

Efficient sharing of radio spectrum requires sensing and use of channel state information (CSI), measured by commercial shared spectrum radio access equipment. CSI sensing could be construed by a malicious agent to reveal the structure, capabilities, limitations, and vulnerabilities of incumbent US federal wireless signals in space, including military waveforms.

***CSI must not be aggregated*** in a way that would allow a third party to infer federal patterns of spectrum usage, especially via the potentially millions of infrastructure and user equipment devices whose measurements of CSI would be needed by the SAS for maximizing spectrum utilization.

Expressed simplistically, according to Title 18, the US criminal statutes, it is a crime to listen to US federal radio channels for the purpose of discovering information that “could be” either “injurious to the US” or “potentially advantageous” to a foreign power.

Charlie, a malicious agent having access to a database of CSI, could correlate signatures to operations, such as spectrum usage interference patterns correlated to visits of federal agents making arrests, etc.

A SAS composed as a TVWS database would facilitate analyzing signals of incumbents such as military radar systems, facilitating such correlations of CSI with operations, potentially revealing capabilities and limitations of military value to an unfriendly nation, rendering harm to US national security operations.

## Recommendations

1. SAS responsibility for protecting national security information should be acknowledged and SAS operations should be required to prohibit the unauthorized aggregation of channel state information and should limit the promulgation of authorized knowledge acquired from spectrum sensing.
2. FCC should adopt a three tiered federated SAS comprised to protect national security and to enforce spectrum usage requirements and mandates;
  1. a secure core SAS authorized to aggregate and analyze channel state information,
  2. regional SAS control centers operated by commercial entities for the benefit of public usage of the spectrum, and
  3. a lower layer of SAS nodes able to authorize use of shared spectrum and able to clear spectrum in response to alarms or on command of regional or secure core SAS.



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