On the Regulation of Civil Millimeterwave Technology in USA

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The views in this presentation are those of the author and are not necessarily those of the FCC or US Government.
Basic Physics

• Above 30 GHz, molecular resonances have a large impact on propagation - unlike lower frequencies
• Path loss can be quite large!
Some Bands Have Very High Loss
Japanese 50 GHz Developments

• About 1985 Japanese MPT “urges” Fujitsu and NEC to develop “simplified radio system” at 50 GHz to open this part of spectrum for commercial use.

• Special simple licensing procedures effectively subsidize users

• Models developed for T1 and NTSC video
UK Radiocommunications Agency 1987 Analysis
FCC Docket 94-124

- NPRM adopted 10/20/94
- Addressed possible unlicensed use of 59-64 GHz (and automotive radar at 76-77 GHz)
- R&O adopted 12/15/95
- Comments focused on indoor use although outdoor also allowed
  - Indoor systems have yet to be sold
  - Outdoor systems are available but performance limited by rules that focus on indoor
A Commercial 60 GHz System

“If you permit it, they will build it” - *The Field of Dreams* doctrine

- First FCC Part 15.255-certified millimeter wavelength system operating in the 57.05 to 64 GHz band
- Fast Ethernet (100 Mbps), OC-3/STM-1 (155 Mbps), OC-12/STM-4 (622 Mbps) and Gigabit Ethernet (1 Gbps) full-duplex bandwidths
- Extremely high link availability
- Narrow beam width increases security and enables virtually interference-free operation

Third-generation, mature product line
Simple one-person installation and alignment

Docket 02-146
70/80/90 GHz

• Started with 7/14/00 public workshop on 92-95 GHz band

• Workshop attracted public interest in this field and Loea Communications announced interest in 71-76 GHz and 81-86 GHz

• 2002 International Microwave Symposium lunch session on commercial mmW attracts 200 paid attendees
Docket 02-146
70/80/90 GHz

• 6/28/02 NPRM adopted
  – Several policy options considered for spectrum use: licensed (with and without auctions) & unlicensed

• 11/04/03 R&O adopted
  – Licensed only in 71-76 and 81-86
  – Both licensed and unlicensed in 92-95
  – Several manufacturers still seek mandatory \textit{a priori} coordination