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# Cellular as a Local Loop

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# Agenda

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- Vanishing wireline services
- Orphaned applications
- Cellular Data Services
- Connectivity anywhere (almost)
- Legacy protocols on new networks
- Backup for voice
- Word of Caution

# Disappearing Landline Services

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- So Far:
  - Telegraphy (Morse Code)
  - SMDS (ATM on DQDB)
  - D-Channel ISDN Data (based on Datakit)
- Next?
  - X.25
  - Leased Analog Pt-Pt and Multidrop Lines
  - Frame Relay
  - Shared pools of dialup modems for Internet access

# What's Killing Services

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- Discontinued Equipment
- Loss of skilled technicians
- Economics
- Appeal of 'Everything Over IP'

# Legacy Application Orphaned

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- Supervisory Control and Data Acquisition

- Remote locations
- Huge installed base

- Lottery

- Many ticket machines require X.25 or similar
- Sales sites often not easily accessible to data

- Automatic Teller Machines

- Some still on Bisync over analog line

- Point of Sale Credit Card Verification

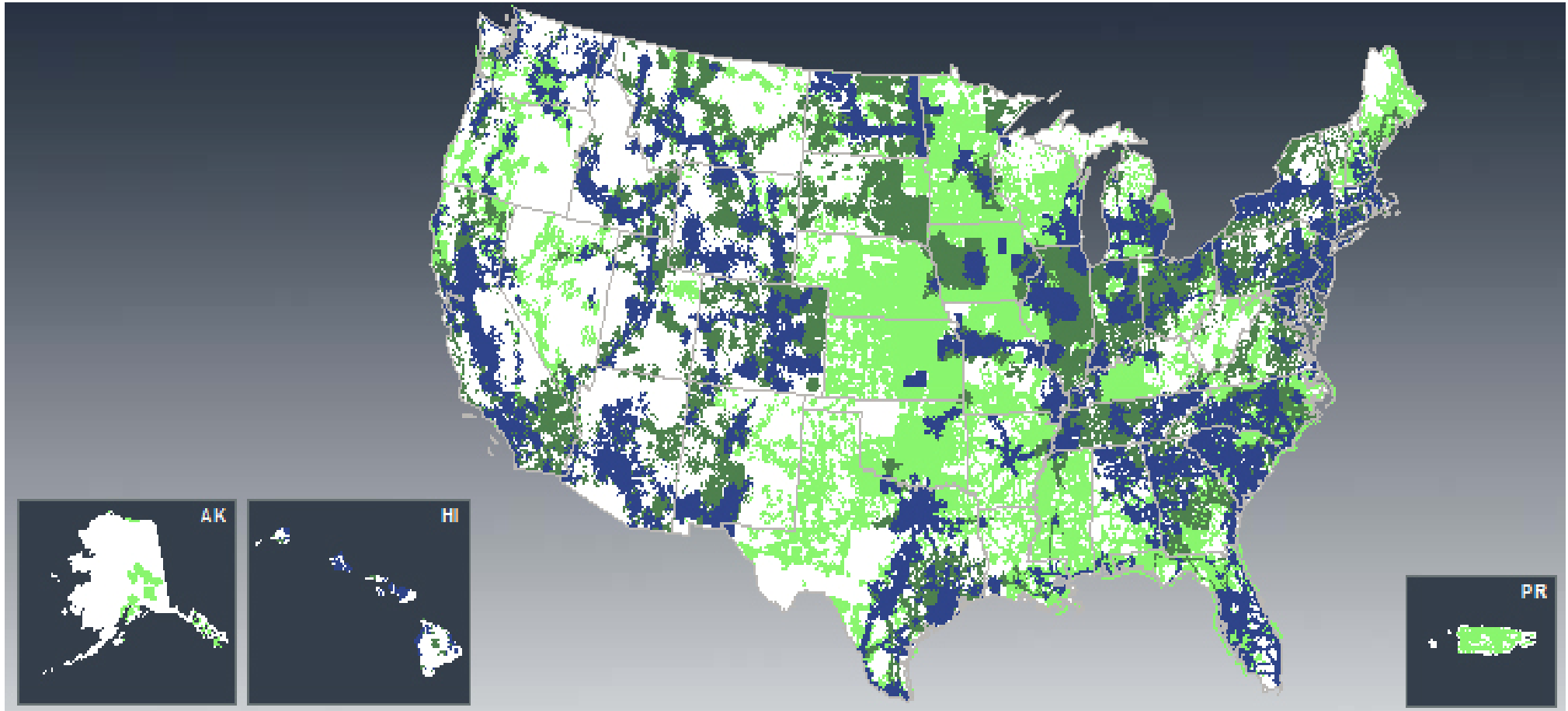
- Switched data on ISDN D Channel

# Cellular's Many Attractions

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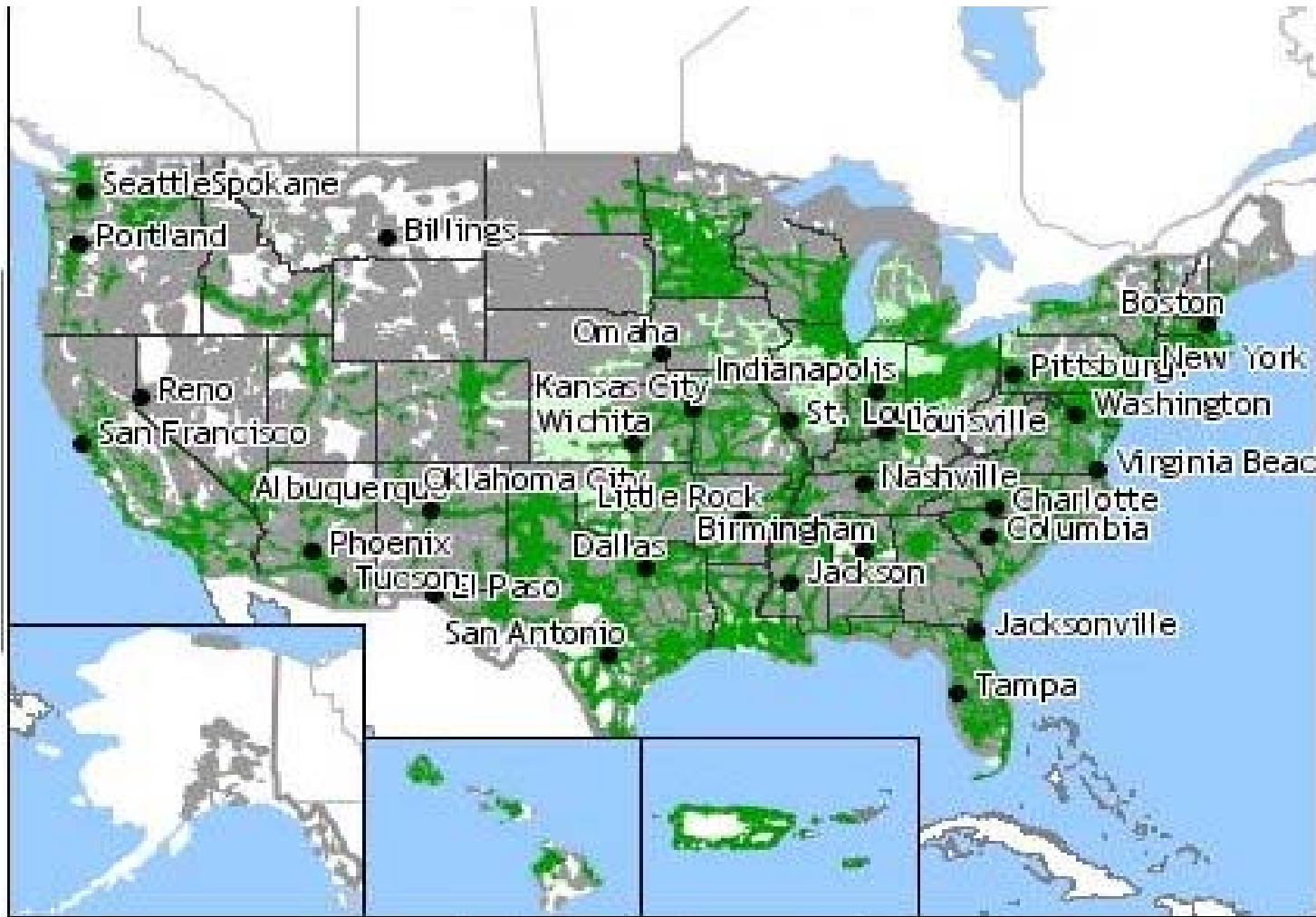
- Broadband 3G has adequate bandwidth for orphaned applications
- Reasonable geographic coverage
  - EVDO – Most of the US
  - HSDPA – 185 carriers in 85 countries
  - HSUPA – 26 carriers in 22 countries
  - WiMAX – Coming
- Enhanced Service – always on
- Affordable prices

# Connectivity Anywhere (Almost)



Verizon Broadband Coverage

# Connectivity Anywhere (Almost)



Sprint Coverage  
Green = On Net; Grey = Roaming

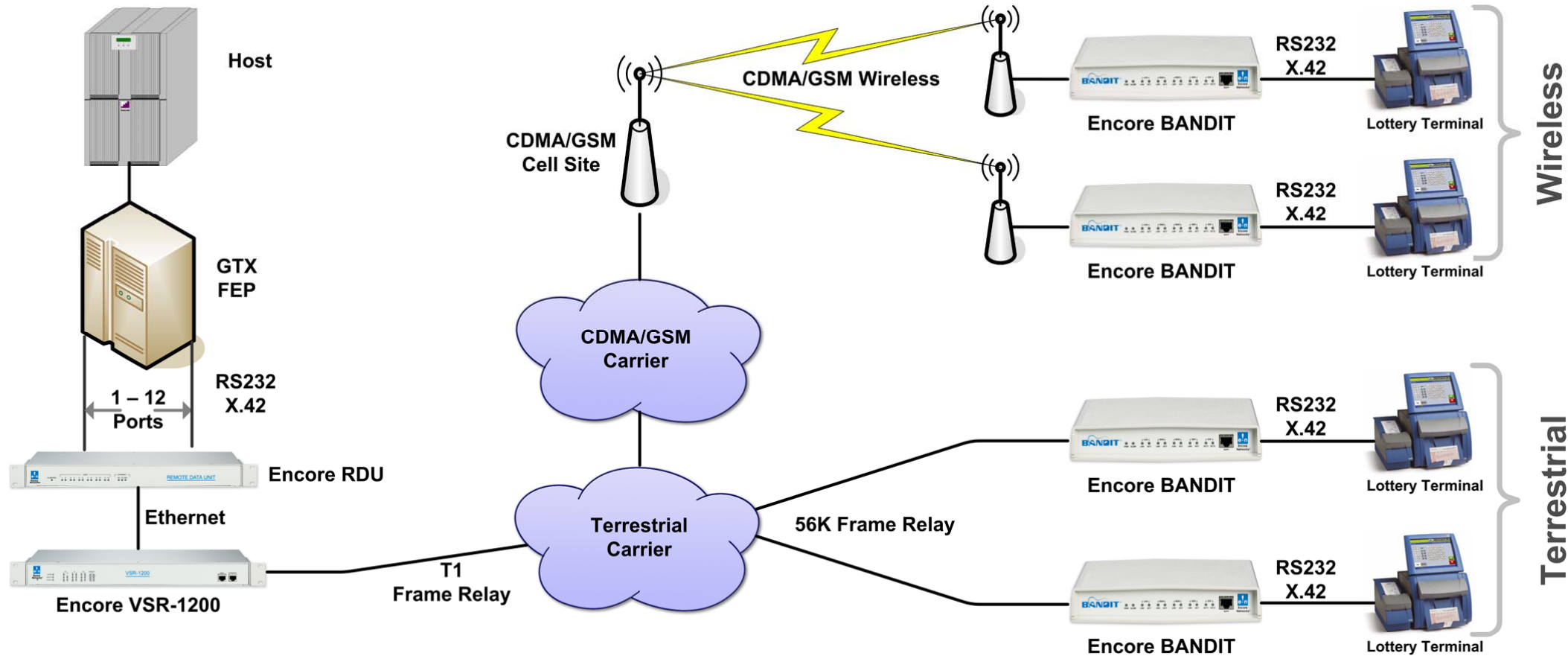


# Cellular Data Pricing

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- Telemetry: very low data volume
  - As little as \$15/month
- Basic Internet Access: capped usage
  - \$35 to \$60 per month
  - Recent standard data plan is \$49/month
- Unlimited Broadband
  - \$99-\$150/month offered in 2008

# Lottery Terminal



Drawing courtesy of Encore Networks

# Lottery or SCADA Terminal



Hardware courtesy of Encore Networks

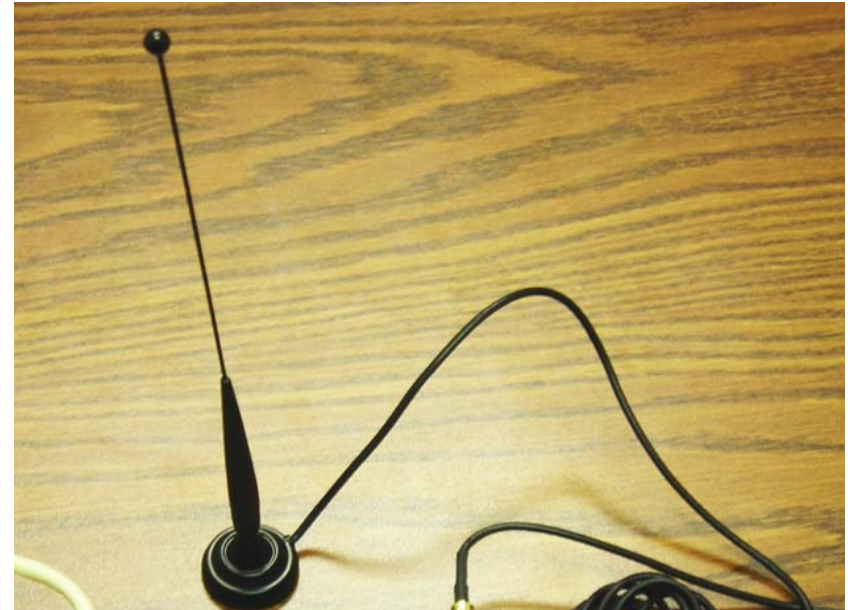
# Compact Cellular Antenna



Hardware courtesy of NSG Datacom

# Choice of Antennas

3 dB Gain



0 dB Gain



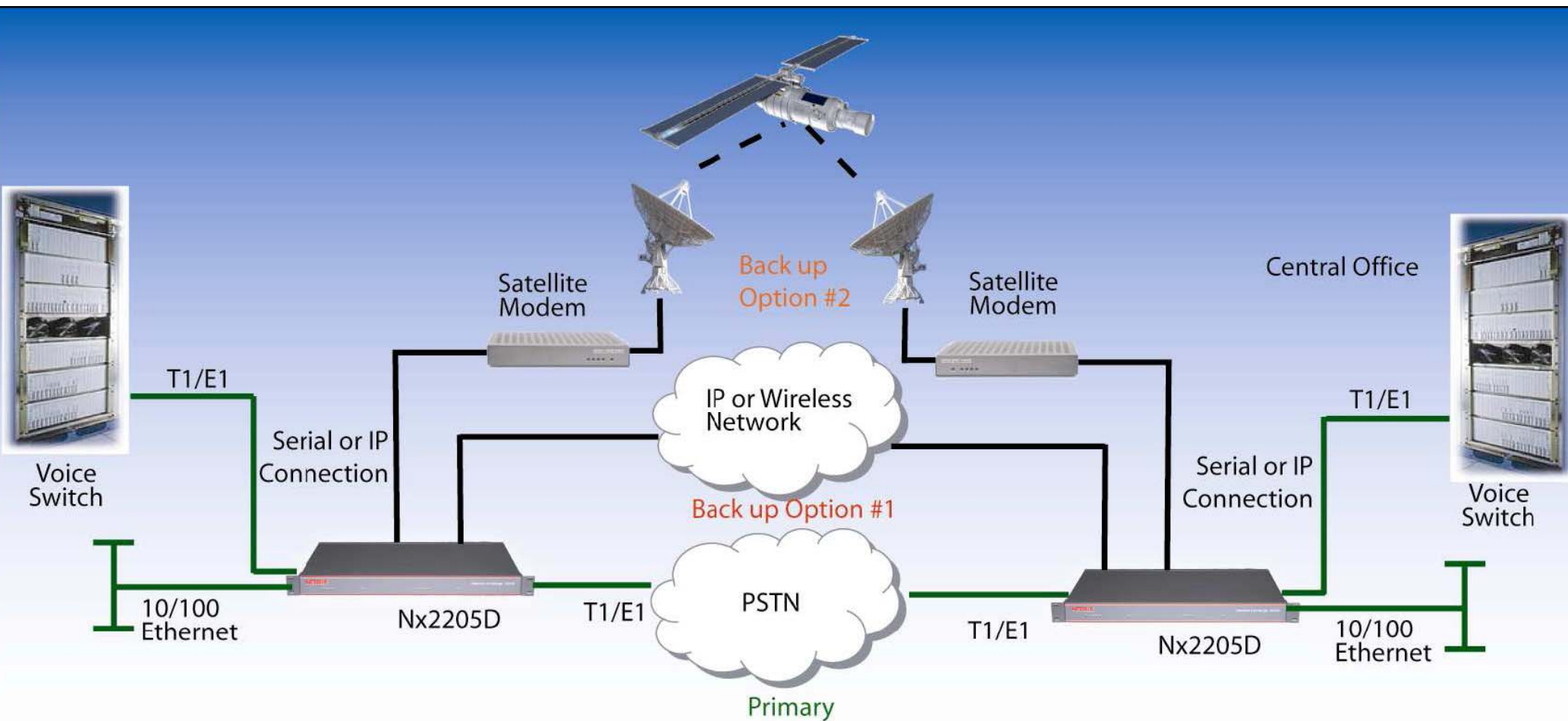
Higher Gain Antennas  
Offered in Many Shapes

# Don't Forget Voice

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- VoIP on Cellular Data
  - Not a normal cellular call; can't dial anywhere
  - Pt-Pt on the data circuit
- Branch to HQ 'talkativity'
- May do Facsimile
  - Not universally supported

# Branch Office Backup



Drawing courtesy of NSG Datacom

# Cautions and Concerns

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- Acceptable Use Policies
  - Pages of fine print
- Outright prohibitions on certain uses
  - Replace leased line
  - Voice
- High cost for exceeding data quota
  - \$.50 per MB
- Potential for summary disconnection