

Inside *Innovention*...

Government Watch:  
*global Internet freedom* .....3

Consultant Watch:  
*Fred Graichen* ..... 5

Company Watch:  
*Binary Training alliance* .....7

## The Once and Future Internet

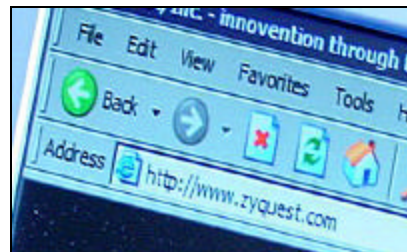
**I**t began in 1957 as a military reaction to the Soviet launch of Sputnik. Russians in space meant the U.S. was vulnerable to nuclear attack. The DoD responded by creating the Advanced Research Projects Agency (ARPA). Its mission? To keep on top of technology so the Soviets could never again surprise us and gain the upper hand.

Chief among ARPA's concerns was maintaining communications and control over weapons systems after a nuclear attack. In 1962, the problem was handed over to Paul Baran of RAND Corporation.

### Baran's Breakthrough

Baran made two groundbreaking contributions. First, Baran was quick to realize that a

centralized communications network was too vulnerable to attack. Take out the center and communications stop. But a decentralized network wasn't the answer either. It was just several small centralized networks



linked together. Baran's solution was a distributed network with no central authority. The idea is that you assume the network is unreliable, so you give every node equal authority to originate, pass, and receive messages.

Second, Baran proposed that messages be divided into "message blocks" before transmission. (Today, we call them

packets.) Each block (or packet) is sent separately and then reassembled at the destination. It doesn't matter what particular route any packet takes, as long as it reaches its target. This scheme is sometimes called "hot potato" routing.

Packets are tossed like hot potatoes from node to node until they reach their destination. The beauty of this system is that it is extremely resistant to attack. If any particular node fails, the packet is tossed to a different one.

### Into Academia

In 1969, UCLA installed the first node for the new distributed packet-switching network. By the end of the year, the infant network – dubbed ARPANET – included four nodes. The Internet was born. By 1971, it included 15 nodes. The number grew to 37 by 1972.

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Internet ...Continued from front cover

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Conceived as a military strategy and implemented as an academic tool, the fledgling Internet soon morphed into the personal communications toy of scholars who weren't just exchanging research information, but gossip, personal news, plain old chitchat. Before long, mailing lists evolved and e-mail became a fact of life.

Throughout the 1970s, the network became more sophisticated. The original NCP (Network Control Protocol) was replaced by TCP/IP (Transmission Control Protocol/Internet Protocol), which allowed a growing number of networks to link to ARPANET. It didn't matter what kind of machine you were using; as long as it could "speak" the network's transmission protocols, you were in. The National Science Foundation joined the network frenzy, foreign computers got into the act, and business began to see the potential. As the network expanded, the nodes were divided into the 6 basic Internet "domains": gov, mil, edu, com, org, and net.

### **Beyond ARPANET**

By 1989, ARPANET had become so successful that it had outlived its usefulness and was allowed to die. And still

the Internet grew. By 1994, there were 3.2 million hosts and 3,000 websites. By 1997, the number of hosts had grown to 19.5 million, the number of websites to 1.2 million. And in January 2001, the number of hosts was estimated to be 110 million, while the number of websites had skyrocketed to 30 million.

### **Controlling the Uncontrollable**

A mere 30 years after ARPANET, the Internet has become indispensable for people in all walks of life, in all businesses, in all parts of the globe. Today, the biggest problem is not how to facilitate communication, but how to stop it. Every day, Internet users are inundated with seemingly endless spam, pop-up ads, viruses, and solicitations. Congress has even gotten into the act, passing the CAN-SPAM Act of 2003. Signed into law in December 2003, the anti-spam legislation is already becoming a law enforcement nightmare.

The problem for Internet legislation and control is that the Internet is a dream of Utopian anarchy come to life. Anyone with a computer and modem can log on, surf the Net, upload a site, communicate with people around the world, download a library

of information on any imaginable subject, advertise products and services. The list goes on and on. And ultimately, the ability to stop it, control it, or regulate it is very problematic.

Ask any bureaucrat in any authoritarian government. The Internet's freedom has become a major concern for countries such as Cuba, China, Saudi Arabia, North Korea, and Vietnam, whose laws have become increasingly repressive as they attempt to control this most democratic of global enterprises. Nevertheless, the citizens of these countries are finding ways to log on.

### **U.N. Stakes a Claim**

In what can only be seen as a last-ditch effort to bring the Internet under control, these countries have turned to the United Nations, claiming that the Internet has so many problems that it needs to be governed. Predictably, they have gained U.N. support by pointing a finger at the United States and crying foul. The U.S., they charge, is unfairly running the Internet and locking them out. The biggest offender is ICANN (the Internet Corporation for Assigned Names and Numbers), which oversees the naming of web sites.

While ICANN's functions

# government watch

## global Internet freedom

**A**t a time when most Americans take Internet use for granted and even bemoan the excess of unsolicited material being stuffed into their e-mail inboxes, the citizens of some countries face heavy fines and incarceration for logging on to the web. Congress is addressing this problem of global Internet access with two pieces of legislation.

### Legislation

On the House side, House Policy Chairman Christopher Cox (R-CA) has introduced **H.R. 48, the Global Internet Freedom Act**. In the Senate, Senators Jon Kyle (R-AZ) and Ron Wyden (D-OR) have introduced **S. 1183, the Global Internet Freedom Act of 2003**. Both bills would establish, within the International Broadcasting Bureau, the Office of Global Internet Freedom. The purpose of this office would be “to develop and implement a comprehensive global strategy to combat state-sponsored and state-directed Internet jamming and persecution of those

who use the Internet.” In addition, the bills would require an annual report on the status of state interference with Internet use and of U.S. efforts to counteract that interference.

In addition to denouncing “governments that restrict, censor, ban, and block access to information on the Internet”, both bills call for the U.S. Representative to the United Nations to submit a resolution condemning Internet restriction.

### Engine for democratization

The House Policy Committee, in a white paper detailing the need for Congressional action on Internet access, states that the Internet may be the most powerful engine for democratization and the free exchange of ideas ever invented. Not surprisingly, non-democratic regimes around the world view the Internet as a threat and have instituted increasingly severe policies to prevent or at least limit Internet

access by their citizens.

### Restricted access

The most restrictive countries are Cuba, Laos, North Korea, the People’s Republic of China, Saudi Arabia, Syria, Tunisia, and Vietnam. The methods used to control Internet access include: denying ISP access; censoring Internet content; cost-prohibitive pricing of e-mail accounts; and banning personal computer ownership.

In many of these countries, access is limited to a national “Intranet” and Internet use is carefully monitored at cybercafes. In Laos, for example, anyone who sends or receives e-mail must provide the government with their password, thus giving the government the ability to intercept and read all e-mail. In Syria, the sole ISP is a government-run source that blocks access to any sites considered offensive or pro-Israeli. Saudi Arabia has closed many Internet cafes, particularly those



*Rep. Chris Cox*

*global Internet freedom ...Continued from page 3*

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established for women. And in North Korea, personal computer ownership has been banned and all servers or Internet connections to the outside world prohibited, making North Korea the only country in the world where the Internet does not exist.

### **Censorship solution**

Many believe the solution to Internet censorship lies in a cooperative effort by the private sector and democratic governments. Among the techniques and technologies being suggested to circumvent state efforts to deny Internet freedom are proxy servers, intermediaries, “mirrors”, and encryption. The House Policy Committee has called for the United States to:

1. direct substantial international broadcasting resources to a global effort to defeat Internet jamming and censorship;
2. formally declare that all people have the right to communicate freely with others on the Internet;
3. formally declare that all people have the right to unrestricted access to news and information on the Internet;
4. publicly and prominently denounce state-directed practices of restricting, censoring, banning, and blocking access to information on the Internet;
5. submit a resolution at next year’s U.N. Human Rights Commission annual meeting in Geneva condemning all nations practicing Internet censorship and denying

freedom to access information; and  
6. compile and publish an annual report on countries that pursue policies of Internet censorship, blocking, and other abuses.

How the international community responds to this call for global Internet freedom remains to be seen. It may be that the United States will have to take the lead in ensuring that the Internet remains a source of open communication and information available to everyone.

For more information on legislation of interest to the IT community, visit the Government News page of the ZyQuest website, [www.zyquest.com](http://www.zyquest.com). ✉

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*Internet ...Continued from page 2*

were once performed under U.S. Government contract by the Internet Assigned Numbers Authority (IANA), ICANN is an internationally organized, non-profit institution. That’s not good enough for many developing countries that consider the California-based organization as too Western and English speaking. Instead, these countries favor Internet

governance by the International Telecommunications Union (ITU) whose vision of the Internet includes telecom providers supplying computer-to-computer communications. But many in the Internet community believe that the ITU system would allow governments to censor Internet use. By contrast, the U.S. and ICANN approach allows

individuals to set up their own networks with the sole proviso that they make their networks freely available to everyone.

### **WSIS in Geneva**

Determined to narrow what it calls the “digital divide” and bring the Internet under International control, the U.N. sponsored a “World Summit on the Information Society” in December of

# consultant watch

## Internet virtuoso Fred Graichen

In a 17-year career, Fred Graichen has seen a lot changes in computer consulting. The biggest change? No contest, says Fred. It's the Internet.

Fred started his career after earning a degree in MIS with a business minor from UW-Stevens Point. How did he get involved in consulting work? "Actually, to pay some bills, to be totally honest," Fred commented. He landed his first consulting work with a company called Technology Solutions Corporation, based out of Chicago. The job sent him to Omaha, where he met his wife, Sue, and two gentlemen with whom he started a company called Compete, Inc.

As the company co-founder, Fred ended up doing pretty much everything, from managing teams to consulting at over 70 different Fortune 500 companies in a half dozen countries. Starting your own business "means you're pretty much the

chief cook and bottle washer and everything else," Fred noted.

One of Fred's first gigs for his new company was in China. Back then, there was no Internet in China, so Fred had to carry all his own information resources with him from the States. Fred commented that nowadays, "when you're dealing with leading edge technology, you're really relying on the global knowledge base that's out there on the Internet." Not having the Internet made consulting a lot more difficult. "Doing that same [China] project would have been a thousand times easier with access to information via the Internet. So I can't imagine anything that's benefited consulting more," he added.

Of course there are downsides to the Internet. One of the biggest is quality control. Fred explained, "There's a great line in Rodney Dangerfield's movie, *Back to School*, where the son was buying used books

that were already underlined. And Rodney Dangerfield's line was, 'What if the guy was a maniac. Who knows what he was underlining?' And it's the same thing with the Internet. How do you know who's out there validating the information? You have to take a lot of things with a grain of salt when you're accessing information."

Since joining ZyQuest, Fred has been bringing his extensive mainframe experience and skills in the IBM WebSphere/Java environment to the task of exposing corporate legacy systems to the Internet. He has also found himself increasingly concerned with issues of Internet security.

"Probably the number one project for most IT staffs is what they call single sign on – the ability to sign on to one computer system and have that single user ID allow me to get all the



Fred Graichen

*Fred Graichen ...Continued from page 5*

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access to all the different systems I have around the corporation," Fred explained. "There are dozens and dozens of user IDs that have to be maintained. So synchronizing that processing and coming up with a single sign-on solution is on everybody's task list, and it's one no one wants to touch because it's a daunting task. A lot of companies are coming out with software to help with that, but it's still a massive analysis task to figure out where you have all your eggs across your organization. So that's definitely one of the biggest challenges. That's why there are people that specialize in nothing but Internet security. The company I previously

worked with had probably about half a dozen people who did nothing but Internet security infrastructure."

Where does Fred see the Internet heading? In the direction that commerce takes it. "I think it will be a relatively market-driven technology, although what that market's going to be is anybody's guess," Fred noted. "You see the different uses of the Internet. There are young kids using the Internet and finding technologies that you and I don't even know about and using it. The number of transactions that people under 21 are doing on e-bay alone is a shadow economy in itself. I think that we'll see the Internet become more of a media

band, and I think we'll see it converge with other technologies, like television and telephones. I don't think that promise has been completely fulfilled yet."

Like all the truly great consultants, Fred's skills and interests extend beyond his knowledge of Java, IDEAL, and JCL. Fred would eventually like to be as comfortable in the high school classroom as he is working with AIX, AS/400, MVS, and OS/2 platforms. What would Fred teach? "Probably history. That's part of my ten-year goal," he said. But who knows. In ten years, Fred may be teaching the history of the Internet via the Internet. ✍

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*Internet ...Continued from page 4*

2003. Held in Geneva, the summit was attended by 60 heads of state and 12,000 delegates. In preparatory talks for the summit, the United States and its backers were able to forestall an attempt by developing countries to put the Internet under U.N. control. And they were able to spearhead a declaration that included explicit references to

freedom of information online, despite protests by Vietnam and China.

### **Into the Future**

So where does the Internet go from here? In 2005, the World Summit on the Information Society will meet in Tunisia, again aiming to tighten Internet governance. Given the history of the Internet and its ability to elude control,

the summit's outcome probably won't please World Government supporters. But for people who value the bottom-up, spontaneous, democratic, unpredictable nature of the Internet, the future looks good. ✍

# company watch

## Binary Training alliance

Someone said a woman can never be too rich or too thin. Well, ZyQuest believes no one – man or woman – can ever be too educated. With that philosophy in mind, ZyQuest has formed an exclusive multi-year strategic alliance with **Binary Training, Inc.** to provide a greater range of IT educational opportunities for clients throughout the Midwest.

Formerly Productivity Point of Wisconsin, Binary Training offers an impressive array of technical and end-user classes, including certification preparation for Microsoft, Novell, Cisco, and Lotus at their training facilities throughout Northeast and Central Wisconsin. By pooling their resources, ZyQuest and Binary Training become the largest, most diversified training services provider

in our area.

ZyQuest president Al Zeise commented, “The strategic alliance will provide a higher level of service to our clients by providing a wide range of courses and expanded facilities. And it allows ZyQuest to focus on new and emerging technologies while maintaining the continuing educational needs of all our consultants.”

Binary Training president Dave Anderson noted that he is “excited about forming an alliance with one of the top application development firms in the Midwest.” Anderson added, “I think the expanded application service offerings that ZyQuest brings to the table and the operational experience and breadth of classes that Binary Training brings to the table will definitely be an advantage for our customers.”

Overall, the strategic alliance is a true “win-win” situation. Both ZyQuest and Binary Training win by expanding their course offerings, training facilities, and customer exposure. More than that, said Connie Hames, ZyQuest’s Manager of Educational Services, clients win by having access to a greater range of technical courses and a larger pool of talented and knowledgeable instructors. “We want to provide the best education for the client,” Hames emphasized. The new strategic alliance will help both ZyQuest and Binary Training do just that.

For more information about ZyQuest’s IT classes, call our Computer Learning Center at 920-983-6035 or visit our website: [www.zyquest.com](http://www.zyquest.com). ✉





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