Once upon a time, the Internet was a wholly virtual environment, moored only loosely to the physical world. It was where information went to become free, where censorship was routed around, where communities could leap barriers of distance and culture in a single bound . . . and where no one knew you were a dog. The kicker was that these aspects were built into the fabric of the Net, thanks to its origins in military communications research. You couldn’t tie the Net to the real world if you wanted to.

The physical world is making a comeback, even online. With the collapse of the dot-com stock bubble, things like brick-and-mortar storefronts, tangible assets, face-to-face meetings and hard-dollar profits suddenly are fashionable again. Following the same pattern, the foundational assumption that Internet users and sites have no connection to geography is eroding. It’s now possible to determine with high levels of certainty where someone is connecting from. This allows for targeting of services and content, but also raises the possibility that physical-world laws will encroach on cyberspace.

Like it or not, the era when one could confidently speak of the Net as a world apart is coming to a close. Profitability and traditional stock valuation metrics do matter in the end. Napster and MP3.com have been forced to restructure their offerings in response to pressure from the music industry. (Just before we went to press MP3.com was bought by a major record company, Vivendi Universal.) Most, though not all, of the largest retailers, banks and content providers on the Net will be the biggest, most established real-world corporations in those categories.
This doesn’t mean the Net has been a failure; on the contrary, the Net is changing the elements of the physical world even as it adapts to it. The line between the digital and analog worlds is blurring, and the resulting hybrids will inherit many important traits from their online forebears. Last month we considered one example of this hybridization, the convergence of the Internet and telecommunications. In this issue we look at how location and identity on the Net are becoming more directly tied to their physical counterparts.

The Net will never have the same direct connection to the physical world as the telephone network, which runs on fixed circuits between identifiable points and relies on a geography-based system of telephone numbers. Moreover, the Net supersedes geography in practice because it fosters so many interactions between dispersed individuals and organizations. Internet services aren’t priced to users based on distance, and one of the great appeals of the Net is its ability to bring together parties who otherwise would not connect because of distance or other barriers. However, there is still demand for some degree of geographic or personal identification amid the Net’s primordial soup.

Who Am I? Where Am I? And Why Am I Here?

The placeless place of cyberspace

Every node directly connected to the Internet has an address, in the form of an Internet protocol (IP) number, but those numbers have no correlation to physical geography and only limited connection to the logical topologies of IP networks. And many people and things are connected only indirectly. (For more on IP numbers, see the ENUM section in last month’s issue, and the discussion of IPv6 in Release 1.0, May 1999.)

From the perspective of an IP packet, it matters not at all whether 192.41.19.44 is in Pago Pago or Palo Alto. For other purposes it matters quite a lot. Different regions may have different laws or regulations. Users in one area may speak a different language, be subject to different tax regimes, have access to different services and be subject...
to different intellectual property distribution agreements than users elsewhere. And knowing the location and time zone of a user may give the party on the other end of the transaction useful information about buying patterns or the risk that a credit card number is fraudulent. (Of course, what some consider helpful targeted marketing others may see as heinous abuse of privacy . . .)

The Net’s separation from physical geography is, to some degree, a fact of life. All directly-connected nodes on the Net are equal, and there is no mechanism in the protocols to account for political boundaries such as national borders. Many people who use the Net have long seen this refusal to respect borders as a benefit, intentional or otherwise. It makes it difficult for governments or corporations to control information flow, giving people freedoms they may lack offline. That same freedom is also the root of many vexing policy conflicts, ranging from regulation of online gambling to the application of trademark law to Internet domain names. Law follows borders, but the Net does not (see page 16).

X marks the dot
“The Internet snuck up on people. They thought that territory and jurisdiction no longer mattered. That is proving not to be the case,” observes Martin Dodge, a British researcher who has compiled a comprehensive Internet mapping Website called the Atlas of Cyberspaces (see resources section). Maps and links to physical geography can make the Net more comprehensible, he says, as well as shedding light on usage patterns and how they correspond – or don’t correspond – to patterns in the real world.

Dodge is also director of product development at Peacock Maps, which sells poster-sized maps of the Internet. Peacock Maps spun out of TeleGeography, a telecom-

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1 The Internet’s original routing architecture assigned addresses purely on a sequential basis, but this approach didn’t scale because routers had to keep track of every address. In the early 1990s the Internet technical community debated whether to group IP addresses by geography or by network provider, ultimately choosing the latter. A major factor was that network-based addressing didn’t require the same level of central authority to manage address assignment. For more on this history, see “Topological Ordering in Cyberspace,” a 1998 paper by Jeanette Hofmann of Wissenschaftszentrum Berlin für Sozialforschung, available at http://duplox.wz-berlin.de/docs/lisbon/.

2 See http://www.peacockmaps.com. Peacock’s initial posters were created in collaboration with Bill Cheswick, who later commercialized his Internet mapping technology and founded Lumeta, a 2001 PC Forum debutante (see release 1.0, march 2001). The name comes from a remark by one of Cheswick’s colleagues, who likened the tangled color-coded representation of Internet nodes to a peacock splattered on a windshield.
Communications research and consulting firm acquired last year by bandwidth exchange Band-X (see release 1.0, June 1998). Greg Staple, a lawyer by day who founded both TeleGeography and Peacock, argues that we need a “public geography” of the Net if we are ever to understand its social impacts and hidden rules. “We’ve gone through the period of the greatest explosion of space since the Renaissance, yet you look in vain for representations of what we see,” he says. Dodge is trying to help. In addition to his Website, he has co-authored two books, Mapping Cyberspace and the forthcoming Atlas of Cyberspace, to showcase the best Internet maps.

As Staple admits, maps also serve more prosaic purposes, such as telling companies that want to sell things where to find people likely to buy them. “Mapmakers have from time immemorial drawn maps to buried treasure,” he quips.

Four startups profiled later in this issue – Quova, Digital Envoy, NetGeo and Infosplit – pick up on this demand for geographic information about cyberspace to serve commercial needs. They sell to Website owners, content creators, service providers and others, offering services that can pinpoint, with claimed certainty over 99 percent in some cases, where a particular IP address is physically located.

These “geo-location” services, which pin down the location of fixed points on the Net, differ from location-based technologies that pinpoint mobile devices with far greater accuracy (see release 1.0, April 1999). These two capabilities can complement one another, and at some point will likely be combined in new service offerings. If a device is mobile and can identify its location and interact with its surroundings, there’s no need to guess based on an IP address. However, there must be ways to integrate that local data with information in network-based databases.

Location-Based Domain Names

The flip side of locating Internet users in physical space is locating Internet sites by physical coordinates. SRI International of Menlo Park, CA, the research institute that did some of the original development work on important Internet technologies, has developed a proposal called .geo to make the latter process much more robust.

We use accuracy or certainty to refer to the likelihood that a service will return the correct location for a given IP address, at the relevant level of granularity (country, city, zip/postal code).
The US National Academy of Sciences has estimated that 80 percent of information on the Internet has some spatial component. Though some sites represent companies that are purely virtual, in most cases the people, organizations and businesses behind a site are connected to one or more physical locations.

The extreme, but increasingly common, case is brick-and-mortar stores that have a Web presence for informational purposes or online ordering. Today, if you want to use the Net to find a hardware store or a Thai restaurant in a particular neighborhood, you must either depend on the inaccurate and incomplete results generated by a search engine or Web directory, or you have to go to an intermediary such as CitySearch or Vindigo that has created a local city guide site.

The Internet’s domain name system has always had mechanisms to associate sites with countries and some other geographic entities. Most top-level domains are country-specific, such as .fr for France and .cn for China, and many of the country-code domains (including .us) are subdivided into regional and local hierarchies.

For example, the Metropolitan Transit Authority in New York City has its Website at http://www.mta.nyc.ny.us, which is eminently logical . . . but terribly unwieldy. Such local government sites are supposed to register in .us, but hardly anyone else does. (New York City, choosing convenience over protocol, is at http://www.nyc.gov.) The vast majority of sites are registered, and will continue to be registered, in non-geographic generic top-level domains (gTLDs) such as .com. Even within the country codes the bulk of registrations are at the top available level of the hierarchy (often a third level after a category identifier such as .co.uk for businesses and .ac.uk for educational institutions), providing only limited geographic information.

A workable overlay of geography onto the DNS shouldn’t depend on users to remember and type in the specific physical coordinates of a site. Much of the usage for such a service would be for geo-targeted searches anyway. The combination of the Internet’s universal information access and physical space becomes valuable when you don’t know exactly where something is located.

In 1996, a group of technologists proposed a standard called DNS LOC (RFC 1876) to embed geographic information in their domain name records (see Resources Section). However, this mechanism requires sites to specify their location. Few have done so. DNS LOC also works only for organizations with a Web presence; it provides no help for objects or places in the physical world not tied to a domain name.
SRI’s solution is to create a new gTLD, .geo, which would incorporate geographic information in the form of latitude/longitude coordinates about businesses or other entities in the physical world. The world would be divided into cells of varying sizes for scalability, with more populous areas having denser resolution.

A network of “georegistries” would manage domain names associated with these cells. Each domain name would include one or more latitude/longitude pairs but would be tied to richer metadata stored in the georegistries. The metadata allows a site to, for example, identify the type of location, provide contact information, specify multiple locations (such as stores) for a single entry, and define objects down to arbitrarily small resolutions. Interpreting the domain name, identifying the proper georegistry and retrieving the metadata would be the responsibility of applications or service providers; end-users would simply see Websites or applications enhanced with rich location information.

“Ubiquitous access to geo-referenced data will lead to tremendous growth in location-based services,” argues Yvan Leclerc, head of SRI’s .geo initiative. “Without it, we are left with a hodge-podge of Websites and partial indices that make it difficult to find information about a location or an area.” The United Nations Commission for Trade and Development (UNCTAD) and other international bodies have expressed support for .geo on the assumption that it will allow developing countries and out-of-the-way regions to promote themselves for tourism and economic development rather than relying on commercial entities that index locations selectively.

SRI submitted .geo to the Internet Corporation for Assigned Names and Numbers (ICANN), the DNS coordination body that has just authorized seven new gTLDs. (Disclosure: Esther Dyson served as the founding chairman of ICANN and is currently a member of its at-large membership advisory committee.) Though its staff and many others expressed great interest in the .geo proposal, ICANN turned down SRI’s request in its first wave of “proof of concept” new gTLDs. SRI plans to re-submit its proposal in the next wave of gTLD applications.

.geo is an enabling infrastructure and not a substitute for geographical indexes independent of the DNS. Even if SRI succeeds in convincing ICANN to designate the gTLD, it will have to establish the global network of georegistries and georegistrars, not to mention convincing companies to populate the databases and Websites to incorporate the location data through the .geo API.
From Location to Identity

The oncoming downpour
We have explored the theme of online identity several times in these pages (See Release 1.0, February 1998, June 1996, April 1996). So many things, from commerce to community, depend on knowing something about the other parties to an interaction. Many of these issues concern trust, the essential lubricant of both information and financial transactions. Trust enablers such as GeoTrust (See Release 1.0, October 2000) seek to address this need for specific people or companies. The companies we discuss in this issue tackle the related problem of knowing where someone or something is located.

Location itself only offers a general window on identity, not the rich, granular, authenticated identity of digital certificates (See Release 1.0, February 1998) or even the user-specified elements of the World Wide Web Consortium’s platform for Internet privacy preferences (P3P). Location is a rough approximation, but one that works well enough for many situations.

Knowing that you are based in Boise or Bulgaria tells me something about you, at least statistically. I can determine the average income of people in your area or the prevalence of online fraud originating there. Predictably, the direct marketers are way ahead of us, having long ago realized that postal codes are a pretty fair indicator of demographic characteristics and buying habits.

Beyond this, location can be a data feed into more general online identity frameworks. Up to now, identity management systems have included standards such as P3P and several interesting but poorly adopted efforts such as Firefly’s Passport (See Release 1.0, February 1998) and Novell’s DigitalMe (See Release 1.0, April 2000). All that will likely change with Microsoft’s Hailstorm initiative, announced in March.

Hailstorm is a component of Microsoft’s .Net distributed software vision, one that brings identity management to the forefront as a critical component of Web services. In a way, Hailstorm is the first attempt at a unified field theory of 21st-century software. It ties together virtually every hot topic in the computer industry today: distributed computing, component software, instant messaging, XML, Web-telephony integration, online privacy/identity, the post-PC world, user-centric interfaces, knowledge management, you name it.
Hailstorm is an effort to define major building blocks for Web services as re-usable components with addressable interfaces. All this is tied together with an authentication infrastructure descended from the Passport technology Microsoft acquired with Firefly in 1998. One difference between Passport in its Firefly incarnation and as the basis of Hailstorm is that tens of millions of people now have Passport accounts through MSN or Hotmail (Microsoft claims 160 million, but that includes duplicates and abandoned accounts).

Who'll stop the rain?
Identity is a many-faceted thing. The initial set of Hailstorm services includes address, profile (name, nickname and photo), contacts, location, notifications, inbox, calendar, documents, application settings, favorite Websites, wallet, device settings, services and usage. These are all containers, which can hold data such as names, credit-card numbers, URLs . . . and physical locations. The idea is that Hailstorm adopters would be able to integrate one or more of these services directly into their offerings. eBay, Expedia and Groove are among those who have already announced partnerships to develop Hailstorm-based services.

Microsoft plans to sell Hailstorm services on a monthly subscription basis, and to offer central Web-based repositories for user data. The company has been at pains to emphasize that users will be able to configure how and when their information is made available to third parties. Of course, Microsoft being Microsoft, Hailstorm has still provoked significant concern in some quarters.

Net Geographers
Hailstorm, certificates and most of the technologies usually associated with online identity are user-centric. They track or authenticate individuals, regardless of where those individuals are physically. Another way to tie the Net more closely to the physical world is to identify devices. Says Quova CEO Marie Alexander, “It's really the location of a physical device that we're talking about and not the location of an individual.” These geo-location services use a variety of techniques to determine where a machine, and therefore its user, are located.

Quova, Digital Envoy, NetGeo and Infosplit have all come forward offering Internet geo-location services. Larger network service providers such as Digital Island and
Akamai offer some similar services, though not with the accuracy and granularity of these specialized providers. (Digital Island, which this month agreed to be acquired by Cable & Wireless, originally developed its own technology but now uses Digital Envoy’s NetAcuity to power its Traceware 3.0 offering.)

All of the companies see the same major application categories for geo-location: content targeting, ad targeting, fraud detection, regulatory compliance, IP licensing enforcement and routing optimization. They use a similar basic approach – compiling a database of the more than 1 billion active IP numbers (out of a potential pool of more than 4 billion), then running millions of pings (which measure the round trip time of a packet between two hosts), traceroutes (which show the hops a packet takes between two points) and other tests. The differences arise from the data sources and intelligent mapping technologies each company employs.

The location of some IP numbers is readily available from existing public databases; in other cases the location must be determined by measuring the distance from known points, matching addresses with known ISPs network maps and so forth. Most dial-up users have their IP addresses dynamically assigned from a pool every time they log in, which must be accounted for when identifying the location of such addresses. All the geo-location companies say they have techniques to identify such pools and assign them to geographic locations; they claim that firewalls and network address translators (see Release 1.0, May 1999) can similarly be taken into account. (We have no means to test these assertions, or the accuracy levels the companies claim, but potential customers may...)
Quova follows the distributed model of Akamai (see release 1.0, December 1999). It has a global network of 60 servers in 18 different locations to collect information on IP address locations. The servers are constantly collecting data, which is then analyzed through a set of algorithms to identify the geographic location of each new address. Quova uses 13 data points for each IP address. Quova’s uniquely large distributed network is important for accuracy, Alexander says: “We’ll actually take an IP address and look at it from multiple places in the world. We create a triangulation effect.” This approach also keeps the database more current, claims Quova chief scientist Chris Herringshaw.

Alexander sees the benefits of geo-location not just for optimizing existing online offerings, but in making the Internet a viable channel for products and services that up to now have not been able to take advantage of it. “A pizza shop in Palo Alto could see the benefit of advertising on the Web, because they could reach the people they want to reach and not pay prices for reaching everyone on the Web,” she says.

More generally, successful “click and mortar” strategies will require effective integration of online and offline channels, and the ability to target online content based on a user’s physical location will be a part of that. Inventory management is an important aspect of this that is often overlooked, Alexander points out. It may be more efficient for a retailer to show customers only the products it has in its local distribution centers, rather than those that must be shipped from elsewhere.

Hearkening back to established direct-marketing concepts, Alexander even calls into question the “one-to-one” mantra that has been central to so many e-commerce sites and their technology suppliers (see release 1.0, September 1999). “There are not the economies of scale in marketing one-to-one that there are in marketing to a geographic group of people,” she asserts, because people are influenced by trends they see around them in their local area rather than buying in markets of one. That may be an overstatement, but it’s certainly true that location influences buying habits.

Instead of emphasizing personalization, Alexander says, sites should focus on giving users a relevant experience, which may involve their expressed preferences but may also be closely tied to their geographic location for some products or services.

Quova sees several other applications for its technology. For example, IP telephony service provider Net2Phone uses Quova to identify the location of its customers for
fraud detection and to ensure it charges the appropriate rates for international calls. CNet and Engage use it for ad targeting.

Then there’s JumpTV, a Canadian company seeking to Webcast American broadcast television signals. Under current law, such rebroadcasting is legal for Canadian customers but not for viewers in the U.S. A similar company called ICraveTV was shut down last year by lawsuits from broadcasters, but JumpTV believes it can comply with existing laws by allowing only Canadians to view its streams. Other potential Quova customers are looking at using the technology to measure the effectiveness of offline advertising in driving customers to Websites and to determine how to best balance loads among servers and routers.

In addition to returning a geographic location for each IP address, Quova assigns a confidence factor. Customers can tune how high the confidence must be before a geographic assignment is made, up to 99.9 percent. Quova says 80 percent of the entries in its database have a confidence factor of 90 percent or higher.

Down the road, Quova plans to use geo-location as the first of many service offerings. “We want to create services that help you optimize the experience between Websites and users,” Bhargava declares. That includes bandwidth sensing to deliver different forms of content based on the end-user’s connection and device sensing to reformat content based on the size and resolution of the recipient’s screen. The company announced last month the acquisition of RealMapping, a competitor based in Amsterdam. It is also banking on its strategic relationship with VeriSign as an important differentiator going forward.

Digital Envoy
Sanjay Parekh was working at cable telephony equipment vendor Arris Interactive when he came up with the idea for Digital Envoy. When he visited the Websites of FedEx and Ikea, he says, “The first thing they asked was what country are you in. I thought that was a little stupid. The Internet is supposed to make things faster and easier for all of us. I thought there has to be a better way than having to tell the site manually where you were.” With that simple idea as the starting point, he pulled together a group of friends, including Excite co-founder Ben Lutch, as the nucleus of a new company, Digital Envoy.

Originally, Parekh says, he thought personalization would be the primary application for Digital Envoy’s technology. But like others in the space he quickly found that
its uses were broader. Digital Envoy today has customers using the technology for personalization, regulatory compliance, advertising, traffic analysis, fraud detection, digital rights management and content distribution networks.

In describing the opportunity in streaming media, Parekh hearkens back to his cable experience. Cable operators originally were able to make money only from monthly subscription fees, he explains: “They didn’t derive additional revenue until ad insertion devices came around. Since they knew the location of each node, they could insert ads that were geographically relevant and they could segment the stream. Our technology allows us to do the same thing.”

Customers such as iBeam and CinemaNow use Digital Envoy to manage local ad insertion and syndication of streaming media content.

But wasn’t the promise of the Internet that it could break out of the rigid, limited distribution agreements that characterize traditional media? On the contrary, argues Parekh, allowing media and advertising to be restricted by geography will make more content available online. “Look at the 2000 Olympics example,” he says. “NBC did not allow any Webcasting to be done because they couldn’t control distribution of the content. So, what has the Internet bought us?” With the ability to manage digital rights by geography, he says, “I think a lot of people who are unwilling to put their content online are going to start putting their content online.” (We admit to some skepticism here, given the difficulties traditional media companies have had adjusting to the Net, but it’s a testable proposition.)

Digital Envoy claims accuracy of over 99 percent at the country level, and 80 to 90 percent down to the city level. It uses over 20 methods to evaluate the location of IP addresses. Though some of these, such as traceroutes, are obvious, many of the others were not readily apparent and required the effort of a focused team to develop, Parekh says. Digital Envoy has partnered with Digital Island (see release 1.0, December 1999), among the first companies to offer geo-location services. Digital Envoy also has a relationship with Siemens, which both collaborates on technology development and serves as a sales channel for the service.

Asked to differentiate Digital Envoy from its competitors, Parekh points to the company’s customer list, including 24/7 Media, Network Associates, Advertising.com, Gracenote and Incanta. He also claims Digital Envoy’s performance, at .12 milliseconds per query and 8,000 transactions per second on one server, is superior to what
others offer. Digital Envoy’s service ranges from a few thousand to tens of thousands of dollars per month, depending on usage and the granularity of the data.

Parekh is convinced geo-location is an important feature that will become widespread on the Net. “From a usability standpoint it’s unbelievably important. I think it makes it so much easier to navigate around the Net,” he says. Especially as less-experienced users continue to go online, automatically determining location in order to display the proper language and content will make a big difference in usability, he feels.

Infosplit

Infosplit’s geo-location service got a boost when the startup was contacted by the French plaintiffs in the lawsuit over Nazi memorabilia on Yahoo!’s auction site. The company’s founder and CEO, Cyril Houri, is French, and he agreed to testify on behalf of the organization suing Yahoo! that it was technically possible to identify the location of users visiting the site. Up to that point, Infosplit had concentrated on the advertising market with its service, but Houri says the experience showed him there was a bigger market opportunity: “We immediately saw how big the story was.”

As it turns out, though, most of the company’s customers are not interested in regulatory compliance, but in digital rights management. “The Yahoo! case was very interesting, but it’s not something we’re going to see over and over again,” Houri predicts. Governments, he says, are more likely to apply rules governing appropriate content at the ISP level than to individual sites. We’re not so sure this is true, but the other element at work here is cost. A site may find it easier or cheaper or more politically correct to remove the offending material than to deploy geo-location for all its users. In Yahoo!’s case, the site removed the Nazi memorabilia in connection with its shift to paid auction listings.

About 80 percent of Infosplit’s sales leads and inquiries involve streaming media services, Houri says. Houri attributes the interest level to the disconnect between traditional media business models and what has so far been available on the Internet. “Global rights for programs don’t exist. You buy the rights for a country or even a state,” he explains. As a result, “For this market [geo-location] is a ‘have-to-have’ application. This is going to be their tool to port their business on cable television to the Internet.”
Infosplit claims 98 percent accuracy at the country level, 90 percent at the state level, and 80 to 85 percent at the city level. But Houri is quick to add that “We’re the only company that is confident enough in our technology to display it on our Website.” When you visit Infosplit’s site you see what the company believes to be your city and country location.

In addition to the basic geo-location offering, NetLocator, InfoSplit offers an enhanced version that Houri claims can work through proxy servers. These services mask the originating IP address, preventing an accurate geographic determination. Infosplit’s response is to send a small Java applet directly to the client machine, from which it reports the IP address without going through the proxy server. This wouldn’t help with a dedicated anonymity-oriented service such as Zero Knowledge Systems’ Freedom (see Release 1.0, December 1999), though.

Because Infosplit isn’t collecting any personally identifiable information, Houri believes it won’t run afoul of privacy concerns. Privacy advocates and users of anonymizer services that rely on proxy servers deliberately to hide user identities might see things differently. Infosplit also offers an easy-to-use tool to make a Website geography-specific, tied into its location service on the back end.

In addition to its streaming media clients, which include Peter Gabriel’s On Demand Distribution and Moviesystem.com, Infosplit has a partnership with Engage for targeted advertising and with Global Internet Billing for fraud detection. It offers either a hosted option for which prices vary based on the volume of queries, and a server license for $12,000 plus monthly or quarterly database upgrade fees.

NetGeo

“We are attempting to map out the entire topology of the Internet - all the routers, the hubs, the switching points - and link them to a physical map,” explains NetGeo CEO Mark Cramer. What makes this difficult (but worth doing!), he says, is that the necessary information isn’t available in any one place.

NetGeo emphasizes the depth of engineering expertise it has applied to the geo-location problem. The company collects data from 24 sources and assigns locations using a variety of proprietary technologies, including a specially optimized trace-route application and an engine for extracting location clues from host domain names. Its geo-location engine employs autonomous agents and machine-learning techniques to cross-reference different data sources, assigning locations to IP num-
bers through an iterative weighting process. For example, the engine automatically re-runs those results that have a high probability of being incorrect, and uses algorithms to identify when the location of an existing IP address changes.

NetGeo was co-founded by Michael Yang, who started and served as CEO of comparison-shopping engine MySimon (now part of CNet), and Sanku Jo, a computer scientist who had done Internet infrastructure research at Lawrence Berkeley Lab and Korean Telecom Research Center, as well as launching Korea’s first Internet bulletin board system in 1991. Jo thought up the concept for NetGeo in late 1998 and convinced Yang of its business potential. Development work and patent filings began in January 1999, though NetGeo wasn’t officially founded until February 2000.

Yang says geo-location appealed to him “because it’s infrastructure that’s core to the Internet. We felt that identifying the geographical location of an Internet user would enable us not only to deliver customized information, but also the technology could be used to accelerate the downloading of information such as video streams.” Yang is now NetGeo’s chairman. Cramer, who previously worked at e-commerce enabler NexTag and Internet measurement company Keynote Systems, was a consultant to NetGeo for six months before taking over as CEO in January. He says he became convinced, like Yang, that “the technology is fundamental to the growth of the Internet.”

NetGeo has signed up HNC, one of the largest fraud-detection services providers, and its InfoScope product is integrated in that company’s eFalcon online fraud solution. HNC independently benchmarked NetGeo against four competitors, and NetGeo came out “head and shoulders” above the others according to senior director of marketing Kristina Jade Yee. In addition to accuracy and granularity of results, Cramer says, potential customers care about ease of integration and speed of deployment, since geo-location typically feeds into a larger system.

For media companies in particular, Cramer sees enforcement of existing geographic rights agreements as necessary if streaming media is to become widespread on the Net. “What we have seen over the last couple of years is that there are fundamental things about the world that are carried forward no matter what the Internet does,” he argues. “There are certain ways that people do business that are not going to change because of the Internet.” It might be nice to think of new arrangements in which content is available freely to everyone, but the reality is that content creators will insist on enforcement of existing limited distribution windows, he believes.
Based on granularity of information and volume, NetGeo typically charges between $3,000 and $50,000 per server per month. Cramer says customers have so far resisted paying on a per-query basis, preferring a more traditional software licensing model.

NetGeo is pursuing new applications for its technology including intelligent routing and load balancing. Just as content delivery networks such as Akamai improve Website performance by caching data at local edge servers, a geo-location-powered service could determine which server is physically closest to a requesting user and avoid unnecessary long-haul traffic. NetGeo has one partnership signed in this area, and it is negotiating with other potential customers.

Back to Earth: The Legal Landscape

Revisiting Law and Borders

"Global computer-based communications cut across territorial borders, creating a new realm of human activity and undermining the feasibility – and legitimacy – of applying laws based on geographic boundaries," wrote David Johnson and David Post in Law and Borders, published in these pages five years ago (SEE RELEASE 1.0, JUNE 1996). Is that statement still true?

So many major Internet policy issues involve the assumption that it is difficult or impossible to identify the physical location of a user online. Yahoo!'s argument in the Nazi memorabilia case was that it couldn't differentiate between bidders from France, where the transaction was arguably illegal, and those from other countries that had no such restrictions. Similar debates have arisen regarding online gambling, pornography and intellectual property. Champions of online free speech and privacy such as John Gillmore and John Perry Barlow (whose Declaration of
[y]ou have no sovereignty where we gather”) have argued that the Net will simply
overwhelm excessive efforts to apply geographically based laws.

If sites can use geo-location services to determine where users are coming from,
however, that argument may no longer hold water. Courts and governments may
argue that any time a company can differentiate its users by country, it must do so or
be liable for violating country-specific laws.

Not that this answers all the questions. What if it's possible to know with 95 percent
certainty where an Internet user is physically located? Is that enough for local laws to
apply? What about 99 percent? 99.999 percent? There will always be some margin of
error, but that's true in the physical world as well. Some companies set up offshore
accounts, mail drops and shell corporations to shop for opportune jurisdictions, but
the world's legal systems don't come crashing down. The standard doubtless should
vary depending on what's at stake. We might tolerate more errors when the underly-
ing rules concern comparison advertising than when they involve medical informa-
tion or hate speech (though reasonable minds can differ here).

The widespread interest in geo-location among streaming media companies and
content distributors, though based upon intellectual property rights rather than
governmental restrictions on conduct, give an inkling of where things could go. If
content owners want to license streaming video distribution country-by-country,
preventing those in certain regions from gaining access to the material, they can use
geo-location services to enforce those rules.

Whether this is a good thing or a bad thing depends on your perspective. The point
is that the result resembles the traditional physical world of tightly controlled media
rather than the Napsterized universe some may have expected. As Quova CEO Marie
Alexander declares, “Those restrictions are part of the world as we know it.” Perhaps
the laws of the world as we know it are poised for a comeback in cyberspace?

Action at a distance

Johnson, a partner at the law firm Wilmer, Cutler & Pickering, doesn’t see it that
way. “We always assumed you could find out where someone is,” he says. “That
doesn’t solve, or even address, the basic question: Given that you have an increasing
number of transactions involving people at a distance from one another, does it
make sense to determine the rules with some traditional choice of law analysis, or does it make sense to have some set of rules for the electronic interaction?"

In other words, whether governments can, in theory, apply the legal regime of users’ home countries to online transactions isn’t the hard question. More important is whether they should. “Even if you could tell where everyone is all the time, it doesn’t follow that it would be a good idea to make every Website subject to the law where every individual is located,” Johnson observes. The transaction costs of tracking all those users and legal requirements would be immense, and identifying a user’s location is not the same as being able to enforce a judgment anywhere in the world.

The real issue is how to choose the appropriate legal regime, given that the Net vastly increases the number of transactions that occur across geographic boundaries. Johnson and Post’s argument was that creating new cyberspace-specific rule sets, rooted in voluntary choice and contracts, would often be preferable to using the physical-world laws of either party to an online transaction. So a seller on eBay is subject to eBay’s terms of service, which may include SquareTrade’s online mediation services (see Release 1.0, March 2001 and October 2000).

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**WIDERAY: SEEING INFRARED**

The oddity of location-based information services is that they combine geographically fixed content sources and mobile users. In other words, the information stays put but the users do not.

Wireless networks designed to communicate with mobile devices are generally not optimized for such fixed information sources. A personal digital assistant such as a Palm may be good for viewing movie listings when you’re standing in a mall or the conference schedule from a trade-show floor, but typically users have to download that content through their PCs rather than getting it directly at the relevant location. Through a clever combination of paging networks, caching devices and infrared (IR) beaming technology, WideRay thinks it has a solution.

WideRay is an 18-person startup based in San Francisco with a hardware research group in Vancouver, Canada. It has developed a small caching appliance, the Jack, that companies deploy in locations such as retail stores, shopping malls, car dealerships or sports stadiums. The appliance receives data over the Flex paging network and stores it locally.

Users download content and applications directly from the devices by pointing their PalmOS devices (a PocketPC version is in the works) at the built-in IR transmitter. WideRay has created its own enhanced IR protocol that expands the range to 15 feet. It has also developed a complete environment for creating and displaying dynamic Web content on Palm devices, using standard protocols such as HTML, XML and SQL.

WideRay’s first deployment is at the Sony Metreon shopping center in San Francisco, where customers can download information such as daily events, store listings and movie showing times. The company has also signed Land Rover (which plans to distribute car information at its dealerships) and Stanford University (which has experimented with conference schedules and information about its football team for students attending games).

Because WideRay uses a low-bandwidth broadcast paging network, populating the devices with content is much cheaper than over an Internet connection or wireless data network. The company charges a monthly fee for the device and tiered levels of data over the network.

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Two main benefits of this approach, Johnson argues, are that it promotes beneficial competition among different rulesets, and that it renews the beneficial social contract underlying the rules. “The fundamental reason to have online rulesets, and choice among online rulesets, is to rebuild the overlap between those who are impacted by the rules and those who decide what the rules are.” Johnson readily admits that convincing governments to allow or encourage such ruleset competition has been very difficult.

The taxman cometh
Any time there is a choice between two sets of rules, the parties involved have incentives to game the system. Over time, results tend to one extreme or the other. Because US corporations can incorporate in any state, there has long been competition among states to create the most attractive corporate law regime . . . thus attracting lucrative incorporation fees and job-producing activities in-state involving corporate offices and litigation. Delaware is the champion of this particular battle. Its laws are highly efficient for corporations, but some see them as too lenient in corporate governance and other requirements (the “race to the bottom”) as a result.

In the case of boundary-spanning Internet legal issues, the tendency has similarly been for the least restrictive rules to win out, at least so far. Imposing European Union privacy directives on all data everywhere flowing over the global Internet is much more difficult than a self-regulatory approach involving safe harbors, which happens to resemble the US approach. Singapore may be able to filter most in-country Internet traffic to enforce its anti-sedition laws, but it can’t force Yahoo! or AOL to apply them to their Singaporean customers.

In some cases, though, even the least common denominator approach wouldn’t make sense. Take the application of sales and use taxes to Internet services, currently a hot issue in the US because these taxes fund a substantial percentage of state and local government services.

Buy a book on Amazon.com, and you pay no sales tax. Buy the same book at a Borders store down the street and you pay the tax. One can argue that applying local sales taxes to online purchases would be confusing, burdensome, impossible to police and detrimental to the beneficial growth of e-commerce. But the status quo is not without consequences: It gives online retailers an unfair advantage over brick-and-mortar competitors. There may be offsetting factors, such as shipping costs and the absence of instant gratification online retailers face, but brick-and-mortar sellers
have their own unique costs as well such as inventory and store leases. The only thing that is clearly uneven on an apples-to-apples basis is the tax situation.

Sooner or later this gap will have to be closed. Proposals such as a uniform sales or value added tax for online purchases in the US or a restructuring of state and local sales taxes in general make far more sense than attempts to rope online transactions into the existing tax system. Forcing online companies to track and collect the appropriate tax for every jurisdiction in the country would be an excessive burden.

Working out the new systems will take time, though, during which it’s better not to throw a monkey wrench into the growth of e-commerce. Those considerations led the US Congress to pass the Internet Tax Freedom Act in 1998, putting a moratorium on new Internet-specific taxes, and are likely to cause it to be extended this year. Eventually, though, a resolution must be reached.

Johnson and Post are right that the best compromises in most such debates will be new online regimes that make heavy use of contract law. (The tax issue may be somewhat different because it concerns revenue collection rather than government restrictions on certain types of activity.) The past five years have brought Internet legal conflicts to the forefront and illuminated the challenges around geography and identity online. The next five years will likely be the time new legal structures to overcome these challenges will be explored seriously.
Triumph of the Weblogs

By Kevin Werbach

In the beginning, there were the voices: people expressing themselves, communicating with one another, offering their perspectives on the world and sharing their passions. By lowering the barriers to publishing, the Web can make those voices, whether representing individuals or their organizations, more powerful than ever before. But that requires the right tools, metaphors and platforms. Through a gradual process of evolution and technology development, the voices have finally found a native online form through which to express themselves: a new kind of Website known as the Weblog.

A Weblog (also known as a blog) is a personal Website that offers frequently updated observations, news headlines, commentary, recommended links and/or diary entries, generally organized chronologically (see screen shots below). They vary greatly in style and content. Lawrence Lee provides links and abstracts to interesting articles on the Web; Linux Journal senior editor Doc Searls offers stories from his daily life along with thoughts on industry developments; Trellix cto Dan Bricklin (see below) uses digital photos to illustrate entries. Some Weblogs are sections of personal or business Websites, while other Weblogs are the Website.

Personal homepages and online diaries have been around since the early days of the Web, but the earliest sites to call themselves Weblogs began around 1997, and the phenomenon has only really taken off over the past two years (see release 1.0, July/August 1999). There are now hundreds of thousands of living Weblogs (see resources for some examples), with more launching every day.

In some ways, Weblogs are the fulfillment of the nascent concept of online zines we described six years ago (see release 1.0, June 1995). They are mechanisms for people to share their lives and their interests with a global audience, to build communities or to create targeted information resources. Some things have changed, though. E-zines are typically static or are updated monthly. Weblogs are inherently dynamic, with new content added whenever the author has something to say . . . in many cases daily or several times a day. Though e-zines offer links to other sites, links are pervasive in most Weblogs.

The distinguishing element of a Weblog is that it’s organized chronologically and designed for short, frequent updates. More frequency means more emphasis on the content, says Bricklin: “You don’t worry about the way the thing looks, you only...
worry about what you are going to say.” It also means more frequent viewing, as readers learn to check often for new material. Finally, because Weblogs are not static but follow their authors through time as they live their lives, they reek of personality and individuality. “Reading a Weblog, you feel you know this person,” notes Bricklin.

The blog biz
Pyra Labs and Userland are the leading providers of tools and hosting for Weblog creators. Some tech-savvy authors have created their own scripts to manage dynamic Weblogs, and other free packages such as Greymatter and the open-source Slashcode software as well as a hosted offering called LiveJournal have also generated followings. Pyra’s Blogger and Userland’s M anila/Radio Userland probably have the broadest user base among popular Weblogs, though, and both companies have actively promoted the Weblog concept.

Userland makes money through annual software licenses, with M anila and Radio Userland as part of its Frontier content-management and application-scripting environment. Pyra has a different business model. The company raised angel financing from O’Reilly & Associates, Advance Publications, The Accelerator Group and former managing editor Jerry Michalski. It also had trials underway at companies such as Cisco for a fee-based corporate version of its free Weblog creation tools.

Unfortunately, Pyra got caught in the dot-com funding crunch late last year, which also sparked an internal debate about whether to maximize revenues or continue to make the technology available to the widest possible audience. In the end, everyone but ceo Evan Williams left the company, though Williams vowed to press on.

There was skepticism he could do so successfully, until last month Williams announced he had signed a licensing agreement with Trellix. Williams had met Trellix cto Dan Bricklin at last year’s PC Forum, where both spoke on a Web applications panel (see Release 1.0, March 2000). Under the arrangement, Pyra will continue to develop and market Blogger, while Trellix can integrate and promote the technology with its own offerings. (In true Weblog form, Williams and Bricklin described

“We view Blogger as one of several applications we feel are important to have as part of our suite of tools for personal and small business publishing,” explains Trellix ceo Don Bulens. He continues: “We have very vibrant communities, but Blogger’s user communities are hyper-vibrant.” The average Trellix user updates his or her site twice a month; many Blogger users do so twice a day or more.

Trellix has evolved from selling packaged software to a hosted service for ISPs and portals, which use it for their Web publishing offerings. Bulens and Bricklin see Blogger as complementary with their existing offerings: Whereas Trellix makes it easy for non-technical users to create and maintain graphically appealing Websites, Blogger is tuned for short, frequent, chronologically-organized and link-heavy updates.

Selling writing tools isn’t the only way to build a business around Weblogs. For example, Moreover.com indexes and syndicates real-time news headlines in an XML-based format. Though the company’s primary business is selling topical feeds to large Websites and enterprises, its headline listings are popular among Webloggers. Moreover and Blogger jointly developed a free service called Newsblogger that makes it easy to incorporate Moreover links into Blogger-created Weblogs. Another startup making creative use of Weblogs is Onclave, which has created a platform for dynamic enterprise information portals that incorporates Weblog tools into collaborative workflow. (DISCLOSURE: KEVIN WERBAH IS AN ADVISOR TO ONCLAVE.)

Why Weblogs matter
Many Weblogs are pointless, self-indulgent or interesting only to a small circle of people. As with everything else on the Web, though, there are plenty of diamonds in the rough. One person’s meat is another’s poison, and even sites with a tiny audience may satisfy their creators and readers enough to stay vibrant for a long time. Notes Userland ceo Dave Winer, “As a writer and a lover of good writing, I look forward to lots of great new ideas coming from people I’ve never heard of before.”
Weblogs address several aspects of the terminal information overload we face today. First, there's just too much stuff out there for anyone to read through all of it. Keeping up with breaking news and developments in specific fields of interest has never been more challenging. Second, the proliferation of content on the Web reduces the authority of traditional media brands and gatekeepers, who no longer have a lock on audience eyeballs (see Release 1.0, November 1999).

Weblogs let humans serve as filters and amplifiers of content from many sources, and allow users to choose the editors they like. As we’ve discussed before (see Release 1.0, July/August 1999), this vision requires good syndication mechanisms for people to find Weblogs they like and dynamically to filter and aggregate content from several Weblogs. Such tools are still in the early stages of development. However, the rapid adoption of extensible markup language (XML) formats for distributing content as well as dynamic Web services is a hopeful sign.

P2P journalism
For journalists in particular, Weblogs hold great potential. Any good journalist has far more to say than fits into the format of a publication. It may be background information, good resources for others interested in the topic, interview transcripts, source documents, personal commentary or whatever doesn’t see the light of day. Few established journalists have taken the bait so far, though San Jose Mercury News Internet columnist Dan Gillmor, Doc Searls and former New Republic editor Andrew Sullivan are all experimenting with Weblog sites. (We humbly note our own effort at [http://www.edventure.com/conversation/weblog.cfm](http://www.edventure.com/conversation/weblog.cfm).)

Of greater impact so far are the Weblog-like sites that seek to replace traditional journalism with user-generated content. Slashdot, with its rabid community of tech-savvy readers and contributors, is the best-known example. Because Slashdot’s software is freely available as open source, many other sites use and redistribute modified versions. Among the most interesting is Plastic.com, whose founder Steven Johnson spoke at this year’s PC Forum (see Release 1.0, March 2003).

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**DOC Searls Weblog**

Friday, May 10, 2001

[FIGURE 3: Doc Searls Weblog.]
In effect, these sites are collaborative Weblogs. In contrast to the traditional publishing model (one set of editors determined what content you see), or the “Daily Me” (See Release 1.0, April 2000) vision of a dynamic newspaper assembled from preferences preset by the user, Weblog journalism draws from both the reader and the publisher. For that reason it is sometimes called peer-to-peer (P2P) journalism (See Release 1.0, November-December, 2000).

All this leads to a brave new media world, where the boundaries between committed amateurs and working journalists may be difficult to determine. Recently Apple’s PR company refused an interview request made by Joe Clark, author of the NuBlog Weblog, on the grounds that he wasn’t properly credentialed. But if a site such as NuBlog attracts a readership that includes the kinds of “industry influencers” PR firms crave, why emphasize such arbitrary distinctions?

“There are an awful lot of people out there who are remarkably good journalists who are not formally in the profession,” says Searls. The authority of Weblogs comes from their readers and from the ease with which they can be updated, he points out. Weblog journalists can refine their thoughts almost continually. They are constantly talking with their audience, who are also talking with one another.

It’s a blog, blog, blog, blog world
Weblogs are still gaining acceptance as more than quirky personal diaries. But smart companies are increasingly realizing the value of empowering individuals within their organizations to express themselves and use the Web as a personal communications channel (See Release 1.0, February 2000). Weblogs are a perfect way for organizations to humanize themselves when talking to their employees, business partners and customers. It used to be that you trusted the local merchant because you got to know him or her personally, says Bricklin. Now, he continues, “The Weblog is a way of being able to expand that intimacy to your constituency online.”

Weblogs reduce the friction in creating and finding quality content. Whatever you think about the specimens available today, those are powerful qualities. Doc Searls summarizes the phenomenon well: “I think Weblogs are what we expected Web pages to be in the first place.”

29 MAY 2001

FIGURE 4: Tomalak’s Realm Weblog by Lawrence Lee.
Resources & Contact Information

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Cyril Houri, Infosplit, 1(212) 683-0662; fax, 1(703) 814-8685; cyril@infosplit.com
Franck Jeannin, Linkguard, 44 (1628) 589-800; fjeannin@linkguard.com
Doc Searls, Linux Journal, 1(650) 361-1324; doc@searls.com
Michael Yang, Mark Cramer, NetGeo, 1(650) 318-8000; fax, 1(650) 318-8008; michael@netgeo.com,
mark@netgeo.com
Joe Clark, NuBlog, joeclark@contenu.nu
Evan Williams, Pyra Labs, 1(415) 538-8404; ev@pyra.com
Marie Alexander, Rajat Bhargvara, Quova, 1(650) 508-0700; fax, 1(650) 508-0347; marie@quova.com,
rajon@quova.com
Yvan Leclerc, SRI International, 1(650) 859-6153; fax, 1(650) 859-3735; leclerc@ai.sri.com
Dan Bricklin, Dan Bulens, Trellix, 1(978) 318-7200; fax, 1(978) 318-7294; danb@trellix.com, donb@trellix.com
Martin Dodge, University College London/Peacock Maps, 1(202) 431-0667; mdodge@peacockmaps.com
Dave Winer, Userland, 1(650) 697-5263; fax, 1(650) 697-7169; dave@userland.com
Greg Staple, Vinson and Elkins/Peacock Maps, 1(202) 639-6744; g staple@velaw.com
Saul Kato, WideRay, 1(415) 263-2804; fax, 1(415) 263-2810; skato@wideray.com
David Johnson, Wilmer, Cutler & Pickering, 1(202) 663-6868; d johnson@wilmer.com

For further reading:
DNS LOC (RFC 1876) — http://www.ckdh.com/dns-loc/
SRI’s .geo information site — http://www.dotgeo.org/

A sampling of Weblogs:
Scripting News (Dave Winer) — http://www.scripting.com
Evhead (Evan Williams) — http://www.evhead.com
Camworld (Cameron Barrett) — http://www.camworld.com
Tomalak’s Realm (Lawrence Lee) — http://tr.pair.com/
Doc Searls — http://doc.weblogs.com/
NuBlog (Joe Clark) — http://www.contenu.nu/nublog.html
Dan Gillmor’s eJournal — http://web.siliconvalley.com/content/sv/opinion/dgillmor/weblog/
Dan Bricklin — http://danbricklin.com/log/

Weblog tools:
Blogger — http://www.blogger.com
Userland Manila — http://manila.userland.com
# Calendar of High-Tech Events

## 2001

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<tr>
<td>June 19-21</td>
<td><strong>INFOWORLD CTO FORUM</strong> - San Francisco, CA. Speakers include Dan Bricklin, Steve Jurvetson, Josh Levine, John McKinley and Ray Ozzie. For info, email <a href="mailto:ctoregister@infoworld.com">ctoregister@infoworld.com</a>; ctoforum.infoworld.com.</td>
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<td>June 20-22</td>
<td><strong>STREAMING MEDIA WEST</strong> - Long Beach, CA. Experience the reality and boundless horizons of streaming technologies, content and business models. To register, 1 (888) 301-8890; email, <a href="mailto:register@streamingmedia.com">register@streamingmedia.com</a>; <a href="http://www.streamingmedia.com/west">www.streamingmedia.com/west</a>.</td>
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<td>June 24-27</td>
<td><strong>MINDSHARE</strong> - Laguna Niguel, CA. Jupiter’s executive forum. For more info, contact Katie Baker at 1 (212) 780-6060 x6103; fax, 1 (917) 534-6804; email, <a href="mailto:mindshare3@jup.com">mindshare3@jup.com</a>; <a href="http://www.jupiterevents.com/mindshare">www.jupiterevents.com/mindshare</a>.</td>
<td>Laguna Niguel, CA.</td>
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<td>June 25-26</td>
<td><strong>14TH BLED ELECTRONIC COMMERCE CONFERENCE</strong> - Bled, Slovenia. This year’s theme is e-Everything: e-Commerce, e-Government, e-Household, e-Democracy. For info, contact Joze Gricar at +386 (4) 237-4291; fax, +386 (4) 237-4365; email, <a href="mailto:gricar@uni-lj.si">gricar@uni-lj.si</a>; ecom.fov.uni-mb.si.</td>
<td>Bled, Slovenia.</td>
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<td>June 25-28</td>
<td><strong>PC EXPO</strong> - New York, N.Y. In its 19th year, one of the largest IT events in the country. For more info, contact Meredith Zeitlin; call 1 (800) 249-8241; email <a href="mailto:mzzeitlin@cmp.com">mzzeitlin@cmp.com</a>; <a href="http://www.pceexpo.com">www.pceexpo.com</a>.</td>
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<td>July 22-25</td>
<td><strong>INTERNET SUMMIT</strong> - Carlsbad, CA. The Industry Standard’s flagship event. To register, call 1 (800) 255-1444; fax, 1 (415) 733-5401; email, <a href="mailto:conference-info@thestandard.com">conference-info@thestandard.com</a>; <a href="http://www.thestandard.com/events">www.thestandard.com/events</a>.</td>
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<td>November 7-9</td>
<td><strong>EDVENTURE’S HIGH-TECH FORUM</strong> - Berlin, Germany. Our 12th year in Europe. Call Daphne Kis, 1 (212) 924-8800; fax, 1 (212) 924-0240; <a href="mailto:daphne@edventure.com">daphne@edventure.com</a>; <a href="http://www.edventure.com">www.edventure.com</a>.</td>
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- Events Esther plans to attend.
- Events Kevin plans to attend.

Lack of a symbol is no indication of lack of merit. The full, current calendar is available on our Website, www.edventure.com. Please contact Joanna Douglas (joanna@edventure.com) to let us know about other events we should include.
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