

COMMUNICATIONS FOR THE SMART GRID

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JCPB



*JOHNSON CITY
POWER BOARD*
Making your community®



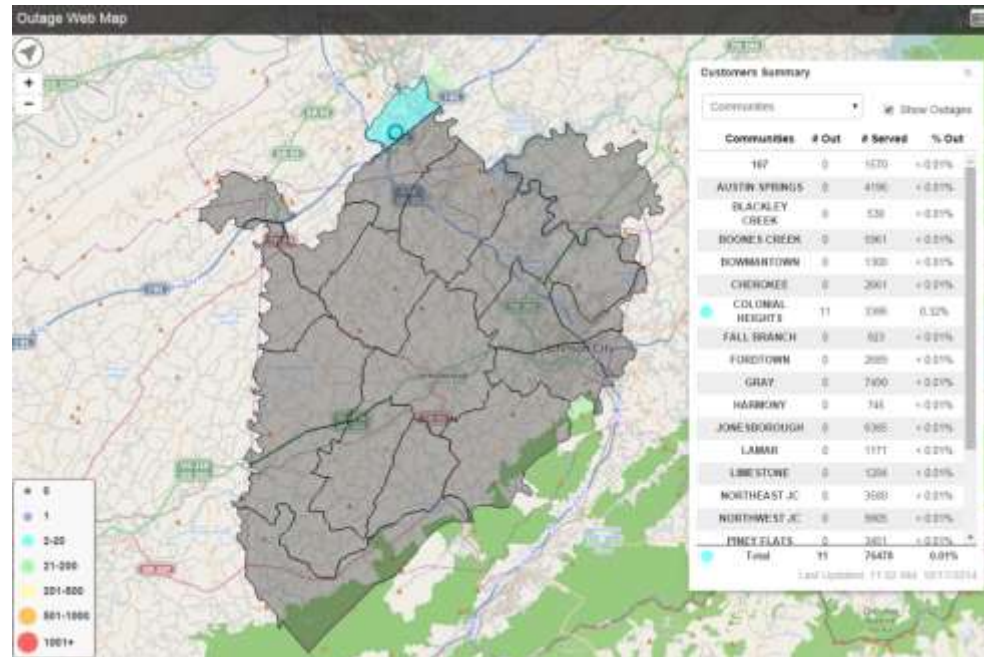
About Johnson City Power Board

- Serves 4 counties in eastern Tennessee
- Serves 77,000+ metered locations
- Provides electric and other related services and applications

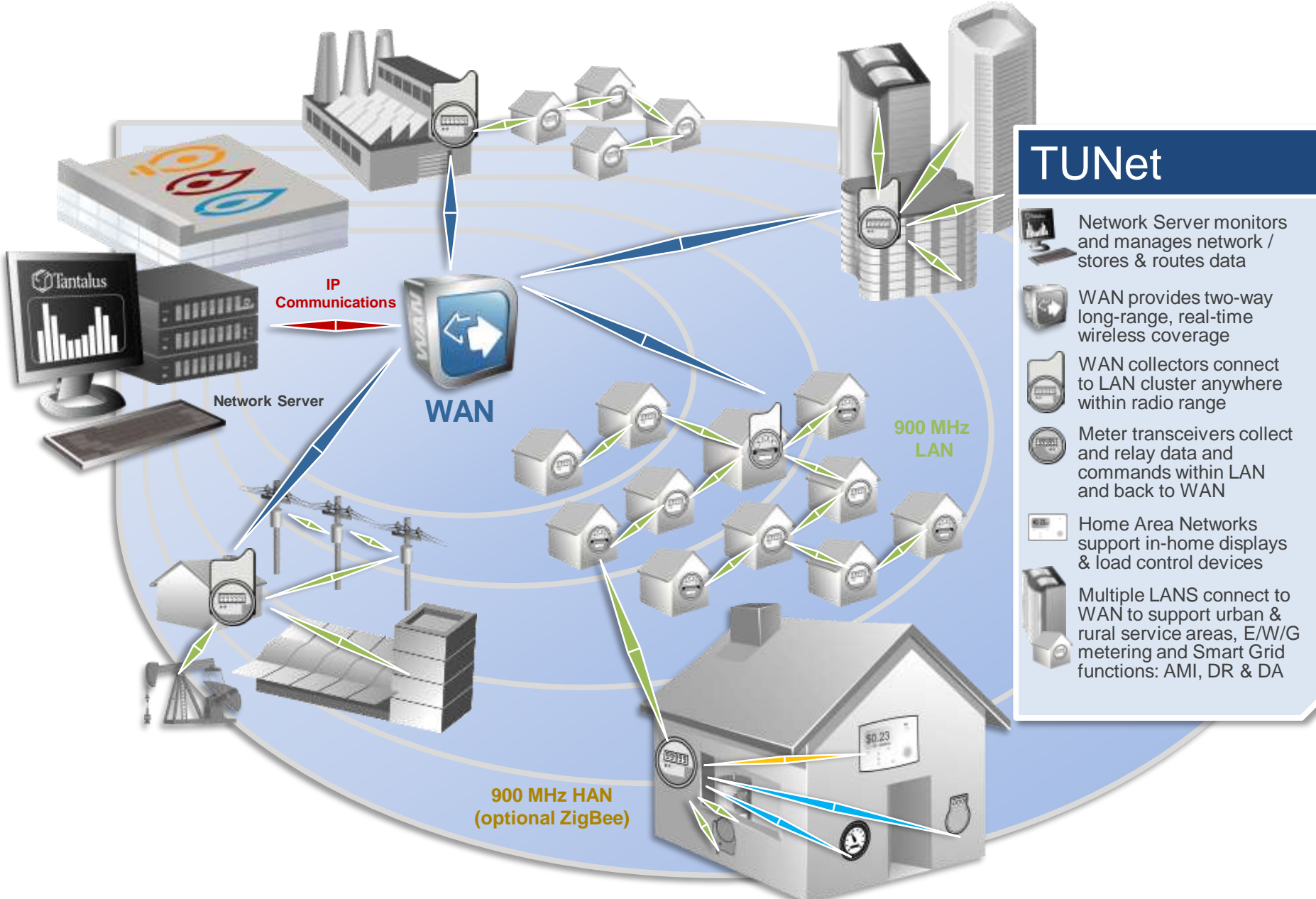








AMI at JCPB

- Today's AMI Drivers for JCPB
 - Remote disconnect/reconnect
 - Fully automate meter reads
 - Improve outage management
 - Provide improved visibility, customer service, and energy efficiency applications to consumers



How Tantalus AMI Works



-  Network Server monitors and manages network / stores & routes data
-  WAN provides two-way long-range, real-time wireless coverage
-  WAN collectors connect to LAN cluster anywhere within radio range
-  Meter transceivers collect and relay data and commands within LAN and back to WAN
-  Home Area Networks support in-home displays & load control devices
-  Multiple LANS connect to WAN to support urban & rural service areas, E/W/G metering and Smart Grid functions: AMI, DR & DA

AMI Network Components

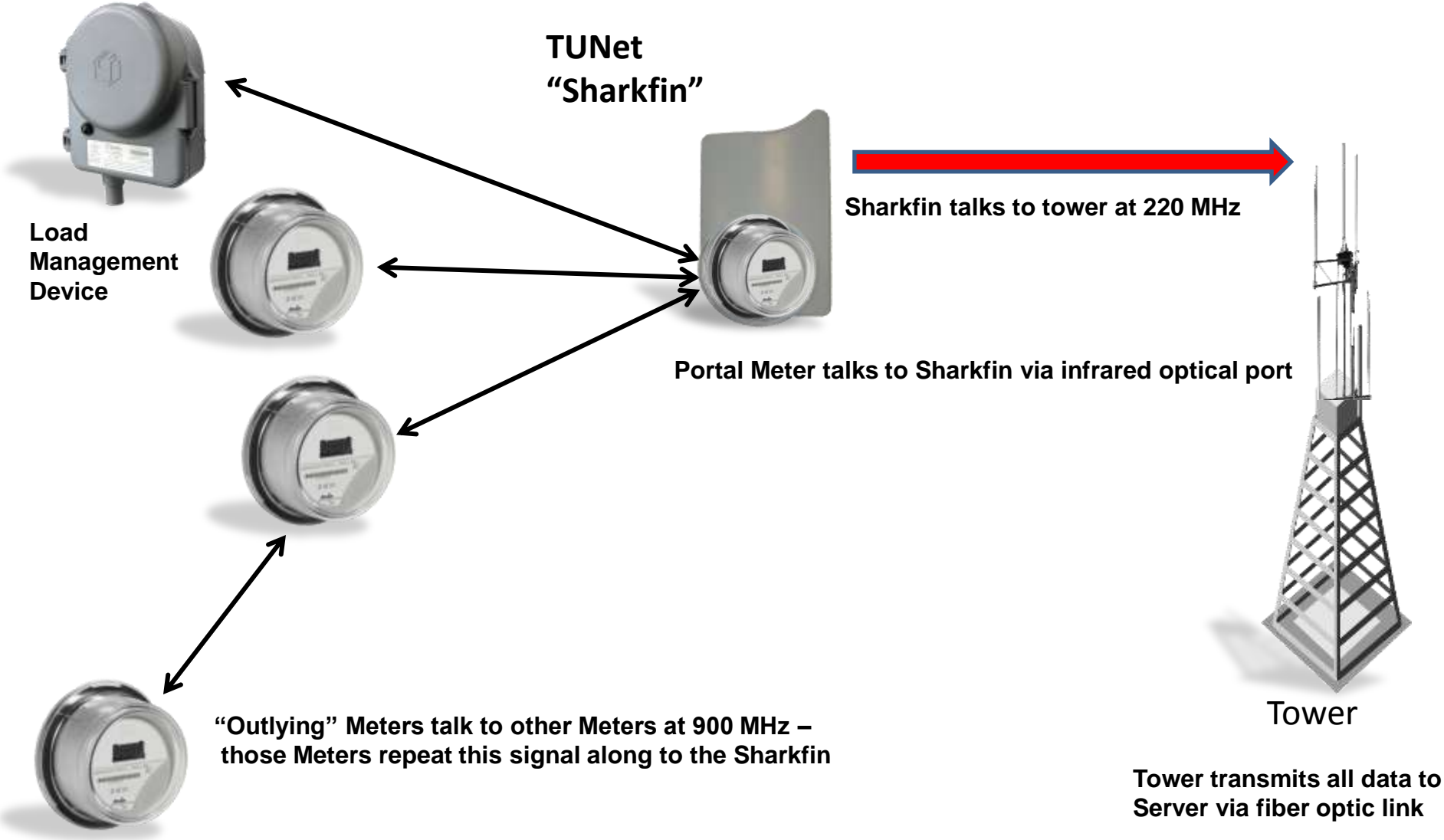


- Tantalus Network Controller (NC) installed at a radio tower to transmit data at 220 MHz to multiple types of transceivers
- This frequency allows for a wide service area with a 30 mile range per tower
- Crossband Repeaters strategically deployed to receive data for applications like load management



AMI System Operations

Individual Meters and Load Control Devices talk to Portal Meters at 220 MHz wireless communications



Traditional Disconnect Service

There are 4 ways to Disconnect Self-Contained Services:

1. Cut service at weather head or transformer – meter should be removed if cut
2. Remove meter and install meter blank
3. Install disconnect sleeves (AKA “Boots”) on load side terminals of meter and leave meter in place – services disconnected in this manner are sealed with yellow seals if customer requested and red seals if disconnected for non-payment
4. Operate installed remote disconnect (RD) meter to open internal contacts

Traditional Reconnect Service

There are 4 ways to Disconnect Self-Contained Services:

1. Make up service at weather head or transformer
2. Remove meter blank and install meter
3. Remove disconnect sleeves (AKA “boots”) on load side terminals of meter and set meter back in place
4. Operate installed remote disconnect (RD) meter to close internal contacts



AMI-Enabled Remote Disconnect/ Reconnect

Alternative method to use AMI for
remote disconnect/reconnect:

- Remote disconnect under-glass (RDUG) meters have internal contacts rated to make and/or break load of up to 200 amps
- JCPB utilizing RDUG on 2S self-contained services
 - Installing 12S RDUG meters in 2014
- Strategically deployable in needed areas
- Supports prepaid energy applications
- Immediate field-initiated verification of service disconnect/reconnect

HOME Remote Disconnect Current Status

REMOTE DISCONNECT

CURRENT STATUS

HISTORICAL STATUS

OUT OF SERVICE

Single Meter Report:

Meter ID: by Meter ID

Customer ID: by Customer ID

Name: by Name

Account No.: by Account No.

Multiple Meter Report:

Report all devices that are currently ...

Connected

Disconnected

Armed For Connection

All

((Not Route = (ANY) AND

(Not Feeder = (ANY)) AND

(Not Line Section-Station = (ANY)) Go

Tantalus



AMI-Enabled Load Management

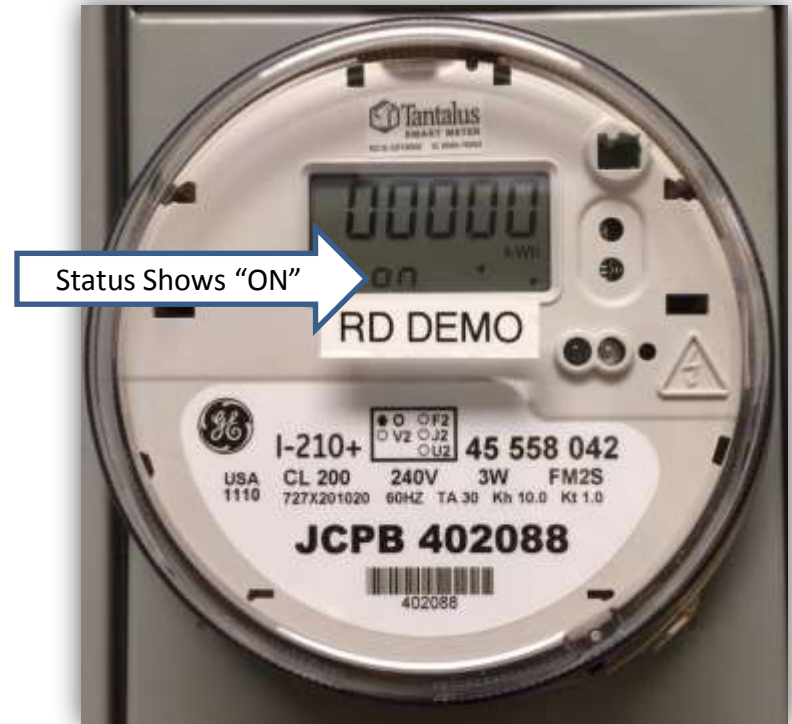
- Utilize integrated RF communication modules
- Utilize internal load-break rated relays
- Internal relay is wired into the control or power circuit of a device (ex: HVAC/water heater)
 - Can be controlled by JCPB to shed load during Demand Response events
 - Driven by system load – periods of high electricity demand can be controlled and peak power usage “shifted” to off-peak times by effective use of a well managed Load Management program
- Currently, LMs are being installed on water heaters at multi-family dwellings (apartments) and the Johnson City Housing Authority



Load Control Device and RD Meter



Load Control Device



RD Meter

Live Demonstrations of JCPB AMI

1. Remote Disconnect/Reconnect
2. TUNet Dashboard for Active System Monitoring
3. Simulated Power Outages
4. Simulated Voltage Sags/Swells

Results

- Avoided truck rolls for service disconnect, reconnect, meter reading, and billing disputes
- Potential to save hundreds of thousands of dollars via load management during peak periods
 - Savings result from avoided excess demand charges and wholesale power purchases
- Can utilize same technology for systemwide voltage regulation during peak periods



Questions?



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