R*TIME Global interface,

a new paradigm in interface design

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Overview Schedule

5 min – Introduction and Greetings

20 min – The R*TIME Global Interface

10 min – Demo

10 min – Q&A

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Introductions

- Brent Young - Instructor

  Lead Software Engineer

  Cromwell, CT

  860-632-5874 ext14

  byoung@curtisswright.com

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The R*TIME Global Interface (A History)

- All Plant Process Computers gather data from external systems.
- R*TIME has native interfaces to:
  - Modbus
  - ODBC
  - OPC
  - RTP Protocols

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The R*TIME Global Interface (A History)

- Serial and TCP/IP interfaces have no standard, hence no standard or native interface.
- In the past
  - interfaces were developed from scratch by copying and pasting code.
  - there was no standard for how to handle connections to the devices

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The R*TIME Global Interface (The Problem)

- Millstone Unit 3 has 6 Serial Interfaces to the PPC.
  1. Digital Radiation Monitoring Systems
  2. Leading Edge Flow Meters
  3. Meteorological data
  4. Inadequate Core Cooling and Monitoring
  5. Environment Data Acquisition Network
  6. Environmental Equipment Qualification
- Needed a way to standardize the interfaces.

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Why A Global Interface? (The Goal)

- Reduces time required to create a project. ($$$)
- Enhances software consistency and quality (Also $$$)
  - Gives source code a consistent look and feel
  - Helps enforce Coding standards. i.e. Good Programming Practices
  - Provides a tested base platform

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Why A Global Interface? (The Goal)

- Reuses existing R*TIME base system configuration management processes. (Configuration done with DB Utility)
- Reduces new development by using existing R*TIME source code. (aiconvert and mv2eu)

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Why A Global Interface? (The Design)

- Treat each External system like a DAS (Data Acquisition System) Node
- Map each point using a unique Tag as defined in the R*TIME Scan DB(i.e. 100_2_1_1)
- First number indicates the Application ID
- Second number represents the Packet ID
- Third represents the Register Index
- Fourth number represents Sub-Register Index

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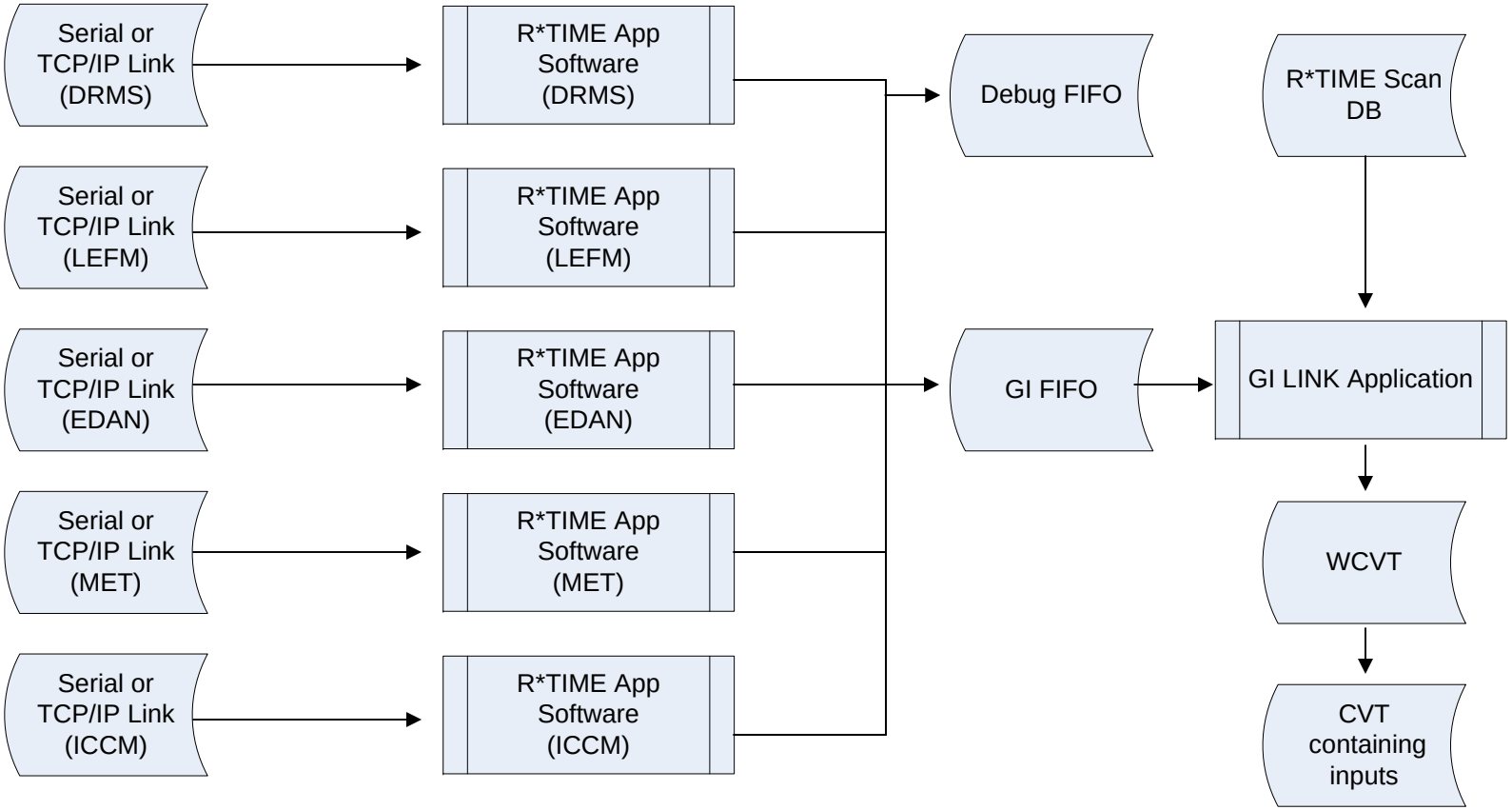
Global Interface Data Flow



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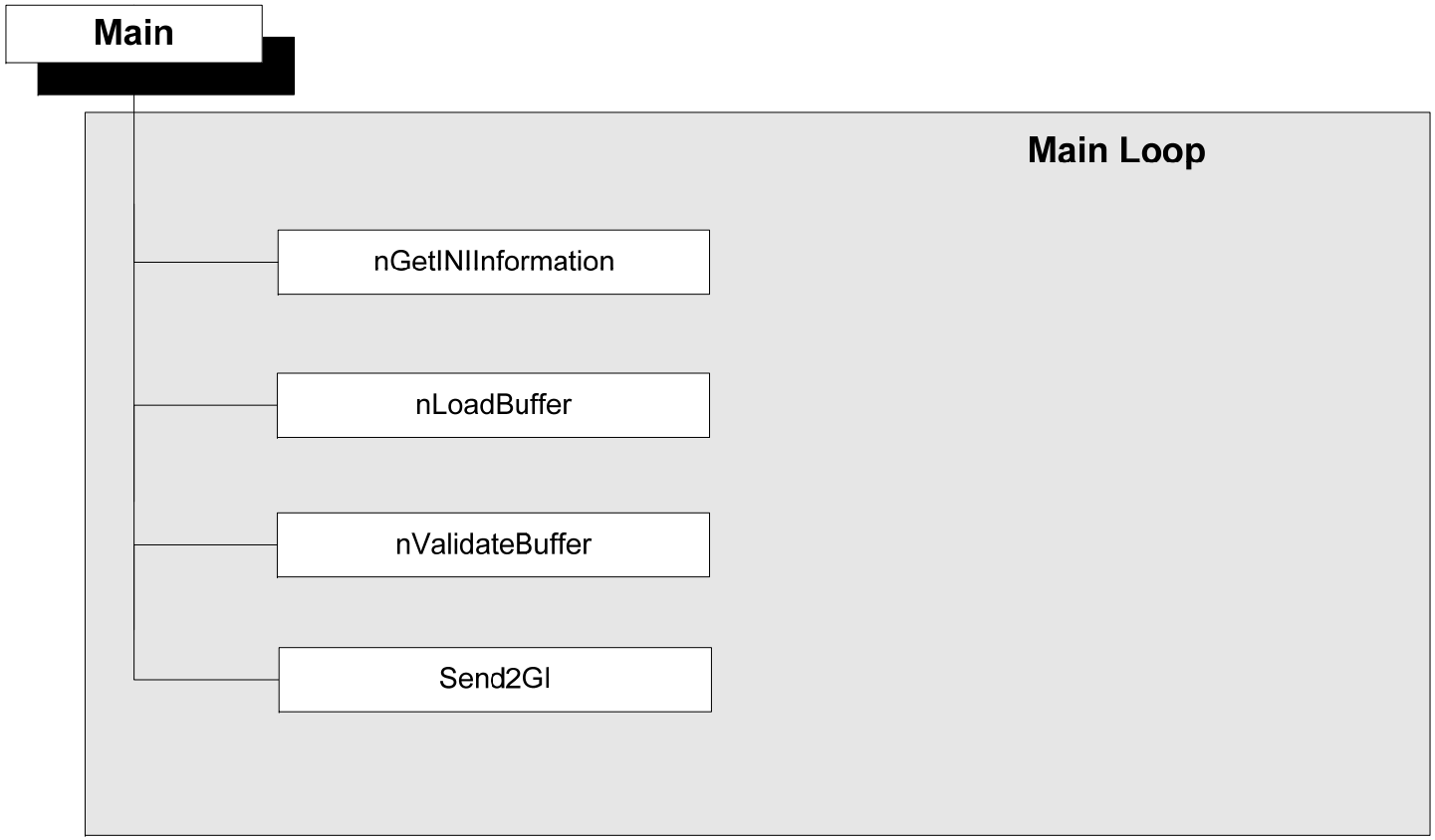
R*TIME Application Functions



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Creating the R*TIME applications for Millstone

- Step 1 – Use the Global Interface Template Application
- Step 2 – Fill in the nGetINIInformation Function
- Step 3 – Fill in the nLoadBuffer function
- Step 4 – Fill in the nValidateBuffer function
- Step 5 – Fill in the Send2GI function

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Why A Global Interface?

- Features
  - C++ Classes for TCP/IP Interfaces provides a standard mechanism to:
    - ❖Attach to TCP/IP ports
    - ❖Read data from TCP/IP ports
    - ❖Write data to TCP/IP ports
    - ❖Handle errors
  - C++ Classes for Serial Interfaces
    - ❖Attach to TCP/IP ports
    - ❖Read data from TCP/IP ports
    - ❖Write data to TCP/IP ports
    - ❖Handle errors

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Why A Global Interface?

- Features
  - C++ Classes for Access to the GI FIFO
    - ❖Attach to the GI FIFO
    - ❖Read data from the GI FIFO
    - ❖Write data to the GI FIFO
    - ❖Handle errors
  - C++ Classes for Access to Debug Memory FIFO
    - ❖Attach to the Debug Memory FIFO
    - ❖Read data from the Debug Memory FIFO
    - ❖Write data to the Debug Memory FIFO
    - ❖Handle errors

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Why A Global Interface?

- Features
  - GI Link Application
    - ❖Read data from the GI FIFO
    - ❖Uses Standard R*TIME Functions aiconvert and mv2eu
    - ❖Stores point info to the DB

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Why A Global Interface?

- Features Continued
  - Allows for configuration of point data using the R*TIME DB Utility
  - Uses the R*TIME Engineering Unit Conversions
  - Uses the standard R*TIME Scan Range checking of Individual Points, including the ability to:
    - Clip Values
    - Set Values to Range Failed Quality

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Why A Global Interface?

- Features Continued
  - Standard Error Messaging
  - Real time Debugging
  - GI Link Application Diagnostics
  - High processing speed (<10ms)

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Demo

- Serial/TCP IP Test Utility
- ICCM Application
- GI FIFO/ GI LINK Diagnostic Display
- Real Time Debugging

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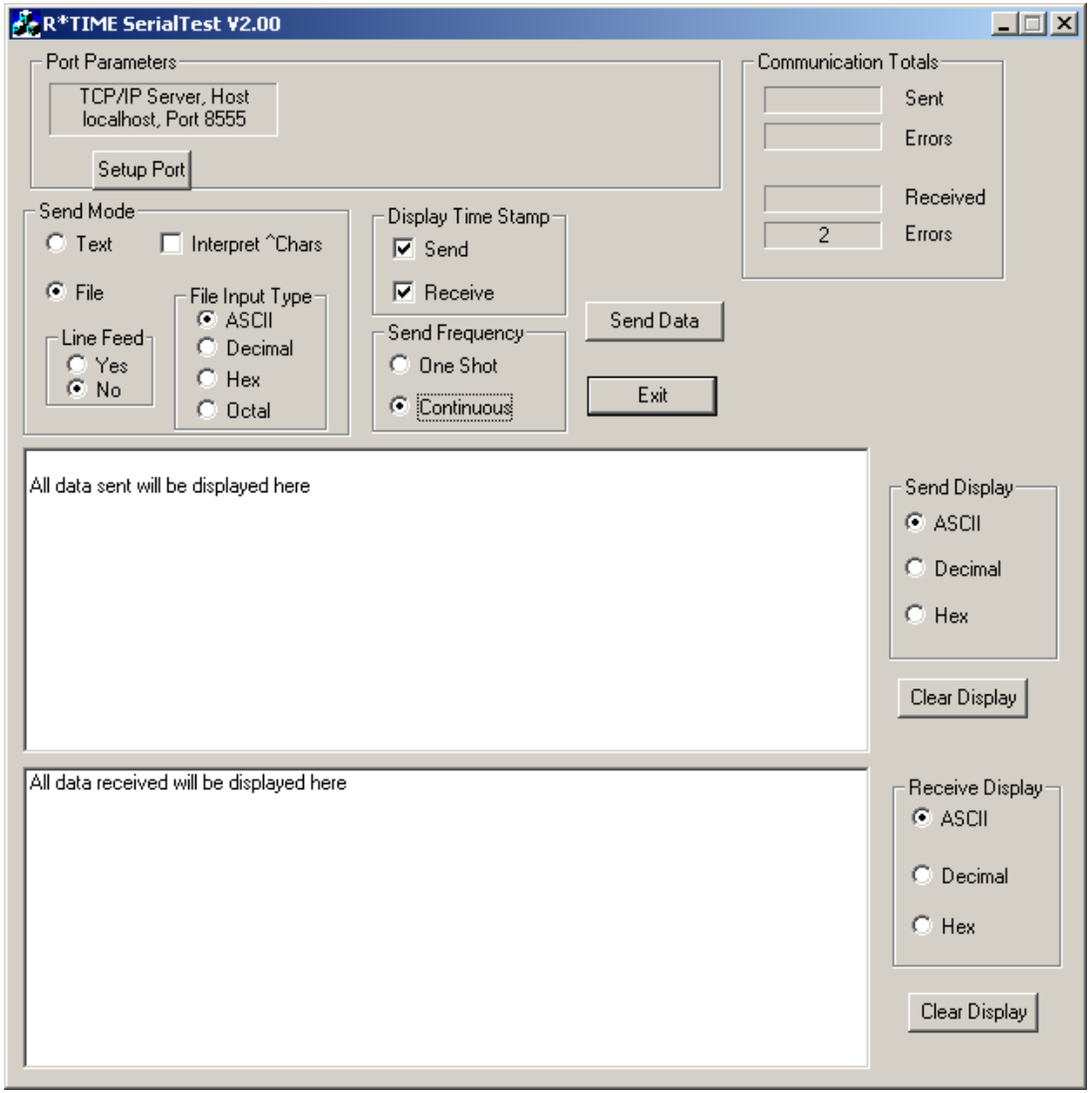
Demo



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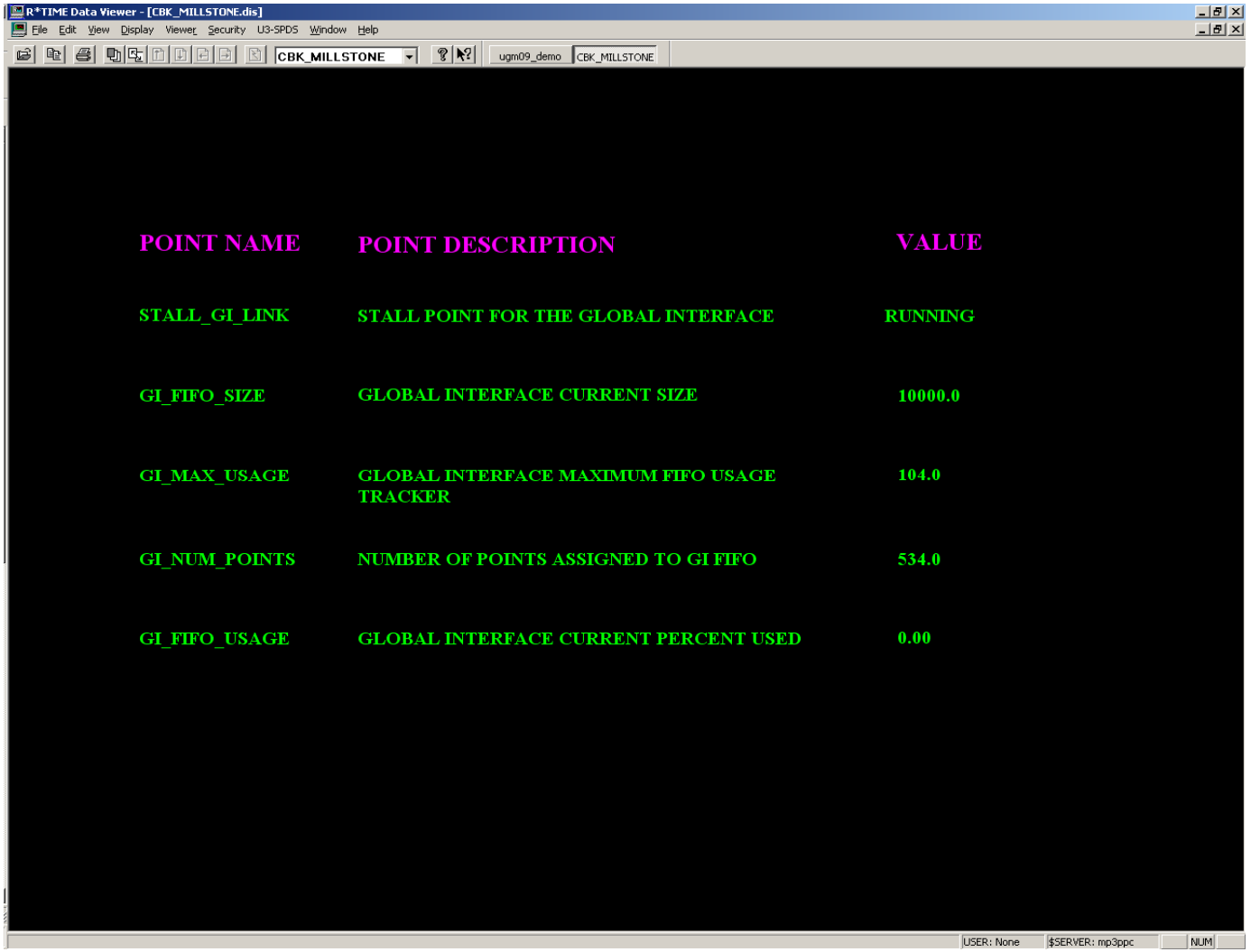
Demo



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