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Autor: Zander, Ed

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The invisible Internet

People always ask me where the Internet is going. And I must admit I love to watch their faces when I say quite definitively, "It's going away."

The Internet is there, whenever you need it.

The Internet is going away in the same sense that electricity and plumbing did in the 20th Century – out of sight and out of mind. When electricity and plumbing first infiltrated daily life, people had to dig their own

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wells, install their own pipes and generate their own electricity. Today, of course, utilities and licensed practitioners do this for us. Fortunately, the Net will evolve the same way. In the years to come, people will do almost anything they want through simple appliances, hand-held devices, autos and cell phones. And for the first time in the short history of the Internet, they won't have to download software or configure devices. This means the act of tapping into the Internet will become such a nonevent that it won't merit mention.

The Net will assume an ever present, behind-the-scenes quality. No longer will you tell a friend: "Get on the Internet and compare air fare to Bora Bora." You'll just say: "Compare air fare to Bora Bora." Who today ever says: "Activate the plumbing and pour me some water?"

The Internet will be everywhere, but largely invisible

This vision of the future stands in stark contrast to one offered by sceptics who say the Internet will become an invasive nuisance, something of an annoying gnat of the digital age. They predict the Internet will buzz around your face 24 hours a day, pestering you with unwanted queries, requests and data until you are so frazzled that you streak naked into the woods with plans of never returning.

What these sceptics don't understand is that the Internet will evolve into a tool that is no more invasive than the electrical socket in your bedroom. Consider that electricity is more prevalent than ever, but we only use it when we want to, and never has it been more user-friendly than it is today. No one today ever says: "That electricity is everywhere, and it's driving me nuts."

The Internet is there, whenever you need it

The Internet will assist us only when we've requested help. Otherwise, it will butt out. In many cases, the Internet will bypass humans altogether, allowing devices to communicate with each other. Your sprinkler system will modify its

settings based on weather service data, your dishwasher will search for times when electricity is cheapest before washing a load, and your house will help your hotel room preset the temperature, music settings and TV channels. And you'll never even think about it.

In business, the invisible Internet may be even more prevalent. Some factory computers, for instance, already update the shipment lists of their suppliers, requiring no human involvement and giving employees more time to tackle other responsibilities.

In other cases, the Internet won't actually be invisible, but will seem like it. This is because you won't have to upgrade software, you won't have to hunt down and reboot a PC and you won't have to wait until you step out of a car to use the Net. The Net will pulse through your wall, your dashboards, your mobile phones, your pagers, your refrigerators – all of it out of sight and mind until you need assistance. Just like electricity, and just like water.

In the global economy, there is a great incentive to make this so. It's called survival. Companies planning to succeed in today's economy are hustling to make their products and services less invasive even as the Net becomes more pervasive.

They will offer you wireless services that provide assistance based not only on your personal preferences but on your ever-changing proximity to other services. If you wish, for instance, the Net will tell you when you're standing a block from a bookstore that is offering a 20% discount on a new novel by your favourite author.

Companies also are making sure that tapping into the Web today isn't a chore. In a three-year campaign to unchain Web users from their desks, for instance, manufacturers are expected to boost yearly sales of Web-ready mobile phones and PDAs to 360 million units, 35 times more than current levels. Meanwhile, thousands of families are testing out Whirlpool's Web-ready refrigerators and washing machines. Ford and General Motors have announced cars that access online road maps and read you your

e-mail. And service providers are creating a world in which you'll never think about the software that pulls up your portfolio as you sit in a traffic jam. All of this will make the Net easier to access and simpler to use.

For consumers, the advantages of the invisible Net are monumental. Unless you enjoy spending hours pecking computer script into a PC, the invisible Net will spare you from having to deal with operating system installations, esoteric manuals and skyrocketing IT costs. The boiler room of the Internet will hum far away in massive datacenters around the planet, tackling most of the IT problems you are forced to address today.

We're not quite there

The Internet hasn't yet matched the telephone system's level of availability, penetration and reliability. But believe

me, that will change. Every year, general networking and bandwidth metrics improve. And every day, the Net grows by two million new Web pages, 200 000 new access devices and 150 000 new users. The share of companies making more than 10% of their sales online will go from 14% today to 61% in a few years.

All of these developments are intensifying the push for an Internet that is more consumer-friendly, easier to access and 100% device agnostic. In other words, an Internet that is invisible. And only then will many of us in technology think we've done our jobs. 11

Ed Zander is President and COO of Sun Microsystems, Inc.

Speicherlösung der Zukunft

Die Zukunft der Speicherlösungen liegt in der so genannten «Virtualisierung» von frei verfügbaren Plätzen im System. Dabei unterstützt ein offenes System jede Anwendung, jedes Betriebssystem, jede Plattform sowie jede zugrunde liegende Speicher- und Serverinfrastruktur. Nach den Vorstellungen von Compaq soll die hauseigene VersaStor-Technologie diese Ansprüche erfüllen können. VersaStor werde die Gewohnheiten, wie heute gespeichert werde, grundlegend verändern, meint Mark Sorenson von der Enterprise Storage Software Division bei Compaq. VersaStore soll laut Sorenson der erste Industriestandard für Open SAN (Storage Area Network) werden. Nach sieben Jahren Entwicklungszeit soll es noch in diesem Jahr das Roll Out geben. Eine erste Beta-Version kündigte Compaq noch für das zweite Quartal an. IBM hätte, so heisst es, bereits ein starkes Commitment für die Storage-Management-Lösung abgegeben. Compaq will mit VersaStore auch seine Kompetenz in Sachen Storage-Software unter Beweis stellen. Lewis untermauert den Schwenk des PC- und Notebookherstellers in Richtung Software mit Zahlen: Das Wachs-

tum betrage im PC-Bereich derzeit nur noch 3%, während im Storage-Sektor Zuwachsraten von über 30% zu erwarten sind. Die Stossrichtung von Compaq geht dabei klar in Richtung Open SAN, was für die Entwickler heisst, dass in Zukunft alle Speicherarten wie NAS (Network Attached Storage), DAS (Direct Attached Storage) und SAN miteinander verbunden sein werden.

Homepage: www.compaq.com

Datenspeicher mit höherer Kapazität

Erstmals beobachteten Physiker der Universität Hamburg die magnetische Ausrichtung einzelner Atome. Mit einem speziell ausgerichteten Rastertunnelmikroskop erkannten sie bei extrem dünnen Schichten eines so genannten antiferromagnetischen Materials ein Streifenmuster. Verursacht wurde dies durch die magnetischen Momenten benachbarten Atomreihen, die sich immer genau entgegengesetzt ausrichteten. Die Ergebnisse könnten zu einer enormen Erhöhung der Speicherkapazität magnetischer Datenlaufwerke führen. In Compu-

tersimulationen setzten Theoretiker des Forschungszentrums Jülich magnetische Schichten Atom für Atom zusammen. «Wir haben zuerst ein theoretisches Modell dafür entwickelt, wie magnetische Muster auf atomarer Ebene aussehen könnten», beschreibt Stefan Blügel die aufwändigen Vorarbeiten zu diesen Experimenten. Für die nun beobachteten antiferromagnetischen Materialien sagten sie ein typisches Streifenmuster voraus. Grund: Auf eine Reihe mit Nord-Süd gerichteten Atomen folgt immer eine Reihe mit Süd-Nord-Ausrichtung. In Zukunft wollen die Forscher sogar das magnetische Moment von Atomen dreidimensional betrachten. Ausgehend von diesen grundlegenden Experimenten hoffen sie, die magnetische Ausrichtung einzelner Atome kontrolliert steuern zu können. Damit liesse sich die Kapazität von heutigen magnetischen Datenspeichern um das Hundertmillionenfache steigern. Auf heutigen Festplatten wird ein Bit durch einen magnetisierten Bereich aus rund 100 000 000 Atomen dargestellt.

Homepage: www.uni-hamburg.de
 Homepage: www.fz-juelich.de