6Harmonics Inc.

- **Who’s Who:** Founded by wireless talents and world top entrepreneurs from multiple wireless companies with solid records in 3G/4G RD, IP generation and BD
- **What we do:** Cognitive Radio, first of its kind
  - Frequency agile, fully automatic adaptation
  - Spectrum re-farming
  - Spectrum “white Space”
  - Carrier grade Super “WiFi” networking
- **Why it is relevant:** One radio vs many radios
  - Dramatically lower cost and high spectrum efficiency and reliability
- **Competitive advantage**
  - Protected by IP (19 patents pending)
  - Well proven in the field
  - Ready for volume production
- **Value proposition:** deliver cost effective wireless broadband with specific routing protocol to address transaction base communications

6Harmonics uses up to 6 harmonics to connect all the human beings and smart things
6Harmonics Products

- Low power Cognitive Base Station with self organizing capability
  - Mesh, self organized network
  - Smart Grid backhaul
  - Smart metering aggregation
  - Cellular network data off load
  - Low latency, low power and long range

- Real Time Spectrum Manager
  - Network optimization tool
  - Spectrum monitoring and re-farming
  - Spectrum diagnosis
  - Interference statistics
  - RRM

6Harmonics products got well proved in fields
Smart Grid Challenges

- What is smart grid? An intelligent Communication System in parallel with the electrical wires
  - Wired solution
  - Wireless solution
- Smart Grid Challenges
  - Low latency (< 20 ms)
  - Ubiquitous coverage
  - Always connected
  - High reliability for emergency
  - Up load limitation
  - Transaction based
  - Resilience to attack

6Harmonics has resolved these challenges with Go To White Space (GWS) solution

No satisfactory solution exits yet!
TV White Space-Smart Grid 2\textsuperscript{nd} Life

- Each TV market usually uses 10~15 TV channels
- The golden spectrum for
  - Longer reach
  - Better penetration
  - Diversity delivery
  - Channel bounding
  - Cost effective

6Harmonics cognitive radio and routing protocols have well considered the requirements for latency, reliability and malicious attack using WS
Super WiFi Will Dominate

- **American won LAN-WiFi and evolution**
- **European won WAN-GSM and evolution**

- Cellular Concept is 60+ years old! Macro Cellular is not suitable for AAA (anyone, anytime, anywhere) broadband
- Macro cellular based wireless system for broadband needs to be re-planned for both performance and cost effectiveness
- LTE is too expensive and complicated for AAA (Anyone, Anytime, Anywhere! ) and didn’t consider iPhone type of devices and transaction communications for M2M
- Wireless today is lack of technology and business innovation
- Wireless Industry is ready for a paradigm shift and an “end-game” solution
  - Government is re-farming the spectrum and WiFi gets more golden spectrum then LTE
  - Chip is cheap as SiO2
  - Cognitive radio is mature that can make network topology flexible, dynamic and adaptive
  - Traditional telecom monopoly business model is collapsing

6Harmonics upgrades WiFi protocols to achieve WAN Performance