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IT SecurityUsing ArcSight SIEM

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Abstract— In Today's world Data is very important and we are storing our confidential data using the latest technology like –Cloud, Virtualization and BYOD (Bring your own device i.e. Laptop, mobile etc.). We all are storing our confidential data over there .Even there is advancement in the thinking and behaviour of Hackers. Cyber Attack is also a big concern. To provide Cyber Security and to protect from External threat - From Unauthorized Access etc., Internal Threat- That comes from an inside of an Organization. Many systems and applications which run on a computer network generate events which are kept in event logs. These logs are essentially lists of activities that occurred. Every data needs to be recorded. To overcome all these problems we have ArcSight SIEM (Security Information and Event Management) Technology. ArcSight SIEM will collect, analyse and present information on security products, Operating System, Databases etc. and will monitor all the data coming from different devices and will give us the centralized views of logs

Keywords— Information Security, ArcSight SIEM.

I. INTRODUCTION

ArcSight SIEM will identify and mitigates business risks. It will protect us from external threats such as malware and hackers, internal threats such as data breaches and fraud. It will give us a real time analysis and historic view into external attacks, insider threats and compliance breaches. So that we can intelligently and effectively protect our environment .ArcSight Security Information and Event Management (SIEM) system is a centralized system for collecting data, analysing from any devices and also does a real time event correlation. We can make a report of the vulnerabilities. Even we can inform about the vulnerabilities and can respond also.

II. ISSUES

There are so many organizations like RSA Security , Zappos .They all were using technologies like Cloud , Virtualization etc. to save confidential data over there .They lose millions of users, loss of billions of dollars, tinting of brand value of some of the biggest organizations that puts TODAY's enterprise at a risk LARGER than ever before. Even Organization were being hacked and then at that moment they don't Know .They are also using Security Technology to fight against the hackers but there technology give the details of the hackers after that company would be bankrupt or going to be shut down .So we have the Technology ArcSight SIEM that will inform us who is on the network and what he is doing whether he is trying to hack it or not. If that guy is hacker then we would be informed on the same day only so that our organization won't be losing billions of dollars and won't get bankrupt like others.

III. FUNCTIONAL PARTIONING OF PROJECT

1. Data collection

At this layer events from different devices would be forwarded to Smart connector by using push or pull function. They collect events from hundreds of devices in different format, and then they normalize it into a common event format (CEF). The Connectors collect locally and then send the normalized events to our logging and correlation products in a guaranteed, secure, and bandwidth-efficient manner.

2. Data consolidation

At this layer all the data would be forwarded from smart connector to logging engine. Logger receives structured data in the form of normalized Common Event Format (CEF) events and unstructured data such as syslog events. Logger is a log management solution that is optimized for extremely high event throughput, efficient long-term storage.

3. Data correlation

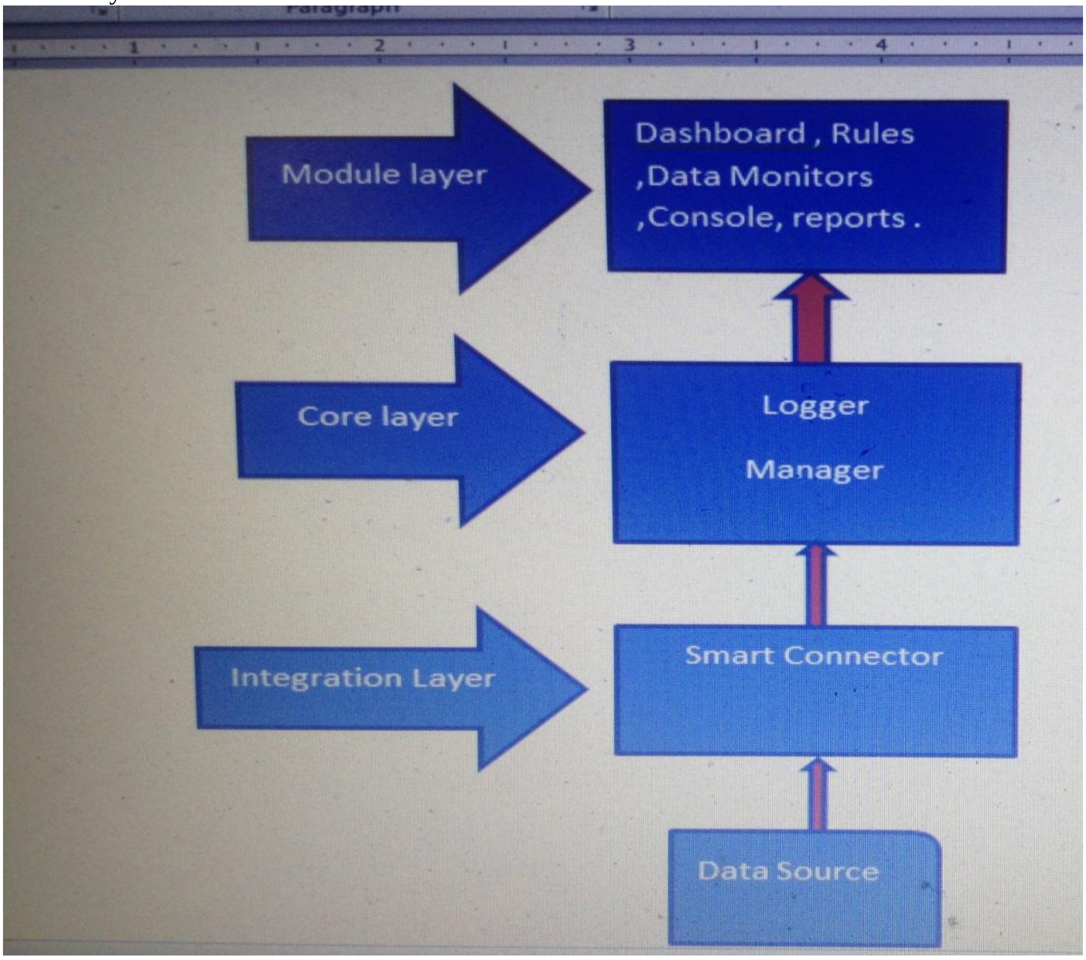
Correlation is a process that discovers the relationships between events, infers the significance of those relationships, prioritizes them and provides a framework for taking actions. ArcSight Enterprise Security Management (ArcSight ESM/Manager) is a software solution that combines traditional security event monitoring with network intelligence, context correlation, anomaly detection, historical analysis tools, and automated remediation.

4. Data Collaboration

At this layer we can integrate ArcSight SIEM technology with existing security point solution (i.e. Global Threat Intelligence, Vulnerability Scanner, Application Code Scanner etc.) to provide additional layer of security to strengthen network security posture of the organization.

IV. THREE TIER ARCHITECTURE

By using three tier architecture how data would be collected from different devices and forwarded to Smart Connector and then forwarded to Manager. Finally we can see the events in Arcsight Console. The Arcsight Console is the administrative part where we can monitor dashboards, analysis of data and can inform about the hackers and through pattern also we can check the data monthly and can inform about the threats .By monitoring we can identify who is on the network, what he is doing, where he is on the network .We can also respond to the vulnerabilities .We can protect our organization from Cyber Attack.



V. METHODOLOGIES

Different Components that we are using under this.

1. Arcsight Smart Connector

Functions performed by Smart Connector:

Normalization

After receiving data from different devices it will collect the data and will normalize in a readable format .Example

Check Point: "14" "21Nov2005" "12:10:29" "eth-s1p4c0" "ip.of.firewall" "log" "accept" "www-http" "65.65.65.65" "10.10.10.10" "tcp" "4" "1355" "" "" "" "" "" "" "" "" "" "firewall" "Len 68" This is how data would be normalized.

Categorization

It will categorize the events received from different devices. Example

Date	Time	Event Name	Source IP	Device Name
21st nov 2013	12:10	Accept	65.65.65.65	Checkpoint

Category	Description	Examples
Object	Object refers to the entity being targeted.	Application, Operating System
Behaviour	What is being done to the object	Authentication, modify

Filter

It will filter out the events that are not required. Filters applied at the Smart Connector select only events that match the conditions, and then forwarded to the Manager for processing. Non-matching events are not forwarded to the Manager. Basically there are two types of filters

A. Named Filter

In this filter is predefined for every event that is received from different devices. We don't have to create filter by specifying conditions for creating rules, reports every time.

B. Unnamed Filter

In this filter is not predefined. We have to create filter by specifying conditions for creating rules, reports etc.

Aggregation

We can configure Connector to aggregate events that have the same values in a specified set of fields, either a specified number of times, OR within a specified time limit. Let's take an example

Suppose we have firewall device from which we have received around 10 events having same source IP, Destination IP etc. Then the aggregated event would be 1 and aggregated count would be 10. In this way volume of events sending to manager would also be reduced.

Caching

Suppose we lost the connection between connector and manager then at that moment all the data would be saved to caching.

2. ArcSight Logger

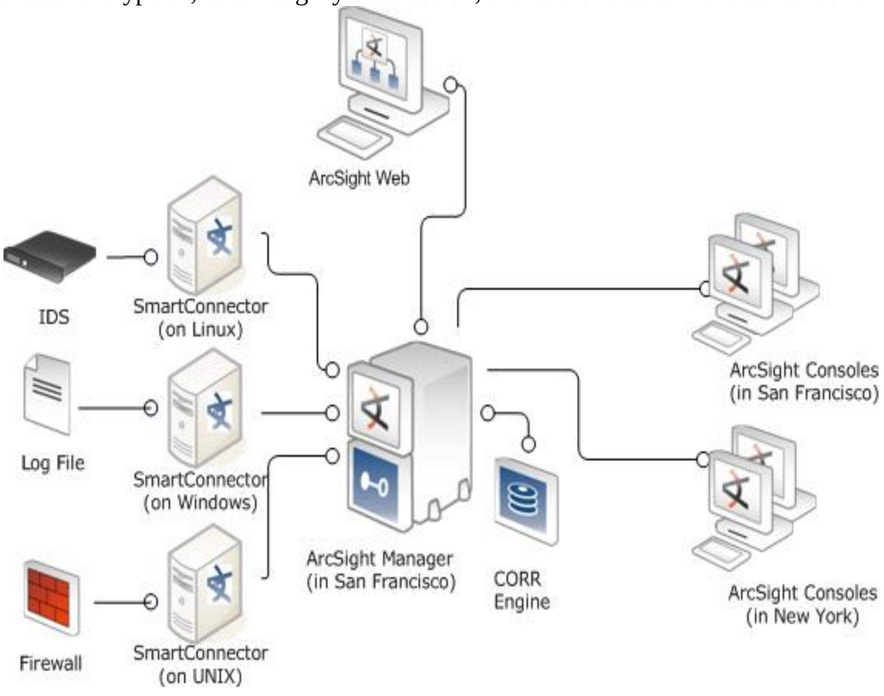
It's basically data storage where events would be stored. Analysis is also possible. We can see the vulnerabilities. But we can't respond to vulnerabilities. Some Organisations just want to use logger for Auditing purposes.

3. ArcSight ESM/MANAGER

ArcSight ESM is a Security Information and Event Management solution that collects and analyses security data from heterogeneous devices on network and provides us a central, real-time view of the security status .It will also give us notification on the console. We can respond through Workflow tools which includes Use Cases, Stages. On the right hand side we can see the Console. It has radar, graphs etc. It also has resources that includes filter, reports, active Channel. Through this we can analyse, notification on mobile, mail we can get.

VI. DEPLOYMENT SCENARIO

This is how I have deployed this Arcsight SIEM Technology to protect from Cyber Attack, Vulnerabilities. ArcSight Console, ArcSight Manager, and ArcSight Smart Connector communicates using HTTP (Hypertext Transfer Protocol) over SSL (Secure Sockets Layer), often referred to as HTTPS (Hypertext Transfer Protocol Secure). The HTTPS protocol provides for data encryption, data integrity verification, and authentication for both server and client.

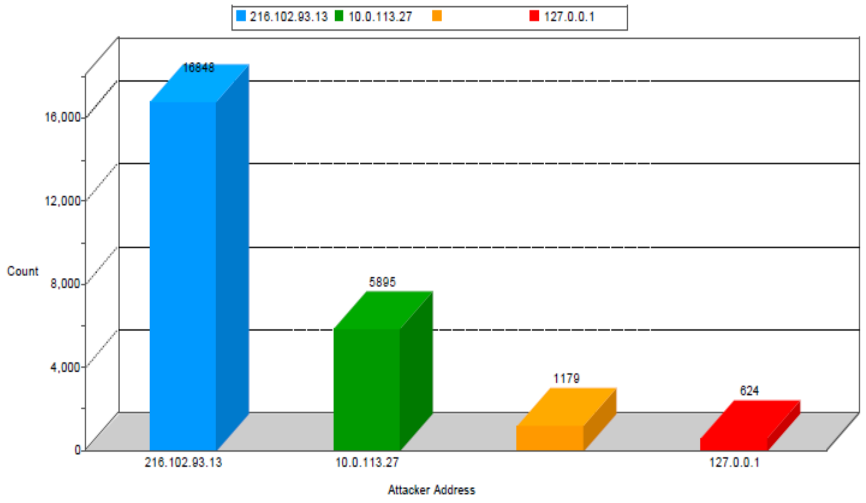

ArcSight Web
IDS
SmartConnector (on Linux)
Log File
SmartConnector (on Windows)
Firewall
SmartConnector (on UNIX)
ArcSight Manager (in San Francisco)
CORR Engine
ArcSight Consoles (in San Francisco)
ArcSight Consoles (in New York)

VII. ANALYSIS

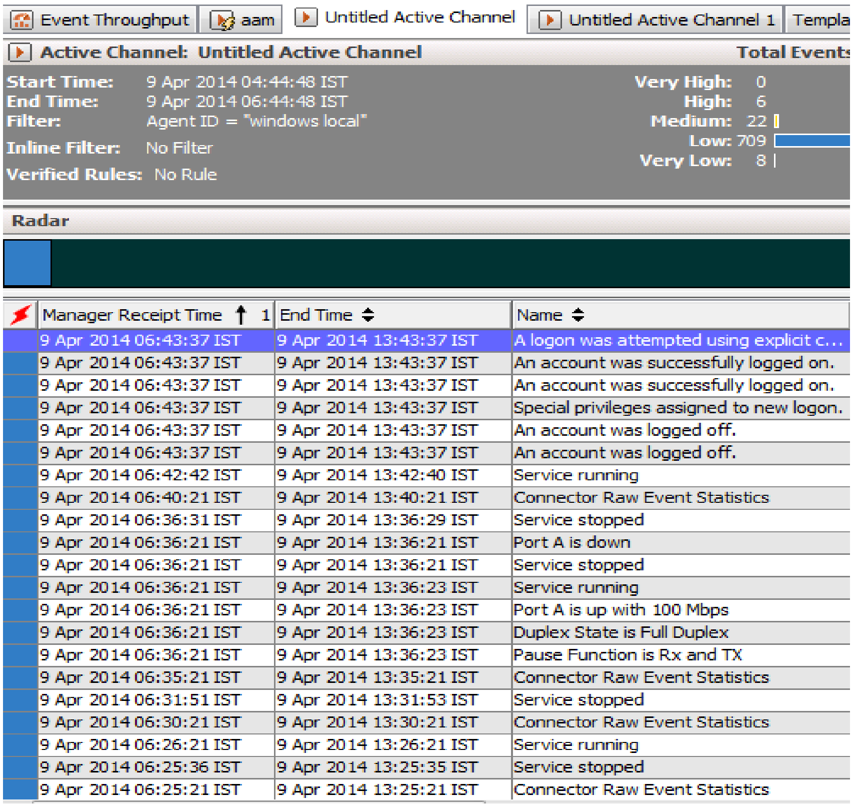
After implementing this technology I have got windows failed logins and notified through mail, and also I have made a report for the failed logon. I have also investigated the failed logins. The failed logins gives the details of Attacker Address and which Target Address the Attacker was targeting to .Even I had deployed this in my laptop to know if someone tries to get false login attempt to my computer .So I will flash out the details of windows failed logins.

12-12-2013-18:30:24 to 12-13-2013-18:30:24

failed login



Above is the Report which includes the Attacker Address, Count and the Target Address. The Red, Blue, Green are the priority rating .It means which is most harmful to our organization then we have to tackle with those attackers. The Report would be forwarded to the higher level or through mail we would be notified about this report.



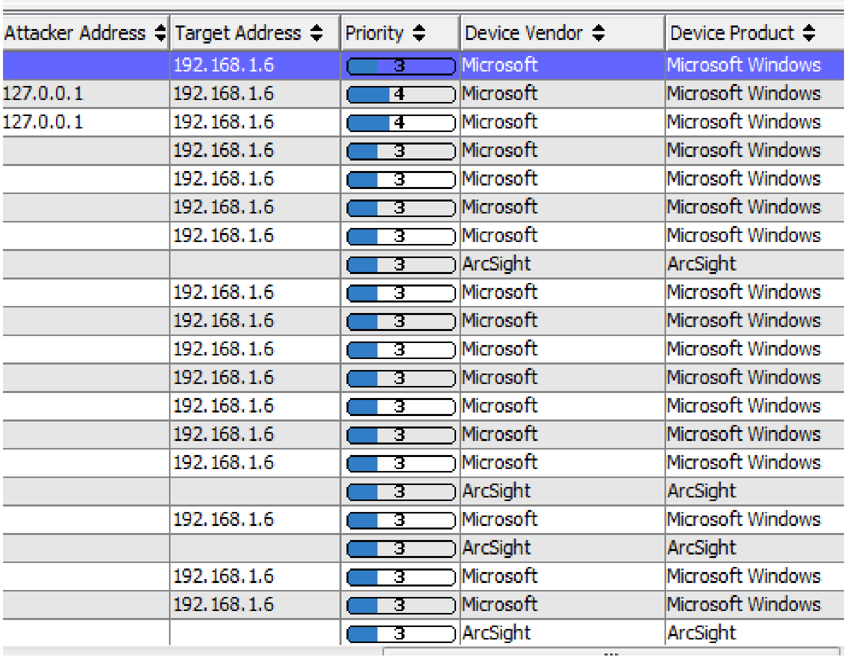
Active Channel: Untitled Active Channel **Total Events**

Start Time: 9 Apr 2014 04:44:48 IST
End Time: 9 Apr 2014 06:44:48 IST
Filter: Agent ID = "windows local"
Inline Filter: No Filter
Verified Rules: No Rule

Very High: 0
High: 6
Medium: 22
Low: 709
Very Low: 8

Manager Receipt Time ↑ 1	End Time	Name
9 Apr 2014 06:43:37 IST	9 Apr 2014 13:43:37 IST	A logon was attempted using explicit c…
9 Apr 2014 06:43:37 IST	9 Apr 2014 13:43:37 IST	An account was successfully logged on.
9 Apr 2014 06:43:37 IST	9 Apr 2014 13:43:37 IST	An account was successfully logged on.
9 Apr 2014 06:43:37 IST	9 Apr 2014 13:43:37 IST	Special privileges assigned to new logon.
9 Apr 2014 06:43:37 IST	9 Apr 2014 13:43:37 IST	An account was logged off.
9 Apr 2014 06:43:37 IST	9 Apr 2014 13:43:37 IST	An account was logged off.
9 Apr 2014 06:42:42 IST	9 Apr 2014 13:42:40 IST	Service running
9 Apr 2014 06:40:21 IST	9 Apr 2014 13:40:21 IST	Connector Raw Event Statistics
9 Apr 2014 06:36:31 IST	9 Apr 2014 13:36:29 IST	Service stopped
9 Apr 2014 06:36:21 IST	9 Apr 2014 13:36:21 IST	Port A is down
9 Apr 2014 06:36:21 IST	9 Apr 2014 13:36:21 IST	Service stopped
9 Apr 2014 06:36:21 IST	9 Apr 2014 13:36:23 IST	Service running
9 Apr 2014 06:36:21 IST	9 Apr 2014 13:36:23 IST	Port A is up with 100 Mbps
9 Apr 2014 06:36:21 IST	9 Apr 2014 13:36:23 IST	Duplex State is Full Duplex
9 Apr 2014 06:36:21 IST	9 Apr 2014 13:36:23 IST	Pause Function is Rx and TX
9 Apr 2014 06:35:21 IST	9 Apr 2014 13:35:21 IST	Connector Raw Event Statistics
9 Apr 2014 06:31:51 IST	9 Apr 2014 13:31:53 IST	Service stopped
9 Apr 2014 06:30:21 IST	9 Apr 2014 13:30:21 IST	Connector Raw Event Statistics
9 Apr 2014 06:26:21 IST	9 Apr 2014 13:26:21 IST	Service running
9 Apr 2014 06:25:36 IST	9 Apr 2014 13:25:35 IST	Service stopped
9 Apr 2014 06:25:21 IST	9 Apr 2014 13:25:21 IST	Connector Raw Event Statistics

I have collected the details of the logs who have tried so many times to open my Account with the multiple false password or we can say Brute Force Attack. So we can see in the above and below the details of Attacker Address as well as the Name the end time, Manager Receipt Time. We can see all the details related to the Attackers as Mentioned. Some raw events that we have received from different Sources would be normalized so that we can go through with the details of the event and who actually have tried to get the password details using Brute Force Attack.



Attacker Address	Target Address	Priority	Device Vendor	Device Product
	192.168.1.6	3	Microsoft	Microsoft Windows
127.0.0.1	192.168.1.6	4	Microsoft	Microsoft Windows
127.0.0.1	192.168.1.6	4	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
		3	ArcSight	ArcSight
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
		3	ArcSight	ArcSight
	192.168.1.6	3	Microsoft	Microsoft Windows
		3	ArcSight	ArcSight
	192.168.1.6	3	Microsoft	Microsoft Windows
	192.168.1.6	3	Microsoft	Microsoft Windows
		3	ArcSight	ArcSight

These all are the details of the Attacker address and related to the vendor and which services we are using.

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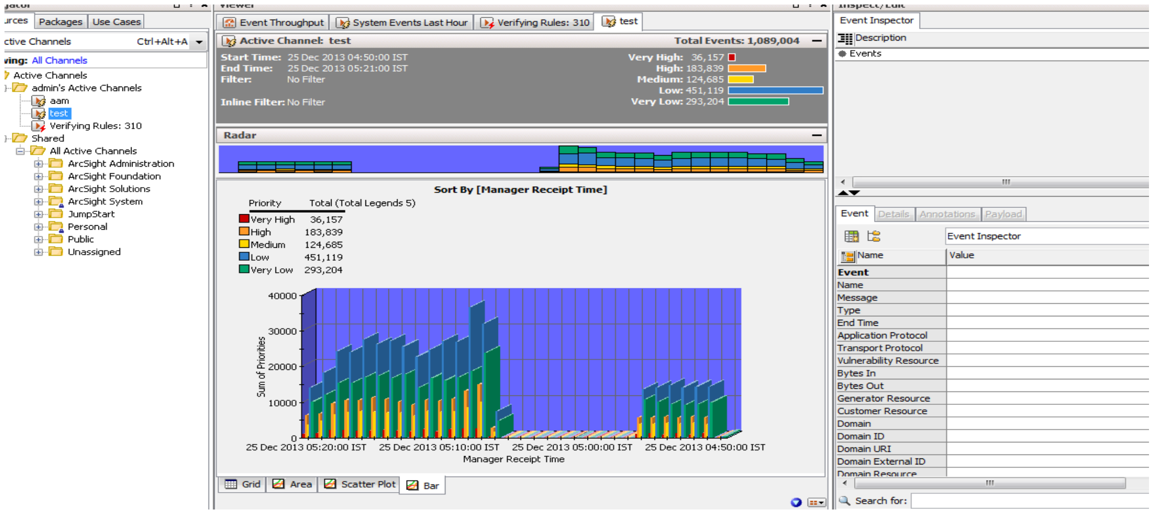


Active Channel: test Total Events: 1,089,004

Start Time: 25 Dec 2013 04:50:00 IST
End Time: 25 Dec 2013 05:21:00 IST
Filter: No Filter
Inline Filter: No Filter

Very High: 36,157
High: 183,839
Medium: 124,685
Low: 451,119
Very Low: 293,204

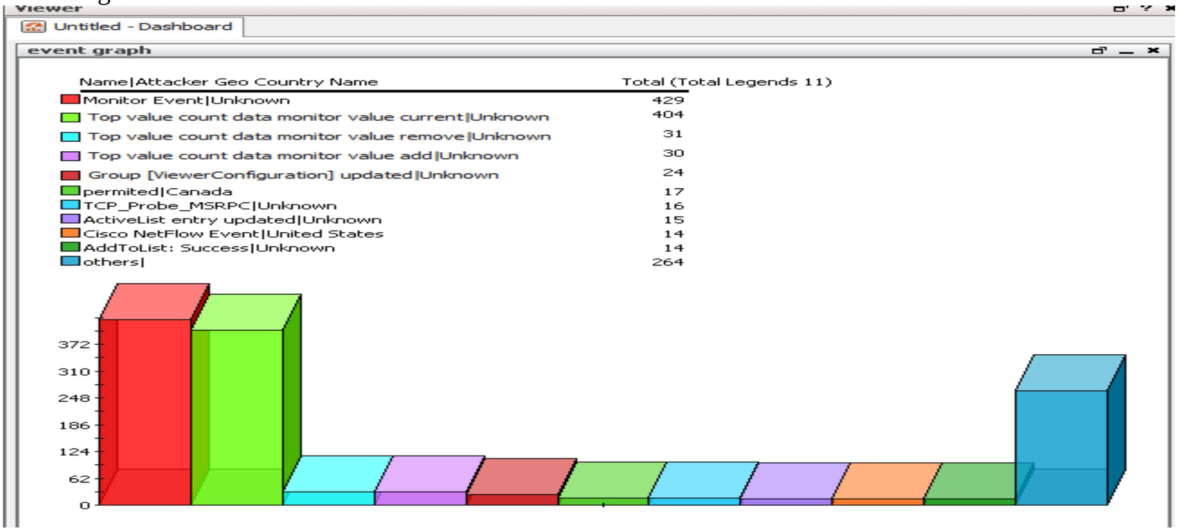
Sort By [Manager Receipt Time]

Priority	Total (Total Legends 5)
🟥 Very High	36,157
🟧 High	183,839
🟨 Medium	124,685
🟦 Low	451,119
🟩 Very Low	293,204

Event Inspector

Name	Value
Event	
Name	
Message	
Type	
End Time	
Application Protocol	
Transport Protocol	
Vulnerability Resource	
Bytes In	
Bytes Out	
Generator Resource	
Customer Resource	
Domain	
Domain ID	
Domain URI	
Domain External ID	
Domain Resource	

This is Arcsight Console where I have captured the details of various events in a Bar Chart. We can also see the details of these chart in various format like 3D Chart, Pie Chart .With the details of all the event severity. How much is that particular data is severe for our Organization. Priority includes the color coding as we can see above with Very High priority is there. It means we need to deal with the highest priority first so that no further loss of an account details we would be facing.



Name|Attacker Geo Country Name	Total (Total Legends 11)
🟥 Monitor Event|Unknown	429
🟩 Top value count data monitor value current|Unknown	404
🟦 Top value count data monitor value remove|Unknown	31
🟪 Top value count data monitor value add|Unknown	30
🟥 Group [ViewerConfiguration] updated|Unknown	24
🟩 permited|Canada	17
🟦 TCP_Probe_MSRPC|Unknown	16
🟪 ActiveList entry updated|Unknown	15
🟧 Cisco NetFlow Event|United States	14
🟩 AddToList: Success|Unknown	14
🟦 others|	264

Above is the Dashboard where we can monitor our organization and even respond to any vulnerabilities .We can see the details in Bar chart of an organization. With an Event Name as Group is with the highest priority we need to deal with .After this we escalate to higher level where first events would be annotated then there will different stages to check the details of the Attacker through various stages . If the people from Admin Department find something very severe they will notify us about the attacker either through mail or they will text us.

VIII. CONCLUSION

In this paper I have shown that how we can monitor after collecting the data from different sources like security devices –firewall, IPS etc., Databases-MY SQL, Oracle etc. and would be informed about the hackers when we would be going to be hacked or being hacked .Implementing this technology will help us identify and prioritize threats. Fraud detection and forensic analysis can also be done by using this technology .I can say that by using this technology we can be relaxed as we would be getting notification either through mail or Text message on the registered number. Even if third person tries to modify the data then we would be informed .I am still working on to strengthen our security by integrating ArcSight SIEM with an existing security, Databases etc. of an organization.

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