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Enhancing Data Security in Cloud Environment using Watermarking Technique

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ABSTRACT:

Millions of pictures are generated in varied digital devices each day. With the dawn of easiness in transferring and manipulating of digital knowledge, digital image integrity has so become a serious issue. Resolution to the current drawback is to enter watermark within the digital knowledge. typically watermarking has been used in government documents, passport for security options, currency notes, and stamp papers for legal purpose. Watermarking is terribly useful for distinctive the document of any approved person. Digital watermarking emerged as a resolution for copyrights detection, protection and maintenance of vital knowledge. Cloud computing has been one amongst the foremost vital computing paradigms emerged in recent years. This paper gift review of varied sorts of digital watermarking techniques and in what means the integrity of watermarking will be attacked therefore as throttle the system and propose sturdy technique to boost knowledge security in cloud atmosphere in collaboration of digital watermarking once used for cloud computing will considerably result to build the system sturdy moreover as secure users knowledge.

INTRODUCTION:

The recent advancements in digital info have created refined changes in our society and life. The blessings of digital info conjointly created new challenges and opportunities. Innovations, supported by powerful software package, new devices like photographic camera, digital voice recorder, TV, camera and have reached the shoppers, worldwide, use manipulate and knowledge the pleasure within the multimedia system knowledge. net and wireless communication networks offer present channels to send and exchange info. Cloud computing emerges as paradigm of net computing in that can-do, climbable and usually virtualized resources as extremely centralized. Cloud computing provides the potential to use the storage resources furthermore as computing resources on usage basis and scale back the investments and expenditures within the organizations computing surroundings. The creation and deletion of virtual machines running on physical infrastructure and most commonly controlled by hypervisors which is that the most vital value effective furthermore as versatile computing paradigm. The use of mobile device to access and share multimedia system content such as pictures, video, transfer of software package applications, pay on-line bills and communicate on the cloud over the net is increasing with the forceful growth in multimedia system technology. Digital watermarking technology is associate info concealing technology that obliquely embeds some identification info into a digital carrier while not touching the worth of the initial carrier [1][2]. By extracting these watermarks hidden within the carrier, it's potential to substantiate the content creator, transmit the key info, or confirm whether or not the carrier has been tampered with. The fundamental characteristics of digital watermarking are security, concealment and lustiness[3]. The digital watermarking algorithms are additional divided into spatial domain algorithms rework domain algorithms and compressed domain algorithms. Unremarkably used variation domain algorithms [4] embrace distinct Fourier rework (DFT) [5], distinct cost transforms (DCT) [6] and distinct rippling transforms (DWT) [7]. The rework domain rule typically adds the watermark info to the radio frequency a part of the human perception [8].

By dominant the intensity and position of the watermark embedding, 3 could be a exchange between the watermark physical property and lustiness, and therefore the watermarked image can notice higher performance.

LITERACTURE SURVEY:

Li et al. [9] introduced the watermarking methods for smart cities by utilizing the DCT in the neural network domain. The authors conclude that the proposed method not only embeds and extracts the watermark but also efficiently determines the watermark attribution.

Zhang et al. [10] introduced the three different key generation schemes content-based, noise-based and unrelated-based images respectively. Pre-train model is accurately adjusted with watermark keys and in the detection phase, the user sends the watermark key to the DNN model. This is the external service provider that ultimately submits the threshold to classify the Boolean decision. He introduced three different methods for generating a watermark key, but not well for giving a continuous performance on the standard datasets.

Uma, B., & Sumathi, S.[11] Proposed a solution to the security threat and fear faced by cloud users using robust reversible watermarking and RSA digital signature. It was stated in their work that due to the limitation of the traditional watermarking technique in distorting the water marked objects and not able to extract it full content back the need to use the robust reversible watermarking in protecting data on the cloud. Two security methods reversible watermarking and RSA digital signature were used to improve confidentiality and cloud security level between mobile user and mobile cloud environment when sending information to the mobile cloud service providers in their work. Due to rise in technology and increase transfer of multimedia content son the cloud using mobile devices.

Monisha, M., & Chidambaram S [12] proposed an enhanced security technique to have a secure communication of data in the cloud over the internet using RSA digital signature with robust reversible watermarking algorithm. In their work, RSA was used to encrypt and decrypt the multimedia content using its public and private keys and hash function was used to reduce the size of the multimedia content to any size called hash value and to also, sign the multimedia content for authentication and validation. In order to prevent the security challenge of insider attack on user data in the cloud by cloud service provider administrator.

Merrer et al. [13] suggest creating controversial patterns if the opponents succeeded in the attack, the corresponding samples are called "true opponents". In this scheme, the set of opposite samples is used as the WM key set to change the decision boundary of the target neural network. While attacks fail, images l watermark key is a complete combination of true and false opponents.

Islam M, Roy A, Laskar RH [14] Proposed watermark approach based on LWT; ANN was used to extract watermarks, several attacks were simulated on the watermarked image, and then ANN was used to reconstruct the original image.

Islam M, Ahsan S, Ullah M, [15] proposed a digital image watermarking technology based on DWT, entropy and neural network is proposed to protect image authentication. First, a host image and a watermark image are divided into a plurality of frequency bands by using a wavelet transform. Then, the entropy of each frequency sub band is calculated to find the maximum entropy sub band, so that the maximum entropy sub band of the watermark image can be embedded into the maximum entropy sub band of the host image. Finally, the neural network is used to determine the relationship between the pixels value of the host image and the watermark image for subsequent watermark extraction process. In addition, to reduce image processing attacks, a moving average filter is used before extraction.

CLOUD COMPUTING SERVICE MODELS:

There are three computing service models.

Software-as-a-service (SaaS): Consumer has a capability to use the provider's applications running on a cloud infrastructure. Examples SaaS are Google Apps, Salesforce.com, etc.

Platform-as-a-service (PaaS): PaaS Provides the consumer with the capability to deploy onto the cloud infrastructure (middleware, databases), Consumer created or acquired applications, produced using programming languages and tools supported by the provider. Examples Google Application Engine, Windows Azure etc.

Infrastructure-as-a-service (IaaS): IaaS provision the consumer with the Computational capabilities to processing, storage, networks, and other computing resources in a centralized, location transparent service and allow the consumer to deploy and run arbitrary software, which can include operating systems and applications like Amazon Web Services(AWS), Microsoft Azure, Google Compute Engine (GCE), Joyent etc.

CLOUD DEPLOYMENT MODELS:

Cloud computing architecture identifies four deployment models as described below:

Private cloud: The cloud infrastructure is operated for a private organization. It is managed by the organization or a third party, and may exist on premise or off premise.

Community cloud: The cloud infrastructure is shared for specific community or shared by several organizations that has communal concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organizations or a third party, and may exist single tenant.

Public cloud: The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services (multi-tenant).

Hybrid cloud: The cloud infrastructure is a combination of two or more clouds (private, community, or public) that are bound together by standardized or proprietary technology, but remain as a unique entities that enables application and data portability.

CLOUD COMPUTING SECURITY:

The concern is for security in cloud computing environment when passing on any organizations critical information to geographically dispersed cloud platforms and that too is not in control of that particular organization whose data is to be stored on a cloud platform. Security issues related to the security of cloud computing are-

- Privileged access
- Separation of the data from its actual location
- Data availability
- Regulatory compliance
- Long term viability

OVERVIEW OF WATERMARKING:

A watermark is particularly of data that's embedded with the info so on avoiding its handling to validate for possession proof. wide used watermarking is on still pictures, videos, and largely on audios. reckoning on the kind of information to be watermarked numerous formulas area unit used like patchwork algorithm used for image watermarking, Watermarking typically consists of 2 phases; watermark embedding i.e. introduce little pictures or pattern into the knowledge while not touching the original knowledge. A secret's won't to engraft the watermark data into the info. Once the watermark data is embedded the info is obtainable for the employment. Another section is watermark detection or verification this section is employed to verify the possession of the info. The info is compared with the suspicious information victimization identical key. Image watermarking is generally used theme for knowledge that contain image files, the image watermarking uses a personal key and one formula, for image watermarking.

The watermarking technique had provided further security to cloud knowledge. For the previous couple of years, reversible watermarking techniques area unit gaining quality attributable to increasing some applications in sensitive and vital areas, i.e., vital military communication, medical department, and a few law-enforcement.

Digital watermarking techniques area unit classified consistent with documents sorts such as:

1. Text Watermarking: it's Associate in nursing approach for text document copyright protection. Digital watermarking for text documents area unit primarily classified into three sorts.

- Line shift coding: This vertically shifts location of text lines to encipher the document.
- Word shift coding: This horizontally shifts location of words to encipher the document.
- Feature coding: this can select sure options and alerts those chosen options.

2. Image Watermarking: during this technique a watermark is value-added to image traced. The watermark could be a a part of the image and can't be simply faraway from an image.

3. Video Watermarking: This involves embedding scientific discipline data derived from frames of digital video into the video itself.

4. Audio Watermarking: during this technique Associate in nursing electronic symbol is embedded in Associate in nursing audio signal. Some authors planned the employment of text or pictures to be embedded within the audio file such any of such audio file can be analyzed for a potential recovery.

PROBLEM STATEMENT:

When any organization is opting cloud services, the main concern is for security in cloud computing environment when passing on any organizations critical information to geographically dispersed cloud platforms and that too is not in control of that particular organization whose data is to be stored on a cloud platform. Security concerns based on delivery and deployment models are data integrity, data locality, data Confidentiality and data access. Some more security related concerns are Sign on process, Authentication &authorization, network security and identity management.

RESARCH GAP IDENTIFIED:

Following Security problems associated with the protection of cloud computing are-have been known.

i) Privileged access: This is the question regarding UN agency has the privilege to access the information.

ii) Separation of the information from its actual location: The coding is performed, UN agency is accountable for coding & at that layer the coding is completed.

iii) Information availability: The cloud seller move entire information to a totally different location or surroundings and ought to the prevailing surroundings should be compromised.

iv) Long term viability: This is the essential issue, what happens to the user's helpful information once the cloud seller goes out of business, will the info is came back to shopper and if came back what's the format of the info.

v) Virtualization security management: The virtual machine, storage manager, hypervisor or hosts area unit least variety of elements needed to setup a virtual surroundings. Virtual threats area unit threats to a virtualized surroundings area unit generic in nature like denial of service attack

vi) Trusted cloud computing: It is will be viewed as security design designed to defend cloud systems from numerous malicious intrusions and attacks to guarantee that the computing resources can execute in an inevitable manner as it was designed.

CONCLUSION:

With the development of cloud computing, cloud security has become an important issue. One of the major challenges in the cloud computing is security. Cloud computing is actually not a new special weapon for solving security problem. The paper discusses on the survey of cloud computing characteristics, emerging security issues for service models and security aspects for deployment models. Various digital watermarking techniques are studied with respect to authentication for cloud data. This paper tries to provide a new insight into the essence of cloud security. Still, these frameworks have certain limitations in terms of security and performance. In Future work the critical study of a digital watermarking as a security aspects for different techniques, algorithms visualization of technology same to the cloud computing system will be needed.

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