Lesson 6 (week March 22-28) Using other LabVIEW Features

- Remote clients see and exchange data--Data Socket; Several clients can receive the data
- View & Control VI Front Panels remotely--Requires no programming; Multiple clients can view the same panel simultaneously; Only one client can control the front panel at a time

Using DataSocket Technology DataSocket Transport Protocol (dstp)

You publish (write) or subscribe (read) data by specifying a URL, in much the same way you specify URLs in a Web browser.





Using DataSocket Technology DataSocket Transport Protocol (dstp) 1. Find the VI from Help»Find Examples...»Search 2. Type in "datasocket" and search 3. Choose DS SendImage.vi

This VI (in conjunction with DS ReceiveImage.vi) loads images located in the dsdata directory, displays them on a graph, and then publishes them one column at a time to a subscribing client. Note that to avoid data loss during publication, buffering constraints must be set for the image URL on the DSTP server as well as the client-side subscribing connection. Configuration Picture Sending Column 0.00

This VI (in conjunction with DS ReceiveImage.vi) hads images located in the dsdata directory, displays them on a graph and then publishes them one column at a time to a subscribing client. Note that to avoid data loss during publication, buffering constraints must be set for the image URL on the DSTP server as well as the client-side subscribing connection.

Picture Configuration	1
Picture Data Files	
0 B dsdata\collesium.dsd	
월 dsdata∖venize.dsd	
뭠 dsdata\du mo.dsd	
URL	
dstp://localhost/image	
Sleep (ms) Between Columns	

Using DataSocket Technology DataSocket Transport Protocol (dstp) 1. Find the VI from Help»Find Examples...»Search 2. Type in "datasocket" and search 3. Choose DS ReceiveImage.vi

This VI (in conjunction with DS SendImage.vi) dynamically displays image data received from the DSTP Server. On the DSTP Client-Side Buffering Constraints tab, you can change the size of the buffer that holds unprocessed data. Note that to avoid data loss, buffering constraints must be set for the image URL on the DSTP server as well. Picture DSTP Client-Side Buffering Constraints Buffer Utilization 0.656 % parents, earning (% of MaxBytes) Buffer Utilization 🦻 - range range (% of MaxPackets) 100%

This VI (in conjunction with D data received from the DSTP Client-Side Buffering Constrai that holds unprocessed data. constraints must be set for th	S SendImage.vi) dynamically displays image Server. On the DSTP ints tab, you can change the size of the buffer Note that to avoid data loss, buffering is image URL of the DSTP server as well.
Picture DSTP Client-Sid	e Buffering Constraints
Base URL dstp://129.100.91.68	8/image
MaxBytes 100000 MaxPackets 250	Data is dropped from the client buffer if either of these constraints is violated.

Remote Front Panels - Resources

- NI Developer Zone (zone.ni.com)
 - Search for Remote
 Front Panel
 - Tutorials &
 Instructions Are
 Available for
 Download
 - Information on
 Incorporating Web
 Cameras into
 Remote Panel
 Applications



Using built-in web server technology Configuring the server for clients

A. Configure the Web Server by selecting Tools»Options and selecting the Web Server pages from the top pull-down menu: 1.Web Server: Configuration

2. Web Server: Browser Access-->input the remote computer name or IP 3. Web Server: Visible Vis-->license to see Vis and theses VIs should be

in memory of the Server

Use these pages to control browser access to the server and to specify which front panels are visible remotely.

Configuring for clients

B. Configure the Web client by opening a new VI and selecting
Operate»Connect to Remote Panel to display the
Connect to Remote Panel dialog box:
1.Input the IP address of the server and the VI you want to see
2. Indicate if you want to control it

you can access to the server and to specify which front panels are visible 7 and controllable remotely.

Using built-in web server technology

- 1. Find the VI from Help»Find Examples...»Search
- 2. Type in "statistics" and search
- 3. Choose statistics.vi
- 4. Follow the instructions on last transparency to
- do the configuration 5. Connect and run
- Please practice in a group of 3 Note that the computer name is as following: UC08 -->
- uc08.uc.publab.uwo.ca



Using built-in web server technology Real remote control to an Ocean Optics spectrometer



The LabVIEW Professional **Development System includes** a remote panel license that allows five clients to view and control a front panel remotely. You can upgrade the remote panel license to support more clients.⁹

Using built-in web server technology Real remote control to an Ocean Optics spectrometer



Using built-in web server technology Real remote control to an Ocean Optics spectrometer

The instructor's computer IP address is 129.100.100.145 and the remote VI is ADC1000USB_Sample.vi

Is it safe? Yes, the server can disconnect the client anytime by selecting Tool>>Remote Pane Connection Manager. And the client can not modify the Block Diagram.

There are other communication methods in LabVIEW, Please refer to <u>Chapter 18--Networking in LabVIEW</u> of *User Manual*

Calling Code from Text-Based Programming Languages

1. Use the Call Library Function Node to call most standard shared libraries or Dynamic Link Libraries (DLLs).

For instance: in the ADC1000USB_Sample.vi, we use All functions>>Advanced>> Call Library Function Node

and then right-click>>configure



🔀 Call Library Funct	ion	×
Library Name or Path		Browse
Function Name	funcName	Run in UI Thread 💌
Calling Conventions	C 🔽	
Parameter	return type	
Туре	Vcid	Add a Parameter Before
		Add a Parameter After
		Delete this Parameter
Function Prototype:		
void fundName(void);	
	OK Cancel Help	

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2. Use Code Interface Node CIN as an alternative method for calling source code written in C.

The Call Library Function Node generally is easier to use than the CIN.

ActiveX Objects, Properties, Methods, and Events

ActiveX-enabled applications include objects that have exposed properties and methods that other applications can access.

Objects can be visible to the users, such as buttons, windows, pictures, documents, and dialog boxes, or invisible to the user, such as application objects.

LabVIEW as an ActiveX Client

When LabVIEW accesses the objects associated with another ActiveX-enabled application, it is acting as an ActiveX client.

- select all controls>>refnum>>automation refnum control in front P
- Right-click this control to select **Active Class** from the type library
- In block diagram, use the **Property Node** to get (read) and set (write) the properties associated with an ActiveX object.
- Use the **Invoke Node** to invoke the methods associated with an ActiveX object.

- 1. Find the VI from Help»Find Examples...»Search
- 2. Type in "ActiveX" and search
- 3. Choose Writer table to XL.vi





- 1. Find the VI from Help»Find Examples...»Search
- 2. Type in "ActiveX" and search
- 3. Choose slideshow.vi

launch PPT	make visible	load presentation	get slideshowsettings	set to full screen	run blideshow	close reference to PPT
PowerPoint_Application	Image: Contraction of the second s	Den FileName ReadOnly WithWindow	SlideShowSettings	n <mark>∎C SlideShowSetting</mark> I ShowType	n Run	Error Out
Select slide show presentation	This VI w	vill prompt the	Chan	ge to su	ffix .ppt	
	run the s	lide show in a	tion			
	E	rror In (no error) status OFF code 0 source	Error Out Status OFF code 0 source			15



Burleigh's FREEDOM[™] 1500 Nano Robot systems with 8200 Inchworm [®] motor controllers offer automated alignment systems, with 20-nanometer linear resolution.

We will use their demo LabVIEW VI (DemoLV.vi) to demonstrate capabilities for both remote control and Active X application access.

Block Diagram



LabVIEW as an ActiveX Client of MS Word

Instructions: Select the desired plot style (8 choices) and transparancy level (%) and run the VI. Control values may be changed while the VI is running. Additionally, the view of the 3D graph can be changed by positioning the mouse pointer over the graph, holding down the left mouse button, rotating the graph to the desired position, and releasing the left mouse button. Press the stop button to guit.



Look at the two sub Vis: 3D Parametric Surface.vi and Basic Properties.vi

Block Diagram



Build the X, Y, and Z matrices that form the 3D parametric torus surface. Plot the torus surface on the CWGraph3D Active X control. Update the plot style and transparency properties of the 3D parametric surface.

LabVIEW as an ActiveX Client of MS Word

WordApplication	
	error out
error in (no error)	status code
status code	a 0
	source
source	
J	

Homework:

Modify the VI to close and quit the PowerPoint Application at the end.

Please refer the example: Writer table to XL.vi



ActiveX Objects, Properties, Methods, and Events LabVIEW as an ActiveX Server

Other ActiveX-enabled applications, such as Microsoft Excel, can request properties, methods, and individual VIs from LabVIEW, and LabVIEW acts as an ActiveX server.

For example, you can embed a VI graph in an Excel spreadsheet and, from the spreadsheet, enter data in the VI inputs and run the VI. When you run the VI, the data plot to the graph. Refer to the examples\comm\freqresp.xls for an example of using LabVIEW properties and methods in an Excel spreadsheet.

Closely look at **Tools>>Macro>>Visual Basic Editor**

mplitude	10
umber of Steps	100
ow Frequency	10
igh Frequency	100





Note 1 : Use Ctrl+M to clear the chart, Ctrl+L to run the vi.

Note 2 : Before you run this example go to LV Preferences/ Server Configuration and enable Active-X and all server Resources. Under Preferences/Server Exported Vis, allow access to freqresp.llb.

Summary

1. Two features of LabVIEW for seeing data and remote control: Data socket to indicate an URL and built-in web server technology

2. Calling Code from Text-Based Programming Languages Use the Call Library Function Node and Code Interface Node

3. ActiveX Objects, Properties, Methods, and Events

LabVIEW accesses the objects associated with another ActiveX-enabled application, it is acting as an ActiveX client.

Other ActiveX-enabled applications can request properties, methods, and individual VIs from LabVIEW, and LabVIEW acts as an ActiveX server.