Licensed or Unlicensed, That is the Question?

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Context

- Intel supports both unlicensed & licensed uses:
  - 6.78 & 900 MHz for ISM
  - 2.4, 5 & 60 GHz for Wi-Fi
  - >6 GHz for UWB
  - <1 GHz for IMT
- Intel doesn't oppose any new technology, but "*licensed versus unlicensed*" is not primarily a technology question.

Licensed v. Unlicensed?

- Allocation decisions must be made on the margin, *i.e.*, how should the next MHz be allocated?
- Policymakers must consider the costs & benefits of possible uses in particular bands.
- Or what the "opportunity cost" of each alternative is?

Exclusive *Flexible* Licenses

- Exclusive licensees, if they have *flexibility*, face the opportunity costs of their technology & service decisions. They have:
  - Good information
  - Strong incentives
- Exclusive licensed use is the "opportunity cost" of unlicensed use and policymakers should try to quantify it.

E.g., <1 GHz

- It's propagation characteristics for "wide area coverage" networks are great.
- The opportunity cost of unlicensed use of this spectrum would be high. 2 bad possibilities:
  1. High power unlicensed use will lead to a "tragedy of commons" or cacophony with:
     - Suboptimal quality of service
     - Suboptimal network incentives
  2. Low power unlicensed use will forego the spectrum's inherent propagation advantage.

Recommended Paradigm

1. Cleared or shared spectrum should presumptively be exclusively licensed on a flexible basis.
2. Unlicensed use should be permitted where such use would not create:
   - Foreclosure or significant interference,
   - Especially where the spectrum is suitable for high powered, wide area network use as it is <1 GHz,
   - That is, where the opportunity cost is low as it is for 6.78 & 900 MHz and 2.4, 5 & 60 GHz.