
 **ADVANCED COMMUNICATIONS**

IVNUA Conference

- Introductions
 - Who I am
 - Who is Adv Comm


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 **ADVANCED COMMUNICATIONS**

Wireless Basics

- Reliability
- Security
- Frequencies
- Financial Feasibility
- Pt to Pt or Pt to Multi Point


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Intro to Wireless communications

- Services
 - Wireless Voice
 - Wireless Data
 - Wireless Video
 - Radio Broadcast
 - Radar
 - Wireless Sensors
- Define Services Understandably

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Buzzwords

- WIFI
- WIMAX
- Bluetooth

- Cellular Data Cards
- DECT
- RFID
- FEMTOCELL


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Reliability

- Making sure to get the bestest and mostest signal to wherever its going
 - Commercial Data Card, the Service Provider is in control
 - Pt to Multipoint WLAN, Accounting Dept is in control
 - Pt to Pt You are in control

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The Mostest and Bestest Signal

- Path
- Power
- Frequency
- Modulation Technique
- Noise

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Security

- Process
- Determine level risk
- User Friendly vs Non User Friendly Access

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Standards based equip

- Security concerns are more prevalent
- Trading interoperability for security
- Buzzwords
 - WEP
 - WPA
 - AES
 - 128 and 256 Bit
- More time and processing power to hack
- The security of the solution is directly relative to the implementation and maintenance
- WLANs are almost always Standards Based

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Proprietary Equipment

- Non Standards Based Security Approach
- Higher Cost (Niche market solution)
- Add on levels of security for regulation compliance
- Commercial Data Cards Sit in this Arena so far
- <http://www.gottabemobile.com/GottaBeSecure+WiFi+Vs+Mobile+Broadband.aspx>
- http://www.nortel.com/solutions/wireless/collateral/nn_107760.09-15-04.pdf

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Frequencies

- **Unlicensed**
 - ISM BAND
 - 900
 - 2.4
 - 5.X
 - UNII BAND

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Frequencies Cont'd

- **Licensed Microwave**
 - 6,11,18,23,24,28,38Ghz
 - Public Safety 4.9Ghz
 - ITSM EB 2.5

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Financial feasibility

- **Balancing the Needs of;**
 - Application Engineer
 - End User
 - Accountant
- **Understanding Equipment Limitations**
 - Receiver Sensitivity
 - The more brains the better
- **Start with Conservative Engineering**
 - Highest Power Output
 - Best Line of Site

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Pt to Pt OR Pt to MultiPoint

- What is the application
- What is the service Needed
- What are the Security Concerns
- What is the Financial Situation
- What are the Assumptions

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Example WIFI

- Municipality, or Campus WiFi Public Access
- Wireless Data, Pt to Multipoint
- Willing to accept a lower level of Reliability and Security
- Thus
 - Implementation Cost Low
 - Maintenance Cost Low
- Assumptions
 - End user absorbs Security Cost
 - End user equipment and location determines reliability

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Multi-Meg Internet

- Private WAN
- Fixed Wireless Data, Pt to Multipoint/Pt to Pt
- Could be Service Provider Solution but too Expensive
- Thus
 - Implementation Cost Medium-High
 - Maintenance Cost Medium-Low
- Assumptions
 - Access Equipment More Capable and Costly
 - Path is biggest Factor determines reliability

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The Decision Maker's Hero

- Study=Gather the Appropriate Data
- Plan=The Steps needed to reach the WIRELESS End-Goal
- Build=Wireless Build-out for Dummies

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Study-What

- Strategic Wireless Study
- This comprehensive wireless networking study will cover all aspects of wireless WAN engineering, implementation, and management, cost


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Cost

- Recurring Cost
 - Voice
 - Data
 - Outsourced Support
 - Labor


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Strained Resources

- WAN Bandwidth
- Internet Bandwidth
- Mobility
- Server Resources


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The Future

- New Applications
- New Revenue Potentials
- New Locations


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The System

- Path Link Paper Study
- WLAN Coverage Paper Study
- Frequency Availability
- Determine all Local Assets as viable
Access Point Locations

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Use the right tools

- Outside Consultants
- Vendors
- Bandwidth Utilization and Forecasting
- User Feedback


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Document Everything

- Link all your current issues to this solution
- Determine Need for High Availability
- Determine Best Solution Provider
- Consider Partnering with Sister Agencies, Commercial Enterprise
- Financial Options (Rent, Buy, Finance, Lease)

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Plan

- Turning the study data into an actionable plan
- Have Broad Wireless Goals
- Have Specific Application Goals
- Layout Priorities

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Wireless Pt to Pt vs Landline

- Cost Comparison
- Hybrid Solutions
- As Primary Link
- As Backup Link

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Basic Cost Comparison

- Equipment
 - Routers vs Bridges
- Recurring
 - Line Cost vs Tower Rental
- Installation
 - Telco-Router vs Antenna


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Additional Cost


- Implementation Time
- End Point Move
- Support
- Training
- Maintenance
- Catastrophic Repair
- Insurance
- Security
- Average Downtime
- Upgrade

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Show Chart


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Hybrid Solutions

- Wireless Repeater Points
- Wireless to Fiber
- T1 Voice Across Wireless
- Wireless to ISP
- COW

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Primary Link Considerations

- Power Backup at all nodes (especially at Repeater Node)
- Using current Landline solution as backup
- Create Mesh or Ring Network
- Determine Critical Outage Time
- Consider SLA Contracts
- Implement Appropriate Grounding and Surge Protection
- Consider Utilization Control
- Network QOS Implementation
- Application Testing
- Routed or Bridged Link
- Consider Spacial Diversity

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Backup Link Considerations

- Bridged or Routed Solution
- Pre-Test with all critical apps
- Utilization Control during Contingency Operations
- Secondary Network Node Collocation
- Separate or Isolated Power Grid
- Fiber Isolation
- Rapid Deployment vs In-place/Always On

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