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Software Radios Architecture and Technology

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The software radio depends on wideband and agile antennas, RF, analog to digital and digital to analog conversion (ADC/ DAC) technology for multiband multimode capabilities. As technology challenges such as self-generated interference and dynamic range are overcome, the complexity of software radio nodes will continue to increase with most of that complexity accounted for in the software. At the same time, service providers need seamless plug-and-play across handset and infrastructure nodes. Fortunately, increased capacity and reduced costs of digital signal processing (DSP), field programmable gate arrays (FPGAs) and DSP-core based applications specific integrated circuits (ASICs) enable software radio applications in base stations, handsets and vehicular radios. This presentation provides a brief overview of the software radio architecture emphasizing the issues raised as the software content grows from a few tens of thousands of lines of code for today's programmable digital radios to hundreds of thousands of lines of layered middleware in the future.