Gasgard XL Network Capabilities

August 4, 2010
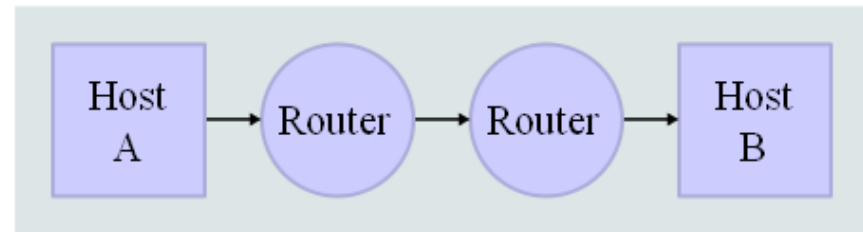**Gustavo Lopez**

EVERY LIFE HAS A PURPOSE…

- The Gasgard XL controller was designed to be networked through MODBUS®
  - Wired RS-485 MODBUS® connection
    - Multidrop bus configuration
  - Ethernet with MODBUS® through TCP/IP
    - **Gasgard XL TCP/IP operation at 10 Mbit/s half-duplex only**
    - **Large flat networks may require the use of additional 3rd party products such as gateways in front of each Gasgard XL to not bog down network performance**
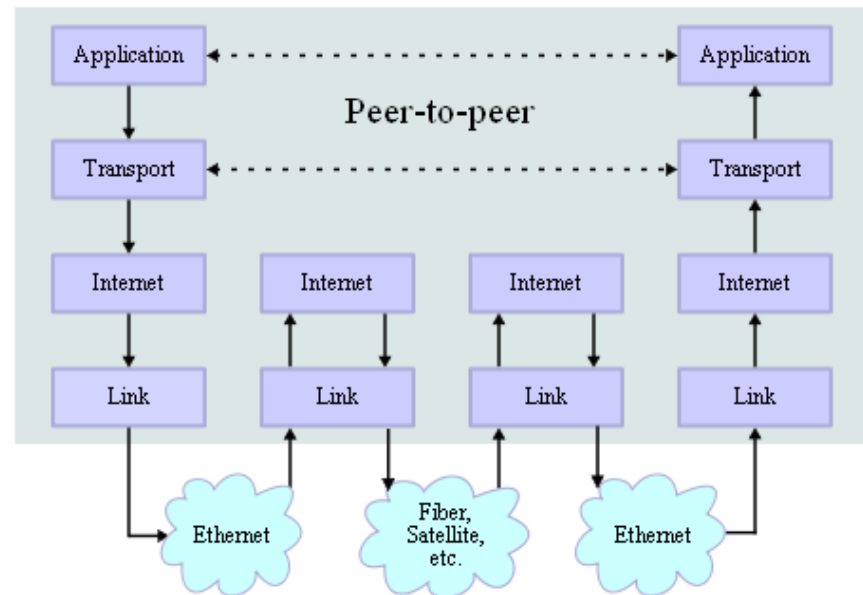
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TCP/IP Overview

- TCP/IP is the set of communication protocols that is used for the internet or other similar networks
  - The protocol is divided into various layers to provide abstraction of protocols and services. Each layer is interconnected and communicates separately
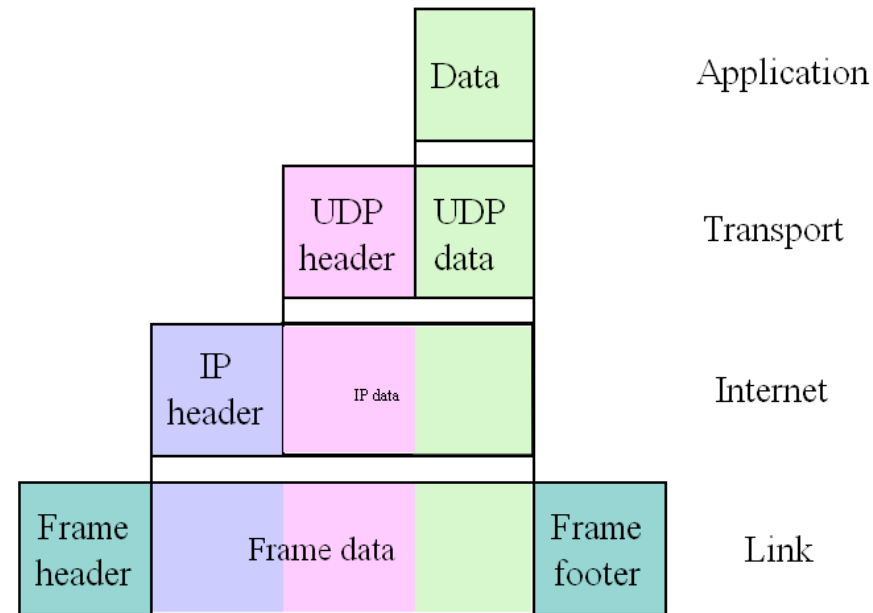

Network Connections

Host A → Router → Router → Host B

Stack Connections

Application ←----- Peer-to-peer -----→ Application

Transport ←-------------------------→ Transport

Internet   Internet   Internet   Internet

Link   Link   Link   Link

Ethernet   Fiber, Satellite, etc.   Ethernet

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TCP/IP Overview

- Four layers in TCP/IP
  - Application, Transport, Internet and Link
- Each layer passes data/information between each other
  - Each layer is completely encapsulated from each other
- Devices can operate in three modes
  - Simplex, Half-Duplex or Full-Duplex

Simplex Operation

- **Network cable sends information in one direction only**

- **Used in technologies like fiber optic communications where one strand is used to send data in each direction**

Device A
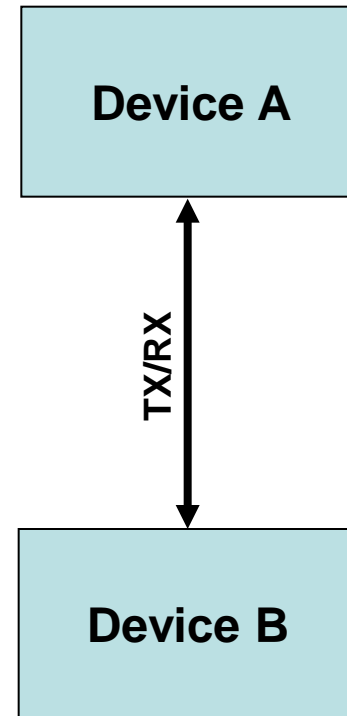
Transmit
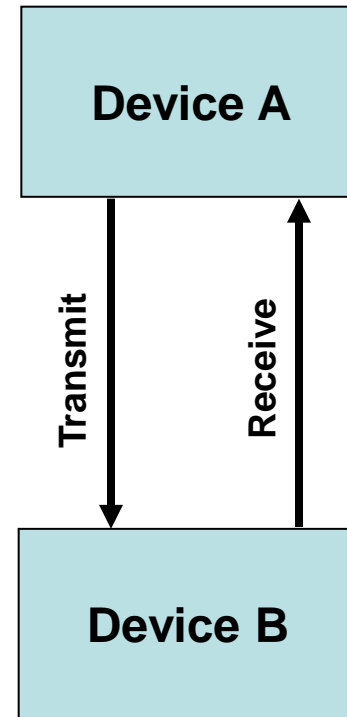
Receive

Device B

Only one line can be active at a time

Half-duplex operation

- Communication between two nodes occurs in both directions (transmit/receive)
  - Only one direction or the other can be utilized at a time
- Devices essentially take turns transmitting
  - Issues can be found in large flat networks where devices need to respond quickly
- *Gasgard XL operates in this mode only at 10Mbit/s*
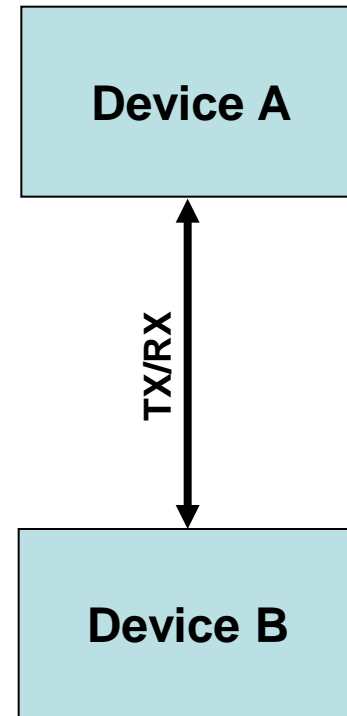
Device A

TX/RX

Device B

A Transmit will not occur until the Receive is complete

Full-Duplex operation

- Connection between two devices capable of sending data in both directions simultaneously

- Sometimes the word "duplex" only is referred to this type of operation
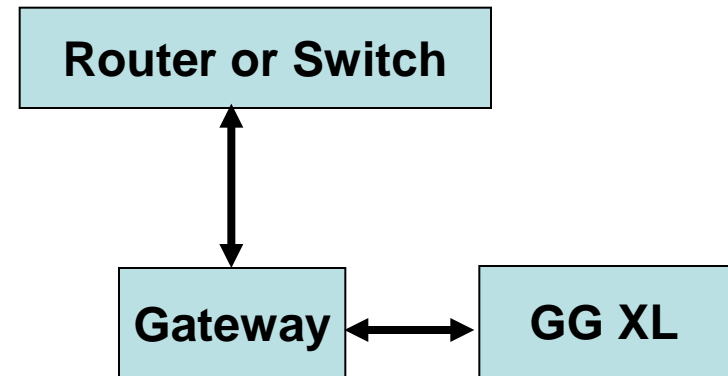
Device A

TX/RX

Device B

TX and RX can occur simultaneously

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- The Gasgard XL works in half-duplex operation at 10 Mbit/S
  - If installing on a large flat network, you may require gateways in front of each controller because of network performance issues
  - There has already been one major installation that required this type of approach

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┌───────────────────────┐
│   Router or Switch    │
└───────────────────────┘
            ↕
┌─────────────┐      ┌─────────────┐
│   Gateway   │◄────►│    GG XL     │
└─────────────┘      └─────────────┘
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Gateway in front of each GG XL may be required
Consult with the NW expert prior to the installation
Smaller networks may not require a gateway

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Recommended gateways

- There are many network gateways providers

- Recommended gateway providers include

  – ICC Designs (http://www.iccdesigns.com/)

    ▪ ETH-1000 has already been validated internally

  – MOXA (http://www.moxa.com/)

    ▪ MGate MB3180 has also been validated internally

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Summary

- The Gasgard XL was not designed to work on large flat networks as a stand-alone device
  - It can be installed on such networks only if accompanied by a gateway that can allow for faster response
  - Consult with the customer's network expert prior to the installation
- The TCP/IP output on the Gasgard XL provides flexibility of being installed on large systems
  - Verify the customer's network topology and performance requirements along with the Gasgard XL's capabilities (10 MBit/S at Half-Duplex Only)
- Reference http://www.tcpipguide.com/ for more detailed information on the TCP/IP protocol