Setup NI LTE Application Framework

Install required Software packages on PC/Laptop

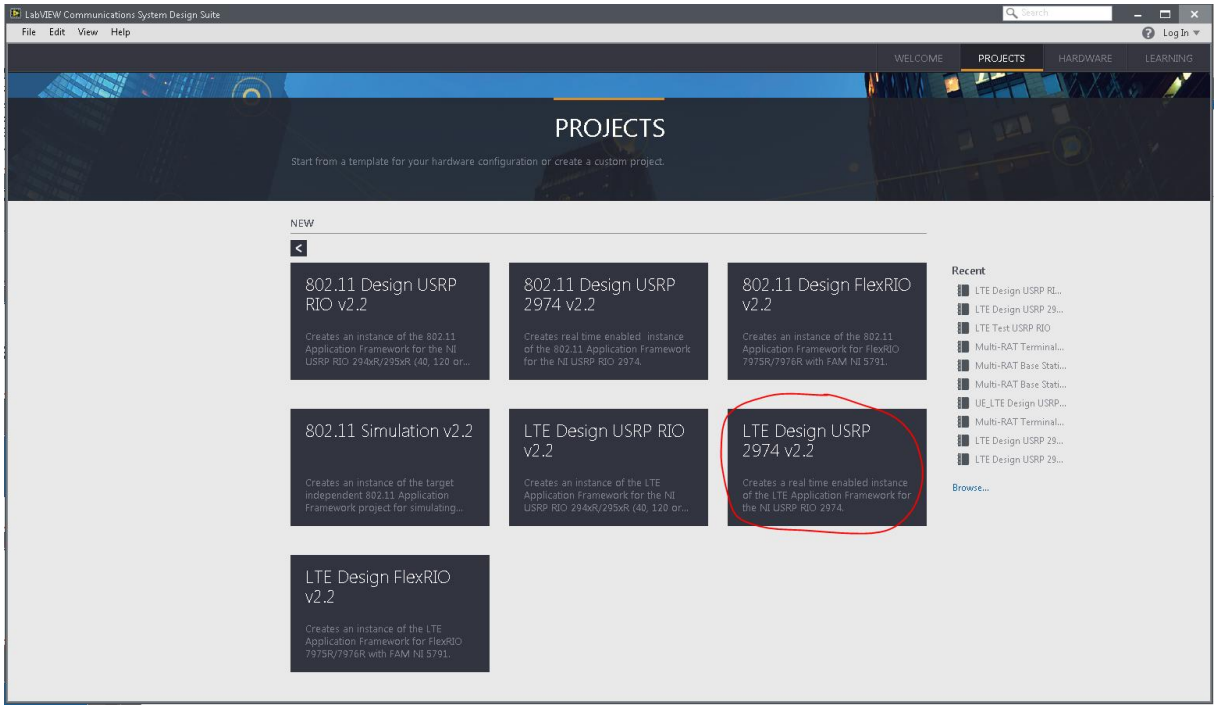
Note: The following steps must be done for each of the devices (eNB and UE)

- Install LabVIEW Communications System Design Suite 2.0
  - Download installer from webpage given on github starting page under *Supported Hardware and Software*
  - Install LabVIEW Communications System Design Suite 2.0
- Install NI-USRP 17.2 Driver
  - Download installer from webpage given on github starting page under *Supported Hardware and Software*
  - Install NI-USRP 17.2 Driver
- Install LabVIEW Communications LTE Application Framework 2.2
  - Download installer from webpage given on github starting page under *Supported Hardware and Software*
  - Install LabVIEW Communications LTE Application Framework 2.2

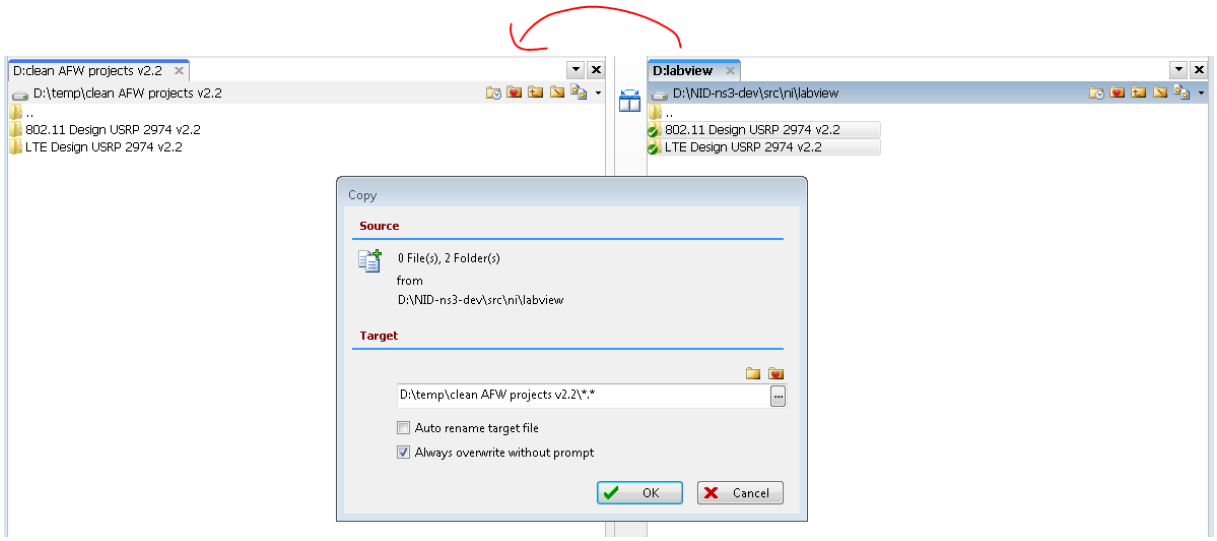
LTE Application Framework Settings

Note: The following steps must be done for each of the devices (eNB and UE)

- Open LV Comms 2.0
- In the Projects tab, click on ‚Application Frameworks‘
- Create new LTE Application Framework project (LTE Design USRP 2974 v2.2) and save this project to a known folder. Now close LabVIEW.

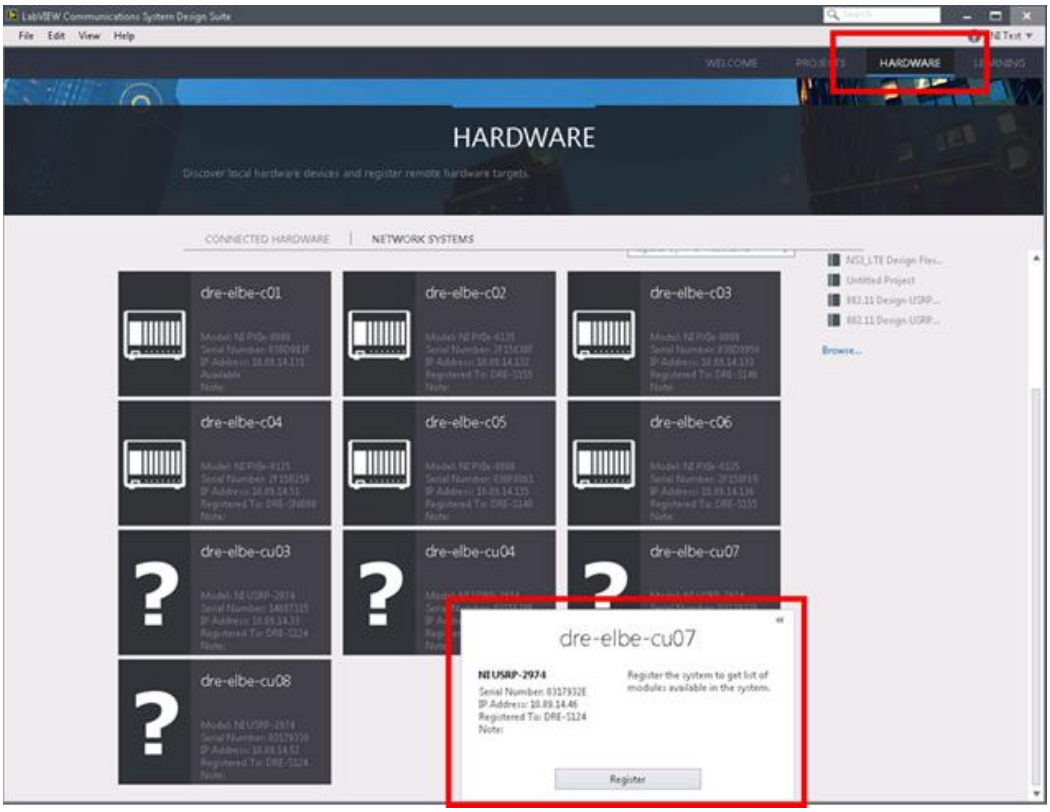


- Clone LabVIEW code from https://github.com/ni/NI-ns3-ApplicationExample-LV-Code.git to a temporary folder.
- Copy (and replace) additional LabVIEW files located in src\ of temporary folder to aforementioned newly generated LabVIEW LTE Application Framework project

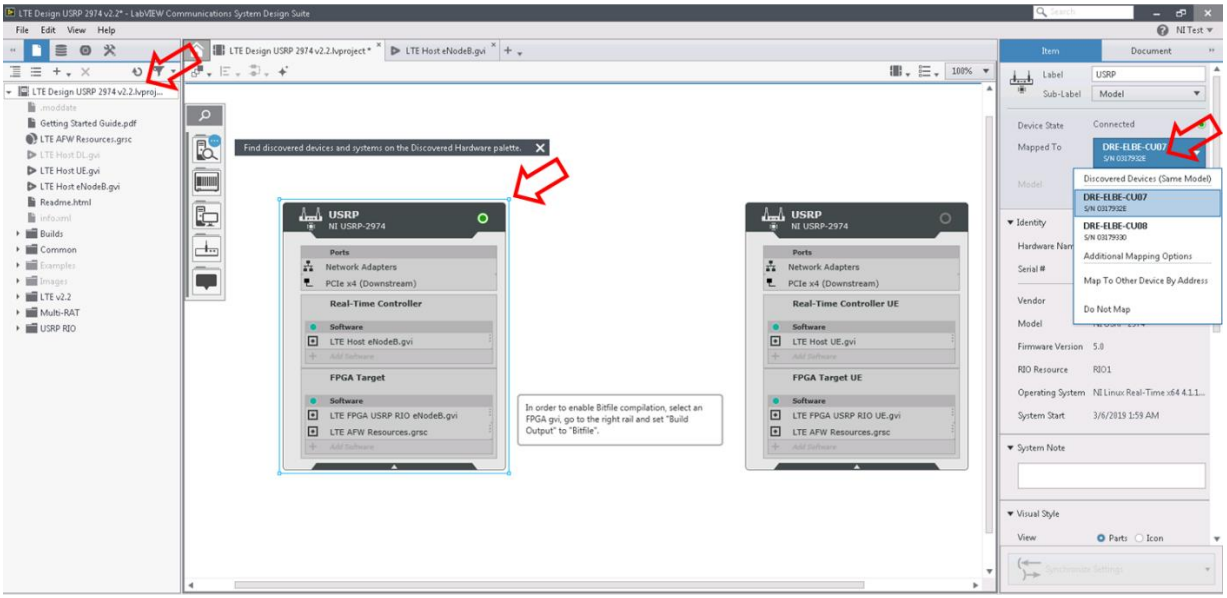


- Open modified LTE Application Framework project (LTE Design USRP 2974 v2.2.lvproject)
- Register the targeted device (e.g. USRP 2974) in the hardware manager
    - Go into the LabVIEW **HARDWARE tab,** and under the **NETWORK SYSTEMS** tab, select the USRP-2974 hardware resources to be used for the project by selecting this and clicking "Register" (Note: Default username: root, no password)

      Note: If the desired USRP-2974 device is not listed, enter the IP address of the device in the *'Register by IP or Hotsname'* textbox to register.



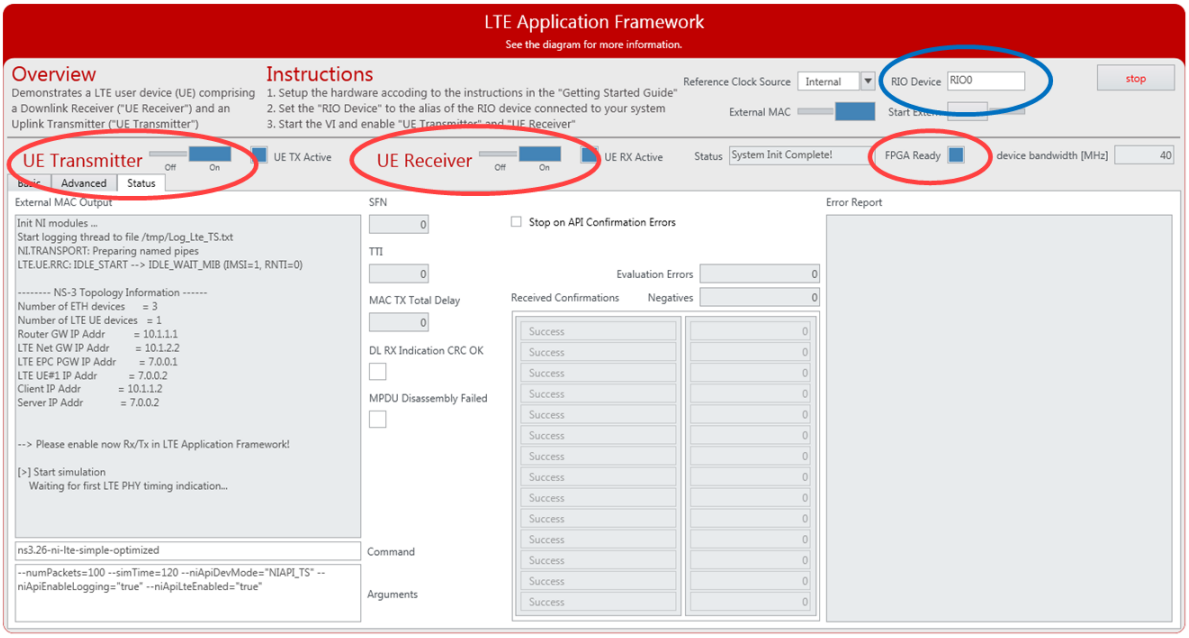
- In the LabVIEW project file (doubleclick at leftmost red arrow), click on the block for USRP-2974 (middle red arrow - IMPORTANT: Please select the block that corresponds either to eNB or UE depending on which device you are setting up) and open the right item bar to map the discovered and registered network device to the project (rightmost red arrow).



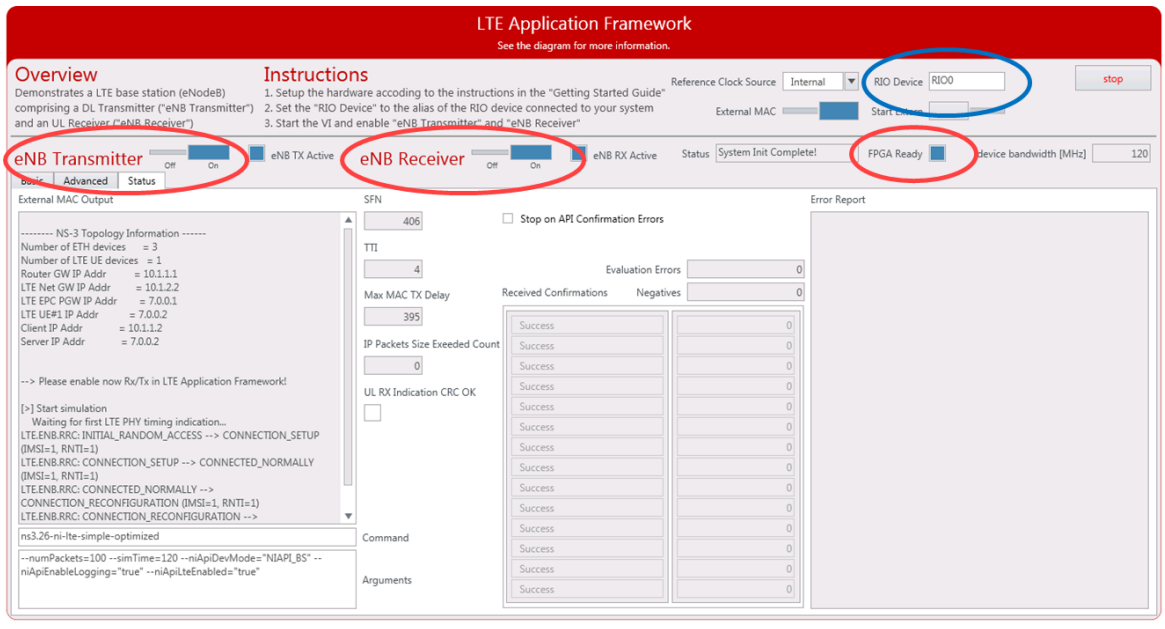
Run the LTE Application Example

Note: For the LTE Application Example, the ns3 code will be called from the LTE Application Framework itself to ensure correct setup of the API communication between ns3 and the Application Frameworks

- Open “LTE Host UE.gvi”, check for correct RIO device setting according to chosen hardware (see blue circle in below picture), go to status tab and start the VI
- When the “FPGA Ready” Indicator is highlighted, UE transmitter and UE receiver can be started as shown below



- Open “LTE Host eNodeB.gvi”, check for correct RIO device setting according to chosen hardware (see blue circle in below picture), go to status tab and start the VI
- When the “FPGA Ready” Indicator is highlighted, please **start eNB Transmitter first** and eNB Receiver second as shown below



- The ns3 stack (ns3.26-ni-lte-simple-optimized) will be started from within the Application Framework and the progress of transmission can be observed in the status tabs. The example transmits 100 packets from a client in a remote host at eNB side towards a server running on the UE side.