# Modular Wireless Xbox Kinect Data Transfer Device

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## Purpose

MWXKDTD is the development of a modular Kinect data transfer solution that seeks to alleviate issues a Microsoft Xbox Kinect user may experience when attempting to operate multiple devices with their Personal Computer. Problems faced:

- Installation of PCI card per Kinect device
- Motherboard may not have multiple PCI card slots
- Each Kinect device requires unique serial ID
- Each Kinect utilizes full power capacity of PCI card

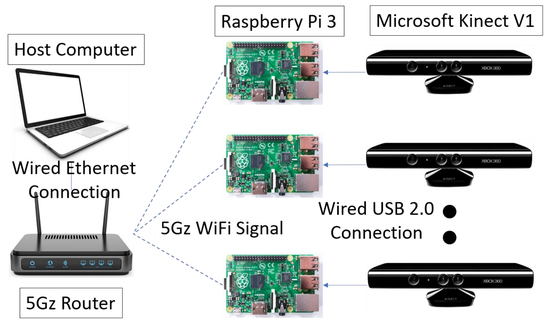


**Figure 1:** Schematic diagram of system

## Goals

- Develop software to interpret data from Raspberry Pi
- Adapt existing Raspberry Pi Kinect API for wireless data transmission
- Implement software to virtualize Kinect video
- Test functionality by operating the our solution with an existing computer vision project that uses multiple Kinects

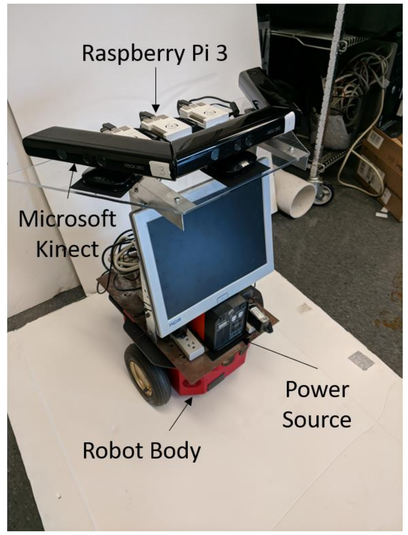


**Figure 2:** System on Pioneer 2 robot

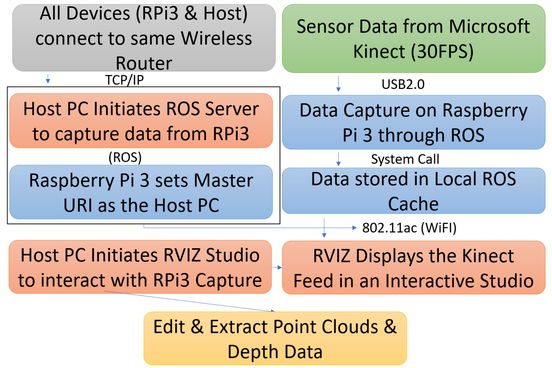


**Figure 3:** System design protocol

## Design

Our solution is a combination of hardware and software that seamlessly integrate to allow the wireless transfer:

- The Kinect transfers information to the Pi via USB
- The Pi captures the information using the ROS framework
- The Pi transmits this information to the main Desktop (Linux) over a 802.11ac connection
- The Main Desktop decodes he information using the ROS framework
- The bitmap is displayed in RVIZ as point clouds

## Results

Our 3 Kinects send video data [30 images per second, infrared, and depth] to a Raspberry Pi device via USB connection. The Raspberry Pi processes the video stream using ROS and wirelessly transfers the video stream to a Linux host PC over a Wi-Fi network. The host PC virtualizes the video stream at 30 FPS using ROS.

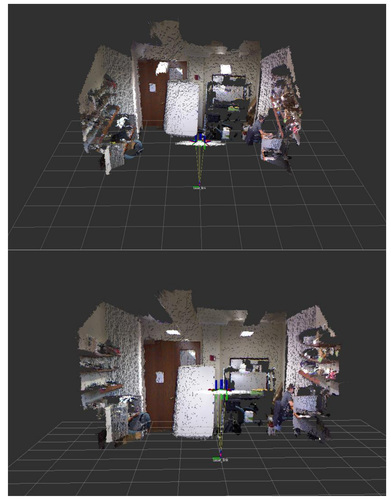

**Figure 4:** Sample point cloud from Kinect delivered wirelessly to host PC.