

The Design of Air Traffic Control Platform System Based on SOA

Xiaofei Du

School of Automation, Wuhan University of Technology, Wuhan, Hubei Province, 430070, China

Keywords: SOA; Air Traffic; Control Platform Control System; Suggestion

Abstract: In recent years, China's national economic development has been accelerating. The air traffic control industry and even the overall civil aviation industry are facing a major transformation. The reform driving forces that have been condensed for a long time have proposed corresponding measures for the air traffic control business strategy. Responsibility-oriented to service-oriented process changes, and more requirements are put forward for the information system structure, platform control system and operation management method under the traditional situation. This article explains the definition and architecture of SOA, analyzes the platform design of China's air traffic control information system based on SOA architecture, and further puts forward suggestions for the improvement of air traffic information system under the new architecture, hoping to promote China's air traffic The control platform control system has been further optimized and improved.

Introduction

As far as the current situation is concerned, the development speed of China's air traffic control business is not only accelerating, various types of air traffic control equipment are continuously increasing, the air traffic informationization is also under construction in the second phase, and the hardware conditions of basic station data communication are also continuing Under the premise, develop and design the air traffic control platform control system. However, it should be noted that the information system part of each device is still in an independent state, and the protocol interfaces used also have different states, which restricts the basic information between the devices, resulting in certain problems in the stable operation of the system. . So at present, China is currently designing the air traffic control platform control system based on SOA, so that our country's control system has been developed more quickly.

1. Definition And Architecture Of SOA

Traditionally, when sharing information and data, the corresponding interface programs were written directly between the systems that exchanged information. However, there are many problems with this type of architecture. When the number of exchanged systems increases, the number of interfaces between systems will continue to increase. In extreme cases, there may be N systems with $N(N-1) / 2$ interface. In addition, when the interface is implemented directly through programming, it is difficult to expand and maintain during the long-term use [1]. Therefore, a central street store for data exchange can be established in the entire system, thereby effectively exchanging data between the various systems, providing the system with a data bus that supports the flow of information, and can build the current and future The integration of the application systems to be expanded is the sharing of information between business systems. Through such a unified interface model, not only can the coupling degree between the systems be effectively reduced, so that the openness and standardization of the data exchange interface is improved, but also to ensure that the data is exchanged, to achieve high efficiency and stability Status [2].

The so-called SOA is actually a service-oriented software architecture. Under the general environment of the Internet, it is a specification of logical units for design, development, and application management. It can integrate different functional units in applications through interfaces and Contract to unite. The basic element of the SOA architecture is the service. As a reusable component in the business process, it provides information services or simplifies the data transfer

process of the turntable, responds to customer requests, and proposes high-quality services.

From the perspective of the overall architecture, SOA mainly includes three points: service requester, service registrant, and service provider [3].

2. At Present, China's Air Traffic Control Information System Is Based On The SOA Architecture Platform Design

At present, when designing the air traffic information system architecture, the first and most important step is to meet the overall needs of cross-regional and cross-department collaborative public integration platforms, and integrate official documents, service, and financial management systems. Provide corresponding service resources, so as to achieve comprehensive office coordination, realize the integrated management of the human resources of the air traffic control system, accelerate the speed of internal information flow, and thus improve the service level and work efficiency of the unit [4].

In the design process of the air traffic control information system, it is necessary to follow the SOA idea, according to the characteristics of the needs of each application level, the structure is clearer, and the information service platform is more accurately positioned, and through platformization, the business can be reasonably disassembled Points, so that the coupling between various business links can be reduced, and the business processes are optimized accordingly, thereby improving the accuracy and flexibility of the business logic.

When constructing the platform of China's air traffic control information system, we can refer to some typical enterprise service bus solutions in the software industry, and integrate related procedures such as service registration, service security and service quality to achieve business applications and their own Features are integrated to achieve rapid adjustment, achieve the purpose of quick access to excuses, and improve the stability and security of system operation.

Therefore, the service station of air traffic control information should be distributed, and follow the relevant development standards, establish the corresponding my integrated solution, and achieve the corresponding integrated application through the flexible service interface and adapter. The new platform built should implement corresponding architectures such as Web services, intelligent routing, and message intermediary, so as to realize more than a dozen integrations of various applications in the air traffic control industry. This enables the air traffic control system to be seamlessly connected to external units such as the Civil Aviation Administration, airports and airlines.

3. Suggestions For The Improvement Of The Air Traffic Control Information System Under The New Framework

(I) Need to strengthen the construction of network and information security protection

Network security is the most important part of ATC security. According to the SOA architecture, the corresponding information system design can make it easier to realize information sharing across borders, and data access is more open, and service calls are made. Yes, cooperative operation can bring more but at the same time will make It is more vulnerable to attacks [5]. Therefore, for the air traffic control system, the construction of safety infrastructure and the improvement of corresponding reasonable measures such as safety protection means are becoming more and more important. The air traffic control system should carry out corresponding protection construction through grading, evaluation and inspection in accordance with the information security standards required by the state, so as to highlight the safety foundation of the air traffic control system.[10]

(2) Need to optimize information management and operation and maintenance personnel organization structure

For the production and operation of air traffic control, a sound information system plays a supporting role. As far as our country's current situation is concerned, there are decentralized systems and functions in the ATC information system, and there are also decentralized management and operation and maintenance functions, resulting in the lack of operation and maintenance

personnel and service providers in separate systems, which is not conducive to the background of big data. Under the requirements of unified management requirements.[8-9] Therefore, it is necessary to reorganize the operation and maintenance supervision, IT services and security management personnel on the basis of the personnel of each operation management department and the need to ensure technical support personnel, so as to realize unified deployment. In addition, technical personnel in operation and maintenance management should also improve their professional capabilities, and relevant departments should strengthen training to strengthen the establishment of operation and maintenance management teams [6].

For example, the staff in the operation and maintenance management team can be divided into three levels. The first level of staff needs to be on duty for 24 hours and is responsible for monitoring of basic equipment and application systems; It is necessary to eliminate difficult faults, and optimize and improve infrastructure and application systems.[7] The third-level staff needs to support problems that the second-level staff cannot solve. The third section of the staff may be composed of internal experts and external service providers.

Conclusion

At present, China's air traffic control platform control system based on SOA can not only meet the needs of big data and cloud computing services built by the future air traffic control industry, but also integrate, analyze and manage different source data for unified deployment. According to the requirements of the module, it can also be implemented in stages for different regions, businesses and platform systems in accordance with the module. It has never reduced its impact on the current existing system, and fully utilized the existing assets. In this way, work efficiency is improved, work costs are reduced, business flexibility and innovation are realized, and the control management system in China is further improved and optimized.

References

- [1] Liu Xiaoxiao. Design of multi-role educational management system for vocational colleges based on SOA architecture [J]. Digital Technology and Application, 2019 (4): 161-162.
- [2] Wu Wenjing, Chen Runchao, Li Jinlong. Design and Implementation of SOA-based Passenger Transport Hub Information Management System [J]. Transportation Science and Technology, 2019 (3): 104-105.
- [3] Wei Ge, Ren Xiang, Xu Shiming. Design and Implementation of Self-service Tax Service System Based on SOA Architecture [J]. Wireless Internet Technology, 2017 (20): 114-117.
- [4] Tao Wei, Huo Ran. Design and Implementation of M City Cigarette Logistics System Based on SOA [J]. Information and Computer (Theory Edition), 2017 (6): 116-118.
- [5] Ju Yan, Hu Ting, Liu Yandi, et al. Design and implementation of a smart military barracks management system based on SOA architecture [J]. Information System Engineering, 2017 (2): 95-97.
- [6] Lin Yujie, Huangfu Hancong. Research on SOA-based document management system integration scheme [J]. Electronic Design Engineering, 2017, 25 (18): 64-68.
- [7] [7] Cao Juntao, Hong Mei, Wang Wei, Yuan Wei. Research and design of lightweight workflow middleware based on SOA [J]. Computer and modernization. 2008 (06)
- [8] [8] Chen Shiyi, Ye Dejian. New cloud platform service management middleware based on SOA architecture [J]. Microcomputer application. 2016 (07)
- [9] [9] Wang Furong, Zhu Yunfeng. Research on security RFID middleware architecture based on SOA [J]. Fujian computer. 2010 (10)
- [10] [10] Gao Hui. Research on middleware model of RFID complex event processing based on

