

Key Points in developing LXI instruments

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It was not difficult

- Utilized Off the shelf Ethernet to Serial adapter
- 10 man months development
 - 7 months for 1 Development Engineer
 - 3 months 2 Development engineers
- Subcontract
 - IVI driver



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Our Experience

- C, C++ Embedded Design
- 0 experience in network Development
- 0 experience with HTML
- Platform used
 - NetBurner Module
- 2 man months used for testing of product.



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Selection of platform

- Web Page support
 - Ability to insert POST and GET preprocessors
 - Allows creation of HTML based upon variables.
- Port support
 - Must have 5 open ports for VXI-11
 - Multiple connections on ports.
 - Two connections minimum.
 - Require.
 - Open close, device_write, device_read
 - Discovery
 - » Adds do_cmd.
 - Sockets
 - Open, close part of Kernel
 - Write and read of data



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Selection of Platform

- Protocol support
 - DHCP
 - Must be able to turn on and off
 - AutoIP
 - Enable disable
 - Duplicate IP support
 - Send Null probes when static
 - DNS
 - Verify host Name
 - MDNS
 - For the future



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Speeding up development

- Membership
- Lan Status Indicator
- Web Pages
- Discovery
- Sockets
- IVI COM Driver
- Certification



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Membership

- Attending a meeting first
 - Speeds up the development process.
- Join a group
 - Why
 - Provides ability to search for documents
 - Provides access to Plugfest testing
 - What Group
 - Technical committee
 - Lan WeB WG



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Lan Status indicator

- Color
 - Green or Yellow.
- LED goes out
 - When cable is disconnected.
 - Upon detection of duplicate address.
 - When Lease is not renewed.
 - It stays off, even if new address is found.



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Web Pages

- All are verified.
 - Even the instrument page and help pages
- Strict coding is not required.
 - Strict eliminates Center
 - Problems in look and feel with different browsers
- Verify The CSS
 - Not required by LXI
 - Improves operation with all browsers



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Discovery

- VXI-11 is not required.
 - Full Implementation
 - 500+ lines of C code.
 - Many hours writing test code.
- device_docmd
 - Must return 8, not supported
 - Agilent tool uses command, NI does not.



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Minimal Discovery

- Port 111 packet decode
 - UDP required for discovery
- Port 1024
 - create_link
 - device_write
 - device_read
 - destroy_link
 - do_cmd
 - TCPIP options (Buffer size)



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Sockets

- If VXI-11 is not supported Sockets must be.
- IVI Uses Visa Driver
 - Command string is either
 - Instr – using VXI-11
 - Socket



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IVI Driver

- Make It Yourself
 - Use a tool
 - Pacific Mindworks Nimbus – IVI Com or IVI-C
 - National Instruments CVI – IVI -C
 - Testing is ½ of the effort.
 - Testing was 2 months of the effort
- Subcontract.
 - Pacific Mindworks
 - Vektrex
 - National Instruments



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Questions

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