
O'Reilly Emerging Telephony (eTel) 2006 Conference

By Mark Duncan, askmar

The O'Reilly conference on Emerging Telephony was held in Burlingame at the San Francisco Airport Marriott on January 24-26, 2006.

In the words of Surj Patel, one of the conference organizers, *"I want a flash mob of smart geeks and their toys and hacks at this conference. If you're not a geek but need to know what the minds that invent the future are thinking and how that affects your business, come find them here together with some great vendors and "Next Gen" telecom demos."*

The conference more than fulfilled these objectives!

Overall Observations

Asterisk was given tremendous coverage at the conference, both for development tools, hardware platforms, operating system support, and many examples of implementations:

- Low-end: running on \$109 GumSTIX (the size of a gum stick)
- High-end: 3 GHz Pentium with a T3 line supporting 960 calls if hardware echo cancellation is provided.
- Limitations: high availability is difficult, redundant coverage is hard to achieve using Asterix.
- Deployed on Linux, OS X, and under VMWare Workstation 5, and a stripped down version of Linux called AstLinux.
- While Asterisk does not currently address the very large enterprise, it more than meets the need for PBX / voice mail / conferencing functionality for everything from home to medium sized businesses.

- Ruby on Rails seems to have found a market niche with Asterisk. It was interesting to see that this also runs under Xcode on OS X! Very sophisticated call center applications making calls to a MySQL database can be quickly coded.

There was considerable usage of WiFi networks for providing isochronous voice service, with and without mesh networking.

Established vendors like Skype, Yahoo, and Microsoft use proprietary protocols, whereas new entrants focus on using standards based. Reminiscent of Sun Microsystems strategy, Google seems to be the leading promoter of open "standards."

The essence of drama is conflict, and there promises to be a lot of it in telephony in forthcoming years. On one side, the United States government is pushing CALEA to make wire tapping easier, and on the other side, with Phil Zimmerman's ZPhone you get inexpensive, totally secure, encrypted VoIP conversations. Similarly, telcos are trying to pass legislation minimizing or preventing competition enabled by new technology, while at the grassroots, under the radar, people are implementing low-cost voice networks using WiFi and Asterisk.

Particularly in the United States, wireless providers have operated private gardens that severely restrict what phones and services can be accessed by their customers. This has fragmented the market, making it difficult for a publisher to reach these customers. Companies such as Bluepulse are developing technology that may provide a level playing field.

Tuesday

24 January 2006

Tuesday, the first day of the conference, differed from the subsequent two days of the conference in having three parallel tracks. There were four sessions I attended, two in the morning, broken by a half hour break, and the same for the afternoon sessions, with a hour long lunch.

24 January 2006, 8:45 AM

The first session was *Ruby on Rails with Asterisk*, both being open source development environments, the later viewed as a PBX, but actually being a bundle of telephony protocols and VoIP magic. RAGI (Ruby Asterisk Gateway Interface) was released in October 2005. It enables building more intelligent applications that remember past user behavior. We were referred to www.snapvine.com/code/ragi for the examples provided in the lecture. This technology is fast moving, Ruby on Rails just had its first 1.0 release in December 2005! (Among other things, you can run it under Xcode on OS X!

Of interest, about 50% of the portables in the room were Powerbooks. Evidently they have been widely adopted by alpha geeks, ever since Apple came out with OS X!

24 January 2006, 10:45 AM

The second morning session, *Build your own wireless voice network* was more of a mixed bag. The first speaker dealt with creating an emergency network in Louisiana after the Katrina hurricane. It would have been nice if they could have put more emphasis on the lessons learned.

The second speaker was a computer science professor from Indiana, Brian Capouch, who had figured out how to do remarkable things with minimal money to provide wireless Internet and VoIP capabilities to rural farmers (Voice over WISP). At the end, he made reference to www.openwrt.org. He made extensive use of Asterik with WiFi technology for his implementations.

24 January 2006, 1:45 PM

The first afternoon session was on *CCXML*, a proprietary implementation by Voxeo. It is heavily based on the Java JAIN call control model. It lets you do asynchronous event control of state machines, and it do call control events — the overall objective being to allow you make calls to issue control commands and events. You can start out doing a phone conference with 25 lines of calls, and rapidly design more elaborate call centers, where a supervisor can give suggestions to an operator, without the caller hearing them.

24 January 2006, 3:45 PM

The last session of the day was on *Implementing your own Phone*. A popular module for doing this was the Telit GM862 cellular module. Sparkfun Electronics started by talking about how they had retrofitted a rotary dial phone with a cellular phone capability.

The second speaker, Surj Partel, (www.surjpatel.com for his blog) talked about creating a *GSM Linux phone*, noting as motivation that trying to work with a major carrier involves a \$10,000 licensing fee, as well as unit royalties. The RF module is only made by Siemens, Nokia, Falcom, and Telbit. All of the other parts have many suppliers. The principal problem is one of systems engineering, getting everything to be small and sufficiently low in power.

The original third speaker was unable to attend, so Brad Templeton, chairman of the Electronic Freedom Foundation talked about how they implemented a free phone booth at the last two Burning Man events. Of interest, he noted that people no longer remember phone numbers, they are highly reliant on their phone and address books.

Wednesday

We missed the morning sessions in order to attend SDForum's half-day program on the Python language in Santa Clara, CA. See [Christine Herron's excellent blog](#), for coverage on the morning programs.

25 January 2006, 1:30 PM

The afternoon comprised a series of 20 minute talks. The speaker from Nokia noted that 40% of sales are to new subscribers, and 60% are replacement phones. Of the replacement phones, this reflects about 26% of the subscriber base — average user keeps their phone for four years. Canalyt was cited as the source of this research. The Nokia S60 smart phone will have about 25 million units in 2005.

25 January 2006, 1:45 PM

The computer science professor from Indiana at St. Joe College, Brian Capouch spoke again. He noted that they have 3,000 people on 1,500 square miles that they currently serve with 16 access points. (The state is neither rural or urban, but it certainly is stressed out!) This low density provides daunting challenges, with the vast majority not knowing about the Internet, or how to start using it. Also, they have a continuing brain drain with smart people leaving the state. The advent of 802.11 opened the door for them. By buying used Compaq portables for \$40 on eBay, and Netgear WTR54 equipment, they can provide wireless connectivity for \$100 in equipment. Commodity gear is a godsent, and Linux is a mega-godsent. With the dawn of Asterik, they have started a telephone club, so as to remain under the regulatory radar. Brian noted that stealth trade-groups in paying off politicians are writing legislation that is making his type of rural telephone networking illegal.

25 January 2006, 2:30 PM

A guy from Cepstral made the point that text to speech was much more useful than speech recognition. The key is to provide information that is localized, customized, and personalized. He made mention of Ovolab Phlink as software available on the Mac.

25 January 2006, 2:45 PM

The CTO from Bel Air Networks, Stephen Rayment spoke about their *Muni Mesh WiFi* and emerging telephony. Started in November 2002, the Ottawa Canada company has 120 installations and 4 products. He noted that voice is needed for public access, public works, and public safety applications. He showed three different mesh designs, and strongly advocated their switched mesh design based on their Bel Air 200. With 13 access points, you can get 65 Mbps throughput. He noted that a given access point can only run about 1400 packets per second, supporting a maximum of 24 calls. He also observed that you get 1 to 3 msec per hop, so you allow 15 msec for a wireless mesh.

25 January 2006, 3:00 PM

The next speaker, [Matthew Gast](#) made referenced to [opencircuits.com](#). He is also an author of a recent O'Reilly book. He noted that voice is isochronous and can tolerate less than 50 msec delay. There are many proprietary standards that are pre-inventing the wheel. Currently Japan is the largest market. The basic objective is to make 802.11 behave a lot more like cell phone networks. Effectively this means you can only get about 20 calls per access point, and 50 to 60% of this to allow for contention. He observed that the 802.11e Quality of Service has gone through 13 drafts. The 802.11k radio resource measurement is due in November 2006, and the 802.11r Faster Transitions is due in March 2007.

25 January 2006, 3:15 PM

[Bill Weinberg](#) at the Open Source Development Lab in Beaverton, Oregon; home of Linux, noted that while there are 24 cellular phones based on Linux in 2004 and 2005, the middleware and call stacks that they use are very fragmented. He noted that the objectives of handset manufacturers and carriers was very different from FOSS hackers.

25 January 2006, 3:30 PM

Brent Lang, the VP Marketing at Vocera Communications, Cupertino, CA spoke about their *WiFi phones*. Started in March 2000 and

capitalized with \$40 million, Vocera shipped its first product in October 2002. Currently they have 250 installations and 100,000 users. They have targeted healthcare (realtime), hotel and resorts (service), and retail (highly mobile). Their system consists of sophisticated software that runs on a PC, and small communication badges. It allows users to quickly route calls to the appropriate department, person, extension, or resource, as well as many other advanced phone features such as sending pages, forwarding calls, text messaging, or group broadcasts. In a hospital, they have reduced the paging rate by a factor of 12. *Apple Computer uses them in some of its retail stores, but has a love hate relationship, since their system runs on a Windows PC.*

25 January 2006, 4:30 PM

[Tome Hale](#) a senior vice president at Adobe, formerly Macromedia, observed that for the installed base of 600 million PCs, 89% have pdf and 97% have flash plugins. The first versions of Flash took 18 months to be updated, but today it only takes 7 months to obtain 90% adoption. This is because so much of the web makes use of Flash in web sites. He contrasted this with Java 1.4 with 33% penetration after 49 months, IE6 with 77% after 51 months, and Windows XP having 33% after 49 months. They have supported both video and audio since Flash 6.

25 January 2006, 4:45 PM

PayPal talked about their providing a micro-payments capability. Since Nokia VC investment in 2000, they have 96 million accounts, with 9% of all US ecommerce using them, and 5% globally. People who use PayPal, do transactions twice as often as people who do not use it. They noted that current credit cards have minimum rates of 20, 30 or 40 cents, that is prohibitive for microtransactions. They are proposing a flat 5% microtransaction fee instead.

25 January 2006, 5:30 PM

The last half hour was devoted to five minute presentations of companies with interesting technology. After a certain point, it was really

hard to keep everything straight. There was a guy talking about Zeroconf (zero configuration networking) and VoIP with Asterik that makes use of Apple's Bonjour technology to advertise the services provided by Asterik.

Thursday

26 January 2006, 9:15 AM

[Sean Egan](#) at Google presented Gaim and Voice. Evidently this is Google's effort to add VoIP to IM. Gaim started in 1998 by Mark Spencer as an IM client, and has since passed through several maintainers, with Sean being the current maintainer. Libgarn is the backend for Gaim. Sean observed that current protocols are closed and proprietary, and that Google Talk was intended to be an open protocol that would facilitate IM and PC to PC voice calling. Gaim-vv adds voice and video capabilities. Libjingle is the Google Talk client source code.

26 January 2006, 9:30 AM

Jean-Marc Frangos of British Teleco talked about 21CN that enables fabless voice service providers. He also runs a small VC fund for them that is based in Palo Alto.

26 January 2006, 9:45 AM

Marc Davis, a professor on leave from UC Berkeley, who is leading the Yahoo Berkeley Labs discussed their research on ways to integrate GPS, camera, and other sensor information to automatically fuse what, where, who information together by capturing appropriate spatial, temporal and social information. Ideally, the system would be able to automatically identify the people in each photograph, and know who these photographs should be shared with. For further information, see research.yahoo.com/berkeley.

26 January 2006, 11:00 AM

Phil Zimmermann, the creator of PHP, talked about *ZPhone*. It generates encryption keys at the beginning of a session that are thrown away at the end of a conversation. By reading

numbers to each other during the call, one can verify that there is no man in the middle monitoring the call. In fact, if these numbers agree, it indicates that all previous calls were unmonitored as well!

26 January 2006, 11:15 AM

Michael Robertson spoke about *Open Directories and Gizmo*. He observed that when you look at the volume of calls, while hardware phones are only 10% of the clients, they account for 35% of the calls! Gizmo is an open source, soft client that competes with Skype, that operates on Mac and Windows. My impression is that this technology is incorporated into Jabber and Google Talk, but I wasn't entirely clear on this.

26 January 2006, 11:30 AM

Johannes Ernsta spoke on *Identity Crisis: Namespaces Out of Control*. He made reference to his website at netmesh.info/jernst. He noted that we have a variety of protocols including SMTP, AIM, POST, and Skype, and countless ways of providing this information including phone, email, IM, website, blogs, and VoIP. He showed a triangle representing the situation in 2006, with Liberty-Alliance companies, Microsoft Vista WS-*.based Inforcards, and URL based YARDIS.org as being the three major players.

From Johannes blog, *"Somewhat surprisingly, a whole series of speakers have been talking about the importance of identity today at the O'Reilly Emerging Telephony conference. From the telcos (France Telecom in the morning), to several softphone providers, myself and now Microsoft. I've also had numerous side conversations with people who recognize the problem, don't want to contribute to more identity stovepipes and are a very receptive audience for URL-based identity. URLs, and the open, multi-party YADIS effort just make a lot of intuitive sense."*

26 January 2006, 11:45 AM

[Brad Templeton](#) gave a humorous and passionate talk on *Why ILECS should love CALEA*. He first took on the role of his evil twin, talking rapidly about how requiring permission to in-

novation kills it dead. He observed that telcos have buildings full of lawyers and lobbyists and work hard to see how many regulators they can own. The telcos view innovative pricing as scary. CALEA originated in 1993 as requiring telcos to facilitate the ability to do wiretaps. However, they were only 1633 wiretaps done last year, or 5 to 6 thousand if you include the FISA and NSA wiretaps. In the past, the federal government reimbursed the expense of doing these wiretaps. But new legislation that is proposed to become effective in 18 months, will no longer provide such reimbursement.

[David Isenberg](#) spoke on the Freedom to Connect making reference to his freedom-to-connect.net website.

26 January 2006, 1:30 PM

Bob Marsh spoke on *Solar-Powered Communications Systems*. He noted that 2.5B people have little access to electricity or communications. But 1B of these people are within 100 km of a town with a communications infrastructure. Requirements for a product in this environment is that it use open source software, be an integrated solution, be needs based, rugged, use alternative power, be affordable and sustainable. They have deployed their solution in Uganda as part of ActionAid, with 5 villages serving 3200 people as of June 2005. He noted that in third world countries, dust is everywhere, nothing goes to plan, ever, and everything takes three longer than you would expect.

26 January 2006, 2:00 PM

Blaine Cook and Evan Henshaw-Plath spoke on *Phone Communities and Activism*. They are involved with social justice organizations, and spoke about their experiences in using SMS to provide action alerts. Their first effort, SMS-TxTMob was restricted by the spam filters they encountered. Their next effort was to use a Java Applet in the browser and use P2P SMS. They noted that the walled gardens of wireless operators are a very real form of censorship. Fundamentally, what is needed is to move beyond a pay to play teleco system that would foster the ability to innovate and dissent. To do

this, they are working on encrypted, anonymous voice mail.

26 January 2006, 2:15 PM

Benjamin Keighran spoke on *Disruptive Mobile Widgets*. He started working on this when he was 19, and now at age 23, just released the first beta in November 2005. Bluepulse <www.bluepulse.com> addressed the question of why hasn't the mobile Internet market taken off? There are two issues. First, despite the installed base of 2B handsets, there is no easy way for a publisher to reach all of them. Each handset has a different browser, and a given carrier will only support specific handsets. Second, there is no good way to move content on the PC to a mobile device. Bluepulse solves these problems by creating a common layer that runs on top of Symbian, Java, Brew, Aggregator, carrier portals, support, and billing, providing a uniform and common interface.

26 January 2006, 2:30 PM

The worst presentation of the conference was by Amritansh Raghav of Microsoft on the *ICE Demonstration*. He seemed to be talking about identity in terms of presence, e-mail and real-time communications; but his slides were extremely difficult to read, due to poor colors and screen views containing text that could not be read. He also talked very, very fast with an heavy accent that made it difficult to follow what he was saying. It was a good time to hit the restroom and return a phone call.

26 January 2006, 3:00 PM

[Phil Zakielarz](#), an undergraduate student at MIT, spoke on his work on gesture recognizing. He decided that a MEMSIC accelerometer was best, and interfaced it to an Atmel AVR that includes an ADC and serial port. He wrote some Javascript and integrated it with the Minimo, mini-Mozilla browser. This enables tilting a Google map to have it scroll the map in a given direction. You basically can use the accelerometer in place of a scroll bar. In the future, he thinks it could be used to detect

presence, like when you are walking with your phone.

Author's note — Sun Labs has also done work in this area, mounting an accelerometer in a wane, allowing gestures to indicate actions and commands.

26 January 2006, 3:15 PM

Shawn Van Every a media researcher with the NYU Interactive Telecomm Program spoke about their research. He cited Dodgeball, Socialight, Grafedia, and Gumspots as examples of mobile social relationships that they are investigating. He also talked about their own experiments with as-ls (call the list) being used for things like lost and found, shout out, and wishing happy birthday. Geo phone tag lets the user select a street location and add an audio tag that appears on a Google map. They also have a popularity dialer, than can send calls at a predetermined rate, to make the recipient appear to be popular.

26 January 2006, 3:30 PM

David Mandlestam of Sangoma talked about the "Call Capacity of a PC based PBX." Fundamentally, the question is how large a PC is needed to run Asterix? It turns out that software echo cancellation takes the majority of the resources, between 10 to 30 MHz depending on the implementation. On a 730 MHz Pentium III, this means 20 calls with software echo cancellation and 120 calls without. The solution is to use hardware echo cancellation. If this is done, you can support 960 calls using a 3 GHz processor, which exceeds the capacity of a T3 line!

26 January 2006, 4:30 PM

[Peter Saint-Andre](#) spoke on *Jingle: Jabber Does VoIP*. He said that there are over 50,000 servers and 25M users of xmpp. They are working with Google Talk. Their protocol provides authenticated identify, whereas authentication is optional with SIP, which is why it is not used. Jingle brings multimedia capability to Jabber. Right now they are working on various enhancement proposals for Jabber, and hope that they will have convergence with Google

by the end of the second quarter. In particular, they are still working on defining the various codecs.

26 January 2006, 4:45 PM

[Shirish Andhare](#) spoke on the *Power of Hosted VoIP and Web 2.0 Mashups*. Sylantro was funded in 1998 and has received \$97M in funding from Mayfield, Accel, and Vaguard among others. They are providing a redundant, scalable IP-based PBX replacement for traditional circuit switched Centrex services that primarily sold to large carriers and service providers.

26 January 2006, 5:15 PM

[Alec Saunders](#) at Iotum spoke on *Filtering Relevant Content*. He stated that we all trying to find a balance between work and our life. They look at your calendar, contacts, and IM information, and than using a Versatel Networks IQ 1500 Media Gateway, figuring out what messages to forward, and the appropriate devices to use, at any particular date and time of day.

26 January 2006, 5:30 PM

[Kristian Kielhofner](#) spoke about *AstLinux*, a minimal Linux configured specifically to run the Asterix PBX software. It is configured to allow operation from read-only flash memory and runs in only 26.8 MB memory. Two of the platforms that they support are the Soekris Net4801, a \$150 board consuming 12 Watts of power and providing 3 Ethernet and 1 USB port, and a TinyPBX that runs on a GumSTIX. For more information, see <www.astlinux.org>.

26 January 2006, 5:45 PM

The last talk in the conference was [Martin Geddes](#) on *The Last Word in Telephony*. He noted that what everyone wants in a phone is to be “always available, anywhere.” He compared POTS, mobile, and Skype in terms of the following criteria:

- Always available, anywhere
- The right person
- The right channel
- The right time
- Wanted message

- Perfect comprehension
- Easy transaction
- Flawless control

Ranking each of the services from 1 to 5, each criteria separated by 45 degrees, provided a polar chart with three polygons, allowing easy comparison of the three services. He suggested Douglas Galbi’s book, “Sense in Communications.” With respect to SMS, he noted that it requires a high effort to compose messages, and appeared to recommend voice messaging as a preferred direction.