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OpenPTrack - Quick start

https://github.com/OpenPTrack/open_ptrack

deploying an OpenPTrack system has three main steps:

- system configuration

- calibration

- tracking

Full documentation is in other /docs - this is a quick start for only calibration & tracking.

IP addresses and hostnames refer to the following system. Be sure to replace them to fit your install ! In summary, there are three computers - two have a Kinect and a swiss ranger each - one just has a Kinect.
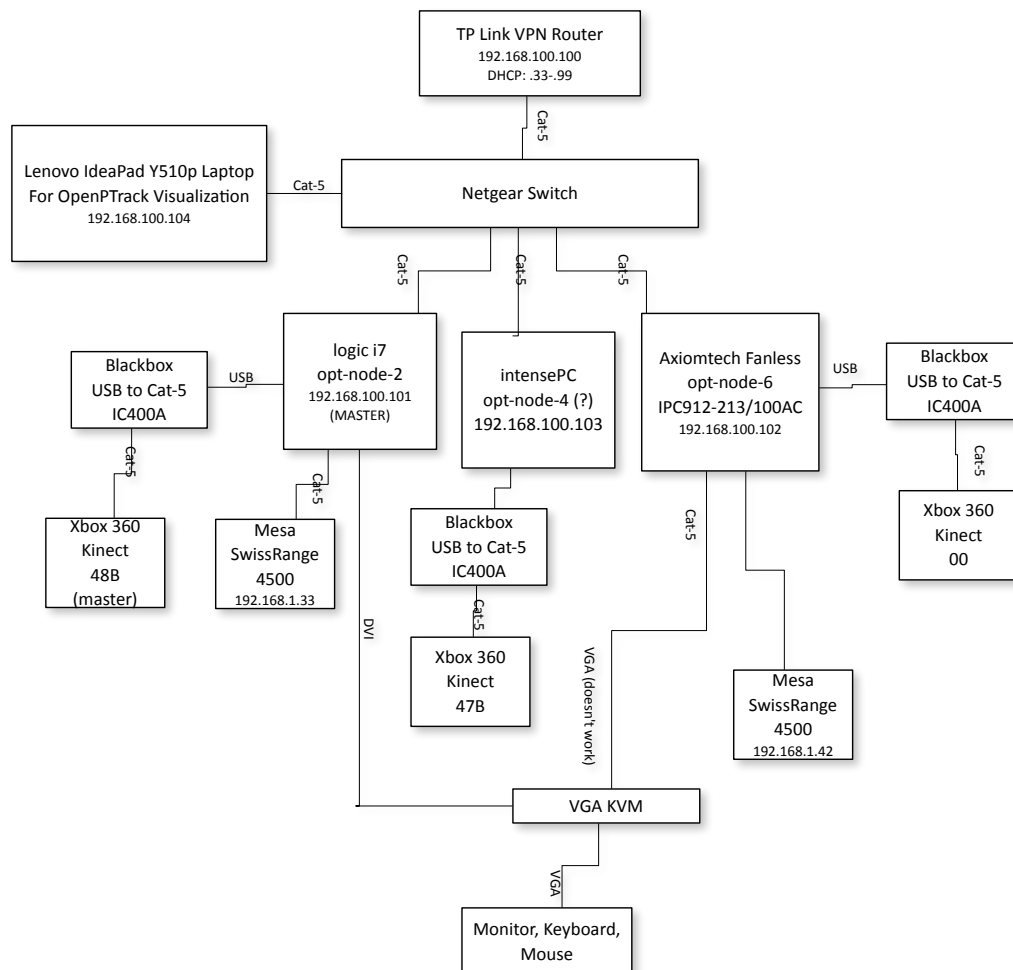
Calibration Quick start

this is shorthand for the 'full doc' /doc/multicamera calibration with serials.doc

1. ensure camera ~/workspace/ros/catkin/src/open_ptrack/opt_calibration/conf/camera_network.yaml is set up per physical install (described in the full doc). Below is for the existing system:

```
# Camera network parameters
num_cameras: 5
camera0_id: "B003626202002039B"
camera1_id: "192.168.1.33"
camera2_id: "KinectUI"
camera3_id: "B00364702715040B"
camera4_id: "192.168.1.42"
base_camera: 01
calibration_with_serials: true

# Checkerboard parameters
rows: 6
cols: 5
cell_width: 0.138
cell_height: 0.137
```

2. generate calibration files on master:

roslaunch opt_calibration calibration_initializer.launch

after that completes, first remove line 9 on any serial-less sensors (1) in folder: /home/remap/workspace/ros/catkin/src/open_ptrack/opt_calibration/launch/

<arg name="device_id" value="$(arg camera_id)" />

Then copy calibration files across computers:

SSH into **each node** and run the command below, by opening the terminal and typing "ssh <ip address>", then the full command to copy master is :

scp 192.168.100.101:~/workspace/ros/catkin/src/open_ptrack/opt_calibration/launch/*.* ~/workspace/ros/catkin/src/open_ptrack/opt_calibration/launch/.

then, after copying the files, launch, and calibrate per normal (per full doc):

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[1] Kinects have two styles of configuration - with or without serial. The serial #s are either visible for the cameras (type dmesg) or they are all zeroes - depending on the firmware and driver. Without serial (aka, 'by name') are limited to one Kinect per CPU.
with serial:
```
Product: Xbox NUI Camera
Manufacturer: Microsoft
SerialNumber: B003626202002039B
```
without serial:
```
Product: Xbox NUI Camera
Manufacturer: Microsoft
SerialNuber: 0000000000000000
```

```
roslaunch opt_calibration opt_calibration_master.launch
```

and, per sensor, per machine:

roslaunch opt_calibration sensor_*

etc...

checkerboard...

then, after you get all cameras calibrated, checkerboard on floor & run the following to save calibration:

```
rostopic pub /opt_calibration/action std_msgs/String "saveExtrinsicCalibration" -1
```

after calibration is saved, inspect every detection_node launch file (in /home/remap/open_ptrack/detection/launch)

if it's a Kinect with serial, make sure it is:

<include file="$(find detection)/launch/detector_serial.launch">

if it's a Kinect without serial, make sure it is:

<include file="$(find detection)/launch/detector_with_name.launch">

then copy the files to the same path (/home/remap/open_ptrack/detection/launch) on all nodes, similar to the process for calibration.

ie, per node:

scp 192.168.100.101:open_ptrack/detection/launch/*.* /home/remap/open_ptrack/detection/launch/.

then launch detection per normal...

Tracking Quick start

this is shorthand for the doc/usage.txt document

open 6 terminal windows, and type the following into each

1. roslaunch tracking tracking_node.launch

2. roslaunch detection detection_node_B00362620202039B.launch

3. roslaunch detection detection_node_SR_192_168_1_42.launch

4. ssh -XC 192.168.100.103

roslaunch detection detection_node_KinectUI.launch

5. ssh -XC 192.168.100.102

roslaunch detection detection_node_B00364702715040B.launch

6. roslaunch detection detection_node_SR_192_168_1_33.launch

ok - now with those all up - hit 'enter' in 1) first - then each consecutive - waiting 5-10 seconds per one to ensure it launches without error. (it will take some time to get used to the output / tell error from debug info)

to run visualizer on laptop:

1. rosrun rviz rviz
2. File -> Open Config File
3. [find your .rviz file… may need to copy it from master]

NOTE: Each detection process is likely set for manual ground plane - you will need to select three points on the ground plane by shift-clicking with the mouse, and then hit 'q'. If you don't get a good image on which to select the ground plane, restart the sensor process (ctrl-c).

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that should just work. to restart if it crashes, two methods:

soft restart:

hit ctrl-c and ctrl-\ in all windows. type

pkill -f ros; pkill -f nodelet; pkill -f XnSensor

on each host.

repeat above.

2. if that doesn't work, we reboot both machines, repeat above startup.

to do new calibration / range finding

rostopic echo /tracker/tracks
then ctrl-c / break when at point of interest, note the last x/y

tracking & detection calibration:

3. if the ID is changing a lot, change tracking threshold

open_ptrack/tracking/conf/*.yaml

then copy to all machines so values are equal... on each host:

cd ~/open_ptrack/tracking/conf

scp 192.168.100.101:open_ptrack/tracking/conf/*.* /home/remap/open_ptrack/tracking/conf/.

4. if the people are not being detected (or too many objects track as people) change detection threshold

open_ptrack/detection/conf/*.yaml

then copy to all machines so values are equal... on each host:

scp 192.168.100.101:open_ptrack/detection/conf/*.* /home/remap/open_ptrack/detection/conf/.

so, combined command:

scp 192.168.100.101:open_ptrack/tracking/conf/*.* /home/remap/open_ptrack/tracking/conf/. ; scp 192.168.100.101:open_ptrack/detection/conf/*.* /home/remap/open_ptrack/detection/conf/.