Conference Logistics

- Conference materials

- Room layout

- Meetings: WSRD-SSG and CSMAC

- DFS Test System Demo

- Food

- Internet resources – www.its.bldrdoc.gov/isart

- Boulder

- Informal social events: Hike and happy hour

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Current Background

- ISART (in general)

- FCC National Broadband Plan

- Presidential Memo

- NTIA Plan and Fast Track Recommendations

- Proposed legislation

Why is Finding Extra Spectrum Difficult?

- Economic Constraints
  - Established legacy
  - Lack of incentive
  - Budgetary constraints

- Technical Complexity
  - Technology is moving to wider bandwidths
  - Advanced Technical knowledge
  - needed to forecast success/failure of repurposed spectrum
  - Variety of systems and usage models

- Stakeholder Dynamics
  - Diverse array of stakeholders, roles, and relationships
  - Competing self-interests

Diverse Array of Stakeholders, Roles, and Relationships

- Government
- International communities
- Spectrum managers and regulators
- Federal and private-sector incumbents
- Big business and lobbyists

- Think tanks
- Unlicensed users and small business
- Acquisition offices and investors
- Technologists, innovators, and R&D
- Standards bodies
- Application users

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Competing Influences and Self-Interests

- Federal vs. commercial
- Science vs. politics
- Regulators vs. regulated
- Profit vs. social benefit
- Short-term vs. long-term

- Licensed vs. unlicensed
- Business X vs. business Y
- Agency X vs. agency Y
- Business X vs. agency Y
- Service X vs. service Y

ISART 2010 – Spectrum Sharing

- Format Goal: Multi-stakeholder, multi-disciplinary debate and discussions

- Principle-Based Goal: To evaluate sharing as a means of improving overall utilization of the spectrum

- Session Topics:
  - DSA Technologies and Rules
  - Measuring Spectrum Occupancy
  - Interference Protection Criteria
  - Spectrum Management
  - Sharing LMR Bands
  - Sharing Radar Bands
  - Business
  - Context Awareness
  - Research

ISART 2010 – Conclusions

- There are successful spectrum sharing solutions, largely amongst existing spectrum holders

- There are other DSA solutions beyond sensing—
e.g., database, beaconing

- Primary obstacles are trust and complexity of sharing scenarios

- DSA technology is somewhat captured in R&D until regulators provide a big enough sandbox to justify investment

- Conflicting self-interests cause information-sharing asymmetries

- Need for flexible funding structures, incentives, and continued Executive/Legislative support

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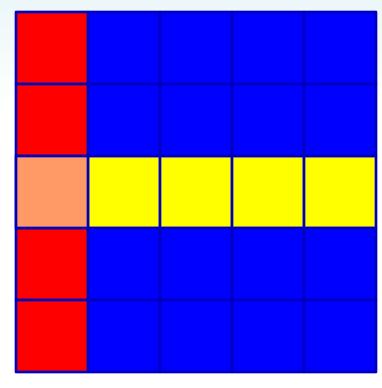
ISART 2010 – Unanswered Q's

- What whitespace should be used for spectrum sharing? Why?

- What are the IPC's of incumbent systems? What technologies and upgrades are available to make systems less susceptible to each other?

- What information is available to improve context awareness and enable cognition and/or DSA?

- Are there legitimate spectrum sharing business models?

- What rules and regulations would promote harmonious coexistence and sharing?

Spectrum Discussions

Means to Further Exploit Spectrum

Reallocation: Inventory, Technology Alternatives

Relocation: Inventory, Spectrum Alternatives

Spectrum Sharing: Interference Protection Criteria, Propagation, Information Sharing, DSA

Technology Upgrade, Re-engineering, and R&D: Digital Signal Processing, Adaptive Antennas

Rules, Regulation & Enforcement: Trust, Access

RS#1   RS#2   RS#3   RS#4   RS#5

Radio Service

When Focused on Individual Radio Services…

- Inventory usage models, operational parameters, and propagation to identify underutilized spectrum and whitespace.

- Evaluate compatibility with other systems.

- Re-engineer to achieve optimal spectrum efficiency, e.g., reduce out-of-band emission, reduce susceptibility to interference, enable information sharing.

- Assess viability of sharing business models and markets.

- Develop rules and a regulatory framework for improving utilization.

ISART 2011

- Principle-based goal: To develop forward-thinking rules and processes to fully exploit spectrum resources.

- Chosen radio service: Radar

- Format goal: To bring together the radar and communications communities for idea sharing and collaboration in an effort to engineer the radar spectrum for maximum benefit to all stakeholders.

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Why Radar?

- Radar spectrum is being squeezed, and in some cases performance is being degraded

- Uses a lot of spectrum – 1537 MHz or 45% of spectrum between 300 MHz and 3700 MHz

- Radar has existed a long time - there is good reason to examine radar spectrum efficiency

- Potential for good quality whitespace

- Advanced R&D community

ISART 2011 Outline

- Lectures – Bill Melvin (GTRI/SEAL)
- Inventory Briefings – Matthew Hussey (Senator Snowe)
- Keynotes – Thomas Power (NTIA), Phil Weiser (CU)
- Overview Panel – Michael Calabrese (New America)
- International Radar Compatibility – John Mettrop (CAA)
- Radar R&D – Joe Guerci (Guerci Consulting)
- Sharing with Commercial Systems – Julius Knapp (FCC)
- Regulatory Reform to Facilitate Spectrum Sharing – Eric Nelson (NTIA/ITS)

Acknowledgements

- ITS'ers

- Co-Chair

- Steering Committee

- Session Chairs

- Speakers

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