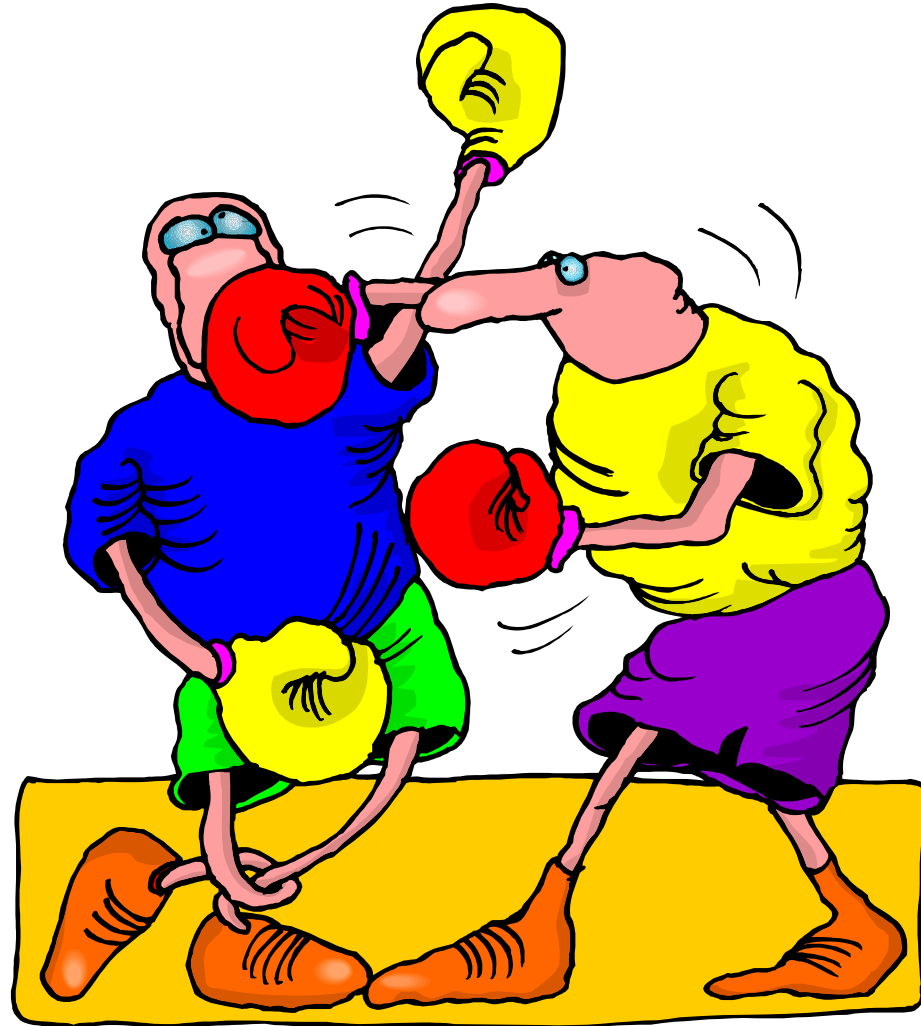


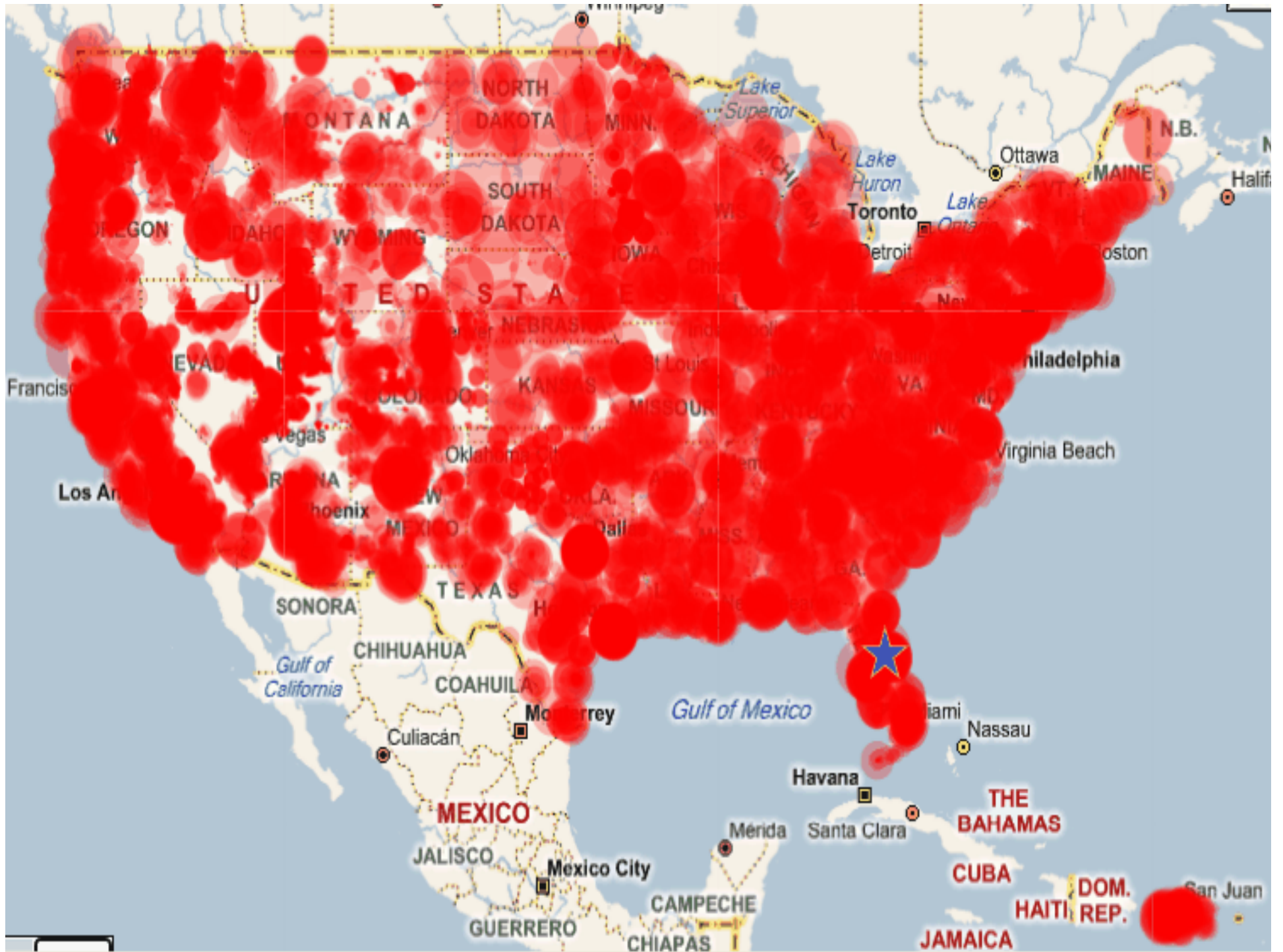


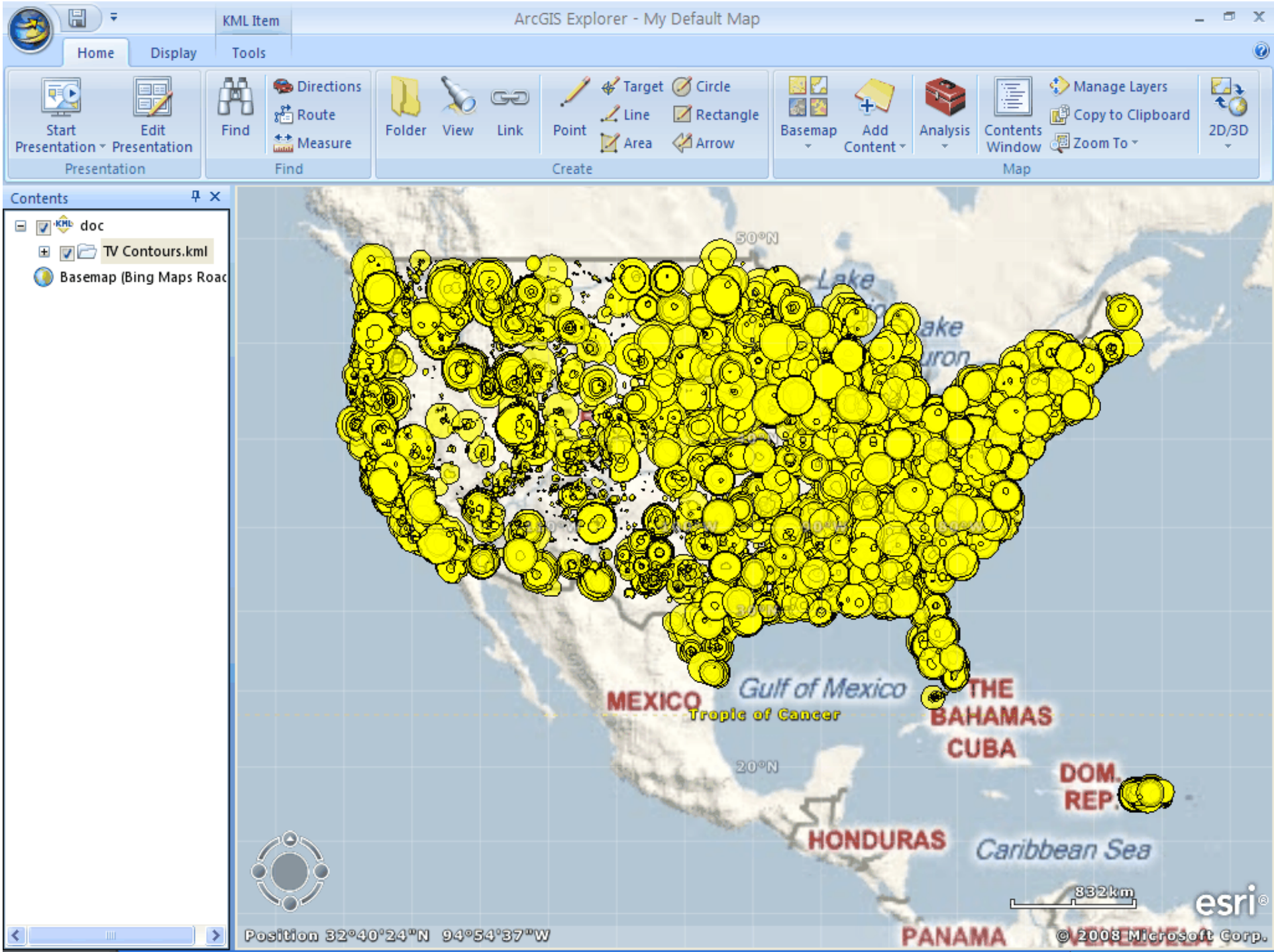
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TV White Space vs Net Neutrality

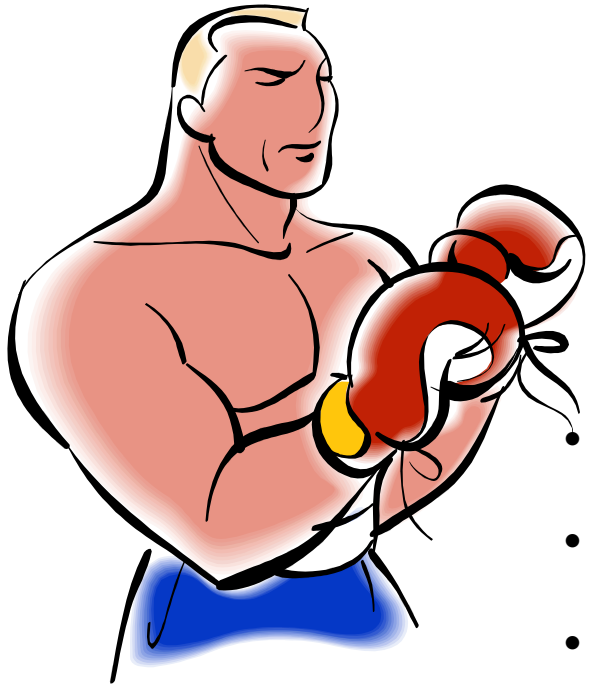


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The Tale of the Tape

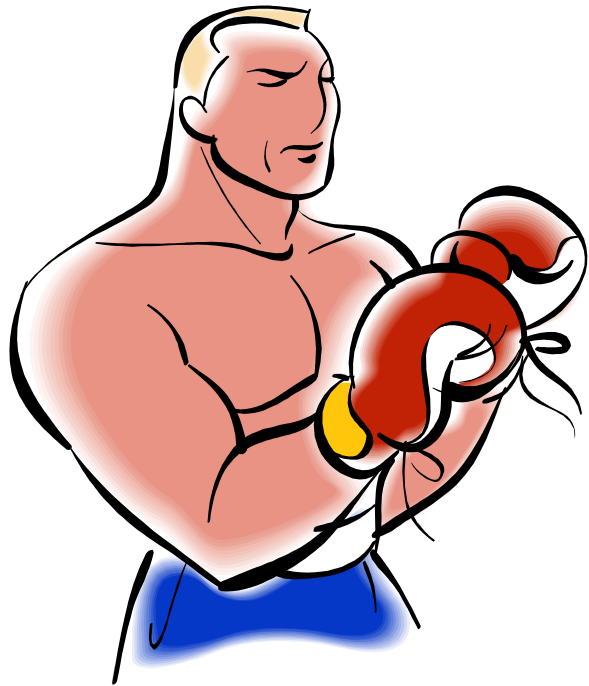


"This new unlicensed spectrum will be a powerful platform for innovation...When we unleash American ingenuity, great things happen." - FCC Chairman Julius Genachowski

TV White Space

Rural Broadband
Champion?

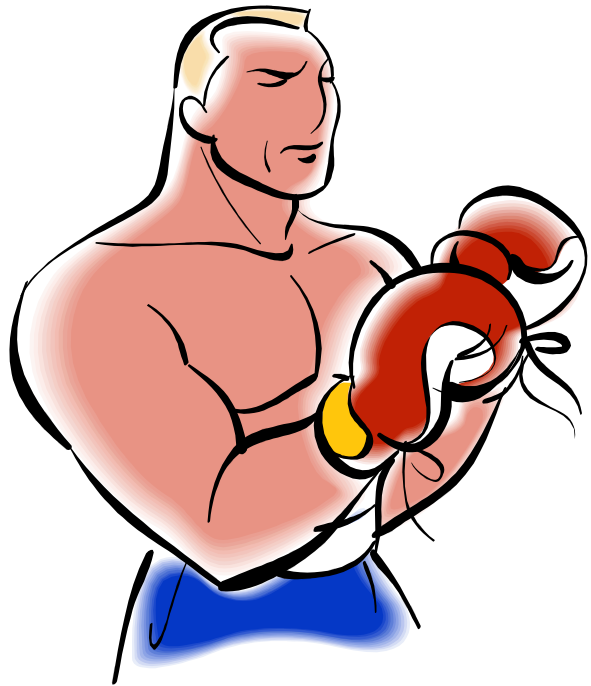
- Channels 2- 13 VHF & 14-51 UHF
- The rules limit how much white space a device can access
- Channel 37 is reserved for special applications
- The band has not been cleared (*Consolidated Database System*)
- Device power limits - unlicensed band
 - o Fixed - 4 Watts
 - o Portable - 100 mw any channel non adjacent to a TV broadcast
 - o 40 mw any channel adjacent to a TV broadcast
- "HAAT" restrictions may limit use in hilly/mountainous areas



TV White Space

Rural Broadband
Champion?

- Propagation characteristics of these frequencies increase both the potential for interference & self interference
- Currently there is no process, mandated by the FCC, to mitigate interference with fixed TVBD users
- Substantially better coverage than 900 MHz and 2.4 GHz
- The band has not been cleared (**Consolidated Database System**)
- Low powered portable can only operate in channels 2-51 (channel 37 excluded)
- Need for development of mitigation interference techniques and commercially available equipment
- N.A.B. still opposes use of TV White Space
- TV White Space rules should enable rural broadband deployments. As such, the HAAT rules must be revisited.

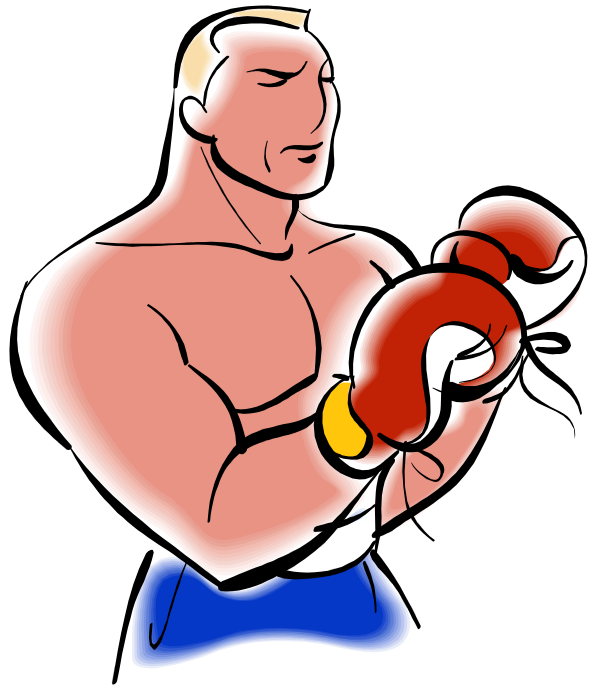


TV White Space

Rural Broadband
Champion?

Middle Mile

- Potentially suitable for rural deployments
- High power point-to-point links could achieve 100 Mbps perhaps as far as 20-30 miles
- Wide propagation is problematic however
- Public Benefit: lower middle-mile costs can drive rural broadband deployment



TV White Space

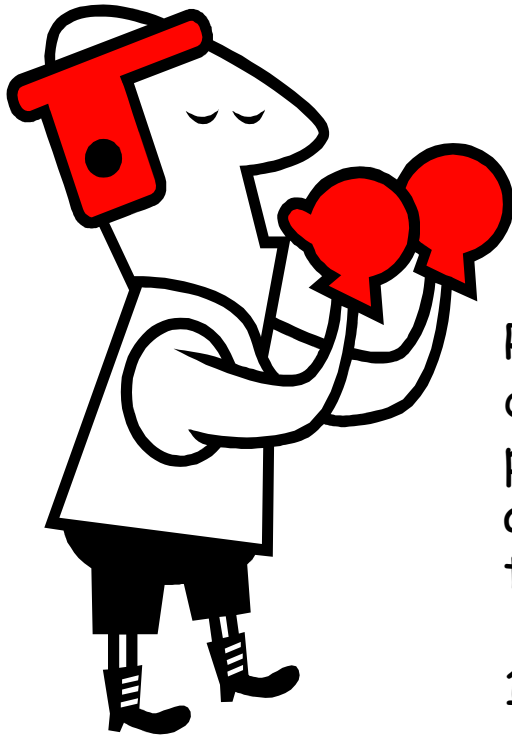
Rural Broadband
Champion?

Last Mile

- Focused upon more last mile competition and options, particularly for "connected devices".
- Low power, generally a point-to-multipoint or mesh architecture
- Oriented toward integrated devices or supplement to licensed mobile broadband uses
- Largely an urban application and solution
- Public Benefit: Additional last-mile options and /or competition, - especially for integrated devices, smart grid et al.

The Tale of the Tape

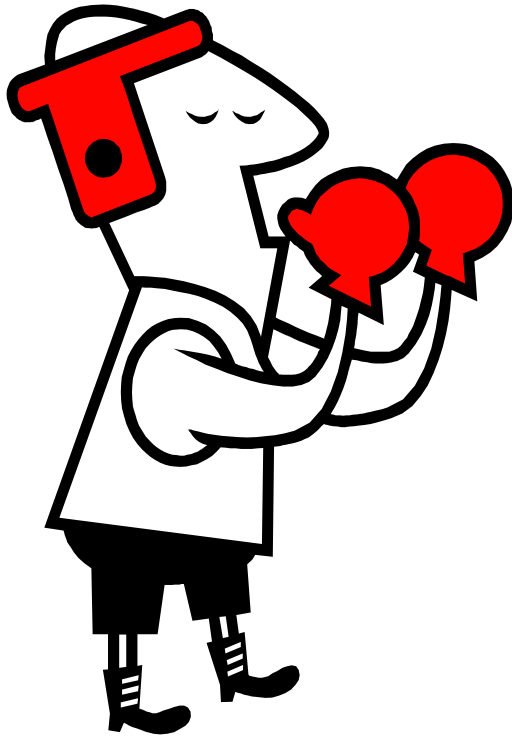
Impact of Net Neutrality Rules



Net Neutrality
Unknown Contender?

Recently adopted FCC rules prohibit “unreasonable discrimination” of Internet content and applications, prohibits blocking of lawful Internet content and applications, and imposes network performance transparency rules on all broadband providers.

1. Applies to fixed wireless and excludes mobile wireless. TV white space rules allow for “fixed” & “portable”.
2. Allows for ISPs to engage in “reasonable network management.”
3. May prohibit arrangements in which a website or applications provider would pay for priority service to a consumer.



Net Neutrality
Unknown Contender?

Ideally the FCC should create guidelines that balance an ISPs' need to manage traffic and yet maintain the importance of an open network.

What happened to the FCC's "Open Internet Order"?

- Preserve the open Internet as a platform for innovation, investment, competition, and free expression.
- Rules that would protect consumers' and innovators' right to know basic information about broadband service
- Right to send and receive lawful Internet traffic,
- Right to a level playing field
- Providing broadband ISPs with the flexibility to reasonably manage their networks.

Is There A Clear Winner?

