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Outline of Broadcast-based H2G Communication Solutions

An Examination of RDS and NOAA weather radio and others for smart grid communications

1. Background:

1. Value proposition of the broadcast architecture for the smart grid
 1. High value low costs solution desired for economic benefits to utility and consumers
 2. Leveraging existing infrastructure cuts time and costs required for mass deployment
 3. Fast response time of a broadcast system would enable
 1. Demand Response (Hourly, minutes, seconds)
 2. Frequency Regulation applications
 3. Integration of renewable generation
 4. Hourly and more advanced dynamic pricing schemes
 4. Location targeted broadcast could
 1. Reflects time & location specific marginal costs
 5. Leverage/Harmonize with SGIP Business & Policy Working Group: Broadcast of ~~RTO/ISO~~ real time price data
 1. <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/BnPSystemsandDevicesSubGroup>
 6. Inform consumers while preserving privacy
 7. Minimize consumer actions required ([GE slider might be an option here](#))
 8. Leverage/Harmonize with GE/AEP Slider vision:
 1. <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/H2G>

2. Overview of requirements

1. Desired characteristics
 1. Single nation wide standard [\[Do you mean standard data format \(or a set of\) or system with equal access to all aggregators/utilities?\] I really see this as protocol agnostic, more equal access for all types of traffic a nationwide standard applies more at the physical layer with the RDS\(base level interoperability\) in my view.](#)

2. International compatibility for OEMs
3. Full market coverage
4. Redundancy and reliability
5. Time stability of solution
6. Time to deployment
7. Availability of Hardware
8. Ease of System integration
9. Low Capital and operating cost of infrastructure
10. Low Capital and operating cost to consumer devices

2. Technical requirements

1. Authentication
 1. Encryption capable
2. Security of infrastructure
 1. Physical
 2. Cyber
3. Multiple broadcast frequencies/towers to minimize risk of too many MW on one tower
4. Redundancy of key elements
5. Role of network paths in hybrid broadcast/2-way system [Where 2-way might be AMI or Internet]
6. Stability of solution
 1. Decades of stability desired (belongs above?)
7. Performance specifications
 1. Actual field (in a variety of home structures) performance
 2. Location filtering/targeting
 3. Types of control packets (use cases)
 4. Packet length constraints for each technology class
 5. Missed packet expectations/consequences

3. Technology overview of RDS

1. Sample architecture diagram of a FM-RDS solution
2. Strengths and weakness of this approach

4. Technology overview of weather radio

1. Sample architecture diagram of a NOAA radio based solution

2. Strengths and weakness of this approach

5. Technology overview of other broadcast based solutions

1. Paging
2. others