

# Construction and Application of Cloud Platform for Urban Rail Transit

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**Abstract:** Rail transit is a new form of transportation in the process of modern urban development. It has a far-reaching impact on improving urban traffic environment, relieving urban traffic pressure and improving urban traffic service quality. The rail transit cloud platform is an important part of modern rail transit, and it is also a key factor related to the construction quality of urban rail transit. In this paper, the current situation of construction and application of urban rail transit cloud platform are introduced in detail, and the related standard compilation of urban rail transit cloud platform, achievements in the development and construction process, construction mode, index establishment, acceptance process optimization, cloud operation and maintenance system establishment and other issues are systematically expounded. According to the technical drive and standard compilation of urban rail transit cloud platform, the development of urban rail transit cloud platform is prospected.

**Keywords:** City; Rail Transit; Cloud Platform

## 1. Introduction

The urban rail transit industry has developed for more than 100 years. With the advent of the information age, the construction of urban rail transit has been integrated with information technology, which is developing in the direction of informationization and digital operation. The application of information system in urban rail transit is mainly to collect and analyze information data quickly, so as to provide data and information support for the normal operation of urban rail transit and the realization of information management. Building a cloud platform in urban rail transit system can play an active role in the data center of urban rail transit, effectively promote the effective integration of software and hardware resources of various specialties of urban rail transit, and realize the optimal allocation of resources and data sharing, which is of great practical significance for reducing

the construction and operation costs of urban rail transit and improving its economic and social benefits.

## 2. Urban rail transit cloud implementation status

In recent years, China's urban economy has developed rapidly, and at the same time, the traffic volume has also increased greatly, which has brought great pressure to urban traffic. Therefore, it is necessary to strengthen the construction of urban traffic and improve the service function of urban traffic. With the proposal and implementation of China's strategy of strengthening the country by transportation, the construction of smart urban rail transit has become one of the main tasks of China's urban modernization. The national urban rail transit has entered a brand-new development stage, and the research

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on the application of urban rail transit cloud by related enterprises is deepening. Various new technologies are widely used in urban rail transit cloud, which promotes the rapid development of urban rail transit cloud.

At present, in the process of urban rail transit construction in China, different regions and construction units have significant differences in cognition and attention to urban rail transit cloud. Influenced by the differences of engineering boundary conditions, construction and operation organization structure and other factors, there are large variables in the actual landing process of urban rail transit cloud projects, which often deviate from or violate the original intention of planning positioning and design.

### **3. Analysis of cloud platform construction of urban rail transit data center**

#### **3.1 Building a resource pool**

In the traditional processing mode of rail transit information system, the processing of hardware resources and software resources is independent of each other, so it is impossible to effectively monitor the running status of rail transit, which leads to the failure to optimize the allocation of resources according to the actual running situation of rail transit, resulting in low resource use efficiency. It not only wastes a lot of resources, but also increases the running cost, and leads to such problems in the actual running process of rail transit. Based on these problems, through in-depth study of information processing system and application of cloud platform technology in the process of urban rail transit construction, the traditional processing methods and modes of rail transit system have been effectively changed, and hardware resources have been integrated, and all computing and storage resources have been integrated to form storage data. These stored data can be converted through the cloud platform, and each system resource is integrated into a unit to form multiple resource pools. Finally, the corresponding application programs are created for these resource pools, which can effectively share the resources in the resource pool through the service form, improve the efficiency of resource use in an all-round way, optimize the urban rail transit system, effectively improve the construction of urban rail transit cloud platform and

the operation service capability of urban rail transit, relieve the pressure of urban traffic and promote the development and progress of urban construction.

In the process of building a cloud platform for urban rail transit data center, building a resource pool should start from the following aspects.

Firstly, various system storage devices and hardware resources are integrated in the resource storage pool.

Secondly, the system data of resources are integrated and optimized in the storage pool, and a standard model is created for the data processing system, and standardized data processing is realized.

Finally, a data management server is set up to implement unified management of the storage resource pool accessed by each automation system. At the same time, according to the actual situation, the data storage interface should be set reasonably, so that the cloud platform can realize the automatic processing of data and effectively improve the operation efficiency of urban rail transit.

#### **3.2 Virtualization of nodes and interfaces**

Virtualization of urban rail transit cloud platform is the key content of urban rail transit cloud platform construction. Its main construction measure is to transform the physical nodes of each rail transit system into nodes of virtual space cloud platform. In the running process of each system software, virtualization needs to be realized through the cloud platform node server, and each system does not interfere with each other, and it can be managed in a unified virtualization way. Cloud platform virtualization node can be effectively applied in physical space, give full play to its advantages, and realize smooth migration function in virtual space, which effectively solves the defect that traditional rail transit information processing must carry out physical hardware migration, and makes rail transit information processing system more convenient and efficient in practical application.

At present, interface servers are set up in urban rail transit, the main purpose of which is to effectively realize the transmission and sharing of data and information during its operation. In the process of building the cloud platform for urban transit traffic, data and instructions are interconnected through network cables and communication interfaces. In this system, the quality of data

transmission, including its flexibility, stability and practicability, is affected by the construction quality of system interfaces and the protocols between interfaces. If the physical ports or cables are damaged, it is likely to adversely affect the normal functions between interfaces. Although there are interface nodes on the virtual platform of urban rail transit, it is impossible to reduce the network security protection between each system. At the same time, because the virtual platform is designed inside the cloud platform, the possibility of network attacks between systems is effectively reduced.

### **3.3 Building a multi-tenant virtual environment**

In the process of building a cloud platform for urban rail transit, it is realized by building a multi-tenant virtual environment. In the process of building a multi-tenant virtual environment, traditional data center servers and storage arrays are disposed of in different places, and the two are connected. Attention: when associating the two, it is often necessary to apply additional conditions. However, when applying this method, the operation efficiency is low, and it will also have an adverse impact on the urban rail transit economy, resulting in the loss of economic benefits.

When building a virtual environment with multiple tenants, in fact, the network and storage system of each system are still independent of each other, and each system runs independently in its own field. This method can effectively improve the convenience of the multi-tenant virtual environment, and can also make the network and storage system of each system realize the state of separation and mutual connection, effectively ensuring the safety of urban rail transit information and improving the use effect.

### **3.4 Cloud platform security measures**

In the process of building the cloud platform of urban rail transit, it is very important to ensure the security of the cloud platform, and security is the top priority in any field. Therefore, strengthening the security of the cloud platform and implementing security measures are the key factors in the construction of urban rail transit cloud platform, and also the key points affecting the application effect of urban rail transit cloud platform.

To effectively improve the security of urban rail

transit cloud platform, there are mainly following measures.

(1) When applying the cloud platform of urban rail transit, it is necessary to establish a complete safety management mechanism and clarify the responsibility for management safety. In view of the cloud platform control system, the security measures should be strengthened to improve the system security, and the database system and virtual server operating system of the cloud platform should be strengthened, and comprehensive detection measures should be strengthened to reasonably apply middleware and system source code, so that the application security of urban rail transit cloud platform can be significantly improved to ensure the normal operation of urban rail transit.

(2) Strengthen the construction of monitoring host system in the cloud platform system, so as to effectively monitor the server operating system, effectively prevent Trojan horse virus and protect the correct operation of the server, thus effectively improving the security of the cloud platform and enabling it to work normally. In addition, it is necessary to strengthen the safety protection for the control system, effectively prevent the development of illegal or illegal control behavior, and regularly check the alarm information to ensure that the alarm information plays its correct function and fully guarantee the safety of the urban rail transit cloud platform.

(3) Safe network environment is an important condition to improve the safety of urban rail transit cloud platform. Therefore, it is necessary to strengthen the security construction in the local network, rationally plan the network structure, stratify the information system according to the importance, and adopt logical isolation method to effectively isolate the general server from the core server to ensure the server security. In the process of controlling the cloud platform, it is necessary to constantly update security technologies and optimize security policies, such as setting access control rules scientifically and reasonably, so as to effectively prevent Trojan viruses from invading the cloud platform, improve the security of the cloud platform and significantly reduce risks.

(4) According to the actual needs of rail transit operation, the information security of the cloud platform system can be effectively guaranteed by rationally deploying security softwares, and the cloud platform sys-

tem can be optimized comprehensively to realize the rational configuration of the cloud platform system, so as to achieve the purpose of improving the security of the cloud platform system.

(5) It is necessary to establish a perfect security audit mechanism for the application of cloud platform, and effectively strengthen the internal audit work, so as to effectively collect illegal transaction information, track and trace it, and effectively verify the source of illegal transaction information, so as to ensure the security of cloud platform system and improve the operation security of cloud platform.

## 4. Conclusion

To sum up, in the process of modern urban development and construction, strengthening rail transit construction is the key work content, and urban rail transit cloud is not only an advanced urban rail transit construction technology, but also represents advanced productivity. Its connotation is very extensive, including various standard rail transit and various business scenarios, etc. It is a pioneering urban rail transit development mode formed with the development and wide application of advanced technologies such as cloud computing and big data in modern society. At present, urban rail transit cloud is still a new thing, and its practical experience is not enough. In the actual construction process, there are still some problems, which need to be studied in depth.

In view of the construction and application of urban rail transit cloud platform, it is necessary to standardize and improve industry standards, promote the optimization and update of urban rail transit cloud, and strengthen the innovation of management and maintenance system, so as to play an active role in building a modern smart city and promoting the informatization development of smart urban rail transit.

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