The Seeker: Network Element Manager Integrated with IPDB

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Abstract. **Any country in the world constantly seeks the upgrade in every aspect of life and so is network industry. India is one of them as developing nation to constantly evolve in network industry although the evolution is considered to be moderate. With the growing amount of data produced every minute and the need of quick access of data at the user end in a network, the efficient yet exhaustive use of cloud resources has become more important than ever. Hence to reduce the time consumption and complication of the data collection when needed, the collaborative approach can be applied where in cloud gaffer along with network IMSI profile view including network element IP database manager can be developed known as The Seeker. The Seeker is a new gen software tool which is born with the collaborative approach in which cloud gaffer along with 5G/4G network IMSI profile view including network element IP database manager. There are micro services which require minimal resources, whereas there are other critical heavy resource usage projects which requires almost the entire cloud pot. Not only so, but there is also Generic Cloud which provides specific number of required resources and there are CBIS/NCIR cloud which provide another kind of resources. The variety of cloud products that any company serves to the user requires different types of hardware, input/output operation efficiency & geo-dependency to name a few. Thus, while deploying a cloud product or a service, finding out the right cloud for the use case becomes a time taking and hectic job. Even if we do so, many a times we find that someone else also using the same cloud resources and the job gets stuck. This tool will provide an one stop solution to procure that right cloud resources using OpenStack. Moreover, when the database is solid, the optimization of the resources becomes easier too! When it comes to Network Element Manager, it allows the user to obtain IP addresses that have not been allocated. The user must provide information about the cloud, IP type and vlan, IP in each. However, this is to automate the user request by processing the search into database and providing the users with required information. Moving on to latest Network IMSI profile view, in general network company uses shared data layer (SDL) as a backend of subscriber database. Imagine in a month how many requests will be raised regarding troubleshooting. Hence to achieve the solution for above problems THE SEEKER will have to be used.**

Keywords: DBMS, CBIS, NICR, Cloud keeper, IPDB, Open stack, Rack Id, Rack ID version

I. INTRODUCTION

In later couple of years, a conglomerate Finnish enterprise Nokia Solutions and Network which has a great success rate and continuing to be so in telecommunication industry, information technology and also satisfying consumer needs was founded in the year 1865.The headquarters of this multinational organization are situated in Espoo, Finland. As per reports of the year 2018 the number of employees in Nokia Networks are approximately 1,03,000 and running hired over 100 countries including India and is

conducting business in supplemental 130 counties and delineated global profits. It is not

only the organization listed on Helsinki stock exchange but also Manhattan's securities market. Nokia Networks and Solutions has been in charge in various sectors from past 150 years. Initially, It was established as a pulp mill and has been in direct link with resources like rubber and cables. Later since 1900's it has set it's prime focus on telecommunications, licensing and technology evolution in far-reaching scale. It is one of the major contributors to a mobile telephone sector which has been a part of evolution of networks over years starting from GSM or 2G to LTE and 5G, which they are working currently. It was also one of the leading mobile phones and smart phone vendors collaborating with Microsoft until early 2000's. Nokia has almost 6.1 billion subscriptions as per the reports of 2018. Moving onto this project, It is a software application build from the scratch to satisfy the needs of the organization based on it needs. Using this application, we can save the cloud storage space and keep track of allocated resources and deallocate them when required. This automated application also includes IP address allocation, deallocation, health check, IOPS and complete detail about IP addresses. It also includes global and local search for easy access of IP addresses or to whom it was assigned.

II. LITERATURE SURVEY

In paper [Xavier et al., 2016], The everyday hiking traffic growth and demand is encouraging network operators to find fresh economy-efficient solutions toward the installation of future 5G mobile networks. The network sharing model was explored in the past and was semi deployed. Currently, advanced mobile network multi- tenancy applications are highly obtaining momentum, constructing the way toward further shrinking capital expenditure and operational expenditure (CAPEX/OPEX) costs, while making available new business opportunities. In paper[Wesley et al, Feb 2016],This article provides an overall paradigm of the 3GPP standard evolution from network sharing principles, methods, and architectures to time-ahead on-hiking multi-tenant systems. In specific, it introduces the model concept of the 5G Network Slice Broker in 5G systems, which helps us to understand about mobile virtual network operators, over-the-top providers, and network industry horizontal market players to appeal and charter supplies from armature suppliers firmly via signalling means. In paper [Yohannes et al., 2017], The choosy competency units objective is to ensure that the competency blocks that are tested and assessed are units that have a big domination on the successfully completing the project at the company. In paper [Satapathy et al., 2017], This paper demonstrates how the

infrastructure selection of Node.js and former web server provides the insight in the way applications perform that execute on top of them. Web services operate upon network throughput where it provides an idea of a metric parameter for correction. They are developed and tested in both node.js and in .NET which are anchored in Internet Information Services (IIS Server). Systematic tests and assessments are done explaining various test cases to mark a difference of the performance of Node and IIS. In paper [Jayanthi et.al., 2016]. The execution assessed outcomes helps us understand some meaningful executed data of Node and IIS Server in a ample amount of time. In paper [Rodrigues et al., 2018], shedding some light on above consequences, they put forward a novel SDN-based big data management method regarding well-versed network resource consumption such as network bandwidth and data storage units.

III. PROPOSED WORK

The Research work done identifies There are micro services which require minimal resources, whereas there are other critical heavy resource usage projects which requires almost the entire cloud pot. Not only so, there is Generic Telco Cloud which provides specific number of required resources and there are CBIS/NCIR cloud which provide another kind of resources. The variety of cloud products that Nokia serves to the user requires different types of hardware, input/output operation efficiency & geo-dependency to name a few. Thus, while deploying a cloud product or a service, finding out the right cloud for the use case becomes a time taking and hectic job. Even if we do so, many a times we find that someone else also using the same cloud resources and the job gets stuck. So once the tool is developed the results will be compared side by side and tested.

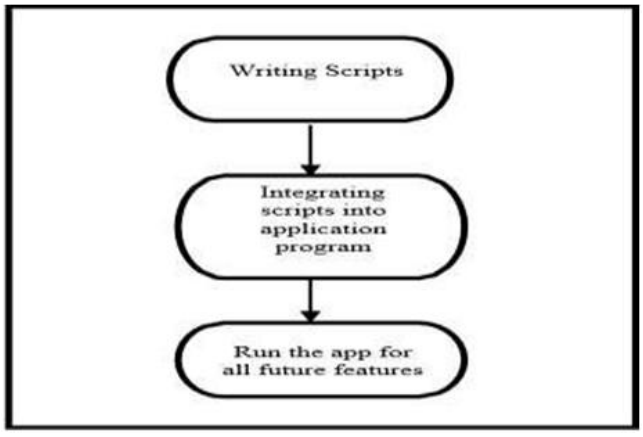

Fig. 1. Proposed Model for The Seeker

A. Data-set Description

Nokia's customers include service providers whose combined networks support 6.1 billion subscriptions, as well as enterprises in the private and public sector that use our network portfolio increase productivity and enrich lives. Nokia also serve consumers with technology and devices. The Enterprise Solutions group develops wireless systems for use in the corporate sector. Wireless switching and transmission equipment are sold through the company's Networks division. Nokia operates 15 manufacturing facilities in nine countries and maintains research and development facilities in 12 countries. After the sale, Nokia began to focus more extensively on its telecommunications infrastructure business and on Internet of things technologies. After the sale, Nokia began to focus more extensively on its telecommunications infrastructure business and on Internet of things technologies. Nokia continues to be a major patent licensor for most large mobile phone vendors. As of 2018 Nokia is the world's third- largest network equipment manufacturer. Nokia develop and deliver the industry's only end- to-end portfolio of network equipment, software, services and licensing that is available globally.

B. Data Pre-processing

(a) Data A front end database management tool

(b) Link this database with each cloud

(c) Tool would have information regarding: Which cloud resources, how much of it, which type of resources (GTC,NCIR,CBIS,hardware type, their versions),which location got allocated to which project/user.

(d) The present resources available in all of the cloud.

(e) The tool user would login and provide details about the cloud resources required (vCPUs, RAMs, Disk spaces, Networks details, underlying hardware requirement, blade version, cloud type, location etc) and the network element type.

(f) The tool would provide with the cloud information having the requirement. It would also provide details of the deployments done by other users previously in different clouds for the same network element type. So, that if the present requirement is not met by any of the cloud, then the user can use NEs from other projects/users. Even if the requirements are met, users will have a choice to use NEs from other projects as well.

(g) Thus, the work moves on efficiently as well as there are no unnecessary redundant NEs deployed.

Time is saved for procuring the right type of cloud for optimum usage. Reusability of the cloud resources are increased. Number of same types of redundant NEs would reduce drastically. Overall, cloud performance would increase. Whenever, there is an upgrade, maintenance, re-installation required in the cloud, an automatic message is broadcasted to all the users regarding the same, so that the users are prepared for the downtime and the end customer is thoroughly briefed as well. Any undue escalation in business-critical projects is avoided. idea brings quality improvements. This idea brings time or cost savings.

- improves an existing process.
- improves or creates a new way of working.
- brings new revenues by other means.
- brings other benefits for Nokia.

IV. EXPERIMENTAL RESULTS

Fig. 2.

The figure.3 represents the Network Element tool. It is a Nokia proprietary tool to access the network element resources.

To learn Basic commands of Software Version for example:

Current set: This command prints the software version of OMS class and their states.

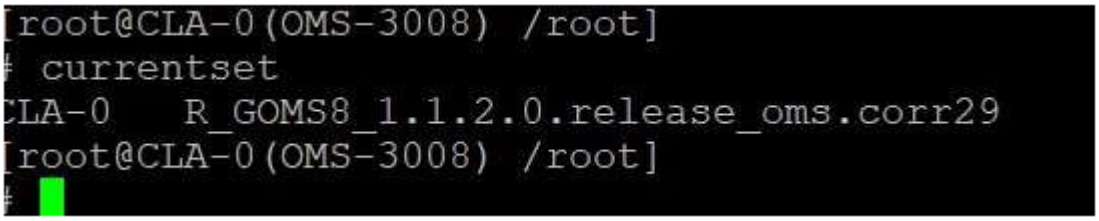

Fig. 3.

Here platform type can be open stack either inter company or intra company related. Organization is referred to teams. CBIS /NCIR version refers to Nokia infrastructure platforms and hardware rack ids and some parameters are present.

Fig. 4. THE SEEKER Tool GUI-Global search

Fig. 5. THE SEEKER Tool GUI-Admin login

Fig. 6. THE SEEKER Tool GUI-IPDB

Fig. 7. THE SEEKER Tool GUI-Resource Filtering

V. CONCLUSION

In Overall, at Nokia Networks and Solutions was a good learning experience. Various facets of software Development lifecycle and the methodologies that are used to design the software were incorporated during the internship. One learning was to incorporate the Agile development methodology for software lifecycle. During the weekly reporting of progress to the team, I learnt how to incorporate client feedback into the software even late in the development cycle. Lastly, during the internship and the various sit- downs of the company.

I learnt how to develop quality software. Among the many learning's, the most important one was to learn how a company functions and interacts with its competition.

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