WMIC and the RPC in the enterprise application integration

Yao Wang
Computer Intelligence and Intelligent Engineering
Guangdong University of Technology
Guangzhou, Guangdong, China
huananwangyao@163.com

Yongquan Yu
Computer Intelligence and Intelligent Engineering
Guangdong University of Technology
Guangzhou, Guangdong, China
yyq@gdut.edu.cn

***Abstract*—Today Enterprise application integration and information technology has become very critical for successful functioning of any enterprise in this world. The goal of enterprise application integration is to achieve data sharing, associated organic combination of data, using a unified platform for future large-scale enterprise information laid the foundation for the scale of integration. At first, this paper proposed WMIC technology and introduced the WMIC technical principle, and WMIC had the powerful function. Through Combined with the actual project design, implementation technology of RPC and WMIC -based on the enterprise application integration framework [1]. The framework enables you to consolidate heterogeneous systems, applications and data. To simplify the IT environment and reduce operational costs, free resources to focus on strategic. The framework provides an innovative solutions, it is has been practiced successfully in project management. At the last, to give the user a richer experience, the results of WMIC will be outputted in HTML format.**

Keywords-component; WMI; WMIC; RPC; application integration

I. INTRODUCTION

In the times of information explosion, enterprises often set up all kinds of information systems to maximize efficiencies in both product development and management control. With information systems being built with different techniques and in varying of times, there is a series of problems in information systems. Such as: information institutions are not sound and has not formed a closed-loop management which means information islands, not unified technology platform, lack of a unified information standards, more security vulnerabilities and other issues. It is so short of interconnection and information share that the system can not be run smooth. So updating information of enterprise are not synchronized and even inconsistent, resulting in low ROI on enterprise information. In order to better resolving the issues between integration of EIS and sharing of information, eliminating information island, more and more enterprises will be integrated seamlessly. Not only to solve the heterogeneous enterprise applications and data exchanges between the shared, but also the enterprise business requirement to the market that can be response fast.

At the same time, enterprise application integration facing difficult of integration, high costs, the lack of flexibility and adaptability in the past. But if the integration of technology use the WMIC technology, which the situation is different, WMIC has the advantage of simple commands, easy to write and function powerful and so on, thus reducing the burden of enterprise application integration technology.

In this paper, WMIC and RPC-based enterprise application integration system principle is that by the client/server approach which make the enterprise application integration traveling light.

II. RELATED TECHNOLOGIES OF ENTERPRISE APPLICATION INTEGRATION

A. WMI technology

Windows Management Instrumentation (WMI) [2] is the Microsoft implementation of Web-based Enterprise Management (WBEM), which is an industry initiative to develop a standard technology for accessing management information in an enterprise environment. WMI uses the Common Information Model (CIM) [3] industry standard to represent systems, applications, networks, devices, and other managed components .

CIM is a standard, unified, object-oriented framework for describing physical and logical objects in a managed environment. To provide a common framework, CIM defines a series of objects with respect to a basic set of classes, classifications, and associations. To understand the components of the WMI architecture, shown in Figure 1, it helps to analyze the creation of an implementation of the WBEM standards. WMI [4] consists of several parts: provider, CIM repository, management applications, CIM object manager, principal among the various components through COM / DCOM communication.

978-1-4244-7874-3/10/$26.00 ©2010 IEEE

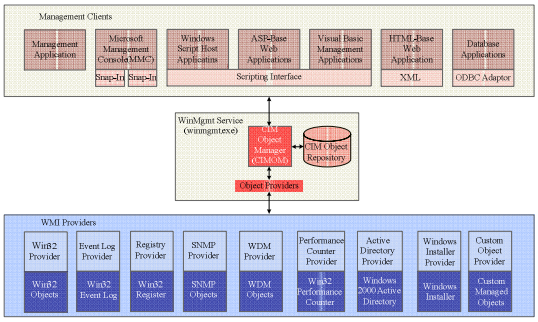

Figure 1. WMI work diagram

B. *WMIC Technology*

WMIC [5] extends WMI for operation from several command-line interfaces and through batch scripts. Before WMIC, you used WMI-based applications (such as SMS), the WMI Scripting API, or tools such as CIM Studio to manage WMI-enabled computers. Without a firm grasp on a programming language such as C++ or a scripting language such as VBScript and a basic understanding of the WMI namespace, do-it-yourself systems management with WMI was difficult. WMIC changes this situation by giving you a powerful, user-friendly interface to the WMI namespace. WMIC is more intuitive than WMI, in large part because of aliases. Aliases take simple commands that you enter at the command line, then act upon the WMI namespace in a predefined way.

C. *RPC protocol*

Remote Procedure Call (RPC) is a protocol for requesting a service from a program located in a remote computer through a network, without having to understand the underplayed network technologies. RPC presumes the existence of a low-level transport protocol, such as TCP or UDP, for carrying the message data between communicating programs. RPC is also known as client/server mode, it's on a level socket programming. This mode eliminates the need for network programming. In short, as RPC provides a function-oriented interface, it is often much easier to use than raw socket programming. RPC is also powerful enough to be the basis for many client/server applications.

III. SYSTEM DESIGN AND IMPLEMENTATION OF ENTERPRISE APPLICATION INTEGRATION

A. *Design principles*

These principles [6] have been taken into consideration in the preparation of the design: support for remote computer monitoring and control of resources, but mainly for the monitoring and alarm; multiple heterogeneous operating systems server can be managed from a single platform; monitoring parameters as comprehensive as possible; to provide a graphical interface, It is best WEB interface;high availability of control systems; Easy to use, easy to expand; General is the low-cost, high-performance integrated system software design.

B. *Realization of monitoring function*

The server are able to operate in the same way with local machine, monitoring objectives requentments: management server system availability and performance; Monitoring and Performance Statistics, such as: memory utilization, disk free space, the process of implementation, CPU utilization; monitor both file and registry changes caused by software installations; The collected data will be output to web-based graphic interface for monitoring.

IV. WMIC AND RPC-BASED SPECIFIC IMPLEMENTATION

WMIC and RPC-based enterprise application integration system principle is that by the client/server approach to achieve. Figure 2 represent the client and server specific implementation principle.

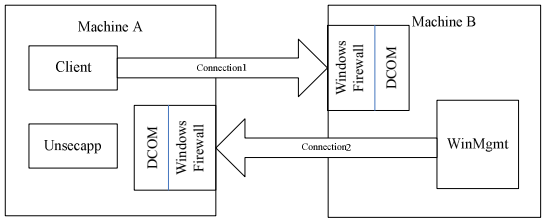

Figure 2. Client/server specific implementation principle

Start the Remote Procedure Call, and two Windows Management Instrumentation service, Supporting for masking of underlying heterogeneous systems by the Applications Manager, which to be added the monitor, to implement the goal of data sharing and seamless integration of associated data.

A. *Basic Information Collection*

WMI supports multiple programming languages to access, including VBScript, C++, Delphi and other advanced programming language, based on rapid implementation and simple language, we use the WMIC command line to achieve. The Microsoft WBEMTest tool is a utility which provides a GUI you can use to query for WMI classes and class instances, change property values, execute methods, and receive event notifications.

1) Follow these directions to get started with WBEMTest and get remote connection[7]

a）In the monitoring host: Click Start and then click Run, Enter wbemtest in the Open edit field. Then press OK

b) Enter \ \ root \ cimv2 <be monitored ip>;

c) Enter the user name and password

d) press Connect Button In the Connect dialog

At this point, has been a successful connection dialog.. we can get next step.

2) Other information for remote connection: wmic /node: "[full machine name]" /USER: "[domain]\[username]" PATH win32_terminalservicesetting WHERE (__Class!="") CALL SetAllowTSConnections 1

a) After modified, the operation of remote connection is as follows: wmic:root\cli>/node: "objective IP" /USER : " domain" \username

/ / And then press

Enter password: xxxxxxxx

Figure 3 shows the connection procedure

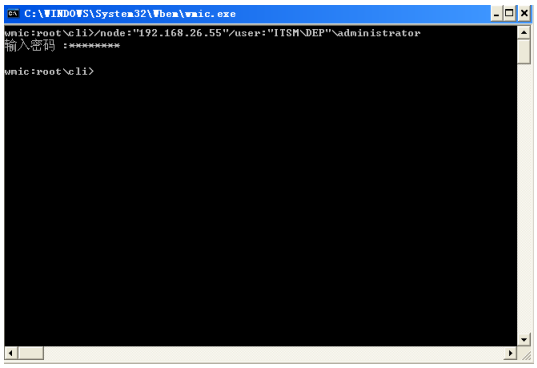

Figure 3. Connection procedure

b) To achieve process management :

wmic:root\cli>process list brief // Information listed in the core of the process, similar to the Task Manager .Figure 4 shows the details of process

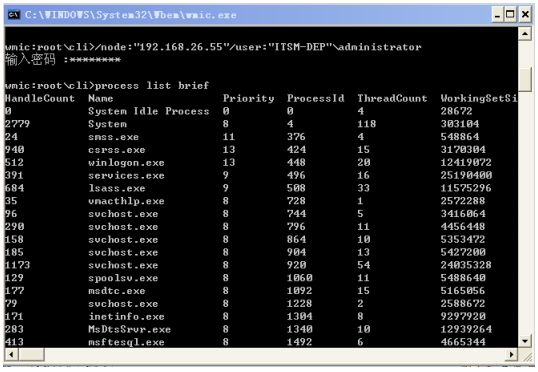

Figure 4. The details of process

B. *The application to achieve the details of the remote machine*

1) Also allows other data to read, full grasp of the remote computer data, to achieve the data sharing[8].

a) wmic set the IP address:wmic nicconfig where index=0 call enablestatic("192.168.1.5"), ("255.255.255.0") ; index=0 note is to configure the network interface 1. / / Configure or update the IP address:

b) configure the gateway (default route): wmic nicconfig where index=0 call setgateways("192.168.1.1")

2) Computer SystemsManagement:

a) wmic Computer Systems get SystemStartupOptions // view the system boot options, the contents of the boot

b) wmic computersystem where "name='abc'" call rename 123 / / change the computer name from abc to 123

c) wmic computersystem where "name='google'" call joindomainorworkgroup "","","MyGroup",1 / / change working group from google to MyGroup

3) Monitor Management

wmic DesktopMonitor where Status='ok' get ScreenHeight, ScreenWidth; // Get screen resolution

4) System Environment Settings Management

a) wmic Environment where "name='temp'" get UserName,VariableValue / / get temp environment variable

b) wmic Environment where "name='path' and username='<system>'" set VariableValue="%path%;e:\tools"// change the path environment variable value, add e: \ tools

c) wmic Environment create name="home", username="<system>",VariableValue="%HOMEDRIVE%%HOMEPATH%"// Add system environment variables home, value is% HOMEDRIVE%% HOMEPATH%

5) /node:legacyhost qfe get hotfixid // see what patches to fight the current system

6) To View The Current CPU Speed

a) wmic cpu get CurrentClockSpeed // cpu current speed, shows in Figure 5

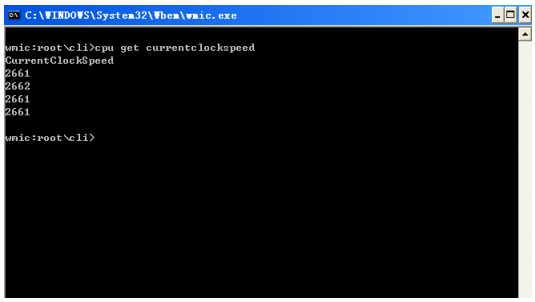

Figure 5. CPU speed displayed

C. *WMIC dynamic display of the results collected*

The console isn't the only place to send results. You can instruct WMIC to send output to a file in XML, HTML, or Managed Object Format (MOF) format [9]. MOF is the native WMI file format for classes and class instances in the WMI repository on a WMI-enabled the original class and save the form. In this paper, the browser shows code that directs the output of CPU information to an HTML file. The /output global switch instructs WMIC to send the output to file1.htm. The /format verb-specific switch instructs WMIC to transform the native XML output into an HTML form. You can create Extensible Stylesheet Language (XSL) files to format output or use any of the XSL files stored in the \%systemroot%\system32\wbem folder of any computer with WMIC installed. Here the results will be redirected to file1.htm document collection process.

wmic / node: this machine IP (192.168.12.172) / output: f: \ file1.htm CPU get description, maxclockspeed, revision

Shown in Figure 6, can be very intuitive, clear display any data of the remote computer.

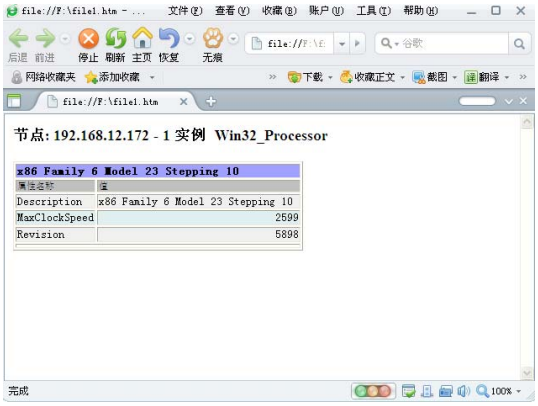

Figure 6. CPU performance graph

Through this operation, we can see that the command performance on the different needs ,only a simple command can achieve a lot of action after using WMIC, thus Use of the WMIC can greatly reduce the burden of programming , programmers can focus on the realization of system functions . So the WMIC and the RPC represents a significant improvement from rapid integration of enterprise applications.

V. CONCLUSION

A method based on concept of WMIC is proposed in this paper to resolve the problem faced by the big companies on the EAI, while the methods nowadays lack in valid integrating plan. As the WMIC command prompt and function powerful, so use WMIC and the RPC can make programming easier, which helps you focus more on your application and a variety of technical tuning methods instead of programming, reducing development costs while also enhancing the efficiency. Above all, it is a very useful manipulation try and economic instrument for enterprise to apply integration of these norms.

So far, this technology has been applied to a business office resources management system. And has made outstanding contributions to enhance the overall management including reasonable using resources, increasing the service response rate, ensuring the quality of services. This system is easy, secure and reliable, so it is possible to be applied to various of offices resources management.

REFERENCES

[1] Masters thesis net on the J2EE platform Gateway Web Services-based Enterprise Application Integration [DB], http://www.lunwen51.com.

[2] Fan send rain, Xiong Guixi based on WMI + .Net Remoting Computer Management System Design and Implementation [J], *Research Design Results* ,2007-03.

[3] Distributed Management Task Force, Common Information Model (CIM) Infrastructure [S/OL], 2008-06-12

[4] Cooperstein, J. Windows Management Instrumentation: Administering Windows and Applications Across Your Enterprise[J] , *MSDN Magazine*,2000-05

[5] Zhu Qisheng, I'm ugly but I am strong!--WMIC, the new super-command-line tool [N], *Windows & .Net Magazine* 2008-04.

[6] Tang Zhong, He Huimin, Su Feiji, WMI technologies in network management software, server design and implementation [J] *Guilin University of Electronic Technology*,2008-12.

[7] Boshier ,A. Windows Management Instrumentation: A Simple, Powerful Tool for Scripting Windows Management[J] , *MSDN Magazine*,2000-04.

[8] Windows weapon-WMIC use[J], *Hacker X Files*, 2009

[9] http://msdn.microsoft.com/en-us/default.aspx