

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

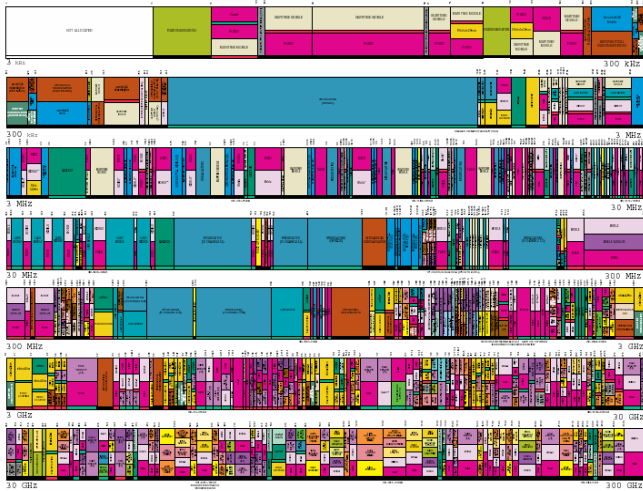


# XG Communications Program Information Briefing

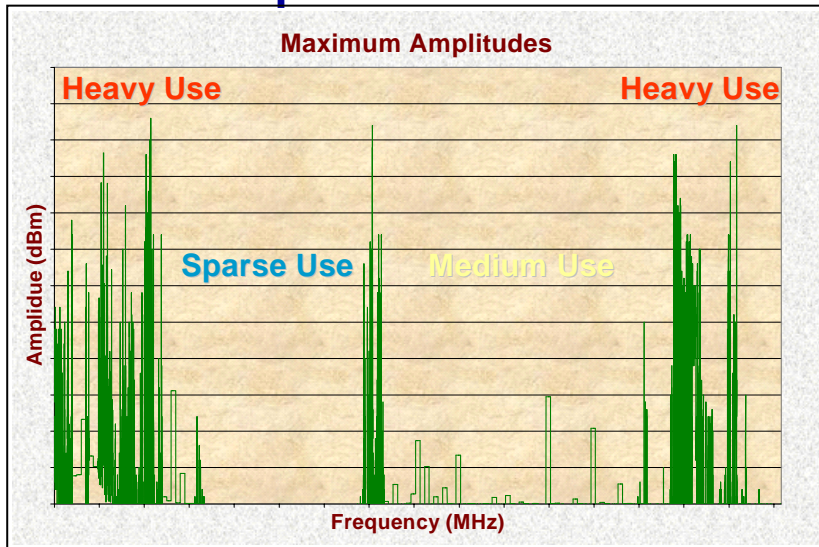
Preston Marshall  
DARPA ATO Program Manager

7 April 2005

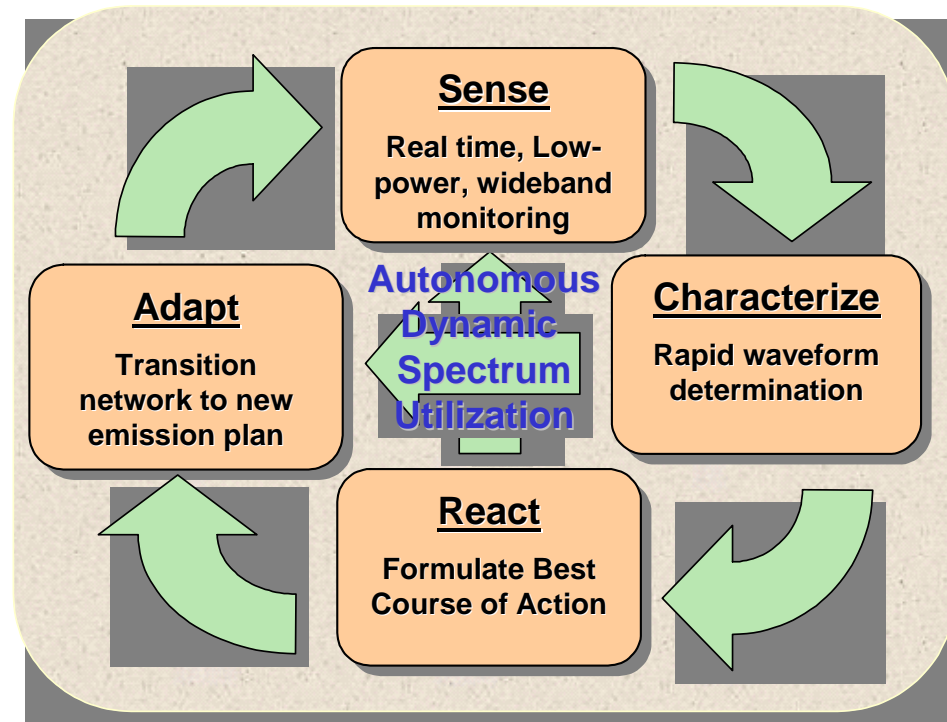
## All Spectrum May Be Assigned, But...



## ...Most Spectrum Is Unused!



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



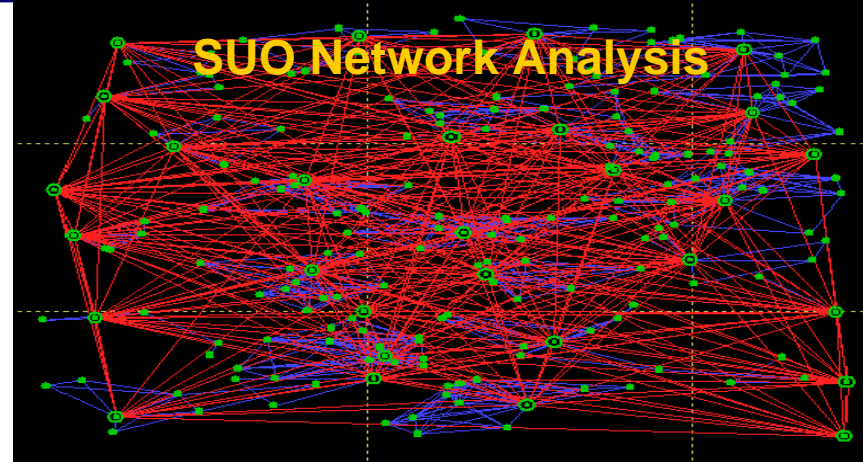
**Goal: Demonstrate Factor of 10 Increase in Spectrum Access**



# 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

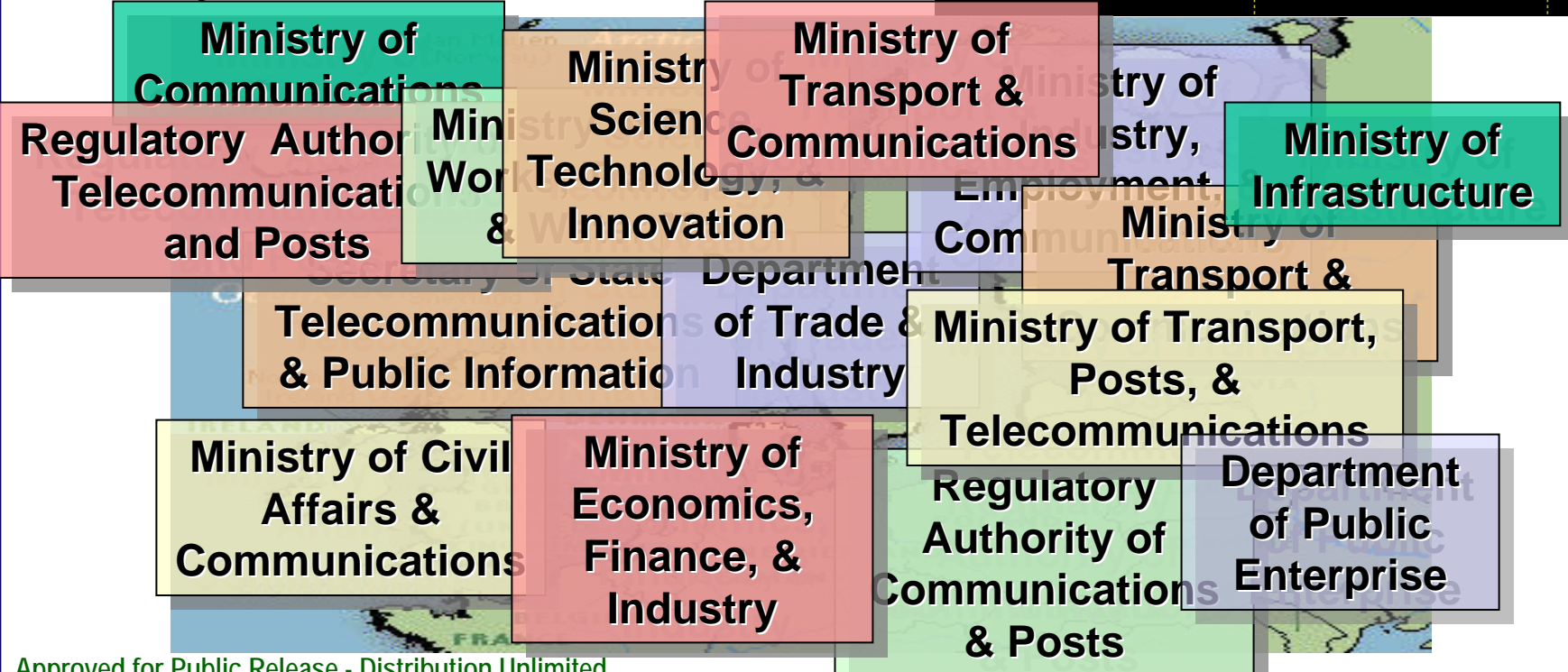
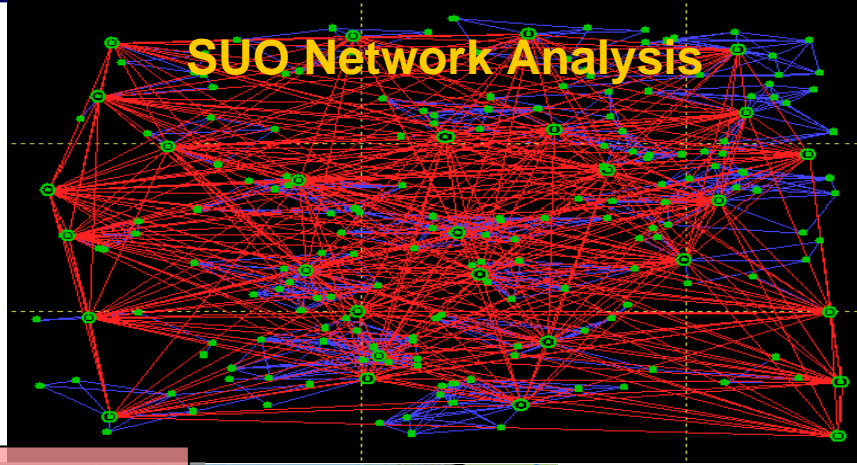




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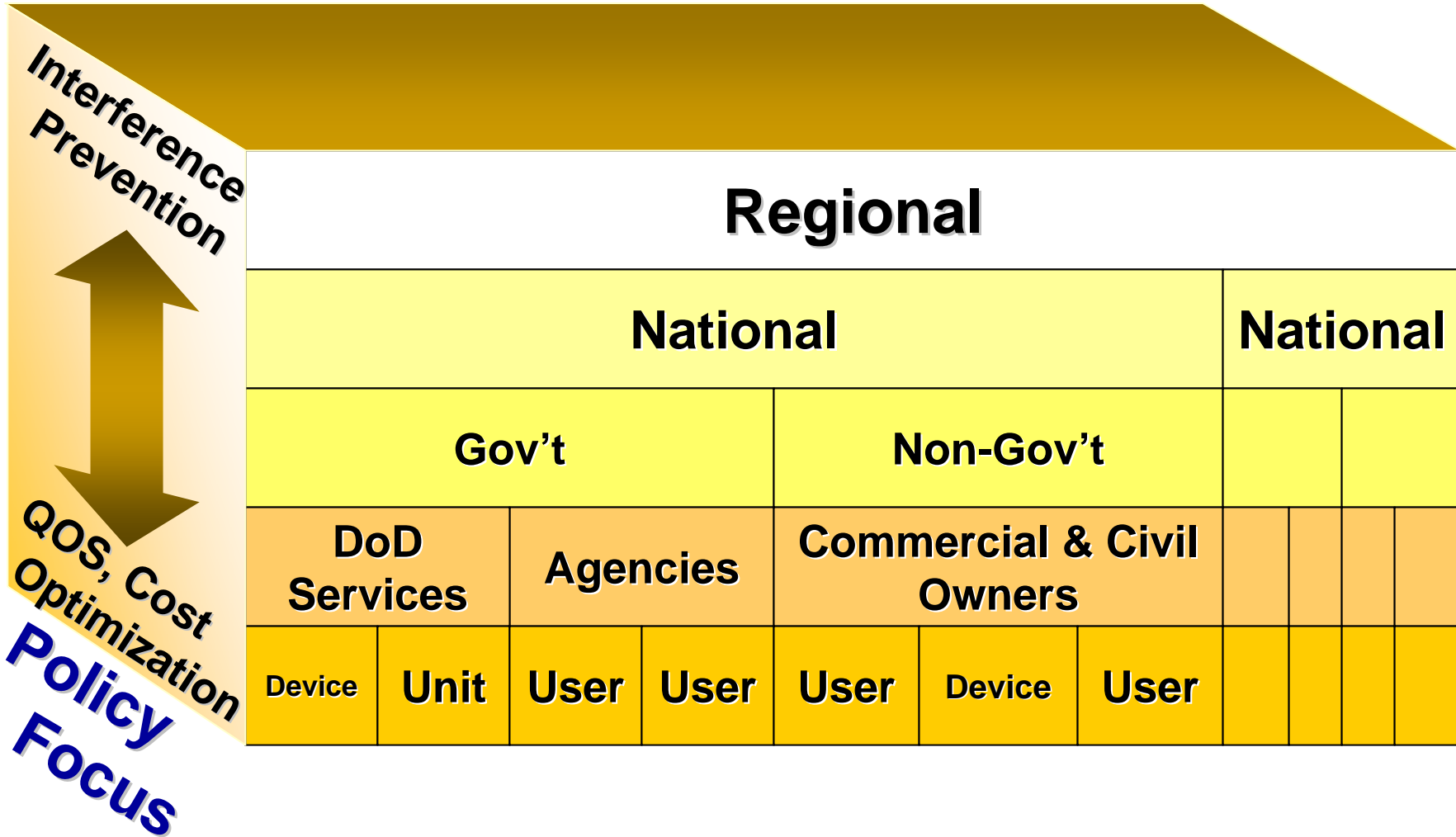


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# Policy Sources



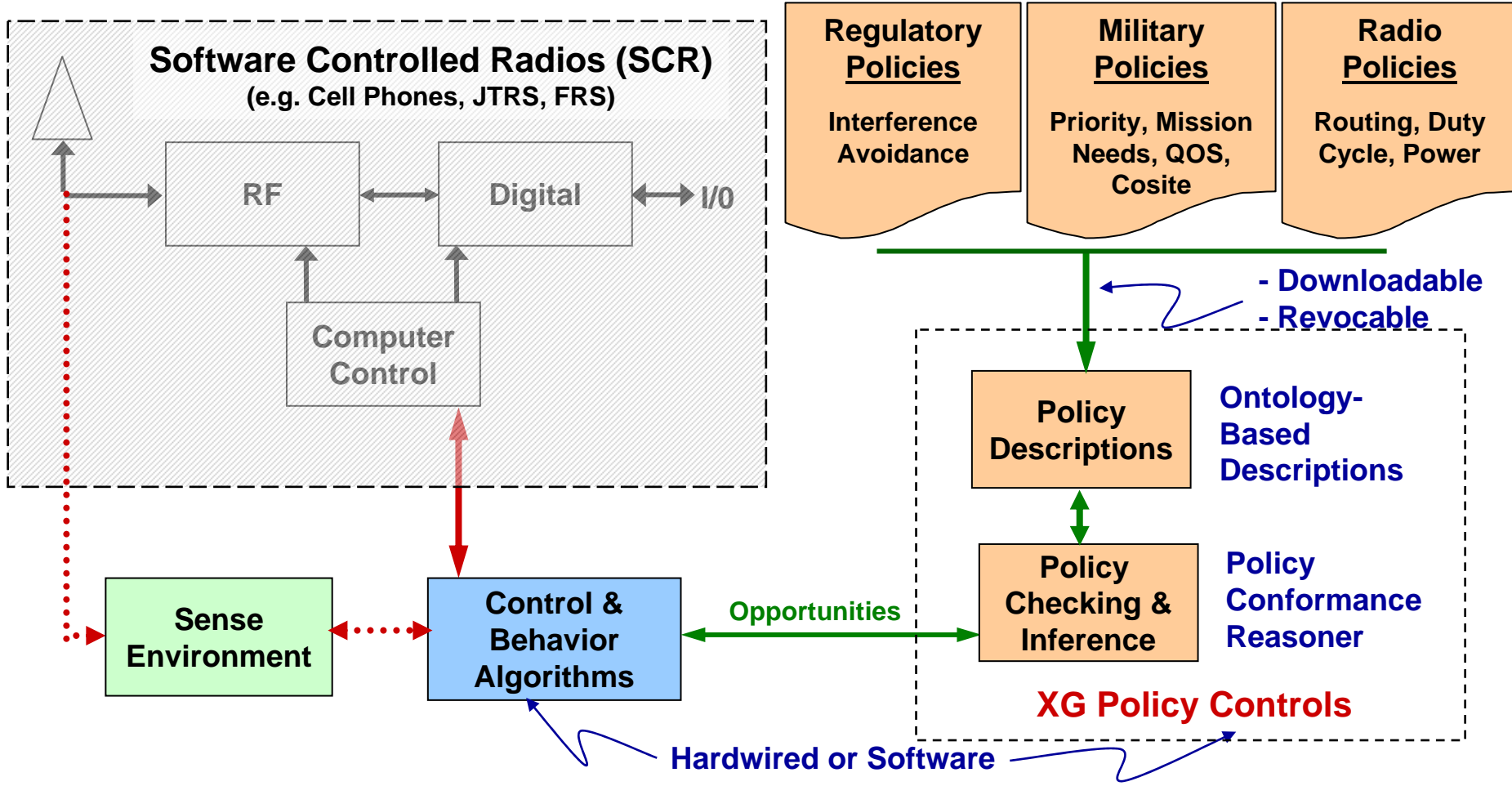


# XG Key Principles



- **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

