



2002 COMET AWARDS

ILLUSTRATION AND DESIGN BY MIRA RAMUJ-STEIN

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After much discussion, debate, e-mail, teleconferencing and outright arguing, the editors of Communication Systems Design, CommsDesign.com and EE Times are excited to present the 20 winners of the 2002 Comet Awards—the companies we believe are the industry's rising stars. Culled from an extensive list of the very best that the communications industry has to offer, the winners epitomize what we feel it takes for a young company to make it in a sector now notorious for its unpredictability.

20 COMPANIES THAT WILL SHAPE THE FUTURE

So what exactly does it take to become a CSD Comet? To find out, read on. But here's a hint: Watch for words and phrases such as vision . . . cutting-edge technology . . . outpacing . . . and . . . first. Also look for terms that emphasize the leveraging of current installed networks and technologies. The days of the go-it-alone breakthrough idea are well behind us. It's time to connect the dots and capitalize upon technologies that will make what we have now work better, faster, more reliably and at lower cost. That's what the Comets represent this year.



After demonstrating unique backplane transceiver capabilities in the spring with its AN5500 five-port, 6.25-Gbit/s transceiver with adaptive equalization, Accelerant Networks Inc. joined such erstwhile competitors as Velio Communications and Texas Instruments in promoting the Higher Speed Backplane Initiative. The company was formed in late 1999 by Jim Tavaoli and Paul Nahi, with the daunting mission of outpacing serdes devices in high-speed interconnect by offering superior crosstalk performance. Now up to 57 employees, Accelerant is finding that even as some high-speed metro-networking opportunities have dried up in the harsh winds of 2002, the in-building interconnect world is still showing a need—need for speed.

Location: Beaverton, Ore.

Founded: October 1999

URL: www.accelerant.net

Phone: (503) 439-3450

Financing: Three rounds of venture funding

Main Products: High-speed backplane and networking transceivers



Everyone may talk about SIP—the Session Initiation Protocol—but few seem to be doing much with it, especially since the recession slowed interest in client-side packetized voice. Acme Packet is revitalizing interest in SIP by making the protocol a central aspect of what the company calls “session-aware networking.” Its Net-Net family of session border controllers includes a session router, media manager and session director and delivers real-time interactive communications across Internet Protocol (IP) network borders. For this, the family defines routing parameters, sets up and performs signaling for communication sessions, steers media sessions according to quality-of-service constraints, and provides accounting and QoS reporting for service-level agreements. Acme’s 40 employees work with such soft-switch partners as Sonus Networks, Syndeo and Sylanro, yet its sys-

tems range from soft-switch gateways to enterprise border controllers.

Location: Woburn, Mass.

Founded: August 2000

URL: www.acmepacket.com

Phone: (781) 756-6800

Financing: Venture funding

Main Products: Net-Net family



Founded by Olaf Vethe in 1996 as an R&D company, Birdstep Technology emerged fully feathered in the latter months of 2001, having perfected its Intelligent Mobile IP Client software, and just went public in May. Targeted at operators, wireless Internet service providers and hardware manufacturers, the software enables what has become somewhat of a wireless holy grail, namely, always best connectivity, regardless of the underlying infrastructure (LAN or WLAN, GSM, GPRS, UMTS or cdma2000.) Fully IETF compliant, Birdstep’s technology goes up against connectivity stalwarts such as Ecutel and IP Unplugged, but has already found a nest with its home country’s largest operator, Telenor. It is also used internally by Cisco, with which Birdstep is the only IOS ecosystem partner.

Location: Oslo, Norway

Founded: 1996

URL: www.birdstep.com

Phone: +47 24 13 47 00

Financing: Public since 2002. Privately funded, with a total of \$30 million to date

Main Product: Birdstep Mobile IP Client software



Centellax was incorporated in the spring of 2001, and in less than a year displayed its first driver amps at the 2002 Optical Fibers in Communications conference. The fabless semiconductor specialist uses a mix of GaAs and SiGe processes to provide optimal physical-layer devices for 40-Gbit/second markets. The founders intended to provide a mix of broadband amps, drivers for both lithium and electroabsorption modula-

tors, and—in the future—higher-integration devices. Recognizing that the target market may not mature for several quarters, Centellax has restricted its head count to 25 employees and is relying on private investors.

Location: Santa Rosa, Calif.

Founded: April 2001

URL: www.centellax.com

Phone: (707) 568-5900

Financing: Private individual investors

Main Products: Broadband amps, lithium modulator drivers, electroabsorption modulator drivers for 40-Gbit/s networks



When Corrigent was founded with a majority investment from Orckit Communications in late 2000, it might have appeared a late entrant to the resilient packet ring game. But Corrigent is not aiming for a straightforward RPR implementation. Instead, the company’s CM-106 and CM-110 Packet-ADMs are intended as Sonet-compatible add-drop multiplexing systems that leverage the advantages of RPR for the type of legacy Sonet environments found in incumbent carriers. Corrigent uses multiprotocol label switching as a flow-definition method, yet sees its systems as providing more-optimal use of bandwidth than most next-generation Sonet products.

Location: San Jose, Calif.

Founded: September 2000

URL: www.corrigent.com

Phone: (408) 392-9292

Financing: Private, with majority funding from Orckit Communications

Main Products: CM-106 and CM-110 Packet ADMs



With the mantra “three standards, two chips, one world,” Envira Inc. has stormed the wireless LAN arena with its two-chip WiND502 multimode chip set for IEEE 802.11a, .11b and upcoming .11g networks. The RF portion of that chip set, the EN303, was announced this summer; the integrated baseband/MAC

half is due in the fall.

Although the company is going up against incumbents such as Intersil, Broadcom and Atheros, its founders are no strangers to wireless or to that industry's major players. Gideon Barak was chairman of the board of Butterfly Ltd., a maker of Bluetooth chip sets, before it was bought by Texas Instruments in February 1999. In the meantime, co-founder Izik Kirshenbaum worked on state-of-the-art wireless communications systems for the Israeli Ministry of Defense and is a two-time winner of the Israel Defense Award.

Together, Gideon and Izik have assembled a 55-member team that by all indications could well leapfrog the competition and take the technological lead in the hottest technology area of 2002.

Location: Kfar Saba, Israel; Palo Alto, Calif.

Founded: March 2000

URL: www.envara.com

Phone: (650) 251-9986

Financing: Asian, European and Israeli venture capitalists; raised an additional \$20 million in a recent round

Main products: Wireless LAN chip sets



Since its spin-off from LANOptics in 1999, EZChip has made some partial disclosures of its 10-Gbit/second network processor and company president Eli Fruchtler has been active in many standards bodies and organizations. But the company qualifies for the 2002 Comets because of the arrival of the NP-1 10-Gbit, single-chip, seven-layer processor that uses a configurable architecture to eliminate the need for classifiers or content-addressable memories. EZChip relies on IBM as a fab, and partners with Big Blue to ensure glueless interfaces to IBM's switching fabric. Its 90 employees are betting on 2002 as the year to establish the NP-1 as a 10-Gbit contender.

Location: Yokneam, Israel; Campbell, Calif.

Founded: 1999

URL: www.ezchip.com

Phone: 972-4-959-6666 (Israel); (408) 879-7355 (U.S.)

Financing: Venture funding

Main Product: NP-1 10-Gbit processor



Coming at a time when the mobile voice market has reached saturation point and third-generation networks are proving too expensive, Flarion Technologies Inc.'s high-speed flash-OFDM mobile broadband technology has captured operators' attention worldwide. With an Internet Protocol-friendly air link that enables average mobile user data rates of 1.5 Mbits/second at consumer price points, Flarion has found traction through its low-latency connection, parameterized quality-of-service and Mobile IP-based mobility management.

The technology itself was invented at Bell Labs in 1998, by Rajiv Laroia, who founded Flarion in February 2000.

Led by CEO Ray Dolan, formerly executive vice president of what is now Verizon Wireless, the company has partnered with the likes of Cisco, HP/Compaq and IBM and even has its own Flarion Alliance Program. With a staff head count of 155 and rising, Flarion boldly challenges us to ask about market share again 12 months hence.

Location: Bedminster, N.J.

Founded: February 2000

URL: www.flarion.com

Phone: (908) 947-7000

Financing: A private company backed by Bessemer Ventures, Charles River Ventures, Cisco, Pequot Capital and others

Main products: Wireless infrastructure for IP-based data



Garuda Networks is the first company to combine the functions of a telephony soft switch, voice gateway, video server and high-speed data delivery mechanism through a single network device. By eliminating what otherwise would be a maze of network equipment and wiring, the company has dramatically reduced the installation time and cost of providing voice, video and data services through legacy broadband networks.

One of Garuda's features is its ability to deliver user-selectable services without

the traditional need for service-provider intervention.

Founded in 1999 by current CEO and president Sanjay Gidwani, the company's technology is embedded in its flagship product, the Proteus Services Platform. Thus armed, Garuda is positioned to drive the multiservice market with ground-breaking technology that brings telco performance into the enterprise. However, preferring to quietly win new accounts, the company has deliberately avoided the spotlight until it has gained a firm foothold.

With the Comet Award, the curtain's pulled back.

Location: Fremont, Calif.

Founded: 1999

URL: www.garudanetworks.com

Phone: (510) 770-0400

Financing: Recently added \$4.7 million to \$5.4 million raised in April 2000

Main Product: Proteus Service Platform



If you ever woke up screaming, "Self-adaptive silicon!" you can thank Impinj Inc. Born of the brain trust of industry titan Carver Mead and co-founder Chris Diorio, the company has embarked on a mission that amounts to nothing less than realizing the heretofore unthinkable: Moore's Law for analog.

Impinj's technology is predicated on the theory that analog circuits that self-calibrate can be implemented in low-cost, low-power digital CMOS processes and then integrated with digital components on systems. The company has proven the technology with data converter designs, including a 14-bit, 300-Msample/second digital-to-analog converter dissipating 55 mW. Plans include complete analog front-end products, leading eventually to full mixed-signal systems-on-chip.

If Mead's list of credits is anything to go by, self-adaptive silicon will be on all our minds for some time to come.

Location: Seattle

Founded: May 2000

URL: www.impinj.com

Phone: (206) 517-5300

Financing: \$30 million to date, led by Madrona, Arch and Polaris venture groups

Main Product: 14-bit, 300-Msample/second ADC



Founded way, way back in March 2000—another era, when security was viewed casually as a somewhat-necessary evil—Layer N Networks decided to knuckle down and tackle the mutually exclusive problems of high security, high throughput and high scalability. No such thing as aiming low for Layer N co-founders Mike Salas, Oscar R. Mitchell and Rajat Datta.

Their solution is embodied in the UltraLock family of processors. The parts effectively form a complete Secure Sockets Layer appliance on a chip and have the added distinction of being the only such devices to incorporate TCP/IP processing. Essentially allowing Gigabit Ethernet in/Gigabit Ethernet out for server farms and enterprise networks, Layer N and UltraLock look secure in the face of such incumbents as Hifn and Broadcom as well as other upstarts such as Corrent, NetOctave and Cavium.

That's good news for its 45 employees, a head count the company expects to expand to 50 by year's end.

Location: Austin, Texas

Founded: March 2000

URL: www.layern.com

Phone: (512) 250-2129

Financing: Privately held; \$11.5 million from Austin Ventures, Granite Ventures, Seed Company Partners, Agave Capital and others

Main Product: UltraLock security family



When it comes to real-time operating systems, few have the credentials of Jim Ready, who 20 years ago invented VRTX, the first widely deployed RTOS. Now at the helm of embedded-Linux software provider MontaVista Software, Ready is chipping away at the undisputed king of RTOSes: Wind River Systems and its VxWorks operating system.

With a strong focus on data and telecommunications, MontaVista has leveraged Linux's open architecture and inherent simplicity, robustness and reliability, along with the wealth of native-Linux networking software, to bring

about a revolution in real-time, carrier-grade embedded OSes.

MontaVista's Carrier Grade Edition 2.1 is the leading embedded-Linux platform for telecommunications and its Linux Professional Edition enables development across a who's who of microprocessor architectures.

Location: Sunnyvale, Calif.

Founded: 1999

URL: www.mvista.com

Phone: (408) 328-9200

Financing: Privately held with funding totaling \$60 million, led by Alloy Ventures, US Venture Partners, IBM and Intel Capital

Main products: Embedded-Linux software



Some revolutions are big, some are small. Ask the folks at NanoOpto Corp., and they'll be the first to admit that their revolution is very small—subwavelength size, in fact. Founded in 2000 by Princeton professors Stephen Chou and Ed Zschau, as well as former Apple and Sun executive Howard Lee, the company is applying advances in nanofabrication to create a class of optical-component building blocks that enable low-cost, high-volume integrated optical components. The first practical implementation comes in the form of Subwavelength Optical Elements (SOEs). As for competition, NanoOpto has none—except the old, discrete way of doing things.

Location: Somerset, N.J.

Founded: June 2000

URL: www.nanoopto.com

Phone: (732) 627-0808

Financing: Privately held; A-round financed to the tune of \$20 million, led by Morgenthaler and Bessemer Ventures

Main Product: Subwavelength optical devices



Using high-performance, SiGe-based modems and supporting hardware and software, Narad Networks is leveraging the ubiquitous cable infrastructure to realize symmetrical 100-Mbit/second data rates—with accompanying services—initially to small-to-medium-size

businesses. Narad was founded two years ago on the vision of Dev Gupta, who had already founded and sold two networking companies to Cisco (MaxComm and Dagaz Technologies). Gupta's trick is to operate at frequencies above the regular cable channels (from 860 MHz up to 2.4 GHz) and then use switched Ethernet as the signaling protocol over the hybrid fiber/coax network. The True Broadband solution, Narad's first product, lets operators and service providers offer premium services to businesses, such as data backup, disaster recovery and outsourced storage, along with VPN, VoIP, TDMoIP and videoconferencing services.

Location: Westford, Mass.

Founded: July 2000

URL: www.naradnetworks.com

Phone: (978) 589-1800

Financing: Privately held; \$64 million in financing led by Polaris Ventures

Main Product: True Broadband for switched Gigabit Ethernet over HFC



Firmly focused on the data center infrastructure, Nauticus Networks is intent on reducing the cost of application switching, load balancing and SSL security. Founded in late 2000 by Josh Weiss, Brian Ramelson, Paul Phillips and Stephen Metzger, the company plans to merge the performance and scalability of Layer 2 to 7 switching with the intelligence and control of appliances. Part of its secret security sauce is the decryption of SSL traffic at the load balancer, thereby offering clear traffic for inspection by perimeter security. Armed with custom silicon to do the heavy lifting by removing the software bottleneck surrounding TCP termination and policy enforcement, the company is on track to deliver personalized and secure application services on its Nauticus platform for a tenth of the traditional cost.

Location: Framingham, Mass.

Founded: October 2000

URL: www.nauticusnetworks.com

Phone: (508) 270-0500

Financing: Privately held; \$38 million led by Charles River Ventures and Matrix Partners

Main Product: Gigabit-scale, secure application switches



PacketLight Networks has developed an architecture that combines classical dense wavelength-division multiplexing (DWDM) with Layer 1 and 2 transport aggregation and cross-connect functionality. The result is a solution that allows a carrier to deliver any service mix over metro optical networks. Essentially, its PL-16000 system can put any mix of services over a single wavelength, and using DWDM can allow multiple wavelengths per fiber—thereby cutting carrier costs. Going up against the big boys of Ciena, Nortel and Cisco is not an issue for company founders Yuval Porat, Michael Mesh, Yaki Luzon and Hagay Katz. They're confident that the five pillars of their solution—multiservice (TDM, data and storage) DWDM transport and multiplexing; service cross-connect and grooming; lambda cross-connect; Ethernet transport and aggregation; and SAN native support—will carry them forward. And so are we.

Location: Kfar Saba, Israel; San Diego

Founded: March 2000

URL: www.packetlight.com

Phone: 972-9-7645416

Financing: Privately held, with a total of \$29 million of funding to date

Main Product: PL-16000 integrated optical-transport system



What do you get if you combine hardware and protocol experience from BBN's Darpa-funded "Super-Router" project with the principal network-management savvy from Axon Networks? You get Quarry Technologies, a company with the expertise and knowledge to design, manufacture and support a high-reliability, carrier-class service edge-switching solution that can realize its vision of what Internet Protocol services should be. That vision encompasses security, tailored service quality, detailed accounting visibility and ready management control—all at low cost. That vision is distilled within Quarry's iQ-series switches and iQSMS management suite.

Location: Burlington, Mass.

Founded: November 1998

URL: www.quarrytech.com

Phone: (781) 505-8300

Financing: Privately held; financed to the tune of \$70 million over three rounds

Main Product: iQ-series Service Edge Switches and iQSMS Service Management Suite



As Web services and data interchange rise exponentially, the limitations of XML in terms of intelligence, performance and security are coming into stark relief. Recognizing this, the team of Sunil Gaitonde, John Chirapurath and Girish Juneja together founded Sarvega Inc. in Chicago in 2000. With combined expertise in hardware, application development and the core enterprise, the trio spurred the development of the XPE Switch, the first purpose-built, hardware-based, intelligent XML switch, which pushes data intelligence deep into the network. Targeting Fortune 500 enterprises, the switch can dynamically understand, prioritize and securely switch all XML dialects to multiple endpoints. Which is good, given that Sarvega is going up against such notables as Cisco, as well as other startups such as Forum Systems and Datapower. All are vying for a share of a market expected to grow from \$879 million in 2002 to \$4.8 billion in 2006.

Location: Burr Ridge, Ill.

Founded: 2000

URL: www.sarvega.com

Phone: (630) 734-5927

Financing: Privately held; received \$10 million in Series A funding in Q4 2001

Main Product: XPE XML Switch



Ken Koenig and Mitri Halabi got together in July 1999 to form Vivace Networks Inc. to help carriers leverage, extend and evolve the capabilities of existing data networks, thereby enabling those carriers to scale their services more profitably. How prescient. Since 1999, when all-IP networks were the rage, the grim reaper of reality has

come calling and anyone found not supporting all network types has given up the ghost. With Vivace's Multi-Service IP Switches, carriers can efficiently and profitably deliver business-class frame relay, ATM, Ethernet and IP services from a single, easily integrated platform. The switches bring circuit-switched reliability and predictability to packet-based networks by combining deterministic Layer 2 switching and quality of service with the flexibility and intelligence of Layer 3 routing. ATM-switch proponents like Lucent, Nortel and Cisco need to watch out.

Location: San Jose, Calif.

Founded: July 1999

URL: www.vivacenetworks.com

Phone: (408) 432-7700

Financing: Privately held, with \$120 million in funding to date

Main Product: Vivca5100 and Vivca1050 multiservice switches



Few technologies have garnered as much attention in communications of late than ultrawideband wireless signaling. And few companies have been as enthusiastic and vocal about UWB's potential for high-speed, short-range communications as XtremeSpectrum Inc. Founded in 1998 by John McCorkle and Martin Rofheart, XtremeSpectrum leap-frogged UWB incumbents such as Time Domain and Multispectral Solutions Inc. when it announced this summer—with much ado—the much-heralded Trinity UWB chip set that is capable of rates up to 100 Mb/second. After spending much of July giving demonstrations of multiple wireless A/V streams from a single box, XtremeSpectrum is now well on the way down its chosen path of ubiquitous, low-cost, low-power wireless connectivity.

Location: Vienna, Va.

Founded: November 1998

URL: www.xtremespectrum.com

Phone: (703) 269-3000

Financing: \$12 million in third-round funding in June, with new investors including POD Holding. Previous investors include Cisco, Texas Instruments and Motorola.

Main Product: Trinity, four-piece ultrawideband chip set