Dynamic and Secure Business Data Exchange Model for SaaS-Based Collaboration Supporting Platform of Industrial Chain

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ABSTRACT

In this paper, by analyzing the characteristics of data exchange process of SaaS-based collaboration supporting platform for industrial chain, a dynamic and secure business data exchange model for the platform is established. On this basis, methods for business data automatic obtain and format conversion, client authentication based on encryption lock and SOAP extension, business data encryption based on public key of the platform, and instant key created by client is discussed. The implementation of these methods is studied based on a .NET environment. Furthermore, the dynamic and secure business data exchange model is used in the SaaS platform of the automotive industry chain and SaaS platform of the injection industry chain, as it meets the multi-source and heterogeneous information exchange requirements.

Keywords: Authentication, Data Exchange, SaaS Platform, Secure Transmission, SOAP Extension

1. INTRODUCTION

Data integration and exchange is a kind of data processing technology, which converts a kind of data structure into another, transmits and exchanges the instance of data in the heterogeneous systems through computer network (Fagin, Kolaitis, Miller, & Popa, 2003). Data integration and exchange based on integration adapter is a common method for solving multi-source and heterogeneous information data exchange. This paper mainly works on dynamic and secure data exchange technologies for SaaS (Software as a Service)-based collaboration supporting platform of industrial chain, which is a public platform for SMB (Small and Medium sized Businesses group), it works in the Internet environment and running by a third department. Works as a data exchange center,
it exchanges business data with enterprises’ inner software systems whenever required, such as ERP (Enterprise Resource Planning) and PDM (Product Data Management) systems. To the various SMB and the complex Internet environment, dynamic optimization and secure technologies for the platform are the key technologies to be solved.

There are many research results on data integration and exchange adapter at home and abroad. About related products, Sybase launched the Sybase DXP platform for data exchange, IBM introduced WebSphere information Integrator solution for data integration at the same time, and Microsoft launched Biztalk business integration program. Furthermore, many companies and research institutions have also launched corresponding middleware products for data exchange, for example, the OnceDI of ISCAS (Institute of Software Chinese Academy of Sciences), data exchange platform eStarConnect of VTech and so on (Wang, 2010). To the SaaS platform for SMB, Sybase DXP and WebSphere information integrator are not suitable, this mainly because of their large structures, expensive implement fee and complex configuration procedure (Li & Liu, 2008). Middleware products such as OnceDI cannot meet the needs of bidirectional data exchange, and more than that, these products generally require an open service port, it will bring some security risk to the platform.


These results have some reference value for Internet-based data exchange of heterogeneous systems, but lack consideration for automatic obtain of data to be exchanged, format conversion and secure transmission. The SaaS-based collaboration supporting platform has many different requirements for data exchange. Based on the results of these studies, with the needs of the platform for the dynamic data exchange of multi-source and heterogeneous systems, this paper mainly research on technologies for achieving dynamic and secure business data exchange between the platform and enterprises’ heterogeneous systems.