The following default files were found:

/tomcat-docs/index.html

Systems Affected

170.75.32.15

Description

Cisco ASA SSL VPN Detection/Encryption and Authentication

The remote host is a Cisco Adaptive Security Appliance (ASA) running an SSL VPN server

Solution

Make sure the use of this device is authorized by your company policy.

GLESEC recommends “Implementing the First Five Quick Wins” based on the Twenty Critical Security Controls for Effective Cyber Defense, Version 4.1 that were formulated as a joint effort from the NSA, US Cert, DoD JTF-GNO, the Department of Energy Nuclear Laboratories, Department of State, DoD Cyber Crime Center plus the top commercial forensics experts and pen testers that serve the banking and critical infrastructure communities. These are readily available from GLESEC which has provided the following link: [Top 20 Critical Security Controls](#)

The Critical Controls represent the biggest bang for the buck to protect your organization against real security threats. Within Critical Controls 2-4 are five “quick wins.” These are subcontrols that have the most immediate impact on preventing the advanced targeted attacks that have penetrated existing controls and compromised critical systems at thousands of organizations.

The five quick wins are:

- a) Application white listing (in CSC2)
- b) Using common, secure configurations (in CSC3)
- c) Patch application software within 48 hours (in CSC4)
- d) Patch systems software within 48 hours (CSC4)
- e) Reduce the number of users with administrative privileges (in CSC3 and CSC12)

6. Security Intelligence

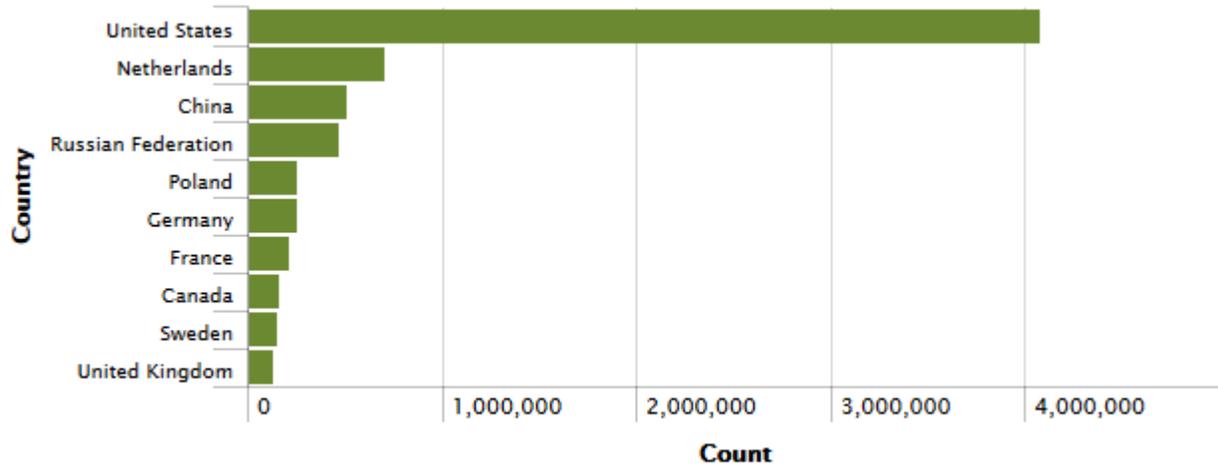
The purpose of this section is to highlight intelligence gathered from the devices under contract as well as outside sources such honeypots, known malicious sources, vulnerability databases, relationships with CERT and CSIRT teams that GLESEC possesses, together with various other threat feeds.

The vast majority of attacks on **INSPIRA HEALTH NETWORK** originated geographically from the following Top 10 countries: **USA, Netherlands, China, Russian Federation, Poland, Germany, France, Canada, Sweden, United Kingdom** listed in order of frequency. The attacks that we observed are happening to companies all around the world. Some results do not include location information that allows map plotting.



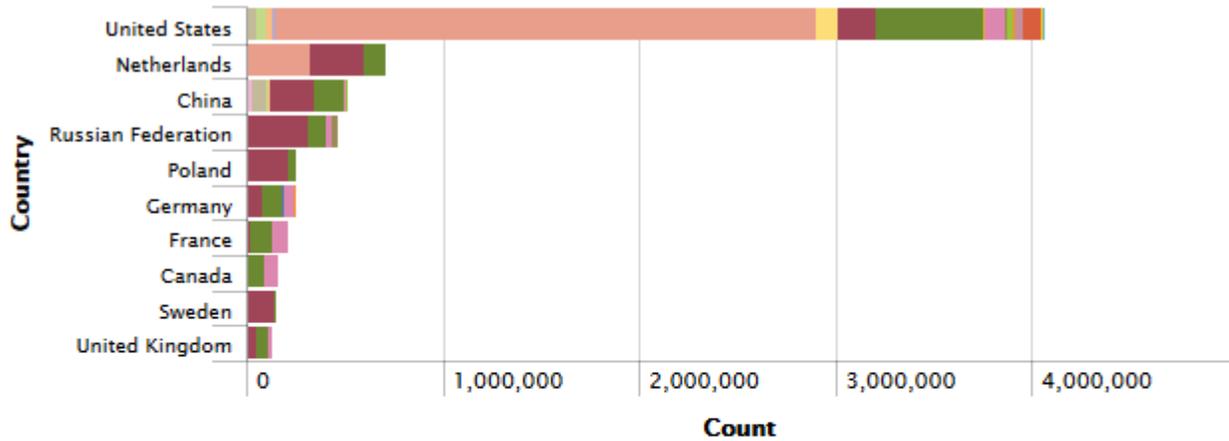
Graph: Top 10 Attacking Countries Blocked

This report provides the count of total attacks blocked by country



Graph: Top 10 Attacking Countries Blocked by Attack Type

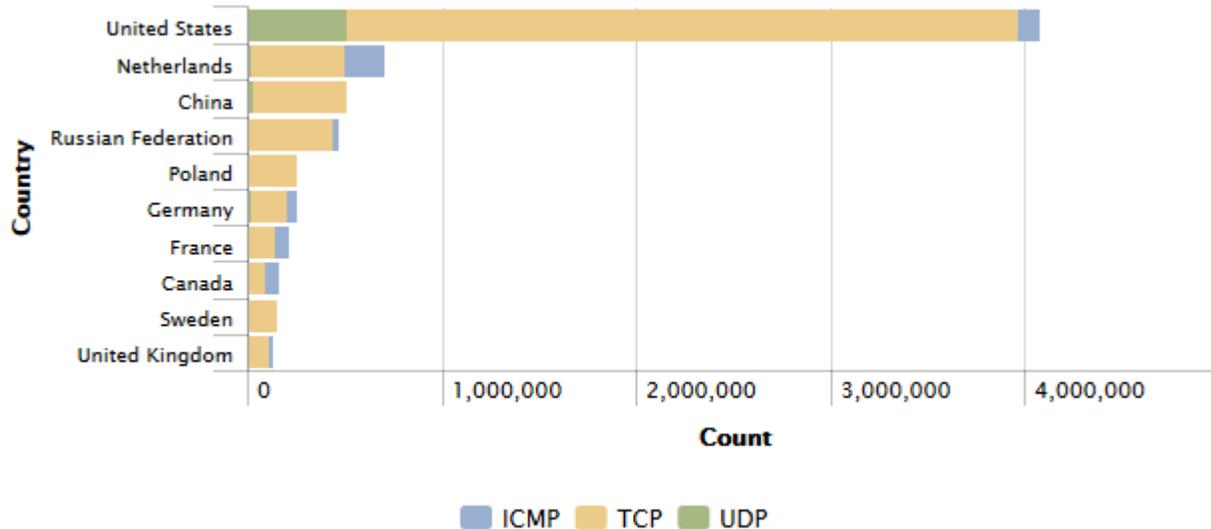
This report provides the count of total attacks types blocked by country



- Anomaly...dow-SYN
- Anomaly-...est-DOS
- Anomaly-S...tion-Cli
- DNS flo...DNS-PTR
- Invalid L...er Length
- Invalid TCP Flags
- L4 Source...ort Zero
- Ping Sweep
- SIP-Scan...PVicious
- Source Ad... Attack)
- TCP Scan
- TCP Scan ...izortal)
- TCP Scan (vertical)
- TCP hand... not syn
- Threat List
- UDP Scan
- UDP Scan ...izortal)
- network ...TCP-SYN
- network ...SYN-ACK
- network ...IPv4 UDP

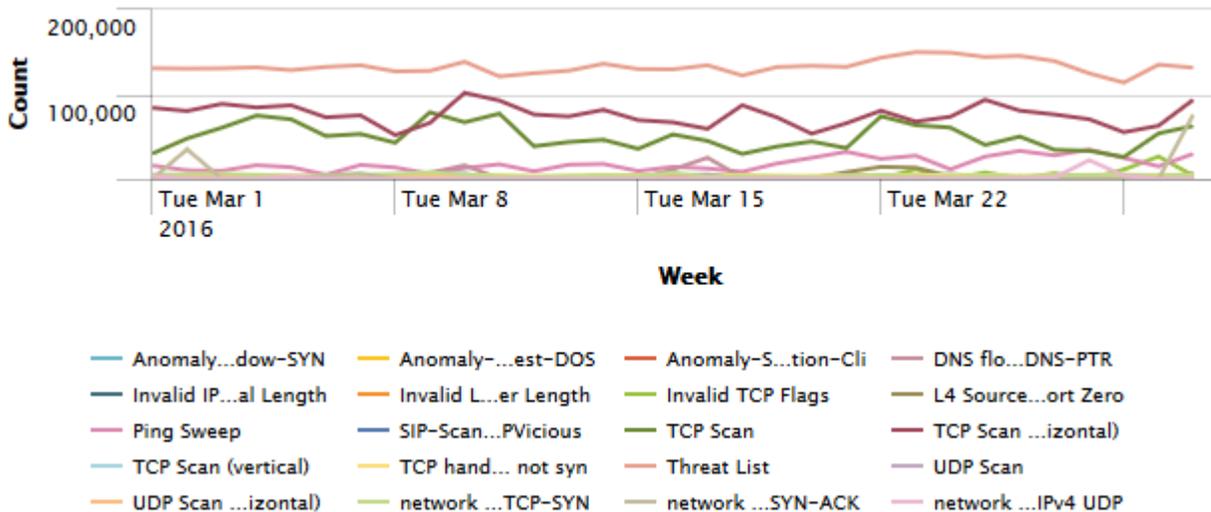
Graph: Top 10 Attacking Countries Blocked by Protocol

This report provides the count of attack protocols blocked by country



Graph: Attacks Types Blocked by Week

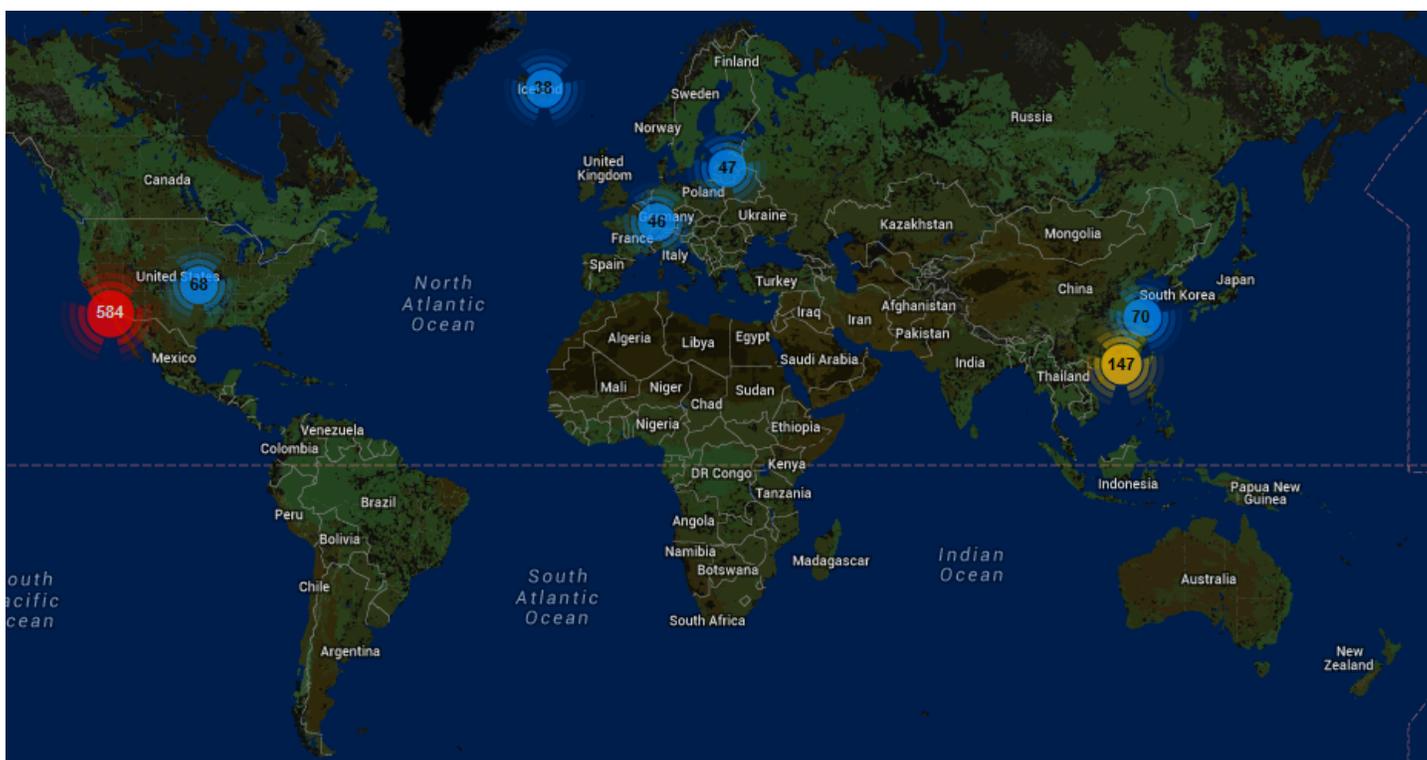
This report provides the count of attacks blocked by week



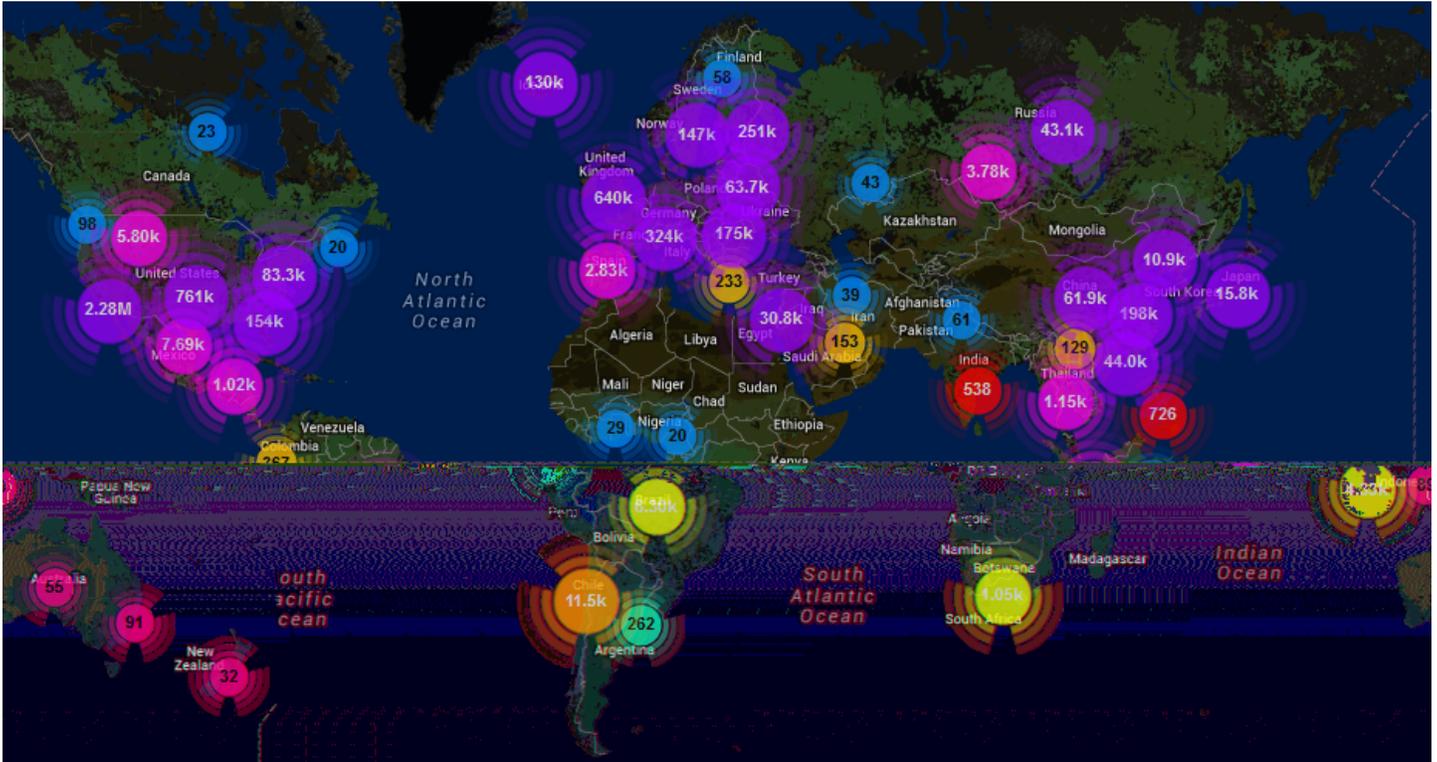
Known Threat Source Information

3,431,528 attacks on **INSPIRA HEALTH NETWORK** are from known threat sources that have been compiled and correlated with attack source IPs gathered from the DefensePro attack logs and outside sources such as honeypots, known malicious sources, vulnerability databases, relationships with CERT and CSIRT teams that GLESEC possesses, together with various other threat feeds.

8,454,444 attacks on **INSPIRA HEALTH NETWORK** from the DNS Blacklist obtained by correlating values from the Project Honey Pot Database. Some results do not include location information that allows map plotting.

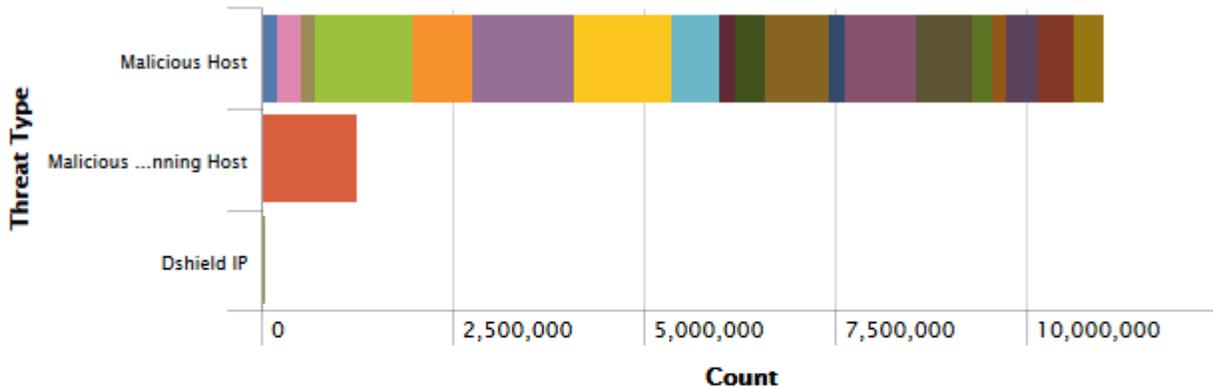


Map of geographic distribution of **5,873,613** attacks on **INSPIRA HEALTH NETWORK** from known threat sources obtained by correlating values from AlienVault Labs; Emerging Threats; Zeus, Spyeye, and Palevo Tracker. Some results do not include location information that allows map plotting.



Graph: Known Threat Sources by Threat Type

This report provides the Top 20 known threat sources by IP and their respective infringing threat type.



- 185.94.111.1
- 188.68.224.62
- 193.105.134.220
- 193.106.30.210
- 198.20.69.74
- 198.20.69.98
- 198.20.70.114
- 198.20.87.98
- 198.20.99.130
- 209.126.116.147
- 218.246.0.97
- 46.161.40.120
- 66.240.192.138
- 66.240.236.119
- 71.6.135.131
- 71.6.165.200
- 71.6.167.142
- 80.82.79.104
- 82.221.105.6
- 85.25.43.94

Port Information

Port Information: Port **80** (http), Port **1443** (ms-sql), Port **8080** (https-alt), Port **3306** (mysql)

Commonly scanned in order to attack web servers. SQL injection is currently the most common form of web site attack in that web forms are very common, often they are not coded properly and the hacking tools used to find weaknesses and take advantage of them are commonly available online. This kind of exploit is easy enough to accomplish that even inexperienced hackers can accomplish mischief. However, in the hands of the very skilled hacker, a web code weakness can reveal root level access of web servers and from there attacks on other networked servers can be accomplished. Structured Query Language (SQL) is the nearly universal language of databases that allows the storage, manipulation, and retrieval of data. Databases that use SQL include MS SQL Server, MySQL, Oracle, PostgreSQL, MongoDB, Access and Filemaker Pro and these databases are equally subject to SQL injection attack.

Web based forms must allow some access to your database to allow entry of data and a response, so this kind of attack bypasses firewalls and endpoint defenses. Any web form, even a simple logon form or search box, might provide access to your data by means of SQL injection if coded incorrectly.

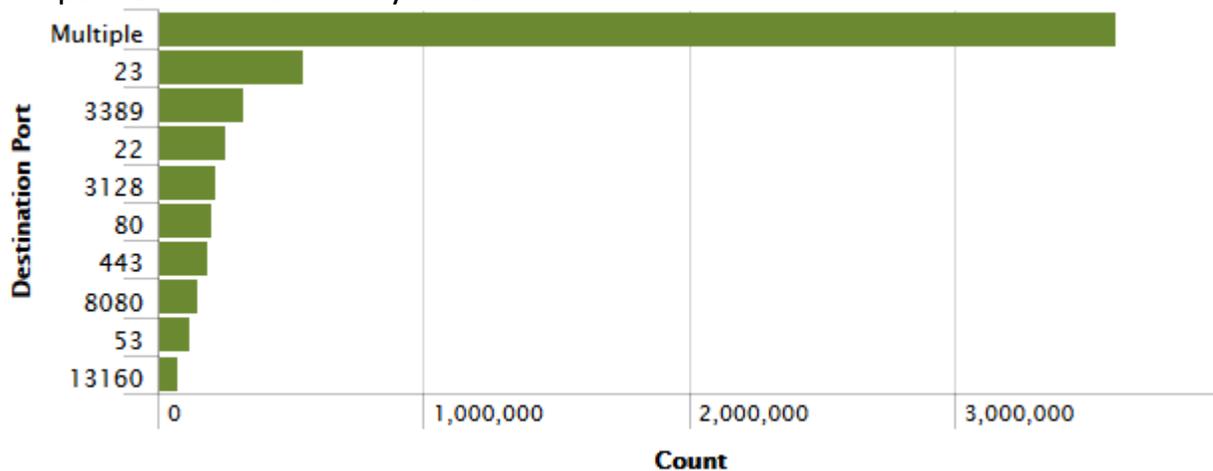
OWASP Top 10 for 2013 lists A1-Injection as the greatest threat and defines this category as:

Injection flaws, such as SQL, OS, and LDAP injection occur when untrusted data is sent to an interpreter as part of a command or query. The attacker's hostile data can trick the interpreter into executing unintended commands or accessing data without proper authorization.

A SQL injection attack consists of insertion or "injection" of a SQL query via the input data from the client to the application. A successful SQL injection exploit can read sensitive data from the database, modify database data (Insert/Update/Delete), execute administration operations on the database (such as shutdown the DBMS), recover the content of a given file present on the DBMS file system and in some cases issue commands to the operating system. SQL injection attacks are a type of injection attack, in which SQL commands are injected into data-plane input in order to effect the execution of predefined SQL commands.

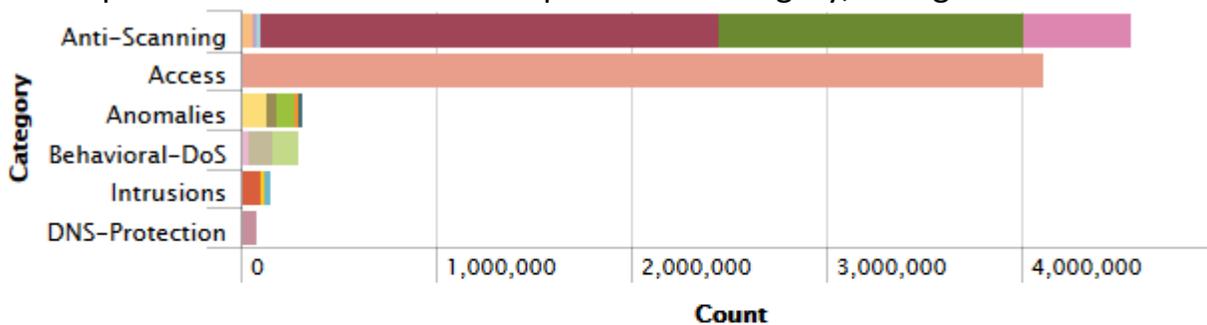
Graph: Attacks Blocked by Destination Port

This report provides information on the total number of attacks blocked that were attempted on which port and for how many times.



Graph: Attacks Blocked By Threat Category

This report lists the attacks blocked per Attack Category, listing the attack name.



- Anomaly...dow-SYN
- Anomaly-...est-DOS
- Anomaly-S...tion-Cli
- DNS flo...DNS-PTR
- Invalid IP...al Length
- Invalid L...er Length
- Invalid TCP Flags
- L4 Source...ort Zero
- Ping Sweep
- SIP-Scan...PVicious
- TCP Scan
- TCP Scan (...izontal)
- TCP Scan (vertical)
- TCP hand... not syn
- Threat List
- UDP Scan
- UDP Scan (...izontal)
- network ...TCP-SYN
- network ...SYN-ACK
- network ...IPv4 UDP

Graph: Critical Attacks Blocked

This report provides Critical Attacks information, attack name, network security rule along with the number of times the attack was launched



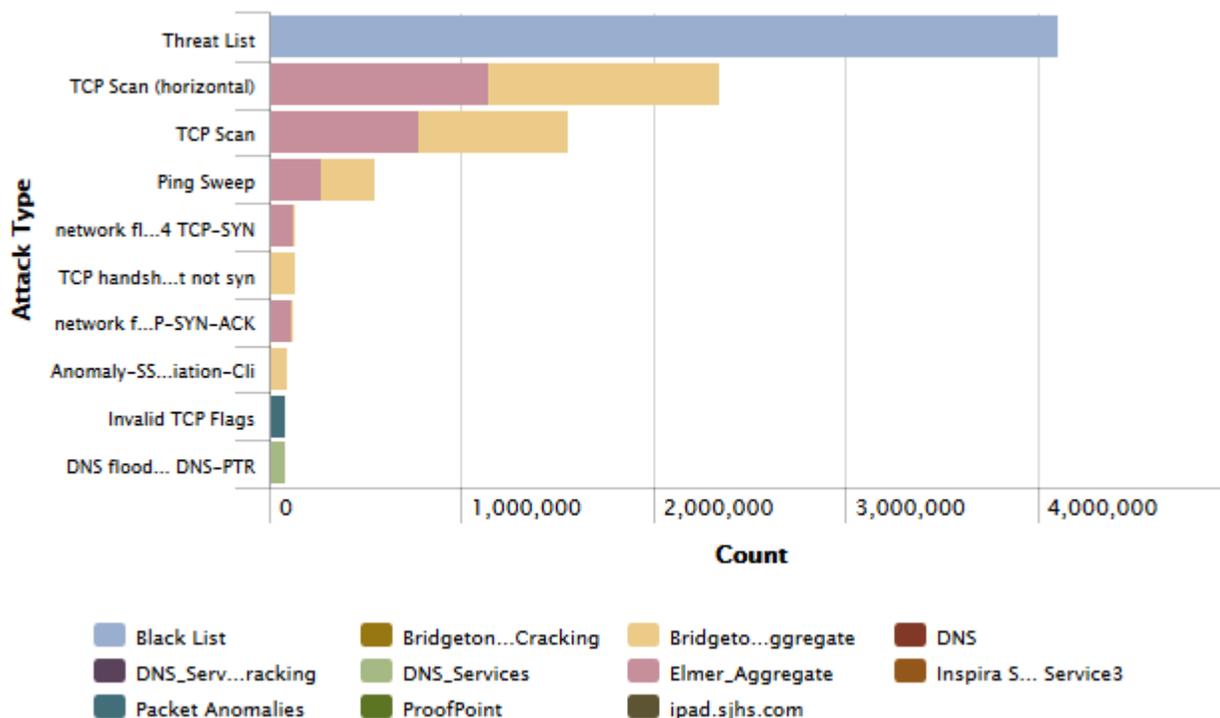
Graph: Top Attacked Destinations Blocked

This report provides information on the system IPs, which were the destination of the attacks for most number of times along with the network security rule.



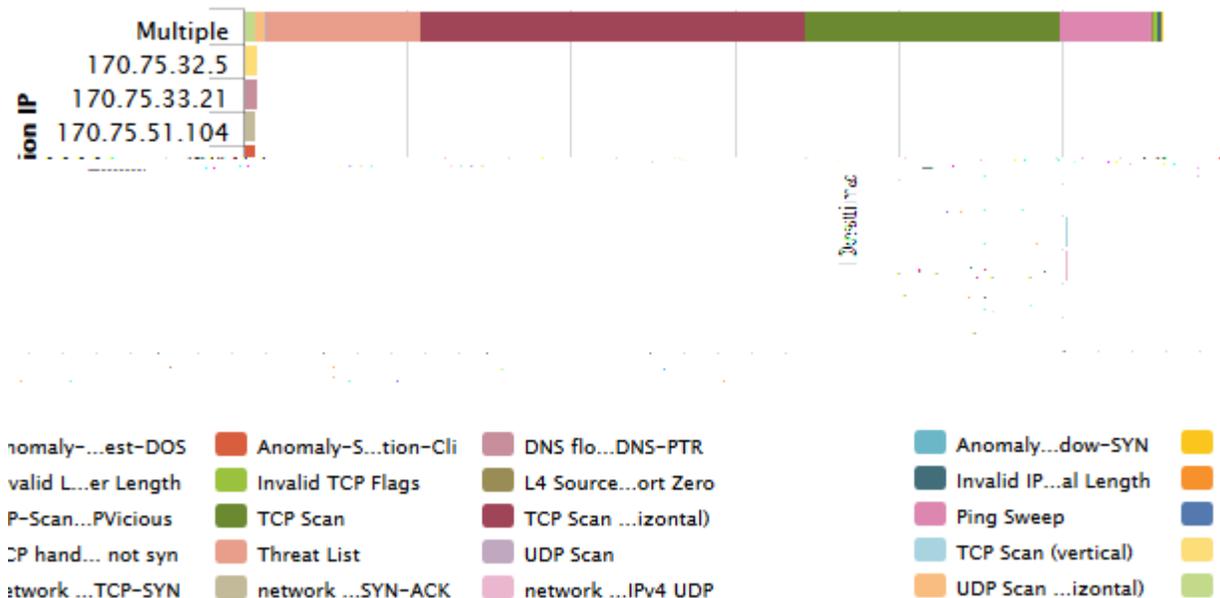
Graph: Top Attacks Blocked

This report provides information on the Top Attacks Blocked, the attack name, network security rule and the total number of attacks blocked with this combination.



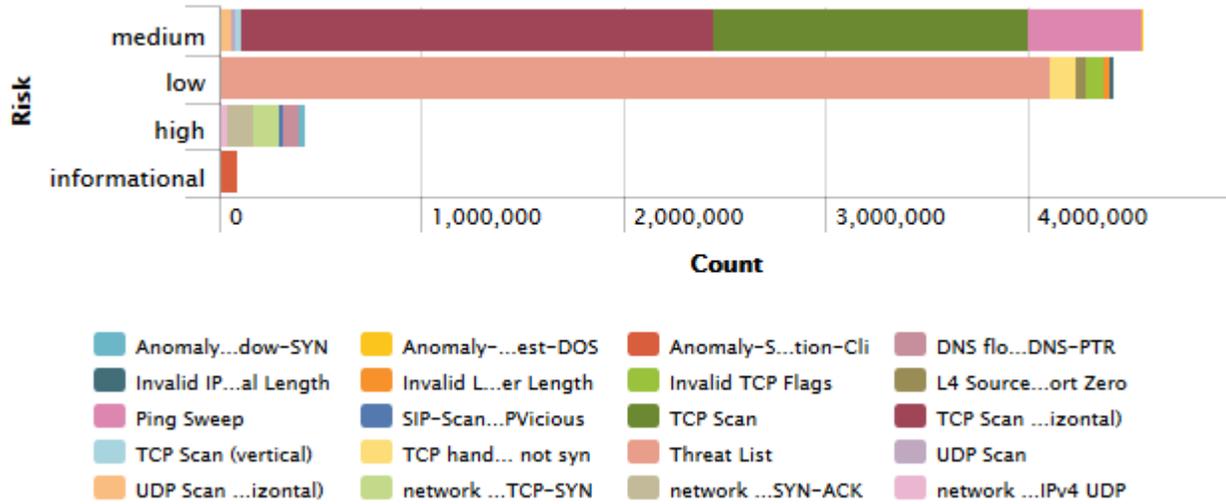
Graph: Top Attacks Blocked by Destination

This report provides information on the top attacks targeted at destinations that were blocked on the DP IPS. In this report the destination on which the attack was targeted, attack name, and count are shown.



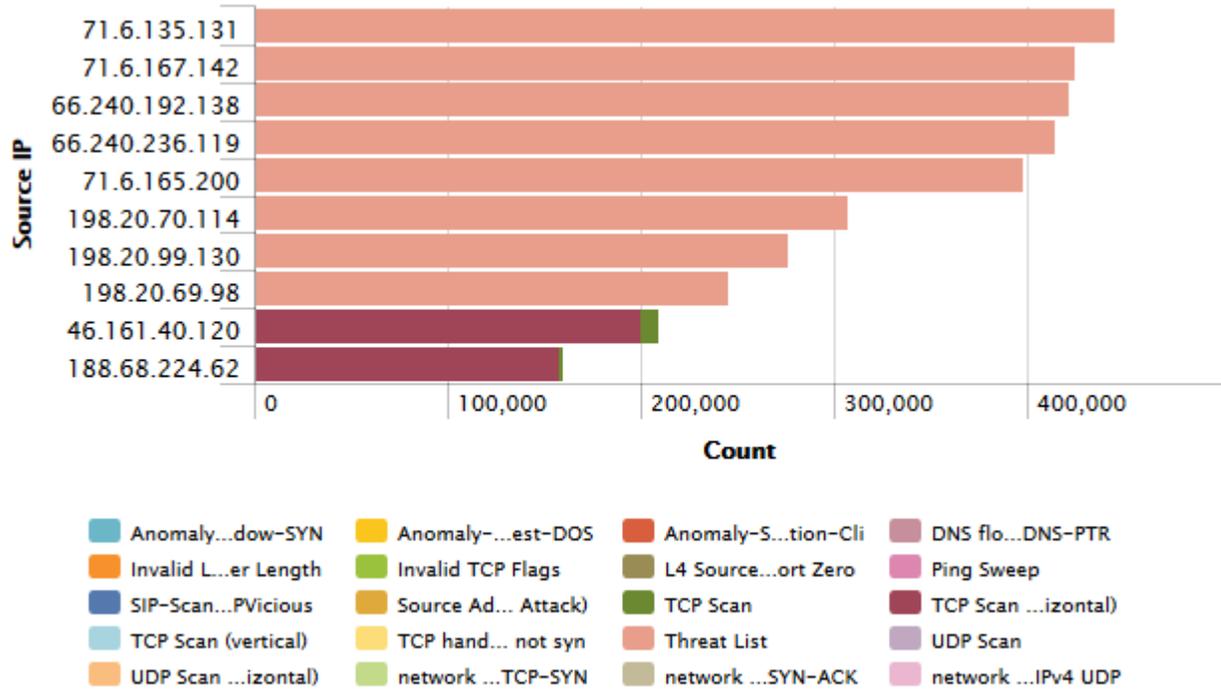
Graph: Top Attacks Blocked By Risk

This report provides information on the attacks, which were blocked on DP IPS based on their risk. In this report the risk of the attack and attack name are shown.



Graph: Top Attacks Blocked by Source

This report provides information on the top attacks blocked, categorized by attacks for each source that was the source of attacks along with the attack name and the number of attacks that triggered with this combination.

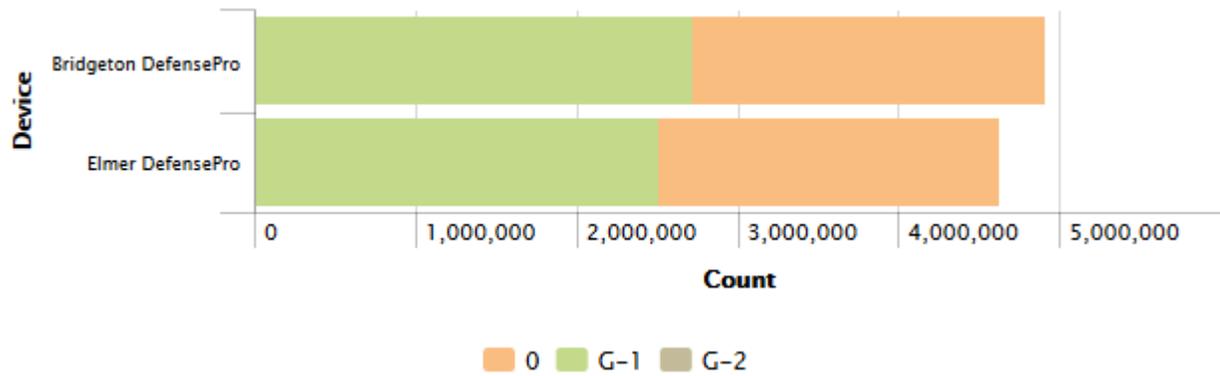


NOTE: See Appendix 1 – Critical Attack Sources (WHOIS Information)

Graph: Top Destinations by Attacks Blocked

Graph: Attacks Blocked by Physical Port (per single IPS device)

This report lists the attacks per physical port.



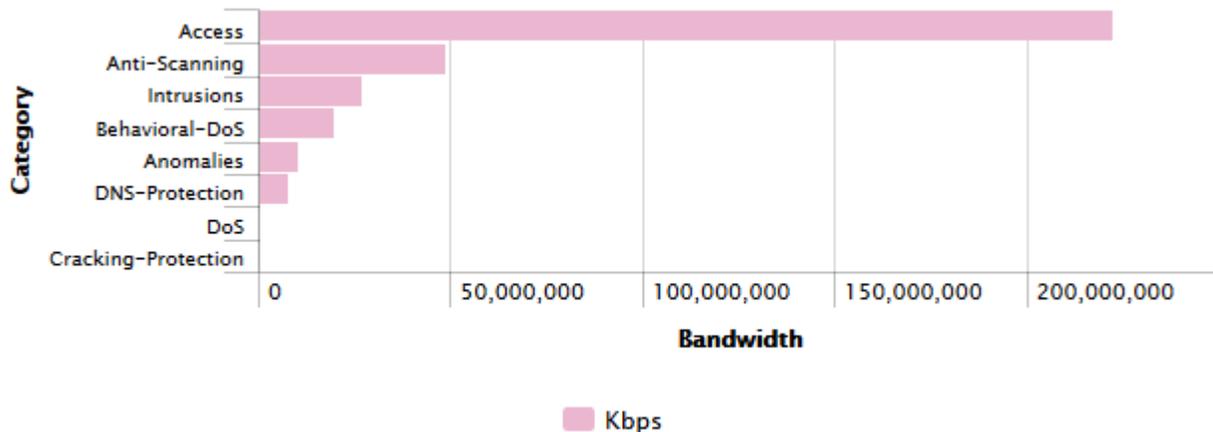
Bandwidth Information

Access protection dropped **212.00 Gbps**, Anti-Scanning protection dropped **46.33 Gbps**, Dos Protection Dropped **0.07 Gbps**, Intrusion protection dropped **25.60 Gbps** of total traffic, Behavioral-DoS dropped **18.56 Gbps**, **9.60 Gbps** dropped by Packet Anomaly protection rules, DNS Protection dropped a total of **7.37 Gbps** of traffic, for a total of **319.74 Gbps** of malicious traffic was discarded this period.

Category ↕	Gbps ↕	Mbps ↕
Access	212.00	217088.37
Anti-Scanning	46.33	47441.24
Intrusions	25.60	26214.01
Behavioral-DoS	18.56	19000.99
Anomalies	9.80	10039.98
DNS-Protection	7.37	7546.96
DoS	0.07	68.82
Cracking-Protection	0.01	13.90
HttpFlood	0.00	0.00
Total Bandwidth in Gbps/Mbps	319.74	327414.27

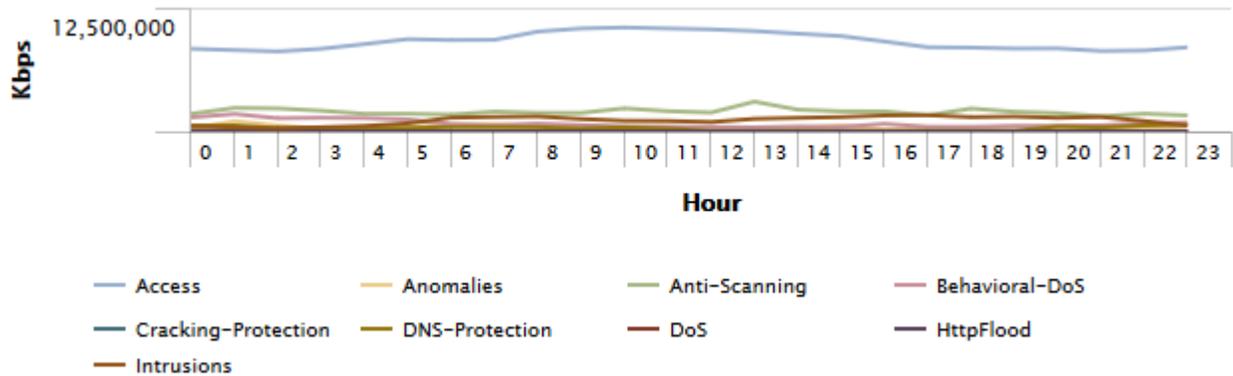
Graph: Attack Categories Blocked by Bandwidth

This report shows the attack categories based on the BW of the attacks sharing the same category including Kbps.



Graph: Bandwidth by Blocked Threat Category by Hour of Day

This report shows the most bandwidth consuming threat categories based on the bandwidth of the attacks sharing the same threat category for each hour of day.



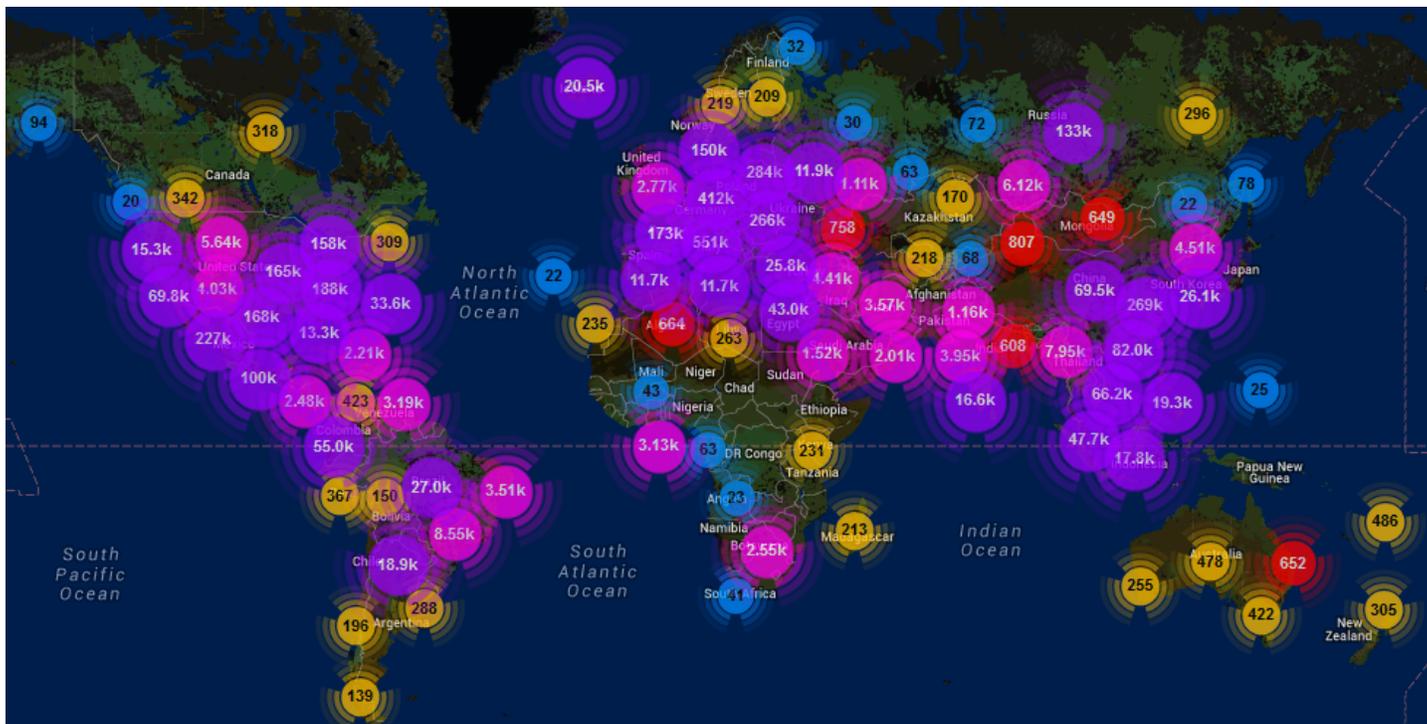
Graph: Top Attacks Blocked by Bandwidth

This report shows the most bandwidth consuming attacks based on the BW of the attack including Kbits.



Scanning Information

Map of geographic distribution of **4,562,486** attacks on **INSPIRA HEALTH NETWORK** from scanning sources. Some results do not include location information that allows map plotting.



Network-wide Anti Scanning protections dropped enumeration attempts which otherwise thwart any effort for threat modeling, commonplace after the information gathering phase of a targeted or planned attack.

We have included some of the most important ports scanned this period which tend to be exploited frequently by attackers. **Port Information:** Port **80** (http), Port **443** (http-alt)

Commonly scanned in order to attack web servers. SQL injection is currently the most common form of web site attack in that web forms are very common, often they are not coded properly and the hacking tools used to find weaknesses and take advantage of them are commonly available online. This kind of exploit is easy enough to accomplish that even inexperienced hackers can accomplish mischief. However, in the hands of the very skilled hacker, a web code weakness can reveal root level access of web servers and from there attacks on other networked servers can be accomplished. Structured Query Language (SQL) is

the nearly universal language of databases that allows the storage, manipulation, and retrieval of data. Databases that use SQL include MS SQL Server, MySQL, Oracle, PostgreSQL, MongoDB, Access and Filemaker Pro and these databases are equally subject to SQL injection attack.

Web based forms must allow some access to your database to allow entry of data and a response, so this kind of attack bypasses firewalls and endpoint defenses. Any web form, even a simple logon form or search box, might provide access to your data by means of SQL injection if coded incorrectly.

Port Information: Port **1433** (ms-sql-s), **3306** (mysql)

OWASP Top 10 for 2013 lists A1-Injection as the greatest threat and defines this category as: Injection flaws, such as SQL, OS, and LDAP injection occur when untrusted data is sent to an interpreter as part of a command or query. The attacker's hostile data can trick the interpreter into executing unintended commands or accessing data without proper authorization.

A SQL injection attack consists of insertion or "injection" of a SQL query via the input data from the client to the application. A successful SQL injection exploit can read sensitive data from the database, modify database data (Insert/Update/Delete), execute administration operations on the database (such as shutdown the DBMS), recover the content of a given file present on the DBMS file system and in some cases issue commands to the operating system. SQL injection attacks are a type of injection attack, in which SQL commands are injected into data-plane input in order to effect the execution of predefined SQL commands.

Port Information: Port **23** (telnet), **22** (ssh)

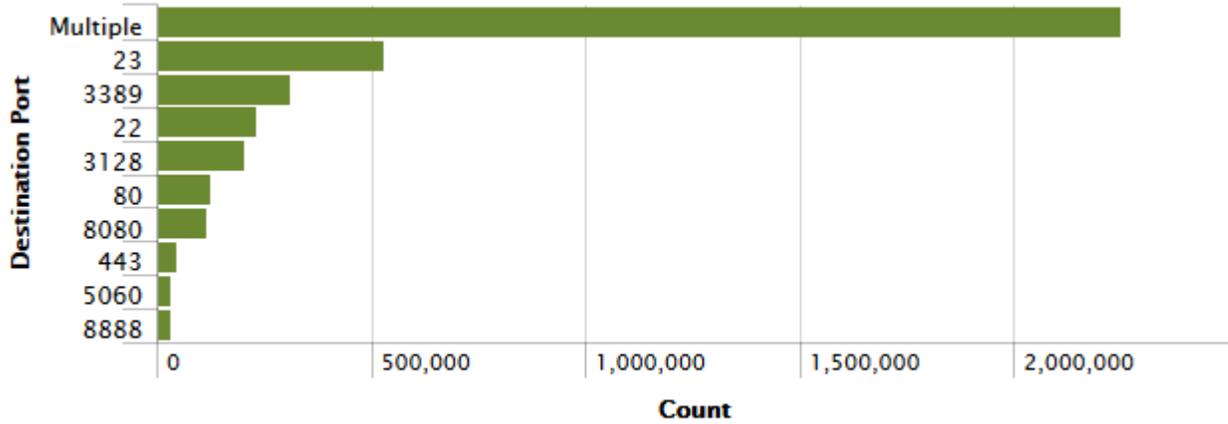
This port is commonly bruteforced for default administrative accounts which usually provide access to network and communications equipment.

Port Information: Port **5060** (sip)

The default gateway commonly associated with the SIP (Session Initiation Protocol) is the system port 5060. This communication portal supports the signaling protocol which is widely deployed for setting up (including tearing down) of sessions involving multimedia communication like video calls, voice calls and even VoIP (Voice over Internet Protocol). Threat actors commonly seek out these servers to commandeer the service in order to make free calls to countries of their choice or use them to carry out phone scams.

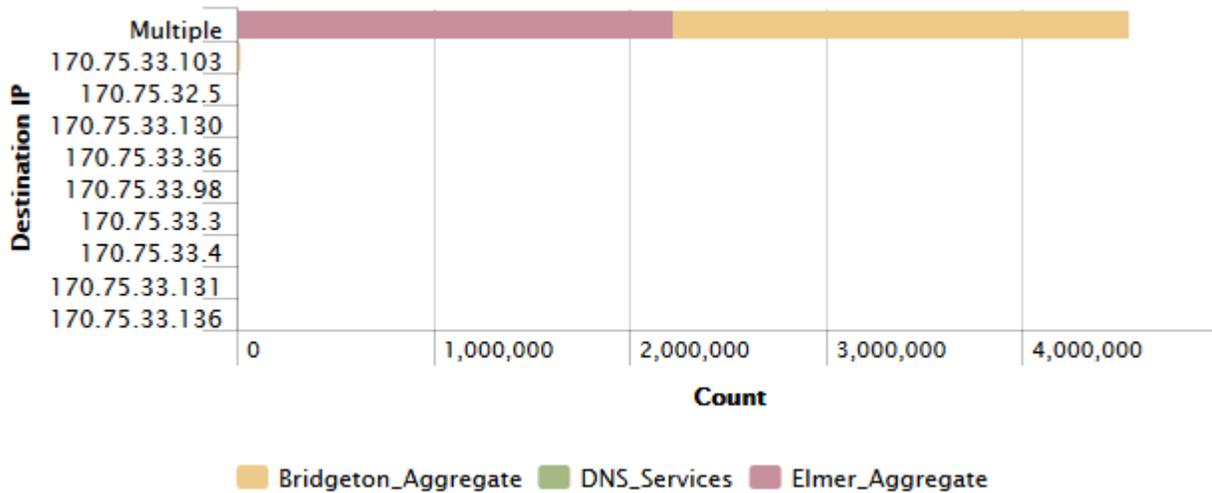
Graph: Top Probed Applications Blocked

This report shows historical view of the Top probed L4 ports.



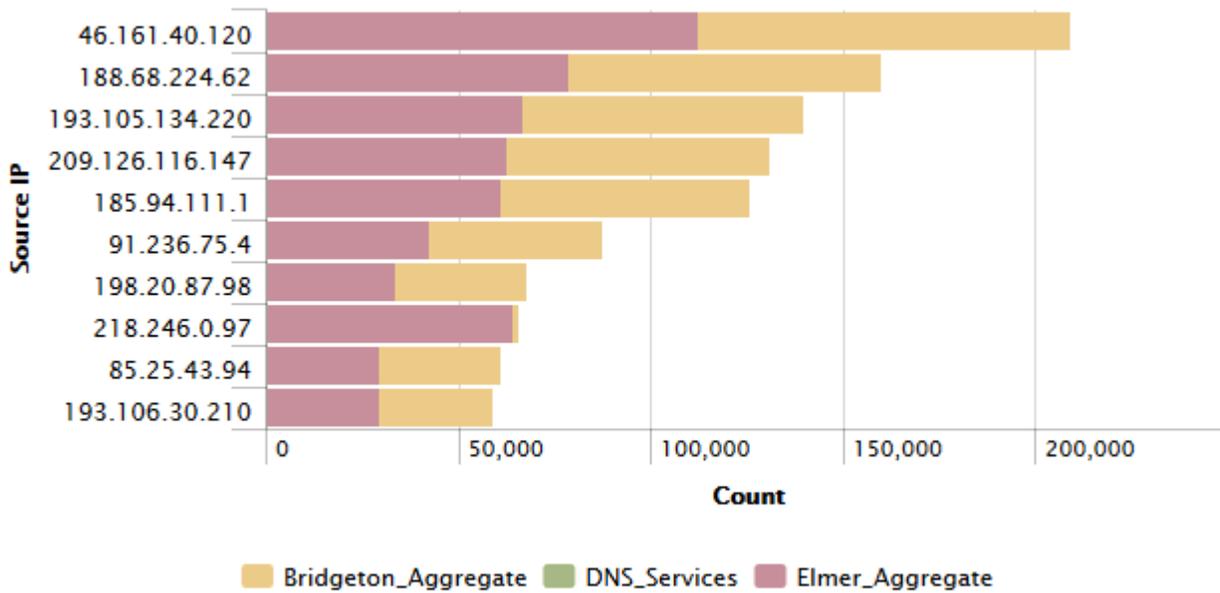
Graph: Top Probed IP Addresses Blocked

This report shows historical view of the Top probed IP addresses that were being scanned along with the network security rule.



Graph: Top Scanners Blocked (Source IP Addressed)

This report shows historical view of the Top source IP addresses that have scanned the network by network scanning activities along with the network security rule.



[NOTE: See Appendix 2 – Top Scanners Blocked \(Source IP Addressed\)](#)

Vulnerability Management

It is important to establish a vulnerability management program as part of the information security strategy because soon after new vulnerabilities are discovered and reported by security researchers or vendors, attackers engineer exploit code and then launch that code against targets of interest. Any significant delays in finding or fixing software with dangerous vulnerabilities provides ample opportunity for persistent attackers to break through, gaining control over the vulnerable machines and getting access to the sensitive data they contain. Organizations that do not scan for vulnerabilities and proactively address discovered flaws face a significant likelihood of having their systems compromised.

The GLESEC AVDS Management System platform performs a security mapping of your organization network, runs tests on everything the speaks IP, and accurately evaluates the presence of vulnerabilities.

Many of the vulnerabilities will provide CVE data. CVE (Common Vulnerabilities and Exposures) is a list of information security exposures and vulnerabilities sponsored by US-CERT and maintained by the MITRE Corporation. The CVE mission is to provide standard names for all publicly known security exposures as well as standard definitions for security terms. The CVE can be searched online at <http://nvd.nist.gov/>.

Vulnerability Score

The score of a vulnerability is determined by its risk factor; High, Medium or Low, as well as its value in the Common Vulnerability Scoring System (CVSS). The CVSS “base score” represents the innate risk characteristic of each vulnerability. CVSS is a vulnerability scoring system designed to provide an open and standardized method for rating IT vulnerabilities. CVSS helps organizations prioritize and coordinate a joint response to security vulnerabilities by communicating the base, temporal and environmental properties of each vulnerability. In addition to numeric scores, the CVSS provides severity rankings of High, Medium, and Low but these qualitative rankings are simply mapped from the numeric CVSS scores.

Vulnerabilities are labelled as:

- a) Low risk if they have a CVSS base score of 0.0 – 3.9
- b) Medium risk if they have a CVSS base score of 4.0 – 6.9
- c) High risk if they have a CVSS base score of 7.0 – 10.0

Vulnerabilities in the report are classified into 3 risk categories: high, medium or low.

High Risk

Describes vulnerabilities that can allow an attacker to gain elevated privileges, remote command execution, full read/write access, or critical information disclosure (e.g. passwords, hashes) on a vulnerable machine and should be addressed as top priority.

Medium Risk

Describes vulnerabilities that either expose sensitive data, directory browsing and traversal, disclosure of security controls, facilitate unauthorized use of services or denial of service to an attacker.

Low Risk

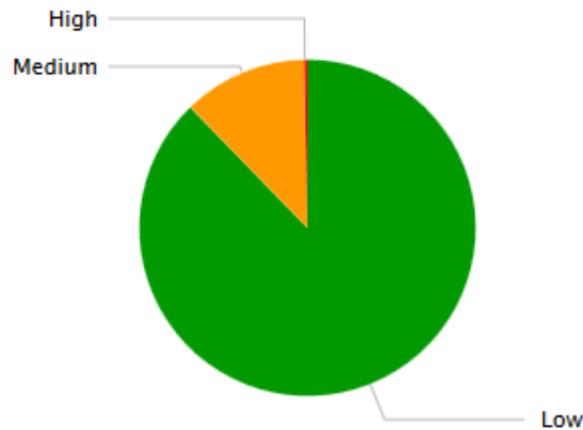
Describes vulnerabilities that allow preliminary or sensitive information gathering for an attacker or pose risks that are not entirely security related but maybe used in social-engineering or similar attacks.

Vulnerability Information

We can observe that Intrusions (known attack signatures), HTTP Flood and Web Scanning attempts are targeting Web Servers and are being dropped by the DefensePro. We cannot be 100% sure but there is a high probability that this type of attack is occurring and if the DefensePro was not in place, the attack might have been successfully carried out. The same is true for Mail servers which are frequently being scanned (Web Scanning).

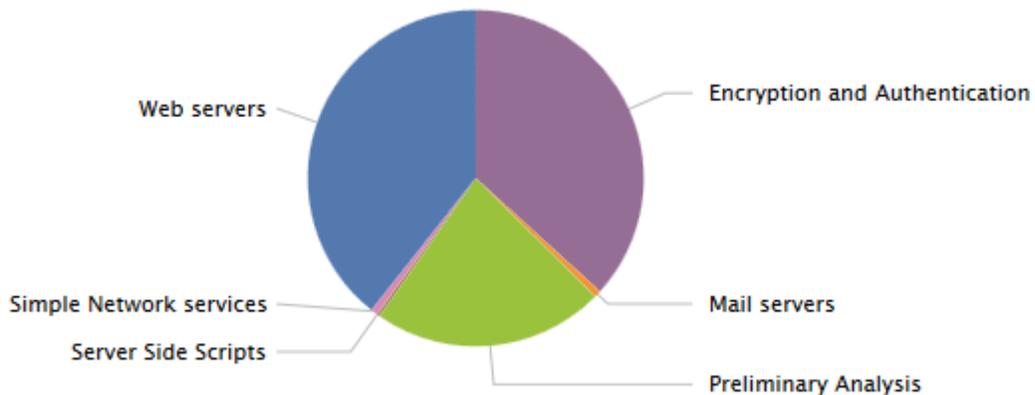
Graph: Risk Distribution

This report depicts the risk distribution of vulnerabilities discovered this report period



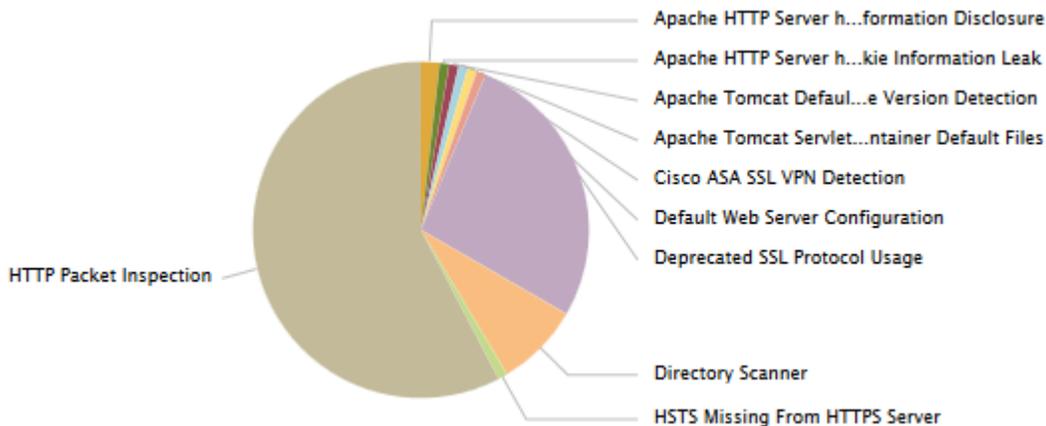
Graph: Most Frequent Vulnerability Category

This report depicts the most frequent vulnerabilities by category discovered this report period



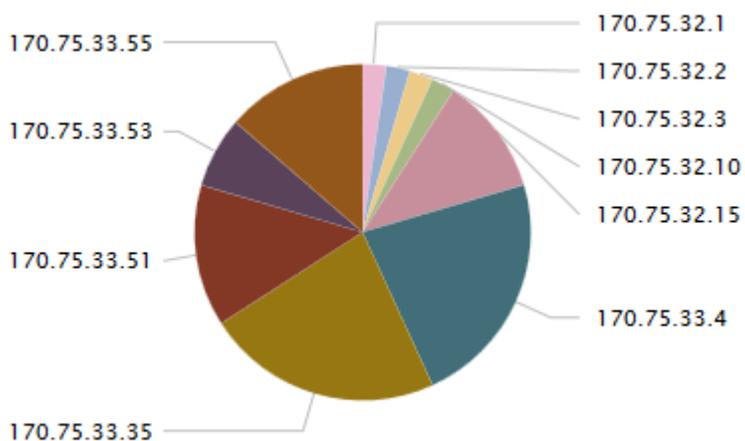
Graph: Most Frequent Vulnerability Name

This report depicts the most frequent vulnerabilities discovered this report period



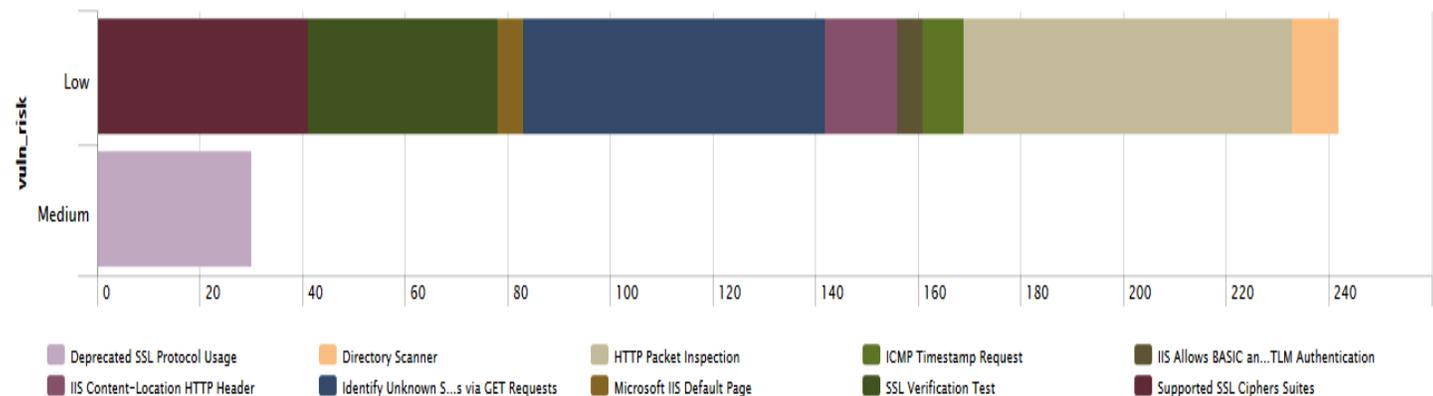
Graph: Most Vulnerable Host

This report depicts the most vulnerable hosts discovered this report period



Graph: Vulnerability Risk by Vulnerability Name

This report illustrates the vulnerability risk and count by vulnerability name discovered this report period



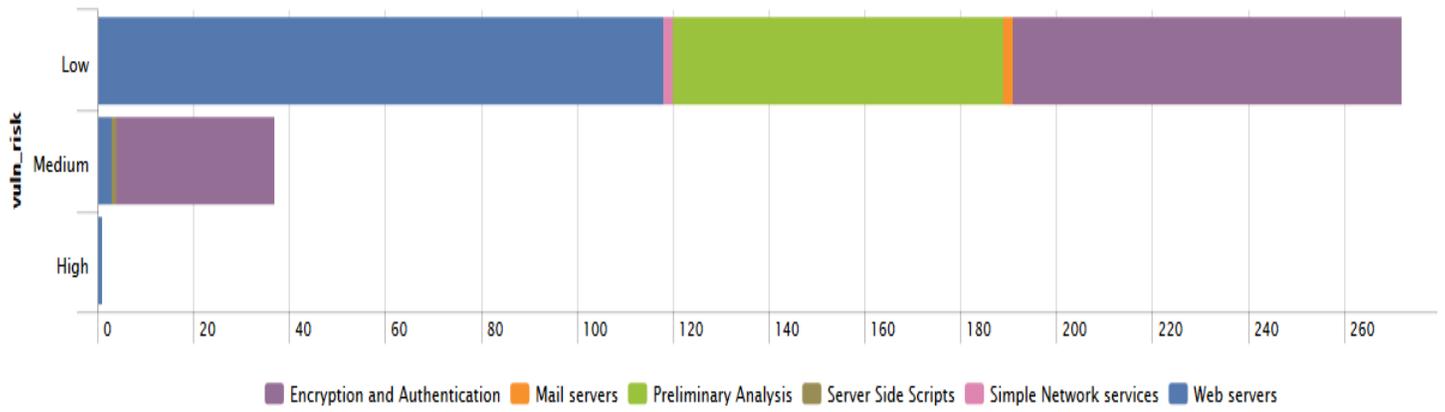
Graph: Vulnerability Risk by Host

This report illustrates the vulnerability risk and count by category discovered this report period



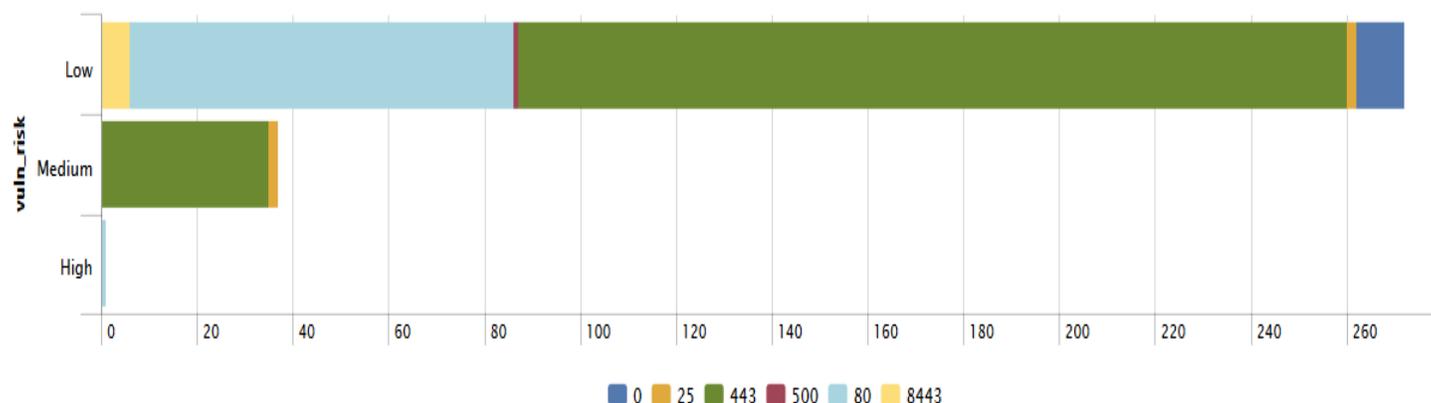
Graph: Vulnerability Risk by Category

This report illustrates the vulnerability risk and count by category discovered this report period



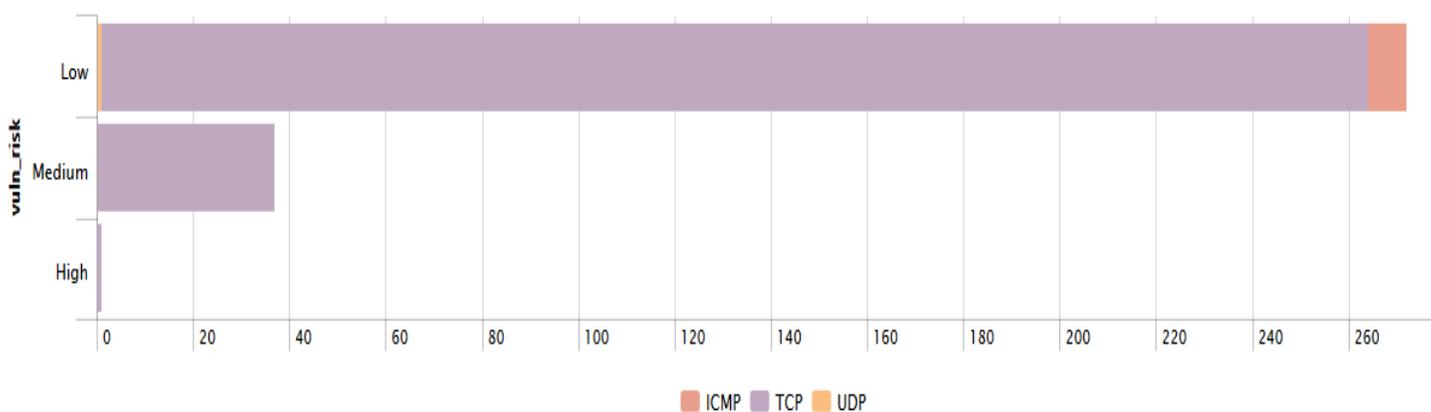
Graph: Vulnerability Risk by Port

This report illustrates the vulnerability risk and count by port discovered this report period



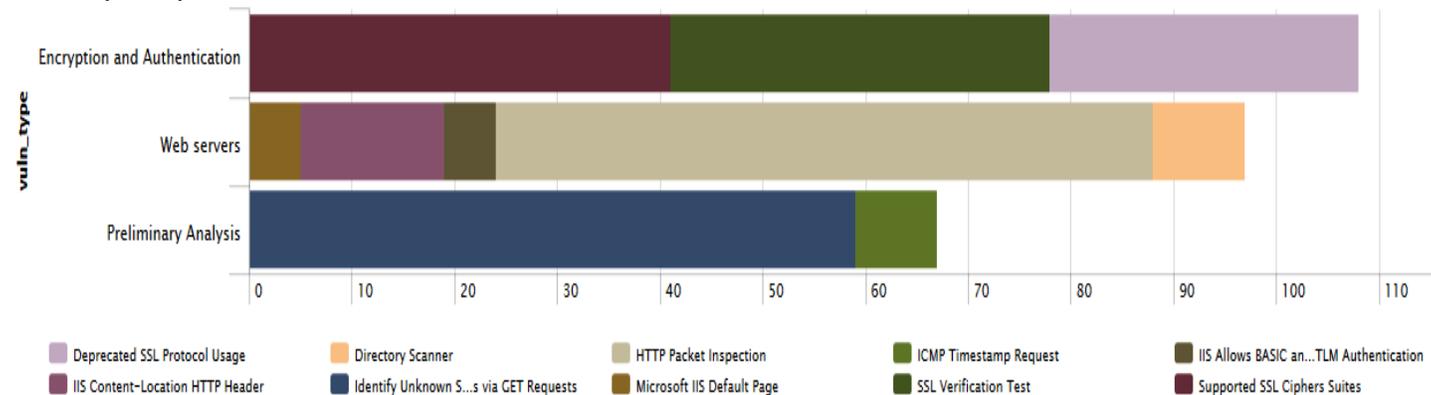
Graph: Vulnerability Risk by Protocol

This report illustrates the vulnerability risk and count by protocol discovered this report period



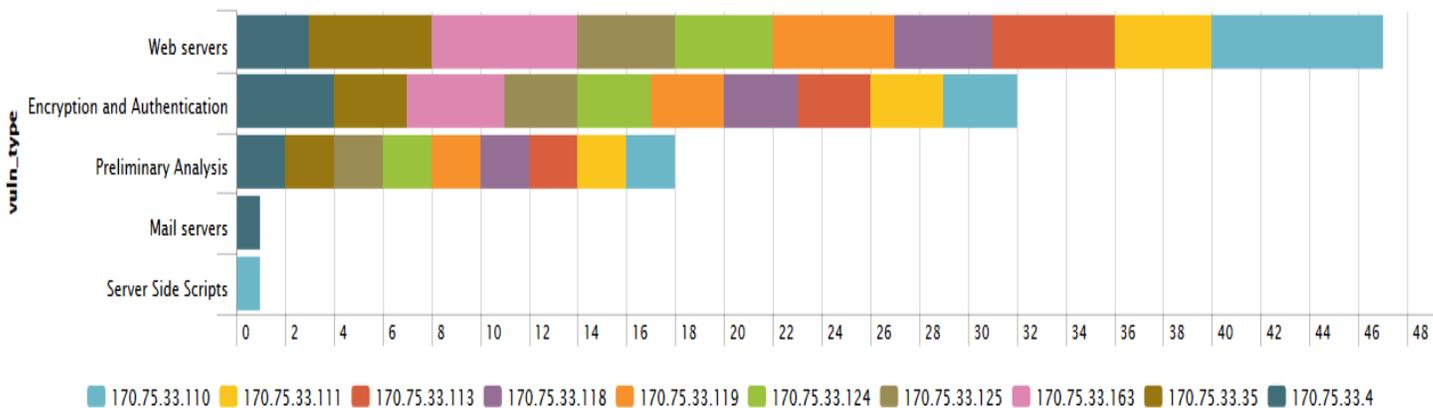
Graph: Vulnerability Category by Vulnerability Name

This report illustrates the vulnerability category and count by vulnerability name discovered this report period



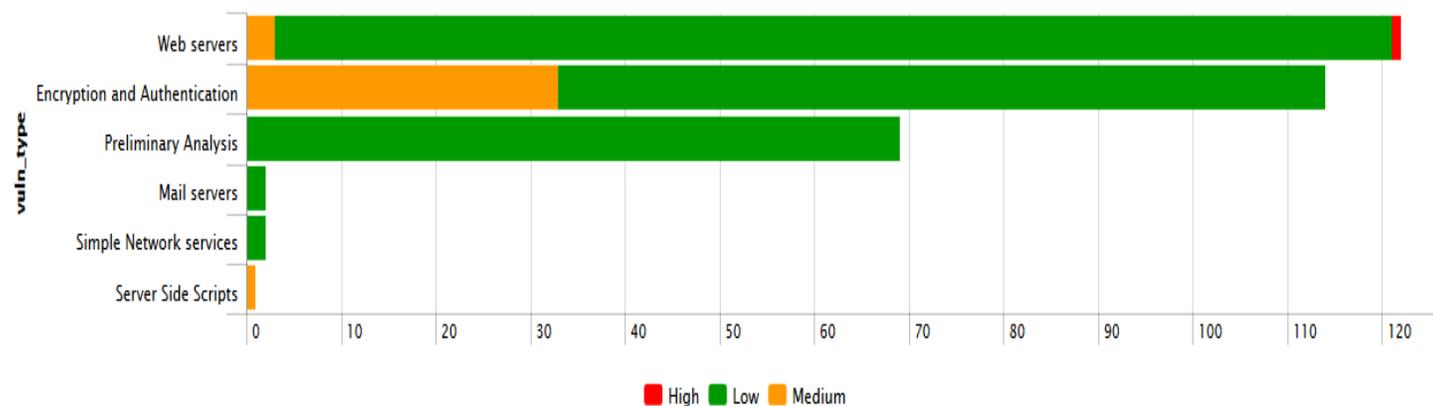
Graph: Vulnerability Category by Host

This report illustrates the vulnerability category and count by host discovered this report period



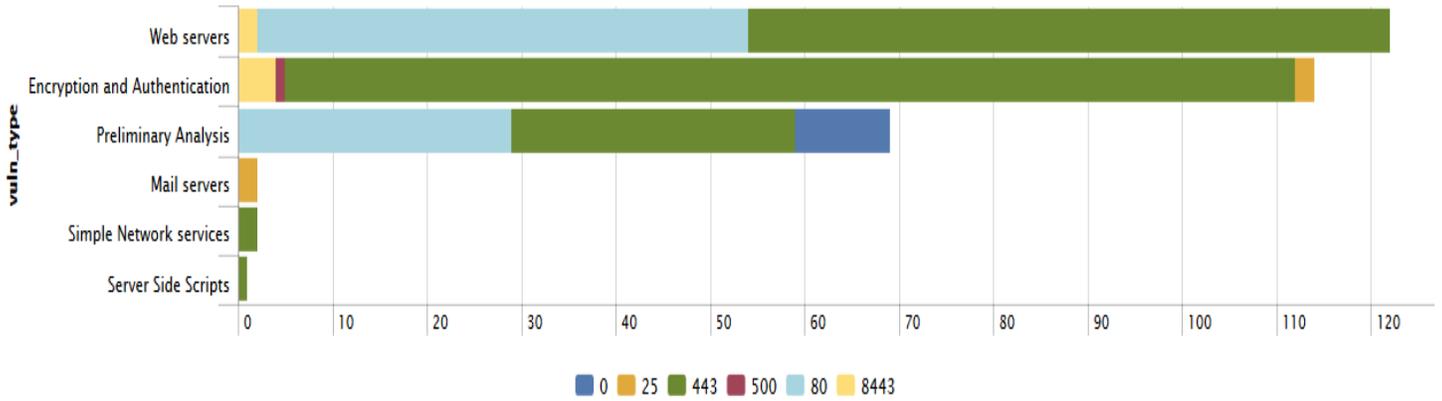
Graph: Vulnerability Category by Risk

This report illustrates the vulnerability category and count by risk discovered this report period



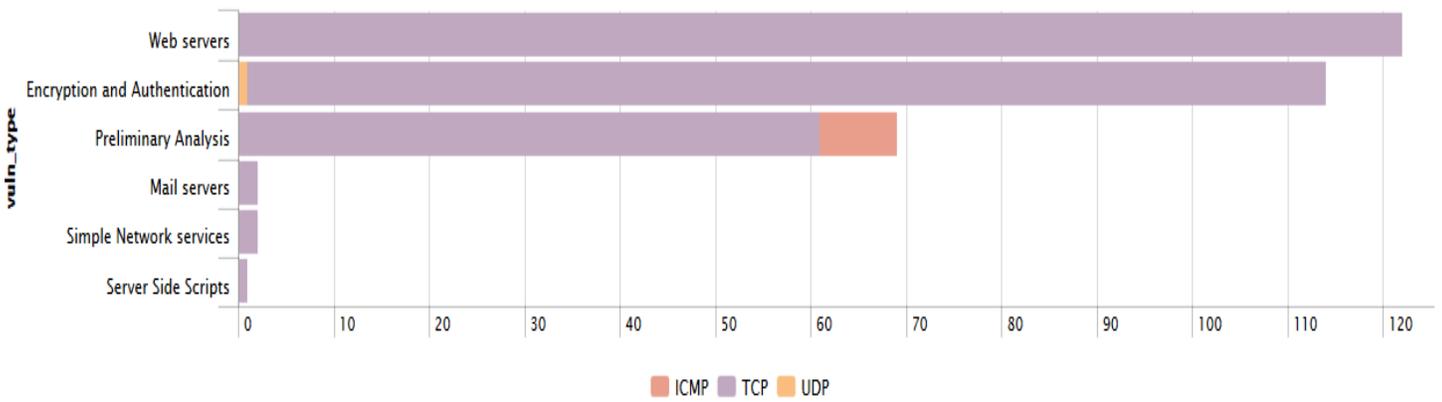
Graph: Vulnerability Category by Port

This report illustrates the vulnerability category and count by port discovered this report period



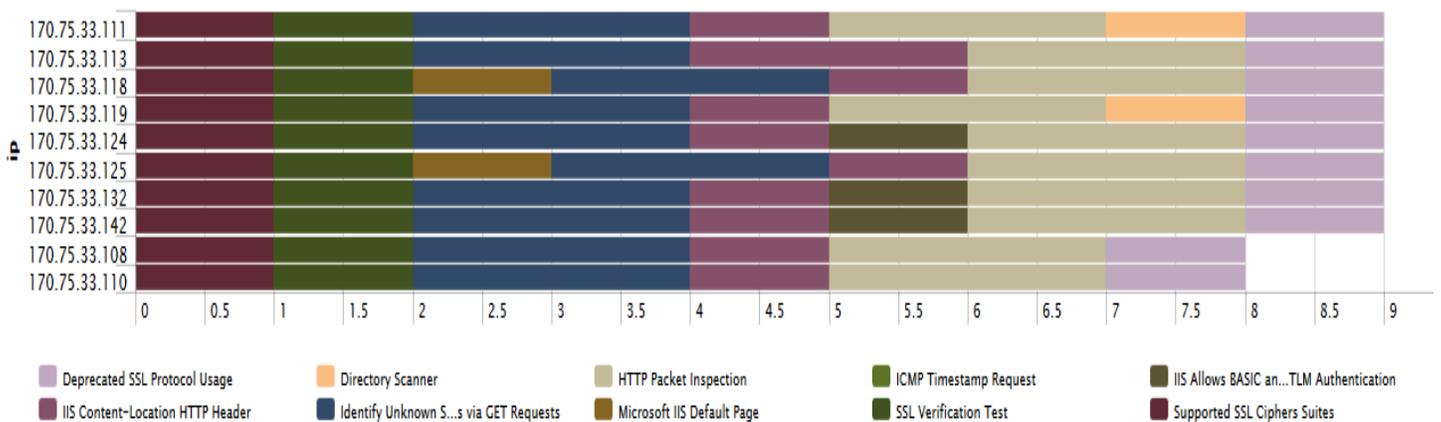
Graph: Vulnerability Category by Protocol

This report illustrates the vulnerability category and count by protocol discovered this report period



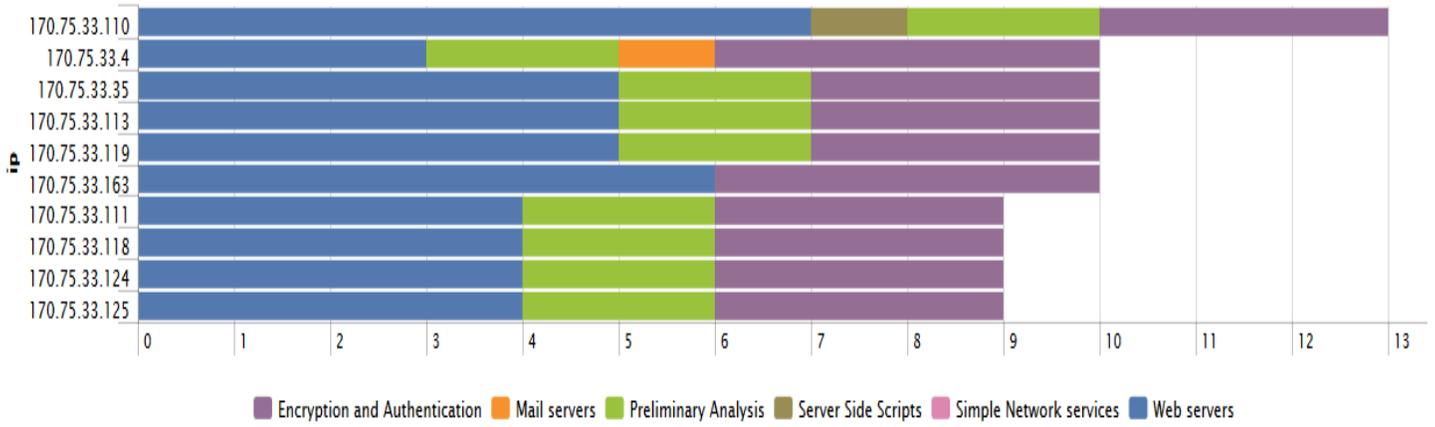
Graph: Host by Vulnerability Name

This report illustrates the vulnerability name and count by hosts discovered this report period



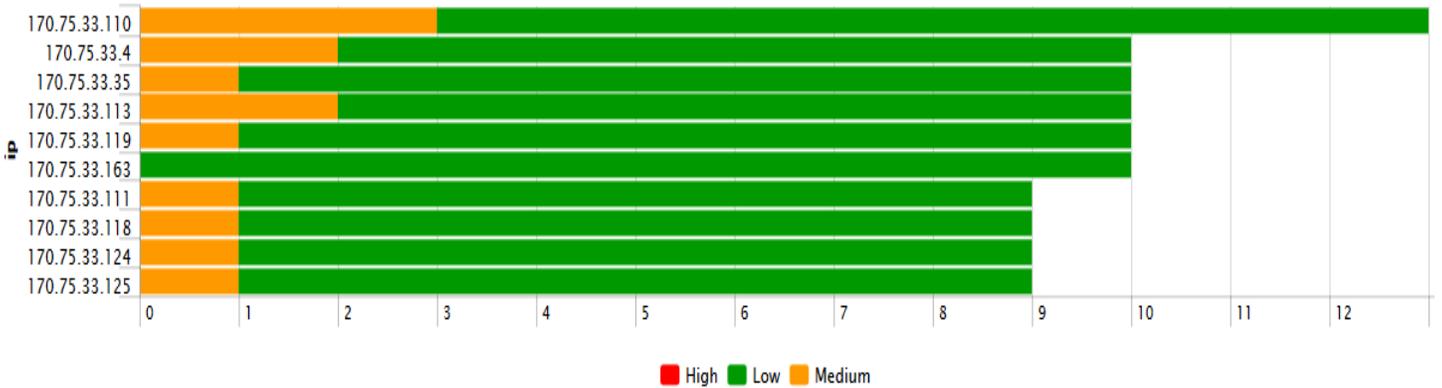
Graph: Host by Vulnerability Category

This report illustrates the vulnerability category and count by hosts discovered this report period



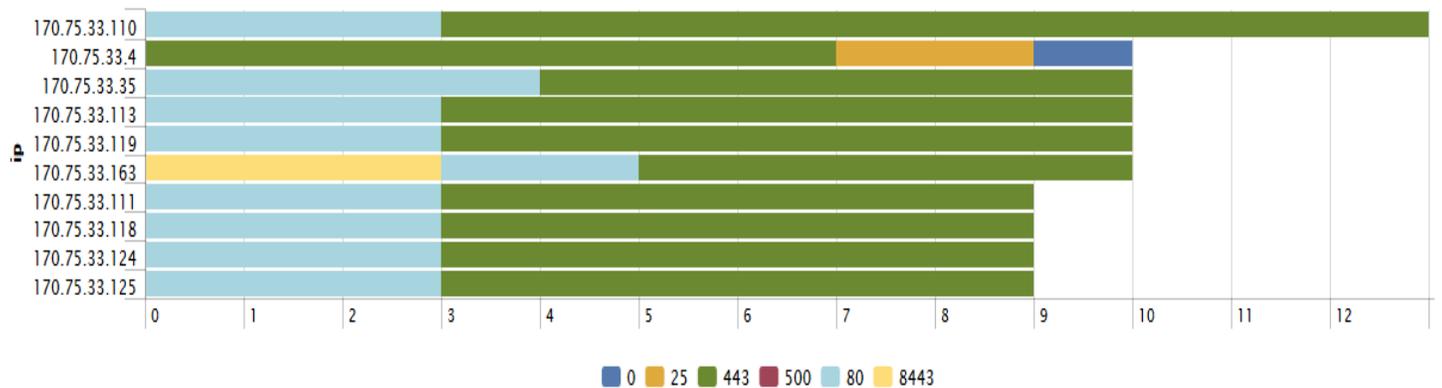
Graph: Host by Vulnerability Risk

This report illustrates the vulnerability risk and count by hosts discovered this report period



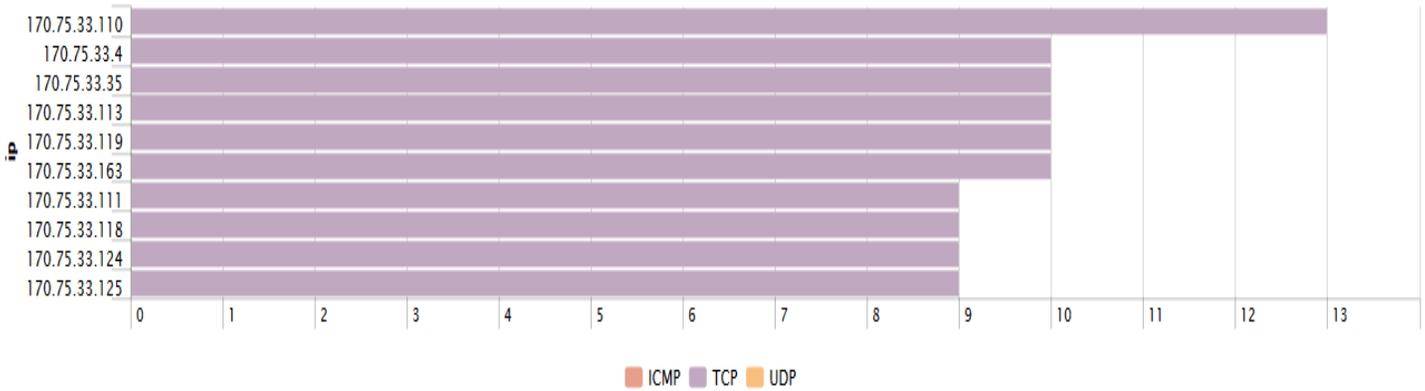
Graph: Host by Port

This report illustrates the port and count by hosts discovered this report period



Graph: Host by Protocol

This report illustrates the protocol and count by hosts discovered this report period



7. Security Operations

The purpose of this section is to highlight the activities performed by GLESEC’s Global Operations Center (GOC) including: monitoring availability and performance of equipment under contract, Change Management and Incident Response activities.

a) Monitoring System Availability

INSPIRA HEALTH NETWORK DefensePro Availability:

The Bridgeton DefensePro 516 was considered up and available **99.986%** during this report period.

Host State Breakdowns:

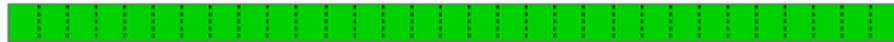
State	Type / Reason	Time	% Total Time	% Known Time
UP	Unscheduled	30d 23h 53m 50s	99.986%	99.986%
	Scheduled	0d 0h 0m 0s	0.000%	0.000%
	Total	30d 23h 53m 50s	99.986%	99.986%
DOWN	Unscheduled	0d 0h 6m 10s	0.014%	0.014%
	Scheduled	0d 0h 0m 0s	0.000%	0.000%
	Total	0d 0h 6m 10s	0.014%	0.014%
UNREACHABLE	Unscheduled	0d 0h 0m 0s	0.000%	0.000%
	Scheduled	0d 0h 0m 0s	0.000%	0.000%
	Total	0d 0h 0m 0s	0.000%	0.000%
Undetermined	Nagios Not Running	0d 0h 0m 0s	0.000%	
	Insufficient Data	0d 0h 0m 0s	0.000%	
	Total	0d 0h 0m 0s	0.000%	
All	Total	31d 0h 0m 0s	100.000%	100.000%

State Breakdowns For Host Services:

Service	% Time OK	% Time Warning	% Time Unknown	% Time Critical	% Time Undetermined
PING	99.888% (99.888%)	0.034% (0.034%)	0.000% (0.000%)	0.078% (0.078%)	0.000%
Average	99.888% (99.888%)	0.034% (0.034%)	0.000% (0.000%)	0.078% (0.078%)	0.000%

The Elmer DefensePro 516 was considered up and available **100 %** during this report period.

Host State Breakdowns:



State	Type / Reason	Time	% Total Time	% Known Time
UP	Unscheduled	31d 0h 0m 0s	100.000%	100.000%
	Scheduled	0d 0h 0m 0s	0.000%	0.000%
	Total	31d 0h 0m 0s	100.000%	100.000%
DOWN	Unscheduled	0d 0h 0m 0s	0.000%	0.000%
	Scheduled	0d 0h 0m 0s	0.000%	0.000%
	Total	0d 0h 0m 0s	0.000%	0.000%
UNREACHABLE	Unscheduled	0d 0h 0m 0s	0.000%	0.000%
	Scheduled	0d 0h 0m 0s	0.000%	0.000%
	Total	0d 0h 0m 0s	0.000%	0.000%
Undetermined	Nagios Not Running	0d 0h 0m 0s	0.000%	
	Insufficient Data	0d 0h 0m 0s	0.000%	
	Total	0d 0h 0m 0s	0.000%	
All	Total	31d 0h 0m 0s	100.000%	100.000%

State Breakdowns For Host Services:

Service	% Time OK	% Time Warning	% Time Unknown	% Time Critical	% Time Undetermined
PING	99.988% (99.988%)	0.022% (0.022%)	0.000% (0.000%)	0.011% (0.011%)	0.000%
Average	99.988% (99.988%)	0.022% (0.022%)	0.000% (0.000%)	0.011% (0.011%)	0.000%

b) Monitoring system performance

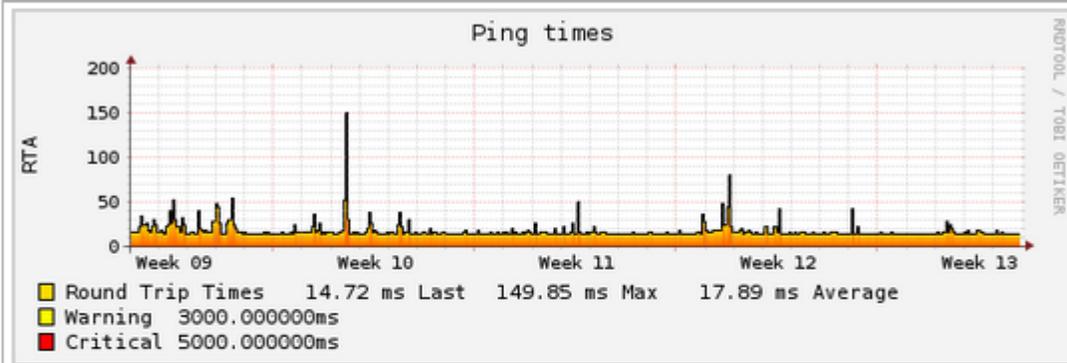
INSPIRA HEALTH NETWORK Bridgeton DefensePro 516 Host Performance

Round trip ping times averaged **17.82** ms from the GLESEC GOC to **INSPIRA HEALTH NETWORK** with **0 %** average packet loss.

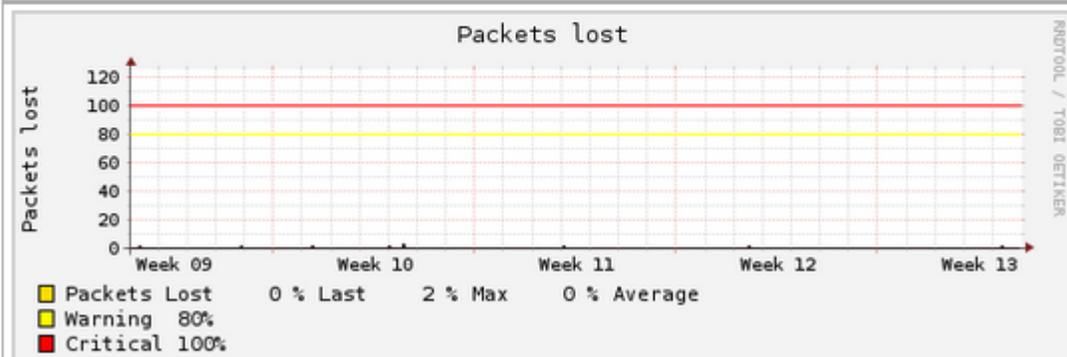
Host: Bridgeton DefensePro 516 Service: Host Perfdata

Custom time range 01.03.16 0:00 - 01.04.16 0:00

Datasource: Round Trip Times

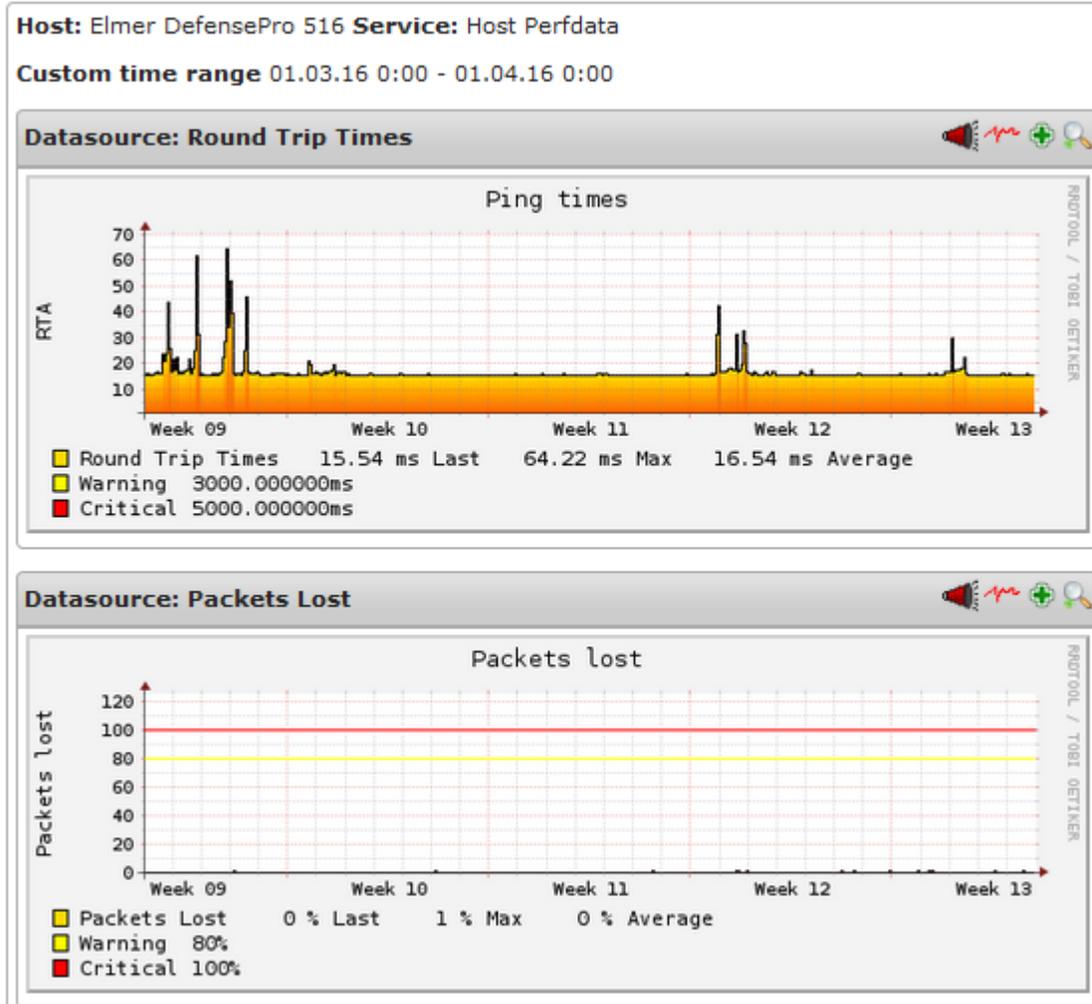


Datasource: Packets Lost



INSPIRA HEALTH NETWORK Elmer DefensePro 516 Host Performance

Round trip ping times averaged **16.54 ms** from the GLESEC GOC to **INSPIRA HEALTH NETWORK** with **0 %** average packet loss.



c) Change Management

Ticket#2016031510000151 — MSS Monthly Security Report

Back | Lock | History | Print | Priority | Free Fields | Link | Owner | Customer | Note | Phone Call Outbound | Phone Call Inbound | E-Mail Outbound | Merge | Pending | Close |

- Move - ▾

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☆	NO.	TYPE	=	FROM	SUBJECT	CREATED	🔗
	1	customer – phone	↔	Christopher Lanzalotti	MSS Monthly Security Report	03/15/2016 19:25	

▼ Article #1 – MSS Monthly Security Report Created: 03/15/2016 19:25 by Irving Brown

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From: Christopher Lanzalotti
To: Reportes
Subject: MSS Monthly Security Report

To open links in the following article, you might need to press Ctrl or Cmd or Shift key while clicking the link (depending on your browser and OS). ✕

The MSS monthly security report has been successfully completed.

d) Incident Response

No incident on March 2016

8. Appendix 1 – Critical Attack Sources (WHOIS Information)

This section provides additional WHOIS detail for the Graph: Critical Attacks

NetRange: 198.20.64.0 - 198.20.127.255

CIDR: 198.20.64.0/18

NetName: SINGLEHOP

NetHandle: NET-198-20-64-0-1

Parent: NET198 (NET-198-0-0-0-0)

NetType: Direct Allocation

OriginAS: AS32475

Organization: SingleHop, Inc. (SINGL-8)

RegDate: 2012-08-24

Updated: 2012-08-24

Ref: <https://whois.arin.net/rest/net/NET-198-20-64-0-1>

OrgName: SingleHop, Inc.

OrgId: SINGL-8

Address: 500 West Madison Street

Address: Suite 801

City: Chicago

StateProv: IL

PostalCode: 60661

Country: US

RegDate: 2007-03-07

Updated: 2015-03-04

Comment: <http://www.singlehop.com/>

Ref: <https://whois.arin.net/rest/org/SINGL-8>

ReferralServer: <rwhois://rwhois.singlehop.net:4321>

OrgAbuseHandle: ABUSE2492-ARIN

OrgAbuseName: Abuse Department

OrgAbusePhone: +1-866-817-2811

OrgAbuseEmail:

OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE2492-ARIN>

OrgTechHandle: NETWO1546-ARIN

OrgTechName: Network Operations

OrgTechPhone: +1-866-817-2811

OrgTechEmail:

OrgTechRef: <https://whois.arin.net/rest/poc/NETWO1546-ARIN>

OrgNOCHandle: NETWO1546-ARIN

OrgNOCName: Network Operations

OrgNOCPhone: +1-866-817-2811

OrgNOCEmail:

OrgNOCRef: <https://whois.arin.net/rest/poc/NETWO1546-ARIN>

== Additional Information From <rwhois://rwhois.singlehop.net:4321> ==

%rwhois V-1.5:003eff:00 rwhois.singlehop.com (by Network Solutions, Inc. V-1.5.9.5)

network:Class-Name:network

network:ID:ORG-SINGL-8.198-20-70-112/29

network:Auth-Area:198.20.64.0/18

network:IP-Network:198.20.70.112/29

network:Organization:Shodan LLC

network:Street-Address:359 Avenida de las Rosas

network:City:Encinitas

network:State:Ca

network:Postal-Code:92024

network:Country-Code:US

network:Tech-Contact;I:NETWO1546-ARIN

network:Admin-Contact;I:NETWO1546-ARIN

network:Abuse-Contact;I:ABUSE2492-ARIN

network:Created:20121210

network:Updated:20121210

%referral rwhois://root.rwhois.net:4321/auth-area=.

%ok

inetnum: 188.68.224.0 - 188.68.255.255

netname: PL-SPRINT-20090825

descr: "Sprint" S.A.

country: PL

org: ORG-Szo5-RIPE

admin-c: JPOL-RIPE

tech-c: JPOL-RIPE

status: ALLOCATED PA
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: SPRINT-PL-MNT
mnt-domains: SPRINT-PL-MNT
mnt-routes: SPRINT-PL-MNT
notify: ripe-contact@sprint.pl
created: 2014-03-26T09:35:44Z
last-modified: 2014-03-26T09:35:44Z
source: RIPE

organisation: ORG-Szo5-RIPE
org-name: "SPRINT" S.A.
org-type: LIR
address: "SPRINT" Sp. z o.o.
address: Jagiellonczyka 26
address: 10-062
address: Olsztyn
address: POLAND
phone: +48895221100
fax-no: +48895221125
admin-c: JPOL-RIPE
mnt-ref: RIPE-NCC-HM-MNT
mnt-ref: SPRINT-PL-MNT
mnt-by: RIPE-NCC-HM-MNT
abuse-c: SDC186-RIPE
created: 2010-07-20T11:23:37Z
last-modified: 2014-03-21T13:50:28Z
source: RIPE
e-mail: ripe-contact@sprint.pl

person: Jacek Politowski
address: "SPRINT" S.A.
address: ul. Jagiellonczyka 26
address: 10-062 Olsztyn
address: Poland

phone: +48 89 522 11 68
fax-no: +48 89 522 11 25
e-mail: jacek.politowski@sprint.pl
nic-hdl: JPOL-RIPE
notify: ripe-contact@sprint.pl
mnt-by: SPRINT-PL-MNT
created: 2010-07-21T08:46:59Z
last-modified: 2012-11-27T13:19:34Z
source: RIPE

route: 188.68.224.0/20
descr: Sprint S.A.
descr: Sprint Data Center
descr: Olsztyn, Poland
origin: AS197226
mnt-by: SPRINT-PL-MNT
created: 2014-04-24T11:56:07Z
last-modified: 2014-04-24T11:56:07Z
source: RIPE

NetRange: 71.6.135.0 - 71.6.135.255

CIDR: 71.6.135.0/24
NetName: NET-24
NetHandle: NET-71-6-135-0-1
Parent: CARINET-5 (NET-71-6-128-0-1)
NetType: Reassigned
OriginAS: AS10439
Customer: CariNet, Inc. (C04837931)
RegDate: 2014-01-03
Updated: 2014-01-03
Ref: <https://whois.arin.net/rest/net/NET-71-6-135-0-1>

CustName: CariNet, Inc.
Address: 8929 Complex Drive

City: San Diego
StateProv: CA
PostalCode: 92123
Country: US
RegDate: 2014-01-03
Updated: 2014-01-03
Ref: <https://whois.arin.net/rest/customer/C04837931>

OrgAbuseHandle: ABUSE341-ARIN
OrgAbuseName: CariNet Abuse
OrgAbusePhone: +1-858-974-5080
OrgAbuseEmail: abuse@carinets.com
OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE341-ARIN>

OrgTechHandle: CARIN-ARIN
OrgTechName: CariNet Networking
OrgTechPhone: +1-858-974-5080
OrgTechEmail:
OrgTechRef: <https://whois.arin.net/rest/poc/CARIN-ARIN>

NetRange: 71.6.128.0 - 71.6.255.255
CIDR: 71.6.128.0/17
NetName: CARINET-5
NetHandle: NET-71-6-128-0-1
Parent: NET71 (NET-71-0-0-0-0)
NetType: Direct Allocation
OriginAS: AS10439
Organization: CariNet, Inc. (CARIN-6)
RegDate: 2006-02-01
Updated: 2012-03-02
Ref: <https://whois.arin.net/rest/net/NET-71-6-128-0-1>

OrgName: CariNet, Inc.
OrgId: CARIN-6
Address: 8929 COMPLEX DR

City: San Diego
StateProv: CA
PostalCode: 92123
Country: US
RegDate: 2014-01-03
Updated: 2014-01-03
Ref: <https://whois.arin.net/rest/customer/C04837984>

OrgAbuseHandle: ABUSE341-ARIN
OrgAbuseName: CariNet Abuse
OrgAbusePhone: +1-858-974-5080
OrgAbuseEmail: abuse@carinets.com
OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE341-ARIN>

OrgTechHandle: CARIN-ARIN
OrgTechName: CariNet Networking
OrgTechPhone: +1-858-974-5080
OrgTechEmail:
OrgTechRef: <https://whois.arin.net/rest/poc/CARIN-ARIN>

NetRange: 71.6.128.0 - 71.6.255.255
CIDR: 71.6.128.0/17
NetName: CARINET-5
NetHandle: NET-71-6-128-0-1
Parent: NET71 (NET-71-0-0-0-0)
NetType: Direct Allocation
OriginAS: AS10439
Organization: CariNet, Inc. (CARIN-6)
RegDate: 2006-02-01
Updated: 2012-03-02
Ref: <https://whois.arin.net/rest/net/NET-71-6-128-0-1>

OrgName: CariNet, Inc.
OrgId: CARIN-6
Address: 8929 COMPLEX DR

City: SAN DIEGO
StateProv: CA
PostalCode: 92123
Country: US
RegDate: 2009-11-17
Updated: 2014-01-06
Ref: <https://whois.arin.net/rest/org/CARIN-6>

OrgAbuseHandle: ABUSE341-ARIN
OrgAbuseName: CariNet Abuse
OrgAbusePhone: +1-858-974-5080
OrgAbuseEmail: carinet@carinet.com
OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE341-ARIN>

OrgTechHandle: CARIN-ARIN
OrgTechName: CariNet Networking
OrgTechPhone: +1-858-974-5080
OrgTechEmail:
OrgTechRef: <https://whois.arin.net/rest/poc/CARIN-ARIN>

NetRange: 71.6.165.192 - 71.6.165.255

CIDR: 71.6.165.192/26
NetName: NET-26
NetHandle: NET-71-6-165-192-1
Parent: CARINET-5 (NET-71-6-128-0-1)
NetType: Reassigned
OriginAS: AS10439
Customer: CariNet, Inc. (C04837981)
RegDate: 2014-01-03
Updated: 2014-01-03
Ref: <https://whois.arin.net/rest/net/NET-71-6-165-192-1>

CustName: CariNet, Inc.
Address: 8929 Complex Drive

City: San Diego
StateProv: CA
PostalCode: 92123
Country: US
RegDate: 2014-01-03
Updated: 2014-01-03
Ref: <https://whois.arin.net/rest/customer/C04837981>

OrgAbuseHandle: ABUSE341-ARIN
OrgAbuseName: CariNet Abuse
OrgAbusePhone: +1-858-974-5080
OrgAbuseEmail: abuse@carinets.com
OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE341-ARIN>

OrgTechHandle: CARIN-ARIN
OrgTechName: CariNet Networking
OrgTechPhone: +1-858-974-5080
OrgTechEmail:
OrgTechRef: <https://whois.arin.net/rest/poc/CARIN-ARIN>

NetRange: 71.6.128.0 - 71.6.255.255
CIDR: 71.6.128.0/17
NetName: CARINET-5
NetHandle: NET-71-6-128-0-1
Parent: NET71 (NET-71-0-0-0-0)
NetType: Direct Allocation
OriginAS: AS10439
Organization: CariNet, Inc. (CARIN-6)
RegDate: 2006-02-01
Updated: 2012-03-02
Ref: <https://whois.arin.net/rest/net/NET-71-6-128-0-1>

OrgName: CariNet, Inc.
OrgId: CARIN-6
Address: 8929 COMPLEX DR

City: SAN DIEGO
StateProv: CA
PostalCode: 92123
Country: US
RegDate: 2009-11

Address: 8929 COMPLEX DR
City: SAN DIEGO
StateProv: CA
PostalCode: 92123
Country: US
RegDate: 2009-11-17
Updated: 2014-01-06
Ref: <https://whois.arin.net/rest/org/CARIN-6>

OrgTechHandle: CARIN-ARIN
OrgTechName: CariNet Networking
OrgTechPhone: +1-858-974-5080
OrgTechEmail:
OrgTechRef: <https://whois.arin.net/rest/poc/CARIN-ARIN>

OrgAbuseHandle: ABUSE341-ARIN
OrgAbuseName: CariNet Abuse
OrgAbusePhone: +1-858-974-5080
OrgAbuseEmail: abuse@carin.net
OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE341-ARIN>

NetRange: 66.240.192.128 - 66.240.192.191
CIDR: 66.240.192.128/26
NetName: NET-26
NetHandle: NET-66-240-192-128-1
Parent: CARINET-3 (NET-66-240-192-0-1)
NetType: Reassigned
OriginAS: AS10439
Customer: CariNet, Inc. (C04837800)
RegDate: 2014-01-02
Updated: 2014-01-02
Ref: <https://whois.arin.net/rest/net/NET-66-240-192-128-1>

CustName: CariNet, Inc.
Address: 8929 Complex Drive

City: San Diego
StateProv: CA
PostalCode: 92123
Country: US
RegDate: 2014-01-02
Updated: 2014-01-02
Ref: <https://whois.arin.net/rest/customer/C04837800>

OrgTechHandle: CARIN-ARIN
OrgTechName: CariNet Networking
OrgTechPhone: +1-858-974-5080
OrgTechEmail:
OrgTechRef: <https://whois.arin.net/rest/poc/CARIN-ARIN>

OrgAbuseHandle: ABUSE341-ARIN
OrgAbuseName: CariNet Abuse
OrgAbusePhone: +1-858-974-5080
OrgAbuseEmail: carin@carin.net
OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE341-ARIN>

inetnum: 46.161.40.0 - 46.161.40.255

netname: ankas-net
descr: net for ankas
country: UA
admin-c: ACR53-RIPE
tech-c: ACR53-RIPE
status: ASSIGNED PA
mnt-by: MNT-PIN
mnt-by: MNT-PINSUPPORT
mnt-domains: ANKAS-MNT
mnt-domains: MNT-PINSUPPORT
mnt-routes: ANKAS-MNT
mnt-routes: MNT-IV25
org: ORG-AL355-RIPE

created: 2015-03-17T21:21:28Z
last-modified: 2015-04-28T12:00:30Z
source: RIPE

organisation: ORG-AL355-RIPE
org-name: Ankas Ltd.
org-type: OTHER
address: Leontovicha 11 street,
address: 01046, Kiev,
address: Ukraine
phone: +380443000151
fax-no: +380443000151
e-mail: info@ankas-group.net
abuse-c: AR31530-RIPE

abuse-mailbox: abuse@ankas-group.net
mnt-ref: MNT-PINSUPPORT
mnt-by: ANKAS-MNT
created: 2015-03-10T08:36:30Z
last-modified: 2015-09-17T18:37:31Z
source: RIPE

role: Ankas Contact Role
org: ORG-AL355-RIPE
admin-c: TIM173-RIPE
tech-c: TIM173-RIPE
address: Leontovicha 11 street,
notify: info@ankas-group.net
address: KIEV
address: Ukraine
phone: +380443000151
fax-no: +380443000151
abuse-mailbox: abuse@ankas-group.net
e-mail: info@ankas-group.net
nic-hdl: ACR53-RIPE
mnt-by: ANKAS-MNT

created: 2015-03-10T08:59:10Z
last-modified: 2015-09-17T18:40:38Z
source: RIPE

route: 46.161.40.0/24
descr: XSERVER
origin: AS48031
mnt-by: MNT-IV25
created: 2015-03-19T06:44:18Z
last-modified: 2015-03-19T06:44:18Z
source: RIPE

9. Appendix 2 – Top Scanners Blocked (WHOIS Information)

This section provides additional WHOIS detail for the Graph: Top Scanners Blocked (Source IP Addressed)

NetRange: 209.126.96.0 - 209.126.127.255
CIDR: 209.126.96.0/19
NetName: HSI-7
NetHandle: NET-209-126-96-0-1
Parent: NET209 (NET-209-0-0-0-0)
NetType: Direct Allocation
OriginAS: AS30083
Organization: Hosting Solutions International, Inc. (SERVE-6)
RegDate: 2013-12-26
Updated: 2013-12-26
Ref: <http://whois.arin.net/rest/net/NET-209-126-96-0-1>

OrgName: Hosting Solutions International, Inc.
OrgId: SERVE-6
Address: 210 North Tucker Blvd.
Address: Suite 910
City: Saint Louis
StateProv: MO
PostalCode: 63101
Country: US
RegDate: 2003-04-15
Updated: 2014-11-13
Ref: <http://whois.arin.net/rest/org/SERVE-6>

OrgAbuseHandle: HAD16-ARIN
OrgAbuseName: HSI Abuse Department
OrgAbusePhone: +1-314-266-3638
OrgAbuseEmail: abuse@hostingsolutionsinternational.com
OrgAbuseRef: <http://whois.arin.net/rest/poc/HAD16-ARIN>

OrgTechHandle: SWI19-ARIN
OrgTechName: Wintz, Sascha
OrgTechPhone: +1-314-480-6840
OrgTechEmail: s.wintz@hostingsolutionsinternational.com
OrgTechRef: <http://whois.arin.net/rest/poc/SWI19-ARIN>

OrgNOCHandle: SWI19-ARIN
OrgNOCName: Wintz, Sascha
OrgNOCPhone: +1-314-480-6840
OrgNOCEmail: s.wintz@hostingsolutionsinternational.com
OrgNOCTRef: <http://whois.arin.net/rest/poc/SWI19-ARIN>

inetnum: 91.236.74.0 - 91.236.75.255
netname: ELAN
descr: Przedsiębiorstwo Usług Specjalistycznych ELAN mgr inż. Andrzej Niechcial
country: PL
org: ORG-PUSE2-RIPE
admin-c: RN2672-RIPE
tech-c: RN2672-RIPE
status: ASSIGNED PI
mnt-by: RIPE-NCC-END-MNT
mnt-by: CONNECTED-MNT
mnt-routes: CONNECTED-MNT
mnt-domains: CONNECTED-MNT
notify: p.siwicki@connected.pl
changed: hostmaster@ripe.net 20120229
created: 2012-02-29T10:44:49Z
last-modified: 2015-05-05T01:57:30Z
source: RIPE
sponsoring-org: ORG-SA635-RIPE

organisation: ORG-PUSE2-RIPE
org-name: Przedsiębiorstwo Usług Specjalistycznych ELAN mgr inż. Andrzej Niechcial
org-type: other
address: 26-065 Piekosz  w, ul. Jarz?binowa 50

e-mail: robert.niechcial@elanprojekt.pl
abuse-c: AR29581-RIPE
mnt-ref: CONNECTED-MNT
mnt-by: CONNECTED-MNT
changed: p.siwicki@connected.pl 20120224
created: 2012-02-24T14:27:03Z
last-modified: 2014-11-17T22:43:14Z
source: RIPE

person: Robert Niechcial
address: 26-065 Piekoszów, ul. Jarz?binowa 50
phone: +48531720941
nic-hdl: RN2672-RIPE
mnt-by: CONNECTED-MNT
changed: p.siwicki@connected.pl 20120224
created: 2012-02-24T14:28:41Z
last-modified: 2012-02-24T14:28:41Z
source: RIPE

route: 91.236.74.0/23
descr: ERANK
origin: AS198540
mnt-by: CONNECTED-MNT
changed: p.siwicki@connected.pl 20120312
created: 2012-03-12T10:59:45Z
last-modified: 2012-03-12T10:59:45Z
source: RIPE

route: 91.236.74.0/23
descr: ERANK
origin: AS49102
mnt-by: CONNECTED-MNT
changed: p.siwicki@connected.pl 20120312
created: 2012-03-12T10:59:19Z

last-modified: 2012-03-12T10:59:19Z

source: RIPE

inetnum: 46.161.40.0 - 46.161.40.255

netname: ankas-net

descr: net for ankas

country: UA

admin-c: ACR53-RIPE

tech-c: ACR53-RIPE

status: ASSIGNED PA

mnt-by: MNT-PIN

mnt-by: MNT-PINSUPPORT

mnt-domains: ANKAS-MNT

mnt-domains: MNT-PINSUPPORT

mnt-routes: ANKAS-MNT

mnt-routes: MNT-IV25

changed: admin@pinspb.ru 20150310

org: ORG-AL355-RIPE

created: 2015-03-17T21:21:28Z

last-modified: 2015-04-28T12:00:30Z

source: RIPE

organisation: ORG-AL355-RIPE

org-name: Ankas Ltd.

org-type: OTHER

address: Leontovicha 11 street,

address: 01046, Kiev,

address: Ukraine

phone: +380443000151

fax-no: +380443000151

e-mail: info@ankas-group.net

abuse-c: AR31530-RIPE

abuse-mailbox: abuse@ankas-group.net

mnt-ref: MNT-PINSUPPORT

mnt-by: ANKAS-MNT
changed: info@ankas-group.net 20150310
created: 2015-03-10T08:36:30Z
last-modified: 2015-09-17T18:37:31Z
source: RIPE

role: Ankas Contact Role
org: ORG-AL355-RIPE
admin-c: TIM173-RIPE
tech-c: TIM173-RIPE
address: Leontovicha 11 street,
notify: info@ankas-group.net
address: KIEV
address: Ukraine
phone: +380443000151
fax-no: +380443000151

abuse-mailbox: abuse@ankas-group.net
e-mail: info@ankas-group.net
nic-hdl: ACR53-RIPE
mnt-by: ANKAS-MNT
changed: info@ankas-group.net 20150310
created: 2015-03-10T08:59:10Z
last-modified: 2015-09-17T18:40:38Z
source: RIPE

route: 46.161.40.0/24
descr: XSERVER
origin: AS48031
mnt-by: MNT-IV25
created: 2015-03-19T06:44:18Z
last-modified: 2015-03-19T06:44:18Z
source: RIPE
changed: vitaliy@xserver.ua 20150319

inetnum: 185.94.108.0 - 185.94.111.255
netname: RU-QRATOR-20150331
descr: HLL LLC
country: RU
org: ORG-LA267-RIPE
admin-c: QL-RIPE
tech-c: QL-RIPE
status: ALLOCATED PA
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: MNT-QRATOR
mnt-routes: MNT-QRATOR
changed: hostmaster@ripe.net 20150331
changed: bit-bucket@ripe.net 20151107
changed: bit-bucket@ripe.net 20151107
created: 2015-03-31T15:13:10Z
last-modified: 2015-11-07T19:30:36Z
notify: lir@qrator.net
source: RIPE

organisation: ORG-LA267-RIPE
org-name: HLL LLC
org-type: LIR
address: 5 Magistralnaya, 8A
address: 123007
address: Moscow
address: RUSSIAN FEDERATION
phone: +74953746978
e-mail: mail@qrator.net
abuse-c: AR16870-RIPE
mnt-ref: RIPE-NCC-HM-MNT
mnt-ref: MNT-QRATOR
mnt-by: RIPE-NCC-HM-MNT
created: 2010-04-23T08:29:06Z
changed: bitbucket@ripe.net 20150915

changed: bit-bucket@ripe.net 20151107
last-modified: 2015-11-07T18:54:15Z
notify: lir@qrator.net
source: RIPE

role: Qrator Labs
address: 5-ya Magistralnaya, 8A
address: Moscow 123007
address: Russian Federation
e-mail: noc@qrator.net
org: ORG-LA267-RIPE
admin-c: LA27-RIPE
tech-c: AA8879-RIPE
tech-c: AZ2391-RIPE
nic-hdl: QL-RIPE
mnt-by: MNT-QRATOR
created: 2015-11-07T19:21:50Z
last-modified: 2015-11-07T19:28:08Z
source: RIPE

route: 185.94.111.0/24
descr: radar.qrator.net scan network
origin: AS197068
mnt-by: MNT-QRATOR
changed: aa@qrator.net 20150413
created: 2015-04-13T15:33:46Z
last-modified: 2015-04-13T15:33:46Z
source: RIPE

inetnum: 193.105.134.0 - 193.105.134.255
netname: SWEDENDEDICATED-NET
descr: Christian Maurice Sebastiaan Hein
remarks: !!!
remarks: !! All abuse to info@swedendedicated.com !!

remarks: !!!
country: SE
org: ORG-SD20-RIPE
admin-c: CH446-RIPE
tech-c: CH446-RIPE
status: ASSIGNED PI
notify: info@swedendedicated.com
mnt-by: RIPE-NCC-END-MNT
mnt-by: MNT-SWEDEDI
mnt-by: MNT-PORTLANE
mnt-routes: MNT-SWEDEDI
mnt-routes: MNT-PORTLANE
mnt-domains: MNT-SWEDEDI
created: 2010-02-17T13:13:28Z
last-modified: 2015-05-05T02:08:08Z
source: RIPE
sponsoring-org: ORG-PS39-RIPE

organisation: ORG-SD20-RIPE
org-name: Christian Maurice Sebastiaan Hein
org-type: OTHER
address: Sweden Dedicated Land v gen 8 66060 Molkom
e-mail: info@swedendedicated.com
abuse-c: AC31212-RIPE
abuse-mailbox: abuse@swedendedicated.com
mnt-ref: MNT-SWEDEDI
mnt-by: MNT-SWEDEDI
created: 2010-02-08T09:52:29Z
last-modified: 2016-02-15T17:12:37Z
source: RIPE

person: Sweden Dedicated
address: Land v gen 8 66060 Molkom
phone: +31(0)638332409
e-mail: info@swedendedicated.com

nic-hdl: CH446-RIPE
mnt-by: MNT-SWEDEDI
created: 2010-02-08T09:48:05Z
last-modified: 2015-04-07T04:07:34Z
source: RIPE

route: 193.105.134.0/24
descr: Portlane Network
origin: AS42708
mnt-by: MNT-PORTLANE
created: 2010-03-24T18:54:16Z
last-modified: 2010-03-24T18:54:16Z
source: RIPE

inetnum: 188.68.224.0 - 188.68.255.255
netname: PL-SPRINT-20090825
descr: "Sprint" S.A.
country: PL
org: ORG-Szo5-RIPE
admin-c: JPOL-RIPE
tech-c: JPOL-RIPE
status: ALLOCATED PA
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: SPRINT-PL-MNT
mnt-domains: SPRINT-PL-MNT
mnt-routes: SPRINT-PL-MNT
notify: ripe-contact@sprint.pl
created: 2014-03-26T09:35:44Z
last-modified: 2014-03-26T09:35:44Z
source: RIPE

organisation: ORG-Szo5-RIPE
org-name: "SPRINT" S.A.
org-type: LIR
address: "SPRINT" Sp. z o.o.
address: Jagiellonczyka 26

address: 10-062
address: Olsztyn
address: POLAND
phone: +48895221100
fax-no: +48895221125
admin-c: JPOL-RIPE
mnt-ref: RIPE-NCC-HM-MNT
mnt-ref: SPRINT-PL-MNT
mnt-by: RIPE-NCC-HM-MNT
abuse-c: SDC186-RIPE
created: 2010-07-20T11:23:37Z
last-modified: 2014-03-21T13:50:28Z
source: RIPE
e-mail: ripe-contact@sprint.pl

person: Jacek Politowski
address: "SPRINT" S.A.
address: ul. Jagiellonczyka 26
address: 10-062 Olsztyn
address: Poland
phone: +48 89 522 11 68
fax-no: +48 89 522 11 25
e-mail: jacek.politowski@sprint.pl
nic-hdl: JPOL-RIPE
notify: ripe-contact@sprint.pl
mnt-by: SPRINT-PL-MNT
created: 2010-07-21T08:46:59Z
last-modified: 2012-11-27T13:19:34Z
source: RIPE

route: 188.68.224.0/20
descr: Sprint S.A.
descr: Sprint Data Center
descr: Olsztyn, Poland
origin: AS197226

mnt-by: SPRINT-PL-MNT
created: 2014-04-24T11:56:07Z
last-modified: 2014-04-24T11:56:07Z
source: RIPE

inetnum: 188.68.224.0 - 188.68.255.255

netname: PL-SPRINT-20090825
descr: "Sprint" S.A.
country: PL
org: ORG-Szo5-RIPE
admin-c: JPOL-RIPE
tech-c: JPOL-RIPE
status: ALLOCATED PA
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: SPRINT-PL-MNT
mnt-domains: SPRINT-PL-MNT
mnt-routes: SPRINT-PL-MNT
notify: ripe-contact@sprint.pl
created: 2014-03-26T09:35:44Z
last-modified: 2014-03-26T09:35:44Z
source: RIPE

organisation: ORG-Szo5-RIPE
org-name: "SPRINT" S.A.
org-type: LIR
address: "SPRINT" Sp. z o.o.
address: Jagiellonczyka 26
address: 10-062
address: Olsztyn
address: POLAND
phone: +48895221100
fax-no: +48895221125
admin-c: JPOL-RIPE
mnt-ref: RIPE-NCC-HM-MNT
mnt-ref: SPRINT-PL-MNT

mnt-by: RIPE-NCC-HM-MNT
abuse-c: SDC186-RIPE
created: 2010-07-20T11:23:37Z
last-modified: 2014-03-21T13:50:28Z
source: RIPE
e-mail: ripe-contact@sprint.pl

person: Jacek Politowski
address: "SPRINT" S.A.
address: ul. Jagiellonczyka 26
address: 10-062 Olsztyn
address: Poland
phone: +48 89 522 11 68
fax-no: +48 89 522 11 25
e-mail: jacek.politowski@sprint.pl

nic-hdl: JPOL-RIPE
notify: ripe-contact@sprint.pl
mnt-by: SPRINT-PL-MNT
created: 2010-07-21T08:46:59Z
last-modified: 2012-11-27T13:19:34Z
source: RIPE

route: 188.68.224.0/20
descr: Sprint S.A.
descr: Sprint Data Center
descr: Olsztyn, Poland
origin: AS197226
mnt-by: SPRINT-PL-MNT
created: 2014-04-24T11:56:07Z
last-modified: 2014-04-24T11:56:07Z
source: RIPE

inetnum: 218.246.0.0 - 218.246.15.255

netname: DRCSCNET
country: CN
descr: beijing china
admin-c: LL143-AP
tech-c: LL143-AP
status: ASSIGNED NON-PORTABLE
changed: hua.han@srit.com.cn 20051212
mnt-by: MAINTT-CN-DRCSCNET
source: APNIC

person: Li Liang
nic-hdl: LL143-AP
e-mail: as9811@srit.com.cn
address: No.225 Chaonei Street Dongcheng District Beijing China
phone: +86-10- 65253831
fax-no: +86-10-65244907
country: CN
changed: as9811@srit.com.cn 20030312
mnt-by: MAINT-CNNIC-AP
source: APNIC

inetnum: 85.25.37.0 - 85.25.64.255

netname: DE-HEG-MASS
descr: Mass Sub Alloc
country: DE
org: ORG-HM62-RIPE
admin-c: HM5126-RIPE
tech-c: HM5126-RIPE
status: SUB-ALLOCATED PA
notify: ripe@heg.com
mnt-by: MNT-HEG
mnt-lower: MNT-HEG-MASS
mnt-domains: MNT-HEG-MASS

mnt-routes: MNT-HEG-MASS
created: 2016-01-27T08:37:00Z
last-modified: 2016-01-27T08:37:00Z
source: RIPE

organisation: ORG-HM62-RIPE
org-name: HEG Mass
org-type: OTHER
address: Host Europe GmbH
address: Daimler Strasse 9-11
address: 50354 Huerth
address: Germany
phone: +49 2203 1045 0
e-mail: mass-ripe@heg.com
admin-c: HM5126-RIPE
tech-c: HM5126-RIPE
abuse-c: HMAH3-RIPE
ref-nfy: mass-ripe@heg.com
mnt-ref: MNT-HEG-MASS
notify: mass-ripe@heg.com
mnt-by: MNT-HEG-MASS
created: 2015-11-10T12:52:20Z
last-modified: 2015-11-10T12:52:20Z
source: RIPE

role: HEG Mass
address: HEG Mass
address: Daimler Strasse 9-11
address: 50354 Huerth
address: Germany
phone: +49 2203 1045 0
e-mail: mass-ripe@heg.com
admin-c: JUPP
admin-c: OUZO
tech-c: JUPP

tech-c: OUZO
nic-hdl: HM5126-RIPE
notify: mass- ripe@heg.com
mnt-by: MNT-HEG-MASS
created: 2015-11-05T11:32:14Z
last-modified: 2015-12-07T15:15:08Z
source: RIPE

route: 85.25.43.0/24
descr: BSB-More-Specific
origin: AS8972
mnt-by: INTERGENIA-MNT
created: 2015-02-20T10:54:41Z
last-modified: 2015-02-20T10:54:41Z
source: RIPE

NetRange: 198.20.64.0 - 198.20.127.255

CIDR: 198.20.64.0/18
NetName: SINGLEHOP
NetHandle: NET-198-20-64-0-1
Parent: NET198 (NET-198-0-0-0-0)
NetType: Direct Allocation
OriginAS: AS32475
Organization: SingleHop, Inc. (SINGL-8)
RegDate: 2012-08-24
Updated: 2012-08-24
Ref: <https://whois.arin.net/rest/net/NET-198-20-64-0-1>

OrgName: SingleHop, Inc.
OrgId: SINGL-8
Address: 500 West Madison Street
Address: Suite 801
City: Chicago
StateProv: IL
PostalCode: 60661

Country: US
RegDate: 2007-03-07
Updated: 2015-03-04
Comment: <http://www.singlehop.com/>
Ref: <https://whois.arin.net/rest/org/SINGL-8>

ReferralServer: <rwhois://rwhois.singlehop.net:4321>

OrgAbuseHandle: ABUSE2492-ARIN
OrgAbuseName: Abuse Department
OrgAbusePhone: +1-866-817-2811
OrgAbuseEmail: abuse@singlehop.com
OrgAbuseRef: <https://whois.arin.net/rest/poc/ABUSE2492-ARIN>

OrgNOCHandle: NETWO1546-ARIN
OrgNOCName: Network Operations
OrgNOCPhone: +1-866-817-2811
OrgNOCEmail: netops@singlehop.com
OrgNOCRef: <https://whois.arin.net/rest/poc/NETWO1546-ARIN>

OrgTechHandle: NETWO1546-ARIN
OrgTechName: Network Operations
OrgTechPhone: +1-866-817-2811
OrgTechEmail: netops@singlehop.com
OrgTechRef: <https://whois.arin.net/rest/poc/NETWO1546-ARIN>

== Additional Information From <rwhois://rwhois.singlehop.net:4321> ==

%rwhois V-1.5:003eff:00 rwhois.singlehop.com (by Network Solutions, Inc. V-1.5.9.5)
network:Class-Name:network
network:ID:ORG-SINGL-8.198-20-87-96/29
network:Auth-Area:198.20.64.0/18
network:IP-Network:198.20.87.96/29
network:Organization:Shodan LLC
network:Street-Address:8888 Tallwood Dr #2213

network:City:Austin
network:State:TX
network:Postal-Code:78759
network:Country-Code:US
network:Tech-Contact;l:NETWO1546-ARIN
network:Admin-Contact;l:NETWO1546-ARIN
network:Abuse-Contact;l:ABUSE2492-ARIN
network:Created:20151102
network:Updated:20151102

%referral rwhois://root.rwhois.net:4321/auth-area=
%ok

inetnum: 193.106.28.0 - 193.106.31.255

netname: Infium-2
country: UA
org: ORG-IU17-RIPE
admin-c: INF20-RIPE
tech-c: INF20-RIPE
status: ASSIGNED PI
notify: abusemail@infiumhost.com
mnt-by: RIPE-NCC-END-MNT
mnt-by: INFIUM-UAB-MNT
mnt-routes: INFIUM-UAB-MNT
mnt-domains: INFIUM-UAB-MNT
created: 2009-11-30T12:38:45Z
last-modified: 2015-07-31T08:36:05Z
source: RIPE
sponsoring-org: ORG-OL145-RIPE

organisation: ORG-IU17-RIPE
org-name: Infium, UAB
org-type: other
address: LT-12124, Vilnius, Lithuania, pr Laisves 77C

e-mail: abusemail@infiumhost.com
abuse-c: AC29876-RIPE
mnt-ref: INFIUM-UAB-MNT
mnt-by: INFIUM-UAB-MNT
created: 2013-07-29T11:36:16Z
last-modified: 2016-02-15T16:45:00Z
source: RIPE

person: Infium Ltd
address: 61129, Kharkov, Ukraine
address: Traktorostroiteley 156/41, office 301
phone: +380-931-700-701
e-mail: noc@infiumhost.com

abuse-mailbox: abusemail@infiumhost.com

remarks:

remarks: *****

remarks: * For spam/abuse/security issues please contact *

remarks: * abusemail@infiumhost.com , not this address *

remarks: *****

remarks:

nic-hdl: INF20-RIPE
mnt-by: INFIUM-MNT
created: 2010-07-04T19:12:37Z
last-modified: 2012-04-25T10:17:48Z
source: RIPE

route: 193.106.28.0/22
descr: Infium UAB
origin: AS50297
mnt-by: INFIUM-UAB-MNT
created: 2015-01-03T16:06:07Z
last-modified: 2015-01-03T16:06:07Z
source: RIPE

10. Appendix 3 – Glossary of Terms

Amplification Attack

An Amplification Attack is any attack where an attacker is able to use an amplification factor to multiply its power. Amplification attacks are “asymmetric”, meaning that a relatively small number or low level of resources is required by an attacker to cause a significantly greater number or higher level of target resources to malfunction or fail. Examples of amplification attacks include Smurf Attacks (ICMP amplification), Fraggle Attacks (UDP amplification), and DNS Amplification.

Botnet

A botnet is a collection of compromised computers often referred to as “zombies” infected with malware that allows an attacker to control them. Botnet owners or “herders” are able to control the machines in their botnet by means of a covert channel such as IRC (Internet Relay Chat), issuing commands to perform malicious activities such as distributed denial-of-service (DDoS) attacks, the sending of spam mail, and information theft. As of 2006, the average size of any given botnet around the world was around 20,000 machines (as botnet owners attempted to scale down their networks to avoid detection), although some larger more advanced botnets such as Bredolab, Conficker, TDL-4, and Zeus have been estimated to contain millions of machines.

Computer Emergency Readiness Team Computer Emergency Response Team Computer Security Incident Response Team

Computer Emergency Response Team is a name given to expert groups that handle computer security incidents. Most groups append the abbreviation CERT or CSIRT to their designation where the latter stands for Computer Security Incident Response Team.

DDoS (Distributed Denial-of-Service) Attack

DDoS or Distributed Denial-of-Service attacks are a variant of Denial-of-Service DoS attacks where an attacker or a group of attackers employ multiple machines to carry out a DoS attack simultaneously, therefore increasing its effectiveness and strength. The “army” carrying out the attack is mostly often composed of innocent infected zombie computers manipulated as bots and being part of a botnet controlled by the attacker via a Command and Control Server. A botnet is powerful, well coordinated and could count millions of computers. It also insures the anonymity of the original attacker since the attack traffic originates from the bots’ IPs rather than the attacker’s. In some cases, mostly in ideological DDoS attacks, this “army” could also be composed of recruited hackers/hacktivists participating in large DDoS attack campaigns (Operation Blackout, Operation Payback etc.). DDoS attacks are hard to detect and block since the attack traffic is easily confused with legitimate traffic and difficult to trace. There are many types of DDoS attacks targeting both the network and the application layers. They could be classified upon their impact on the targeted computing resources (saturating

bandwidth, consuming server's resources, exhausting an application) or upon the targeted resources as well:

- Attacks targeting Network Resources: UDP Floods, ICMP Floods, IGMP Floods.
- Attacks targeting Server Resources: the TCP/IP weaknesses –TCP SYN Floods, TCP RST attacks, TCP PSH+ACK attacks – but also Low and Slow attacks as Sockstress for example and SSL-based attacks, which detection is particularly challenging.
- Attacks targeting the Application Resources: HTTP Floods, DNS Floods and other Low and Slow attacks as Slow HTTP GET requests (Slowloris) and Slow HTTP POST requests (R-U-Dead-Yet).

A DDoS attack usually comprises more than three attack vectors thus increasing the attacker's chances to hit its target and escape basic DoS mitigation solutions.

DoS (Denial-of-Service) Attack

A Denial-of-Service DOS attack is an attack targeting the availability of web applications. Unlike other kinds of attacks, DoS attacks' primary goal is not to steal information but to slow or take down a web site. The attackers' motivations are diverse, ranging from simple fun, to financial gain and ideology (hacktivism). A DoS attack generates high or slow rate attack traffic exhausting computing resources of a target, therefore preventing legitimate users from accessing the website. DoS attacks affect enterprises from all sectors (e-gaming, Banking, Government etc.), all sizes (mid/big enterprises) and all locations. They target the network layer and up to the application layer, where attacks are more difficult to detect since they could easily get confused with legitimate traffic. There are several types of DoS attacks. A (non-distributed) DoS attack is when an attacker uses a single machine's resources to exhaust those of another machine, in order to prevent it from functioning normally. Large Web servers are usually robust enough to withstand a basic DoS attack from a single machine without suffering performance loss. A DoS attack famous variant is the DDoS or Distributed Denial of Service attack where the attack originates from multiple computers simultaneously, therefore causing the victim's resources exhaustion.

DNS Amplification Attack

DNS amplification attack is a sophisticated denial of service attack that takes advantage of DNS servers' behavior in order to amplify the attack. In order to launch a DNS amplification attack, the attacker performs two malicious tasks. First, the attacker spoofs the IP address of the DNS resolver and replaces it with the victim's IP address. This will cause all DNS replies from the DNS servers to be sent to the victim's servers. Second, the attacker finds an internet domain that is registered with many DNS records. During the attack, the attacker sends DNS queries that request the entire list of DNS records for that domain. This results in large replies from the DNS servers, usually so big that they need to be split over several packets. Using very few computers, the attacker sends a high rate of short DNS queries to the multiple DNS servers asking for the entire list of DNS records for the internet domain it chose earlier. The DNS servers look for the answer and provide it to the DNS resolver. However, because the

attacker spoofed the IP address of the DNS resolver and set it to be the IP address of the victim, all the DNS replies from the servers are sent to the victim. The attacker achieves an amplification effect because for each short DNS query it sends, the DNS servers reply with a larger response, sometimes up to 100 times larger. Therefore, if the attacker generates 3 Mbps of DNS queries, it is actually amplified to 300Mbps of attack traffic on the victim. The victim is bombed with a high rate of large DNS replies where each reply is split over several packets. This requires the victim to reassemble the packet, which is a resource consuming task, and to attend to all of the attack traffic. Soon enough, the victim's servers become so busy handling the attack traffic that they cannot service any other request from legitimate users and the attacker achieves a denial-of-service.

DNS Flood

A DNS Flood is an application-specific variant of a UDP flood. Since DNS servers use UDP traffic for name resolution, sending a massive number of DNS requests to a DNS server can consume its resources, resulting in a significantly slower response time for legitimate DNS requests.

Exploit

An exploit is an implementation of a vulnerability meant to allow one to actually compromise a target. Exploits can be difficult to develop, as most modern vulnerabilities are much more complex than older ones due to the existence of advanced security measures and complicated constructs in modern hardware and software. Exploits based on previously unknown vulnerabilities, known as "Zero-Day" exploits are highly sought after by hackers and developers and manufacturers alike. By using a zero-day exploit, a hacker can guarantee that his or her attempt to break into a particular computer or device that possesses such vulnerability that the exploit is based on will succeed. Zero-day exploits are traded on both the black market and through legitimate middlemen between legitimate parties from anywhere between \$5,000 to \$250,000 depending on the effects of the exploit and which system they target. Where a PDF exploit might only fetch a few thousand dollars, a severe exploit targeting the latest version of Apple's mobile operating system, iOS, might fetch \$100,000 or more.

Flood

"Flood" is the generic term for a denial-of-service (DoS) attack in which the attacker attempts to constantly send traffic (often high volume of traffic) to a target server in an attempt to prevent legitimate users from accessing it by consuming its resources. Types of floods include (but are not limited to): HTTP floods, ICMP floods, SYN floods, and UDP floods.

Hacker

The term "hacker" has been used to mean various things in the world of computing: one who is able to subvert computer security (regardless of intentions), one who is a member of the open-source software community and subculture, and one who attempts to push the limits of computer software and hardware through home modifications. In the world of computer

security, the term “hacker” is often portrayed as negative by mass media, despite the prevalence of “white hat hacking”, or ethical hacking for the purpose of discovering potential security flaws and reporting them to the proper individuals or organizations so that the flaws may be patched. Black hat hacking, on the other hand, is the breaking into computer systems without any intention of reporting discovered vulnerabilities, often with malicious or financial incentives. The hackers who fall somewhere on the spectrum between “white hats” and “black hats” are referred to as “grey hats”. Grey hat hackers will often perform mischievous activities with (usually non-malicious although at times questionably ethical) motivations. Additionally, grey hat hackers often choose not to report security flaws to the proper channels; rather, they report such information to the hacking community and the general public, enjoy watching the fallout as those with the security flaws scramble to fix them before they can be abused by black hat hackers. Within the open-source software and computer hobbyist communities, however, “hacker” usually has a less negative connotation. Within these cultures, hackers are often individuals regarded as intelligent and clever, and able to come up with creative solutions to existing problems that a software or hardware product developer may have not thought of or publicly released yet. These hackers often refer to “hackers” within the computer security world as “crackers” (as in safe-cracker) to emphasize their belief that calling such individuals “hackers” is incorrect. With the rise of hacker and “hacktivist” groups such as LulzSec (now LulzSec Reborn) and Anonymous, the mass media portrayal of the term “hacker” continues to lead the general public to believe “hacker” is synonymous with “cybercriminal”.

Hacktivist

“Hacktivist”, a portmanteau of “hack” and “activism”, was a term coined in 1996 by Omega, a member of the hacking coalition “Cult of the Dead Cow” (cDc). The term can be loosely defined as, “the ethically ambiguous use of computers and computer networks in order to affect the normal operation of other systems, motivated by a desire to protest or promote political ends.” Oftentimes these events take the form of web site defacements, denial-of-service attacks, information theft, web site parodies, virtual sit-ins, typo squatting, and virtual sabotage. The term has become popular among media outlets in recent years due to the rise of various politically motivated cyber attacks by groups such as Anonymous and LulzSec (now LulzSec Reborn) on governments and corporations across the world.

Honeypot

In computer security, a honeypot is a program or a server voluntarily made vulnerable in order to attract and lure hackers. The attackers who think they are targeting a real resource behave “normally”, using their attack techniques and tools against this lure site, which allow the defenders to observe and monitor their activities, analyze their attacking methods, learn and prepare the adequate defenses for the real resources. There are several kinds of honeypots, some used for research purposes only while others are actively acting as defenses for the real sites.

HTTP Flood

An HTTP flood is an attack method used by hackers to attack web servers and applications. It consists of seemingly legitimate session-based sets of HTTP GET or POST requests sent to a target web server. These requests are specifically designed to consume a significant amount of the server's resources, and therefore can result in a denial-of-service condition (without necessarily requiring a high rate of network traffic). Such requests are often sent en masse by means of a botnet, increasing the attack's overall power. HTTP flood attacks may be one of the most advanced non-vulnerability threats facing web servers today. It is very hard for network security devices to distinguish between legitimate HTTP traffic and malicious HTTP traffic, and if not handled correctly, it could cause a high number of false-positive detections. Rate-based detection engines are also not successful at detecting HTTP flood attacks, as the traffic volume of HTTP floods may be under detection thresholds. Because of this, it is necessary to use several parameters detection including rate-based and rate-invariant.

I2P

I2P is an anonymous overlay network - a network within a network. It is intended to protect communication from dragnet surveillance and monitoring by third parties such as ISPs.

ICMP Flood

Internet Control Message Protocol (ICMP) is a connectionless protocol used for IP operations, diagnostics, and errors. An ICMP Flood - the sending of an abnormally large number of ICMP packets of any type (especially network latency testing "ping" packets) - can overwhelm a target server that attempts to process every incoming ICMP request, and this can result in a denial-of-service condition for the target server.

Internet pipe saturation

These attacks are volumetric floods and often involve flooding the target with an overwhelming bandwidth. Common attacks utilize UDP as it is easily spoofed and difficult to mitigate downstream. Out of state, SYN floods and malformed packets are also often seen. While many attacks aim at saturating inbound bandwidth, it's not uncommon for attackers to identify and pull large files from websites, ftp shares, etc. in order to saturate outbound bandwidth as well.

IP Address

An IP address is an identifier for a device connected to a network using TCP/IP - a protocol that routes network traffic based on the IP address of its destination. IP addresses can either be 32-bit IPv4 addresses consisting of four base-10 numbers separated by periods representing eight digit binary (base-2) numbers called "octets" (i.e. 0.0.0.0 to 255.255.255.255), or 128-bit IPv6 addresses consisting of eight hexadecimal (base-16) numbers separated by colons representing sixteen digit binary (base-2) numbers (i.e.

0000:0000:0000:0000:0000:0000:0000:0000 to
FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF where consecutive groups of four zeroes are replaced by a double colon). When the Internet first became popular, IPv4, with its 32-bit

addresses, offered 2³², or roughly 4.3 x 10⁹ unique addresses. As the number of Internet-connected devices began to grow significantly, people worried that the IPv4 protocol would not contain enough addresses to meet the growing demand for new unique addresses this is why IPv4 will eventually be replaced by IPv6 on a large scale (IPv6 already officially launched in August 2012), which contains 2¹²⁸ or roughly 3.4 x 10³⁸ unique addresses. The Dynamic Host Configuration Protocol (DHCP), which runs on special devices (usually routers) allows for the assigning of IP addresses within a local area network (LAN). DHCP assigns IP addresses on a temporary “lease” basis; once a device’s IP address lease expires, a DHCP server will assign it a new (potentially different) one. IP addresses automatically assigned by a DHCP server are therefore referred to as “dynamic IP addresses”, as a device with a DHCP-assigned IP address may eventually receive an IP different from its original one.

DHCP servers will not assign devices just any IP address in the maximum range of IPv4 addresses (0.0.0.0 to 255.255.255.255), as certain IP addresses are reserved for special purposes. Such addresses include:

- 0.0.0.0 – Represents the “default” network, i.e. any connection
- 255.255.255.255 – Represents the broadcast address, or place to route messages to be sent to every device within a network
- 127.0.0.1 – Represents “localhost” or the “loopback address”, allowing a device to refer to itself, regardless of what network it is connected to
- 169.254.X.X – Represents a “self-assigned IP address”, which a device will assign itself if it is unable to receive an IP address from a DHCP server

Users’ DHCP-assigned IP addresses on a LAN are not the same as their “external” or Internet IP address. This address will be the same for all users connected to a DHCP server, which itself receives an IP address from the Internet Service Provider (ISP) it is connected to. As IP addresses can be used as unique identifiers for users’ machines (and subsequently the users themselves), knowledge of a malicious user’s external Internet IP address can allow law enforcement officials to block, locate, and eventually arrest him or her. As a result, the more advanced attack tools and hackers will employ anonymization techniques - such as the use of proxy servers, VPNs, or a routing network like Tor or I2P - that can make it seem like they are using a different IP address other than their own, located somewhere else in the world. An attack tool called Low Orbit Ion Cannon (LOIC) became infamous for not hiding its users’ IP addresses; this resulted in the arrest of various LOIC users around the world for their participation in distributed denial-of-service (DDoS) attacks.

IP Spoofing

IP Spoofing is the act of creating an IP packet with a forged source IP address for the purpose of hiding the true source IP address, usually for the purpose of launching special types of distributed denial-of-service (DDoS attacks). By forging the source IP address of a packet; the individual sending it can direct the target IP address’ machine to send its reply packet somewhere other than the real IP address of the source machine. Those wishing to launch

DDoS attacks without large botnets can therefore send packets with random spoofed source IP addresses in order to both conceal their own identity and make the attack harder to block (as it looks like it is originating from many sources).

IRC (Internet Relay Chat)

IRC (Internet Relay Chat) is a protocol for real-time text messaging between internet-connected computers created in 1988. It is mainly used for group discussion in chat rooms called “channels” although it supports private messages between two users, data transfer, and various server-side and client-side commands. As of April 2011, the top 100 IRC networks served over 500,000 users at a time on hundreds of thousands of channels. IRC is a popular method used by botnet owners to send commands to the individual computers in their botnet. This is done either on a specific channel, on a public IRC network, or on a separate IRC server. The IRC server containing the channel(s) that are used to control bots is referred to as a “command and control” or C2 server.

ISP (Internet Service Provider)

An Internet Service Provider (ISP) is a company that provides internet access for its customers. ISPs are required by law in many countries to provide a certain level of monitoring capabilities to aid government law enforcement and intelligence agencies, and are often asked by such officials to intervene during cyber attacks by cutting off internet service to the offending machines.

itsoknoproblembro

The 'itsoknoproblembro' tool was designed and implemented as a general purpose PHP script injected into a victim's machine allowing the attacker to upload and execute arbitrary Perl scripts on the target's machine. The 'itsoknoproblembro' script injects an encrypted payload, in order to bypass IPS and Malware gateways into the website main file index.php, allowing the attacker to upload new Perl scripts at any time. Initial server infection is usually done by using the well known Remote File Inclusion (RFI) technique. By uploading Perl scripts that run different DOS flood vectors, the server might act as a Bot in a DDOS Botnet army. Although originally designed for general purpose, some variants of this tool found in the wild were customized to act as a proprietary DDOS tool, implementing the flood vector logics inside without the need to upload additional scripts.

Malware

“Malware”, short for “malicious software”, is any program designed to help a hacker negatively affect the normal operation of a computer. Most forms of malware - including viruses, worms, Trojan horses, spyware, adware, and rootkits - are intended to allow hackers to gain unauthorized access to a machine, without the knowledge of its owner, in order to perform criminal tasks including information theft and amassing botnets to perform distributed denial-of-service (DDoS) attacks. Computer users are often tricked into installing malware through social engineering techniques, or are unaware that a seemingly non-

malware infected program they have installed was infected, containing additional code designed to stealthily perform malicious tasks.

MSSP

An MSSP (Managed Security Service Provider) is an organization which provides "Security as a Service" (Sec-aaS) and may include elaborate operations such as SOCs and NOCs, or something as simple as a cloud-based key management service. Generally speaking, an MSSP is considered an outsourced operation of what was an internal security device or process management function.

Network scan

Scanning is typically an automated process that is used to discover devices such as pc, server and peripherals that exist on a network. Results can include details of the discovered devices, including IP addresses, device names, operating systems, running applications/services, open shares, usernames and groups. Scanning is often related to pre-attack or reconnaissance activities. There are two types of scanning: Horizontal Scan in which the scanner scans for the same port on multiple IPs, and Vertical Scan in which the scanner scans multiple ports on one IP.

Packet

A packet is a formatted unit of data used to transmit information piece by piece across a packet switched network. Packets usually contain three sections: a header, the payload, and a trailer (also called "footer"). A packet header contains information such as the length of the packet (if the network does not use a predetermined fixed packet size), synchronization bits to help the packet match up with the network, a packet number to differentiate each packet from the others, the protocol (i.e. type of information contained within the packet), and the source and destination IP addresses. The "payload" of a packet contains the actual information being transmitted. The trailer or "footer" usually contains a series of bits signaling to the receiving device that it has reached the end of the packet, as well as some type of error-checking information to ensure that the packet was not modified in transit.

Port Scan

A port scanner is a technical leverage to identify available technical services (ports) on a server or application and may include logic to evaluate whether or not those services are vulnerable to common exploits or configuration issues. This is done by sending predetermined traffic to the target and based on a response or lack of a response, the port scanner in use makes its own conclusions with regards to the functionality of the port being scanned.

Reflector/Reflective DoS attacks

Reflection Denial of Service attacks makes use of a potentially legitimate third party component to send the attack traffic to a victim, ultimately hiding the attackers' own identity. The attackers send packets to the reflector servers with a source IP address set to their victim's IP therefore indirectly overwhelming the victim with the response packets.

The reflector servers used for this purpose could be ordinary servers not obviously compromised, which makes this kind of attack particularly difficult to mitigate. A common example for this type of attack is Reflective DNS Response attack.

SIP Brute Force

SIP brute force is an adaptation of normal brute force attacks which attack SIP servers and attempt access to servers to make unauthorized outbound calls at another's expense.

SIP Client Call Flood

This is a flood technique focused on SIP application protocol which involves illegitimate call requests. The idea here is to flood the Session Boarder Control (SBC) and / or SIP / VOIP PBX with too many requests to handle and thus making the service unavailable.

SIP Malformed Attack

Application layer attack on the Session Initiation Protocol- SIP in use in VoIP services, targeted at causing denial of service to SIP servers. A SIP malformed attack consists of sending any kind of non-standard messages (malformed SIP Invite for ex) with an intentionally invalid input, therefore making the system unstable.

SIP Register flood

Application layer attack on the Session Initiation Protocol- SIP in use in VoIP services, targeted at causing denial of service to SIP servers. A SIP Register flood consists of sending a high volume of SIP REGISTER or INVITE packets to SIP servers (indifferently accepting endpoint requests as first step of an authentication process), therefore exhausting their bandwidth and resource

SIP Server Flood

Application layer attack on the Session Initiation Protocol- SIP (in use in VoIP services), targeted denial of service to SIP servers. Common attack vectors include SIP invite and register floods.

Scrubbing Center

A centralized data cleansing station where traffic is analyzed and malicious traffic (ddos, known vulnerabilities and exploits) is removed. Scrubbing centers are often used in large enterprises, such as ISP and Cloud providers, as they often prefer to off-ramp traffic to an out of path centralized data cleansing station. When under attack, the traffic is redirected (typically using DNS or BGP) to the scrubbing center where an attack mitigation system mitigates the attack traffic and passes clean traffic back to the network for delivery. The scrubbing center should be equipped to sustain high volumetric floods at the network and application layers, low and slow attacks, RFC Compliance checks, known vulnerabilities and zero day anomalies.

Social Engineering

Social Engineering (within the context of computer security) is the act of using psychological manipulation in order to gain access to sensitive information, computers, or computer networks. Many famous computer hackers (both white hat and black hat) have used social

engineering in combination with computer-related methods in order to gain information; reformed cyber criminal Kevin Mitnick admitted that it's much easier to trick a person into giving up sensitive passwords or information than it is to obtain the same material solely through the use of computers. One example of a social engineering technique is "pretexting", or engaging the target subject in a specific manner with some form of background information that makes it more likely that he or she will divulge sensitive information. Pretexting often involves extensive research, as the social engineer will need to prepare answers to identifying questions that he or she may be asked during the process of obtaining information. This newly obtained information can often be used in further pretexting attempts, especially in scenarios where the social engineer wishes to gain even greater access to his or her target.

SQL Injection

SQL injection is an attack targeting web applications taking advantage of poor application coding where the inputs are not sanitized therefore exposing application vulnerabilities. SQL injection is the most famous type of injection attacks which also count LDAP or XML injections. The idea behind a sql injection is to modify an application SQL (database language) query in order to access or modify unauthorized data or run malicious programs. Most web applications indeed rely on databases where the application data is stored and being accessed by SQL queries and modifications of these queries could mean taking control of the application. An attacker would for example be able to access the application database with administrator access, run remote commands on the server, drop or create objects in the database and more.

For instance, the sql query below, aiming at authenticating users, is common in web applications:

- myQuery= "SELECT * FROM userstable WHERE username = 'userinput1' and password ='userinput2';"
- Replacing userinput1 by: 'OR 1=1'); -- would result in granting the attacker access to the database without knowing the real username and password as the assertion "1=1" is always true and the rest of the query is being ignored by the comment character (-- in our case).
- Replacing the userinput1 by ' OR 1=1"); drop table users;-- would additionally drop the application users table.

SYN Flood

A SYN flood is a denial-of-service (DoS) attack that relies on abusing the standard way that a TCP connection is established. Typically, a client sends a SYN packet to an open port on a server asking for a TCP connection. The server then acknowledges the connection by sending SYN-ACK packet back to the client and populating the client's information in its Transmission Control Block (TCB) table. The client then responds to the server with an ACK packet establishing the connection. This process is commonly known as a "three-way handshake". A

SYN flood overwhelms a target machine by sending thousands of connection requests to it using spoofed IP addresses. This causes the target machine to attempt to open a connection for each malicious request and subsequently wait for an ACK packet that never arrives. A server under a SYN flood attack will continue to wait for a SYN-ACK packet for each connection request, as the delay could be normal and related to network congestion. However, because a SYN-ACK packet never arrives for any of the connection requests; the massive number of half-open connections quickly fills up the server's TCB table before it can time any connections out. This process continues for as long as the flood attack continues. Attackers will sometimes add legitimate information to their requests as well, such as sequence number or source port 0, as this increases a target server's CPU usage on top of causing network congestion, and could more effectively cause a denial-of-service condition.

TCP Flood

TCP SYN floods are one of the oldest yet still very popular Denial of Service (DoS) attacks. The most common attack involves sending numerous SYN packets to the victim. The attack in many cases will spoof the SRC IP meaning that the reply (SYN+ACK packet) will not come back to it. The intention of this attack is overwhelm the session/connection tables of the targeted server or one of the network entities on the way (typically the firewall). Servers need to open a state for each SYN packet that arrives and they store this state in tables that have limited size. As big as this table may be it is easy to send sufficient amount of SYN packets that will fill the table, and once this happens the server starts to drop a new request, including legitimate ones. Similar effects can happen on a firewall which also has to process and invest in each SYN packet. Unlike other TCP or application level attacks the attacker does not have to use a real IP; this is perhaps the biggest strength of the attack.

Tor

Tor is a network of virtual tunnels that allows people and groups to improve their privacy and security on the Internet. It also enables software developers to create new communication tools with built-in privacy features. Tor provides the foundation for a range of applications that allow organizations and individuals to share information over public networks without compromising their privacy.

UDP Flood

A UDP flood is a network flood and still one of the most common floods today. The attacker sends UDP packets, typically large ones, to single destination or to random ports. In most cases the attackers spoof the SRC IP which is easy to do since the UDP protocol is "connectionless" and does not have any type of handshake mechanism or session. The main intention of a UDP flood is to saturate the Internet pipe. Another impact of this attack is on the network and security elements on the way to the target server, and most typically the firewalls. Firewalls open a state for each UDP packet and will be overwhelmed by the UDP flood connections very fast.

Vulnerability

A vulnerability (in computer security) is any weakness in a computer system, network, software, or any device that allows one to circumvent security measures and perform actions not intended by its developers or manufacturers. Vulnerabilities range from minor to major, with the most significant allowing for privilege escalation (unauthorized administrator or root privileges) or code execution (the running of unsigned 3rd party software). New vulnerabilities can often be discovered by the process of “fuzzing”, or purposely trying to break something by attempting to give it unreasonable input values. Once some kind of crash occurs and can be analyzed, one can discover the existence of a vulnerability that may have not been previously documented. Previously unknown vulnerabilities, known as “Zero-Day” vulnerabilities are highly sought after by hackers and developers and manufacturers alike. By using an exploit based on zero-day vulnerability, a hacker can guarantee that his or her attempt to break into a particular computer or device that possesses such vulnerability will succeed. Zero-day exploits are traded on both the black market and through legitimate middlemen between parties for anywhere from \$5,000 to \$250,000 depending on the effects of the exploit and which system they target. Where a PDF exploit might only fetch a few thousand dollars, a severe exploit targeting the latest version of Apple’s mobile operating system, iOS, might fetch \$100,000 or more.

Vulnerability Scanner

A vulnerability scanner is a type of computer program used to gather information on computers and systems on a network in order to find their weaknesses. By using a vulnerability scanner tool such as nmap or unicornscan, one can determine the number of clients attached to a particular network as well as various information regarding their addresses, ports, applications and services and potential exploits that can be used against them. Some scanners offer the ability to deploy payloads for the purpose of using a found exploit, and others simply display information on network topology. Types of vulnerability scanners include: port scanners, network enumerators, network vulnerability scanners, web application security scanners, database security scanners, ERP security scanners, and computer worms (which require scanning capabilities to spread within a network).

Wireshark

Wireshark is a free cross-platform open-source network traffic capture and analysis utility. It began as a project called “Ethereal” in the late 1990s, but its name was changed to “Wireshark” in 2006 due to trademark issues. The initial code was written by Gerald Combs, a computer science graduate of the University of Missouri-Kansas City, today the Wireshark website now lists over 600 contributors. The program is GUI-based and uses pcap to capture packets, although there is also a command-line version of Wireshark called TShark with the same functionality. Wireshark essentially “understands” the formats of various types of network packets, and is able to display the header and content information of captured packets in an easy-to-read format with various filtering options. Packets can be either

captured directly with Wireshark, or captured with a separate utility and later viewed within Wireshark. As a powerful (and free) network analysis tool, Wireshark has become an industry standard utility for network traffic analysis.

Zeus

Zeus is a well-known Trojan Horse that steals financial information from a user's browser using man-in-the-browser key logging and form grabbing. Additionally, Zeus installs a backdoor on the machines it infects, so these machines can become part of a botnet used for distributed denial-of-service (DDoS) attacks and other malicious activities. Zeus was first detected in 2007 when it was used to attack the United States Department of Transportation, however, it did not become significantly widespread until March 2009. Attacks involving the use of Zeus occurred throughout 2010, including an October 2010 attack by a large organized crime ring attempting to steal over \$70M from individuals in the US with Zeus-infected computers. The FBI made over 90 arrests of suspected members in the US, and various others were arrested in the UK and Ukraine in connection with the attack. In May 2011 the source code of the version used then of Zeus (v2) was leaked, leading to various customized Zeus-based bots being created. Some of the more advanced custom bots based on the leaked code (such as Ice IX) attempted to fix many of the existing issues with Zeus rendering it even harder to detect. However, many security researchers have discovered that even the most well-known custom versions are extremely similar to the original leaked Zeus source code, and are therefore not significantly more innovative or dangerous.

Zero-Day/Zero-Minute Attack

A Zero-Day (or Zero-Minute) Attack is a type of attack that uses a previously unknown vulnerability. Because the attack is occurring before "Day 1" of the vulnerability being publicly known, it is said that the attack occurred on "Day 0" - hence the name. Zero-Day exploits are highly sought after - often bought and sold by private firms anywhere from \$5,000 to \$250,000, depending on what applications and operating systems they target - as they almost guarantee that an attacker is able to stealthily circumvent the security measures of his or her target. Private security firms aside, software vendors will also usually offer a monetary reward among other incentives to report zero-day vulnerabilities in their own software directly to them.

Zombie

A "zombie" or "bot" is a compromised computer under the control of an attacker who often controls many other compromised machines that together make up a botnet. The term "zombie" was coined to describe such an infected computer because the computer's owner is often not aware that his or her computer is being used for malicious activities.

References

<http://security.radware.com/knowledge-center/DDoSpedia/>



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