Software Defined Radios (SDR)

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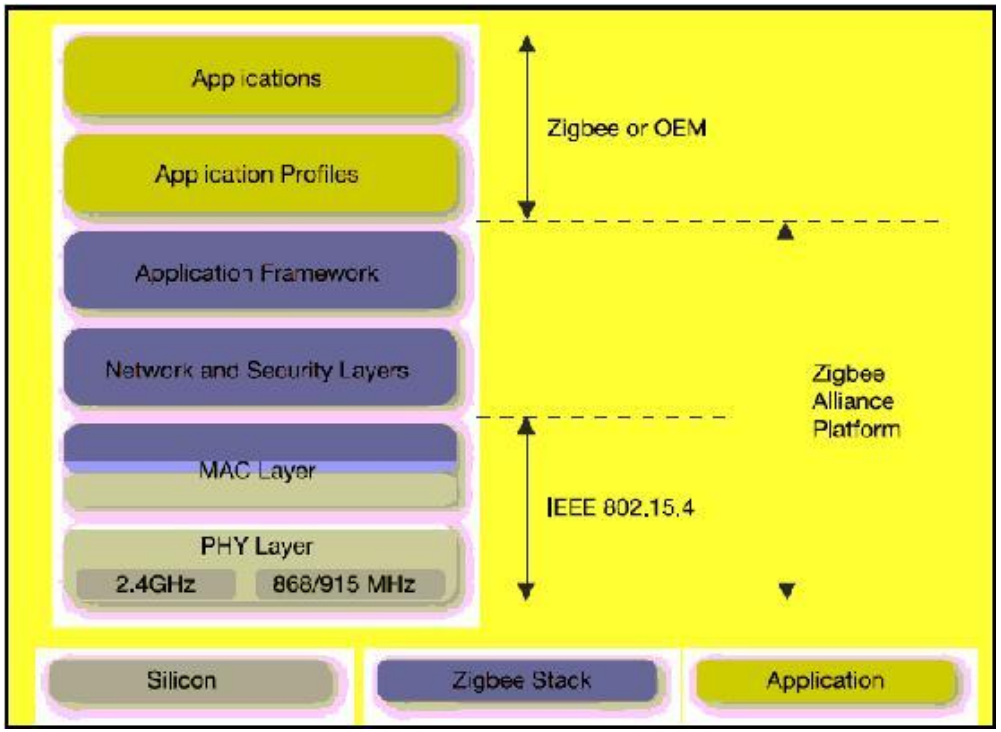
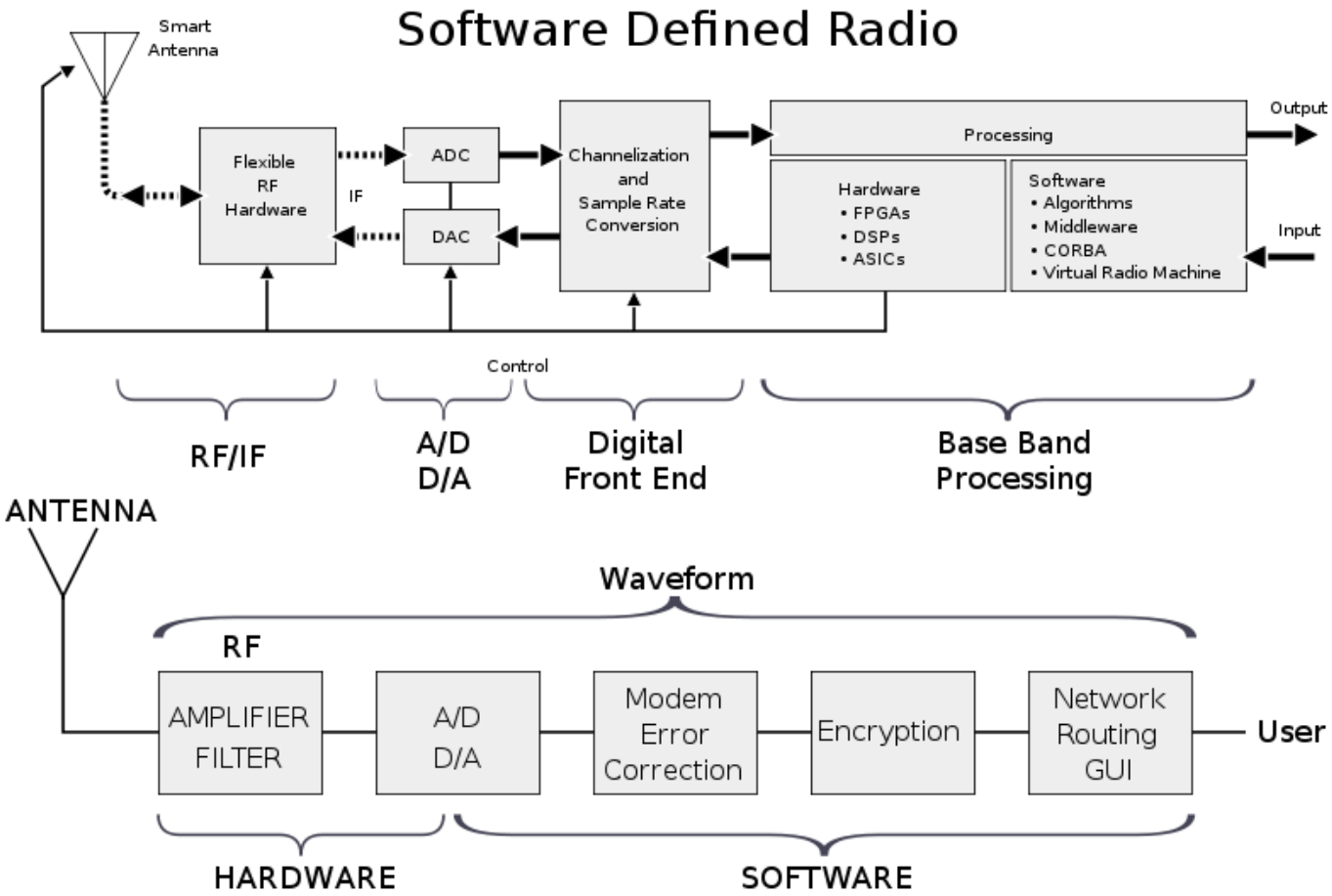
Radio Communication



- A radio transmitter and a receiver configured to the same settings.
- Depending on the configurations and protocols used at different layers, our radio becomes Wifi, Bluetooth, GSM, Zigbee, FM radio, etc.

Software Defined Radio (SDR)



Applications of SDR

- Military communication.
- Testing and evaluating wireless protocols.
- Radio astronomy.
- Wireless network security activities.
- And many more ...

The Falcon III® AN/PRC-152A wideband hand-held tactical radio uses SDR technology for adapting to different waveform applications. [Photo courtesy of Harris RF Communications (www.rf.harris.com).]

Requirements for SDR

- Hardware: USRP, HackRF, BladeRF, RTL-SDR, etc.
- Software: GNURadio, GQRX, SDR#, etc.
- To do some serious work with SDR, a good knowledge in digital signal processing (DSP) is highly necessary.

HackRF One

A software defined radio peripheral capable of transmission and reception of radio signals.

- 10 MHz to 6 GHz operating frequency
- half-duplex transceiver
- up to 20 million samples per second
- USB-powered
- open source hardware

A Walk Through the Spectrum

- FM Radio.
- WiFi packets.
- GSM networks.
- GPS satellite data.
- etc . . .