

Research Article

Design of IT Infrastructure Multicloud Management Platform Based on Hybrid Cloud

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IT infrastructure has multiple master servers wherein its external and internal data fail to be controlled at the same time, resulting in low management efficiency of IT infrastructure cloudy data. Also, the platform information access security management becomes extremely difficult. Therefore, a multicloud management platform for IT infrastructure based on hybrid cloud is designed. The overall architecture and cloud structure design of the cloud management platform is implemented using two master servers, control platform internal and external IT infrastructure cloud data at the same time. The framework also ensures desensitized access to IT infrastructure resources. Also, a cloud data load balancing adaptation process and IT infrastructure cloud management process are designed. The fuzzy information feature extraction method is used to extract the association information of IT infrastructure cloud management and reconstruction of the association rules of frequent item sets of IT infrastructure information. The experimental results show that the cloud link utilization is about 90%, the cloud management delay is lower than 1.1 ms, and the cloud management error is less than 2% in 400 iterations. Also, the accuracy of IT infrastructure packet forwarding is higher than that of the state-of-the-art frameworks.

1. Introduction

With the rapid development of information technology, enterprises need to rely on multicloud processing platform to provide information storage services when they query and organize a large number of data resources. In cloudy environment, the improvement of IT infrastructure can improve the efficiency of data management and ensure the security of information access, so IT infrastructure deployment has become a new trend. According to the analysis report by RightScale, 84% of the enterprises chose the multicloud management strategy when controlling the internal and external data information [1] and only 13% of the enterprises chose the single cloud management method, and more and more enterprises began to change the data information storage form of the single cloud into the multicloud management form [2, 3].

Due to the large volume of enterprise data information, the number of cloud used by enterprises continues to increase. According to the results of the survey, the average cloud utilization rate of enterprises is 4.9, and the complexity

of cloud environment urges the cloud management to move towards IT infrastructure [4]. IT infrastructure multicloud management platform can improve the flexibility of information and data storage and ease of handling information and data and also can maximize the continuity of business services and reduce operating costs. Enterprises can use cloud computing to build a flexible IT infrastructure; improve the availability, adaptability, and security of cloud management platform; and help improve the enterprise's digital service capabilities. With the increasing scale of IT infrastructure construction, higher requirements have been put forward for the storage and operation of IT information and data [5], and the complexity of information and data processing of multicloud management platforms can be effectively reduced, the operating process of platforms can be simplified, the management efficiency can be improved, and the information and data processing needs of enterprises can be satisfied [6] through reasonable management of cloud usage and expenditure.

In the process of digitalization, the efficient integration of information and data resources is increasingly regarded

as one of the most valuable assets of enterprises. When all the information and data of an enterprise are concentrated on one cloud management platform, it is easy to cause the carton of the platform or data loss events, which will bring irreparable losses to the enterprise. In order to prevent the occurrence of such problems, enterprises must adopt the method of decentralized storage of information and data [7] and build IT infrastructure multicloud management platform, and in addition, enterprises must choose the process of load balance and adaptation according to the actual storage workload of information and data to complete the processing of information and data. Therefore, most of the current enterprises use “cloud” technology to improve the business adaptability, while effectively improving service quality, thus reducing the frequency of cloud providers, so as to reduce business costs. The multicloud management platform constructed by “multicloud” technology can realize the function of multicloud simultaneous processing of information data and realize the maximum integration of data computing, which will become the inevitable trend of the development of information data of major enterprises in the future [8].

In reference [9], by studying the status and existing problems of the resources of the “natural resources cloud” system, this paper expounds the main functions of the system and makes a preliminary exploration on the practical application of “cloudy,” so as to further improve the utilization efficiency of the node “cloudy” management of the Ministry of Natural Resources. The combination of “multicloud” management system and fusion sphere cloud application open stack can effectively realize the monitoring, configuration, and management of resources and provide reference for the subnode access of “natural resource cloud.” In reference [10], according to the characteristics of cloud storage platform, an automatic data encryption platform is designed. The platform can automatically identify and adjust various cloud applications through the dynamic programming technology of JavaScript, which can effectively encrypt sensitive multicloud data and realize safe and efficient data management. The experimental results show that the designed platform can automatically adapt to various types of cloud application behavior. At the same time, it can complete the retrieval of data ciphertext with a small amount of performance overhead to ensure the security management of multicloud data.

However, under the above traditional methods, the management efficiency of cloud data in IT infrastructure is low, and the error and delay of cloud management are high. In order to improve the above problems, a new IT infrastructure multicloud management platform based on hybrid cloud is designed.

The unique contribution of the present study includes the following:

- (i) Design of a multicloud management platform for IT infrastructure based on hybrid cloud
- (ii) The framework ensures desensitized access to IT infrastructure resources, and cloud data load balanc-

ing adaptation process and IT infrastructure cloud management process are designed

- (iii) A fuzzy information feature extraction method is used to extract the association information of IT infrastructure cloud management and reconstruction of the association rules of frequent item sets of IT infrastructure information

2. Design of IT Infrastructure Multicloud Management Platform Based on Hybrid Cloud

2.1. Overall Architecture of Multicloud Management Platform. The core function of multicloud system is to convert multicloud resource into cloud service; to provide administrator with the ability to control, operate, and run information data management platform; and to provide users with the service of building information database. The multicloud management platform helps in resolving issues pertinent to multi-IaaS cloud sites. The multicloud management platform is usually located between cloud sites and the user. It acts as a unified cloud service portal and a unified cloud management portal for a server user and server administrator, respectively. The system architecture mainly includes six modules: resource adaptation module, cloud orchestration module, cloud management module, cloud operation module, cloud operation and maintenance module and portal module. Unified registration and management of functional modules, each of which is autonomous and facilitates system upgrades, information maintenance, and data replacement, are achieved through the use of a microbusiness architecture by the multicloud management platform [11]. The cloud management platform architecture is shown in Figure 1.

The core characteristics of each module are described below:

(1) Resource adaptation module

A multicloud management platform can query and store data information of private clouds represented by OpenStack and VMware. These help in updating and managing data of public clouds such as Tencent Cloud and Aliyun Cloud. It also upgrades the functions of container clouds represented by Rancher, as well as manages distributed hardware storage servers such as SDN. OpenStack is an open standard cloud computing platform which is deployed in the form of infrastructure as a service for both public and private clouds wherein virtual servers and other resources are made available to the users. VMwares help users to create and run their virtual machines directly on a single window. Tencent Cloud is a secure, reliable and high-performance cloud computing service provided by Tencent. Aliyun Cloud is the largest public cloud service in China and the world’s fourth biggest web services provider. Therefore, usually, the multicloud management system will use the resource adaptation module to effectively connect the internal and external information and data, using Java EE server to manage the

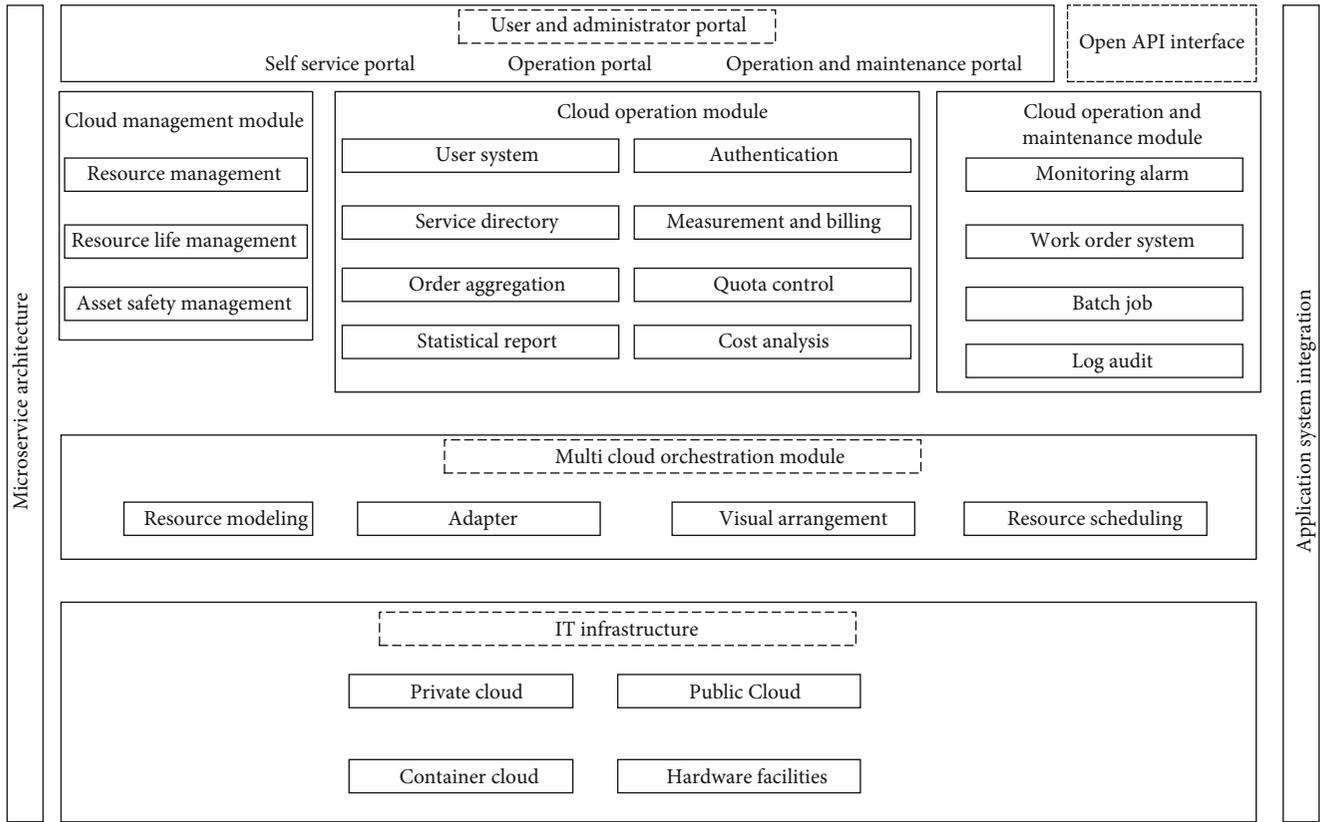


FIGURE 1: Multicloud management platform architecture.

resource information database. This module can transform different types of heterogeneous resource patterns into a unified control pattern determined by the multicloud management platform. It can cover different types of API control applications and wrap them into an interface oriented to high-level information network channels. In addition, the resource adaptation module cannot change the overall structure of the system under the premise of adding new system resource configuration, thereby improving the overall control effect.

(2) Cloud arrangement module

The multicloud management system integrates various types of resources in the private and public clouds and abstracts them into a single-resource pattern, then converts these data resources into services, and stores them on the platform by implementing the code on the pages integrated by multiple search engines in JavaScript. Cloud choreography module can take virtual machine, memory, container, network, application, and other resources as a component and explain their configuration and storage in detail. Leverage the visual management capabilities of the Spring Cloud Config Configuration Center to build flexible composites into different deployment structures, using Visual Studio to create visual web parts in a visual design interface and dragging controls to create new businesses. Cloud scheduling module greatly reduces the time needed to deal with information and data, creates good conditions for automatic

scheduling of resources and complex resource services, and enhances the management and control of information and data resources.

(3) Cloud management module

The basic function of cloud management platform is to manage and integrate all the resources in the system. Therefore, the cloud management module is needed to manage different types of data resources. The main work of the cloud management module is to effectively manage the multitype resource database in the platform and to create, modify, upload, and delete the resource data by using a virtual machine, container, storage volume, subnet, and other devices. The cloud management module can integrate storage resources of platform database effectively, realize real-time or asynchronous data synchronization with CMDB, complete resource definition and tracking relationship between configuration items, and improve the efficiency of configuration management database.

(4) Cloud operation module

The cloud operation module can effectively improve the data resource management and data resource utilization and encapsulate the complex operation of multicloud management platform by PowerShell transformation and Linux transformation. According to the service characteristics of the multicloud management platform, a comprehensive

operation management mode is established to manage the user information of the platform and realize the right allocation of resources. In association with IaaS services, these modules help in providing good integration support, complete the multicloud management platform deployment, achieve platform service directory maintenance and resource optimization analysis, and fulfil other purposes.

(5) Cloud operation and maintenance module

The cloud operation and maintenance module provides business support for the operating platform and uses struts 2 MyBatis framework integration technology to realize SQL Session Factory connectivity for resources in the cloud management platform. The cloud operation and maintenance module is divided into supervision module, failure warning module, work order query module, data processing module, and other related business modules. These modules are closely related to the business of the multicloud management platform, forming the full coverage of the business in the field of information and data management and ensuring the good operation of the system in the field of resource management.

(6) Portal module

The portal module can, according to different types of resources, create various resources needed for the end users, set up the operating portal of the multicloud management platform, provide a self-service portal for the specific users of the cloud host, set up the maintenance portal for the maintenance personnel, and complete the maintenance of the platform for various operations. In terms of statistics and display, the cloud management platform will also use a large screen view to intuitively display the various resources and performance of the platform. In addition, according to the needs and use of users, multicloud management platform through the portal module helps to create mobile phone app, WeChat applet, and other functions.

2.2. SDN Hybrid Cloud Network Structure. Cloud computing is a mode of using IT resources to obtain the required hardware, platform, software, and service resources through the network in an on-demand and scalable way. SDN hybrid cloud is a simple and optimal network architecture technology through software. The core work of SDN hybrid cloud is the interaction and transmission of data between devices. The SDN hybrid cloud system effectively integrates data transfer or interaction processing between devices and applications by means of device docking, which regulates centralized networks and provides flexible network support for a variety of hybrid cloud services and application loads [12, 13]. The SDN hybrid cloud network architecture is shown in Figure 2.

According to Figure 2, the current networked systems are based on traditional network devices. In the existing network, each module distributes the data resource effectively in a decentralized way and keeps close relationship with the transport layer and the control level. Because users cannot

control and forward the database center of cloud management platform directly, it is necessary to configure network protocol to affect the action of transmission through network protocol. Therefore, for traditional network and network structure, SDN hybrid cloud is a kind of closed and difficult to control network, which needs to be hierarchically structured to achieve network management and control.

In the SDN hybrid cloud network architecture, the application layer is mainly divided into three structural layers: application layer, control layer, and infrastructure layer. The application layer uses wireless access points to complete specific service requests. The control layer reads the resource data of the application layer through Java Web-Spring boot, controls the input data of the users, and calls the functional modules of the infrastructure layer, which is mainly responsible for feedback and implementation of the specific work of the functional modules. The SDN hybrid cloud network architecture communicates between East and West interfaces and realizes the consistency of data flow between controllers, and the access and control of NVM are realized by client code programming.

According to the characteristics of mass, diversity, and space of big data, a multicloud management platform of IT infrastructure based on hybrid cloud is designed in this paper. In the hybrid cloud architecture, the cloud storage system includes two different data center platforms, namely, private cloud and public cloud, which transfer data objects by storing data. In a hybrid cloud, the key to efficient integration of data resources is the asynchronous migration of large amounts of data, which requires a formal description of the data elements, as shown in Figure 3.

According to Figure 3, the hybrid cloud storage architecture manages public and private cloud data across IDCs in application servers, backup servers, and cloud storage servers and queries the SDN hybrid cloud network data based on cloud storage data nodes and cloud storage control nodes.

2.3. Cloud Structure Design. The hybrid cloud storage architecture consists of storage cloud architecture, IT infrastructure, and computing cloud architecture, which operate as parallel clusters in the multicloud management platform. In the storage cloud architecture, SSH springboard machine and SSH target machine are adopted to realize multilayer access in the cloud layer and save more resource information data; in the IT infrastructure, massive information resources are effectively integrated by data mining technology; and in the computing cloud architecture, data resource operation is completed by using servers in MDFS system to improve the management efficiency of multicloud data.

Because of the large amount of path information in cloudy environment, most of the files are about 10 GB in capacity. Using conventional mining system for data mining will result in the shortage of server memory. Cloud structure design can separate a large number of documents, divide more than 1 GB documents into several kilobyte subdocuments, and deal with them optimally, so as to manage the smaller documents effectively and utilize the resources effectively.

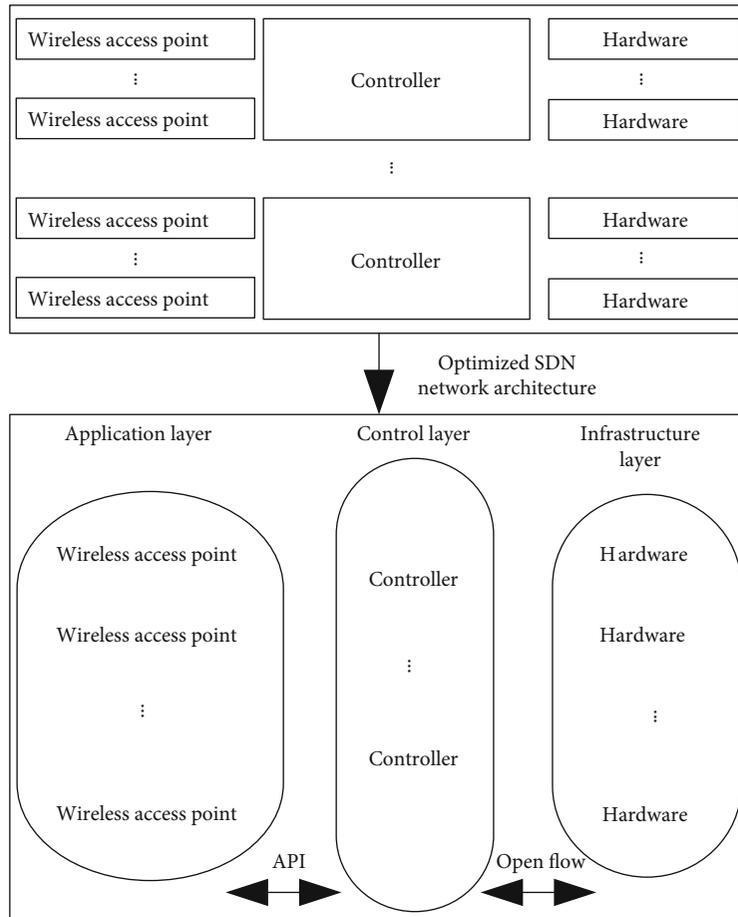


FIGURE 2: SDN hybrid cloud network architecture.

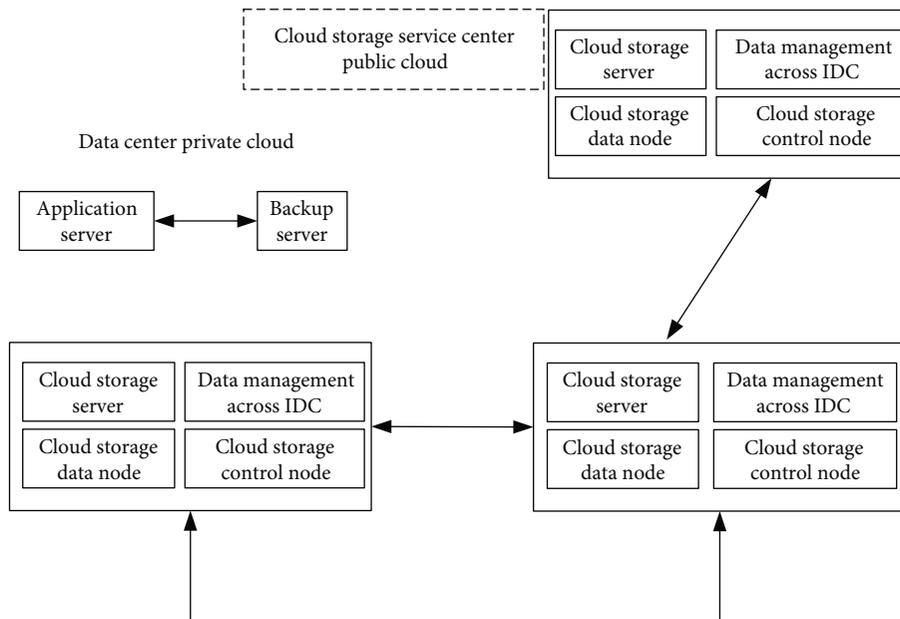


FIGURE 3: Hybrid cloud storage architecture.

All the network link access paths will be integrated in a huge IT infrastructure cloud data repository to facilitate the mining of data resources. The cloud management platform chooses IT infrastructure to process data in batches to ensure the stability of the platform after the read-write task is finished.

In the process of data clustering, there are some problems such as data node failure and work error in the traditional algorithm, so this paper designs cloud structure based on hybrid cloud storage architecture to solve the cloud problem of various IT infrastructures, so as to make the abnormal data nodes run stably. MDFS is used to detect the system running fault regularly to enhance the reliability of the system. The cloud structure design uses two master servers to control the internal and external IT infrastructure cloud data and realizes real-time access to different types of network links under the premise of stable data nodes. The cloud computing layer structure is shown in Figure 4.

As you can see from Figure 4, cloud computing can break down large documents into smaller ones. Cloud hosting leverages 64-bit identity recognition for IT infrastructure data storage on cloud management platforms, enabling each file to be stored in a variety of names on a Linux server. The connection between the system and the host system is very close. Two host servers are responsible for managing different types of data in the system. When one host fails, the other host can also work normally and can run directly. In the early warning of faults, cloud computing can get the working status of the system, locate the fault nodes, and monitor the data of the IT cloud management platform.

2.4. IT Infrastructure Resource Desensitization Access Module. Build dynamic desensitization strategies by proxy for data analysis platforms such as enterprise unified business data centers, and ultimately achieve desensitization access to IT infrastructure resources [14, 15]. If there is no new data resource or configuration requirement in the system, the desensitization method and task are stored in the desensitization access platform to prepare for subsequent call and execution.

According to Figure 5, a common resource desensitization access plan is created by space/image and sound/video, and desensitization tasks are configured in the resource application to ensure the information data security of the cloud management platform for the IT infrastructure of a hybrid cloud. In the data resource desensitization subplatform, the desensitization decision and the corresponding desensitization strategy will be carried out for the source data which are processed, collected, classified, and preprocessed.

The specific job description of the relevant modules in the IT infrastructure resource desensitization subplatform is shown in Figure 6.

- (1) Source data partition module: in order to avoid the impact of a large number of sensitive data on the identification accuracy, according to the file formats of different data resources, the source data is divided into five data types, namely, text, picture, voice,

video, and structured data; or according to different source business platforms, the source data is divided into planning, construction, maintenance, operation, and other unstructured data. According to the above two kinds of source data classification, write the corresponding execution code

- (2) Source data preprocessing module: identify the sensitive data contained in the IT infrastructure resource data characteristics obtained through matching. In general, the quality of samples is poor, so we use the pretreatment, iterative clustering, and resource data generalization in the pretreatment module to filter redundant and invalid data resources and speed up the implementation of follow-up sensitive resource identification and desensitization

2.5. Multicloud Data Load Balancing Adaptation Process Settings. When balancing and adjusting the multicloud data load, a balanced adaptation method shall be established by setting a threshold to determine whether there is interference and other situations in the mixed cloud system. When interference occurs in the system network, the method will automatically adjust the multicloud data flow on the network link to achieve data load balancing [16]. The specific process is shown in Figure 7.

2.6. IT Infrastructure Multicloud Management Process Design. In order to optimize the design of IT infrastructure multicloud management platform, the bottom structure of IT infrastructure multicloud management platform is designed based on DSP and PLC logic control method.

Design the underlying database of IT infrastructure multicloud management platform, and control the instruction loading of IT infrastructure multicloud management platform through instruction scheduling and embedded control. Construct a standard SCPI instruction set, and complete IT infrastructure multicloud management data collection and real-time information processing according to the information loading mode of IT infrastructure multicloud management platform in the bus control and ZigBee network design method [17, 18], so as to improve the ability of IT infrastructure multicloud management and real-time detection. Based on the above analysis, the overall design architecture of the IT infrastructure cloud management platform is shown in Figure 8.

According to Figure 8, the overall process of IT infrastructure multicloud management platform can effectively realize the comprehensive management and information scheduling of IT infrastructure multicloud management platform. Under the hybrid cloud architecture system, carry out the bus development of IT infrastructure multicloud management platform, establish the host computer communication module of IT infrastructure multicloud management platform, carry out information embedded control through modular scheduling, and obtain the identification bit of host computer communication of IT infrastructure multicloud management platform. The specific parameter information is shown in Table 1.

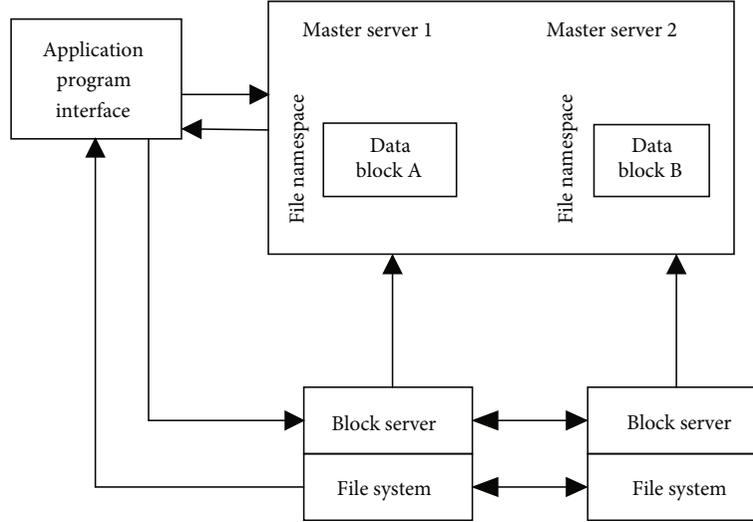


FIGURE 4: Cloud computing layer structure.

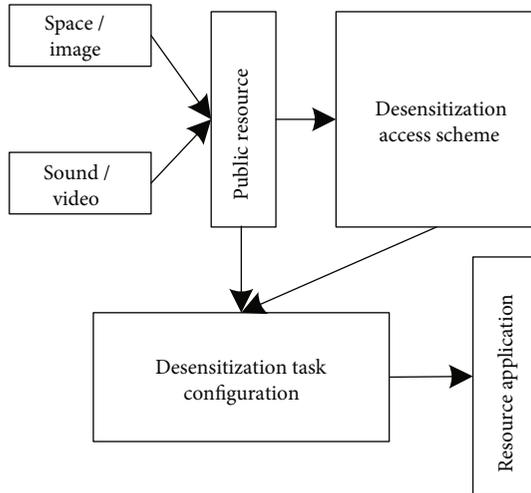


FIGURE 5: IT infrastructure resource desensitization access box.

2.7. IT infrastructure Information Base Management Node Distribution Structure Model. Through the method of data collection and analysis, the paper collects and counts the big data of IT infrastructure informationization management, constructs the best fusion attribute parameter analysis model, and analyzes the IT infrastructure informationization management mode by using the data integration analysis technology. This paper uses directed graph method to fuse data, assumes that the attribute set of IT infrastructure information base management node graph is $X = \{x_1, x_2, \dots, x_n\}$, then models the distribution structure of information database management node; the structure model is shown in Figure 9 [19].

Based on the analysis of the distribution model shown in Figure 9, this paper puts forward the concept of IT infrastructure information base and integrates it with the online management technology of multicloud management information to realize the management of feature quantity of IT

infrastructure database. \mathfrak{R} is the characteristic quantity of the database. The parameter set of information constraint index is obtained through the frequent item set detection method:

$$U = \frac{\mathfrak{R} \cdot \sum_{x=1}^m f(x)}{m}, \quad (1)$$

where $f(x)$ is the ambiguity function of IT infrastructure informatization management data. B represents the task set of big data scheduling for IT infrastructure informatization management, and $B(U_i, U_j)$ represents the feature distribution set of IT infrastructure informatization management, so as to obtain the feature distribution space of resource data intelligent management:

$$B(U_i, W_j) = \begin{bmatrix} (U_1, W_1) & (U_1, W_2) & \cdots & (U_1, W_j) \\ (U_2, W_1) & (U_2, W_2) & \cdots & (U_2, W_j) \\ \vdots & \vdots & \cdots & \vdots \\ (U_i, W_1) & (U_i, W_2) & \cdots & (U_i, W_j) \end{bmatrix}. \quad (2)$$

Integrate IT infrastructure information according to text features and semantic cluster distribution, so as to obtain the fuzziness feature distribution function:

$$F(x) = \iint_{ij} f(i, j) didj \cdot \frac{f((t-j)li)}{\sqrt{|i|}}, \quad (3)$$

where $f(a, b)$ is the similarity feature quantity. Build the statistical information analysis model of IT infrastructure by expanding the query method:

$$P(e_k | \rho_k) \sim t_{(\rho_k + d_c)} \left(\tilde{u}_{e|\rho_k, k}, \tilde{\Sigma}_{e|k} \right). \quad (4)$$

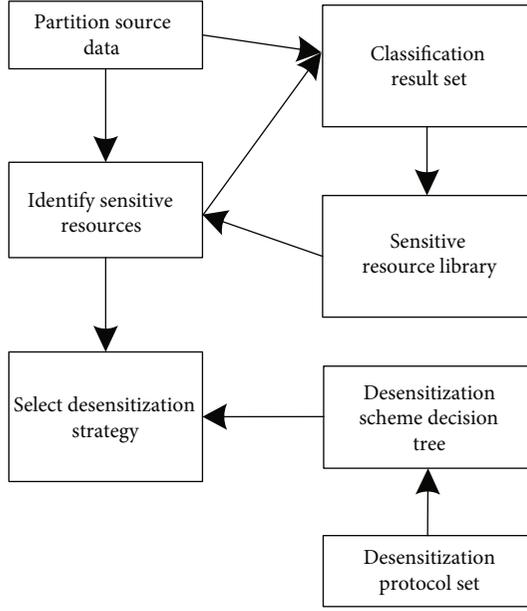


FIGURE 6: IT infrastructure resource desensitization submodule.

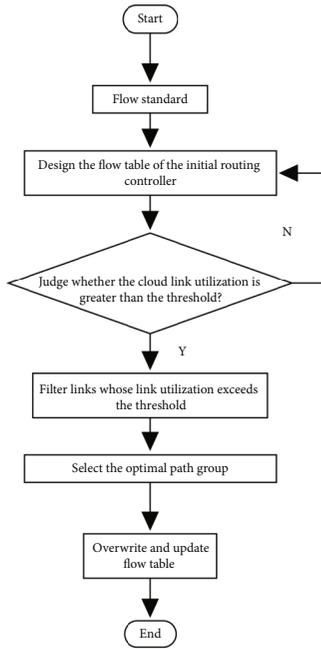


FIGURE 7: Multicloud data load balancing adaptation flow chart.

The directed graph model is used to cluster the information weight ω_k according to the clustering center of information distribution density ν_k and statistical error e_k , so as to improve the fuzzy directivity of management and reduce management error.

2.8. Associated Information Extraction of IT Infrastructure Multicloud Management. Use the resource allocation mode of IT infrastructure to mine the evaluation information, and reorganize multiple sets of association rules for the evaluation data of IT infrastructure multicloud management

informatization:

$$A(\theta) = [a_0(\theta), a_1(\theta), \dots, a_p(\theta)], \quad (5)$$

$$S(t) = [s_0(t), s_1(t), \dots, s_p(t)]^T,$$

where $s_0(t)$ is the information feature distribution set of IT infrastructure multicloud management and $A(\theta)$ is the distribution amplitude of IT infrastructure resources. χ is the quantitative characteristic distribution function of association rules; χ/T^2 is the second moment of IT infrastructure resource information distribution, which obeys the Rayleigh distribution of parameters, that is,

$$Q\left(\frac{\chi}{T^2}\right) = \frac{e^{-(1/(\chi/T^2))}}{2T^2}. \quad (6)$$

Use big data mining technology to optimize the IT infrastructure, establish the information evaluation feature distribution set of IT infrastructure under the multicloud management platform, and finally realize the effective management of multicloud data.

3. Analysis of Experimental Results

In order to verify the practical effectiveness of the design of multicloud management platform of IT infrastructure based on hybrid cloud, the simulation test is carried out under the environment of Mathematica 12.0 platform, using tomcat 4.0 1. The server realizes the management of IT infrastructure information base and establishes IT infrastructure information base and cloud computing data processing platform on Hadoop cloud computing platform. The length of IT infrastructure information sampling data is 1024, the characteristic sampling rate is 240 KPS/s, the data statistical sample set is 800, and the variable statistical sampling frequency is 0.2 ms/time. The proposed method is compared with reference [9] (the “natural resource cloud” management platform based on multicloud architecture) and reference [10] (the data encryption management platform based on cloud storage). The comparison contents are cloud link utilization, management delay change, management error, and packet forwarding accuracy.

3.1. Cloud Link Utilization Analysis. In order to verify the effectiveness of the proposed method in data management, the proposed method, reference [9] method, and reference [10] method are applied to the integration path of internal and external data resources in the actual simulation test. When the utilization rate of cloud link is 90%, it indicates that the system has the best utilization effect; if the utilization rate is more than 90%, the system will have the situation of delay management; if the utilization rate is less than 90%, it will increase the cloud computing amount of data resources and affect the network operation. After 400 iterations of experiments, the cloud link utilization results of 3 different management methods are obtained, and the test and comparison results are shown in Figure 10.

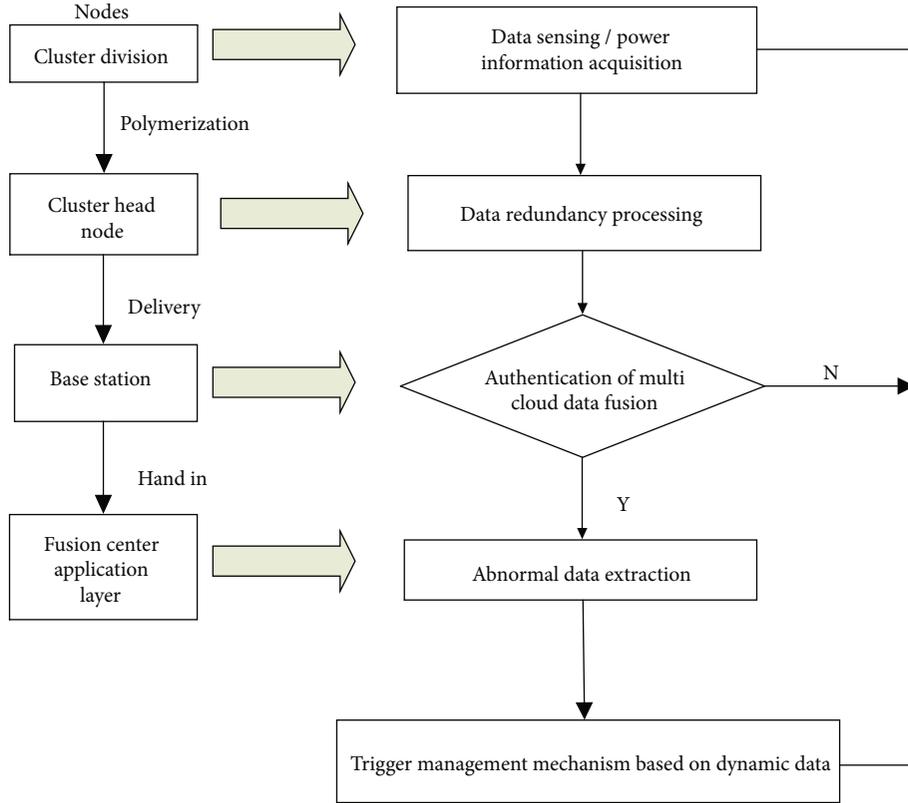


FIGURE 8: Overall design framework of IT infrastructure multicloud management platform.

TABLE 1: Identification bits of host computer communication of IT infrastructure multicloud management platform.

Task flag	Instruction status
000	IT infrastructure multicloud parameter initialization
001	Write characteristic data of cloudy IT infrastructure
010	Output power parameters
011	Send IT infrastructure multicloud management control instructions

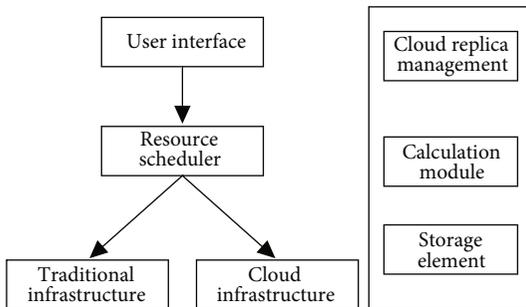


FIGURE 9: Entity component structure distribution model of IT infrastructure multicloud management.

According to the test chart of Figure 10, it can be seen that the proposed method can effectively handle the relationship between multiple resource datasets, and the cloud link utilization ratio remains at about 90%, while the cloud

link utilization ratio of reference [9] method and reference [10] method fluctuates greatly, and the utilization ratio error is 10%~20%. This is because the proposed method constructs a multicloud data load balancing and adaptation method by setting a threshold, so the network load data is more balanced and runs well in the process of data resource integration.

3.2. *Analysis of Management Delay Change.* Taking the change of data management delay as the test index, test the delay of the proposed method, reference [9] method, and reference [10] method when managing 100000 data quantities. The test comparison results are shown in Figure 11.

According to the test chart in Figure 11, the data management latency of the proposed method, the reference [9] method, and the reference [10] method has increased with the increase of data volume, but the data management latency of the proposed method is relatively low at 1.1 ms, which is significantly lower than that of the other two methods. This is because the proposed method constructs a specific function module, fully realizes the effective management of resource data, and avoids the delay of cloud link data management.

3.3. *Management Error Analysis.* Management error refers to the difference between the resource data management results and the real situation of the data. The internal and external data resource management error of the enterprise provides support for the accuracy of subsequent packet forwarding,

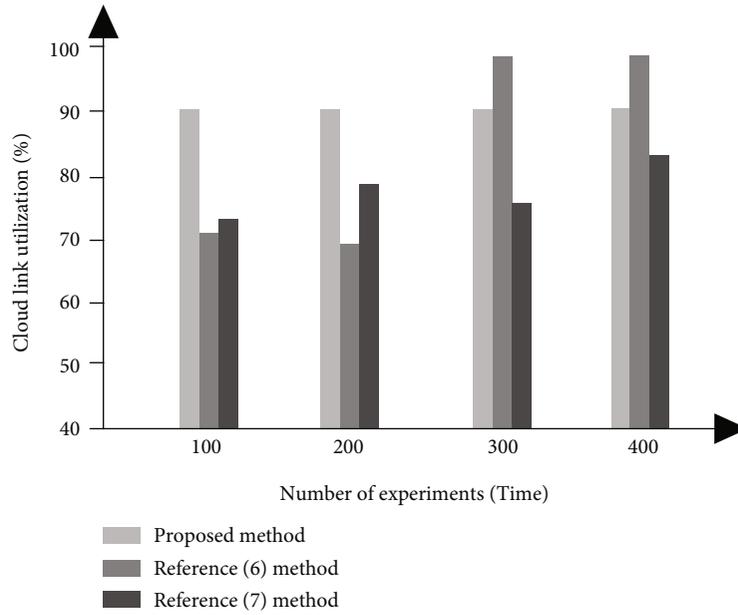


FIGURE 10: Comparison of cloud link utilization results of different methods.

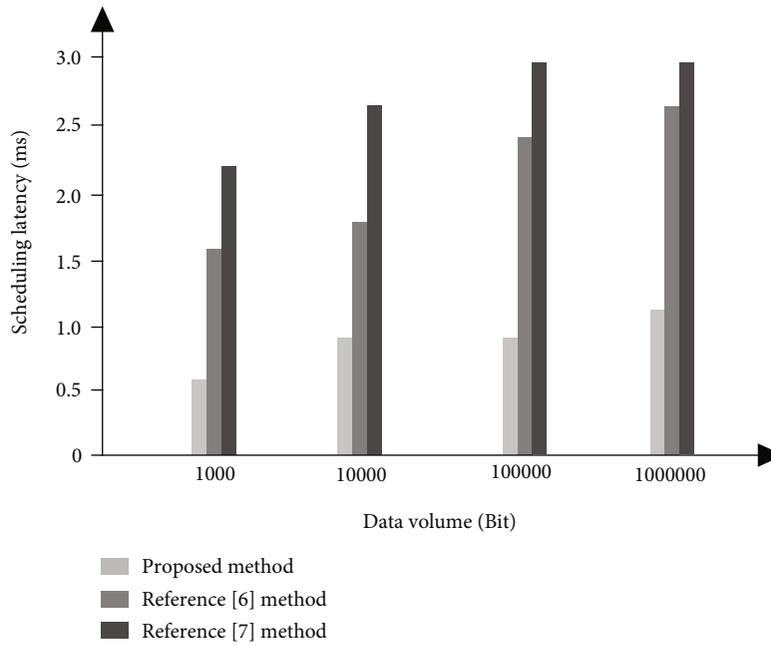


FIGURE 11: Comparison of management delay change results of different methods.

so the management error of resource data is very important. By comparing the resource data management errors of the proposed method with those of reference [9] and reference [10], the superiority of the proposed method is verified. The test comparison results are shown in Figure 12.

According to the test comparison diagram in Figure 12, when the proposed method is used for data management in multiple iterations, the management errors are less than 2%, and when the methods of reference [9] and reference [10] are used to manage data, the management errors are 29% and 26%. This is because in the information management of IT infrastructure, the optimal fusion characteristic

parameters are used as the data analysis characteristics, so as to improve the accuracy of data management and reduce the error of data management.

3.4. Packet Forwarding Accuracy Analysis. Accuracy indicates the security management effect of information access of the system platform. The higher the accuracy of packet forwarding, the higher the application value of the method. Taking 4000 cloud node points as the test basis, compare the packet forwarding accuracy of the proposed method, reference [9] method, and reference [10] method. The test comparison results are shown in Figure 13.

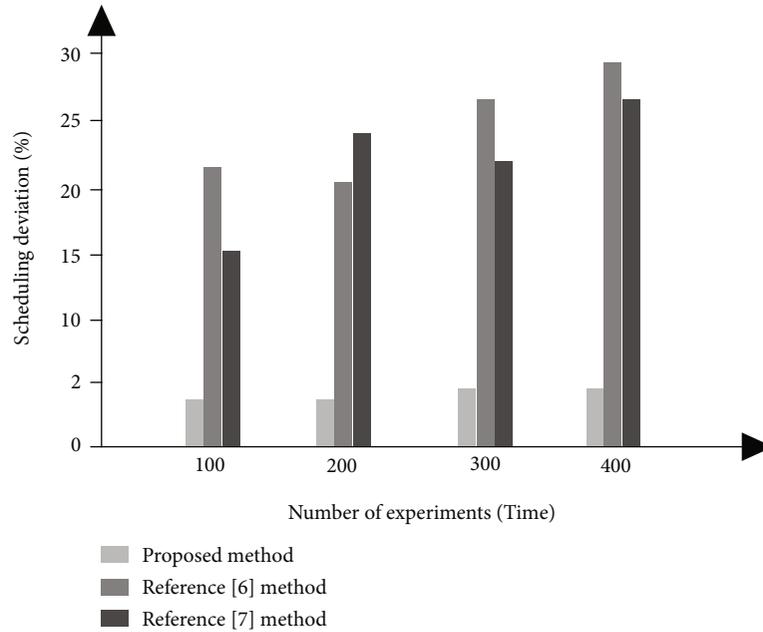


FIGURE 12: Comparison of management error results of different methods.

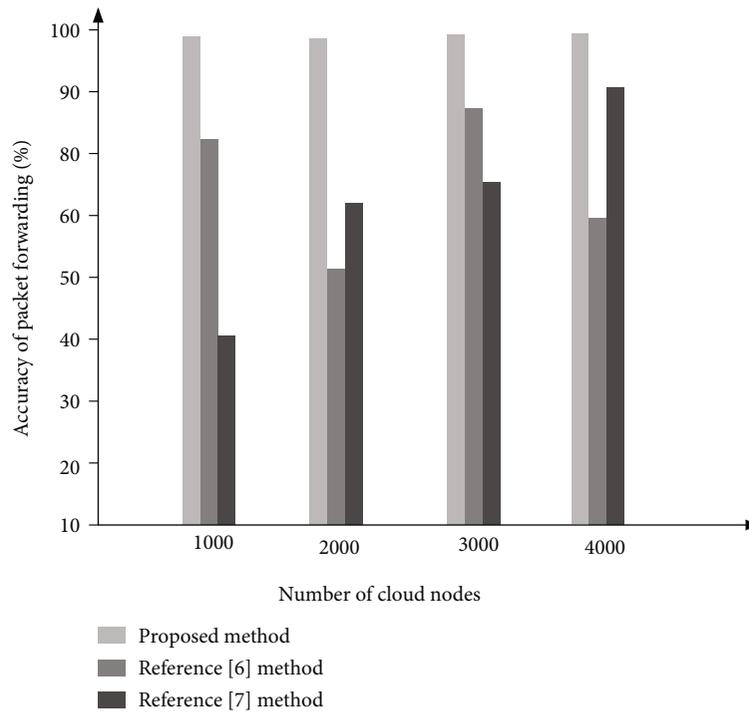


FIGURE 13: IT infrastructure packet forwarding accuracy.

According to the test comparison diagram in Figure 13, the packet forwarding accuracy of the proposed method reaches 99%, while the packet forwarding accuracy of reference [9] method and reference [10] method fluctuates greatly. With the increase of cloud node points, the accuracy of reference [9] method decreases from 80% to 60%, and the accuracy of reference [10] method increases from 40% to

90%. Comparing the test results of the above methods, it can be seen that the packet forwarding accuracy obtained by the proposed method is high, because this method uses association rules to quantify the characteristic distribution function, which is conducive to improving the attribute of data management and the intelligence of cloud management of IT infrastructure.

4. Conclusion

In this paper, a multicloud management platform based on hybrid cloud is designed, and a multicloud management platform with modular functions is designed. The SDN hybrid cloud network is used to control the data exchange between IT devices. Design cloud structure, utilize two master servers, control cloud data of platform internal and external IT infrastructure at the same time, and optimize platform efficiency. Implement dynamic desensitization strategy by proxy, and finally realize desensitization access of IT infrastructure resources. Threshold method is used to design the multicloud data load balancing process and the multicloud management process of IT infrastructure. In order to realize the multicloud management information evaluation of IT infrastructure based on big data technology, the fusion characteristic analysis method of parameter optimization is established to fuse the data information. The experimental results show that the cloud link utilization of the proposed method is higher than 90%, which shows that the hybrid cloud has higher efficiency, the multicloud management delay and error are lower, and the accuracy of IT infrastructure packet forwarding is higher. The above experimental results show that the proposed method has better application effect. Although the use of multicloud management platform or infrastructure has its advantages as highlighted in the paper, it has associated challenges. One of the major issues in this type of framework is that the wider the range of cloud services that get used by the enterprise user, the complexity increases as well. This could affect the business agility, and this aspect could be considered for exploration in the future.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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