



FOCUS - 11 of 77 DOCUMENTS

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**HEADLINE:** THE INTERNET BUSINESS COME HOME;  
A MAILBOX IN CYBERSPACE BRINGS WORLD TO YOUR PC

**BYLINE:** By James Coates, Tribune Computer Writer.

**BODY:**

Harry Anastopoulos, president of a newly hatched Chicago-based Internet consulting company called Telusys Inc., has seen the future of the American workplace in the Information Age, and its name is URL.

URL stands for Uniform Resource Locator, and Anastopoulos and other entrepreneurs expect it will bring the greatest change to the business scene and American home since the personal computer arrived in the early '80s.

A URL is like an address in cyberspace: On the worldwide network of computer networks known as the Internet, it becomes a place where its owner can post or publish anything the owner might wish.

Having a URL means your business is on the Internet-which also means that whatever you are selling instantly is within reach of millions of potential customers.

Anybody with an Internet-capable computer can find you through your URL. It's as simple as clicking on an icon and typing in your name or your business name for a computerized keyword search.

And once they find you, they can view any material you choose to file on the Internet, such as advertising, customer-support literature or even products.

Thus, to growing thousands of businesspeople, whether they work in an office or have a home-based business, these initials from the world of the Internet are becoming as much an indicator of success as the initials BMW were a decade ago.

Time-Warner Inc. has a URL where the entertainment/publishing company does things as diverse as tout the latest cover story in People magazine and print a few sample chapters of the blockbuster novel "The Celestine Prophecy," by James Redfield.

General Electric Co. runs a URL where it discusses properties of high-technology plastics with customers.

The Chamber of Commerce in Sedona, Ariz., runs a URL, and local bed-and-breakfast operators post their availabilities and addresses on it.

Barry Blue and Thomas Demos are among the first Chicagoans to put their business on URLs. They founded Nets to You, which specializes in hooking up individuals and small businesses to the Internet. The company charges \$65 to make house calls, during which a technician provides the necessary software, then configures clients' computers to use the World Wide Web and other Internet features.

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Dozens of local enterprises are starting to use URLs, Blue noted. They are as varied as the International Society of Exposure Analysis, which publishes its newsletter via a Chicago-based URL, and movie editor Joe Scudiero, who has made small samples of several of his films available via his URL.

On the national level, you can find URLs from Miller Brewing Co., Ameritech, Tribune Co., Microsoft Corp., Intel Corp., the University of Chicago, the Louvre, the U.S. Census Bureau, the CIA, Mayor Daley and. . . . An estimated 20,000 other businesses, institutions and individuals are counted among URL pioneers.

Many use URLs to publish their resumes, so prospective employers can look at their qualifications in a decidedly favorable multimedia light. Such URLs typically include everything a printed resume does, plus a photograph and samples of the applicant's work that an employer can peruse or pass up at will.

Conversely, some companies are posting job openings on their URLs. It's then just a matter of a few key strokes to drop a company a note, telling its headhunters where to find your URL.

Knowing how to use the vast numbers of URLs now offered by businesses, government agencies and academic institutions means much more than mere advertising. It means you can exploit the vast resources of the Internet to enhance your business or job.

Anastopolous, therefore, isn't just thinking of Fortune 1000 clients when he talks with an evangelist's zeal of the potential awaiting those in small and medium-size businesses who use URLs to connect to the Internet.

"The playing field has been leveled, and everyone is in the game," said Anastopolous, who noted that the Internet has been swept up in a nationwide wave of popularity because access to it becomes ever easier, thanks to fast-developing technologies.

Thus, as the Internet grows as a nationwide force, the URL becomes a dominant buzzword in the American workplace.

Having one amounts to a giant step beyond having an electronic-mail, or e-mail, address-and remember that e-mail has become the most heavily used part of the Internet among Americans at work and at home.

It takes the e-mail process one step beyond just exchanging information. And that's where the power begins.

In addition to having your address on-line, it's now possible with only a few clicks of a mouse to reach out to other addresses and glean a wealth of information as diverse as sales leads and demographics.

But in order to examine what a URL can do, it is necessary to examine what the Internet can do.

The idea behind the Internet is that roughly 1 million computer networks throughout the world are linked by high-speed telecommunications lines, thus giving people on each of the participating networks access to the resulting "worldwide web."

More than 20 million computer users are known to be on the Internet; most analysts predict that this number will only increase in the coming months and years.

Each participating network contributes whatever unique stores of information it might own and, as the price of admission, makes that data available to all.

Over the last decade this inter-network has grown to include rather amazing resources.

Colleges started posting theses prepared by their graduate students on thousands of topics. Much of the data that supported those theses had been gathered from other Internet sites.

Other schools transformed the entire text of reference works, poetry and literature into computer files and posted them on the network. Newspapers and magazines were added, and publications prepared solely for on-line consumption, called "e-zines," came into being.

Federal agencies as diverse as the Census Bureau, Patent Office, Library of Congress, Social Security Administration and Labor Department began putting reams of statistics, reports, forms and other documents into Internet-connected computers.

Millions of people all over the world created a system of informal computer bulletin boards called newsgroups and used them to exchange views and information on subjects as diverse as biophysics and boyfriends.

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People with access to one network were able to send e-mail to people with access to any of the other networks on the Internet. Soon e-mail became the favored means of exchanging business information in many industries. Plus, home-oriented telephone dial-up computer services like America Online, CompuServe and Prodigy made Internet e-mail available to their customers.

Then, as computer sales began to boom in recent years, having access to Internet e-mail became an important business tool not just for top executives and the computer savvy, but for many ordinary workers.

Growing numbers of experts speculate that having access to the Internet from a desktop computer soon will be as commonplace as having access to a telephone or to a U.S. Postal Service letter carrier.

And much of this optimism stems from the existence of URLs.

Just as the home-oriented dial-up services have moved e-mail from the realm of high-level Internet sites into the public domain, so URLs promise to bring the rest of the Net to the masses.

The key is that URL technology transforms what have been enormously complex commands in the computer language used by AT&T's Unix operating system into the same sort of drag-and-drop on-screen techniques that computer users employ with Microsoft Corp.'s Windows or Apple Computer Inc.'s Macintosh.

For nearly a decade, those Unix commands have served as the key to the information in the Internet when it was the sole domain of computer scientists and the more sophisticated hobbyists. These commands have names like File Transfer Protocol (FTP), Gopher, Veronica, Usenet, Finger, Archie and Internet Relay Chat.

Using FTP, you type commands into one computer and are taken via high-speed telecommunications links to a second computer, where it's possible to read directories of the files that computer's owners have posted for Internet access. Typing more commands allows you to download any file into the original computer.

Gopher does the same thing as FTP, but in a slightly different way. Veronica is a method of searching multiple computers for files containing keywords. The other Unix commands use other methods, but they all amount to reaching out from one computer to another to acquire or offer information.

In 1993 computer scientists on the campus of the University of Illinois at Urbana-Champaign developed graphical software for Windows- and Macintosh-type computers that let users manipulate on-screen icons to do many of the things that can be accomplished by using the Unix commands.

Those computer scientists coined the expression "Internet browser" to describe such software programs and called their browser Mosaic.

At first the browsers simply operated on computers at university and business worksites already connected to the Internet via the backbone of high-speed telecommunications lines.

Each computer on the Internet was given a name by the InterNIC Directory and Database Service, which is supported by AT&T and the National Science Foundation in a voluntary effort to maintain order on the Internet.

The concept of URLs was developed by a consortium of physics departments in European universities called CERN. URLs are subsets of the addresses maintained by InterNIC and thus allow individual users of each computer network to reserve a small part of that network for their interests. These URLs thus designate what are called home pages. For example, <http://www.uiuc.edu> is the URL for the University of Illinois at Urbana-Champaign.

One typed a URL into a browser, and the software would make the proper links to the Internet, then call up on the screen graphical representations of whatever the host computer was offering, including photographs, text files, even multimedia material such as music and movies.

This amounted to doing the same things that were available via FTP, Gopher, Veronica, etc. But now the information surfaced with the same sort of ease as when using Windows- and Macintosh-style PCs.

In most cases a user downloaded this material by clicking on underlined text representing the desired file. This technique of using text as a jumping-off point for the information behind it is called hypertext.

The "http" in most URLs stands for hypertext transfer protocol as in the <http://www.uiuc.edu> address for the U. of I. The initials "www" stand for the World Wide Web, which is the name given to the Internet.

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The ".edu" stands for education, and shows it's a college site. A government site is designated ".gov", while ".com" identifies a commercial site.

The computer scientists who put the whole Internet thing together developed the final key to today's picture when they found ways to use ordinary telephone lines to link PCs with the World Wide Web. This was a major change for the Web, which, for most of its existence, had been reachable only through major computer installations linked to high-speed telecommunications lines leased by colleges, governments and businesses.

And a new acronym came on the scene: SLIP, for Serial Line Internet Protocol.

To link a PC to the Internet, a SLIP connection employs the same modems that are used to hook up that PC to an America Online-type of service.

Once that link is made, the most ordinary home PC enjoys the same Internet status as does a \$500,000 workstation in a scientist's laboratory.

Currently, most SLIP access is obtained by subscribing to a new class of businesses called Internet service providers, which work somewhat like the better known CompuServe-type operations.

Customers phone in using special SLIP software. Once this software connects the computer with the Internet, the user then runs a browser program and begins browsing.

Karl Denninger owns MacroComputer Solutions Inc., one of Chicago's largest Internet service-provider companies. (Nets to You works in cooperation with Macro Computer Solutions.)

Denninger noted recently that in less than a year, the number of his subscribers has grown from a few hundred to about 4,000. Most pay between \$10 and \$20 a month for access to the Internet, either using traditional Unix commands, or SLIP links and URLs.

But supplying SLIP links may prove to be a short window of opportunity for such small entrepreneurial outfits.

In recent weeks, Prodigy, a joint venture of Sears, Roebuck and Co. and International Business Machines Corp., has been offering a Web browser to its 1.5 million subscribers.

Steve Case, president of America Online, says that his service will have a browser up and running in April or May for its 2.1 million customers.

And CompuServe, with 2 million customers in the U.S., also is expected soon to make a browser part of its service.

As Anastopoulos said, he has seen the future and its name is URL.

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**GRAPHIC:** PHOTO GRAPHICPHOTO: Harry Anastopoulos of Telusys Inc., an Internet consulting firm, says that URLs help put everyone "in the game." Tribune photo by Walter Kale.; **GRAPHIC (color):** About the cover. The illustration and design are by John Bleck.

**LOAD-DATE:** March 26, 1995

# Chicagoland

SUNDAY, MARCH 26, 1995

News from  
THE CITY OF CHICAGO  
along with reports from  
around the region.

Mary Schmich

## Ravages of AIDS just can't destroy this family unit

Angela Diaz and her family have gone to California now. Chicago had become too hard. There was food to buy, there were heat bills to pay, and they just couldn't make it anymore.

When I met Angela several months ago, she was 16, one of eight children born in 10 years to a mother of Italian heritage and a father of Mexican descent.

Both their parents had died of AIDS, and Angela and her six younger siblings were living in a Hispanic neighborhood on the North Side with an African-American ex-Marine named Robert Haze.

It was such a strange tale that I didn't know what to do with it. So I did nothing when it might have done some good. I tell it now simply as proof of one family's fierce fight to stay together in the face of awful odds.

On the chilly autumn evening that I first visited the Diaz family, Angela sat at the dining room table and talked about things girls of 16 should not have to know.

"My dad, he used to shoot up needles," Angela said. "My mom got AIDS from him. He died March 23, 1990. I remember because I had just come home from school. I put my bag down and went to make his food. I used to do all the cooking. I used to be a slave. Anyway, after I had brought him the food, he started to have seizures. He was in a recliner and foam was coming out of his mouth."

She recalled her mother's death in the same detail, describing the way her mother's thick hair thinned and then fell out, how her skin and eyes turned yellow.

"My mom, she loved going to the hospital," Angela said. "She said the food was delicious. And I guess she liked the privacy."

Grace Diaz died at home one day in 1992 at the age of 37, leaving seven orphans in the care of Robert Haze.

Haze had joined the family in 1989 as a state-paid attendant for the youngest child, a 1-year-old boy with AIDS. He was horrified by what he saw on his first day—a nest of garbage and filthy clothes, seven rooms overrun by roaches, rats and dirty children.

He threw out the garbage, boiled the clothes, unclogged the toilets. He washed the lice from the children's hair.

The kids, in his words, "were kind of rough." One girl called him "nigger" to his face.

But he stayed on the job, and after Grace's husband died, he moved in. Two years later, close to death, Grace asked him to marry her. By all accounts, they had not been lovers, but he had become a member of the family, and all of them shared one desire: to avoid having the children parceled out to relatives and foster homes.

When Grace Diaz died, Haze began proceedings to adopt the children. A new problem arose.

Because of her illness, Grace Diaz had been eligible for various kinds of public and private assistance. When she died, that money dried up.

Haze worked off and on, but it was hard with seven kids, one of them a 6-year-old with AIDS. The children referred to him as their father, but in the eyes of the state, he was just another man, a single male, eligible for only a meager amount of public aid. Nevertheless, for a while, the family got by.

Several weeks after my first visit, I spent another afternoon at the Diazes' ground-floor apartment—their seventh home in seven years.

The kids rushed in from school, hugged Haze and sat down promptly to do their homework. One of Robert's Rules of Order: No TV or radio until homework was done and rooms were cleaned.

Haze was a congenial, quiet, well-spoken man in his 50s, both patient and stern with the children. Asked why he would take on the task of raising someone else's children, he said simply that they provided him with the family he had never had.

"Sometimes I think he's some kind of angel," Angela said. "Sometimes I think he's sent by God."

The apartment was shabby but neat and filled with Haze's second-hand books, including encyclopedias, sets, the complete works of Mark Twain and several Bibles.

Angela showed off her two favorites. One, a gift from her mother, was "Family Circle Weekend Crafts." The other was called "Viruses."

Angela said that, unlike her parents, Robert emphasized college.

"Robert tells us education is everything. He will tolerate no dumplings in our house."

In the past couple of years, she said, her grades had gone from Ds and Fs to Bs and Cs.

By now, the family was desperate. For mysterious bureaucratic reasons, their food stamps had been repeatedly cut. Now they received \$360 a month in stamps for the

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## Boy set afire over missing food stamps

By Teresa Puente  
TRIBUNE STAFF WRITER

A 10-year-old South Side boy was in critical condition Saturday after being set afire, allegedly by his mother's boyfriend, who police said was upset because he believed the child had stolen about \$30 worth of food stamps.

Police arrested Tony Harris, 35, who lived with the boy's mother and three other children in a second-story apartment in the 1500 block of West 51st Street.

"He's admitted to his actions,"

said Chicago Police Cmdr. Charles Smith. "He was trying to get the truth out of the children."

Harris was arrested on charges of heinous battery and attempted heinous battery, both felonies with penalties of six to 30 years in prison, Smith said.

"If the child should pass, naturally we're going to seek murder charges," Smith said.

Harris doused the boy and his 12-year-old sister with rubbing alcohol and charcoal lighter fluid while trying to get to the bottom of the missing food

stamps, police said.

After questioning the children, who refused to confess, Harris tried to set them on fire using a piece of paper that he lit from the stove, Smith said. He first went after the young girl, who escaped injury. But the boy couldn't get away.

The 10-year-old suffered second- and third-degree burns to 70 percent of his body and remained in critical condition in Wyler Children's Hospital at the University of Chicago.

Typically, victims with such

extensive burns have "a very high mortality rate," said Dr. Elizabeth Beahm, chief resident in charge of plastic surgery at the hospital.

Only his face, part of his lower abdomen and the front part of his thigh were not burned, Beahm said. He is on a ventilator and has been unable to talk because of a breathing tube down his throat, Beahm said.

"The next 24 hours is one hurdle, but he has many ahead of him," Beahm said.

The boy must undergo multiple skin grafts and other operations, and recovery could take years, Beahm said.

"He's in for a long stay and a long recuperation," Beahm said. "He is young and has a good heart. We presume he's healthy. That's one of the best things he has going for him."

The boy's relatives and family friends said they were shocked. "It's sad. How could someone torture somebody like that over \$30. It's nothing but a piece of

See Boy, Page 4

## Question of mural integrity

### They walk line between graffiti, art, many say

By Lynn Van Matre  
and Peter Baniak  
TRIBUNE STAFF WRITERS

An eight-foot-high snake wearing a gold chain coils ominously on the back wall of a garage near downtown Aurora.

A few blocks away, a massive Grim Reaper painted on the side of a small market glowers over the image of a young man with a gun, with messages of peace scrawled in the background.

Is this outlaw gangbanger graffiti or an artistic expression of community pride?

That's one of the questions being faced by Aurora officials as they consider an ordinance that would limit the size of outdoor murals in residential neighborhoods, leading to a debate that touches on wider questions of culture, free speech and art.

"It's a complex issue," observed Jennie Kiessling, director of community-based programs for the School of the Art Institute in Chicago.

Murals—including some that actually incorporate graffiti—"can be really fabulous aesthetically when the colors are magnificent and they are well thought out," Kiessling added. "They relate to the community kids are living in."

But in many people's minds, the boundaries between cultural and artistic expression and gang-related graffiti can be blurry, resulting in such measures as the Aurora proposal.

Supporters of the ordinance, which would limit murals in residential areas to six square feet and restrict murals on commercial buildings to one-tenth of the wall, say it would help curb what can be perceived as gang imagery.

"Areas that have murals tend to have more gang problems," said Ald. Kenneth Hinderling, the proposal's main backer. "That may not be a cause-and-effect relationship, but there is a correlation."

But some artists point out that there usually are significant differences in the intent of murals and graffiti, gang-related or otherwise.

"To me, the difference between murals and graffiti seems relatively clear," said Jon Pounds, director of Chicago Public Art Group, a nonprofit organization that has been involved in Chicago murals since its inception in 1970. "Graffiti is generally seen as an outlaw act, something done covertly. A mural is done openly and tries to engage the community."

But Pounds agreed that for most people, the line between the two is much fuzzier. And, almost invariably, fuzzy boundaries spawn negative assumptions.

"People get confused because they believe that murals either mark an economic downturn in a neighborhood or encourage graffiti," Pounds said.

Once considered the "poor stepchild" of the art world, murals increasingly



Tribune photos by Ed Wagner



Hector Barillas, 17, proudly shows off the mural he helped paint (above) in Aurora. Another mural graces an alley garage near New York Street (left).

While murals were prominent in Mexican art in the 1920s and 1930s and played an important role in America's Depression-era WPA art projects, the current mural movement was fueled by political and social concerns in the 1960s.

Today, public murals are likely to trumpet themes of community empowerment. In Chicago's largely Latino Pilsen neighborhood, for example, murals often reflect a sense of cultural pride and fre-

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## Hofer acquittal grew from unusual tactics

By Jon Hillebrith  
TRIBUNE STAFF WRITER

Helmut Carsten Hofer, who according to Interpol police records "came to notice" of Munich police in the mid-1980s for engaging in prostitution, says he wants to study to become a criminal trial lawyer as a result of his latest brush with the law: his experience as a murder defendant.

Hofer, of course, will have to complete high school first. And

### Attorney worked to raise doubts

if he ever makes it to law school, one of the first principles he is likely to encounter in an ethics class may come from the lips of his current mentor and hero, professor Richard Kling, who teaches at the Chicago-Kent College of Law.

Shortly before Hofer, 26, was acquitted in a jury trial of murdering Wilmette

Suzanne Olds, Kling, who represented the 26-year-old German, was holding court outside court in Skokie.

"I have a strong sense that if you are dishonest with a jury, it will come back to haunt your client," Kling said.

While that generally is true, the high court of reality dictates a fallback doctrine when the

going gets tough:

"It never hurts to suggest that a bad guy or a bunch of bad guys lurk somewhere in the shadows," observed David Protes, a journalism professor at Northwestern University who specializes in legal affairs.

The jury is still out on whether that strategy will work all the time, or, say, in the nega-

tial of O.J. Simpson. But in Hofer's case, the bad-guy-in-the-shadows theory arguably saved

One difference has been Burris' campaign style. Unlike the low-key Gardner, who focused on issues, Burris has adopted a new spitfire persona.

He alleged that Daley has lied about the number of city police officers. He accused Daley of putting a colleague up to offering Burris two high-paying government jobs to stay out of the race. And he makes provocative remarks.

"It's a little bit of a

## Campaign '95

p.m. he is scheduled to tour the Chicago Board Options Exchange.

Back in the studio, Burris still is waiting. Staff members pace outside the sound booth. The clock is ticking.

It has been ticking since Feb. 28, when Mayor Richard Daley defeated Democratic primary opponent Joseph Gardner, a commissioner with the Metropolitan Water Reclamation District. And the clock will remain Burris' enemy until the April 4 general election.

Burris, who out of deference to Gardner did not actively campaign or raise funds before Feb. 28, is running the political equivalent of a 50-yard dash. It would be difficult for any politician, but especially for Burris, whose deliberate, conservative style is reflected by his trademark dark three-piece suits.

"We're doing something that I don't think has been done on this level before: running a 31-day campaign against the mayor of the City of Chicago," said Burris, 57, Illinois' former attorney general and controller.

"If it were anyone other than Roland Burris," he said, "I would say it would be an impossible task."

At times, it appears as if Burris reveals in the challenge. In fact, at several campaign stops, Burris often has reminded audiences how many days remained until the election. It will be 10 on Sunday.

Despite the obvious differences between Burris and Gardner, much of Burris' campaign is almost a mirror image of Gardner's. Perhaps that is by design, since Burris has said repeatedly that Gardner has "passed him the baton."

Burris, for example, advocates reducing the city's head tax on businesses, as did Gardner. He also supports another Gardner platform plank: improving affordable housing. Similarly, Burris says improving public schools will decrease crime and increase economic development. And Burris, like Gardner, has unsuccessfully challenged Daley to debate.

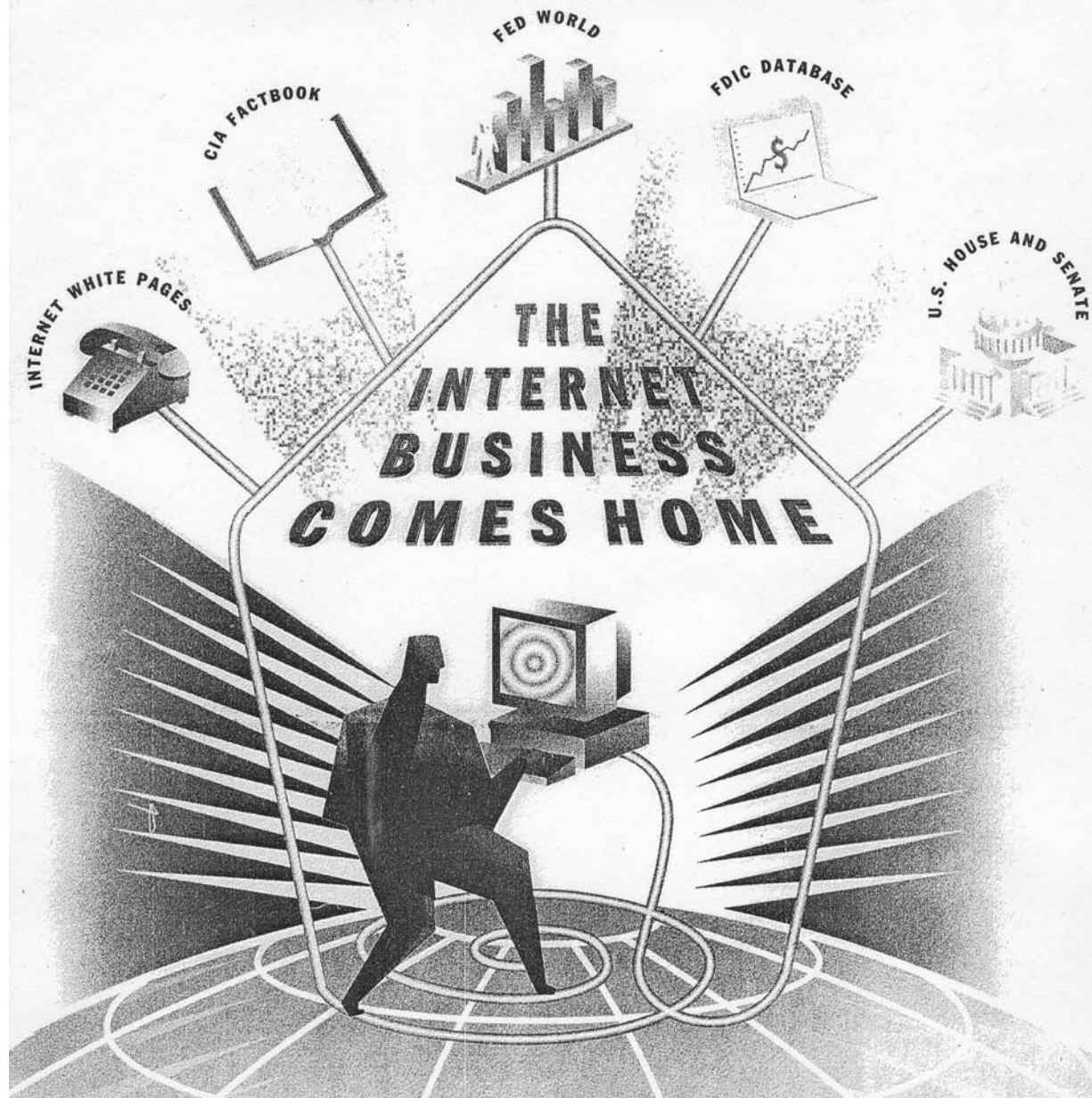
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# Technology and the Workplace



## A mailbox in cyberspace brings world to your PC

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Tribune Computer Writer

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On the national level, you can find URLs from Miller Brewing Co., Ameritech, Tribune Co., Microsoft Corp., Intel Corp., the University of Chicago, the Louvre, the U.S. Census Bureau, the CIA, Mayor Daley and ... An estimated 20,000 other businesses, institutions and individuals are counted among URL pioneers.

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In a hurry to communicate? ISDN may be the information road rocket. **Page 6.**



# The Internet business comes home

CONTINUED FROM PAGE 1

pective employers can look at their qualifications in a decidedly favorable multimedia light. Such URLs typically include everything a printed resume does, plus a photograph and samples of the applicant's work that an employer can peruse or pass up at will.

Conversely, some companies are posting job openings on their Web pages. It's then just a matter of a few key strokes to drop a company's note, telling its headhunters where to find your URL.

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Anastopoulos, therefore, isn't just thinking of Fortune 1000 clients when he talks with an evangelist's zeal of the potential awaiting those in small and medium-size businesses who use URLs to connect to the Internet.

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Federal agencies as diverse as the Census Bureau, Patent Office, Library of Congress, Social Security Administration and Labor Department began putting reams of statistics, reports, forms and other documents into Internet-connected computers.

Millions of people all over the world created a system of informal computer bulletin boards called newsgroups and used them to exchange views and information on subjects as diverse as biophysics and boyfriends.

People with access to one network were able to send e-mail to people with access to any of the other networks on the Internet. Soon e-mail became the favored means of exchanging business information in many industries. Plus, home-oriented telephone dial-up computer services like America Online, CompuServe and Prodigy made Internet e-mail available to their customers.

Then, as computer sales began to boom in recent years, having access to Internet e-mail became an important business tool not just for top executives and the computer savvy, but for many ordinary workers.

Growing numbers of experts speculate that having access to the Internet from a desktop computer soon will be as commonplace as having access to a telephone or to a U.S. Postal Service letter carrier.

And much of this optimism stems from the existence of URLs. Just as the home-oriented dial-up services have moved e-mail from the realm of high-level Internet sites into the public domain, so URLs promise to bring the rest of the Net to the masses.

The key is that URL technology transforms what have been enormously complex commands in the computer language used by AT&T's Unix operating system into the same sort of drag-and-

drop on-screen techniques that computer users employ with Microsoft Corp.'s Windows or Apple Computer Inc.'s Macintosh. For nearly a decade, those Unix commands have served as the key to the information in the Internet when it was the sole domain of computer scientists and the more sophisticated hobbyists. These commands have names like File Transfer Protocol (FTP), Gopher, Veronica, Usenet, Finger, Archie and Internet Relay Chat.

Using FTP, you type commands into one computer and are taken via high-speed telecommunications links to a second computer, where it's possible to read directories of the files that computer's owners have posted for Internet access. Typing more commands allows you to download any file into the original computer.

Gopher does the same thing as FTP, but in a slightly different way. Veronica is a method of searching multiple computers for files containing keywords. The other Unix commands use other methods, but they all amount to reaching out from one computer to another to acquire or offer information.

In 1988 computer scientists on the campus of the University of Illinois at Urbana-Champaign developed graphical software for Windows- and Macintosh-type computers that let users manipulate on-screen icons to do many of the things that can be accomplished by using the Unix commands.

Those computer scientists coined the expression "Internet browser" to describe such software programs and called their browser Mosaic.

At first the browsers simply operated on computers at university and business workstations already connected to the Internet via the backbone of high-speed telecommunications lines.

Each computer on the Internet was given a name by the InterNIC Directory and Database Service, which is supported by AT&T and the National Science Foundation in a voluntary effort to maintain order on the Internet.

The concept of URLs was developed by a consortium of physics departments in European universities called CERN. URLs are subsets of the addresses maintained by InterNIC and thus allow individual users of each computer network to reserve a small part of that network for their interests. These URLs thus designate what are called home pages. For example, <http://www.uiuc.edu> is the URL for the University of Illinois at Urbana-Champaign.

One typed a URL into a browser, and the software would make the proper links to the Internet, then call up on the screen graphical representations of whatever the host computer was offering, including photographs, text files, even multimedia material such as music and movies.

This amounted to doing the same things that were available via FTP, Gopher, Veronica, etc. But now the information surfaced with the same sort of ease as when using Windows- and Macintosh-style PCs.

In most cases a user downloaded this material by clicking on underlined text representing the desired file. This technique of using text as a jumping-off point for the information behind it is called hypertext.

The "http" in most URLs stands for hypertext transfer protocol as in the <http://www.uiuc.edu> address for the U. of I. The initials "www" stand for the World Wide Web, which is the name given to the Internet.

The ".edu" stands for education, and shows it's a college site. A government site is designated ".gov," while ".com" identifies a commercial site.

The computer scientists who put the whole Internet thing together developed the final key to today's picture when they found ways to use ordinary telephone lines to link PCs with the World Wide Web. This was a major change for the Web, which, for most of its existence, had been reachable only through major computer installations linked to high-speed telecommunications lines used by colleges, governments and businesses.

And a new acronym came on the scene: SLIP, for Serial Line Internet Protocol.

To link a PC to the Internet, a SLIP connection employs the same modems that are used to hook up that PC to an America Online-type of service.

Once that link is made, the most ordinary home PC enjoys the same Internet status as does a \$500,000 workstation in a scientist's laboratory.

Currently, most SLIP access is obtained by subscribing to a new class of businesses called Internet service providers, which work somewhat like the better known CompuServe-type operations.

Customers phone in using special SLIP software. Once this software connects the computer with the Internet, the user then runs a browser program and begins browsing.

Karl Denninger owns Macro Computer Solutions Inc., one of Chicago's largest Internet service provider companies. (Nets to you works in cooperation with Macro Computer Solutions.)

Denninger noted recently that in less than a year, the number of his subscribers has grown from a few hundred to about 4,000. Most pay between \$10 and \$20 a month for access to the Internet, either using traditional Unix commands, or SLIP links and URLs.

But supplying SLIP links may prove to be a short window of opportunity for such small entrepreneurial outfits.

In recent weeks, Prodigy, a joint venture of Sears, Roebuck and Co. and International Business Machines Corp., has been offering a Web browser to its 15 million subscribers.

Steve Case, president of America Online, says that his service will have a browser up and running in April or May for its 2.1 million customers.

And CompuServe, with 2 million customers in the U.S., also is expected soon to make a browser part of its service.

As Anastopoulos said, he has seen the future and its name is URL.

The e-mail address for Tribune computer writer James Coates is [jcoates1@aol.com](mailto:jcoates1@aol.com)



Tribune photo by Walter Kala

Harry Anastopoulos of Telusys Inc., an Internet consulting firm, says that URLs help put everyone "in the game."

## Why PC is out before it's even in

CONTINUED FROM PAGE 5

the implications—Hewlett-Packard Co.'s printer division, for example—dominated the market. The first HP laser printers sold for almost \$4,000, but each new generation cost less—and was smaller, weighed less and offered more. That's a case, Higgs said, where a company used its new-product strategy as a competitive weapon.

"To make each successive generation cheaper and cheaper, you're going to put a lot of pressure on profit margins," he said. "A computer company has to take every advantage available to it."

So what does this mean to us, the hapless consumers on the end of the whip?

More than anything else, it requires us to be well informed about what we need a PC to do and less concerned with whether it is going to be obsolete in six months.

About two years ago, I donated one of my two old "luggable" 25-pound portable computers to a shoestring operation that works with the poor. By my standards, the computer was a doorstop; by theirs, it was a miracle.

The group tells me that it's working just fine, thank you. I recently saw one just like it in a trash bin behind my building.

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The illustration and design are by John Bleck.