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An Overview of Jabber and the Jabber Protocol

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Welcome to Jabber programming.

This book shows you how to develop your very own Jabber client, based on the Jabber protocol. For whatever your purpose — fun, corporate development, or just a project for school — we provide the information that you need.

ON THE CD-ROM The CD-ROM that accompanies this book includes an electronic version of the book, source code, and all the tools you need to develop and use a working client application.

What Is Jabber?

Jabber is a very flexible, multi-protocol, multi-use, highly scalable, XML-based communications and presence-management platform. It's designed for everyone, at every level of experience. From the weekend chatter to the corporate power user, Jabber can allow you to dispense with several resource-stealing instant messaging (IM) clients and make your desktop and system neater and less cluttered. Jabber is more efficient in its use of your system resources; all of your IM resources can be in one neat package as opposed to being in several. And, in most cases, Jabber enjoys a more stable connection than other messaging platforms.

The unique presence-management system in Jabber, by far the most advanced of its kind, allows you to manage who can see you and who can't in ways that other chat platforms don't. For instance, when using AIM, we need know only your screen name to see that you are online. You would have to be aware of this and intentionally block us, assuming you knew our screen

names. A Jabber user can control presence with very little effort. Another user, regardless of external platform, must *subscribe* to your presence. You have the choice of rejecting or accepting the subscription at the time it is submitted. Other applications of this system are yet to be discovered. Jabber is a work in progress; the community learns and creates applications of the protocol/platform on an almost daily basis.

Jabber continues to be developed in the open-source community, by people just like you, by professionals, hobbyists, and others with an interest in and commitment to open development.

The first application of Jabber technology is an instant messaging system focused on privacy, security, ease of use, access from anywhere using any device, and interoperability with IM-, phone-, and Web-based services. Jabber is quickly becoming a standard component of Internet infrastructure as public and corporate awareness of the usefulness of instant communications grows.

The Jabber IM system is very different from existing instant messaging services in several significant ways:

Jabber is based on the Extensible Markup Language (XML), the universal format for structured documents and data on the Web. (See `http://www.w3.org/XML/`.) This provides an amazing amount of flexibility as to what the Jabber server itself can do.

Jabber uses a worldwide distributed network, utilizing many interconnected servers. This almost ensures uptime in the network and gives users many optionsfor connecting to the network. For example, if one server is down for any reason, it is a simple matter to move to a new one.

The Jabber code is open source.

Jabber has a modular, extensible architecture, allowing the easy creation and integration of new features, especially those that address specific needs. Each new feature is added as a module instead of being added to the core server, so the server maintains its stability while still allowing for new features to be added. (Changes to the server itself are rarely ever needed, but they have been known to happen: One server that we built for a customer was almost unrecognizable as a Jabber server at the time we built it, but some of its features are now quite common.)

For the most part, the worldwide Jabber network itself is operated by people in the open-source community — people like you who have a need for or a drive to build a server and a network of users or to provide internal communications in a business or organization. Many servers started out as developers' testing platforms and have grown into publicly used servers, connecting the user to his or her various communications platforms. myJabber.org is a perfect example; for the longest time, the only users of the server were the authors of this book. Now, we rarely see fewer than 100 users online at any given time, and new signups are in the

neighborhood of seventy-five a day. Even given the enormous, inestimable size of the Internet, these are significant numbers for us.

Jabber is built on client-server architecture and not a client-to-client architecture, as are some instant messaging systems. All messages and data sent from one client to another must first go through the Jabber server. Although any client is free to negotiate a direct connection to another client, those connections are for application-specific use only. In some specific instances, this is even encouraged — such as in file transfers — but the negotiations for these instances are first made by the server. This keeps the "flow of traffic" in a nice, organized stream and allows for various security protocols like SSL and PGP to be implemented.

Jabber has its own unique IM protocols built right in, enabling person-to-person instant messaging and "group conferencing" on many of the world's operational Jabber servers. In addition to these capabilities, Jabber enables the use of the AIM, Yahoo!, ICQ, and MSN Messenger networks so popular with many Internet users today. Jabber can also communicate with the old mainstay Internet Relay Chat (IRC), making it a very versatile and useful tool.

Where Did Jabber Start?

Jabber started in 1998 with a young man, Jeremie Miller, in the U.S. Midwest. Jeremie wanted to design a way to bring all his IM clients under control and place them in one easy-to-use piece of software. Saying, "I don't do GUI stuff very well," Jeremie determined that what he could do was design a protocol and the back-end server for his idea and then talk someone else into designing the client's user interface. Jabber today easily encompasses dozens of working client models, and the server has been customized by individuals all around the world for their own use. All this work has been done within the open-source community by people of all skill levels — hobbyists, professionals, and people who once were one or the other but now find themselves to be both. We were once hobbyists ourselves, and now our interests and work have brought us to a professional level of use and development.

What Can You, the Developer, Do with Jabber?

What are Jabber's capabilities? This question is hard to answer. Jabber's capabilities are limited only by the imagination and talents of the thousands of open-source designers and developers working with the protocol worldwide. This is tempered by the needs and imaginations of hundreds of thousands of users. Our users have asked us for certain functions, and we have tried to meet these requests whenever possible. Some of the requests were, frankly, quite impossible — some wanted us to model our client directly after their favorite chat client, and others have ask for things that just have not been developed at the server level yet. The way you handle this is completely up to you. You may wish to develop a client and build a large network of users as we have. Or perhaps your intention is to design a dedicated client to be used only by your company or organization.

Currently, Jabber is used as an instant messaging and conferencing platform by many large corporations, Internet service providers, special-interest groups, governments, and individuals all around the world. Some of the functions of these clients are very limited, and were designed or changed by development teams to do only what the organization wanted them to do. We have designed several that do just exactly that. Some will allow connections to only a specified server, others to a specified network. Others are fully functional but have had the "branding" changed so that they appear to belong to one organization.

Jabber clients have been developed to work with almost every known operating system, including but not limited to Windows (9*x*, NT4, 2000, ME, and XP), Linux (Jabber works with many of the most popular flavors of Linux, and users design patches for others all the time), Solaris, Macintosh, BeOS, AIX, and HPUX. People write for the platforms they use on a daily basis, so the operating system you can run a client from is limited only by the number of systems in existence.

Jabber is quite capable of working within existing wireless networks as well, sending text messages to wireless pagers and phones and receiving messages back from wireless-capable handheld devices, such as PDAs and BlackBerry devices. A few clients have even been written for the WinCE/Pocket PC platform and other PDA environments, such as the Palm OS. As the numbers of wireless devices grow, so do the operating systems and the numbers of users. The clients for these devices are still waiting to be designed.

Other new ideas and applications come out all the time. Maybe you've had a great idea about how you would use this unique protocol but were unsure how to make it work. Perhaps you have had a specific need in wireless communications — for example, being able to stay in real-time contact with a sales force that is in the field. This force could be carrying an existing wireless device; you need only make your server and/or client able to talk to it. Some of these devices used to require proprietary software, but now, with a little ingenuity (and a great protocol to apply it to), you can converse with this sales force from your desk, using the same software with which you hold online staff meetings and chat with your best friend or your mother. Whatever your need, look at the Jabber protocol closely and don't think "chat" — think "communications and presence." Jabber may be the platform for you.

The Jabber Server Under Linux

The core Jabber server was built to operate in the Linux environment. So far we have seen it built in almost every known flavor of Linux, including Slackware, Red Hat, Mandrake, SUSE, Debian, and Turbo, just to name a few. We have even seen it run in Yellow Dog Linux, which was written for the Macintosh hardware architecture. It has been built in the various flavors of BSD (developed as a variant of Unix at the University of California at Berkley) and has been adapted to the Mac OS X server, a variant of the BSD operating system. (Yes, Apple based OS X on BSD.) Jabber runs in Sun Microsystems' Solaris (most known versions) and in other Unix distributions used all over the world. Jabber servers have even been built on Windows NT4 Server and Windows 2000 Advanced Server, and we have no doubt that it will run on WinXP

Advanced Server as well. The Jabber server itself is written in the C programming language and can be adapted to any operating system that can work with C. If we didn't mention your favorite OS, don't despair; with a little adaptation Jabber will most likely compile and run in whatever you need it to.

Some of the readers of this book may be fairly new to the Linux operating system, some even extremely new, and one or two of you may have never heard of it before. Don't let this bother you in the slightest. As you become familiar with Jabber development, you'll find that almost everyone you run into in the Jabber community has a Linux/Unix box or two running for one reason or another; most of us have our own Jabber servers, even if they run only in a private LAN. Linux people are a proud bunch and are always willing to talk about their favorite flavors of the OS. Most are always willing to help someone new get started with Linux; keeping this in mind, you should have no shortage of help getting started. The Jabber server that we will build later in this book will be with the Red Hat flavor of Linux, a very powerful variant and as such, really quite common in the community. Consider Linux as a common ground in the Jabber community; even our Mac developers are pretty heavy into OS X and other Mac variants of Linux.

What's the best way to really get involved in this project and the open-source community — and, specifically, in the Jabber community? There are many ways to be involved if that is what you wish to do. Some of you may want only to develop your client and get it running in their private or corporate LAN. Others will jump into the community with both feet and become a part of us. We encourage everyone to take part in some way. Developing Jabber clients is a reasonably simple process, but everything is easier with some help.

The Jabber community has dozens of mailing lists filled with information about the many various parts of development. These lists are available to the Jabber enthusiast at `http://mailman.jabber.org/listinfo/`. Messages fill these lists daily and without a doubt are one of the top methods of communication for developers in the Jabber community. The lists and the messages they transport are a perfect form of "permanent" records for questions and answers concerning any part of the development of your server or your client and for previews of new ideas that people are working on. For more up-to-the-moment, "I need information now" support, visit the Jabber developer's conference room on the Jabber.org server (`jdev@conference.jabber.org`) — you will find most of the Jabber developers hanging out there. Stop in and say hello — they're a friendly bunch. Some of these folks are veteran members and a few are even founding members of our community. In other words, they know Jabber. Don't be afraid to ask any of these people questions — that is what they are there for, and often, a new person shows up and asks "What if we were to . . . ?" If you could, you'd see stunned looks on the other side of the keyboards — sometimes suggestions are made that we have never thought of. You can see how well the interaction of people can work; we learn from one another, sometimes without meaning to.

Summary

We have taken a brief look at the humble beginnings of Jabber and what it is, a look at its creator and the original thoughts behind the server. We have really only partly touched on the capabilities of Jabber, because these grow almost exponentially as more and more people become involved in the project. As we move on in this book, we will discover how many of these items come together into what we believe to be the most powerful communications platform in existence. We will further explore the things that you can do with Jabber, help you set up a server, and take a quick look at some of the available Jabber clients to be found in the community.