Public Review for
Papyrus: A Software Platform for Distributed Dynamic Spectrum Sharing Using SDRs
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Dynamic spectrum sharing has become increasingly important. In the US, for example, the FCC has allowed unlicensed use of spectrum white spaces unused by TV around 700 MHz, giving final rules for access as recently as September 23. More work is needed to understand what strategies will be most valuable to let different devices access and share this spectrum without stepping on the primary users or each other. To see how those designs work in practice, researchers need an experimental platform. That is where Papyrus comes in.

It is just such a platform, built on the USRP software-defined radio and providing two primitives for spectrum sharing. The first primitive is wideband spectrum sensing using power spectral density edge detection instead of energy detection for better accuracy. The second primitive is flexible selection of bandwidth for transmit and receive operations using a distributed version of OFDMA over non-contiguous frequency bands. Both of these primitives are generally useful and a strength of the work.

What is new here? That is the question the reviewers asked, given that the two key features of Papyrus were unveiled as part of the authors’ work on the Jello system presented at NSDI 2010. The answer is that Papyrus has been crystallized as a separate core from the broader Jello system based on experience. This core is the widely reusable portion that other researchers will want most, and it has now been released and is available to the research community. The paper provides an API for the core along with other key parameters. To illustrate the API, it describes how Papyrus is used by Jello, as well as by Ganache, another system the authors have built using Papyrus for intelligent guardband configuration that appeared in Mobicom 2010. All of which should be good news for wireless researchers.

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