# Usage Profiling-as-a-Service for SLA in Multi-Tenant Cloud Computing Environments

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**ABSTRACT**

*Cloud Computing integrated data, applications, users and servers on a vast scale and enables a global optimization of computing resources. However due to security threats from both inside and outside , security remains as a significant Challenge. All stakeholders need an efficient system that predicts any violation before it occurs.*
*Profiling-as-a-service architecture to characterize, understand and profile network traffic at multiple layer in multi-tenant cloud computing. Profiling-as-a-service provide an in depth understanding on traffic pattern Of cloud tenants, but also enhance the security of cloud computing by collaboratively detecting and filtering unwanted traffic toward cloud instance.*

**Keyword: -** *Cloud Computing, Profiling-as-a-service, Multi-tenant, and Security*.

## 1. Introduction

### 1.1 Cloud Computing

Cloud Computing [8] is a collection/group of integrated data and network, hardware, software and internet infrastructure. In addition, the platform provides on demand service that are always on, anytime, anywhere and any place. Using cloud service we need to pay as per use. The various type of hardware and software services are available to general public,enterprises,corporations and business market. Gmail is the best example for cloud computing. When running on Gmail, the storage and software account doesn't exist on our computer but it is on our cloud.
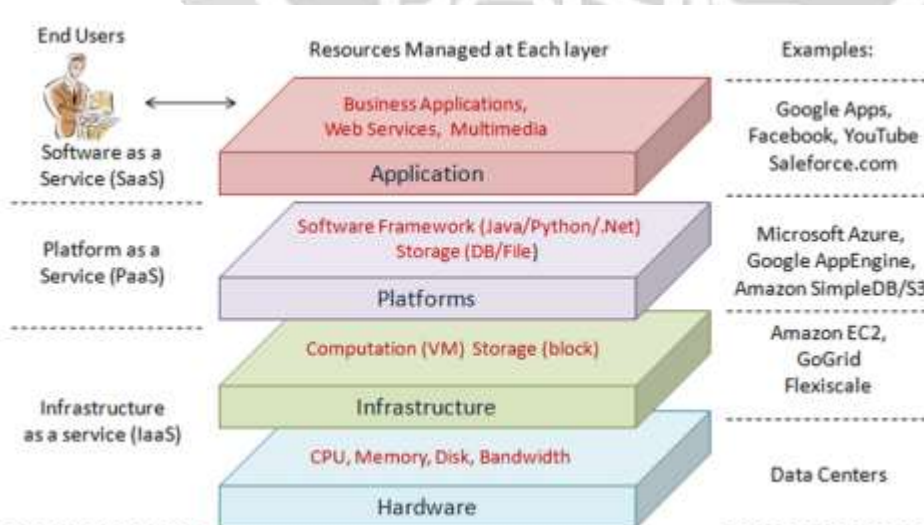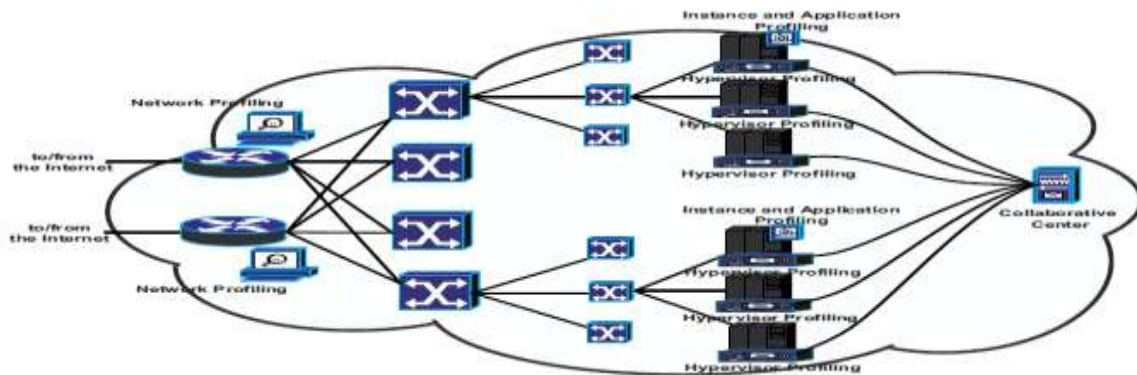


**Fig -1**: Cloud Computing Architecture [8]

### 1.2 Security

Security is considered as one of the main concerns in the adoption of the cloud computing model. Security issues in such an environment include service management (service provisioning and service execution), user access control (while using role based model or working in a hierarchical infrastructure), multiple access to services or resources, denial of service, memory and resource management. However data security and privacy are considered as one of the critical challenges in every information system and it is one of the major concerns in cloud computing research as well. Issues related to data security such as access, privacy, availability or integrity are the main research challenges for health care system in a cloud computing environment.

## 2. Related Work

Kuai Xu, Feng Wang, and Lin Gu[1]propose to develop a profiling-as-a-service architecture to characterize, understand and profiling network traffic at multiple layer in the multi tenant cloud computing environment: Network routers, hypervisors, virtual instances and applications. The propose architecture also provide an in depth-understanding on traffic pattern on cloud tenants but also enhance the security of cloud computing



**Fig -2**: Architecture of layered profiling in cloud computing [1]

Profiling-as-a-Service architecture for establishing hierarchical traffic behavior profiles for instance at multiple layers-Network profiling, hypervisor profiling and instance profiling.

Prasad Pulikal, Claudio Giovanoli, Stella Gatziu Grivas[2] proposed improvement of finding suitable service within the Cloud Brokering system.  In this service selection user search for a keyword and result will be 1000 query. Now the user has to filter this result according to requirement, data security and privacy.
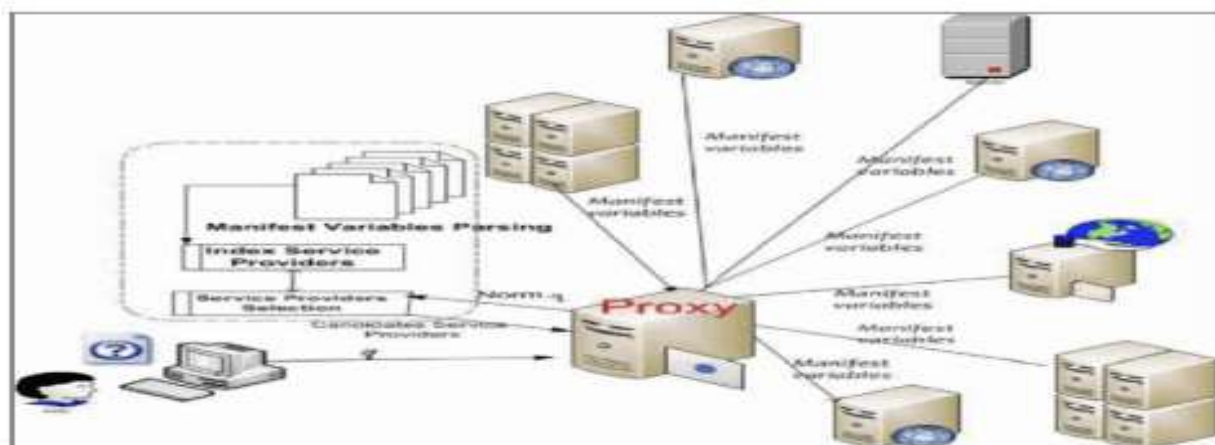


**Fig -3** : Brokerage based Cloud service selection [2]

An agent based framework for cloud service selection by ranking, benchmarking various cloud services through user feedback and third party benchmarking tools. This approach is to rank cloud service according to their performance and user feedback and then use this ranking for cloud service selection

Walayat Hussain, Farookh Khadeer Hussain,Omar Hussain,Elizabeth Chang[3] proposed SLA monitoring architecture could be any one of the three types:1)trusted third party 2)trusted module at the provider side 3)trusted module at consumer side.An intelligent, profile-based SLA violation prediction model, from the provider's perspective.
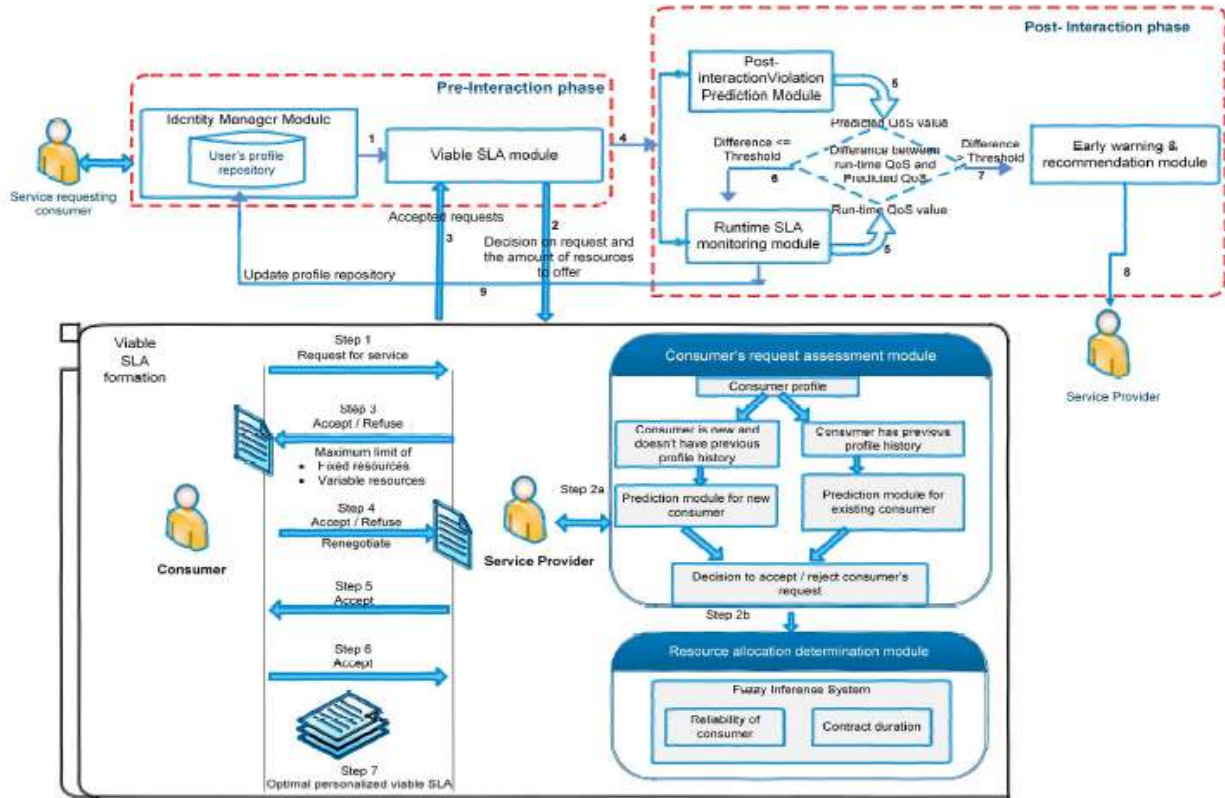


**Fig -4**: Consumer's profile based SLA violation prediction Architecture [3]

This Violation Prediction architecture divide in two phase 1)Post-interaction Phase and 2) Pre-interaction Phase

Ryan Chard, Kyle Chard, Bryan Ng, Kris Bubendorfer, Alex Rodriguez, Ravi Madduri and Ian Foster[4] propose a service that supports automatic profiling of application performance on different instance types to create rich application profiles that can be used for comparison, provisioning, and scheduling.



**Fig -5**: Profiling Service Architecture[4]

This profiling service is implemented as a multi threaded Python application. When a profiling job is requested the service creates a new thread that is responsible for overseeing the execution and moitoring of the tool.

Saravanan M and Manoj P, Smitha G B and Lakshmi V[5] proposed recommendation services are modeled using a newly proposed policy-based engine that combines information from subscriber's behavioral aspects of Mobile Telecom Networks (MTN) and Social Media (SM) inputs.
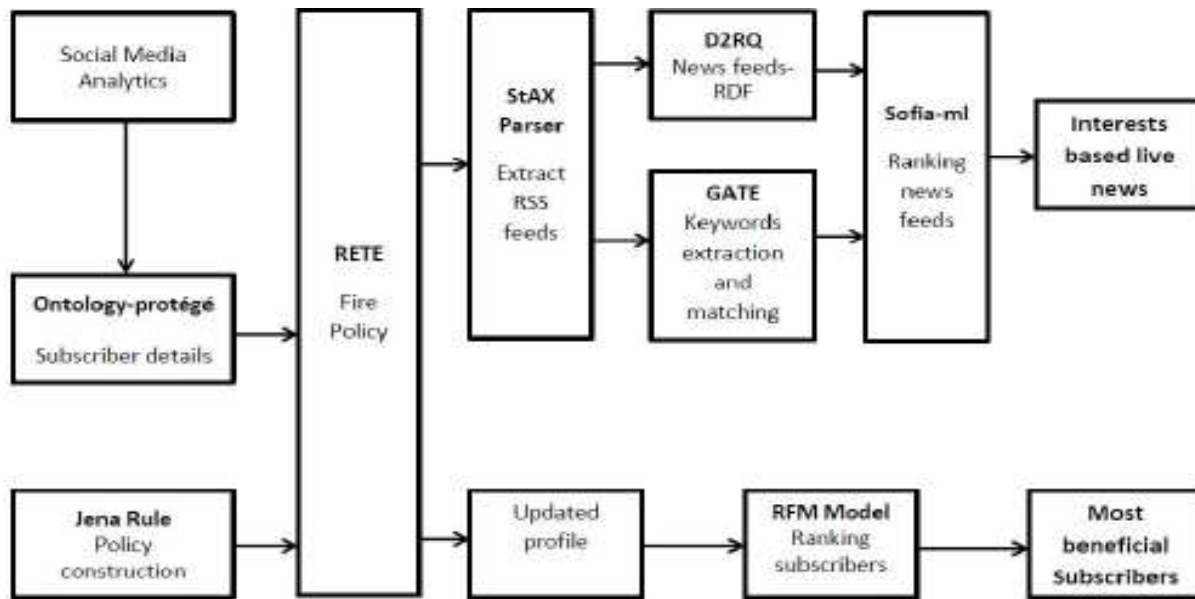


**Fig -6**: Enhanced GPSR architecture [5]

Aatish: The profile based recommendation engine that learning their recurrent and recent behavior and interests in various domains.

## 3. PROPOSED WORK

In this paper used following steps for decrease violation:

Step1: User send request to perform operation.
Step2:Request come to the oAuth server.
Step3: oAuth server send request to identity manager to verify user.
Step4: Identity Manager check user New or Old.
Step 5: If user is new then it will call identity generator to assign temporary rights.
Step 6: Identity generator identify operation. And check SLA to find minimal rule set to assign users. Rule generated from policies.
Step 7: Minimal Rules set will assign to user.
Step 8: Response will return to oAuth server.
Step 9:oAuth server send user accesses and rights for verify to identity verifier.
Step 10: Identity verifier verify and will return response.
Step 11: oAuth server receiving success response.
Step 12: Success response forward to service manager.
Step 13: Service Manager perform the operation and collect resources.
Step 14: Issue Manager is continuously monitoring for the allowed operation with predefined conditions.
Step 15: If issue manager fetch any violation it raise the issue ticket.
Step 16:Issue ticket will forwarded to issue checker.

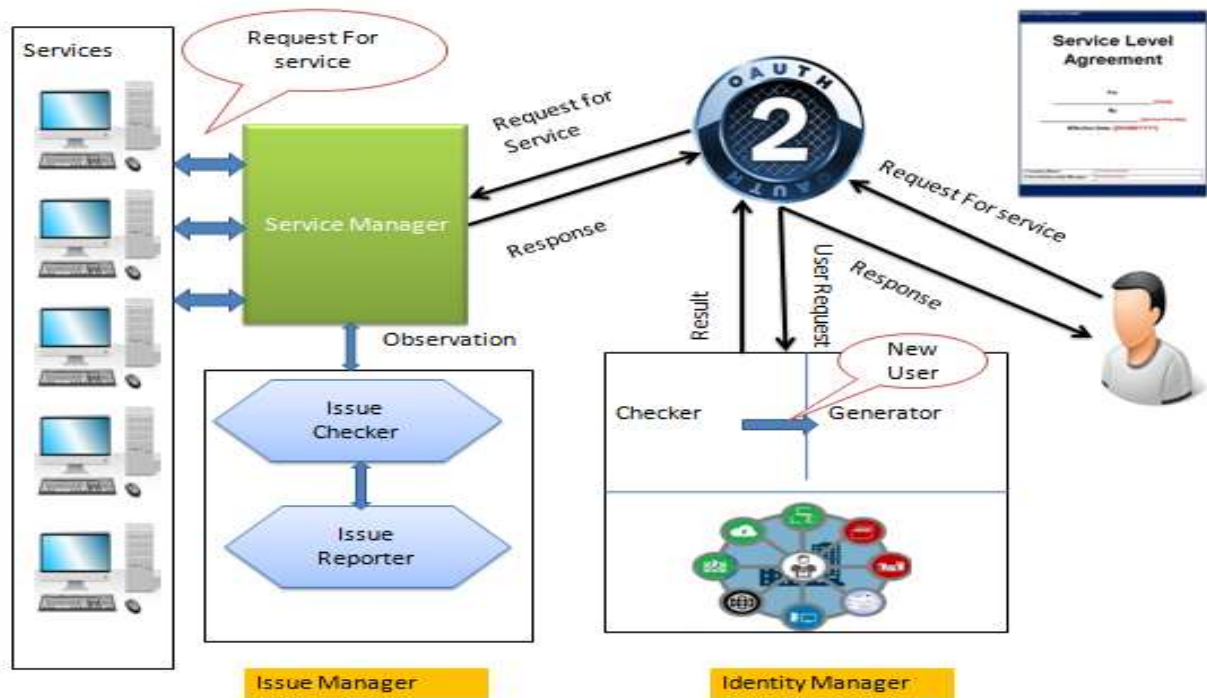**Fig -7**: Proposed  Architecture

## 4. Result and Analysis
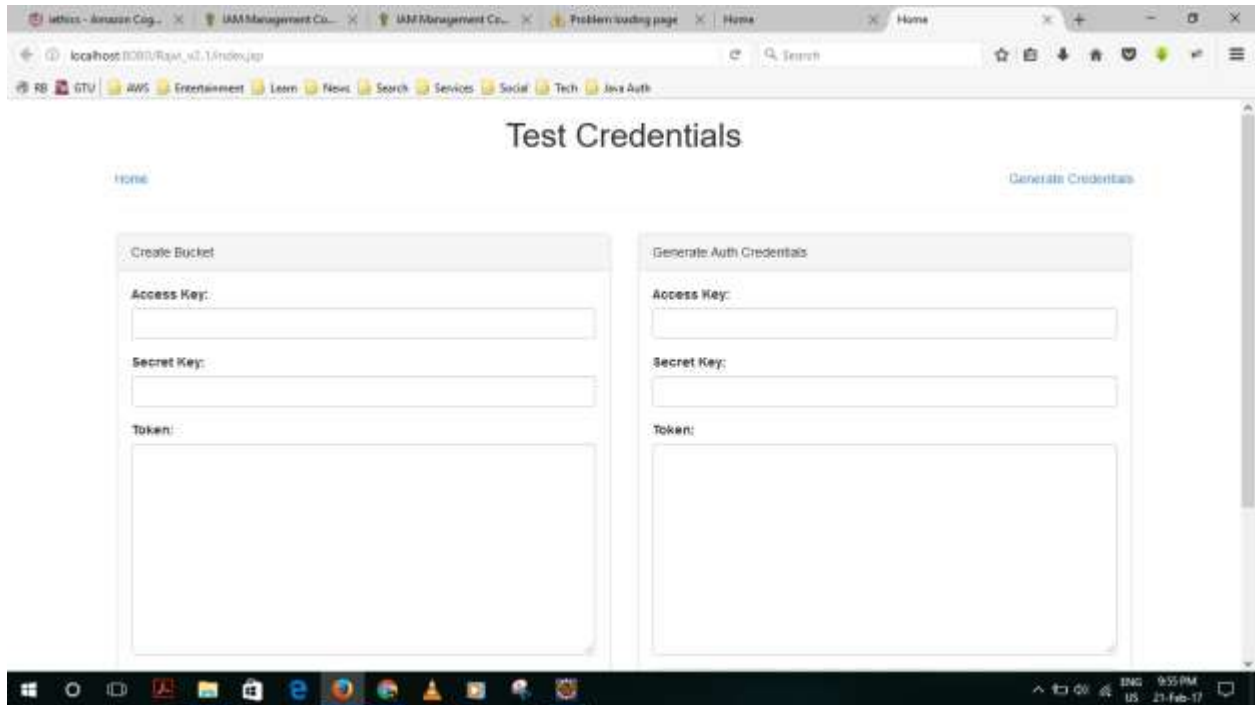


**Fig -8**: Generate Identity ID for user

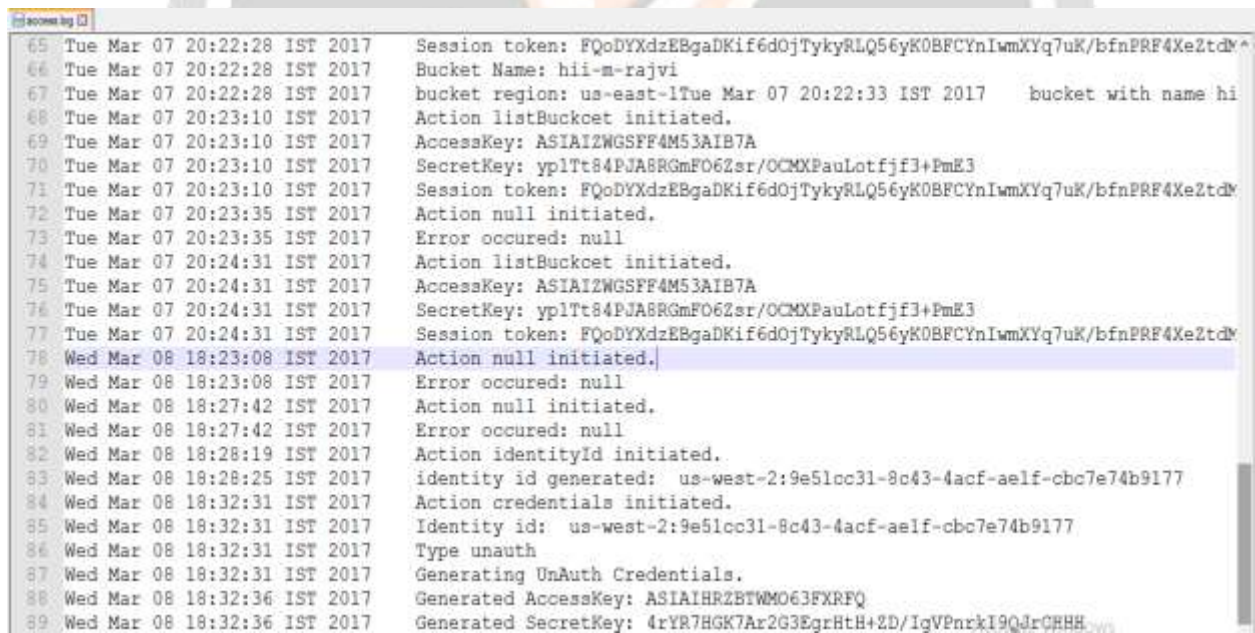**Fig -9**: Credential for users



**Fig -10**: Log file for Storage

## 3. CONCLUSIONS

In this dissertation focus on Profiling-as-a-Service infrastructure and build traffic profiles at multiple layer. And secure the data using SLA and create auto use profile and store the user profile in database for future service selection .Give the depth information of network traffic. To demonstrate the operational feasibility and the practical application of the profiling-as-a-service.

## 4. REFERENCES

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