DEMO Specifications

(1) Spectrum Etiquette Protocol

(2) Spectrum Sensor Applications

Xiangpeng Jing

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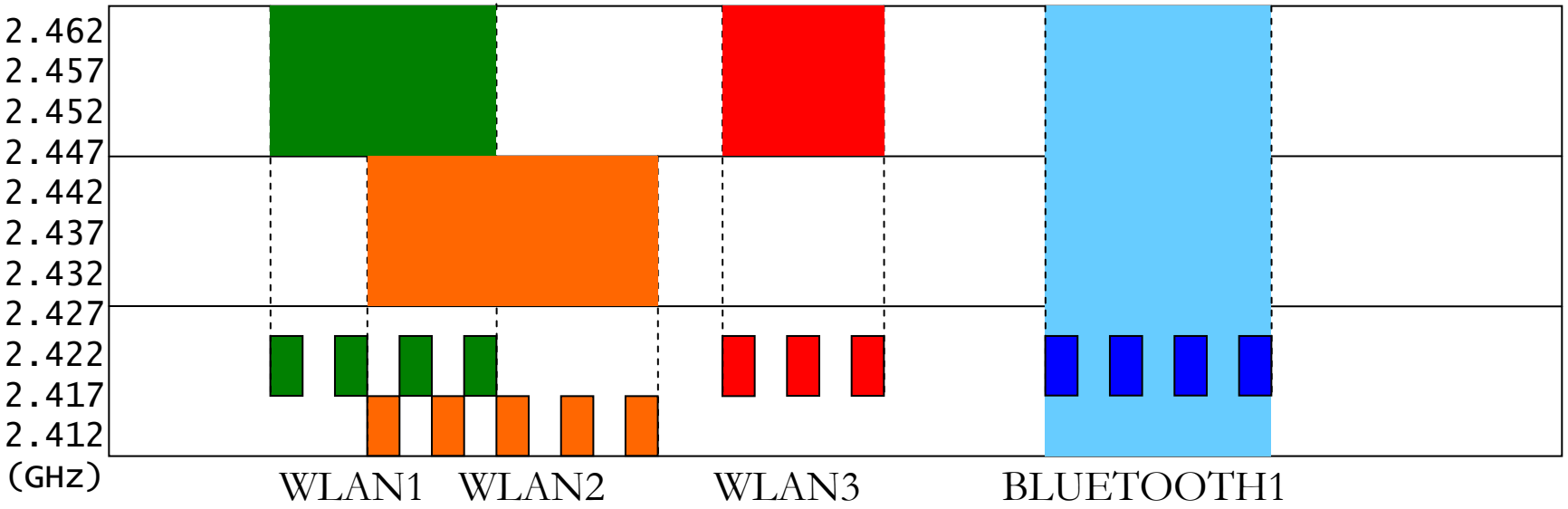
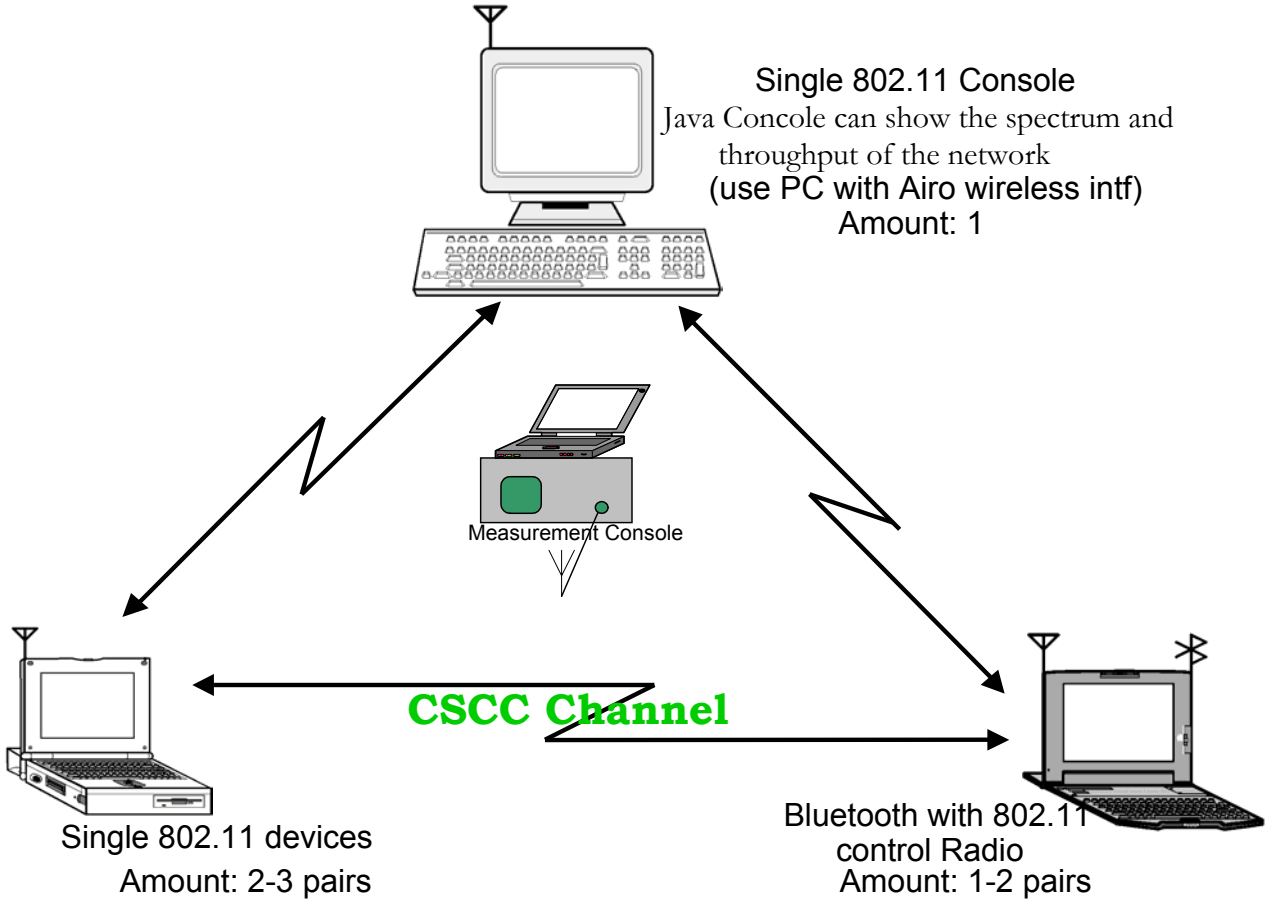
Spectrum Etiquette at ISM Band



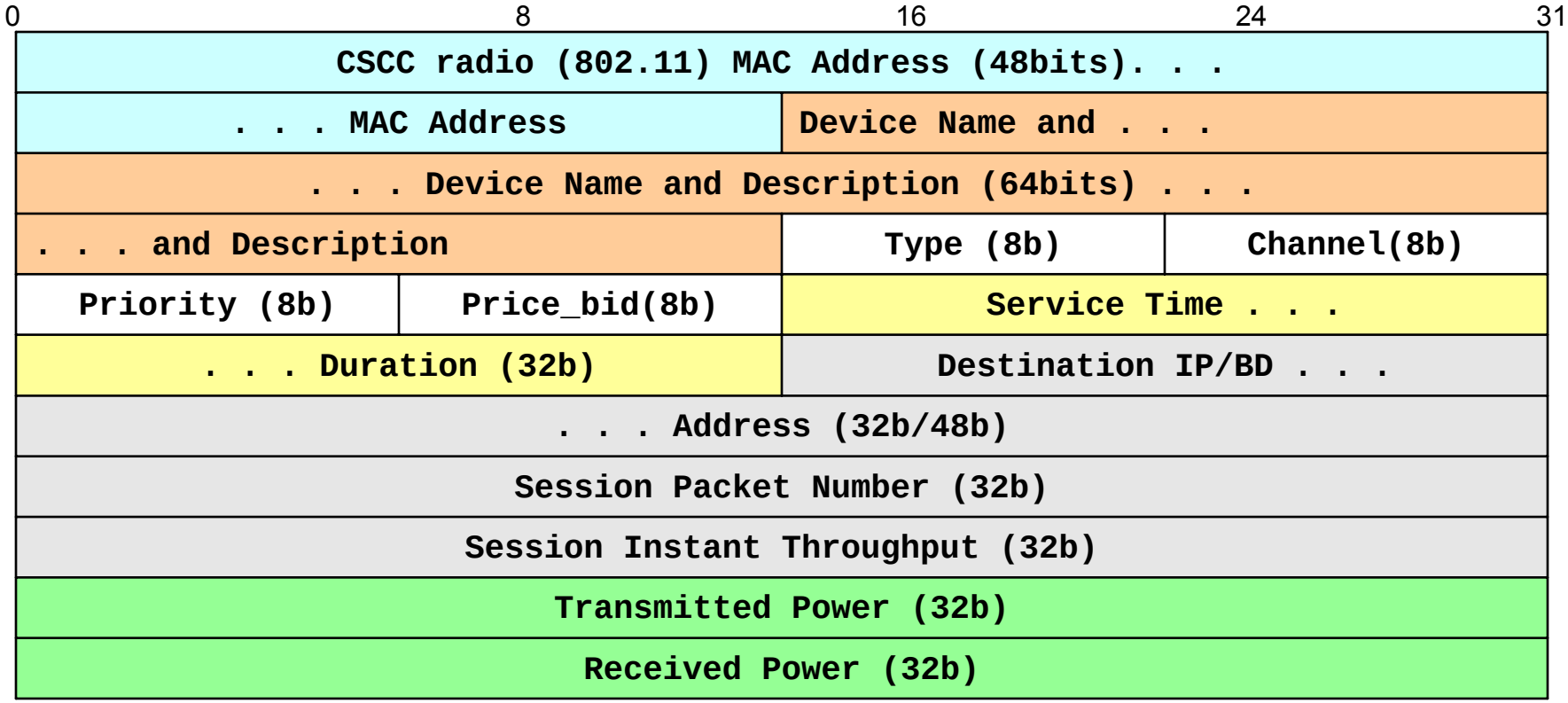
- In the DEMO, only the 3 non- overlapping channels are considered for Etiquette
- Channel 1 is reserved for CSCC
- 802.11b devices compete for the 2 available data channels
- Bluetooth will take the hold band

DEMO Scenarios



- Session-starter is responsible for reporting its statistics by CSCC
- CSCC console shows the networking view, and Measurement console shows the measured spectrum conditions

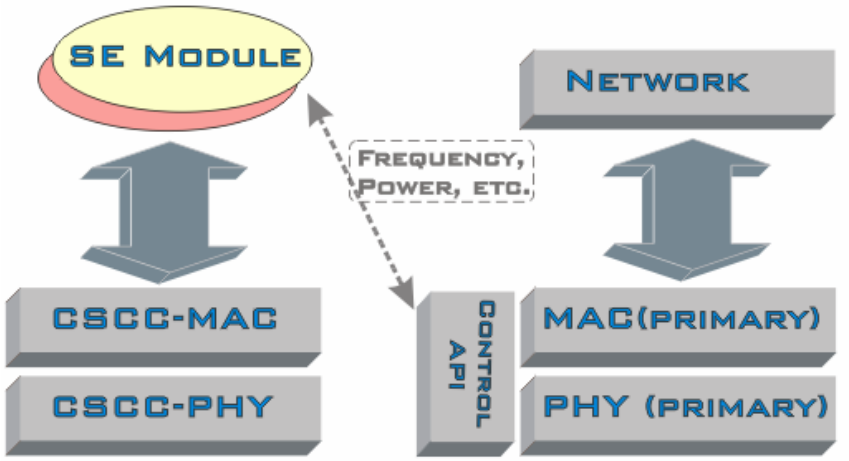
CSCC Packet Format



* The grey part (112bits) is for DEMO purposes only

- CSCC_DEMO (352bits) will allow devices to bid for channels and announce their own data session features
- CSCC packets is encapsulated by standard Ethernet Packet, and broadcast (on-demand) by layer 2 functions

Implementation Structure



Dual Radio Structure

- WLAN devices use single radio structure: for default, radio working in CSCC channel
- Bluetooth devices use dual radio structure

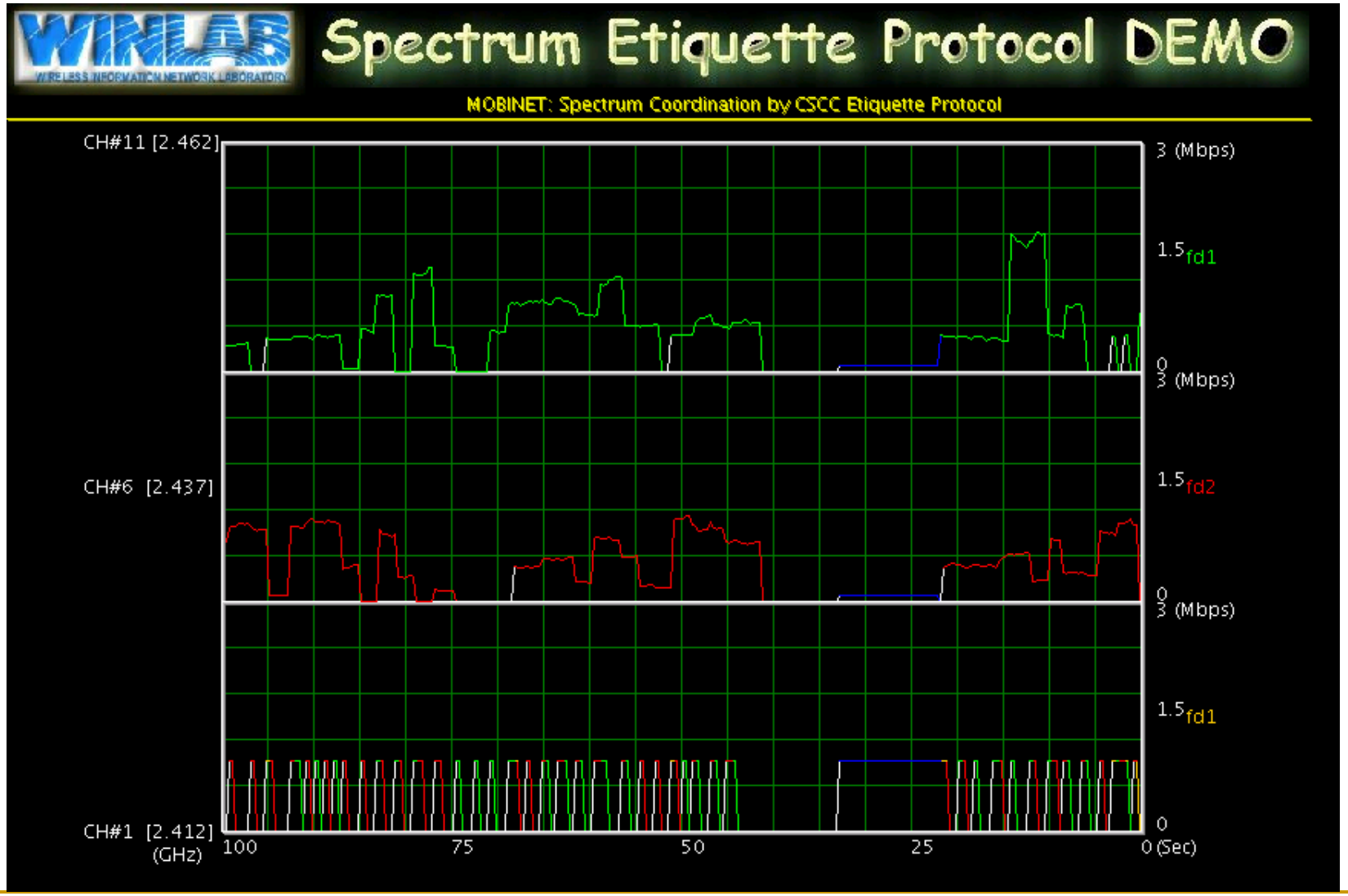
- SE module performs control functions including channel-bid/out-bid, data session control, network statistics dumping, (power control and other QoS issues)
- Channel table is maintained in SE module

Experimental Parameters

CSCC_FRM_TYPE	0x0950
CSCC broadcast interval	1-3 seconds*
Default WLAN Data channel	11 (or with the least interference)
Min Data Session Interval	30 seconds
Max data session packets	2000 packets
Max UDP packet length	1500 Bytes
Max Bluetooth ACL length	500 Bytes
UDP Data Session timeout	2 seconds
Bluetooth Poll timeout / reties	5 seconds / 5 times

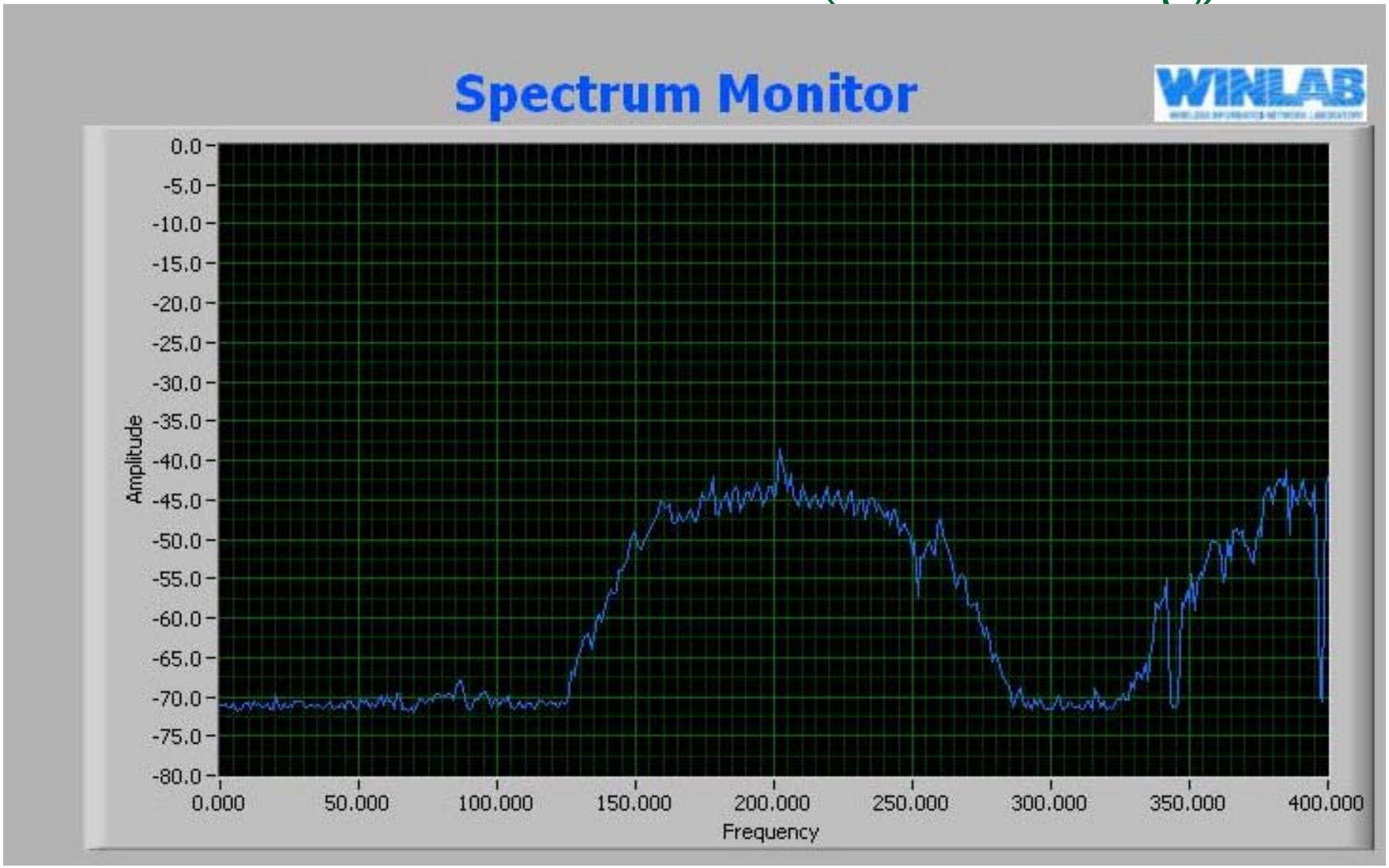
* Bluetooth may have less CSCC interval since its CSCC radio is full-time for control, WLAN CSCC interval may be long due to the long switching time of radios between different channels

CSCC Console at a glance



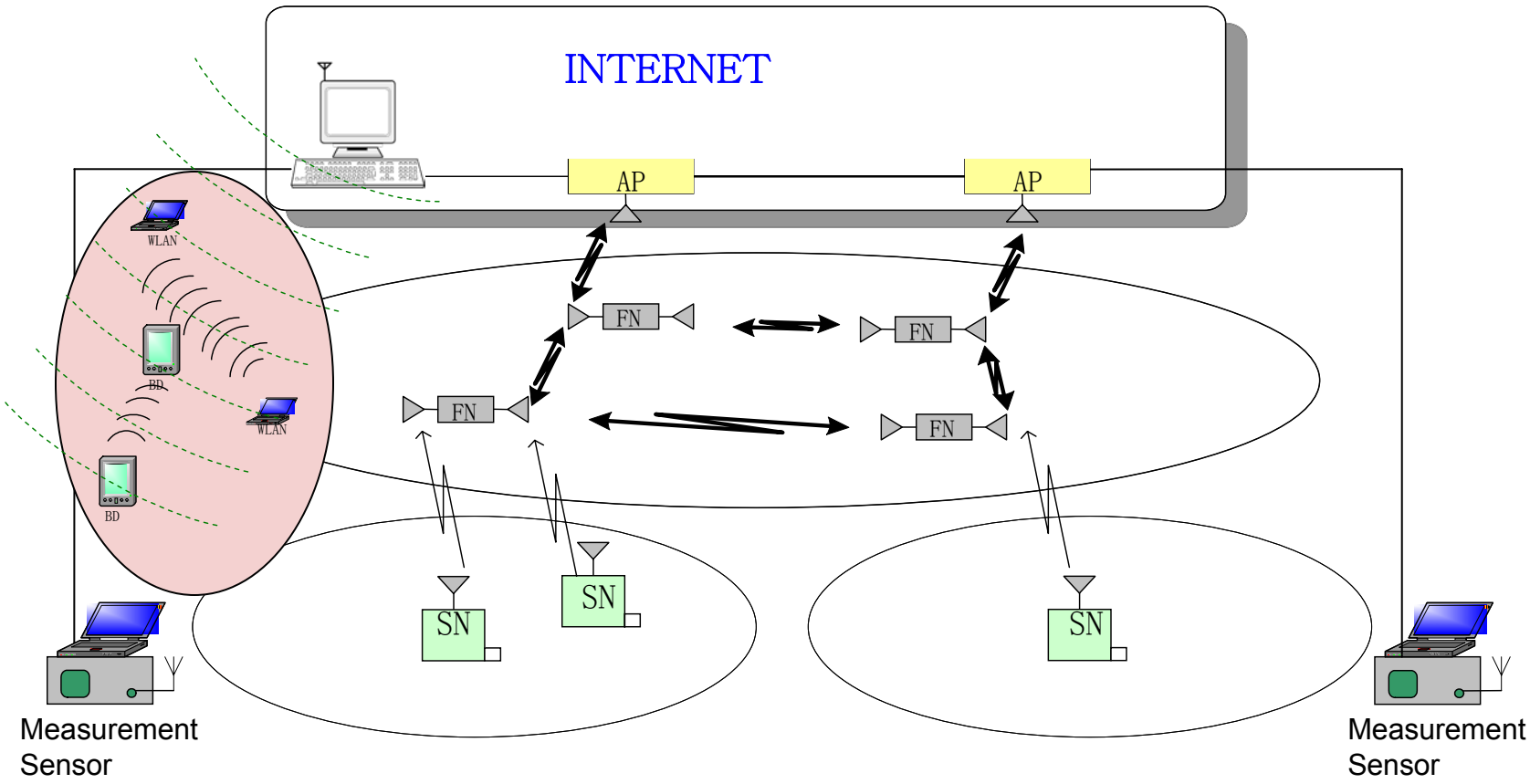
Throughput vs. Time for different channels

Measurement Console (- Xuefeng)



Power(dBm) vs. Frequency Band(2.412-2.462GHz)

Spectrum Sensor Applications



- Spectrum sensors are capable to detect interference sources such as Microwave Oven which can not be detected by CSCC (we should assume that sensor interference is small enough)

Sensor Application Data

- Sensor Node periodically unicast data to its direct parent (after association)
  - {x, y} position coordinate
  - Channel number
  - Link quality (noisy level)
- FN and AP will route all the data to the console
- Console is capable to broadcast the spectrum usage information by CSCC
- Communicating devices will coordinate and choose the least interference channels
- Why position since we are under the same coverage?

Any other discussing issues?

Thank you!