

Cloud Access Monitor

Project report

submitted in fulfilment of the requirements for the Degree of

BACHELOR OF TECHNOLOGY

By

Ikjot Singh (151239)

Under the supervision of

Ms Shikha Singh



Department of Computer Science & Engineering
JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY,
WAKNAGHAT

Candidate's Declaration

I hereby declare that the work presented in this report entitled “Cloud Access Monitor” in fulfilments of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering** submitted in the department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is an authentic record of my own work carried out over a period from February 2019 to May 2019 under the supervision of **Ms Shikha Singh (Tech Lead, Kuliza Technologies Private Limited)**.

The matter embodied in the report has not been submitted for the award of any other degree or diploma.

(Student Signature)

Ikjot Singh (151239)

This is to certify that the above statement made by the candidate is true to the best of my knowledge.

(Supervisor Signature)

Ms Shikha Singh

Tech Lead

Kuliza Technologies Private Limited

Dated:

ACKNOWLEDGEMENT

The completion of project and challenge depends upon the coordination, combined efforts and coordination of many people and many minds come together. I am thankful to my mentor and guide Ms Shikha Singh for her efforts she put in with me to give me right direction while doing this internship project and her valuable advice which will help in long run of my career. I am very much thankful to her and in her debts for providing me guidance for this project.

I am also very thankful to Mr. Uday Kiran Reddy (Director Manager, Kuliza Technologies) and all the fellow team members for their extremely large cooperation and motivation for to do well in this project.

Thanking you,
Ikjot Singh (151239)

Table of Content

1. Chapter 1 INTRODUCTION

- 1.1 Organization
- 1.2 Roles at Kuliza
- 1.3 About Kuliza's Digital Lending Suite
- 1.4 Overview of Project
- 1.6 The Problem

2. Chapter 2 LITERATURE REVIEW

- 2.1 System Requirements and Analysis
- 2.2 Tools used in Cloud Access Monitor
- 2.3 Language and Technologies Used

3. Chapter 3 SYSTEM DESIGN

- 3.1 Design

4. Chapter 4 ALGORITHM & PERFORMANCE ANALYSIS

- 4.1 Overview
- 4.2 Cloud Access Security Broker
- 4.3 Cloud Application Conformity
- 4.4 Protection against the Malware & Other Threats
- 4.5 Data Loss Preventions

5. Chapter 5 CODE REVIEW AND TESTING

6. Chapter 6 CONCLUSION AND FUTURE SCOPE

List of Figures

Figures	Name	Page No.
Figure 1	Work Flow	13
Figure 2	Firewalls	15
Figure 3	UX Topography	22
Figure 4	Unshare User Popup	23
Figure 5	License Details	24
Figure 6	Filter Restrict Files	25
Figure 7	Cloud Providers	25
Figure 8	Summary Page	26
Figure 9	Schedule Reports	27
Figure 10	Files And Folders	27
Figure 11	Emails Data	28
Figure 12	SharePoint Data	28
Figure 13	Apps Access	29

ABSTRACT

This report covers immensely crucial web application which I got chance to develop in my internship where I have learnt a lot this project is basically an idea of both Kulizain as well the client we have and together we have developed and immense important and essential product which will not only help the organization to keep a check over there users as well will help the users who wants to exploit the resources they get through the organization. This product is mainly used by the schools and college of United States as the client is from there. Students have more tendency to do unwanted which should not be done within the premises of the campus as well with the resources of the organization. Need of this product was that student use to access unwanted sites which make the organization data vulnerable as using the business emails on the phishing site can cause the confidential data to get leaked which can be used again the company or a school . There were many instances were bully abuse and other unwanted thing we done through emails which goes untreated . Any student having suicidal thoughts and writing a diary onto the file in cloud can never get accessed and which can cause a loss of life. But now this product can help each and every person in one or the other way. More details are in this project report

CHAPTER 1

INTRODUCTION

1.1 Organization

Kuliza Technologies Private Limited is a Software solution organization headquartered in Bangalore, Karnataka. They offers end to end software solutions to their clients which is enables with design, social apps, social CRM tools, like ZaMobiles, build online communities and networks, user to conceptualize and social commerce platforms which allow everyone build and design application for mobile devices, iOS services and enhance existing application on internet. Za Cloud which have customers through each process from there cloud blueprint which can help their users, explaining the architecture of cloud services and the migration of their product from servers to cloud and monitoring and managing there application remotely. The organization also have an expertise in cloud consulting applications, and there development of cloud based softwares also architecture design for cloud and development.

Kuliza is also working with many national and international banks and big companies in finance market for transforming them to digital and use their technology to build the overall performance and for reaching mass customers and have profits for both the parties. It works on transformation solutions to helps design and build end-to-end softwares are lending companies as well as investors. They are mostly working in finance sector in Mutual Funds,

Digitally equipped lending platforms, and Insurance platforms too. Based in the Silicon City of India ie. Bangalore, they have been working with more than 80 global organization and startups and still doing for the last twelve years from their existence. They have launched nearly 120 products in the tech market and for the customers in the market. Our customers consist of gLOBAL Two Thousand enterprises and F500 also such as Best Buy , Bosch, Myntra, For , HDFC life UTC, Asianet, Titan, Nissan, Vistara Airlines and Intuit and much more. In addition to that startups which are growing which a fast pace also our customers. Some are Connect and sell, Flipkart, Urban Ladder, Quikr, Managed Methods. Our professional and skilled team of engineers and manager includes Data analyst, developers, testers designers and Data specialists who are expert in their respective department and are bleeding and cutting edge of mobile and web applications. The casual environment of the organization adds up to the productivity and boost it up to a great pace where all can work with their top mind set and perform well . No boundation of time and flexible working hours is a great asset for this organization which helps the individual to grow his career and also progress in his personal

life. Their own product LendIn is doing great in the market and making a talk in finance department.

1.2 Roles at Kuliza

There is a huge development, testing, architecture, design, and deployment team spread across geographies who develops and maintains the backend software system for E-filing suite of products. Kuliza is working behind system and developing software solutions. To be more specific, Kuliza working with E-filing module, It is US Business module, for small and medium enterprises (SME or wholesale). Means they deal with customers who are more like a customer-group or the people in a small/medium sized organization globally.

A developer

A developer is a techie who knows and is expert in new cutting edge technologies in the market and is able to build an excellent product from his knowledge. A developer in Kuliza, person must be enthusiastic to work and learn continuously. He/she must be inspired by technologies around them. Each and every individual will get a chance to build and lead the development in Restful APIs, Front End Development, Back End Development, mobile Apps.

A Designer

Designers should have a understanding in detail of how they should design interface which is user understandable and features should be recognized easily by users so that user can take benefits from the product to their fullest. A Designer should design in an interactive way and it should look good and cover all the features in the UX.

A Program Manager

The core of any successful team is their management and a good management decides whether a team can work together and can show a positive vibes or not. The task is not only just to relax and give command but is to know and sit down with the client and know the requirement and vision they have with the product. They should be equipped with high end knowledge to understand both real world scenarios and converting them to a product which can help the client.

1.3 About Kuliza's Digital Lending Suite

Kuliza's Digital Lending Suite is engineered to use already build components and Internal Protocol to solve critical business problems and help a financial organization to help and benefit their customers in a better way. Digital Lending Systems comprises of smart engines which automates and streamline end-to-end loan process handling numerous problems in loan giving and complications in delivering a straight and simple process of loans with minimal or

no background check and processing which take enormous of time of both the parties which may result in loss of a valuable customer. The platform on which the product is build is a highly secure platform which enables integration seamlessly with the other applications and integrate them easily and and contains an ability to launch new loan projects with an agile development models. The idea of scaling up, to evolving and always enhance the direct to customer platform is done using Digital Lending which is brought live.

Kuliza Technologies Digital Lending Products consists of the below mentioned major modules which are currently being built.

1. Digitally Loan Orientation System
2. Integration Broker
3. Intelligent Credits Engine for Loan
4. Analysis of Lending

1.4 Overview of Project

Cloud Access Monitor is a project in which we develop cloud security product which is used to help the admin govern , find and discover and protect the other user under them in the organization which uses the cloud services within organization. The company's products include Cloud Security Gateway that secures enterprises to cloud access, and connects with partner and customer applications outside network; Cloud Service Discovery that discovers and analyzes cloud usage to quantify and reduce the risk of enterprise cloud access, while supporting audit and compliance; and CAM provides organization with a vision into the use of the cloud services and malware and harmful content related with the items in them using sanctioned and unsanctioned cloud products. Its solutions include cloud security risk reduction, cloud access security broker, discovery and shadow IT, cloud access risk evaluation, discovery and visibility of application programming interface (API) users and services, and enterprise cloud security demands API visibility. The company was founded in 2005 and is headquartered in Boulder, Colorado.

1.5 Problem Statement

In today's world and in near future each and every organization including schools , colleges, business organization , universities will be using cloud based services and also integrating them to their daily use for better performing of their users and organized way of functioning of the group. It is not only great for a systematic functioning but also increase and give a boost in efficiency and productivity and better utilization of time. But on the other hand, a lot of data

will be flowing around among different application. And the organization head and Information Technology department has to take care about and have to keep a check over it and suppose to track each and every cloud- service providers, web applications, mobile applications and all the items and data users are using. There could be a lot of unauthorized content for example there could be adult or pornographic content which is legal in many countries but not allowed in organization premises. There could be phishing and risky content in a file which can extract confidential data from the system and exploit outside. To keep a check over these problem and give the admin total control over the data within organization this product is being build with a vision of cloud security.

CHAPTER 2

LITERATURE REVIEW

The chapter provides a brief overview of the project, which involves a description of the business problem and how the product provides a solution to it. The chapter concludes with a description of the Tools & Technologies used in the project.

2.1 System Requirements and Analysis

System requirement and analysis is a way of analyze the product we are building with a visionary goals of enhancing continuously in the journey of product. In different words, system analyzation includes proper research of the product and clearly know what we want to build and have a clear cut knowledge how successfully we can do that for a betterment of an organization and design it accordingly with our thoughts and experiences and continuously look for modification in the product which can help us to keep up to the fast growing technical industry. A product consist of inter related and integrated modules or parts which when we put together with each other performs well without any discrepancy and achieve our main goal or already determined objective.

2.1.1 System Requirements

A major part in building a software project is to take out the right requirement from the clients and know which requirement are possible to build and which are not because un achievable requirement can cause huge amount of human resource loss as well as capital loss. Customers or Clients only have a vision for the product they want to from that product and what need to be an end result. Sometimes they even don't know what and how the product will be build just a vision which creates a difficulty in understanding. Not complete information , redundant and ambiguous or even things which contradict each other requirement can cause failure in product building life cycle. Frequent change in the requirement also a major factor. So requirement should be recognized by someone who is experience in the industry and can a deeper knowledge on what's there in clients mind.

The proposed system is intended to present its users with an easy way to understand the information related to issues and their action plans to which they are entitled to. The users of the system have some fair idea about the graphical interface from the existing system. This system must be made generic and configurable in such a way that different components can be added or removed on the go so that the same interface is available for large number of firm applications.

2.1.2 System Analysis

The objective of system analysis is to know that from which part the situation is being arising and attempting to fix that particular problem in the system. This process includes breaking the system into smaller modules and learn which module is malfunctioning and analyze the ultimate goal and what we need to form and create and which direction should we make an attempt to involve customer so that exact requirement can be specified and definition should be clear to everyone. As a part of system analysis, those three major requirements were broken down into smaller tasks.

2.2 Tools used in Cloud Access Monitor

The following tools / software's are used by different teams during their Software development lifecycle and we use these tools to extract data from and then calculate the metrics discussed above:

2.2.1 GIT

Git is a system which is version controlled (VCS). It is used when many developers are working on a particular project and it is difficult to share the data and changes and new feature to share to everyone through external devices and there could be many conflict and everyone doesn't know the changes done by someone else. It tracks all the changes done in a project files and coordinates on those files between multiple developers or users. It is basically used for software development and reduces the messiness in development process.

2.2.2 Perforce

Perforce is a product which is used commercially by many organizations. It basically compares the changes in a file and its previous version so that a developer can check and see which changes are needed to keep and which are needed to be discarded. With this proper comparing tool and a version control helps a developer and reduce the load of maintaining the changes in the development.

2.3 Languages/Technologies Used

2.3.1 Java

Java is programming language for a computer which is general and easily to understand for normal human. It is concurrent ,object -oriented , basically class-based architecture and essentially is designed to have as less as possible dependencies on other as possible. It is intent to let the software developer and mobile and web developers write on a single system and run anywhere on any machine as this language is platform independent which makes it more portable and easily used for many wide variety of machines. It run over Java Virtual Machines (JVM) which helps to be a platform independent. It don't need recompilation on each of the machine we need it to run on. Application on java are basically compiled to byte code which can execute on any JVM . JVM is a virtual machine over a host machine which includes all the requirement to run an java application and code without any external softwares require and without compiling it again and again. Java is the most used language among all the language and the most popular among the developers and it's so vast that it covers every aspect of programming. It can also make an application which are client-server application using servlet. Java was created by James Gosling and was created in Sun Microsystems in early 2000 and was released in 1995.

2.3.2 JavaScript

Javascript is not a programming language but a scripting language which earlier was used in client side scripting only. But with the introduction of NodeJs it is also being used on server side scripting language as well. Scripting language means it can be integrated with other language and doesn't need any other platform to work. At client side the code can be integrated within the HTML page. When a end user make a request through browser a HTML page pops up which already have javascript written in it what we see is the mixture of both javascript as well as HTML page. While loading the page we can only view the HTML but the javascript code is send to the browser and it runs the code accordingly and shows the desired HTML and data onto the screen.

The drawback can be that the scripting code is is attached within HTML page so anyone can get access to that code and copy it for whatever they want to do which can harm the backend of the web application also if got in hands of a potential hacker. Javascript can be manipulated to affect the backend working as it can be viewed and modified.

This language can be used in others ways and contexts rather than just in a web browser. Many organization has created server-side js as g CGI programming language which can do a same

work as of ASP and perl and many other languages. JS can be used to write complex and real programs on the server-side as well. However that site uses exclusively javascript in the web browsing.

2.3.3 Git

Git is a system which is version controlled (VCS). It is used when many developers are working on a particular project and it is difficult to share the data and changes and new features to share to everyone through internal and external devices and there could be many conflicts and everyone doesn't know the changes done by someone else. It tracks all the changes done in a project's files and coordinates on those files between multiple developers or users. It is basically used for software development and reduces the messiness in the development process.

2.3.4 jQuery

jQuery is a feature-rich, tiny, so fast JavaScript library which can be integrated into JavaScript code to make it more faster and more readable and works better than a simple JavaScript code. It makes other HTML code event handling, traversal of document and manipulation of the document and specially the AJAX part more simpler and very much easy to use for any frontend developer. The Application Program Interface commonly known as APIs which works in multiple web browsers. The combination of extensibility and versatility of jQuery with JavaScript, it changed the process of code writing for enormous numbers of developers who write the code in JavaScript. The main objective of jQuery is to create an application which is much lighter and easy to use in our web applications. Common tasks which require enormous numbers of lines of code to achieve in simple JavaScript can be completed within one or two lines of code if we use jQuery. Many more complicated and sophisticated things in JavaScript are made simpler by use of jQuery; some of them are DOM manipulation and real-time updation of pages like AJAX calls.

The purpose of jQuery is to make it much easier to use JavaScript on your website. jQuery takes a lot of common tasks that require many lines of JavaScript code to accomplish, and wraps them into methods that you can call with a single line of code. jQuery also simplifies a lot of the complicated things from JavaScript, like AJAX calls and DOM manipulation.

The library of the jQuery package has the following features to enhance the performance :

- Manipulation of DOM or HTML
- Manipulation of Cascading style sheets
- Methods of events in HTML that occurs in web apps
- Real-time animations and effects including GIFs

- Asynchronous javascript and Xml calls

2.3.5 AJAX

Ajax Stands for Asynchronous javascript and XML which is a programming language like javascript or java. It is a concept which helps in loading a page faster and real time data change can be shown onto the page without refreshing the whole page again and again. Ajax is client side scripting which continuously connects with the server/database and client to and from without any need of complete refreshing a page and postbacking. The ultimate definition for ajax which can describe it properly is “the method of exchanging data with a server, and updating parts of a web page – without reloading the entire page.”

Asynchronous Javascript and xml is itself a common terminology for different techniques which is used for making a connection to web application servers dynamically with no requirement of loading page multiple times or without multiple pages. It calls the page dynamically and make use of XML Http Request objects to communicate with the backend/server side via Js language only.

2.3.7 JSP:

JSp Stands for Java Server Pages which is also again a server side programming language or rather a technology which is use to enable the creation of platform-independent for creating a web applications and also it is dynamic. Java server pages have accessibility to entire java program or family including java Apis and moreover the Java DataBase to authorize organization databases . WE can include Html code in jsp as we can include Javascript code in html which have the right s to access all java apis. Javascript is mainly useful in the application where we need a pages of website dynamic.

2.3.8 Trello:

Trello is a tool or a web application provided for managing project small task and divide each task . Through trello a manager can handles any task easily and also keep a check over the progress of the task as he like and view it. It organize our product development and create a board according to our choice which is very easy to maintain. In a minute it can shows who is working on what task and what has been completed when and when something is been create and at what stage a task has been reached it is a complete managing tool to organize someone and a project too .

CHAPTER 3

SYSTEM DESIGN

3.1 System Design

In systems design the process the operations the functions of design should be described in through so that each and every can understand it properly and work according to the need and to not waste the time in understanding the actual requirement of the project. It should include each and every aspect and nothing should be left behind which can create a problem in developing and the result can be differ from what is being demand. It should contains proper documentation of each and every requirement , screen layout and process design patterns , Business rules are must and should be included in them, and also the flow or the process diagrams. The resultant of this process will be explains the the new system as a collections of different package and modules and subsystem as modularity in a product is must for every project to be successful in long run, The input to the design stage is the requirement we got initially to build the product and an approved document should be created. For each and every requirement more than one design should be created so that if one fails we have an alternative Design defines the software features and what and how our product will look like and includes diagrams and flowchart and the layouts and all the other diagrams. Less and not a proper details in design can cause heavily to the both parties and scheduled work cannot be processed properly.

JavaScript Dashboards

Front-end is designed using Javascript Software. Dashboards are created which contains charts corresponding to various metrics. In ABSC, following five dashboards are used to display metrics for Cost, Delivery and Practice:

Dashboard – All Metrics

It contains few important metrics related to Cost, Delivery and Practice such as Cost/Story Point Jira (Hrs) and Cost/User Story Jira (Hrs) for Cost metrics, Avg. no. of Commits, Avg. Pull request duration (hrs) and Avg. no. of commits per Story Point for Delivery metrics, and No. of Issues with missing Assignee, Time Estimate, and Story Points for Practice metrics.

Git Dashboard

It contains following graphs to represent Delivery metrics w.r.t. Git:

- o Stash metrics Over Time
- o Percentage Change – Git
- o No. of commits per story point over time
- o Frequently Changed files – Git
- o ServiceNow Incidents & TCM Changes over time

Perforce Dashboard

It contains following graphs to represent Delivery metrics w.r.t. Perforce:

- o Percentage Change – Perforce
- o Frequently Changed Files – Perforce

3.4 System Development Platform

Hardware Specification

Processor	Intel Core i5
RAM	8 GB
Hard Disk	500 GB
Monitors	15 Inch(1920*1280)

Software Specification

Operating System	Windows 7
IDE	Eclipse
Visualization Tool	Jquery Software
Database	Mysql,Google Cloud Store

CHAPTER 4

ALGORITHM & PERFORMANCE ANALYSIS

4.1 OVERVIEW

Managed Methods Incorporated is a US based Cloud security organization which provide cloud security to other organization. The company's products include Cloud Security Gateway that secures enterprises to cloud access, and connects with partner and customer applications outside network; Cloud Service Discovery that discovers and analyzes cloud usage to quantify and reduce the risk of enterprise cloud access, while supporting audit and compliance; and Cloud Access Monitor is a project in which we develop cloud security product which is used to help the admin govern , find and discover and protect the other user under them in the organization which uses the cloud services within organization. The company's products include Cloud Security Gateway that secures enterprises to cloud access, and connects with partner and customer applications outside network. Its solutions include cloud security risk reduction, cloud access security broker, discovery and shadow IT, cloud access risk evaluation, discovery and visibility of application programming interface (API) users and services, and enterprise cloud security demands API visibility. The company was founded in 2005 and is headquartered in Boulder, Colorado. When the data is out of the corporate range , maximum of the companies or enterprises specially schools and colleges lose all the track of the essential data , from where it has arrived into the organization and where is has gone which create a major threat to the data security and integrity of the organization and not violates the non disclosure agreement of the organization. CAM lets the organizations and other institute from a corporate company to a learning school secure their valuable data on different cloud platform like MS graph Google drive , Dropbox, Slack , One drive or team drive and through this software you can have a type of quality check over the incoming and outgoing data through your organization. Which user has logined in which app who have save abrupt files in there cloud and what not. It also helps the owner or admin of any organizations control the use of there cloud services provided to their users and calculate risk a particular file or user is having in there cloud logins and can be remotely perform actions on them.

4.2 The Solution and Requirement

We believe that securing your cloud applications should be easy to install, require no infrastructure changes and have zero impact on your users' experience. So we created our cloud-native security solution to help organizations of all sizes easily secure their cloud data.

As the client is from United States of America, to access the code based we need help of Virtual Private Network (VPN) to access them as our location is in India. So we use software like Global Protect Vpn which was provided by our client and also suggested by them only. We use gitlab as our git repository which is a paid version and provided by the company itself. The programming language for the backend purpose is in core Java only and the frontend is basically on javascript jsp and ajax which is being shifted to react js for dynamic loading of a page. The software used for database is Mysql and mysql workbench for viewing.

How Does it Work?

- A single, cloud-based security system without the need for proxies, agents and virtual appliances.
- Continuous visibility and control across your organization.
- Automatic policy enforcement & control.

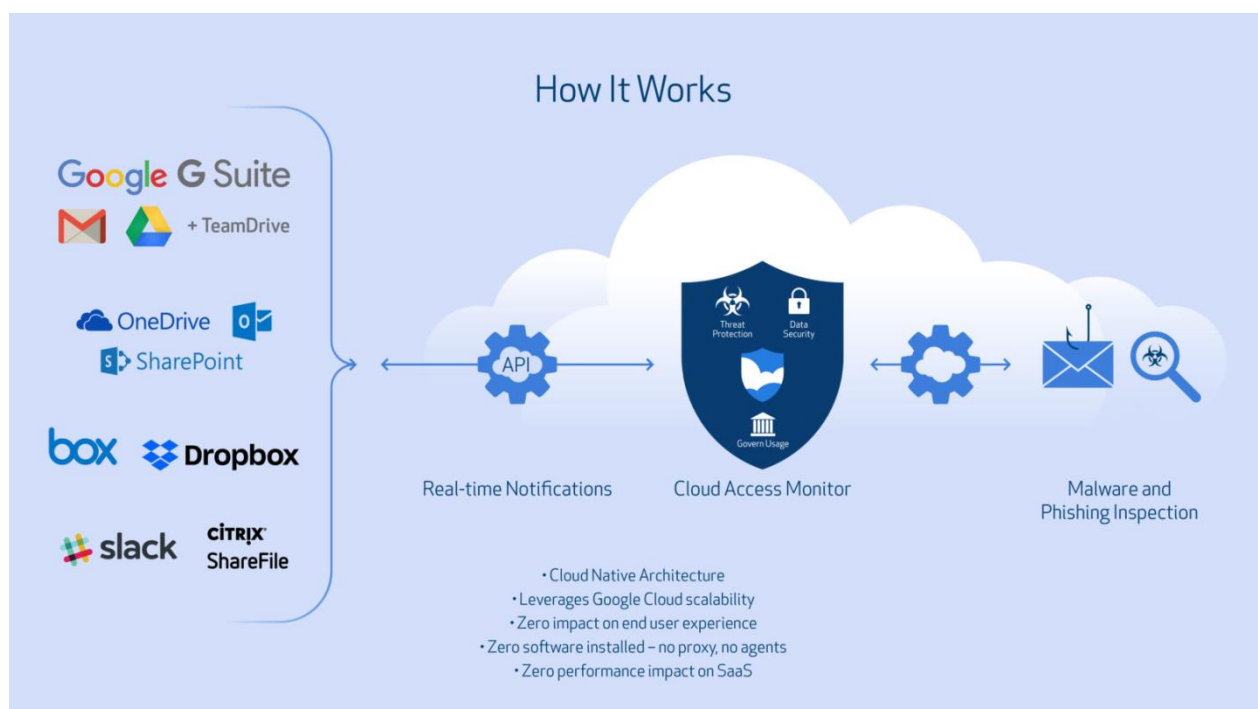


Figure 1 - Workflow

4.3 PROBLEMS WE SOLVE

4.3.1 CLOUD ACCESS SECURITY BROKER (CASB)

CASB is other name for Cloud Access Security Broker. The term is used vastly which is in the market for several years and still going in as one of the most important product in the market. It is mostly among vendors of security , online media and experience analysts who are exploiting it or rather we can say misusing it for their own cause and making it for sophisticated

and confusing to understand. To remove the complexity we simply call it as “Cloud Application Security”.

Rather than the other solution which required other tools like Complicated licensing of many different technologies , agents at the end points and proxies for vpn which may cost a lot , we have a strong belief that protecting your cloud services like Microsoft oneDrive , Msgraph , Sharepoint ,Google Drive and G-suite, Dropbox and other popular services which are cloud based.

4.3.1.1 Why Do I Need a CASB?

In today's world and in near future each and every organization including schools , colleges, business organization , universities will be using cloud based services and also integrating them to their daily use for better performing of their users and organized way of functioning of the group. It is not only great for a systematic functioning but also increase and give a boost in efficiency and productivity and better utilization of time. But on the other hand, a lot of data will be flowing around among different application. And the organization head and Information Technology department has to take care about and have to keep a check over it and suppose to track each and every cloud- service providers, web applications, mobile applications and all the items and data users are using.

To solve this problem the CASB software is introduced which provides a platform for the organization to keep a check on the content within their boundaries of organization. It control across a application which is on cloud and visibility over the data. It collect and come together the all the security aspects of the cloud based services and manage and detect and enforce , control it in easy way which is also user understandable if the person does,nt have the knowledge of basic of cloud services.

4.4 CLOUD APPLICATION CONFORMITY

The dependability conformity rules within all the cloud service providers and cloud data storage providers is next to impossible especially for Google G Suite or Microsoft Graph, Google Drive or any other provider. This Product just take fews minute for any individual to set up and there is proper guidelines related to it available to start a seamless and easy monitoring of your cloud application.

It require a deep understanding for regular conformity of the events happening in cloud some of them are like sharing of data and files among different users or downloading or uploading

a file among machine and cloud data storage softwares. The data in them are private for an organization and no one can share it among others without consent of the admin or the owner so monitoring these events becomes extremely important. This task should be done effectively and as earliest as possible which is done by our product in real time. It mandates in any provider through a process which is called as DLP also know as Data Loss Protection

- Monitoring data in real time without any delay - through check is done and packet is inspected deeply and collects the crucial information about the events occur and every files content. It also detect the file containing some security risk of Personal Identifiable Information(PII), Peripheral Component Interconnect and confidential data like credit cards or bank account related information .
- Detection of use of service which are not identified by the organization or the location. This product alert the admin about the unauthorized and other activities done by the user or any other which could be suspicious for the company and they can double check the authentication of that particular user.
- Automatic working of behaviour of non compliant and filtering it out. Admin receive proper alerts and notifications through email and other platform about the action that are perform if certain law or policy is broken by any file and it can be viewed onto our application also.

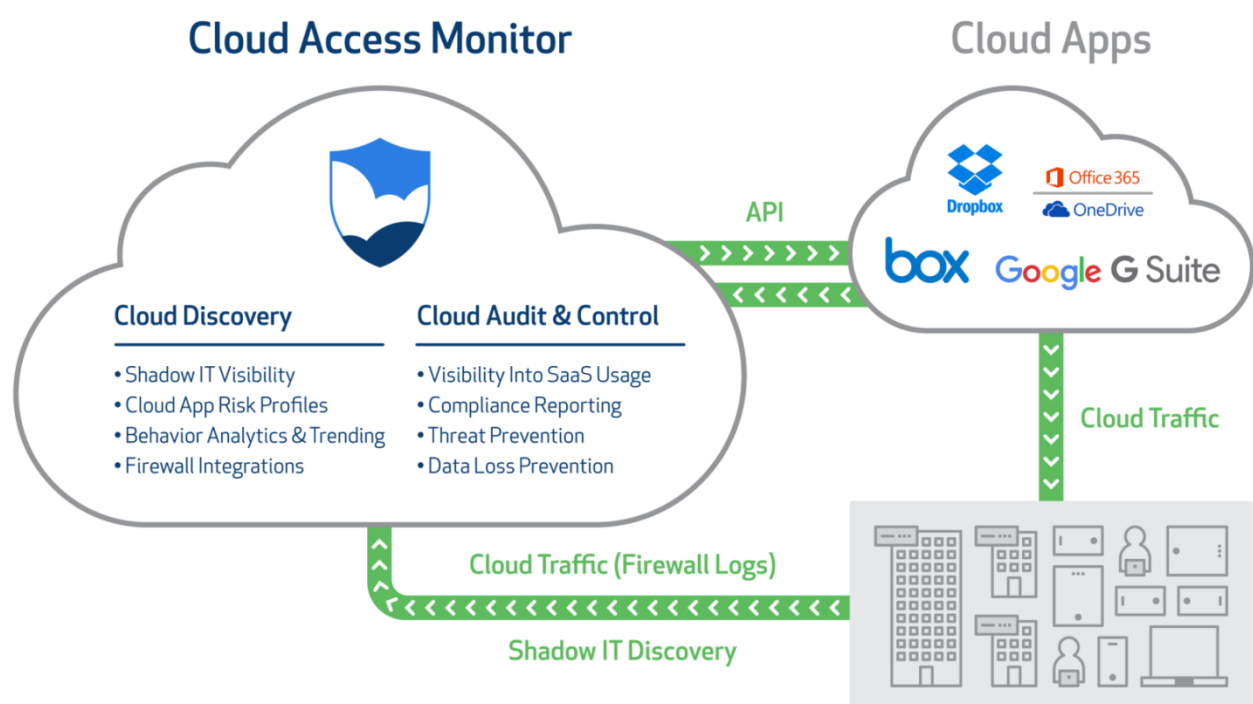


Figure 2 Firewalls

4.5 PROTECTION AGAINST THE MALWARE AND OTHER THREATS IN CLOUD

4.5.1 THE THREAT FROM INSIDE

There could be many threats from inside to a particular organization which solely depend on the users they have. If it is a student organization the exam papers or something irrelevant files and content can be a threat to the dignity of the organization. From a business perspective if users share a confidential file with outside user that can breach up to a great extent and cause many folds to organization which they need to keep a check on. Transferring files secretly to other and unauthorized devices may cost a lot. Commercial enterprises are most likely to face these type of problems malware virus files or any phishing urls.

4.5.2 ACTIVE MALWARE AND THREAT PROTECTIONS

Whether the threats are unintentional or other it will cause huge to business if breached the data which may result in loss of huge capital or objects from the rival companies and cloud access monitor can check all these behaviours easily and can provide a user understandable view to the owner. Utilizing dynamic malware and threads observing strikes the ideal harmony among security and convenience. With the help of project and finding out the attempts of exploiting and making data vulnerable at an early stage and prevent happening this. It prevents the forceful injection of attacks before there could be any possibility so the people responsible of security can act early and they actual measures. When there something suspicious detected we will get notified.

- An abnormal behaviour of a file can be detected then actions can be performed.
- User can be defined to login from a particular geographical area which a organization feels is fine and will block the other access to the cloud services.
- In case an events has occur on a file specially downloading of a file or uploading of any file
- The actions also depends upon how sensitive is the data and some person information should not be shared in the files or emails.
- The metadata and events related to transfer which have took place within the organization can also be check and restricted.

4.6 DATA LOSS PREVENTIONS

4.6.1 PROTECTING THE SENSITIVE DATA FROM SPREADING

The core of a business is not just the project and their internal decision but the secrets they are using for trade the information which should not get outside and make up of the data provided by the client to the organization. It takes no time or just one mistake from a person to do something wrong and share any folder or file through the cloud service providers which can cause depletion of any business. But there could be a way to stop these type of wrongdoing to happen and this is what this project has its vision on. CAM can work more efficiently on this issue and also protect from loss of a data and cloud provider service become more reliable and also it can be deployed in minutes.c

4.6.2 GOVERNANCE OF THE DATA

Using any cloud service provider is so easy that each and every can understand it in minutes so exploitation over these platforms is also easy for any one . So we need a ground check on the cloud and keep our eye on each and every user is difficult as there could be enormous of users in an organization but CAM can keep a track for all the naughty employees or student in a go and directly take a action on your behalf you just need to define the action once. Risk reduction is made so easy that admin can just sit and relax on to his chair in his cabin can we are doing automation on his behalf.

- Get a Deeper look on the inside of your organization activities which can earliar happen onto your back and you may missed those and moreover you can punish the right person. Get the control over the data that is in your system.
- Keep a check on the non authorized or even the authorize application on web as well as on mobile devices which can unintentionally steal your data from the cloud of your organization.
- Give the power to the advance IT solutions and see the magic they can perform in front of you or even when you are not a work as they never take rest .Security teams just enable their policies and protect the data which is more dearest to the company.

4.6.3 CLOUD A COMPLIANCE

When we found any anomaly in the data or a risk is found in our system , this product can notify us with an alert to the admin or the person with the authority or itself perform some actions according to the policies defined by the users which can also quarantine the files and make unavailable for the users which own the file but only the admin have the access. It can revoke the shares from the file if someone is using it in a wrong way. Some of the most common risk has been list down.

- Risk patterns defined by the user and are custom designed.
- Peripheral Component Interconnect number
- Abusive content which are not allowed with organization
- Financial Information including bank accounts and Credit cards details
- Personal Identifier Information also known as PII number
- User accounts which are not trustable
-

4.7 CLOUD VISIBILITY

The cloud environment is very different in the corporate world which was not few years earlier from now and it has changed and increased from many pace. For the deep business process cloud application are their and available for the corporate organization as well as educational institute. Sales department and the marketing teams can use already available tool which are used for automation some are like Hub Spot and Sales force marketo. The other department like Human resource and financing team work on the enterprise account and hiring and employment application some of them are Quick Online , Work dat and Net suite. The other developers works other softwares. Every organization compose of many teams to combine them we need a common platform which is provided by cloud based application that have become an integral part of our daily work and team .Without it we cannot work or function properly. More than ninety five percent of organization are using the public clouds available as it is more reliable and cheap them forming their own. It is expected that by 2022 every business or organization will be working over this network only

The advantage of using these services is they can add on to the productivity, better to manage things , low cost and efficient and influence customers requirement to achieve. The situation is that is can also increase the problem if not used properly and the major issue is the users who are using it , their activity in the service become un trackable which a normal person without any automate product cannot do. “This lack of visibility into cloud activity is known as Shadow IT”.

4.7.1 SHADOW IT AND SOLUTIONS

CAM is best techniques and software which can help in getting the visibility in how the data which we are saving in Cloud services are accessed by whom and how it is stored onto the cloud, Moreover if the data is shared to outside domain it then also keeps a check on it thoroughly. With Cloud Access Monitor we can manage these things which are list down below.

- Control and Monitor all the cloud service application which are used by the enterprise and discover which are sanctioned by the admin and which are unsanctioned.
- Gain the vision of all the events happening inside the organization cloud services and check how often the services are used and by whom and for what purpose
- Analyze and know the risk each activity or application can have on the organization and inform the admin as soon as possible and also the user from which this risk has been detected
- Have a complete and analyze view of communication within users with cloud by checking activity data provided on the different tabs and network security firewalls which keep a track. Some of the firewalls which help us in doing this is Sophos and watch Guard and others.

4.8 PRODUCTS

4.8.1 FILE SHARING PRODUCTS

1. Google services which are Team Drive and simple Drives
2. Citrix Sharefile
3. Microsoft Graph , One Note ,Onedrive and office 365

4. Microsoft Share Point
5. Box
6. Storage Services of Drop Box
7. Slack

4.8.2 Emails And Messaging PRODUCTS

1. Gmail
2. Office 365 Mail/Outlook
3. Slack

4.8.3 Cloud Suite

1. Google G-suite
2. Office 365

4.9 My Role in developing Cloud Access Monitor

In the earlier days we were given the training of Core java and its essential Concepts to make our base strong which were initial aspect to work in the industry . We were having regular interaction with the higher and senior developer and CEO of the company for the gaining and getting knowledge from his experience. We have a great introduction with many employees and some games sessions

Initially , I have session of Java Core and learning few development technique currently we are working on . We get knowledge of the git as called the person who doesn't know git cannot be called as developer. We learned Hypertext markup language (HTML) o know the basics of frontend and the stylesheet of CSS and some of the scripting language and there libraries like JQuery and Bootstrap. Html is mostly used language for web application as used as frontend . There is no alternatively to this language and every application comprise of it only.

Javascript is not a programming language but a scripting language which earlier was used in client side scripting only. But with the introduction of NodeJs it is also being used on server side scripting language as well. Scripting language means it can be integrated with other language and doesn't need any other platform to work. At client side the code can be integrated

within the HTML page. When an end user makes a request through a browser, an HTML page pops up which already has JavaScript written in it. What we see is the mixture of both JavaScript as well as HTML page. While loading the page, we can only view the HTML, but the JavaScript code is sent to the browser and it runs the code accordingly and shows the desired HTML and data onto the screen.

Internship was also equipped with the knowledge of a very important feature of Java, which was the Spring Boot framework, which is used to develop the web application in Java and Spring MVC. Spring Boot helps the developer and reduces the load of them and complies many things itself. Just we need to add the annotation and the work is now of Spring MVC to compile and make the class object of that file. Annotations also define which class is used to interact with the data layer and which is the logic and which will interact with the users of the application very easily.

For practice, we developed a simple TODO application which interacts with the JPA at the backend and used ORM technique. ORM is object relational mapping, which is used to map the Java object into the SQL tables. As we do not need to change the data from object to database, it is understandable.

Task Done By Me :

1. Set Up for Track Website Traffic Whole Product Using Google Analytics and Google Tag Manager

1.1 Why you need Google Analytics

Google's Analytics is used for

- Number of users visit your site
- From Which locations user are accessing my application
- Tracks The devices where is being used to track need desktop or mobile application
- Websites which are used to track and redirect to our website
- Most popular and most visited page on my website

- To traffic onto our site and how much of them has been converted to as our customer
- Optimization of website for better speed
- Blogs and the website do my visitor like and visit most for better understanding there interest

1.2 Why We need Google Tag Manager

Google Tag Manager is web application which is used to manage tag and update the tags on the our web application. When it is added to our application either it is on Web or mobile it tags snippet codes. We can also manage and configured the code as we want also manage the tags via an cloud based UI without any changes in deployed code. This helps in reducing many problems or bugs in our software and prevent us from involving engineers when we want to make new changes onto the system

2. Change Whole UX for Typography and Bootstrap Modal concept

Initially in the products we used the single modal concerts on each page. So i have changed this concept into bootstrap modal in this we use single modal to show the data of overall page.

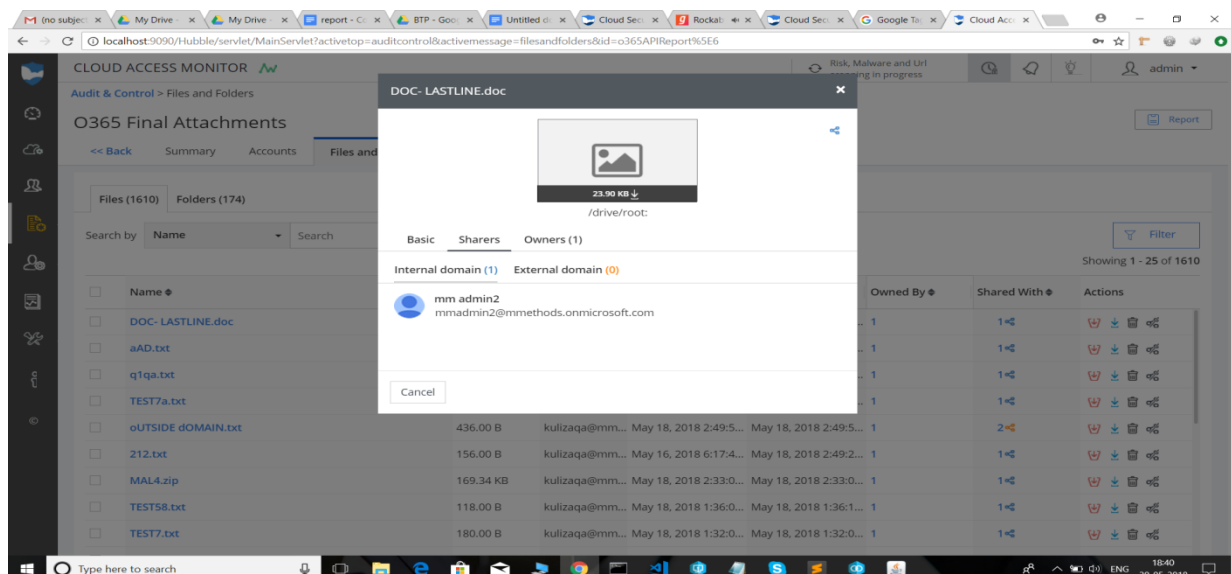


Figure 3 - UX Typography

Description: In this previously, when we use to click on any entity of any column a popup appeared with only that particular entity details. But further with use of bootstrap we managed to get a new popup with which we can go to other column details also associated with that entity in same popup menu.

3. Add Unshare button and Popup to unshare sharer from a particular File

Added a Button onto the UI to show all the sharer of a particular file .All the user email id is displayed onto a popup where we have a multi select option to unshare many user at a time . It is done in such a way that if there are no sharer of a particular file the button to unshare will not be shown for that particular file else it will be displayed over it.

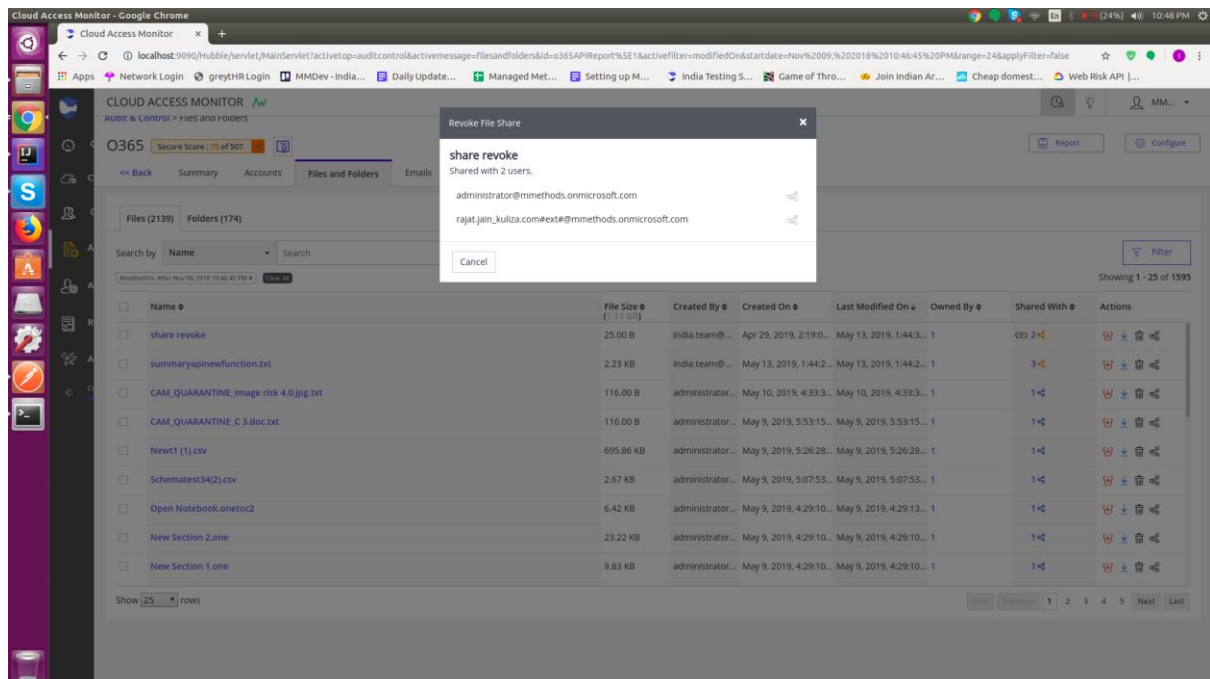


Figure 4 - Unshare User Popup

6. Show All the license A Enterprise Have Office 365 and Add Download License Details

Added an icon which shows all the license or services a enterprise has accessed to or have subscribed to. With the data I parsed the relevant data we want to show on to the UI and

displayed. Moreover added a Download button to show all the details of license in deep in a file.

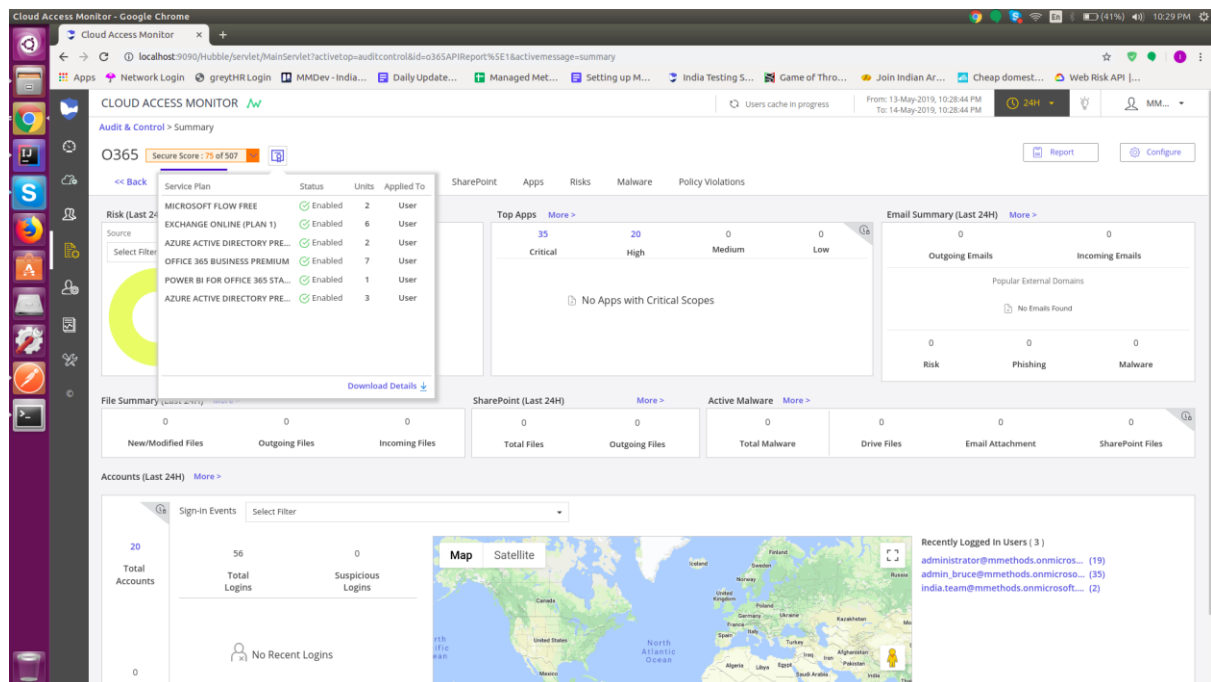


Figure 5 - License Details

5. Add a new Property in Oauth which restrict the files before certain date

Added a new Property while creating a new Saas Application or Oauth while will limit files the files which we will bring to our application from the cloud storage to scan them and check the risk and malware in those file . For this we need to check the old and new oauth both from the audit and control and admin page and also handle for the new as well old oauth.

For the server which were already running on the production,a default value was set and migrated was done so that it doesn't affect other and other server work fine as before . These conditions were also checked where if the migration fails we will get the notification through email with name of the server and at which it has failed.

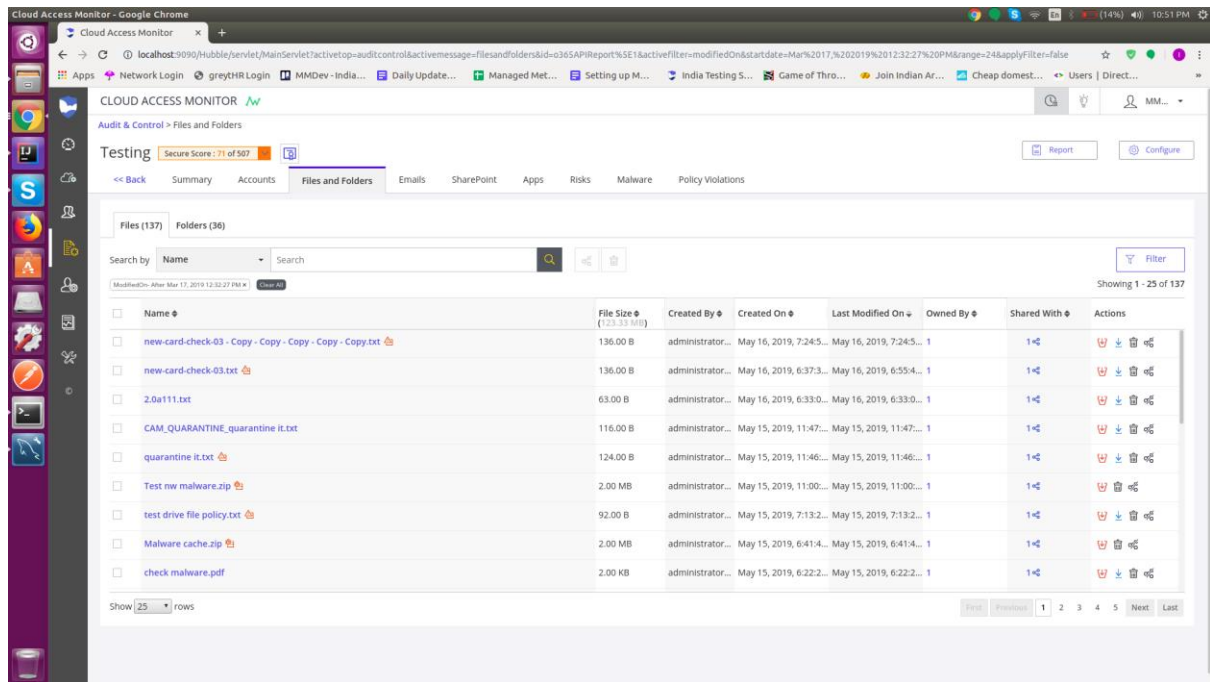


Figure 6 - Filter to Restrict Files

Here are some of the Screenshot of the Product and its Description

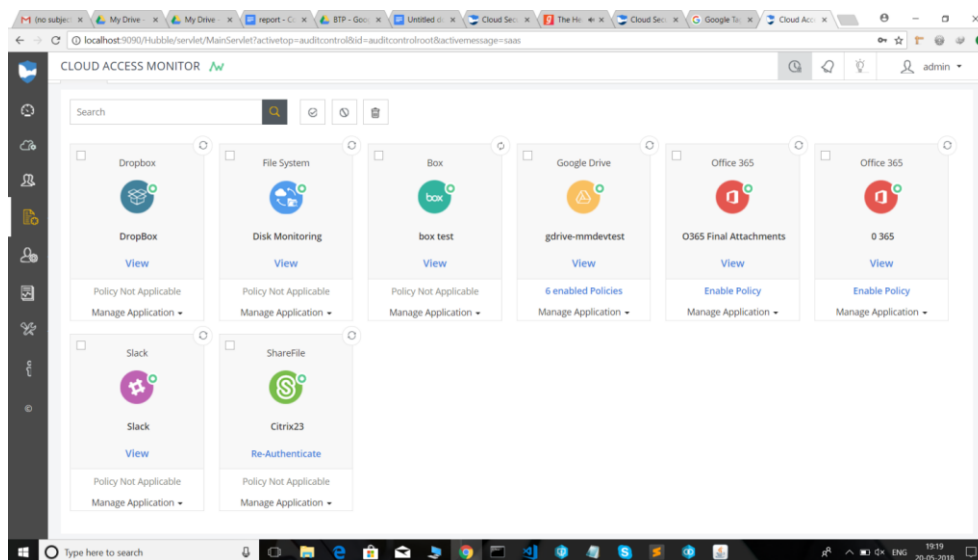


Figure 7 - Cloud Providers

DESCRIPTION: At this page there are all the oths we use Like dropbox , disk monitor, mail etc. These are actually the tools which we use in our product to provide security and track all the data which is shared.

SCREENSHOT 2 -

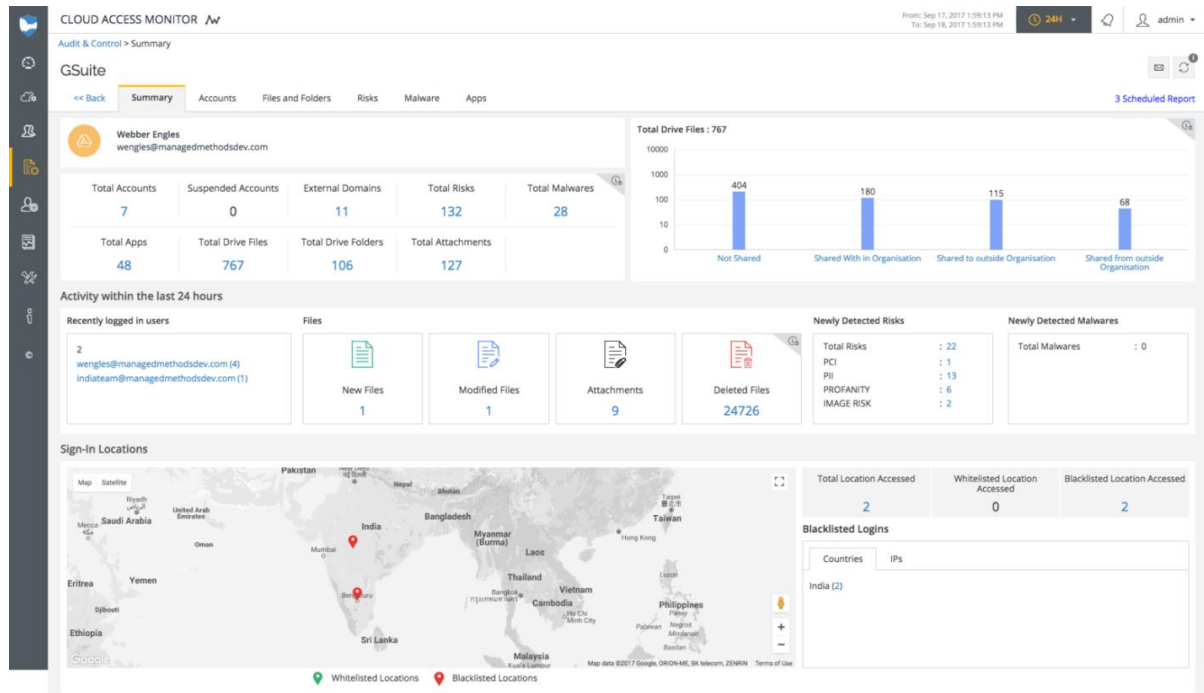


Figure 8 - Summary Page

DESCRIPTION: This is the summary page which shows all the tools details like how many files are shared, is there any fraud happening if yes map can track its location ,other statistical data of the files.

SCREENSHOT 3 -

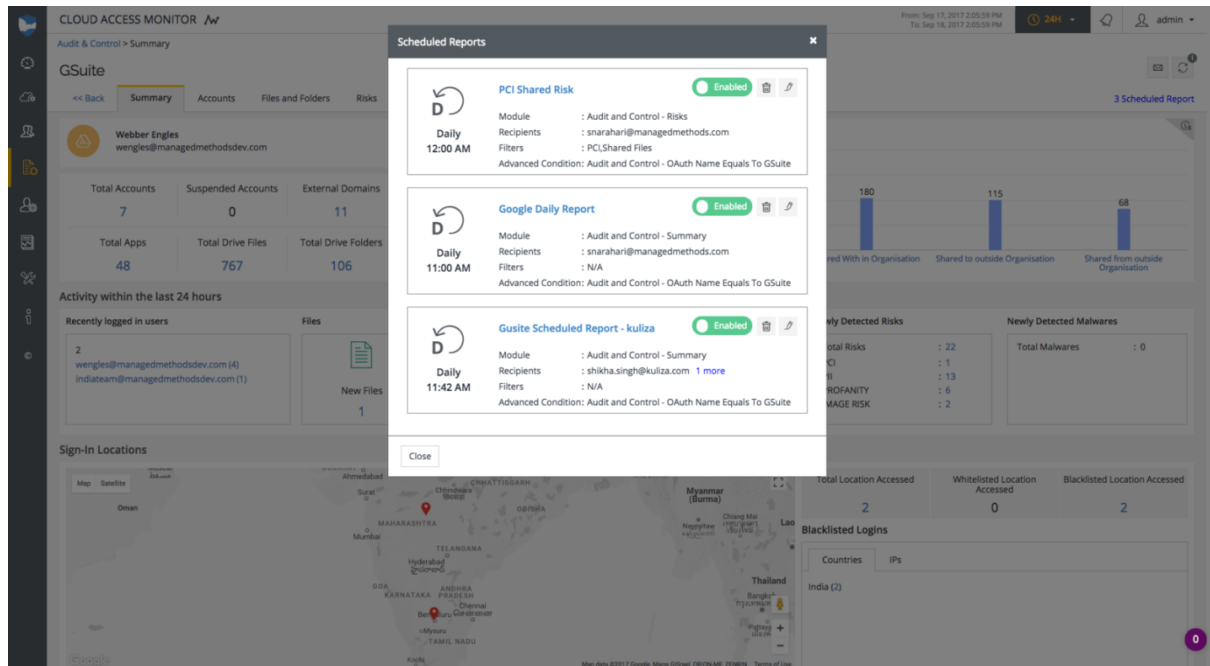


Figure 9 - Schedule Report

DESCRIPTIONS: This report gets generated for future use which is send to the client periodically which shows from which mail id the data is send to which mail id, what data is send ,at what time ,all types of risk etc.

SCREENSHOT 4 -

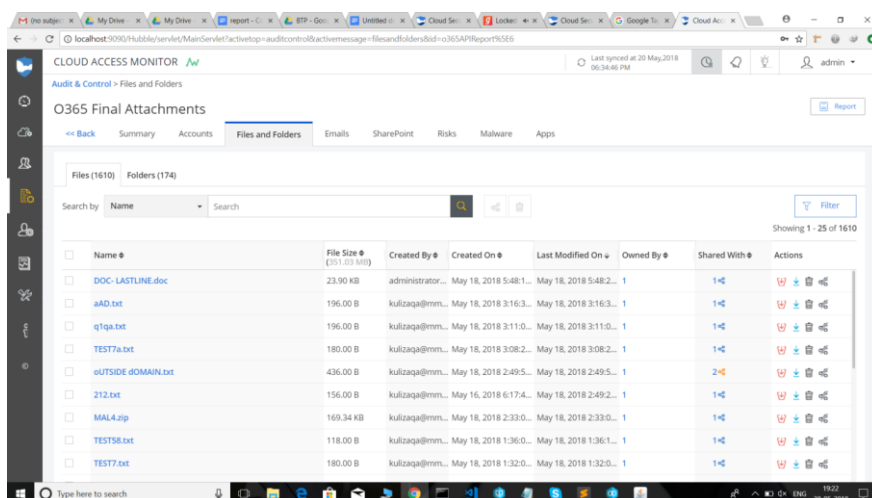
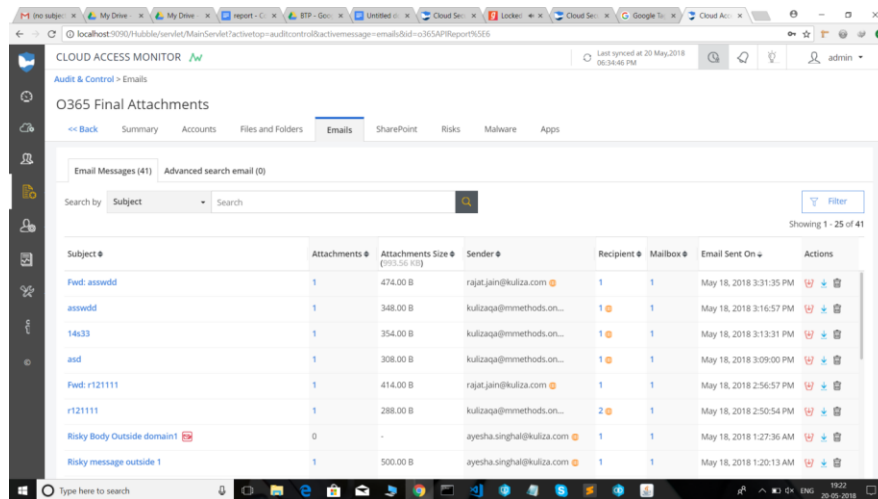


Figure 10 - Files And Folders Tab

DESCRIPTION: This contains all the excel sheet type of view of all the files and folders used in any of the tools of our client.

SCREENSHOT 5 -



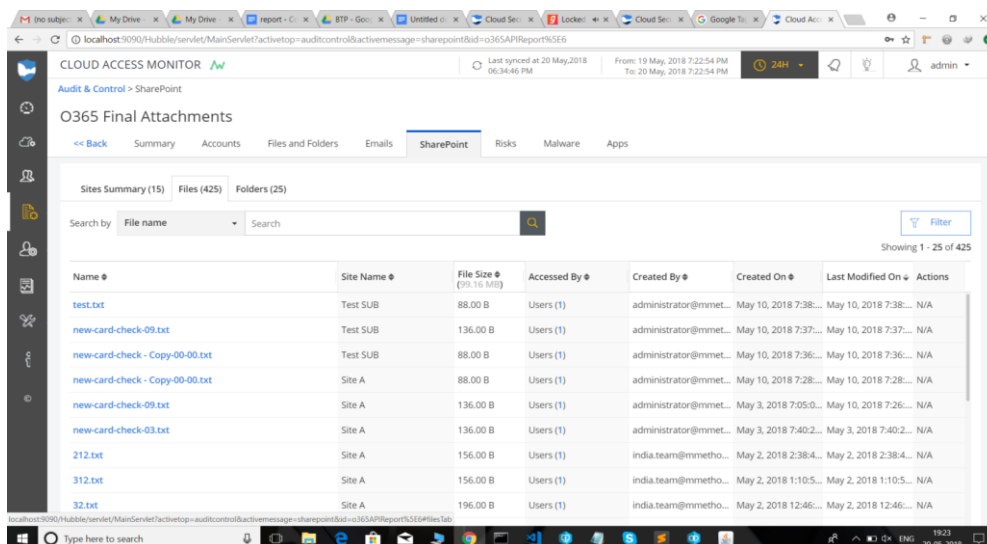
The screenshot shows the 'Emails' tab in the 'O365 Final Attachments' section. It displays a table of email messages with columns for Subject, Attachments, Attachments Size, Sender, Recipient, Mailbox, Email Sent On, and Actions. The table shows 41 messages, with the first 25 displayed.

Subject	Attachments	Attachments Size	Sender	Recipient	Mailbox	Email Sent On	Actions
Fwd: asswdd	1	474.00 B	rajat.jain@kuliza.com	1	1	May 18, 2018 3:31:35 PM	
asswdd	1	348.00 B	kulizaqa@mmethods.on...	1	1	May 18, 2018 3:16:57 PM	
14x33	1	354.00 B	kulizaqa@mmethods.on...	1	1	May 18, 2018 3:13:31 PM	
asd	1	308.00 B	kulizaqa@mmethods.on...	1	1	May 18, 2018 3:09:00 PM	
Fwd: r121111	1	414.00 B	rajat.jain@kuliza.com	1	1	May 18, 2018 2:56:57 PM	
r121111	1	288.00 B	kulizaqa@mmethods.on...	2	1	May 18, 2018 2:50:54 PM	
Risky Body Outside domain1	0	-	ayasha.singhal@kuliza.com	1	1	May 18, 2018 1:27:36 AM	
Risky message outside 1	1	500.00 B	ayasha.singhal@kuliza.com	1	1	May 18, 2018 1:20:13 AM	

Figure 11 -Emails Data

DESCRIPTION: This contain all the mails details like subject, any attachment, sender mail id , time when send etc.

SCREENSHOT 6-



The screenshot shows the 'SharePoint' tab in the 'O365 Final Attachments' section. It displays a table of SharePoint files with columns for Name, Site Name, File Size, Accessed By, Created By, Created On, Last Modified On, and Actions. The table shows 25 files, with the first 25 displayed.

Name	Site Name	File Size	Accessed By	Created By	Created On	Last Modified On	Actions
test.txt	Test SUB	88.00 B	Users (1)	administrator@mmet...	May 10, 2018 7:38...	May 10, 2018 7:38...	N/A
new-card-check-09.txt	Test SUB	136.00 B	Users (1)	administrator@mmet...	May 10, 2018 7:37...	May 10, 2018 7:37...	N/A
new-card-check - Copy-00-00.txt	Test SUB	88.00 B	Users (1)	administrator@mmet...	May 10, 2018 7:36...	May 10, 2018 7:36...	N/A
new-card-check - Copy-00-00.txt	Site A	88.00 B	Users (1)	administrator@mmet...	May 10, 2018 7:28...	May 10, 2018 7:28...	N/A
new-card-check-09.txt	Site A	136.00 B	Users (1)	administrator@mmet...	May 3, 2018 7:05:0...	May 10, 2018 7:26...	N/A
new-card-check-03.txt	Site A	136.00 B	Users (1)	administrator@mmet...	May 3, 2018 7:40:2...	May 3, 2018 7:40:2...	N/A
212.txt	Site A	156.00 B	Users (1)	india.team@mmetho...	May 2, 2018 2:38:4...	May 2, 2018 2:38:4...	N/A
312.txt	Site A	156.00 B	Users (1)	india.team@mmetho...	May 2, 2018 1:10:5...	May 2, 2018 1:10:5...	N/A
32.txt	Site A	196.00 B	Users (1)	india.team@mmetho...	May 2, 2018 12:46...	May 2, 2018 12:46...	N/A

Figure 12 - Sharepoint Data

DESCRIPTIONS: A cloud service , which is made by microsoft for all the enterprises of all the size and quantity of its employees. Share point, One Note , One drive , Office 365 includes everything.

SCREENSHOT 7-

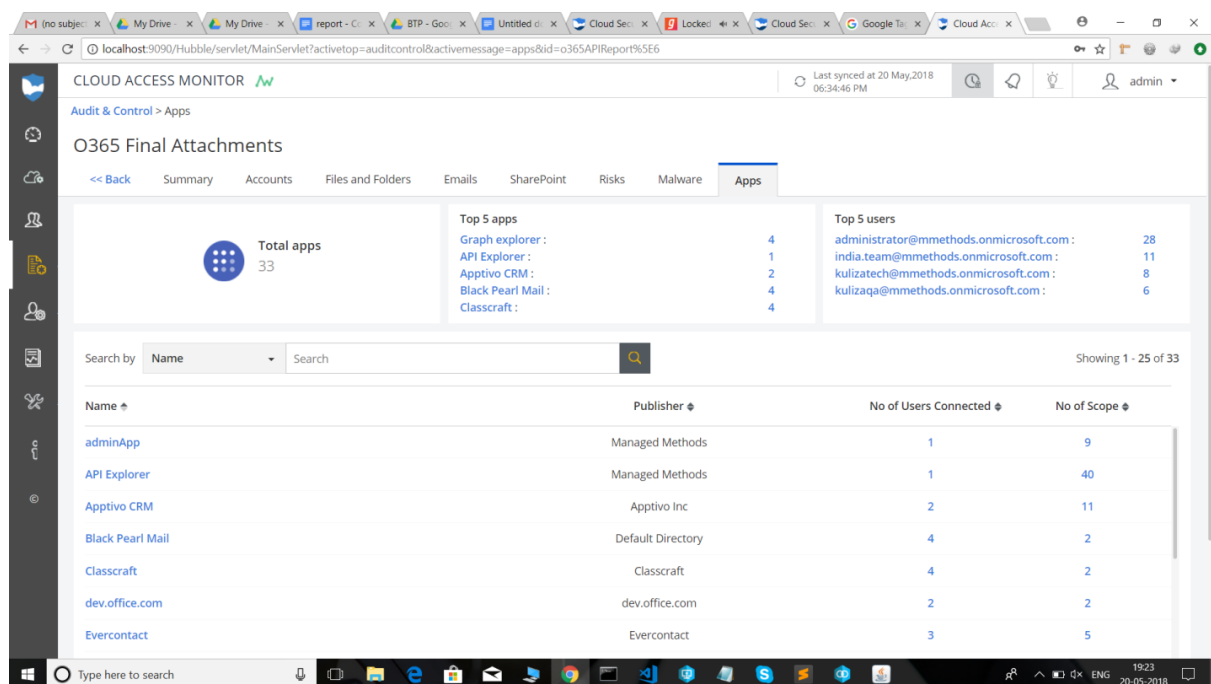


Figure 13 - Apps Access

DESCRIPTIONS: This shows details of all the apps which are used by our product tools .If any user use these emails in any application that application data will be recorded in our application.

CHAPTER 5

CODE REVIEW AND TESTING

6.1 Code Review

After successful completion of the coding, review of code written by a developer is done by some other developer so that the coding standards are maintain there should not be any redundant code in the application. It is also used to find the logical bugs if any in the development phase and used to change them while fixing the code review changes. The code should be user understandable and with proper commenting so that other developer can understand what we have written in code and which approach we have used. It follows the naming conventions of java as well of the company standards which makes it more friendly for other developer. All the methods which are declared in the product are named as what they got and easily understand what they are going to do .

6.2 Dev testing

Dev testing is done as we are building any task or module. It has to been done by the developer it self and need to check all the aspect so that the issue or bug can be resolved by the developer itself and less number of bugs are found in testing process which will help in speeding up the system.

Testing of a software involves design of the software and its techniques strategy. The steps should in proper way and well planned and series of steps should give us the desired result either failure or success. It provide us a way which explains the each and every steps to do testing in parts. When those steps are followed linearly and in a well planned way , we should know and analyse how much our resources in all the form will be required to the same.

Testing has a certain flow which need to be follows

- Testing should start from unit testing at a level where single modules are testing then
- we need to integrate for better testing process

- Techniques present for testing should be used in a better and appropriate way
- The testing should not only be conducted by the specialist Quality assurance engineer but also by the developer who is developing that feature.
- The ways and plan used to high end and low end testing which are essential to see the working of the code flow should be done to make our system more reliable.

Software Testing ways used in this projects

- **Quality Assurance testing(both manual and automated)-Black Box Testing**
- **Sanity Testing**
- **Smoke Testing**
- **Regression Testing**

6.2.1 Quality Assurance testing(both manual and automated)-Black Box Testing:

Quality Assurance Tester is a dedicated tester or engineer who works only to find the bug and malfunction the software. The more he/she found a bug better the product will be and we will find less bug in our system. He is testing the quality of the product and the code and enhancing the software experience. It will be better if he thinks from the user perspective to find the bug.

QA is more focused on the life cycle of the project rather than the development . He should check whether we are delivering what is asked by the client and should not miss any requirement which is must or needed .He should open the software to his fullest.

6.2.2 Sanity Testing:

From getting the software from the developer with some small changes due to some bugs and issues found in the software. This type of testing is the Sanity Testing . It is done to check whether really the bug has been fixed or not and there are no other things affected due to this

bug in the system. Instead of doing the testing again and again of the whole system this type of testing is done.

6.2.3 Regression Testing

There is one more type of testing which is called the Regression Testing which is defines as to check the changes made in code due to some bug or adding a new feature has not affect the other features of the product which were already present in the system. It is to ensure with new feature we do not destroy the other one. It partial testing and checking which part is affected.

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

CONCLUSIONS

With this project we can understand the use and importance of the cloud based software services provided us by different organization is an essential part of the any organization . We in kuliza are also using google business email and drive services and we know how much confidential data is there onto these sites.This project helps each organization to keep a check on its users without there knowing and any one with the wrong doing can be caught which will help the organization to flourish without any internal threat or any outside attack done by hackers through malwares. Moreover this gives many feature like policy and other report generated which can be viewed for a brief and details information of what is going on in the organization with the help of charts and graphs

I can honestly say that my time spent interning with Kuliza Technologies resulted in one of the best summers of my life. It enriched me with multiple skills in high level web development such as iconic, JQuery, bootstrap. Not only did I gain practical skills but I also had the opportunity to meet many fantastic people.

The atmosphere at the Kuliza office was always welcoming which made me feel right at home. Additionally, I felt like I was able to contribute to the company by assisting and working on projects. Those projects not only helped me to acquire knowledge while introducing a new product but also built a teamwork spirit. I got rewarded for my tasks with some goodies by the company. The people here always uplift their new member of the family with lots of guidance and support regarding learning new things.

Overall, my internship at Kuliza has been a success. I was able to gain practical skills, work in a fantastic environment and make connections that will last lifetime. I could not be more thankful.

Future Scope

I found that we can integrate many more things in this project to enhance the vision which can be used for better tracking of the user . We can introduce tracking the url requested by the users using the business email id and sites which are not permitted within the organization and also with them we can fetch the url which user have access through vpn which cannot be caught by the system intranet as well as of intranet.

REFERENCES

- [1] Kuliza Technologies official Website (www.kuliza.com)
- [2] HDFC Life Website (www.hdfclife.com)
- [3] Wikipedia (wikipedia.org)
- [4] Liles, Jeffrey A. and Michael E. Rozalski. "It's a Matter of Style: A Style Manual Workshops for Preventing Plagiarism." College & Undergraduate Libraries, vol. 11, no.2, pp. 91-101, 2004.
- [5] M. Wegmuller, J. P. von der Weid, P. Oberson, and N. Gisin, "High resolution fiber distributed measurements with coherent OFDR," in Proc. ECOC'00, 2000, paper 11.3.4, p. 109.
- [6] R. E. Sorace, V. S. Reinhardt, and S. A. Vaughn, "High-speed digital-to-RF converter," U.S. Patent 5 668 842, Sept. 16, 1997.
- [7] (2002) The IEEE website. [Online]. Available: <http://www.ieee.org/>
- [8] M. Shell. (2002) IEEEtran homepage on CTAN. [Online]. Available: <http://www.ctan.org/tex-archive/macros/latex/contrib/supported/IEEEtran/>
- [9] FLEXChip Signal Processor (MC68175/D), Motorola, 1996.
- [10] "PDCA12-70 data sheet," Opto Speed SA, Mezzovico, Switzerland.
- [11] A. Karnik, "Performance of TCP congestion control with rate feedback: TCP/ABR and rate adaptive TCP/IP," M. Eng. thesis, Indian Institute of Science, Bangalore, India, Jan. 1999.
- [12] J. Padhye, V. Firoiu, and D. Towsley, "A stochastic model of TCP Reno congestion avoidance and control," Univ. of Massachusetts, Amherst, MA, CMPSCI Tech. Rep. 99-02, 1999.
- [13] Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specification, IEEE Std. 802.11, 1997.