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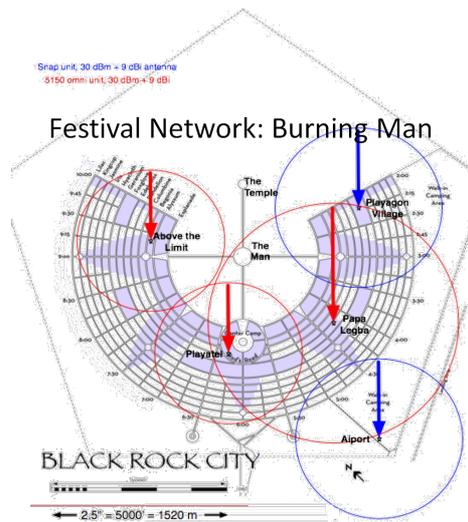
OPINION

Open source project builds mobile networks without big carriers

Data centers, mobile phones, and the software industry have all been changed by open source. Are mobile networks next?



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Open source projects garner the attention of the tech community because the passionate people behind these developments occasionally cause major disruption and create opportunities to change industries, as Android and Linux did. An open source project with the goal of changing how mobile networks are built, from expensive proprietary hardware to cheap commodity hardware - just as mainframe data centers moved to commodity X86 hardware - is certainly worth a deeper look. Learning that former Cisco CTO Ed Kozel is leading the venture, Range Networks makes it worth a deep dive.

For now at least, Range Networks isn't trying to compete with NSN, Ericsson, Huawei and Alcatel-Lucent. The company is looking for underserved areas that need a low-cost alternative to the big mobile network solutions designed for big mobile carriers. Range Networks' OpenBTS has been used to build a temporary mobile network serving 1,200 people over a 10-square-kilometer area at the 2011, 2012, and 2013 Burning Man festivals, as well as permanent mobile networks in Antarctica and Papua Indonesia.

The core of Range Networks innovation is an open source OpenBTS 3G GSM stack and a software defined radio (SDR) covering the 700 Mhz to 2.5 Ghz bands. Range Networks has plans to add 4G and LTE, but in the meantime a visitor to Papua Indonesia, where there has never been mobile phone service, would have to feel extremely entitled to complain about slow 3G Facebook download speeds.

OpenBTS runs on standard X86 hardware that can be packaged in an environmentally hardened enclosure to withstand the elements. Range Networks' engineering team includes not only open source software hackers, but open source hardware hackers too. The SDR is designed by the company's engineers and all the specifications, schematics, and production data have been made available under open source BSD, Creative Commons, and GPL licenses at OpenBTS.org, so other manufactures can improve and produce it in volume at reduced cost.

The Tier project at the University of California Berkeley is a great example of the value of Range Networks' open source model. UC

Berkeley researchers have built software that runs on handsets and OpenBTS that samples the airwaves to find unused radio spectrum, called white spaces, that are free of interference from other types of radio broadcasts. Once the white space is identified, it can be used for voice and mobile data services. Because UC Berkeley built it with OpenBTS, the white space functionality is contributed back into OpenBTS.

Use of white space radio spectrum is of interest to anyone who builds any type of product that uses radios. Government radio spectrum regulators, like the FCC, auction radio spectrum for billions of dollars to commercial users. But the regulators often reserve some spectrum for free public use. If public spectrum is detected as unused by OpenBTS, it can be added to the white space table and used for voice and data. The regulations and exact use of radio spectrum differ from country to country, but a socially or financially motivated entrepreneur could build a mobile network inexpensively in an underserved part of the world using OpenBTS if he or she could identify white space.

Range Networks sees other applications outside of underserved geographies, in academia and public safety. Engineering schools stress hands-on experience. But in the case of mobile phone developments, students are limited to building apps and enhancing a mobile OS and hardware. They have no access to writing software that runs inside the mobile network because Verizon, T-Mobile, and AT&T wouldn't think of opening up their networks for student development. With OpenBTS, students can build a mobile network on campus to use as a platform for experimental code development. The campus OpenBTS network could operate at low power to avoid interfering with the public's use of the mobile carriers' networks. Engineering school projects should lead to more contributions to the OpenBTS source tree, enhancing its features and application.

Another application is public safety. Radio spectrum used by police, firemen, FEMA, etc., is reserved strictly for public safety organizations. In a disaster, where the broadcast infrastructure is damaged or overloaded, an OpenBTS network could be deployed quickly for emergency personnel to communicate.

OpenBTS is a thrilling project. It should awaken in the hearts of the open source community the same excitement, expectations and hope as the home town baseball team's first game of the season.

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Steven Max Patterson

Steven Max Patterson lives in Boston and San Francisco where he follows and writes about trends in software development platforms, mobile, IoT, wearables and next generation television. His writing is influenced by his 20 years' experience covering or working in the primordial ooze of tech startups.



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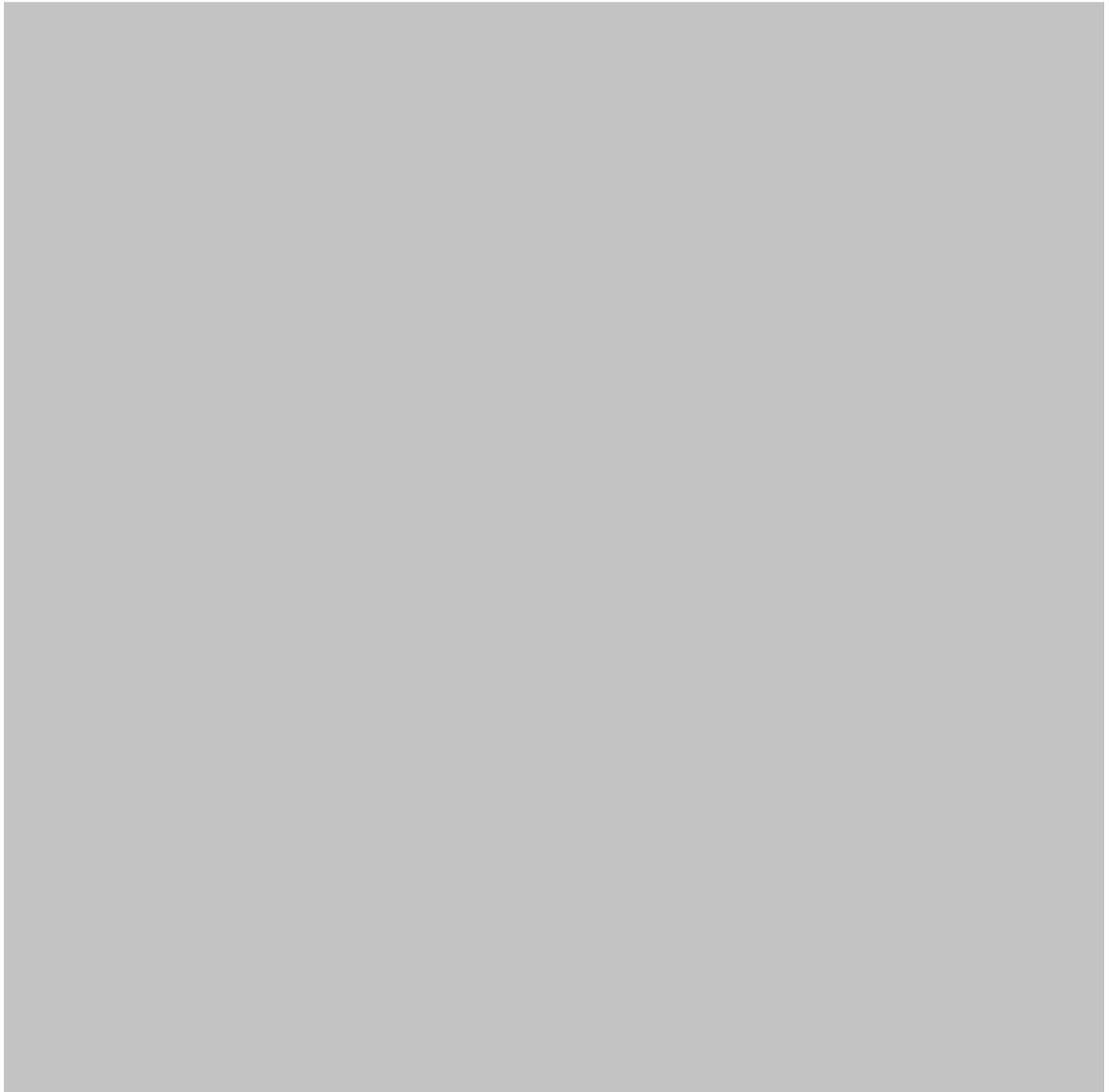
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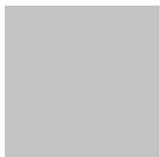
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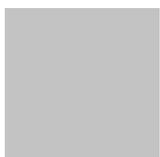


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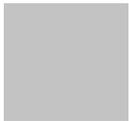
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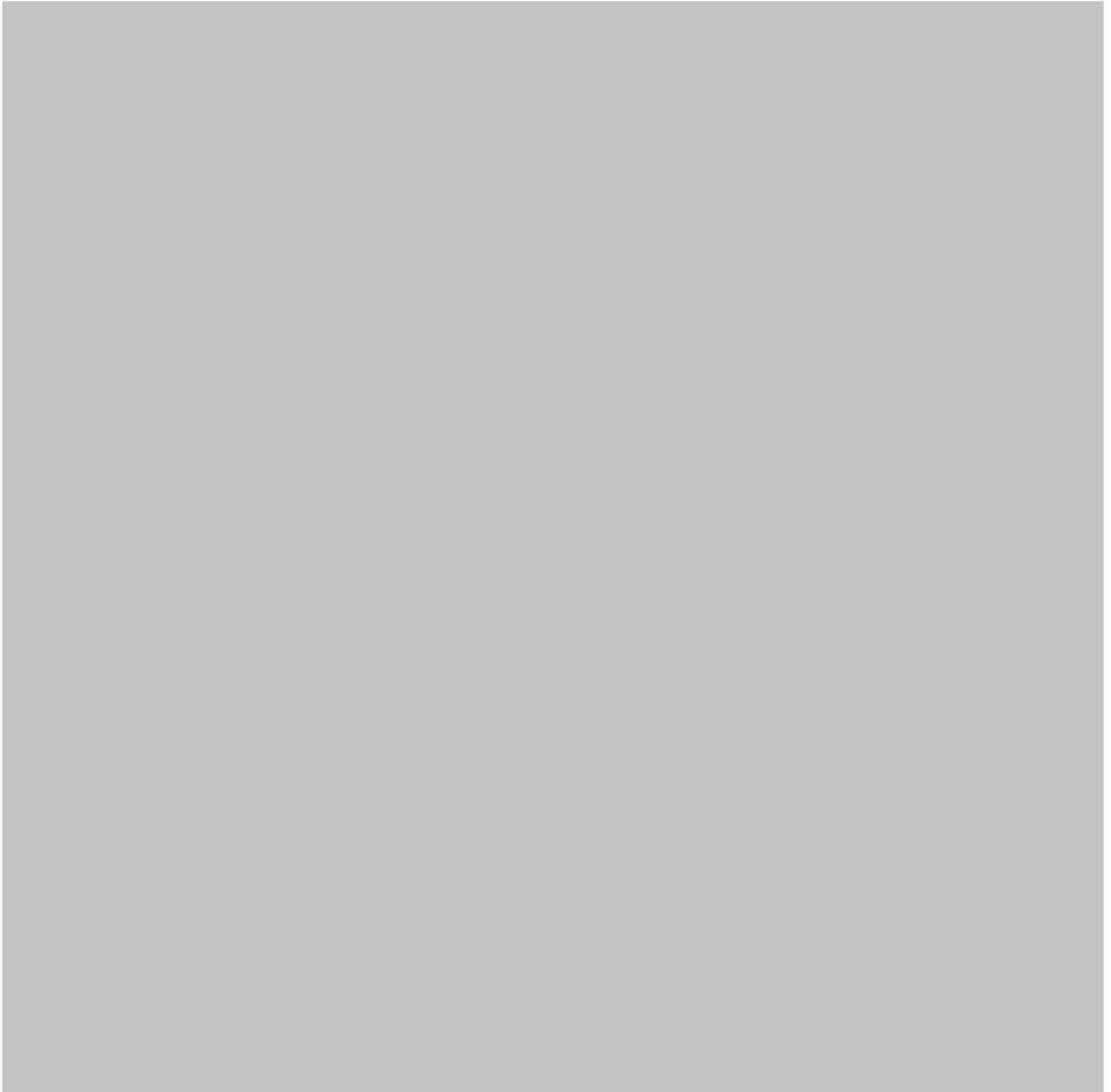
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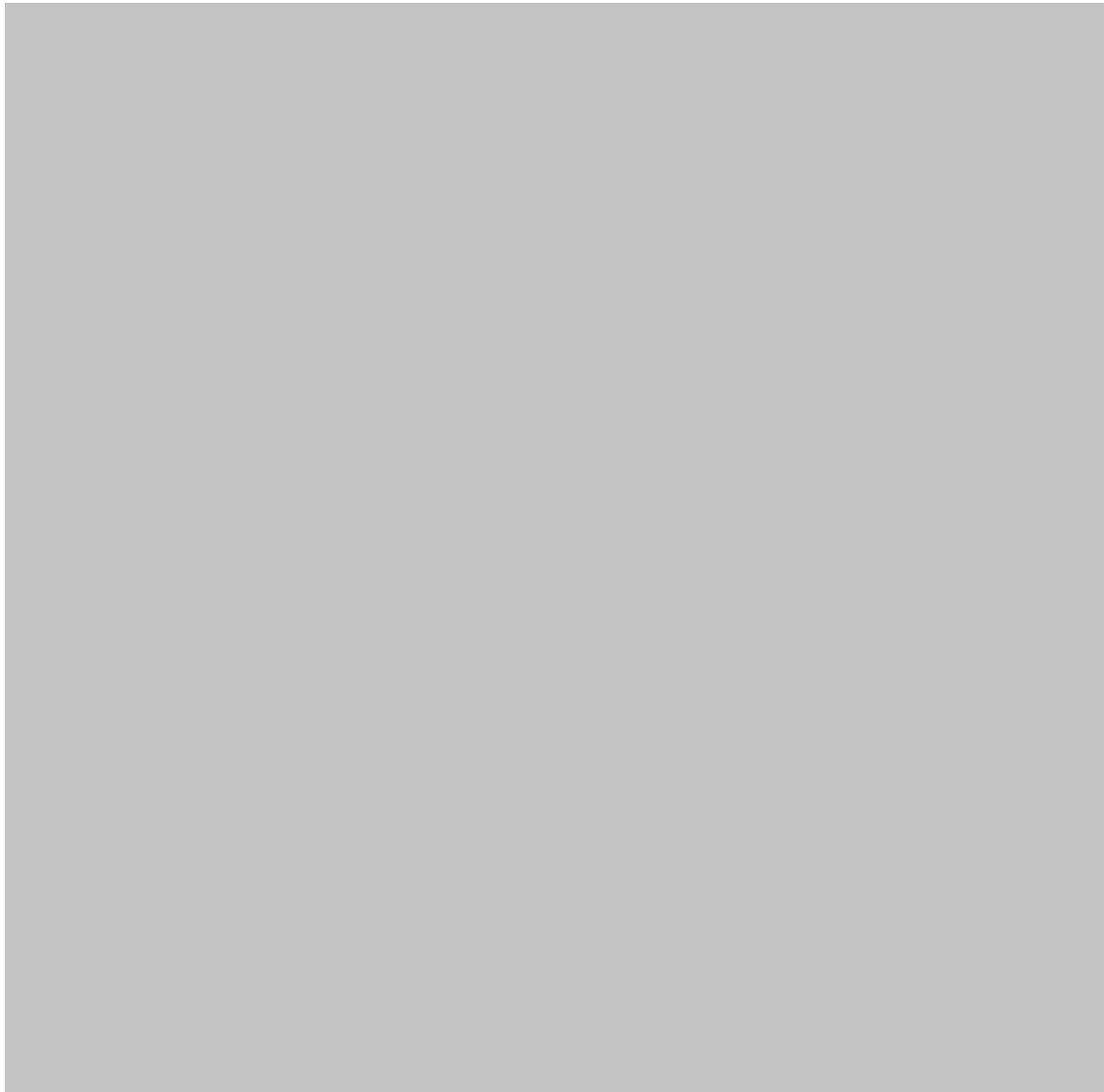
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