ICE Technology Corporation

Massive Connection MOM Leadership

ICE iPush® Communication Server V2

White Paper

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Introduction

In today's modern business world, almost every corporation has its own business information system and applications to assist daily operations. As technology advances, more and more functional software and systems are added to the existing computer structure. How to deliver real-time information and collaborate various modern applications and those legacy but inevitable programs are the main issues for CIOs to consider. Doubtlessly, corporate managements and business development have strong desire to connect and integrate all of their applications to become a real-time system. By this demand, the massive connection message-oriented middleware is created to bring all possible customers, employee, management team, and suppliers together in order to share the information and collaborate for better operation. Within the consolidation, messaging system plays a very critical role ; it is essentially the heart of the data communication.

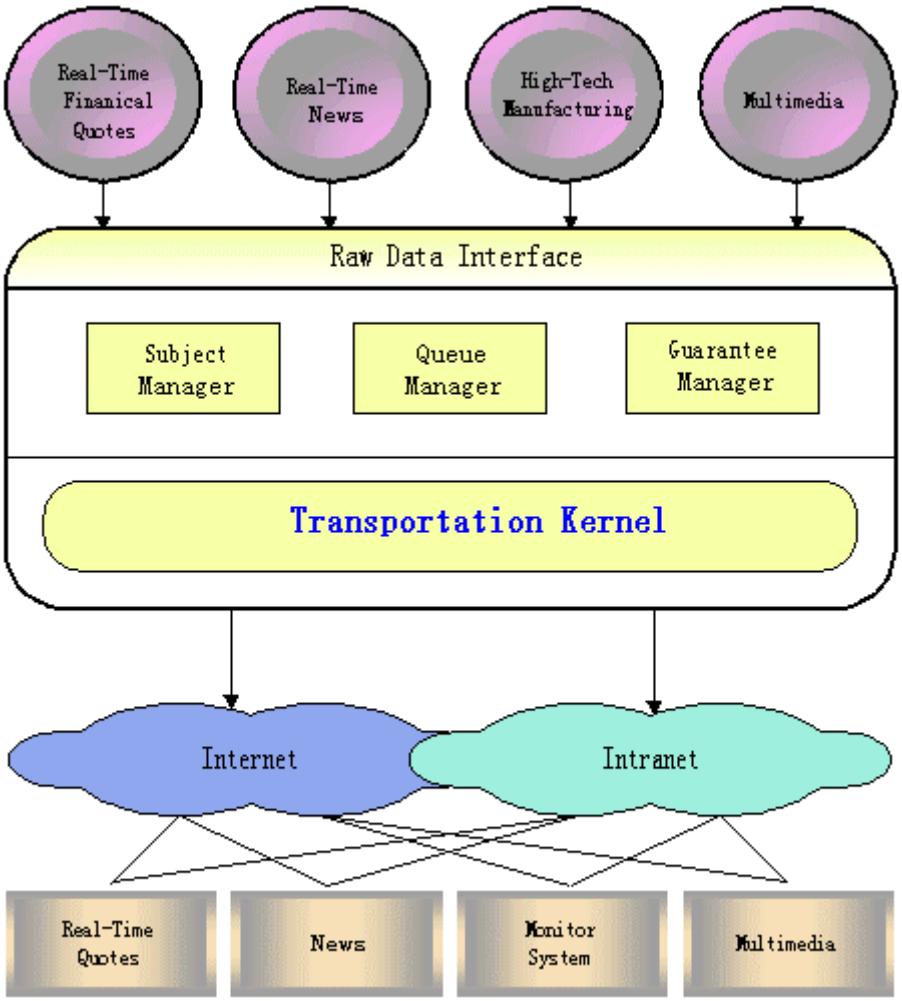
Messaging system acts as a middleware to facilitate data transmission and it usually refers to a Message-Oriented Middleware (MOM). What is MOM? MOM is a messaging system in which information is passed in the form of a message from one program to one or more other programs. The information can be passed asynchronously so the sender does not have to wait for a reply. MOM products cover more than just passing information; they provide services on translating data, security, broadcasting data to multiple programs, error recovery, locating resources on the network, cost routing, prioritization of messages and requests, and extensive debugging facilities.

A MOM with high scalability, performance and reliability should be the foundation to achieving real-time application integration. This white paper shows key features of ICE iPush® Communication Server (iPush® Server or iPush® for short) and points out why iPush® Server is the best fit for corporations for real-time application implement.

The Role of iPush® Server in Modern Data Communication

Obviously, ICE iPush® Server is a Message-Oriented Middleware and acts as an intermediate between the data source and the clients. In the modern world, there are various kinds of information flowing from one place to another. To manage and control the data flow efficiently is the primary function for iPush® server to achieve a reliable, scalable and secure delivery over the network. As shown in figure 1, information such as online quote, real-time news and manufacturing status are crucial data to be sent to the respond parties immediately without any error. iPush® is the perfect message handler in this application; no matter what type of message that is, iPush® can always transmit them to their destination.

Figure 1



Competitive Advantages of iPush® Server

- **Massive Scalability and Performance**
  ICE iPush® Communication Server is not only the data traffic handler, but also proved to be a massive scalable communication server with thousands concurrent client connections to Windows, Linux, and Solaris servers, since it is impossible to calculate the future number of connections there to receive information. Benchmark test shows that an iPush® transportation kernel can support up to thousands of concurrent connections with a entry level PC server. With such enormous scalability, iPush® employs asynchronous messaging transmission for enterprises to collaborate those loosely coupled systems and is the most effective way to build the distributed application over the current wide spread network environment. To ensure that the performance is highly stable and outreached, dynamic load balancing has been implemented into iPush® to support the massively scalable system solution. Based on the description, iPush® is now in the leading position to build up massive messaging system in the market.

- **Real-Time Communication**
  Since iPush® can dispatch information to thousands of receivers simultaneously, all the critical information is send out instantly without millisecond delay. The demand for real-time escalates in modern day business operation; iPush® is a perfect fit for the demand and supplies enterprises with an up-to-the-second message delivery. No more waiting for stock quotes, manufacturing status and worldwide news, iPush® pushes all those to whatever device in the earth just like a click on the mouse.

- **Guaranteed Reliability Durable Availability**
  To assure the message is sent out in the quality of service base, guaranteed message delivery is applied on the system by marking "Persistent" to each message and the message should be delivered once-and-only-once; in other words, a message would not be lost even if the communication provider fails; it would be delivered after the server recovers.

- **High Availability**
  In order to have communication available at all times, iPush® clustering can detect lost connections and has failover support to make sure that the system could be continue to function.

- **Advanced Security**
  iPush®'s security is composed of three parts: authentication, authorization and encryption.
  Authentication: System adopts the ID/Password to authenticate the user identity for the initial access to the processor.
  Authorization: Since iPush® grants users both read and write permission for each subject's two-way communication, each user not only has his or her own ID/Password, but also has the permission that has been set to the account at the beginning.
  Encryption: To protect the confidentiality of each message, iPush® encrypts every outgoing message and orders the client API to decode it. And the subject message has been scrambled. If necessary, iPush® can also plug in the SSL or DES for message encryption.

- **Wide Range Accessibility**
  Due to various types of platforms in the market, iPush® includes a number of API for different systems to transmit their information to the ICE middleware. Basically, about 80% of computer platforms can access iPush® without any major reconfiguration,

- **Multiple Message Models Supported**
  There are two important message models today, Publish-and-Subscribe (Pub/Sub) and Point-to-Point (P2P).
  Pub/Sub: Messages are pushed to consumers automatically; in other words, consumers do not need to request for the delivery. It is a one-to-many model of which every subscriber receives message on channels or subjects they have registered..
  P2P: Messages are exchanged through a virtual channel called 'queue' and each message is delivered only to one receiver. It is a one-to-one model of which there is only one receiver will receiver the message.

  iPush® supports these two message models for enterprise to deploy their messaging system effectively and flexibly in their most interest and

appropriate way.

- **Content-Independent**
  Due to the technology explosion in the recent years, there are so many kinds of the information flowing over the network environment. In the past, there is a specific transmission mechanism for each information type. Therefore, if there are thousands of the data types coming from the sources, thousands of the transmission methods need to be applied. It is not suitable for nowadays information era, since there is a definite need to cross-communicate with other systems and machines which are reading different formats of the data. ICE iPush® is an ideal tool for the enterprise to handle hundreds and thousands kinds of data exchanging to each other. As a result, no matter how many information sources there are, iPush® can easily transfer the data to the client subscribers without any major reconstruction..

Other Key Functions

- **HTTP Tunneling**
  ICE iPush® Provides HTTP tunneling support to allow transmission data penetrate any proxy and firewall configuration. Since the network security is now the major issue of the corporations, most companies have implemented certain level of security control for their business information and often implemented by configuration of the firewall and proxy server. This tunneling technology can friendly deliver the message through these setting to both subscription clients and servers.

- **UDP Supported**
  In iPush® version 2, User Datagram Protocol (UDP) is supported. Generally, engineers who favor UDP want to achieve the message multicast purpose, but ICE Technology Corp. has already developed the multicast method by using Transmission Control Protocol (TCP) which now can broadcast the data to thousands of users as UDP and still remain the characteristic of TCP to ensure the delivery of the packaged data.

- **Administration Tools**

  Channel/Subject Control: System administration personnel can now manage and control these two message addressing through a friendly GUI which allows it to perform administrator and client tasks

  BackOffice: It is a web-based managing program for iPush® 2, so administrator can access to the server regardless where they are. Page format is based on JSP rather the PHP in pervious version, so it gives the system engineers more flexibility in deploying the messaging server. Besides, administrator can monitor and access to all kinds of statistics, such as system, user, memory, etc.

  Logging: The Administration Tool also provides the logging activity to record the size of the message flow in and out of the server

- **Raw Data Service (Optional)**

  Raw Data Service Framework: It acts as a preprocessor to convert all types of data into the iPush® specified data type. Currently ICE Technology Corp. has developed a few numbers of Raw Date Services for financial companies and will continue to offer the framework to business clients in order to generate the best-fit data converter for their enterprises' operation

  Data Monitor: It provides both web-based and stand along application for administrator to monitor the data flow between the source and iPush® communication server

- **Add-on Service (Optional)**

  Generic Historical Data Service: It subscribes to all the communication channels and stores the information in this storage. When clients establish connection and would like to access the messages that were delivered in the past, the GHDS could resend these data the users.

  MTP Service: It stands for Multiple Touch Point Service which converts the message into fax, SMS, email, and/or iPush® data formats. With such service, organizations could significantly increase the system scalability to wider range of receivers

  Add-on Service Interface: ICE Technology Corp. will continue to provide suitable interface that works for the various functional services.

Platforms/API Supported

Platforms supported:
Currently, iPush® Server can be installed in the following systems:

- Windows 2000 Family (Professional, Server, Advanced Server)
- Linux (Red Hat distributions)

Client API Supported:
ICE Technology presently offers APIs to support the following platforms

- ActiveX Control for Windows
  It enable developers to use application development tools such as VB, VC++, .NET Framework, MS Office, ASP, Delphi, C++ Builder, Power Builder, etc. to create their Client applications. Developers can develop various applications executable on browser and Windows platform.
- Java Class
  The Java Class API can be used to develop Java Applets or independent Java applications, both of which can be run on any browsers Java Virtual Machine
- ActiveX Control for Windows CE.NET
  With the Windows CE.NET API, developers can develop applications that work with Windows CE.NET compatible Pocket PCs or Embedded System.
- MS .NET Framework Library
  With this library, developers can develop applications that work with many programming languages included in the MS .NET Framework and use the Visual Studio .NET as RAD tool.
- Linux C Library
  With static and dynamic linking librarys, developers can develop applications in Linux system.
- J2ME
  J2ME API allows developers to build up programs independently from or incorporated with Java Phone or other J2ME devices.

About ICE Technology Corporation

ICE Technology is the very first software company focusing on developing Message-oriented Middleware (MOM). Our mission is to become the world-class business communication software provider, thus, we dedicate to the globalization of ICE products and helped our customers translate advanced MOM technology into their business value.

Since April 2000, we have earned solid credit from our valuable customers in different industries and companies, such as TSMC, Taiwan National Military Department, Taiwan Environmental Protection Administration, Taiwan Water Resources Agency, Taiwan Central Weather Bureau, Hitron Technologies Co., SuperGeo Technologies Inc., National Taiwan University, Taiwan Futures Exchange, financial service institutions, online-game producers, etc.etc.

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