

Developments in Remote Access: Telemetry and Online Support Services

Western Mine Electrical Association

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DCS Supported Sites

- Peabody- 802.11
 - North Antelope Rochelle Mine
 - Somerville Mine
 - Farmersburg Mine
 - Caballo Mine
 - Kayenta & Black Mesa Mine
- Rio Tinto Energy America- Mesh
 - Jacobs Ranch Mine
 - Antelope Mine
 - Spring Creek Mine
 - Colowyo
 - Cordero Mine
- North American Coal- 802.11
 - Mississippi Lignite
 - Sabine
- Titan Cement- Cellular Broadband
- TXU
- Barrick GoldStrike



Online Demonstration

- NARM 108 Shovel Controllogix PLC
- NARM 154 Dragline
- Somerville Dragline Controllogix PLC
- Caballo 336 Shovel PC Anywhere



North Antelope Rochelle Mine



NARM Telemetry Solution

- Cisco 802.11b Based
- Modular Masterlink
 - 2.4GHz
 - 50X Faster than conventional 9600-b/s narrow-band systems and 10 times faster than 900 MHz systems.



NARM Mobile Repeater

- Over 11 Repeaters
- Over 60 MB Collected Daily
- Over 100 Machines Connected – Shovels, Scrapers, Dozers, Haul Trucks.
- Over 40 Square Miles of Coverage



Why 802.11?

- Standardized
 - Tried and True – few problems and large support group available



Why 802.11?

- Commodity Hardware/Cost
 - Widely available at low costs
- License Free
- Security
 - Encryption Keys (WepKeys) and unique SSID (Service Set Identifiers)

Compromises with 802.11

- Scalability?
 - Limited transmission capability (11Mbps)
 - Can be overwhelmed by too much traffic on one channel.

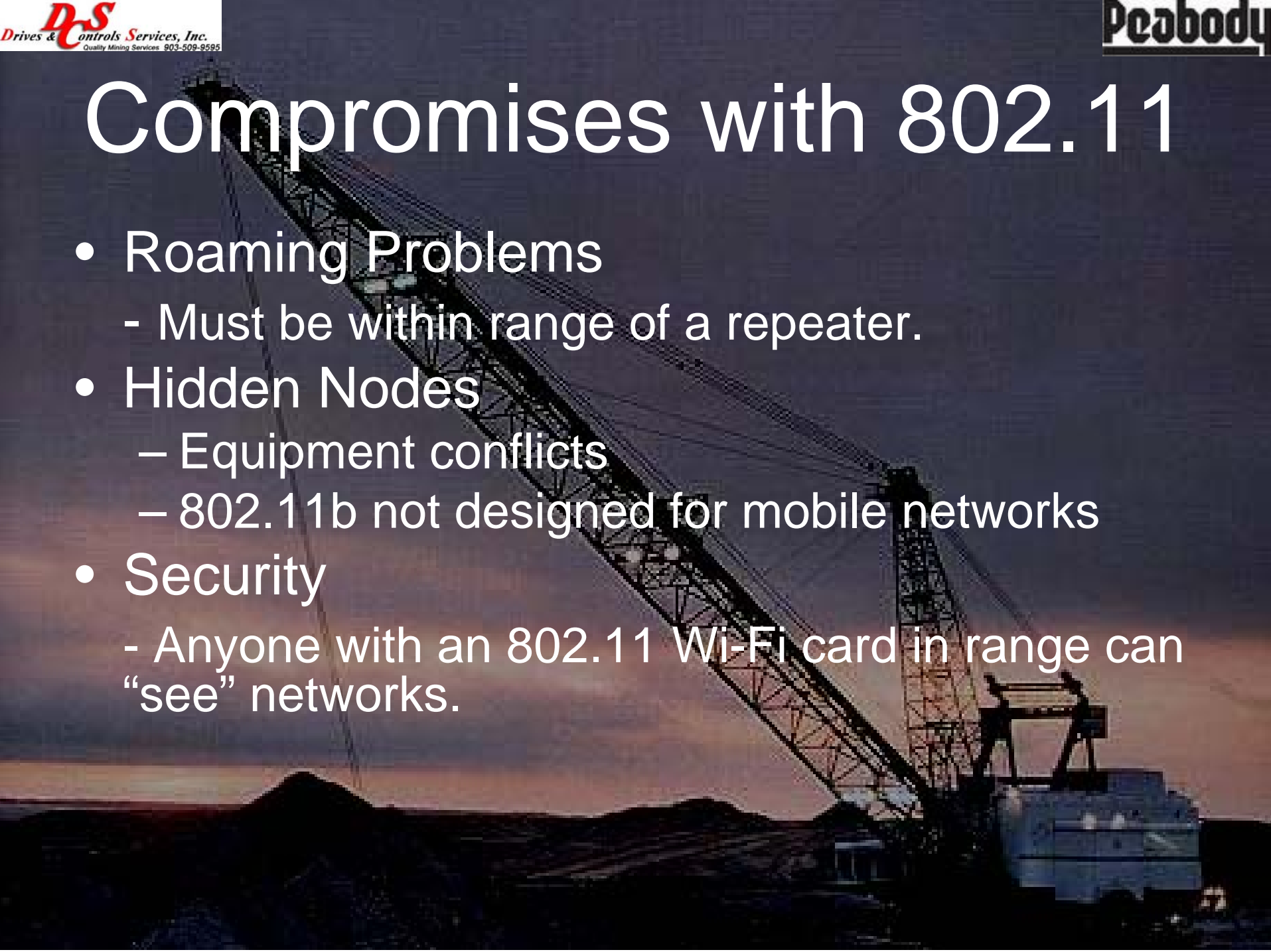


Compromises with 802.11

- Repeaters slow throughput
 - Actual effective throughput ~ Half of nominal bit rate.
 - Due to MAC (Media Access Control) Layer overhead.
 - Each device has it's own MAC Address.

Compromises with 802.11

- Roaming Problems
 - Must be within range of a repeater.
- Hidden Nodes
 - Equipment conflicts
 - 802.11b not designed for mobile networks
- Security
 - Anyone with an 802.11 Wi-Fi card in range can “see” networks.



Remote Support

- Modular Mining - Tuscan
- Drives and Controls Services
 - Draglines, Shovels and AccuWeigh (Onboard Production Monitor and Database)
- Mine Personnel can support remotely.
- P&H
- Allows all organizations to leverage their busy specialists.

VPN Access

- Peabody Solution
 - Firewallled Wireless Subnet
 - Access to Mine Network is restricted
 - Modular and AccuWeigh Servers are on wireless subnet and vendors are administrators

Alternative VPN Access

- Mine IT departments control network
 - Access is tightly controlled by Citrix Server
- Cellular Solution
 - Data can be hosted off-site



Alternatives

- Mesh
 - Proprietary
 - Costly
 - Not Proven at the time of Implementation
- Cellular
 - No Infrastructure at Peabody Sites
 - Works Well In Florida and Possibly Texas
- WiMAX-
- 900 MHz
 - Proprietary
 - Lower Bandwidth
- 5 GHz
 - Used as a backbone to 2.4 GHz systems

Remote Support Is a Reality With 40+ Machines Online

- Peabody 17 Machines at 5 mines
- Rio Tinto- 7 Machines at 3 Mines (4 more machines in Pipeline)
- Barrick 4 Machines
- North American 6 Machines at 3 Mines
- Alcoa 2 Machines
- Arch 1 Machine



Questions?

