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# CONNECTIVITY IN RURAL AND REMOTE REGIONS

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## THE ISSUES

- The Digital Divide
- **The Domestic Digital Divide**
- Globalization Driven by ICT
- **Rural and Remote connectivity is more of an issue prevalent in the developing world than in the developed world.**

## **CONSTRAINTS TO RURAL AND REMOTE CONNECTIVITY**

- Power Supplies
- Access to Effective Telecommunications Infrastructure
- High Costs and Low Budgets
- Lack of Adequate Maintenance Facilities
- Technical and Professional Support

## **POWER SUPPLY ISSUES - 1**

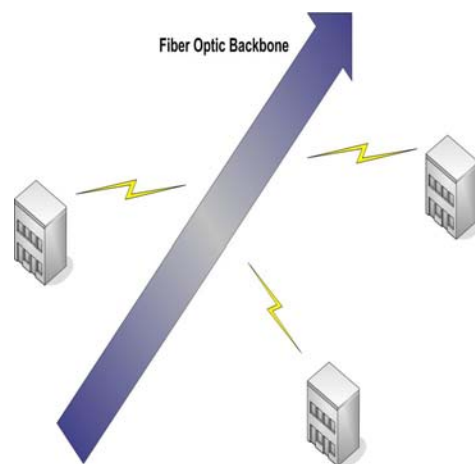
- Cost Reduction Using Energy Efficient Hardware
  - Green PC's
- Other Energy Saving Strategies
- Common Power Supply Problems
  - Surges, Lightning and Brown-Outs
  - Grounding
  - Fuses and Circuit Breakers
  - Power Stabilizers and Regulators

## AUTONOMOUS POWER SUPPLY

- Issues and Options
  - Oversized storage capacity vs Oversized Power source
  - Solar Power
  - Wind Power
  - Generators
    - ✓ Diesel
    - ✓ Methane
  - Mixed Systems

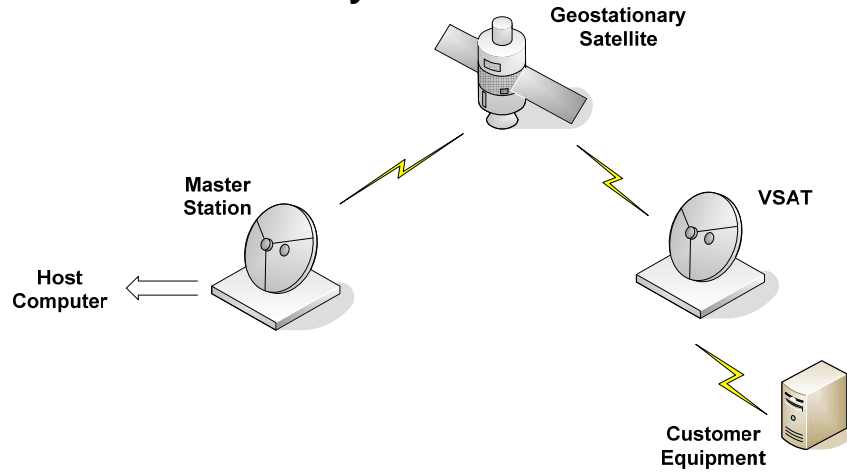
## CONNECTIVITY OPTIONS

- Dial-up
- ISDN
- PRI ISDN Services
- DSL Broadband
- Cable
- T-1/E-1 Circuits
- Fractional T-1/E-1 Circuits
- Frame Relay



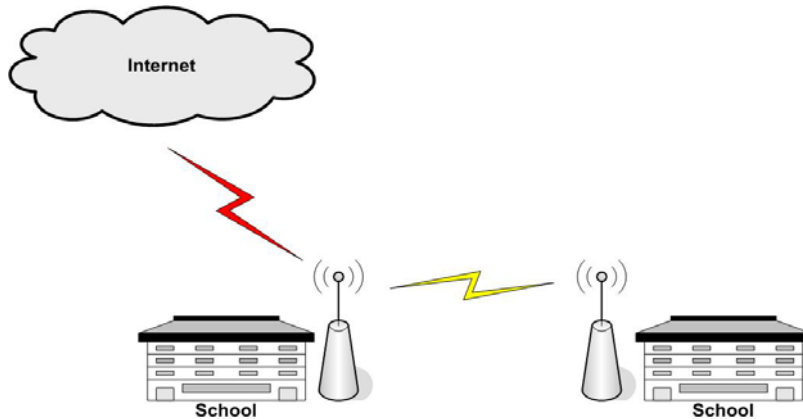
# SATELLITE SYSTEMS

- VSAT Connectivity



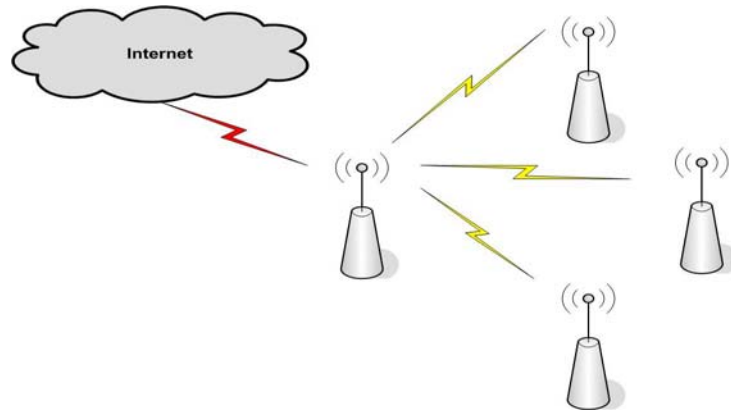
# WIRELESS SYSTEMS

- Point to Point Links



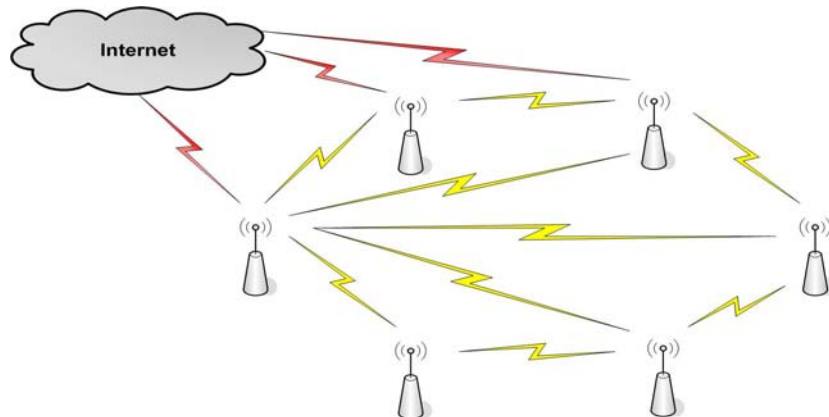
# Wireless Systems

- Point to Multipoint links



# WIRELESS SYSTEMS

- Multipoint to Multipoint links



## WIRELESS CONSTRAINTS

- Wavelengths
- **Absorption**
- Diffraction
- **Line of Site**
- Non Line of Site
- **Range / Distance**
- Capacity

## NETWORKING HARDWARE – THINGS TO KEEP IN MIND

- Interoperability
- **Range**
- Radio Sensitivity
- **Throughput**
- Required Accessories
- **Availability**

## NETWORKING HARDWARE – THINGS TO KEEP IN MIND

- **Other Factors**
  - **Turn Key Solutions**
    - Turn key Solutions, equipment warranty, consistent platform
  - **Open Source Systems**
    - Vendor lock in, discontinued product lines, ongoing license costs
- **Administration**
- **Politics**
- **Security**
- **Timescale**

## CONNECTIVITY OPTIONS

- **WiMax**
- **WiFi**
- **CDMA**
- **Microwave**
- **Satellite**
- **Isolated Networks**
- **The Future?**

## **SUMMARY**

- Each situation is unique
- **What are the issues ?**
- Have we addressed the constraints?
- **What hardware/software best suits each situation?**
  
- Questions