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MACHINE LEARNING ALGORITHMS FOR CLOUD COMPUTING SECRECY: A STATE OF THE ART SURVEY

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Abstract

On-demand accessibility of network resources, in particular data storage and processing power, is provided by Cloud Computing (CC) without special and direct management by users. CC has recently emerged as a collection of public and private data centres that offer a single platform across the Internet to the customer. Edge computing is an emerging computing paradigm that takes end-users closer to computing and data storage to increase response times and spare transmission power. Mobile CC (MCC) transmits apps to cell phones using distributed computing. CC and edge computing, however, have security problems, including client vulnerability and association recognition, which hinder the rapid adoption of computing models. The study of computer algorithms that naturally develop through practise is machine learning (ML). We present an overview of CC security risks, challenges, and solutions using one or more ML algorithms in this review article. We study various ML algorithms, including supervised, unsupervised, semi-supervised, and reinforcement learning, that are used to solve cloud security issues. Then, based on their characteristics, benefits, and drawbacks, we compare the efficiency of each technique. In addition, to secure CC models, we enlist potential research directions.

Keywords: *Machine Learning, Types of Learning, Computing paradigm, Edge computing, Mobile system.*

I. INTRODUCTION

As a new platform for enabling and providing services over the Internet, Cloud Computing (CC) has recently emerged. Popular financial constraints and rising computing costs involve data storage, analysis, and presentation that have made crucial improvements to the existing cloud model [1]. CC is the on-demand accessibility of the resources of end-users, especially

data storage and processing capacity, without the customer needing a direct special organisation.

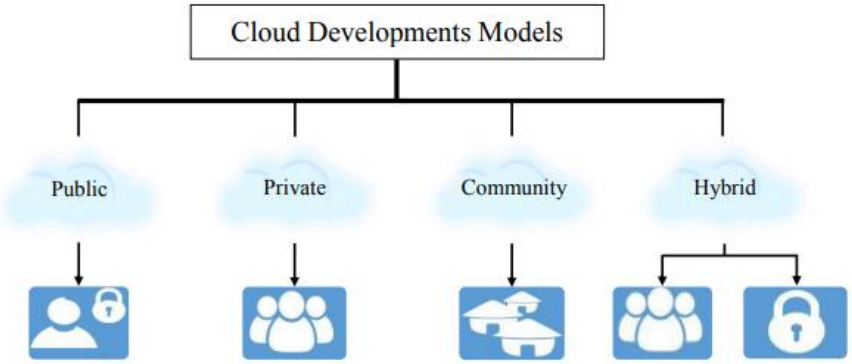

Fig. 1: Illustrates the cloud deployment model [2].

Figure 1 shows the cloud deployment model. Figure 2 shows the service model of the cloud computing. Table 1 shows comparative examination of cloud deployment prototypes. There are four deployment models for cloud computing (CC): private, public, hybrid, and community cloud [28]. There are distinct costs and value propositions in each implementation model. It's also a challenging and important decision to determine the deployment model. CC is a model of development that has tremendous growth potential and is becoming widely popular [3].

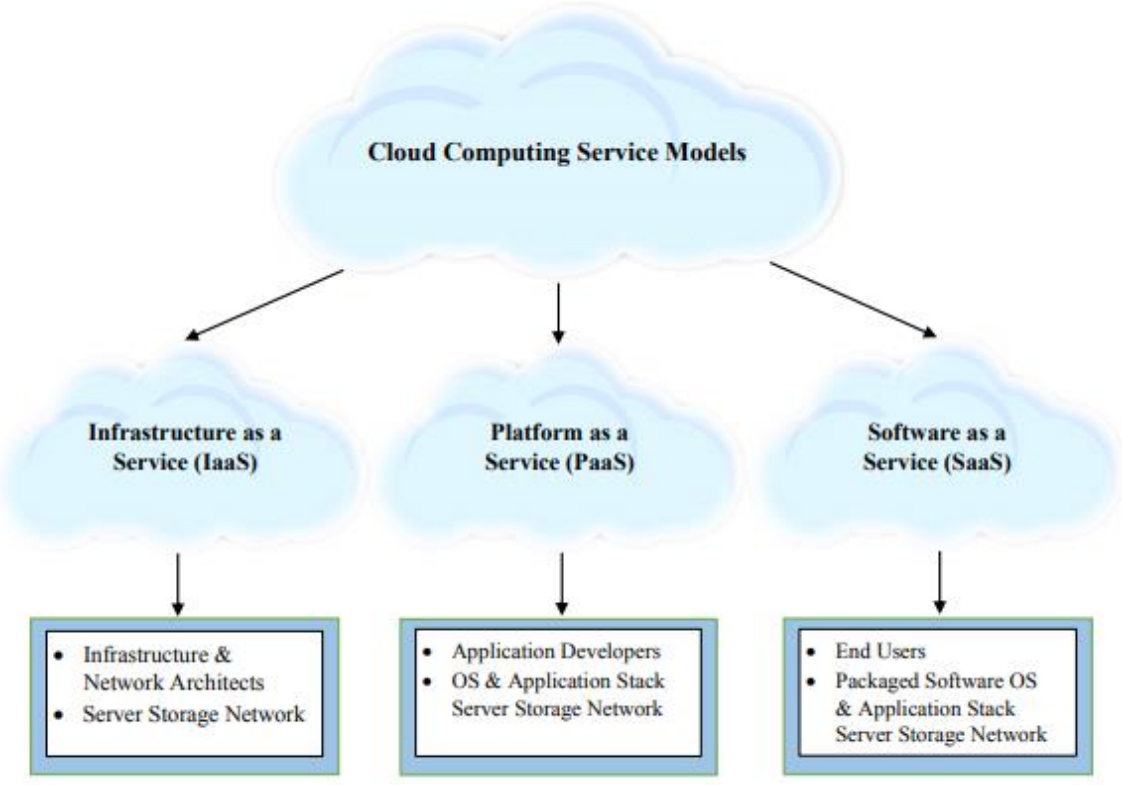

Fig. 2: Illustrates the service model of the cloud computing [2].

Table 1: Comparative examination of cloud deployment prototypes.

Cloud Models	Pros	Cons
Public	• High scalability • Flexibility • Cost-effective • Reliability • Location independence	• Less secure • Less customizability
Private	• More reliable • More control • High security and privacy • Cost and energy efficient	• Lack of visibility • Scalability • Limited services • Security breaches • Data loss
Community	• More secure than public Cloud • Low cost than private Cloud • More flexible and Scalable	• Data segregation • Responsibilities allocation within the organization
Hybrid	• High scalability • Low cost • More flexible • More secure	• Security compliance • Infrastructure dependent

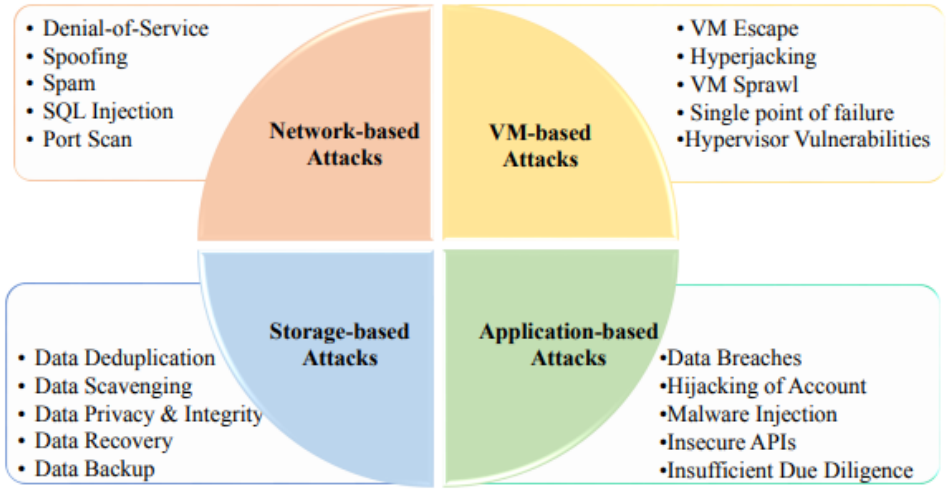

Fig. 3: Depicts the strikes on the cloud component [2].

II. LITERATURE REVIEW

Lee et al. conducted a survey on Machine Learning applications of artificial intelligence: analysis and prospect. One of the most exciting new Artificial Intelligence technology is machine learning. Learning algorithms that we use every day in many applications. One of the reasons why it works so well is that a learning algorithm, one introduced by Google or Microsoft, has learned how to rank web pages every time a web search engine such as Google or Bing is used to search the internet. That's also machine learning every time Facebook is used and it recognises the pictures of friends. Email spam filters prevent the user from having to wade through loads of spam emails, which is a learning algorithm as well. A brief analysis and

potential outlook of the vast applications of machine learning has been provided in this paper [4].

III. DISCUSSION AND CONCLUSION

Security threats and attacks were analysed in this study as the most difficult problems in CC. Different types of ML algorithms have been studied, such as ANNs, K-NN, Naïve Bayes, SVM, K-Means, and SVD, as solutions to fix CC security issues. We checked several suggested strategies using cloud protection ML algorithms. We provided the suggested approaches with an empirical evaluation and analysis and highlighted their advantages and drawbacks. We have also implemented some research recommendations that will need more research in the future.

IV. REFERENCES

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