

**Presentation to the Semantic Web Applications
for National Security (SWANS) Conference**

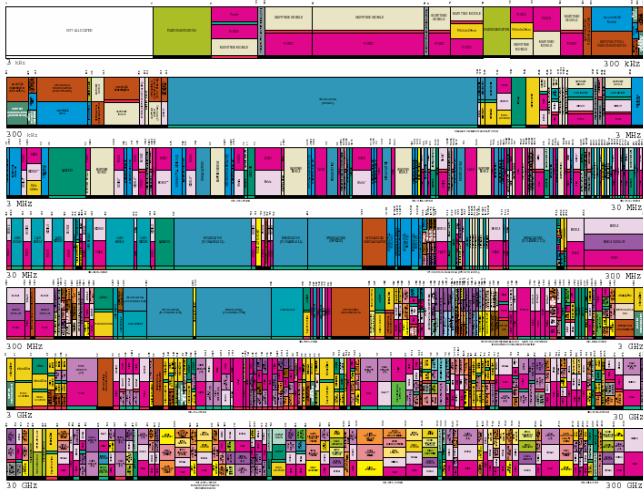


XG Communications Program Information Briefing

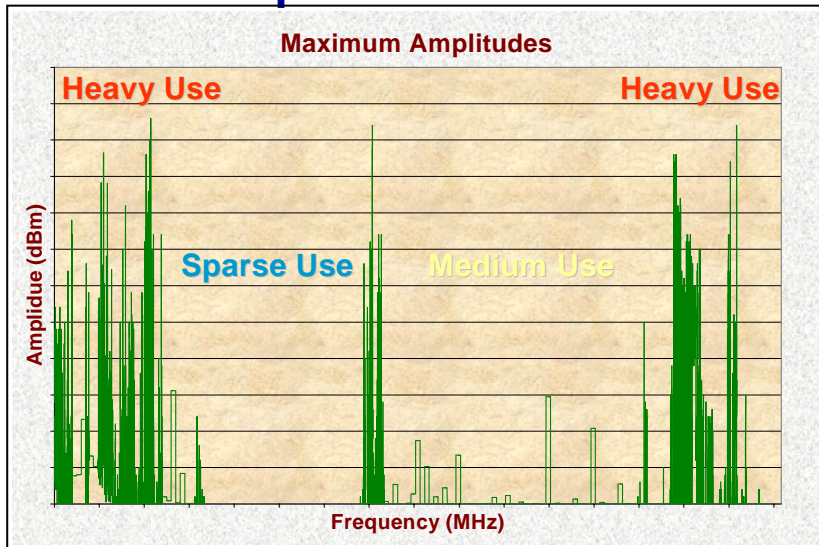
**Preston Marshall
DARPA ATO Program Manager**

7 April 2005

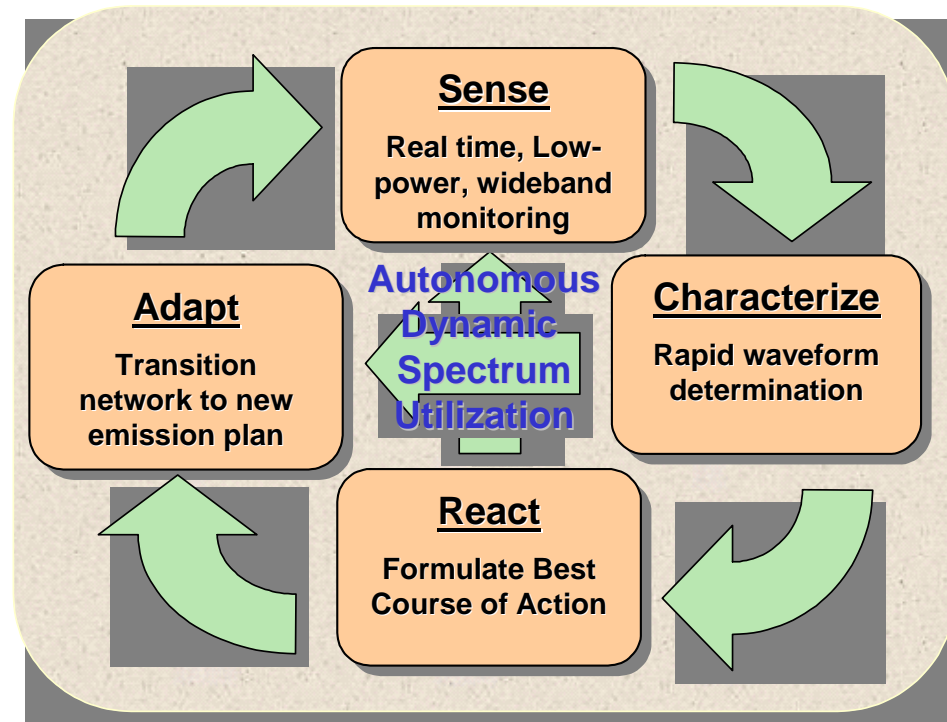
All Spectrum May Be Assigned, But...



...Most Spectrum Is Unused!



XG is Developing the Technology and System Concepts for DoD to Dynamically Access All Available Spectrum



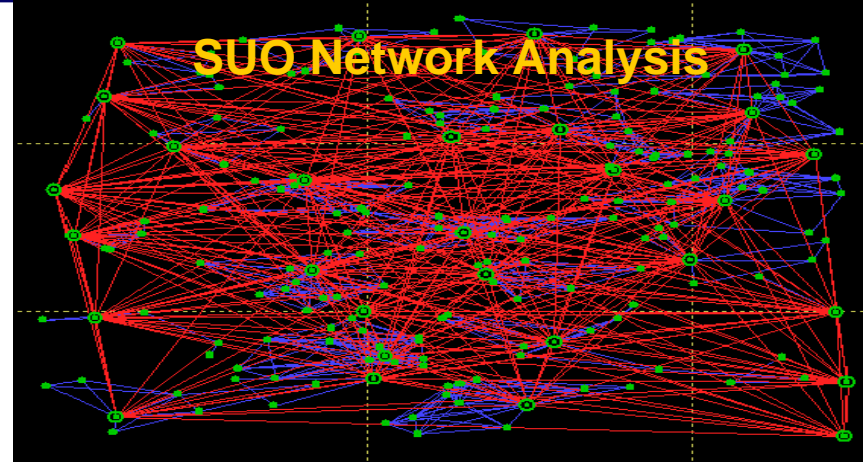
Goal: Demonstrate Factor of 10 Increase in Spectrum Access



A New Way to Access Spectrum Is Necessary



- **Large-Scale Ad Hoc Network Complexity Beyond Human Planning**
 - Dynamic topologies
 - Planning is at least N^2
- **Spectrum Regulatory Processes Vary Between Countries and Regions**
 - Requires Extensive Coordination Time

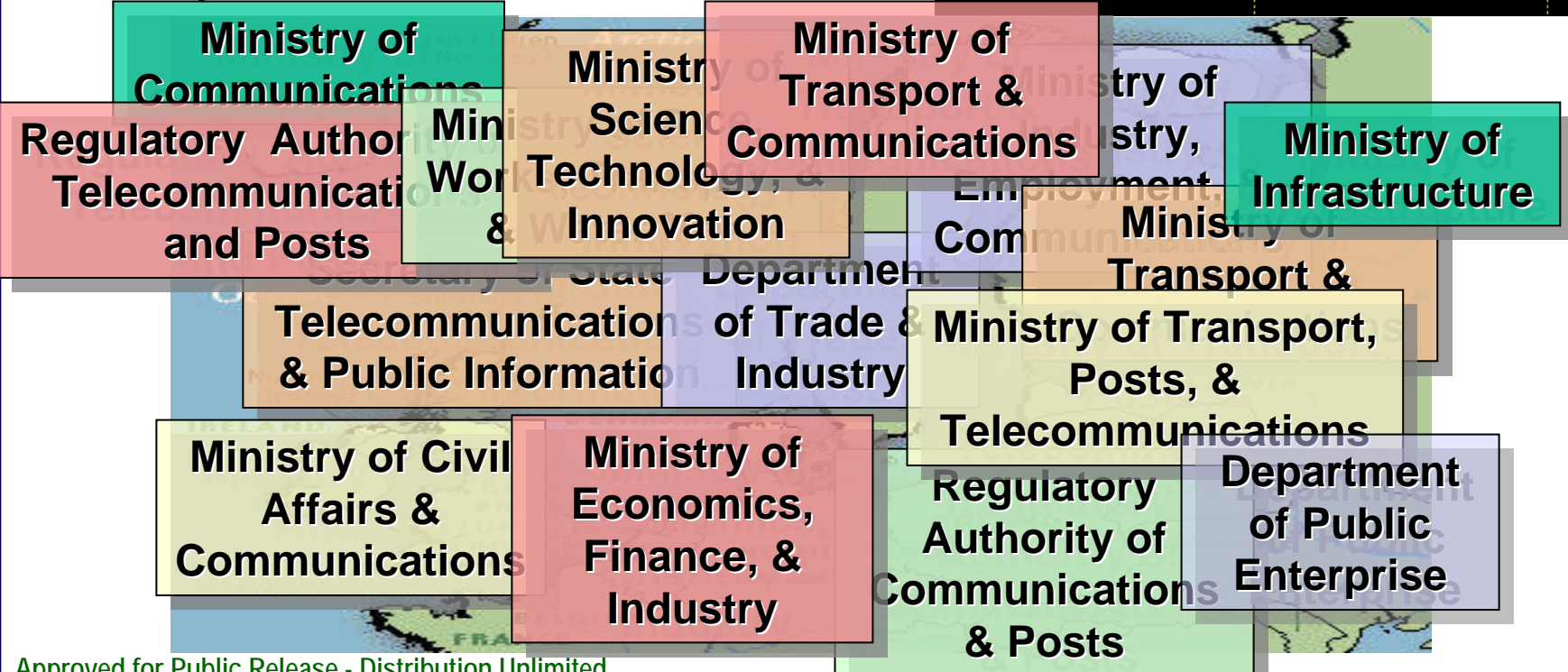
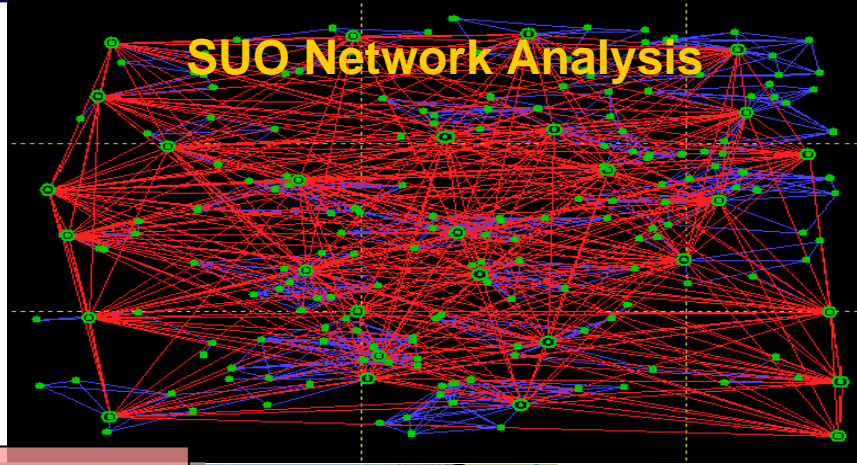




A New Way to Access Spectrum Is Necessary

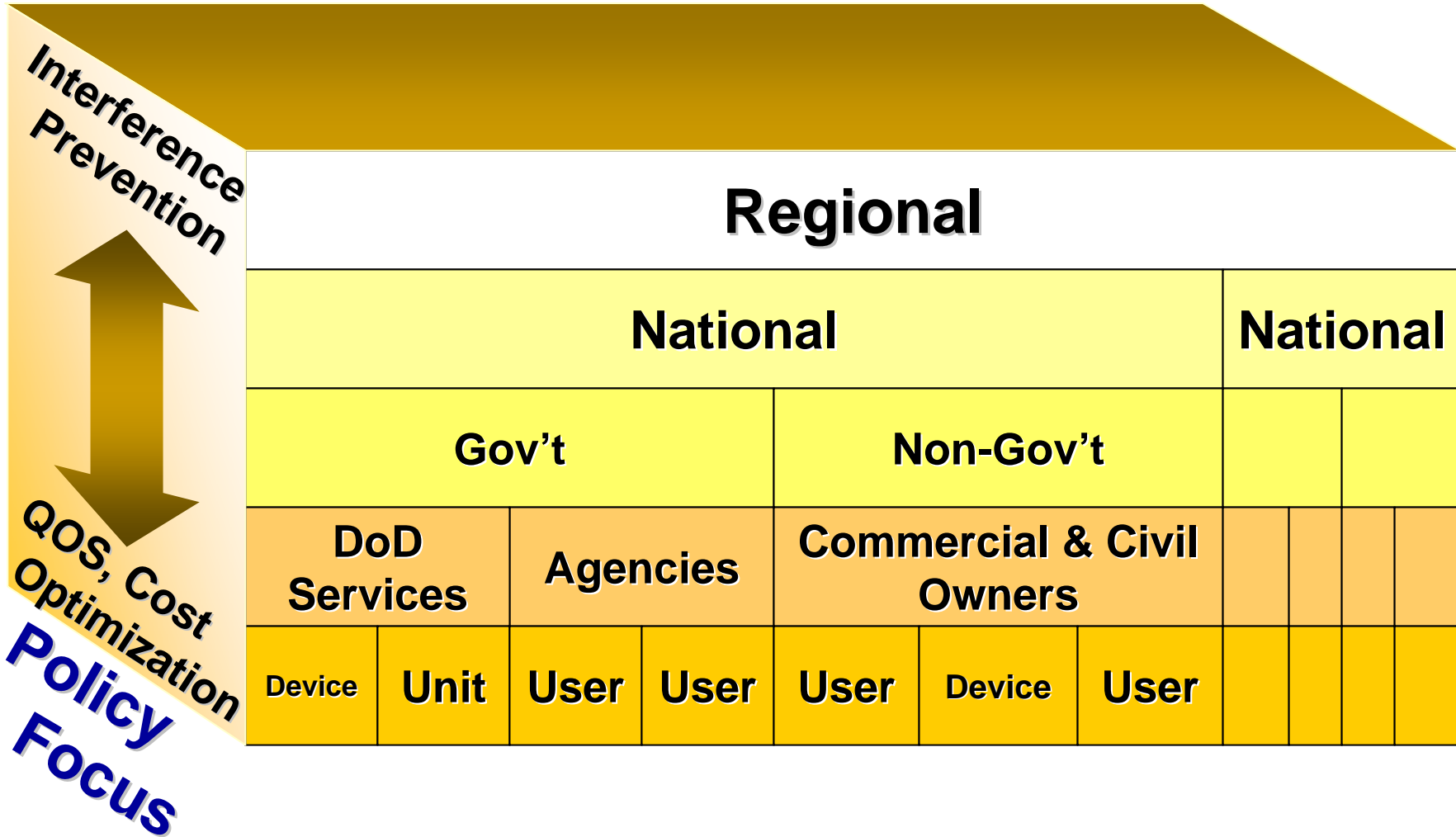


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Policy Sources



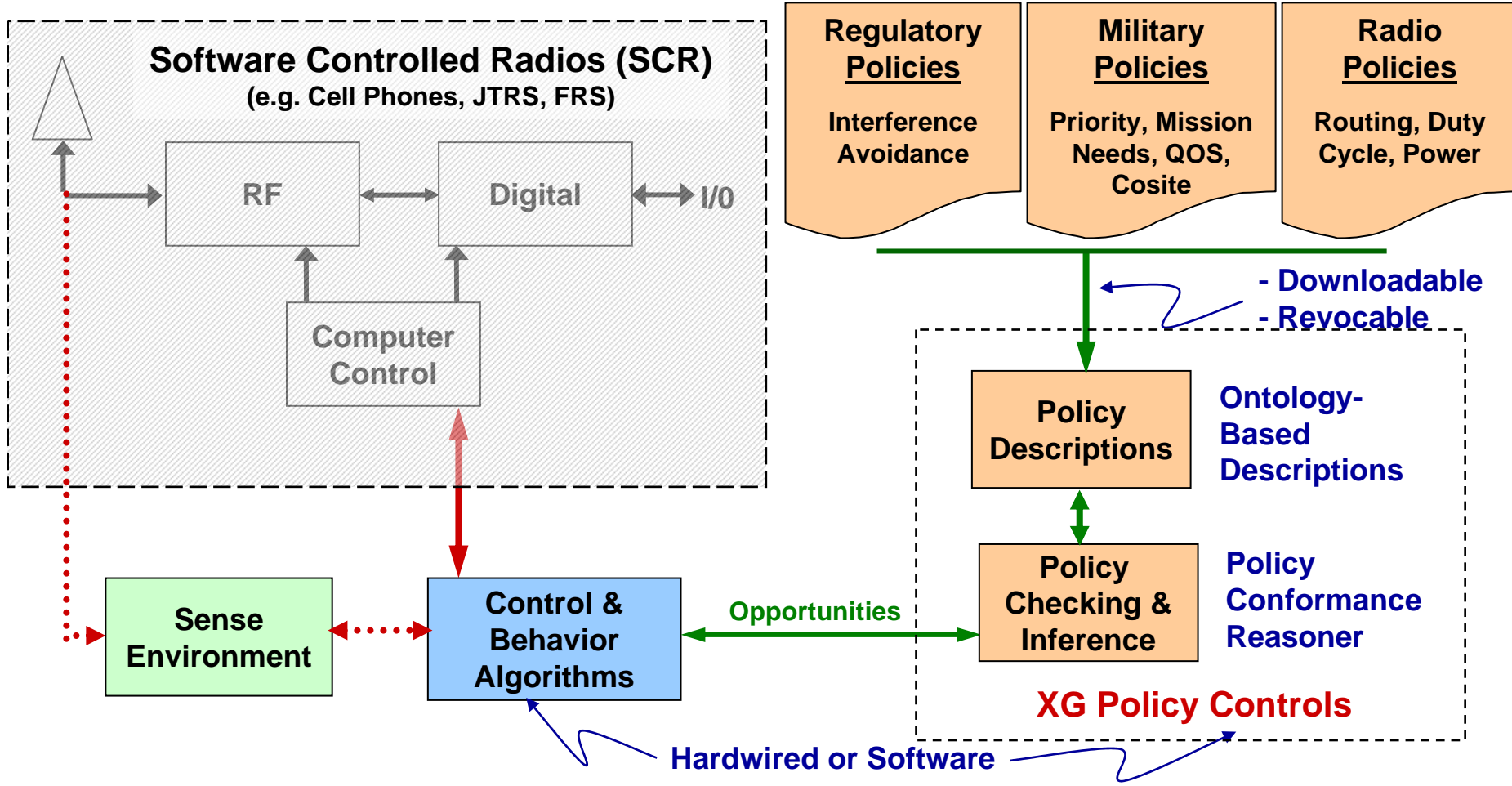


XG Key Principles



- **Suitable for Range of Architectural Implementations**
 - Centralized And Decentralized
- **Identify “Interference-Preventing” Core Set**
 - Flexible with Respect to Desired Interference Threshold(s)
 - Extensible To Other Features (Subleasing, Microcharging,...)
- **Separate Policies From Engineering**
 - Avoid Advocacy For Specific Sharing Policies
 - XG Being Developed In Advance of Policy Framework
- **Provide For Richness/Complexity of Policies**
 - Regulations Neither Flat Nor Hierarchical
 - Multiple Policy Sources
- **Allow For Diversity of Policy Sources**
 - Peer-Peer And Hierarchical Policy Authorities
 - Enable Extension To “Cognitive” Optimizing Logic

Provide Ability to Adapt to Engineering & Policy Changes



The Primary Product XG Program is **Not a New Radio**, but **The Critical Technologies** for Dynamic Military Access to Spectrum

