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PLATFORMS FOR COMMUNICATION

by Jerry Michalski

The integration underway between the communications and computing industries is a chaotic and creative episode in the sequence from one stable configuration to the next. It will take a decade or more for these industries to settle at a new equilibrium. There are some clear survivors in the gene pool, such as the burst of creative energy from the Internet community and quieter computer-telephone integration efforts, but most markets are tangled in historic barbed wire and inadequate evolutionary responses. The problems range from regulation to mindset, funding and market dynamics. The convergence-deal dropout rate is startlingly high. Chaos is the norm.

Take the US wireless market, for example. It's a mess, with many competing protocols -- very few compatible with the rest of the world -- yet little prospect of true voice and data integration. The voice/data schism is everywhere: Companies that tackle voice don't handle e-mail well; those that do data messaging don't do call control or voice processing. Phone companies know they have to scale the wall to higher-value offerings, but they are hamstrung by the Bell world view. Cable tv system operators are hardly players. Even though they have dug the trenches and strung the coax that other carriers lust after, they are focused on near-video-on-demand and next quarter's earnings statement.

Quixotic progress

In general, progress takes longer than we expect it to, and then it has much broader effects than we thought it would, a process which Paul Saffo of the Institute for the Future calls macromyopia. Luckily, humans are truly adaptable animals, and they learn to cope with whatever it takes to get things done, sometimes so well that they forget that things might be different. PCs have been around for almost 14 years, yet the majority of PC users still use eight-character file names, a problem that will persist long after Windows 95 ships. Sometimes learning is so painful that the prospect of change is too scary. In any case, buyers' perceptions of progress in and the value of communications products and services are complex.

While this situation is not surprising, it reflects a real problem for companies trying to stake a profitable claim in the communications integration market. The trick is how to be a successful pioneer in what already

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appears to be a crowded market. Companies need to be visionary and pragmatic. They can't solve all the problems at once, so they have to choose a boundable piece of the puzzle that adds enough value that they earn their keep. They must both fit into the puzzle and keep doors open for future functionality. They must also lead the market with useful and innovative approaches and listen to its reactions. In a sense, they need to stop the usual process of adaptive evolution in favor of creative mutations.

In a perfect world, vendors would design systems that allow people to communicate according to their preferences, their setting (e.g., at work in an office vs. in an airport lounge with a phone and laptop) and the task at hand. This would be easy if there were common solutions for addressing, device and media integration, compelling user-interface design, non-intrusive location tracking, pricing (of course), etc. But there aren't, so in the short run, complexity will increase; long run, vendors will reduce their systems' complexity. Successful vendors must hide that complexity today.

Platforms for communication

Over the past two years, this newsletter has spent considerable time investigating the chaos in communications, with particular attention to how it affects standalone software and to what potentially profitable businesses it might spawn.¹ One of the key recurring themes is the demand for and supply of distributed application platforms.

Computer companies realize that networks aren't just convenient ways to hook computers up for file sharing and message exchange; communications carriers know that networks can do much more than connect two people and leave them alone to create their own content. Personal Communications Services (PCS) and other new offerings have created an awareness that the networks are platforms themselves. Yet (surprise!) everyone seems to have a different definition of "platform" (see box, opposite).

Pieces of the puzzle

This issue of Release 1.0 examines three communications service providers which are tackling pieces of the integration puzzle in useful ways. None of them is yet a third-party development platform, but all of them are examples of what to expect from this market. The first, startup Wildfire Communications, recently announced an elegant and accessible speech-recognition

1 *"Unified Messaging, Parts I and II" (Release 1.0, 12-92 and 1-93), highlighted efforts to meld and simplify the worlds of voice, fax, data and video communications. It started with handheld devices and worked its way up the food chain to enhanced network services. "The Tale of Wireless" and "The Future of the Local Loop" (10-92 and 11-93) delved into the physical infrastructure and posited (among other things) that the deconstruction of the phone system would create an important new software market. "The Internet as a Communications Lab" (2-94) focused on what innovators are doing with this distributed communications platform. "Personal Data Interchange" and "Small Telecom Advances" (9-93 and 4-94) addressed smaller issues that are potential bottlenecks. In a more symbolic note, we also changed the "PC" in "PC Forum" to stand for "Platforms for Communications."*

What does "platform" mean?

Here's what probably comes to different players' minds when you say the word "platform." Phone company engineers picture the Bell Labs-designed Intelligent Network (IN), with ISDN, Service Control Points, Intelligent Peripherals, Signaling System 7 and so on. All IN software runs on their software "generics" and should be isolated and protected from outsiders. The network's "intelligence" seldom reaches as far as the actual telephone. Cellular carriers think it's IS-54 and other signaling standards; they are moving toward the wireline IN. PC- and server-based voice-processing companies think it's a combination of Microsoft's Telephony API (TAPI), Novell's server-based Telephony Services API (TSAPI), the Multi-Vendor Integration Platform (MVIP; see Release 1.0, 1-93) or its challenger, Dialogic's Signal Computing Systems Architecture (SCSA).

To Internet wonks, the platform is TCP/IP and the protocols that ride it. General Magic alliance partners see Telescript. Other data networkers vary. Some think it's one or another flavor of distributed computing environment; others, Lotus Notes, OpenStep, NetWare NLMs or AppWare -- or perhaps Windows, NT and Exchange. Client/server and mainframe types have their particular power and CASE tools, such as PowerBuilder and TI's Information Engineering Facility. Cable tv system operators, accustomed to complete control over what they pour down their networks, picture proprietary networks with just enough upstream signaling to let subscribers choose channels and pay for shows and just enough OS on the set-top boxes to make that happen.

This list doesn't address small pockets that exist outside of these markets, such as campus-wide wireless data or PDAs. Also, these standards exist at many system-architecture levels; some are decades old, some not yet fully baked; many of them overlap and compete.

Small wonder that software vendors who aspire to write software to integrate this stuff wince at this mess.

"automated secretary," which it intends to sell directly to corporations as equipment to install on their premises (a custom-configured Unix box with a T1 line), starting early next year. Its target market: highly paid mobile professionals (see page 6).

The second, AccessLine Technologies, has matured considerably since we first wrote about it (see Release 1.0, 10-92). The personal-number service that AccessLine sells phone companies to put in their central offices is closely bound to the phone systems' Intelligent Network architecture and doesn't have the software agent technology that Wildfire has and IBM's group plans to have. AccessLine's target market: carriers that want to offer single-number services, especially for upcoming PCS (see page 10).

The last, IBM's Intelligent Communications Services (ICS) group, is designing a broadly scoped effort to prototype unified communications services atop its global information network. ICS will mix IBM technology with some licensed from third parties, possibly including Wildfire or AccessLine. Its target market: mobile sales executives (see page 13).

As one might imagine, most communication-system integrators have certain capabilities in common, as do these three companies. These include:

- **wired and wireless access**, often with pagers and sometimes cellular phones;
- **device awareness**, to match communications to what subscribers carry, which may range from no device at all to a powerful telephone-enabled PC;
- **number consolidation**, often using 800 or 500 numbers (see box, opposite), although modes such as e-mail may have separate addresses;
- **a single, unified mailbox** for phone calls, voicemail, faxes, e-mail, pages and file transfers;
- **user profiles**, to track subscriber location and preferences, and sometimes contacts or more "intelligent" functions; and
- **conditional message handling**, which ranges from simple rules that process messages based on the content of certain fields to inference engines that act on a subscriber's behalf.

Open questions

These systems answer the important issues raised by the profusion of messages, contacts, agents, devices and services in different ways, and in some cases only partially. An obvious one is the distributed-data problem. Where should the service provider stash profile information or message data? If there are several stores, how can they be synchronized automatically? Many potential subscribers already have phone and voicemail systems. Given that many PBX and voicemail system vendors are reluctant to allow third-party developers much programming access, how do integrators add value without duplicating functionality or leaving a trail of rogue messages?

Agents and assistants raise a system's complexity, though they can simplify subscribers' lives considerably when they are well implemented. Early on, most of these systems' agent power will be limited, as is the case with agents currently in General Magic's environment. The exception is Wildfire, where the assistant is central to the application and is well fleshed out, albeit within a narrow domain.

If the system is to become a development platform, its creators must decide how much access to offer developers and integrators, what APIs and development kits to create and how to support third parties. There's no guarantee that the developer community can create a lot of useful software with these systems, though we suspect they not only can, but will also discover unexpected ways to use the systems.

Finally, there's account setup. The service provider must get subscribers' contacts, accounts, numbers and devices logged, then help them set preferences and manage other aspects of their user profile. The longer this process takes and the more cumbersome it is, the less likely it is that new subscribers will complete it successfully.

Goodbye 700 numbers, hello 500 numbers

Almost all North American area codes are tied to places. When individuals and companies move, they have to change their phone numbers. A few area codes are not geographic, notably 700, 800 and 900. The latter two are well-known and are huge revenue producers; 700 is a mess -- more about it in a moment. Although 800 numbers are now offered to individuals, neither 800 nor 900 are flexible enough as currently implemented to support upcoming service offerings.

Recently, the FCC approved the use of the 500 area code for non-geographic, wireline and wireless personal numbers. The new area code is ideally suited for services such as PCS, as well as peripatetic individuals with a yen for communicating but no cordless phone. Callers dial 500 numbers the same way they dial regular phone numbers (with a "1," as opposed to the "0" they must dial before 700 numbers). They pay distance-insensitive rates.

So far, the FCC has released 250 of the 781 potential prefix combinations in the 500 area code for use by about 200 entities (some prefixes are reserved). No single entity can get more than four prefixes, but if it can prove that it is running out, it can request more. Prospective service providers must demonstrate their ability to provide personal or terminal mobility (which implies an underlying cellular, pager or PCS system) and manage subscriber service profiles.

Use it or lose it

They must also act fast: If they don't issue numbers to subscribers within 12 months, they lose the prefix. AT&T jumped into the fray early and may have a 500-number service by January, 1995. But it may take longer, since access and billing arrangements aren't set yet.

Eventually, 500 numbers will be portable, which means that subscribers will keep them when they change carriers. That's how 800 numbers work now, after considerable work and anguish among the interexchange carriers; it's also how local-area numbers will have to work to accommodate local competition. Bellcore, home of the North American Numbering Plan Administrator, shares administrative duties over 500 with the Industry Numbering Committee, which frames the rules by which 500 numbers are deployed.

We mentioned in Release 1.0, 4-93, that we have an AT&T EasyReach number that we don't use much. We keep it alive in the hope that we can transfer the number (0-700-CURIOUS) to a 500-number service. The 700 number scheme's tragic flaw is that it is tied to phone lines, not people. A 700-number caller has to know to dial a zero, not a one, and what to do if the default long-distance carrier on that phone is not AT&T, all of which is far too tedious to explain to someone in voicemail or on a business card. Hopefully, 700 numbers will be euthanized and resurrected in some more useful guise.

WILDFIRE COMMUNICATIONS: "WHAT CAN I DO FOR YOU?"

Many communications products are marginal improvements over existing technologies. They patch a few problems and cause a few of their own. Wildfire Communications has taken a fresh look at the act of communication and has created an elegant and useful speech-recognition interface that helps expedite and simplify phone use, yet is positioned to move beyond the telephone. It is one of the most creative designs of a communications interface that we have seen. Think of it as a glimpse into the future that isn't a wishware video.

Wildfire uses a session approach. Instead of placing a call, hanging up, then placing another call (and fumbling with all the phone numbers and contact information between the calls), you dial once into your Wildfire assistant from your desk or the road. You don't need any special equipment to call in. Any ordinary phone will do. Once you are connected to Wildfire, it...well, she -- the current Wildfire system has a woman's voice, and people naturally personify it -- can place multiple calls for you.

You	Wildfire
"Wildfire."	"Here I am."
"Call."	"Call whom?"
"Nick d'Arbeloff."	"At which place?"
"At work."	"Dialing." (phone rings, Nick answers)

While you're in session, Wildfire knows you're there and can do many other things for you. She can store and replay voicemail messages or your own reminders, deal with inbound calls and let you know who else is in session. At any point, say "Wildfire" and she reappears. If you then say "hang up," she will do so and you can place another call or check for messages. Wildfire keeps a profile of how she can reach you and how to handle inbound calls, which you can update at any time.

You	Wildfire
"Wildfire."	"What can I do for you?"
"Find."	"Find what?"
"Messages."	"I found four messages. The first is..."
"What's it say?"	(Plays the message.)

Wildfire smooths the process of completing calls and helps you be more available to callers. The system does a good job of identifying callers, so you spend much less time than before tapping numbers into the dialpad or looking up information in your Filofax or PIM. For example, the informed call waiting feature asks callers to speak their name, then plays that in your ear only (regardless where you're calling from) so you can decide what to do. If you ignore the call, Wildfire takes a message. If Wildfire identifies the caller by recognizing the name, she can take further action. (Long run, it's easy to imagine Wildfire listening for commands all day long over an open microphone. Today, though, costs dictate otherwise.)

Much of the Wildfire system's value is in the care that designers have taken in creating and tuning the interface, which is, of course, hard to describe without a demo. Luckily, this is easy to fix: Dial 1-800-WILDFIRE to take a five-minute spin and overhear a sample interaction.

The relative value of voice and video

Bill Warner, Wildfire's chairman and ceo, founded Avid Technology in 1987. Avid dramatically changed video post-production by turning \$500,000 worth of analog video editing equipment into a digital editing platform that costs as little as \$50,000. When Avid was on its way and doing well, Warner got the itch to create a low-cost LAN video communication product.

You	Wildfire
(On a call.)	(Ring) "Bruce Sterling."
	(in Bruce's voice, for you only)
"I'll take it."	

The more Warner pursued the idea of desktop video, the more he realized that the place to start was with voice communications, which is in many ways preferable to video. He spent some time thinking broadly about communications and kept returning to the phone as the most essential and ubiquitous tool. He also noted that it could use a lot more functionality, so he decided to build software to enhance communications that would be so cool that it would spread like, well...wildfire. In December, 1991, Warner and Nick d'Arbeloff, now the vp of marketing, joined forces with Rich Miner and Tony Lovell, the eventual director of engineering and interface designer, respectively, and financed Wildfire Communications.

You	Wildfire
"Goodbye, Wildfire."	"Thank you. Goodbye!"

Originally the four founders planned to open a service bureau focused on sales automation, but they had a hard time explaining the concepts to venture capitalists and the market potential seemed small. Then they refocused to sell customer premise equipment targeted to corporations with highly paid, mobile individuals such as financial analysts, consultants, executive recruiters and investment bankers. They also made Wildfire more of an entity or character, which helped greatly. In 1992 they got \$2 million from Matrix and other investors; in 1993, Greylock Partners, who originally funded Avid, took part in a second round of \$5.3 million.

Different angles on recognition

The Wildfire interface -- the "sound and attitude" that Tony Lovell and the team have designed -- is a clear differentiator and one of the company's key assets. Wildfire has personality without spurious cuteness. Since speaker-independent, continuous, large-vocabulary speech recognition doesn't exist, the design team achieved Wildfire's natural effect through careful engineering, principally in flow control and phrasing.

For example, at any point in a dialog there are only a few things the user is expected to say, usually six and, if possible, not more than three dozen words. The developers phrase Wildfire's questions in a way that elicits a "yes" or a "no," to avoid mixups with "yup," "sure" and "nope." Wildfire also treats many phrases as single utterances, which improves accuracy. A phrase such as "What's it say?" and a person's full name are stored and treated as single words. At any time, a user can say "Never mind" or "What are my options?"

Because Wildfire usually has a good idea of what to expect from a caller, she can turn on one or more specialized recognizers (from Voice Processing Corporation of Cambridge, MA). A speaker-independent, continuous digit recognizer deals with phone numbers; a speaker-independent discrete recognizer handles common utterances, such as most system commands; and a speaker-dependent, discrete recognizer handles utterances such as contact and object names. Wildfire is developing a speaker-independent, continuous speech recognizer specifically for dates and times.

Although this recognition process requires a lot of ping-ponging between caller and agent, the interaction still seems smooth and natural.

Software architecture and the Virtual Hallway

The Wildfire system uses Object Design's ObjectStore database. The system's principal constructs (objects) are "assistants," "sessions" and "gadgets." Assistants and sessions we just described. Gadgets are abstractions for devices, including telephones, pagers, fax machines, e-mail, PDAs and computers. In its first release, Wildfire supports only phones and pagers. Fax capabilities are easy to add, and the system design will support the rest, but the other devices and media will require more complex integration. For example, Wildfire's contact list can hold information on 150 people. Wildfire developers want to make it easy to import names and numbers from your favorite PIM to speed setup.

*Wildfire's goal is to help its users do five things:
never miss a call, never forget an appointment, always
get the number they need, deal with voicemail more
quickly and naturally, and meet with colleagues easily.*

The system's designers have built many layers of abstraction into its multimedia architecture. Although Wildfire's initial interface is primarily speech, all objects have a canonical form (Wildfire's engineers call them "memes") with alternate values underneath; the system chooses the appropriate one given the user's preferences and session capabilities. That means a prompt or response can be typed, spoken or some combination. It also makes it easy to do different languages or provide more verbose responses to novice users.

Every command has a touch-tone equivalent, which not only means that users can issue commands from a phone keypad if they need to be discreet, or if there's too much background noise, but also that any device that can generate touch tones can drive Wildfire. Eventually, different kinds of computer hardware may play a larger role in the Wildfire system. PDAs and PCs could display options and enhance users' interactions with the system. However, because users can do everything through speech from any phone, devices (even touch tone) are unnecessary.

The session construct adds a useful feature: If you ask, "Who else is around?" Wildfire tells you who else is in session on your system, and can connect you with any of them. Wildfire calls this the Virtual Hallway. Workgroups on the road can collaborate by meeting at an agreed-upon time through Wildfire. (If the developers made the hallway a more persistent place, Wildfire could run an AudioMOO.)

Hardware and pricing

Although Wildfire could be used for a subscription service, the company will initially sell its systems as customer premise equipment. Specifically, Wildfire runs on a custom-configured Pentium computer that is connected to the phone company's central office with a T1 line, which can pass through the local PBX but doesn't have to. Inside the box are voice-processing cards, including a T1 interface from Mitel, 24-port phone line interfaces from Natural MicroSystems and speech-recognition cards from Voice Processing Corp. The cards communicate over a separate ribbon cable that runs along the tops of the cards using the MVIP high-speed telephony bus standard.

Wildfire's system is not cheap, which means its early buyers are likely to be companies with employees for whom call completion is paramount, such as securities traders, consultants, brokers or lawyers. A system for 12 to 24 users costs \$46,850; one for 24 to 48 nonconcurrent users costs \$69,900. On average, per-user costs run from \$1500 per user for large groups to \$2000 per user for small ones. Wildfire expects to ship its first production systems next January. It will also offer a handy way to try Wildfire called PilotPack, which will allow five people to use Wildfire's server for two months with 800-number access for \$3000. PilotPack customers will pay only for the outbound calls. Wildfire is betting that the service will be hard to give up after two months.

Platform aspirations

The Wildfire team has created a useful and enjoyable interface to a flexible and object-oriented communications engine. Several added features are clearly desirable, such as fax and e-mail integration. Beyond that, the system could go in many directions. Imagine Wildfire tightly coupled with personal communicators or service bureaus with Wildfire front ends. To understand which directions to take, Wildfire will listen carefully to its early users' demands for new features.

Another approach would be to tap into the developer community, but Wildfire is not a platform yet. It expects to field a software development kit, but not until the second major system release. Even then, it plans to start slowly, with a few external developers and limited functionality exposed.

Third parties might be just what Wildfire needs. They could create new task-specific assistants or assistants targeted to certain audiences, such as vertical markets. Assistants could have specific skills, such as conferencing expertise. Imagine new assistants that automatically record portions of your conversations and forward the recordings to the participants. There could be stock-market assistants and information-provider assistants. You could send your own assistant to a "course" so it could learn new commands -- a standard employee benefit of the Information Age.

ACCESSLINE REVISITED: FRIEND OF THE INTELLIGENT NETWORK(S)

Since October, 1992, when we first covered AccessLine Technologies (then AccessPlus), the company has become a credible element of the international telecommunications system, and its single-number service has become a service differentiator for wireline and wireless carriers (see Release 1.0, 1-93, for a company profile). In 1992, it had only fledgling pilot projects in Seattle and Baltimore/Washington. Now AccessLine's platform is in use by a dozen carriers in the US and Canada, as well as Telia AB in Sweden.² AccessLine is also pursuing hot leads in Asia and Latin America. Tens of thousands of people already subscribe to AccessLine-based services in almost 30 cities.

Consolidate those numbers

AccessLine has a simple pitch: One Person, One Number. A carrier that has licensed AccessLine's system can offer subscribers a Smart Phone Number to give out, behind which they can stash and manage all of the voice, fax and pager numbers they would otherwise have to publish to others (and update continually). There is no agent, contact list or universal mailbox, just a profile to create that includes information on whether and how to reach the subscriber, as well as what choices to offer callers.

Why publish a pager or voicemail number that's different from your voice number? If an inbound call is from a fax machine, AccessLine detects it and routes it to the fax machine you have set in your profile, whether it's at your home, office or hotel. The options AccessLine can offer callers include: ring your office or cellular phone, page you to a phone, interrupt your current call, leave you a voicemail message (in your existing voicemail or AccessLine's) or talk to someone else.

Other perspectives

AccessLine can do more than consolidate existing numbers. For example, as PCS and other systems become more popular, subscribers can fold them into the AccessLine service as alternate destinations for their existing number. A more radical idea: In China and other countries with weak phone infrastructures, AccessLine can offer virtual phones via easier-to-install pagers. Subscribers get paged when calls arrive, then they go to a phone (if it's nearby), dial in and get connected to the caller. If they can't make it, AccessLine takes a message they can retrieve later. AccessLine turns a pager into the phone ringer.

² AccessLine's North American customers include Ameritech Cellular, Bell Atlantic Mobile, US West NewVector, SNET Cellular, BC Tel Mobility (Vancouver), Bell Canada and Bell Mobility. Much to AccessLine's pleasant surprise, European PTTs have turned out to be more aggressive in their pursuit of single-number services than US companies. The company hopes to close two more European contracts by the end of 1994.

Carriers offer AccessLine's features under a variety of pricing schemes, but on the average, basic service costs \$10 a month, and a richly featured service runs between \$15 and \$20 a month. Unbundled features, such as voicemail notification via pager, advanced caller functions or voicemail fallback for cellular calls (ordinarily a cellular call that doesn't get answered is a dead end), can run \$8 per month. Some carriers are experimenting with alternate pricing plans, such as \$8 per month for all features plus \$.10 per minute of use. Dan Kranzler, the president, is AccessLine's largest stockholder. The company is privately held and recently completed a \$15.5 million private placement managed by Morgan Stanley.

Taking the inside track

Founded by communication-system developers and integrators, AccessLine has architected its systems to fit neatly into the international phone system's Intelligent Network architecture(s)³ aboard fault-tolerant Stratus computers. At first, phone-system engineers thought single-number functions would be performed by other IN components that they could develop in-house. As it turns out, service providers might have waited forever for them to add new features to the so-called software generics that run central-office and cellular switches.

In the meantime, AccessLine built its spot as a phone-system insider. Its offering, no longer suspect, behaves like an IN advanced service node. Engineers now look at AccessLine's box as a way to create new service offerings. In fact, AccessLine may offer near-term ways for carriers to integrate systems they can't seem to fit together, such as wireless and wireline services.

Now the highly publicized PCS auctions and the FCC's approval of 500-number service (see box, page 5) have heightened interest in AccessLine, which already offers much of the software potential service providers need and has integration skills. Carriers who want to deploy 500 number services have a year to use the numbers they are assigned, so they must find useful technology quickly.

Who's calling? Where are you?

The AccessLine System has no address book and offers little call control. There is no sense of a session in progress, as with Wildfire. AccessLine recognizes callers in three somewhat limited ways: if the subscriber gave them a PIN number and they key it in at a prompt; if the subscriber has the Voice Screen function, with which the caller's name and purpose are recorded and played to the subscriber; or if they enter their phone numbers when prompted after leaving voicemail. That last function is wonderful. We wish every voicemail system had it, because it lets you reply to a

3 All Intelligent Networks are not alike. For starters, the cellular system's intelligence and signaling are different from those in the wireline IN. Even within one system, equipment, functions and implementations vary, causing incompatibilities. AccessLine has had to learn to integrate with gear from many major manufacturers and has developed strong relationships with them.

voicemail message by hitting the asterisk key. Note that in the latter two cases, the system merely stores and replays information, rather than actually recognizing the caller and doing something with that information. AccessLine can interrupt you while you're in voicemail to tell you that there's a call for you, then connect you.

People who subscribe to an AccessLine service fill out a schedule template that maps times of day to different phones. The way they update their location if it falls outside that template is burdensome: They must call in, log in, and key in codes that represent specific devices at different locations. AccessLine's engineers have a voice-recognition system in beta, though Wildfire likely has a large lead in that respect. AccessLine's engineers are also working with wireless carriers and equipment manufacturers on autolocation, which relies on tracking information kept by cellular carriers. They expect to have this feature ready by the end of this year, which should greatly facilitate tracking subscribers who have a cellular or PCS phone and keep it with them on standby much of the time.

Platformness and other plans

The AccessLine system does not offer e-mail. Not wanting to reinvent such things, AccessLine will partner with a company that has that expertise. The company is now more open to integrating PDAs and exploring other interfaces than it was before. For example, it is examining calendar-system interfaces in order to get and post schedule information more easily.

AccessLine also offers no software developer's kit, nor a prospect of one. Even though its system is written to be open (on a Unix fault-tolerant Stratus) and obeys all the normal telecom standards, developers would have to know how to program on a Stratus, understand the IN's Service Logic Execution Environment and the role of an IN Intelligent Peripheral and master SS7 signaling. That doesn't describe a lot of Windows programmers, or even many CASE tools. A skilled team could harness it, but nobody has. To make matters worse, other telecom equipment, such as Octel or AT&T's voicemail, is usually non-standard.

IBM'S ICS: AN AMBITIOUS BLUEPRINT

IBM has been rethinking its approach to media and wide-area networks. Its Networked Application Services division (NAS), headquartered in Thornwood, NY, is only four months old. NAS brings under one tent a virtual bazaar of businesses, projects and initiatives, including Fireworks Partners (and Digital Domain), interactive TV, Prodigy (liaison), electronic markets, collaborative business services, kiosks and information delivery, Internet stuff, electronic content distribution and Intelligent Communications Services (ICS; originally called InTouch), the subject of this section.

Fernand Sarrat, who formerly ran IBM's desktop software efforts, leads NAS. All relations between these groups and outside carriers or service providers are now under the purview of John Whiteside, the general manager of the IBM Global Network (IGN), which consolidates Advantis, the IBM Information Network (IIN) and other networking assets. Until last Spring, Whiteside was MCI's svp of global alliance management. Despite his presence, you can tell NAS is a data shop: Most of its efforts have a definite data design flavor.

Intelligent Communications Services

The ICS business unit, which is headquartered in Boca Raton, FL, is better stocked with voice-aware people than most of NAS. One of them is Joel Cawley, the market development manager, who reports to Sarrat. With Colin Harrison, ICS's chief architect, and others, ICS has created an ambitious blueprint for what it should do over the next several years. They start with the assumption of strong growth in cellular, PCS, personal communicators, wireless data networks, modems, online services and the Internet, all of which will create opportunities for companies that can pull the different media and devices together into coordinated offerings.

ICS's vision of this integration reads like the ultimate communicator's wish list. It features global, single-number voice, data and video access; unified messaging; many flavors of wired and wireless transports; distributed network intelligence; media translation services; and features for stationary and mobile users. Users can personalize the service and, of course, get a single bill.

Rather than design an infrastructure from scratch the group has taken an umbrella or glue approach. ICS's general strategy to achieve this is: unfold, abstract and connect. First, wrap existing devices, applications and services in object-oriented containers that have enough information to act as proxies for the real entities. Then make heavy use of abstraction and indirection to intermedate between unlike services, protocols and devices, as well as to isolate processes from the vagaries of path names and network addresses. Mix in a dash of translation engines and intelligence, and buttress the whole affair with a robust operations center.

While our description may seem a little flip, executing it entails daunting integration work, as well as novel distributed-intelligence capabilities. If it delivers on all these initiatives, the best differentiators might well be global access, seamless voice and data integration, unified billing and intelligent user profiling.

Focus, focus, focus

To get there, the development team must balance long and short term objectives. In order to narrow the choices and get a first system out, the ICS team has decided to focus on the following elements:

- **US mobile sales professionals.** This group is away from its home offices and buildings often, but is not out of the US much, which minimizes ICS's exposure to international standards problems. Half of them have secretaries or assistants, nearly all have laptops, few use e-mail, and they almost uniformly view pagers as a stigma.
- **The IBM Global Network.** Although ICS plans to license the technologies it develops to other service providers, it also wants to leverage IBM's voice and data network, which it can control better than third parties' networks. Long run, IGN's global reach should be a great asset. IBM operates in 155 countries and has service offices and equipment sites in most of them.
- **Network intelligence.** It takes sophisticated software to deal with mobile users, multiple devices and quirky communication channels and services without falling back to the lowest common denominator. The ICS team calls some of the key software elements in its system "proxies" and "alter egos." Proxies represent devices, services and people. They deal with mobility. Alter egos are user profiles that use an inference engine to manage messages and handle complex sequences of events. Eventually, alter egos should be able to infer many things from subscribers' patterns of use.

The ICS group has done a lot of market research to plumb perceived value and willingness to pay, including people's price elasticity to different pricing schemes. One notable conclusion is that the people they surveyed want to know how much they are spending as it happens. They prefer flexible, cafeteria-style plans in which they don't have to pay for things they won't or don't use.

Pilots and stages

ICS is about a year away from an initial service offering. The first incarnation is likely to have user personalization, integrated mail, remote LAN access and software toolkits for information providers. ICS is negotiating with several vendors for single-number technology. Intelligent-agent functions will be present but somewhat limited.

The second release will have more personalization, plus ISV and corporate developer toolkits. It may use front-end technology from other vendors. It should also be able to support subscribers using multiple concurrent devices. The third system release will add more network intelligence.

ICS knows it must get its feet in the water soon. If ICS takes a long time to create a system that does everything, it may be eclipsed by other offerings, and it won't get the benefit of market feedback. If it enters with too shallow an offering or one that locks it into specific technologies, ICS may not be able to establish a position of long-term credibility. To this end, ICS may assemble a pilot project that integrates a series of third-party tools and services to enter the market more quickly.

A dash of pepper, a pinch of thyme...

ICS is now deciding which technologies it should adopt and which it should develop. There are some internal ones it can use, such as a security technology called NetSP and paging system enhancements called SendPage.

In many technology domains, however, ICS must evaluate emerging and sometimes competing technologies. To deal with global wireless communications, ICS will likely favor standards that work worldwide, while interworking with market-leading but less global technologies. Although the ICS team believes that voice is crucial function to offer, its first release will do only basic call control. ICS will evaluate and use Microsoft's Telephony API or Novell's Telephony Services API.

Call control is easier if you know who's calling, so ICS will explore different front-end technologies such as those covered elsewhere in this issue of Release 1.0, as well as other methods of identifying callers. Once a system identifies the calling party, it can act on it and make communications more appropriate for both parties. The intelligent-system technology that ICS chooses for these tasks as well as more distributed tasks will have far-reaching consequences. Long term, ICS expects to add agents that act as secretaries, librarians and staff assistants. Short term, the system's architecture and behaviors need additional refinement.

The ICS team needs to make clear which areas it will attempt on its own, and which it will monitor and adopt. IBM is not especially gifted at designing interface technology. To succeed in the communications market, where interfaces are key, it needs to step into the user-interface fray or publish powerful APIs and service interfaces that others can develop to. This is the platform issue, and ICS hasn't yet made a clear statement of how important third parties are to it or what it will offer them, and when.

RESOURCES & PHONE NUMBERS

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COMING SOON

- *Electronic commerce.*
- *Software for education.*
- *Multi-platform, shared-document systems.*
- *Advertising online.*
- *Intelligent drawing and authoring tools.*
- *And much more... (If you know of any good examples of the categories listed above, please let us know.)*

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RELEASE 1.0 CALENDAR

- October 21-22** **The Next Economy - An Evolving Information Ecosystem - San Francisco, CA.** Sponsor: Bionomics Institute. Call Beth Weinrich, (415) 454-1000; fax, (415) 454-7460.
- October 22-26** **@CSCW '94 - Chapel Hill, NC.** Sponsor: ACM. With Jerry Michalski. Call Kevin Jeffay, (919) 962-1938; fax, (919) 962-1799.
- October 23-27** **OOPSLA '94 - Portland.** Objects in all their morphisms. Sponsor: ACM. Call Steve Poltrack, (206) 865-3270.
- October 24** **Fall membership meeting, Massachussetts Software Council - Newton, MA.** Sponsor: Massachussetts Software Council. Fax (617) 437-9686.
- October 24-28** **INTEROP '94 - Paris.** The mother of all networking conferences. Sponsor: Interop Europe. Contact: Carinne Propper, 33 (1) 4639-5656; fax, 33 (1) 4639-5699.
- October 26-28** **Wireless Data '94 - San Francisco, CA.** Sponsors: Wireless Magazine & Datacomm Research. Contact: Frank Rimler, (201) 285-1500; fax, (201) 285-1519.
- Oct 31-Nov 1** **Assets '94 - Marina del Rey.** Sponsors: ACM and GIGCAPH. Contact: Ephraim Glinert, Dept. of Computer Science, RPI, Troy, NY 12180 or glinert@cs.rpi.edu.
- November 1-2** **PDA Industry Forum - San Jose.** A conference for users, programmers & manufacturers. Call Jon Covington, (415) 252-8008; fax, (415) 252-8055.
- November 2-4** **UNICOM '94 - Washington, DC.** Sponsors: NATA and Teleprofessional magazine. Call Pam Frost (202) 296-9800 x232; fax, (202) 296-4993.
- November 4-6** ***The hackers conference - North Lake Tahoe.** The tenth annual! Sponsors: Microsoft, Fantasia Systems, Point Foundation and others. Call Glenn Tenney, (415) 574-3420; fax, (415) 574-0546.
- November 6-11** **Electronic document systems conference & exhibit - Phoenix.** Sponsored by Xplor International. Call Anne Davison, (310) 373-3633; fax, (310) 375-4240.
- November 7-8** **@BusinessNet - New York City.** Sponsored by CMP Publications and New Media Associates. Covers online activity, from advertising to virtual communities. With panel moderated by Jerry Michalski. Call Irene McCarty, (516) 733-6740; fax, (516) 733-6753.
- November 7-10** **SGML '94 - Vienna, VA.** Sponsor: Graphic Communications Association. See how SGML and the Web mix. Call Tanya Bosse, (703) 519-8160; fax, (703) 548-2867.
- November 8-10** **Technology 2004 - Washington, DC.** Sponsors: NASA and the Technology Utilization Foundation. Call Wendy Janiel, (212) 490-3999; fax, (212) 986-7864.
- November 10** **@Advertising Day - New York City.** Sponsor: Center for Communication. With "commercial netiquette" panel moderated by Jerry Michalski. Call Laura Blum, (212) 836-3050; fax, (212) 836-2773.

- November 14-15** **Advanced Distributed Simulation Conference** - Washington, DC. Sponsor: The Technical Society of America. Call Dana Marcus, (310) 534-3922; fax, (310) 534-0743.
- November 14-18** ***Comdex - Las Vegas**. The biggest US show of all. Sponsored by the Interface Group. Call Peter Young, (617) 449-6600; fax, (617) 449-6953.
- November 15-16** **The Art of Software Design** - San Jose. With Alan Cooper, inventor of Visual Basic. Sponsored by the Association of Software Design. Call Cynthia Lewis, (510) 841-5808; fax, (510) 848-4721.
- December 5-7** **Computer Fax Conference** - San Diego. Sponsor: BIS Strategic Decisions. Call Chris Mellyan, (800) 874-9980, x349; fax, (617) 982-1727.
- December 5-7** **IT Services '94** - Santa Clara. Sponsor: Creative Expos and Conferences. Call Cherif Moujabber, (508) 660-7099; fax, (508) 668-2416.
- December 6-8** **DB/Expo 94** - New York City. Produced by Blenheim NDN. Call (800) 2DB-EXPO; fax, (415) 966-8934.
- December 6-9** **Internet World '94** - Washington, DC. Sponsor: Mecklermedia. Call Milissa Brigante, (203) 226-6967; fax, (203) 454-5840.

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- January 11-12** **Resolving the Addressing Dilemma** - Palo Alto, CA. Sponsored by Cavanagh Associates. Tired of messy addressing schemes? Participate! Call Mike Cavanagh, former executive director of the EMA, (703) 875-8666; fax, (703) 875-3780; e-mail <mcavanagh@aol.com>.
- January 17-19** **@SoftExpo95** - San Jose. Sponsored by Software Publisher Magazine. With Jerry Michalski. Call David Webster, (303) 745-5711; fax, (303) 745-5712.
- January 17-20** **ExpoComm Mexico 95** - Mexico. Sponsors: TELMEX, TIA, & IEEE. Call Anna Simmons, (301) 986-7800; fax, (301) 986-4538.
- January 18-19** **Second International Conference on Information Warfare** - Montreal. Sponsors: National Computer Security Association, JINBU Corporation and others. Call Michel Kabay (514) 695-4968; fax, (514) 695-7393.
- January 23-26** **ComNet '95** - Washington DC. Sponsors: Network World, Federal Computer Week, Computerworld. Call (800) 225-4698; fax, (508) 872-8237.
- February 5-8** ***Demo 95** - Palm Springs. Stewart and David's picks. Sponsored by InfoWorld Editorial Products. Call Therese Solimeno, (415) 312-0545; fax, (415) 312-0547.
- February 8-11** ***@Two BBSCON** - Dusseldorf. Sponsored by Two BBSCON. Learn about bulletin-boards and online services in Europe. With Esther Dyson and Jerry Michalski. Call Philipp Ziegler or Corinne Jost, 41 (75) 373 28 32; fax, 41 (75) 373 30 62.
- February 9-10** **EMA Membership Meeting** - San Diego. Sponsored by Electronic Messaging Association. Call Megan Spilane (703) 524-5550; fax, (703) 524-5558.
- February 14-16** **Networks Expo** - Boston. Sponsored by Bruno Blenheim. Call Annie Scully, (201) 346-1400; fax, (201) 346-1602.
- February 20-23** **Digital Hollywood** - Beverly Hills. Sponsored by American Expositions. Call (212) 226-4141.

- March 5-8 ****PC Forum - Phoenix.** Sponsored by us: You read the newsletter; now meet the players. Call Daphne Kis, (212) 924-8800; fax, (212) 924-0240; daphne@edventure.com.
- March 7-9 **Documation '95 - Long Beach, CA.** Co-sponsored by PTM, GCA, The Gilbane Report and GCARI. Call Frank Gilbane, (617) 576-5700; fax, (617) 576-5708, or Marion Elledge, (703) 519-8160; fax, (703) 548-2867.
- March 8-15 **CeBIT '95 - Hannover, Germany.** Sponsored by Hannover Fairs. If you like Comdex... Call Mette Fisker Petersen, (609) 987-1202; fax, (609) 987-0092.
- March 11-15 **SPA Spring Symposium - San Diego.** Sponsored by the Software Publishers Association. Call Suzanne Kuntz, (202) 452-1600; fax, (202) 785-3649.
- March 27-31 **Networld + Interop - Las Vegas.** Sponsor: Seybold Seminars. Call Jay Schirmacher, (415) 578-6900 or (800) 488-2883; fax, (415) 525-0169.
- March 28-31 **Seybold Seminars '95 - Boston.** Sponsor: Seybold Seminars. Call Jay Schirmacher, (415) 578-6900 or (800) 488-2883; fax, (415) 525-0169.
- April 26-27 **WINLAB Workshop - East Brunswick, NJ.** Sponsor: WINLAB. Meet the experts in wireless networks. Call Melissa Gelfman, (908) 445-0283; fax, (908) 445-3693.
- May 7-11 **CHI '95: Mosaic of Creativity - Denver.** Sponsored by ACM. Call Rosemary Wick Stevens, (415) 328-3600.
- May 8-11 **@EMA '95 - New Orleans.** Sponsored by Electronic Messaging Association. Call Heather Burneson, (703) 524-5550; fax, (703) 524-5558.
- May 29-June 2 **Networld + Interop - Frankfurt, Germany.** Sponsor: Seybold Seminars. Call Jay Schirmacher, (415) 578-6900 or (800) 488-2883; fax, (415) 525-0169.
- June 5-7 **Digital World - Los Angeles.** Sponsor: Seybold Seminars. Call Jay Schirmacher, (415) 578-6900 or (800) 488-2883; fax, (415) 525-0169.
- June 13-16 **Ninth Workshop on Parallel and Distributed Simulation - Lake Placid, NY.** Sponsors: ACM, IEEE/TCSIM, and SCS. Call Jason Yi-Bing Lin, (201) 829-5095; fax, (201) 829-5886.
- August 20-25 **International Joint Conference on Artificial Intelligence - Montreal.** Sponsors: IJCAI, AAAI, CSCSI/SCEIO. Call Carol McKenna-Hamilton, (415) 328-3123; fax, (415) 321-4457.
- September 25-29 **Networld + Interop - Atlanta.** Sponsor: Seybold Seminars. Call Jay Schirmacher, (415) 578-6900 or (800) 488-2883; fax, (415) 525-0169.
- November 6-10 **Networld + Interop - Paris, France.** Sponsor: Seybold Seminars. Call Jay Schirmacher, (415) 578-6900 or (800) 488-2883; fax, (415) 525-0169.
- December 3-6 **1995 Winter Simulation Conference - Arlington, VA.** Sponsors: ACM, SIM, IEEE, ASA and SCS. Call Bill Lilegdon, (317) 471-6530; fax, (317) 471-6525.

* Events Esther plans to attend.

@ Events Jerry plans to attend.

Lack of a symbol is no indication of lack of merit.

Please let us know about other events we should include. -- Christina Koukkos

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