

PUSH-PULL TECHNOLOGY AND CORPORATE NETWORKS

PAUL SHANK

PUSH AND PULL TECHNOLOGIES, SOME OF THE HOTTEST NEW INTERNET PROGRAMS, ARE BEING SCALED DOWN TO PROVIDE PRACTICAL, EFFECTIVE INFORMATION FILTERING AND DELIVERY SYSTEMS ON CORPORATE NETWORKS.

WHETHER YOUR CORPORATE NETWORK PROVIDES too much information, too little, or is just too hard to access, new technologies from the Internet are being scaled down to provide efficient, effective information delivery systems. Understanding which to use, for what information, can give you the edge you need. Whether your enterprise has stepped up to an intranet or you are using a conventional network such as Novell, new software products are changing the information you receive and how you receive it.

The Internet has made information available on an unprecedented scale. And that is precisely the problem. We all have more information, much of it unwanted, most of it interesting but useless to the task at hand, and the torrent continues to grow. Email, FTP (File Transfer Protocol), mail lists, usenet newsgroups, the Web, web-phone, where does it end? And more importantly, how do we get the information we need in a timely, accurate fashion?

PUSH VS. PULL

Knowing the difference between push and pull technologies and the relative advantages of each will make your decisions on information management easier. Push systems do just that, they push information into the hands (or onto the screens) of users. Electronic mail, email, is the primary example of this form of information transfer. Recipients of email, like your mailbox at home, will receive whatever someone else wants you to have. You can disregard it, but you receive it. Pull systems, however, require the user to actively search out the information desired. Usenet newsgroups and FTP servers are typical examples of this type of system.

Email and FTP date back to the origins of the Internet, ARPANET—the government sponsored project

designed to allow the U.S. Department of Defense to communicate in the event of a nuclear exchange. Subsequently dominated by researchers, the Internet developed as a convenient medium for scientists to share brief messages via email and more extensive data through FTP. Email is the most widely used application on the Internet, but many people use FTP without even knowing it. If you have ever downloaded a game, program update, or new application, chances are it was done via a FTP link through a Web site.

Information "push" systems are best represented by email lists. These are simply automated forwarding systems that act like a repeater, re-transmitting all messages received by the list to all subscribers. Unfortunately, once subscribed, you receive a copy of every message sent to the list, and this could number into the hundreds per day. While it is efficient at distributing information, it is not helpful to information consumers already overwhelmed with data. Newsgroups grew from the need to post information to many parties. An Internet-based bulletin-board system, newsgroups were the very first information "pull" systems, requiring users to request information from specific newsgroups. But its arcane command structure prevented most users from taking advantages of its possibilities until Mosaic revolutionized the Internet (Fig. 1).

WWW - THE WORLD WIDE WEB

The World Wide Web, or more simply the Web, brought a completely different type of communication to the Internet. The availability of rich graphics, animation, even audio and video clips, has begun to blur the distinction between information and entertainment. And HTML (HyperText Markup Language), the computer language for constructing Web pages, was simple enough that almost anyone could construct a home page and post



Fig. 1. Graphical user interface (GUI) browsers such as Netscape Navigator bring point and click convenience to Usenet Newsgroups.

whatever information interested them. This was great for increasing the information base of the Internet, but now information was strewn from one end of cyberspace to another. Simply finding the information necessary threatened to become an occupation in itself.

This open access to the Internet reeked havoc with the existing cataloging system for information. With Newsgroups, the name of the newsgroup, such as *comp.system.apple2* or *rec.sport.olympic* describes the contents and makes information searches relatively simple. FTP systems have even more rigorously designed hierarchical structures. The Web, however, with its varied interests and hypertext links to computers around the world, defied such straightforward categorization.

Search engines were developed to bring some sense of structure and manageability to the Web, and later the entire Internet—including newsgroups and FTP sources. These programs scour the digital countryside and return the information requested. But the amount of information now available results in so many 'hits' that even these have become virtually useless. To design the type of advanced query necessary to sufficiently filter the information and yield a usable number of results takes more time and talent than most users bring to the keyboard.

In short, the *information superhighway* has become the *information traffic jam*.

PUSH TECHNOLOGY

Push technology was designed to overcome two growing disadvantages of the Internet. First, push technology's format would allow individual customization to 'bring' you the information you wanted. Unlike information

'pull,' which required the user to actively request information each time it was needed, 'push' technology would automatically serve up the information a user pre-selected, 'pushing' the information to the user. Secondly, push technology could greatly reduce the amount of traffic on a network, Internet or intranet. Since a user would be assured of continuous updates or monitoring by the push system, he could reduce the number of 'request/reply' cycles during his work day.

Unfortunately, on the Internet, push technology has already become simply an advertising medium with content thrown in to make it respectable. In fact, push technology, as it is evolving on the

Internet, offers better filtering on the advertising side than it does for the information being pushed. This gross commercialization, however, should not be used in evaluating the importance of push technology on the corporate intranet. Like most Internet applications, push technology offers the advantage of scalability, and in this case, scaling it down to the corporate intranet can give managers and workers continuous updates on the state of the corporation and the processes within that enterprise. It can also be used to link business partners, to automate "Just In Time" inventory programs, schedule maintenance practices, or develop and deploy training programs.

PUSH TECHNOLOGY ON ENTERPRISE NETWORKS

Like the push technologies available on the Internet, intranet push systems can be tailored to the specific individual being served. The CEO can receive constantly updated information on industry happenings. Production managers can monitor assembly lines, inventory reorder points and shipping department progress, while employees can be updated on corporate benefits, policy changes, and even receive up to the minute information from the CEO or shift supervisor. Push technology can be the link between the information superhighway and the information consumer, delivering the information necessary without the time consuming and distracting search procedures now required.

Developers of push technology are beginning to recognize the vast market for corporate network applications. In today's fast-paced business environment, the right information, at the right time, can be the difference between success and failure. And the information is

available. The difficulty is sorting, filtering, and timing.

DIFFERENT METHODS - SIMILAR RESULTS

To understand how push technology can solve these problems for corporate networks, it may be helpful to review two very different models of push products on the Internet. Like most software solutions, both have advantages that must be qualified against the user's requirements. Excite (<http://www.excite.com>) offers a wide range of information options, from stock quotations (delayed 10 minutes) to headline news, technology news, business news, and weather. From a list of standard options, the user tailors the news feeds to suit his interests. This personalized channel shell is then loaded as the user's default home page. Whenever the browser is activated, this is the page that displays. The download from the Excite server is very fast since only the hypertext contents (or 'shell') of the page are downloaded. If a title interests the user, the entire article can be downloaded for viewing or printing. Using Excite's model of push technology requires connection to the Internet during the complete transaction as very little information is actually resident on the user's computer (**Fig. 2**).

PointCast (<http://www.pointcast.com>) is more suitable for either continuous Internet connection or automated connections. Like Excite, the PointCast program offers a wide variety of information, from which the user designs his own personal channel. Unlike Excite, however, PointCast downloads the complete files meeting the user's specifications, so downloads can take as long as 5 to 15 minutes, depending on the user's selection criteria. Updating can be scheduled, by the user, to occur as frequently as necessary. This process happens in the background during Internet connection. This model allows for off-line review and printing of information, reducing total connect time to the Internet (**Fig. 3**).

APPLICATION OF TECHNOLOGY

Like these push technology providers, corporate network push systems have a wide variety of features, appearances, and operational characteristics. Finding the best one for your enterprise requires an analysis of the operating system you are currently using, the types of information the push system will work with, the origin and format of that information, and the volume of



Fig. 2. Excite downloads only the hypertext links to a standardized 'shell' stored on the computer's hard drive. Individual files are downloaded from the Internet via these hypertext links.

information that will traverse your network.

The propose of push technology on your corporate network is to deliver the information necessary for each job function in a timely and reliable manner, with minimal effort on the part of the information consumer.

In designing a push technology system for corporate network, a number of options must be considered, beginning with the basic determination of how much information will come from inside the enterprise (corporate intranet) and how much information will be delivered from the Internet or other networks. All the major providers can work with existing firewall systems or provide that protection in their package. They will also include filters to limit the information sources to appropriate feeds.

Information is delivered through 'channels', with each person or group having their own channel. Each channel is programmed to deliver the information necessary for that group or individual. Channels can also provide two-way communication. The CEO's channel can include capability to address all channels or selected channels, to update the entire workforce or only specific individuals. In most systems, the number channels is theoretically unlimited, although in practice, the number of workers with truly specialized channels is limited to the upper echelons of the organization.

The relative importance of the information to be transmitted through the system must be reviewed. Many push systems include authentication and certified delivery. Authentication verifies the source of the information to confirm that has originated from the correct source.

INTERNET



Fig. 3. PointCast automatically downloads complete files in the background, via user configured scheduling or on manual command.



Fig. 4. Ifusion provides customized content from the Internet or enterprise network.

information is being transmitted, the push technology package should include adequate encryption tools to protect that information. (Fig. 4)

DEFINING THE INFORMATION

The information delivered by the push system can be further subdivided into 'hard' and 'soft' information. Hard information is delivered from hard coded or specified sources, usually within the enterprise. This can range from current sales figures to production line rates or financial data for the CEO. Soft information is often referred to as subject based addressing, and more often comes from sources outside the corporate intranet. This can be competitive data from a source monitored by the push system such as the Dow Jones News Retrieval Service. The push system can monitor this source and deliver or notify the user immediately of new information matching the profile in the system. The design premise for most push technology systems is management by exception. Managers don't want to constantly monitor routine activity. They want to be notified when events out of the ordinary occur. If an assembly line goes down, or a machining center fails, the production manager needs to know immediately. If production continues smoothly throughout the day, he doesn't need to be told this. If a competitor announces a major acquisition, the CEO should know this immediately. If sales are off by 0.2% for the week, she probably doesn't need to have that information presented.

Push technology systems are event driven. They deliver the information specified as it is available or as it changes. This delivers the highest quality, most current data to the information consumer at minimal network load. For instance, the push system monitors machining centers for changes in production that are outside the norms. It can periodically return a "System Nominal" message, but will flash an alert when the production rate falls outside

Certified delivery confirms to the sender that the information have been received by the addressee. These features are very important when the system will be used for dissemination of mission critical information. Especially when important management strategies are being developed, all participants must be assured that they have the same information. In situations where confidential

information specified as it is available or as it changes. This delivers the highest quality, most current data to the information consumer at minimal network load. For instance, the push system monitors machining centers for changes in production that are outside the norms. It can periodically return a "System Nominal" message, but will flash an alert when the production rate falls outside

the preset norms. With a pull technology system, the production manager must request current production rate information from the system. The system then polls all machine centers and returns the data.

OPTIONS AND ACCESSORIES

The information push systems currently available offer a wide range of capabilities, and not all of them provide all the services a company may need. Information comes in a wide variety of formats, from many different sources. Not all push systems can monitor or accept data from all these sources. Virtually all systems can accept input from the Internet and corporate intranets. The difficulty comes in monitoring proprietary and non-standard systems such as machining centers and financial systems, the very information that is so important to managing the enterprise. But there are systems available that provide those features, and many others that can be customized to allow that. This is also an important area of growth in information management. Development of new products and upgrades of existing systems are constant and rapid. New features are being added continually.

If your enterprise has already made the switch to an intranet, or is contemplating that step, visit the web sites below to learn more about the manufacturers of information push systems and the specific features of each product. Push technology can provide your organization with the right information at the right time.

The following list of manufacturers and their Internet addresses are in no particular order and this list may not be complete. It is offered only as a starting point for further investigation.

Wayfarer - <http://www.wayfarer.com/>
 Marimba - <http://www.marimba.com/>
 Intermind - <http://www.intermind.com/>
 BackWeb - <http://www.backweb.com/>
 PointCast - <http://www.pointcast.com/>
 Starwave - <http://www.starwave.com/>
 Tibco - <http://www.tibco.com/>
 Netscape - <http://www.netscape.com/>
 Microsoft - <http://www.microsoft.com/>
 Ifusion - <http://www.ifusion.com/>
 Freeloader - <http://www.freeloader.com/>

CONCLUSION

Is push technology superior to pull technology? Which should you use? The answer is clearly both! Modern enterprises would be lost without email. And for corporate intranets, FTP is the only sensible method for organizing and archiving the vast quantities of technical and financial data we develop. But for real-time operational

data such as plant throughput or current financial information, Push technology is the right solution. Both technologies have their uses. The advantage lies in applying the right technology to the right information.

BIBLIOGRAPHY

- BackWeb Corporation, A Cooperative Architecture for a Flexible "Push-Pull" Broadcast Solution, (Online), <http://www.backweb.com/wii/whitepaper.html>
- Boutin, P., Look Before You Push, Packet - Hotwired, (Online), <http://www.packet.com/packet/boutin/97/13/index2a.html>
- Claymon, D., When Push Comes To Shove, Herring Communications, (Online) <http://www.herring.com:80/mag/issue41/shove.html>
- Davenport, T., Processing Process Information, CIO Magazine (Online), http://www.cio.com/CIO/031597_think_content.html
- Dvorak, J., When Push Comes to Shove, PC Magazine Online (Online) <http://www.pcmag.com/issues/1606/pcmag0025.html>
- Callaway, E., The Learning Intranet, PC Week Magazine, (Online), <http://www.pcweek.com/archive/1336/pcwk0026.htm>
- Lapham, C., The Internet is 'Mission Critical' For Business, CMC Magazine, (Online) <http://www.december.com/cmc/mag/1997/feb/lapham.html>
- Marimba Corporation, Castanet, (Online), <http://www.marimba.com/datasheets.castanet-ds.html>
- Netscape Communication Corporation, Intranet Deployment Guide, (Online) http://www.netscape.com/comprod/server_central/query/idg/index.html
- Netscape Communication Corporation, Intranets Redefine Corporate Information Systems, (Online) http://www.netscape.com/comprod/at_work/white_paper/indepth.html
- PointCast Corporation, PointCast I-Server, (Online), <http://pioneer.pointcast.com/products/iserver/data.html>
- PointCast Corporation, Technical Paper - Internal PointCast Network Traffic, (Online) <http://pioneer.pointcast.com/whitepaper.html>
- Rimmer, D., It's the Content, Stupid, C|Net News.Com, (Online) <http://www.news.com/Perspectives/perspectives.html>
- Tibbetts, J. & Bernstein, B., Application Development: Is Shove Coming To 'Push'?, Techweb (Online), <http://techweb/cmp.com/iw/617/17uwbt.htm>
- Wayfarer Corporation, Information At Work, (Online), <http://www.wayfarer.com/whatis/default.htm>
- Wayfarer Corporation, INCISA DataBridge, (Online), <http://www.wayfarer.com/whatis/technology.htm>
- Wingfield, N., Netscape Pushes Netcaster, C|Net News.Com (Online), <http://www.news.com/News/Item/0%2C4%2C9699%2C00.html>
- Wingfield, N., Freeloader Takes on PointCast, C|Net News.Com (Online), <http://www.news.com/News/Item/0%2C4%2C9611%2C00.html>
- Yoshitake, D., Push Comes to Shove, C|Net News.Com (Online), <http://www.news.com/News/Item/9%2C4%2C9596%2C00.html>
- TJ

Paul Shank is employed by Precision Powered Products, Inc., 12227-C F.M. 529, Houston, TX 77041, telephone: 713 466-6751, fax: 713 466-163, or email: pkshank@pkshank.com.