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A Review on Achieving Cloud Security using Third Party Auditor and Preserving Privacy for Shared Data over Public Cloud

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Abstract: *In the present paper a review related to Achieving Cloud Security using Third Party Auditor and Preserving Privacy for Shared Data over Public Cloudwas done. Cloud computing is a new technology that will attract greater attention from industry and academics in the future. When compared to the expense of creating infrastructure, this technology is more appealing. However, like with any maturing technology, there will be several security vulnerabilities with this system. This research study achieves substantial breakthroughs in data security, data integrity, and access control in the public cloud. Third Party Auditor (TPA) and user separation are successfully employed in this procedure. The TPA uses a hybrid signature generating technique called MD5withRSA. The access control is used to segregate users from data owners, and only those users who have been allowed access by the data owners can access the owner's data.*

Keywords: Cloud computing, TPA, Public Cloud, Data Owner

I. INTRODUCTION

Cloud computing allows dispersed data storage while also lowering use expenses. The cloud permitted access to data at any time and from any location. The user is liberated from the complications of hardware and software requirements for data storage and sharing procedures, and data storage location independence is realized. For data storage and access, the user can simply use the services provided by the many firms offering cloud services. With the ease of access and storage provided by the cloud, questions of usage permission and data security arise. Typically, authorized users are granted access to cloud storage with varying levels of restriction, with access control handled by the system administrator.One of the limits that aid in data security is offering access to data consumption for a specific use and limiting the user's number of methods that may be utilized for access and usage. Some of the user level grouping construction is based on attributes. As the primary usage of the cloud is for content storage and sharing for various purposes, data security when moving or storing files is a worry that necessitates effective solutions. Amazon Simple Storage Service and Amazon Elastic Compute Cloud have made it possible for customers in a variety of industries, including entertainment, legal, product development, and corporate organizations, to store and retrieve various sorts of data. Once the system is powered by the cloud and the cloud security model for data is in place, the process of preserving data security is often not a worry for the user. However, security issues for cloud data continue to be a bigger priority in terms of external assaults on cloud data that destroy the content and breach the integrity of cloud storage. Because cloud security technologies do not ensure the accuracy of user data, users will want procedures to manage data security in the cloud system. These procedures should not necessitate regular data management by cloud users.

II. LITERATURE REVIEW

For the investigation I have selected some research papers that are as follows:

Boyang Wang(2014) [1] aimed a privacy-preserving public auditing mechanism for shared data in the cloud. They utilized signatures to construct homomorphism authenticators, so that a public verifier is able to audit shared data integrity without retrieving the entire data, yet it cannot distinguish who is the signer on each block. To improve the efficiency of verifying multiple auditing tasks, they further extend our mechanism to support batch auditing. There are

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two interesting problems they will continue to study for our future work. One of them is traceability, which means the ability for the group manager (i.e., the original user) to reveal the identity of the signer based on verification metadata in some special situations. Is based on ring signatures, where the identity of the signer is unconditionally protected the current design of ours does not support traceability. To the best of our knowledge, designing an efficient public auditing mechanism with the capabilities of preserving identity privacy and supporting traceability is still open.

Shini.S.G. (2012) [2] examined Medical Imaging and Cloud computing could become the most data and computing intensive activities in future. Cloud is an emerging approach for various medical imaging applications. In this paper they discussed about cloud based medical imaging mechanism and analysed the various security issues associated with this approach. They examined the current solutions and discussed their limitations. Finally, they discussed the future directions for research. Cloud-based medical image sharing platforms are increasingly becoming more prevalent in medicine. Ultimately online medical image transfer systems allow physicians to build better and deeper referral networks, which in turn mean increased volumes and a more open platform for collaboration. Cloud computing has gathered specific attention from information technology vendors in providing massive storage applications and highly managed remote services. Cloud platform can form an exchange platform that all healthcare organizations use and can serve as storage centre of medical records. Reliability and security are the main concerns about cloud computing.

KaipingXue(2018) [3] makes a combined the cloud-side and data owner-side access control in encrypted cloud storage, which is resistant to DDoS/EDoS attacks and provides resource consumption accounting. Our system supports arbitrary CP-ABE constructions. The construction is secure against malicious data users and a covert cloud provider. They relax the security requirement of the cloud provider to covert adversaries, which is a more practical and relaxed notion than that with semi-honest adversaries. To make use of the covert security, they use bloom filter and probabilistic check in the resource consumption accounting to reduce the overhead. Performance analysis shows that the overhead of our construction is small over existing systems. CLOUD storage has many benefits, such as always-online, pay-as-you-go, and cheap. During these years, more data are outsourced to public cloud for persistent storage, including personal and business documents. It brings a security concern to data owners the public cloud is not trusted, and the outsourced data should not be leaked to the cloud provider without the permission from data owners. Many storage systems use server-dominated access control, like password-based and certificate-based authentication. They overly trust the cloud provider to protect their sensitive data.

CONG WANG(2013) [4] investigated outsourced image recovery service from compressed sensing with privacy assurance. OIRS exploits techniques from different domains, and aims to take security, design complexity, and efficiency into consideration from the very beginning of the service flow. With OIRS, data owners can utilize the benefit of compressed sensing to consolidate the sampling and image compression via only linear measurements. Data users, on the other hand, can leverage cloud's abundant resources to outsource the image recovery related `1 optimization computation, without revealing either the received compressed samples, or the content of the recovered underlying image. Besides its simplicity and efficiency, we show OIRS is able to achieve robustness and effectiveness in handling image reconstruction in cases of sparse data as well as non-sparse general data via proper approximation. This privacy-preserving image recovery service in OIRS that we propose to explore is also akin to the literature of secure computation outsourcing which aims to protect both input and output privacy of the outsourced computations. With the breakthrough on fully homomorphic encryption (FHE), a theoretical solution has already been feasible. The idea is to represent any computation via a garbled combinational circuit and then evaluate it using encrypted input based on FHE. Large-scale image data sets are being exponentially generated today. Along with such data explosion is the fast-growing trend to outsource the image management systems to the cloud for its abundant computing resources and benefits. How to protect the sensitive data while enabling outsourced image services, however, becomes a major concern. They thoroughly analyse the privacy-protection of OIRS and conduct extensive experiments to demonstrate the system effectiveness and efficiency. For completeness, we also discuss the expected performance speedup of OIRS through hardware built-in system design.

Zhongbo Shi(2014) [5] examined a novel scheme for coding photo albums in clouds. Utilizing feature-based measurements instead of pixel-wise ones to evaluate and exploit interim age correlations. Unlike previous schemes for image set compression, they adopt content-based feature matching which is invariant to scale and rotation and less sensitive to illumination changes for both correlation estimation and redundancy reduction. Given the complicated

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correlations between images, they first determine the optimal prediction structure of the image set to minimize the total predictive cost by FMST. Based on the prediction structure, they further propose a three-step prediction to reduce complicated disparities between images: the local geometric disparities of image regions are deduced by feature-based multi-model deformation; the intensity disparities are decreased by feature-based photometric transformations; and the limited local displacements are declined by block-based motion compensation. they would like to focus efforts on making our scheme more efficient in dealing with dynamic albums. Our current solution can deal with deleting and inserting images. If some new images are inserted into a compressed album, our scheme may have to rebuild the FMST and re-encode the album. If some images need to be deleted from the compressed album, they need to revise the FMST and may have to Trans code related images. Though useful, the current method for supporting a dynamic album is very simplistic in its approach. In short, our current method can support dynamic albums by transposing the photos in the related path of FMST. They can also limit the depths of FMSTs to narrow the maximum number of processed photos.

RajkumarBuyya(2013) [6] presented Computing is being transformed to a model consisting of services that are commoditized and delivered in a manner similar to utilities such as water, electricity, gas, and telephony. In such a model, users access services based on their requirements regardless of where the services are hosted. Several computing paradigms have promised to deliver this utility computing vision. Cloud computing is the most recent emerging paradigm promising to turn the vision of "computing utilities" into reality. Cloud computing started with a risk-free concept: Let someone else take the ownership of setting up of IT infrastructure and let end-users tap into it, paying only for what is been used. A service offering computation resources is frequently referred to as Infrastructure as a Service (IaaS) and the applications as Software as a Service (SaaS). An environment used for construction, deployment, and management of applications is called PaaS (Platform as a Service). Cloud computing applications span many domains, including business, technology, government, health care, smart grids, intelligent transportation networks, life sciences, disaster management, automation, data analytics, and consumer and social networks. Various models for the creation, deployment, and delivery of these applications as Cloud services have emerged. The Cloud computing paradigm is rapidly progressing, as evidenced by its adoption for the creation and delivery of innovative applications in several domains including scientific, consumer, social networks, health care, enterprises, banking, government, and big data. Several trade magazines have been actively featuring industrial development in Cloud computing.

Israna Hossain Arka(2014) [7]examined independent cloud based collaborative medical image storage and mobile viewer assisted with effective compression and decompression technique with unique security structure design. The proposed design has considered deep technology exploitation to offer medical image access via mobile devices by considering all the current constraints in terms of storage, image clarity and security. The proposed architecture allows both patient and medical practioners to have a cost effective approach in disease management and treatment process. It also introduces healthcare analysts and practitioners to the advancements in the computing field to effectively handle and make inferences from voluminous and heterogeneous healthcare data. Due to the broad nature of the topic, our primary emphasis will be on introducing healthcare data repositories, challenges, and concepts in data science. Not much focus will be on describing the details of any particular techniques and/or solutions in image compression, security and the medical field in particular other than convenient data access opportunity framework. secure independent collaborative cloud-based medical imaging exchange can speed access to pertinent current and historical imaging studies. Hospitals deploying a medical image exchange can view and share images and reports with their referral partners in real time, without relying on physical media such as CDs.

Sajida Karim(2020)[8] presented the Face book compressed videos that decrease the quality of the video, make more blurry and noisy as compared to other social clouds, and signifies the relation existing in video sequences, respectively. These all metrics are robust evident in the compressed video for Qzone and Tumblr videos; Tumblr adds low noise rate as compared to Qzone, and both provide the best quality as compared to other social cloud videos and metrics. Therefore, we can conclude that Qzone and Tumblr metrics capture the high quality of video even in the lowest transmission bit-rates, and increased QoE and provided the QoS. This research will help the social cloud service provider to improve video quality for end users to increase QoS and QoE to generate more revenue. The objective QoE assessment of image quality will help social cloud service providers to improve their service for end-users because users also upload images of their life moments with friends. The design and development of the objective QoE

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framework will enable automatically collect QoE of end-users using social networks that will help improve services without operator intervention.

H. B. Kekre(2016) [9] examinedsimpler image compression technique using vector quantization and hybrid wavelet transform. Hybrid wavelet transform is generated using Kronecker product of two different transforms. Image is converted to transform domain using hybrid wavelet transform and very few low frequency coefficients are retained to achieve good compression. Vector quantization is applied on these coefficients to increase compression ratio significantly. VQ algorithms are applied on transformed image and codebooks of minimum possible size 16 and 32 are generated. KFCG and KMCG are faster in execution and beats performance of LBG algorithm. KFCG combined with hybrid wavelet transform gives lowest distortion and acceptable image quality at compression ratio 192.

Fouad KheliÞ(2018)[10] aimed a model for storing and sharing data securely through the cloud has been presented. RDH-EI has been recently suggested as an approach to ensure secure and privacy-preserving applications for data sharing and management in the cloud, limitations have been reported on the efficiency of conducting RDH in such applications. To address security issues in the cloud more efficiently, a new approach that does not use the process of RDH has been proposed. This is based on the idea of reserving room before encryption via a wavelet-based lossless image coder. Compared with state of- the-art RDH-EI systems, the proposed approach has been shown to offer a significantly higher data insertion capacity with suitable features for the presented cloud model. our analysis shows that the CSP can perform an attack to partially disclose the content of images encrypted with a stream cipher in the existing RDH-EI approach. Alternatively, the proposed approach protects the image content in a more reliable way as the stream cipher is applied on the compressed bit-stream. The proposed idea is to compress the image via a lossless image coder in order to create space before encryption. This space is then filled with a randomly generated sequence and combined with an encrypted version of the compressed bit stream to form a full resolution encrypted image in the pixel domain. The cloud service provider uses the created room in the encrypted image to add additional data and produces an encrypted image containing additional data in a similar fashion. Assessed with the lossless Embedded Block Coding with Optimized Truncation (EBCOT) algorithm on natural images, the proposed scheme has been shown to exceed the capacity of 3 bpp of additional data while maintaining data security and confidentiality.

Ranjeet Kumar(2019)[11] presented paper makes an efficient compression and quality retrieval technique is presented for high resolution or big data images based on low-rank singular value analysis. The proposed technique has been able to compress the image at higher compression rate with acceptable visual quality as per human vision system (HVS), the comparative analysis also considers as evidence that explain the suitability of proposed method as compare to state-of-the techniques and standard technique like JPEG200. Further, visual quality can be improved with SVT on based quality retrieval process as per required applications. The simulation results evidence that the presented technique is able to compress images with high rates. Overall, an analysis shows the efficiency of proposed method of compression and quality retrieval is suitable for various characteristics of images.

Mamta Meena(2016)[12] proposed new architecture on cloud can resolved many issues of legacy system. Standalone system has many drawbacks, to full fill today requirements which can be overcome using cloud. By using this we can see how the images will be uploaded, and how they will be stored in a blob storage on cloud. The public cloud based model using CBIR SaaS Architecture presented in this paper has been successfully implemented by Microsoft Azure. This system can be easily scalable, pluggable and more effective in terms of cost & efficiency. Because of its flexible on-demand principle, it can operate enormous amount of data, which in turn, gives effective use of data storage and processing power. They are going to propose a highly scalable, pluggable and faster cloud based CBIR system, which is capable to store, process and extract and operate large number of images. System can be scalable based on the storage and processing requirements. The main functionality of the CBIR application, in which the image is inserted as query, is to extract the visual property of image and save it for future comparison. The problem involved with the standalone architecture is that the system has to perform multiple operations of feature vector extraction, enrolment and verification. Also any failure occur at any point may cause the whole system down. With the increase in the number of users for such application, they need a scalable solution for such application so the system can be modified based on the user requirements.

B. Nivedha(2017)[13] investigated Image redundancy in the feature, spatial, and frequency domains. They first organize the images into a pseudo video by minimizing the global prediction cost in the feature domain. A hybrid

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disparity compensation method to better exploit both the global and local correlations among the images in the spatial domain. The redundancy between each compensated signal and the corresponding target image is adaptively reduced in the frequency domain. the fast development and prevailing use of handheld cameras, cost as well as required photography skills is much lower than before. Users today have gotten used to taking and posting photos profligately with mobile phones, digital cameras, and other portable devices to record daily life, share experiences, and promote businesses. They are using our proposed method to increase the space in the drive. Here we are using LZ77 compression algorithm for compressing the image size in cloud. For future modification different compression algorithm can be used for better performance.

J. Smith(2012)[14] examined a progressive encoding technique that encodes the structure as well as the plane equations. They encode the planes using distances to three points and a single bit. To decode these planes, they solve a constrained optimization problem that has closed-form solution. They then reconstruct the surface from this representation by implicit zing the discontinuous linear pieces at the leaves of the octree and take a level set of this implicit representation. Their tests show that the proposed method compresses surfaces with higher accuracy and smaller file sizes than other methods. To acquire these models, one typically uses a laser range scanner that generates 3D point samples on the surface of the object. These point samples need to be processed further since almost all applications require polygonal models with explicit connectivity. One of the main difficulties that have hampered the performance of surface reconstruction methods in recent years is the sheer quantity of data. They proposed an algorithm that performs compression on an intermediate data structure that we build from the oriented input points (see the second image from Fig. 1). This data structure is an adaptive octree with planes at every node containing input data points. From this representation, using we can easily compute an implicit function and extract its level set to produce the final, reconstructed surface. Their main contribution is the development of a new method for surface compression that builds and encodes an adaptive octree representation of this surface. They decode the octree by solving a constrained optimization problem that has closed-form solution. To display the surface, we use wavelet pasteurization to compute an approximation to the indicator function of the solid body whose boundary is the surface and reconstruct the shape by extracting a level set of this function using Marching Cubes. In the future, they would like to study the advantages and disadvantages of using functions other than linear polynomial fits at the octree nodes. Higher order polynomials should allow better approximation, further pruning of the octree and hopefully better compression rates. However, their use comes with more complicated decoding strategies and dangers of over fitting.

Man-Wen Tian(2019)[15] examined occurs when both parties conclude the agreement, where one party issues financial paper as the creditor, and the other one party accepts the financial paper as the debtor, the drawer will repay the money to the payee on the expiry date of financial paper for paying off the debt. Financial paper identification system is a hot issue of current file analysis and identification system, including a series of process, such as paper classification, image processing, character segmentation and identification, as well as file image compression. A research on multiple aspects of financial paper identification system was made, and a financial paper identification system with applied value is thereby established on its basis. The colour image of financial image with various types, huge quantity, complicated layout and serious noise disturbance, the paper proposes a hierarchical paper type matching method based on the binary decision tree framework. Among which, the linearization processing of colour paper image is based on the hierarchical process of paper classification application. For every type of binaryzation image, the paper type judgment processing adopts also the hierarchical process. As for one paper image under processing, the first process is the weighted relaxation matching on the basis of paper layout structure, the second process is the OCR-based paper title identification judgment, the third process is the use of the colour analysis on the basis of colour paper image to gradually shorten the range of target paper type, the fourth process is the linear combination of layout structure matching and paper title's OCR identification result to obtain the final type of paper. Same to the decision tree method, the processing method of every node of hierarchical process is simple, but the entire hierarchical method has better results.

A.M. Vengadapurvaja (2017)[16] presented Fully Homomorphism Encryption scheme supports both addition and multiplication. The input images and the corresponding encrypted images are shown. The DICOM image is taken as the input image. The analysis like key space analysis, Key sensitivity analysis, histogram analysis, correlation analysis, PSNR and MSE analysis, Noise analysis are performed. The results are tabulated. The analysis that is performed helps

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us to verify the efficiency of the proposed method in medical image security. When compared to the paper records this method has several advantages. Electronic Health record helps us to maintain large number of records and it is easy to improve all aspects of patient care, including efficiency, instant updating of records with accuracy. This medical record system includes laboratory results, medication lists, Diagnostic tests, physical assessments, past history observations and patient health management tools. One patient record can be accessed by the multiple users. These data are stored in the public cloud. There are many security issues in cloud computing. Due to this, privacy has to be taken into account. Since the patient's name, address and the other health records are present, there may be a possibility of theft, unauthorized access and breaches over the data. Preservation of these records has to be done efficiently.

Chi Yang(2013)[17] examined Cloud promises an ideal platform with massive computation power and storage capacity for processing big data that is of high variety, volume, veracity, and velocity. To reduce the quantity and the processing time of big data sets encountered by the current typical Cloud big data processing techniques, in this paper, they proposed a spatiotemporal compression based approach on Cloud to deal with big data and big graph data from real world applications. In our technique, the big data was compressed firstly according to its spatiotemporal features on Cloud. Based on this spatiotemporal compression, a data driven scheduling was developed to allocate the computation and storage of Cloud for providing better big data processing services. The evaluation was conducted over our U-Cloud platform to demonstrate that the spatiotemporal compression could significantly reduce the data size compared to the previous big data processing techniques on Cloud. Furthermore, our data driven scheduling distributed big data processing workload optimally on Cloud to achieve significant time performance gains. Last but not least, the evaluation results also demonstrated that the data processing quality and fidelity loss of our proposed approach met most of the application requirements. A novel technique for effectively processing big graph data on Cloud. Specifically, the big data will be compressed with its spatiotemporal features on Cloud. By exploring spatial data correlation, they partition a graph data set into clusters. In a cluster, the workload can be shared by the inference based on time series similarity. By exploiting temporal correlation, in each time series or a single graph edge, temporal data compression is conducted. A novel data driven scheduling is also developed for data processing optimization. The experiment results demonstrate that the spatiotemporal compression and scheduling achieve significant performance gains in terms of data size and data fidelity loss.

Chaowei Yang(2016)[18] investigated how Cloud Computing can be utilized to address Big Data challenges to enable such transformation. They introduced and review four geospatial scientific examples, including climate studies, geospatial knowledge mining, and land cover simulation, and dust storm modelling. The method is presented in a tabular framework as a guidance to leverage Cloud Computing for Big Data solutions. It is demonstrated through the four examples that the framework method supports the life cycle of Big Data processing, including management, access, mining analytics, simulation and forecasting. This tabular framework can also be referred as a guidance to develop potential solutions for other big geospatial data challenges and initiatives, such as smart cities. Big geospatial data pose grand challenges during the lifecycle of data storage, access, manage, analysis, mining, and modelling. The four examples illustrate the capability of Cloud Computing to address the 4 V challenges to reach Value with the five Cloud Computing advantages of on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. The boxes filled with section numbers indicate that these sections leverage the features of Cloud Computing to address the relevant challenges within big geospatial data.

Farhan Israk Yen(2019)[19] examined an idea of compressing images using a distributed system to reduce the storage requirement of data (with images). The proposed strategy can provide storage efficiency with an easier way to compress and reconstruct the image in future when needed. An efficient way to compress/decompress image for cloud applications. The compression strategy simply takes the image from any source and divides it by the pixel size of the image and stores the final key-value pairs using Hash Map in the Hadoop distributed file system. Since the whole procedure is done in a distributed manner thus can increase the speed of the compression task. In this paper, they described extensively our proposed compression algorithm with an example image. They are currently experimenting the performance of our implementation in Hadoop system. In future, they will show the experiment results in another article and will further ensure the effectiveness of our compression technique in cloud environment.

Xingyue Chen(2017)[20] investigated a remote data integrity checking scheme with fine-grained update for big data storage. The proposed scheme achieves basic operations of insertion, modification, deletion on line level at any location

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in a file by designing a mapping relationship between line level update and block level update. Scheme analysis shows that the proposed scheme supports public verification and privacy preservation. Meanwhile, it performs data integrity checking with low computation and communication cost. The emerging of distributed storage system designed for big data provides a cheap and convenient way for users to deal with data storage. As they know, hadoop is the most common open-source software framework for distributed storage and processing big data. Hadoop splits files into large blocks and distributes them across nodes in a cluster. Although Hadoop stores several copies of files on different servers, there is still possible that files are lost or corrupted due to hardware damages. Moreover, big data storage providers might be dishonest, and they may discard data which has been rarely accessed or modify data for some purpose.

Hui Cao (2018)[21] examined a Randomized Response Algorithm using the sparse coding to replace Boom filter. The algorithm can achieve differential privacy on batches of data. The algorithm is able to better full fill the trade-off between privacy and utility in the fog environment. The appliance consumption patterns can be masked even if the adversary has obtained the near real-time load profile. At last, theyanalysed the feasibility of our scheme and compared it with other traditional algorithms in IoT. Our algorithm can also be applied to other fields. In future, they will focus on extending the sparse coding to further preserve user's privacy without compromising the data-utility.

III. CONCLUSION

Cloud computing has terrific ability of imparting robust computational electricity to the society at reduced cost. It allows clients with confined computational assets to outsource their huge computation workloads to the cloud, and economically enjoy the big computational energy, bandwidth, garage, or even suitable software program that may be shared in a pay-per-use manner. Despite the first-rate blessings, safety is the number one impediment that prevents the wide adoption of this promising computing version, especially for customers while their personal data are ate up and produced at some point of the computation. Treating the cloud as an intrinsically insecure computing platform from the viewpoint of the cloud customers, we must layout mechanisms that not best guard sensitive records by means of enabling computations with encrypted statistics, however additionally shield customers from malicious behaviours by means of enabling the validation of the computation result. One of these mechanism of trendy relaxed computation outsourcing was these days proven to be viable in principle, however to design mechanisms that are practically efficient remains a very challenging trouble. This paper investigates comfy outsourcing of widely applicable linear programming (lp) computations. In an effort to acquire sensible efficiency, our mechanism layout explicitly decomposes the lp computation outsourcing into public lp solvers running at the cloud and private lp parameters owned by way of the client. The resulting flexibility permits us to discover appropriate security/performance trade off thru higher-level abstraction of lp computations than the general circuit representation.

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