# Overview

The System Management and Information (SMI) is a new LabVIEW reference library which will address some of the most common customer system configuration management and detection tasks. This new LabVIEW reference library will build upon the feature sets of the two existing code bases, RT Management and the CompactRIO System Configuration Information (CRI) Reference Library. The SMI will be published on the LabVIEW Tools Network, and source code will be made available on the LabVIEW developer community for ongoing collaboration.

# Background

The internal NI RT Management library, created by NI R&D Systems Engineering, is a Real-Time target management and file transfer tool for NI CompactRIO and PXI hardware. The CRI library, created and maintained by NI Systems Engineering, is a target and module configuration detection tool for the RIO hardware platform (found at: <http://www.ni.com/example/51852/en/)features>). Both libraries have been used in large customer applications. SMI library will incorporate most of the features of RT Management and all essential features of CRI into a single intuitive reference library.

# Existing Libraries

## RT Management

|  |  |
| --- | --- |
| **RT Management**   * RT Management * File Transfer Behavior | RTManagementTopLevelPalette.JPG  **Functions>>Addons>>RT Management palette** |
| **RT Management (sub palette)**   * Initialize * Close * Restart * Get OS * Get RT INI location * Get startup directory * Configure VI Server * Modify RT INI * Rename * Install startup application * Uninstall startup application * Install all from repository * Format * Capture Image * Reset Device names * Set time | RTManagmentPalette.JPG**Functions>>Addons>>RT Management>>RT Management palette** |
| **File Transfer Behavior (sub palette)**   * Initialize * Initialize (WebDAV) * Initialize (FTP) * Close * Get file * Put file * Delete * Move * Create directory * Create directories * Delete directory * File or directory exists * Recursive file list * Build path * Strip path | FileTransferBehaviorPalette.JPG  **Functions>>Addons>>RT Management>>File Transfer Behavior palette** |

## CompactRIO System Configuration Information (CRI) Reference Library

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| --- | --- |
| **NI CompactRIO Information (CRI) Library palette**   * Get Remote cRIO System * Get Remote cRIO Controller * Get Remote cRIO Backplane * Get Remote cRIO Modules * Get cRIO System Info * Get cRIO Controller Info * Get cRIO Backplane Info * Get cRIO Modules Info * Get cRIO-903x Modules Info * Get cRIO-906x Modules Info * Get cRIO-907x Modules Info * Get cRIO-908x Modules Info * Get cRIO-910x Modules Info * Get cRIO-911x Modules (9111, 9112,…) * Get Ethernet RIO NI 914x Modules Info * Get MXI-Express RIO NI 915x Modules Info * Get sbRIO-96xx Modules Info | CRIPalette.JPG  **Functions>>Addons>>NI CompactRIO Information (CRI) Library** |
| **Examples palette**   * Detect Remote cRIO * Detect cRIO Configuration | CRIExamplesPalette.JPG**Functions>>Addons>>NI CompactRIO Information (CRI) Library>>Examples** |

# Proposed Library

## System Management and Information (SMI) Reference Library

|  |  |
| --- | --- |
| **SMI palette**   * **Detect Network Devices** * **System Management** | **Functions>>Addons>>SMI** |
| **System Management palette** | **Functions>>Addons>>System Management** |
| **DAQmx (subpalette)**   * **Get Module Info (DAQmx)** | **Functions>>Addons>>System Management>>DAQmx** |
| **RT (subpalette)**   * RT >> Initialize * RT >> Close * **RT >> Get Controller Info** * **RT >> Get Chassis Info** * **RT >> Get Module Info (FPGA mode)** * RT >> Get System Settings * RT >> Get Time Settings * RT >> Get System Resources * RT >> Restart * **RT >> Advanced (subpalette)** | **Functions>>Addons>>System Management>> Real-Time** |
| **Advanced (subpalette)**   * **Send System Session** * **Return System Session** * **~~System Hardware Reference~~** * Set System Settings * Set Time Settings * Get status * Get startup directory * Get installed software * Capture image * Get RT INI location * Get RT INI * Modify RT INI * Put RT INI * Install startup application * Uninstall startup application * Configure VI Server * Rename RT target * Format * Get OS * Update OS * **Get Device Mode** * Check for RT * Refresh SysCfg Session * Reset device names * Get latest RSS and all addons * Get latest RSS * RSS addons filter * Install latest RSS and all addons * Install all from repository * Save changes * **RT >> Advanced >> File Transfer Behavior (subpalette)** | **Functions>>Addons>>System Management>>Real-Time>>Advanced** |
| **RT File Transfer Behavior (subpalette)**   * Initialize * Initialize (WebDAV) * Initialize (FTP) * Close * Get file * Put file * Delete * Move * Create directory * Create directories * Delete directory * File or directory exists * Recursive file list * Build path * Strip path | **Functions>>Addons>>System Management>>Real-Time>>Advanced>>File Transfer Behavior** |

# Software Design

## System Configuration API Supported Devices

|  |  |
| --- | --- |
| **Feature** | **Existing LabVIEW Code Resources** |
| Open SysCfg Session | **RT Management:**   * **Initialize.vi** *(INPUTS: Target, error in, Force online?, Username, Password; OUTPUTS: RT Management out, error out, Status)*   + **Second Initialize for initialization without privileges**     - Reinitialize targets in troubled state     - OS specific Default password handling   + **RT Check**   + **Force Online**     - Warning **263168** converted to Error   + SysCfg OS string to enum type conversion   **RAD Utility:**   * **rad\_Open Session.vi** *(INPUTS: Target Address, User name, error in, Timeout ms; OUTPUTS: session out, Cancelled, error out, Password Out)*   + NI-Auth login     - Local Error Handling:       * **-2147220611**: Current user does not have permission       * **-2147220598**: The username or password is invalid       * **-2147220361**: The password supplied for the operation is invalid   + Password FGV     - User Dialog entry |
| Close SysCfg Session | **RT Management:**   * **Close.vi** (*INPUTS: Wait on reboot if needed, RT Management in, error in, Timeout; OUTPUTS: RT Management out, error out)*   + Conditional Restart   + Restart timeout   + Close SysCfg Session (error or no error)   **RAD Utility:** |
| Protected Target Methods | RT Management  RAD Utility |
| Protected Target Accessors | RT Management  RAD Utility |
| Protected File Transfers | RT Management  RAD Utility |

<RAD>\subVIs\NI-Auth\**rad\_Open System Config Session.vi**

<RAD>\subVIs\Targets\**rad\_Apply Network Settings (Static).vi**

<RAD>\subVIs\Targets\**rad\_Apply Network Settings (DHCP).vi**

<RAD>\subVIs\App Images\Deploy App Images\**rad\_Check Image RT-INI For AutoRun.vi**

<RAD>\subVIs\App Images\Deploy App Images\**rad\_Deploy All Bitfiles.vi**

<RAD>\subVIs\NI-Auth\**rad\_Open Session.vi**

<RAD>\subVIs\NI-Auth\**rad\_Open System Config Session.vi**

<RAD>\subVIs\Targets\**rad\_Get Target Info (IP) Wrapper.vi**

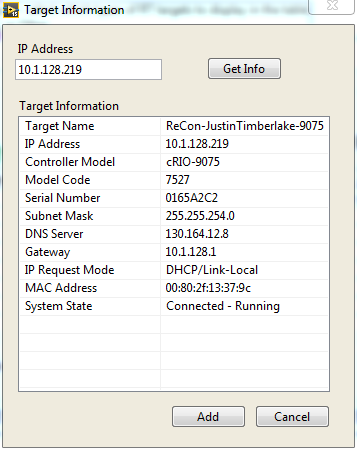
<RAD>\subVIs\Targets\**rad\_Get Target Info (Subnet) Wrapper.vi**

<RAD>\subVIs\Targets\**rad\_Configure Target.vi**

<RAD>\subVIs\Targets\**rad\_FilterTargets.vi**

**Beta Release (Essential Features, Selected Product Support):**

* **Detect Network Devices**
* **Initialize**
* **Close**
* **Get Controller Info**
* **Get Chassis Info**
* **Get Module Info**

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