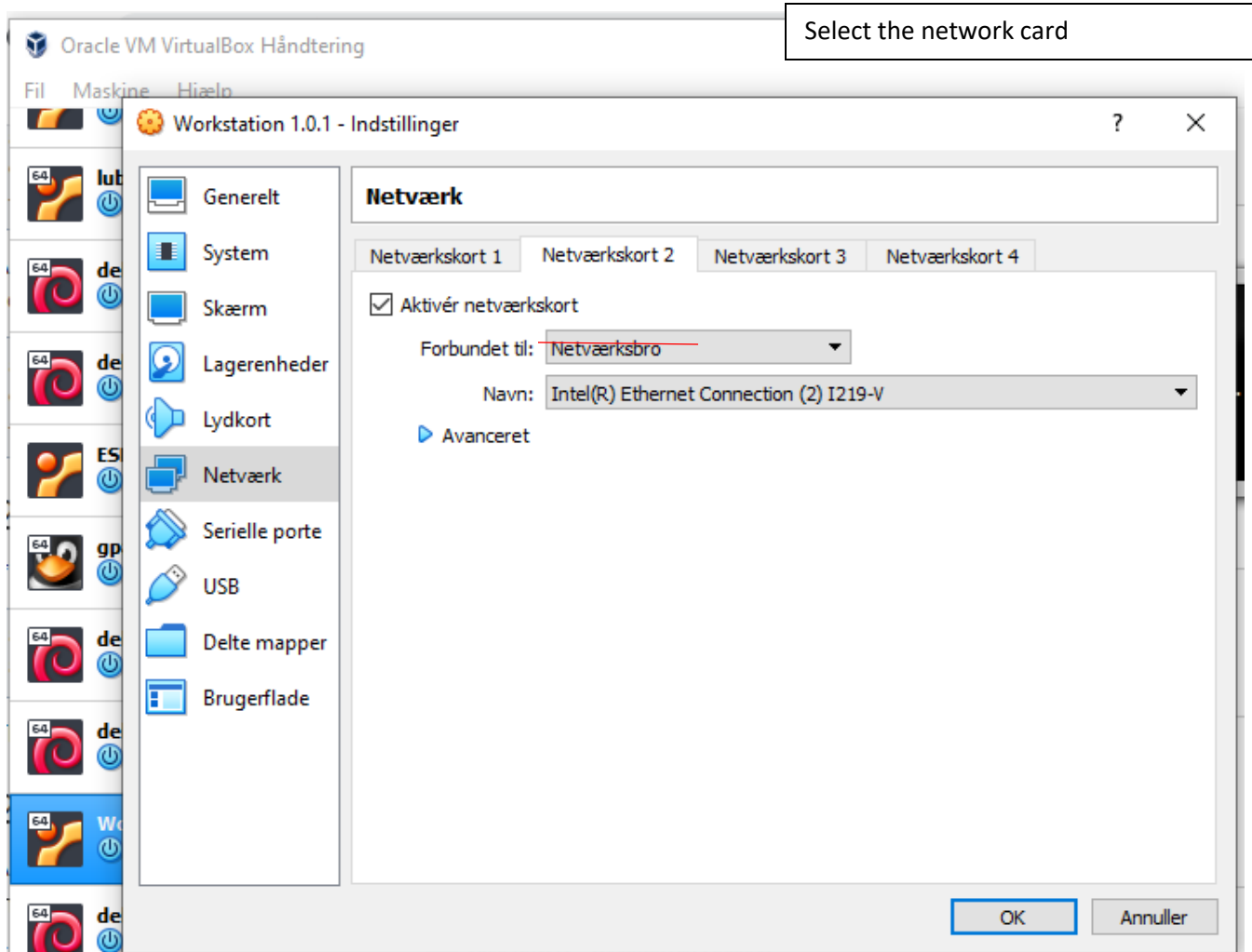


## Setting the virtual image Ubuntu up for network sharing



Before start of the Ubuntu machine. Then start it.

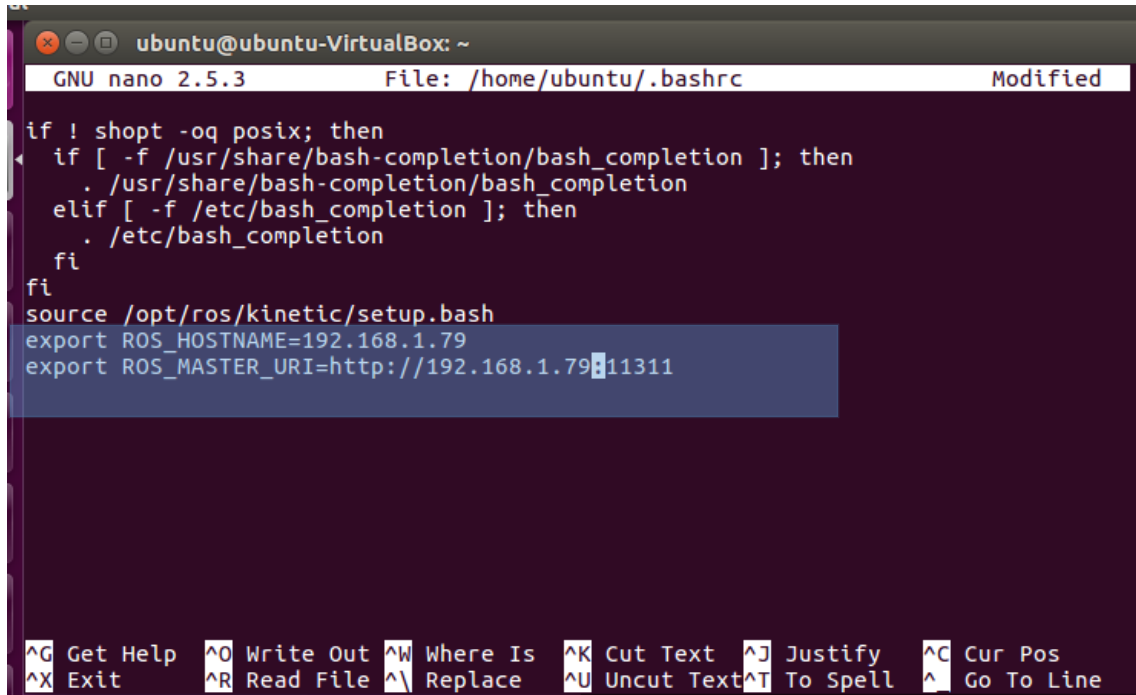
In the Ubuntu machine start a terminal and use ifconfig – to get the ip address for the ROS master

```
ubuntu@ubuntu-VirtualBox: ~  
ubuntu@ubuntu-VirtualBox:~$ ifconfig  
enp0s3      Link encap:Ethernet  HWaddr 08:00:27:ff:db:07  
            inet addr:192.168.1.55  Bcast:192.168.1.255  Mask:255.255.255.0  
            inet6 addr: fe80::fe85:46b1:d2ba:df74/64 Scope:Link  
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1  
            RX packets:95 errors:0 dropped:0 overruns:0 frame:0  
            TX packets:119 errors:0 dropped:0 overruns:0 carrier:0  
            collisions:0 txqueuelen:1000  
            RX bytes:19568 (19.5 KB)  TX bytes:12925 (12.9 KB)  
  
enp0s8      Link encap:Ethernet  HWaddr 08:00:27:48:af:17  
            inet addr:192.168.1.79  Bcast:192.168.1.255  Mask:255.255.255.0  
            inet6 addr: fe80::6423:39eb:2f2c:3751/64 Scope:Link  
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1  
            RX packets:60 errors:0 dropped:0 overruns:0 frame:0  
            TX packets:44 errors:0 dropped:0 overruns:0 carrier:0  
            collisions:0 txqueuelen:1000  
            RX bytes:8232 (8.2 KB)  TX bytes:6049 (6.0 KB)  
  
lo          Link encap:Local Loopback  
            inet addr:127.0.0.1  Mask:255.0.0.0  
            inet6 addr: ::1/128 Scope:Host  
            UP LOOPBACK RUNNING  MTU:65536  Metric:1  
            RX packets:104 errors:0 dropped:0 overruns:0 frame:0
```

Enp0s8 I used

In the terminal

`sudo nano ~/.bashrc` and add the last two lines. Note If you want to use Gazebo – uncomment them with #

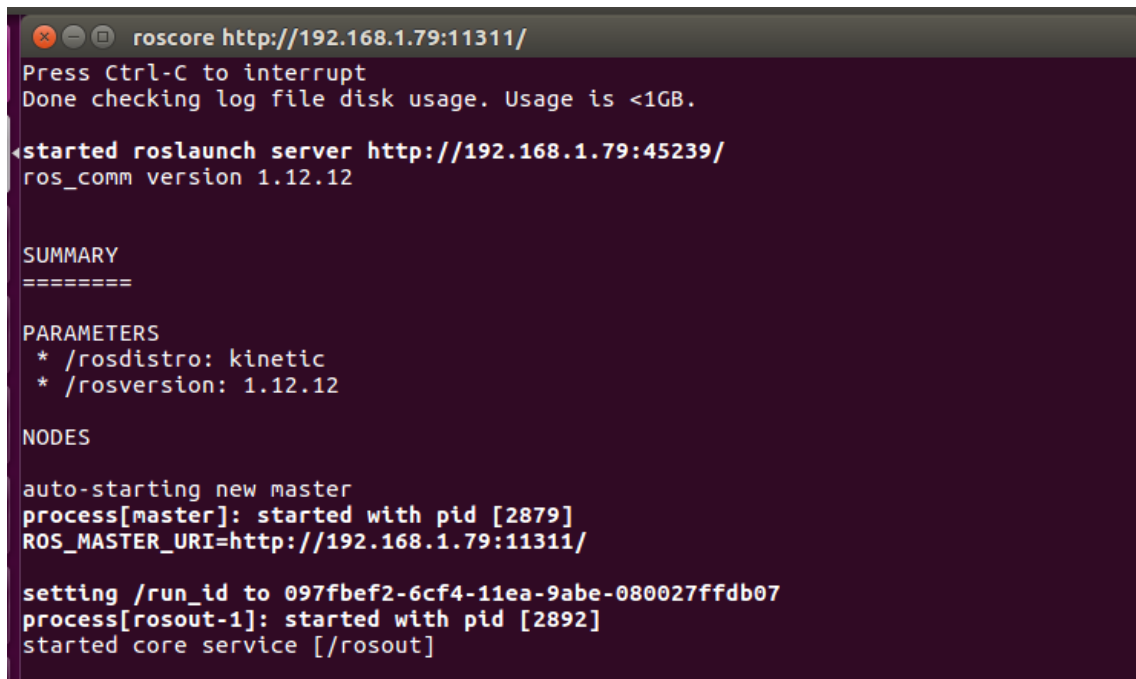


```
ubuntu@ubuntu-VirtualBox: ~
GNU nano 2.5.3      File: /home/ubuntu/.bashrc      Modified

if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi
source /opt/ros/kinetic/setup.bash
export ROS_HOSTNAME=192.168.1.79
export ROS_MASTER_URI=http://192.168.1.79:11311

^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text ^T To Spell  ^_ Go To Line
```

Then start the roscore



```
roscore http://192.168.1.79:11311/
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://192.168.1.79:45239/
ros_comm version 1.12.12

SUMMARY
=====

PARAMETERS
* /rostdistro: kinetic
* /rosversion: 1.12.12

NODES

auto-starting new master
process[master]: started with pid [2879]
ROS_MASTER_URI=http://192.168.1.79:11311/

setting /run_id to 097fbef2-6cf4-11ea-9abe-080027ffdb07
process[rosout-1]: started with pid [2892]
started core service [/rosout]
```

ON the Remote the PI - setup the masteruri and the PI's ip

Ex:

The ros host name ip is the PI's ip

```
GNU nano 2.5.3      File: /home/pi/.bashrc

if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi
source /opt/ros/kinetic/setup.bash
source /home/pi/catkin_workspace/devel/setup.bash
#local ip on the pi
#export ROS_HOST_NAME=192.168.1.78
#master ip
#export ROS_MASTER_URI=http://192.168.1.79:11311

^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Ju
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text ^T To
```

The # sign must be removed in front of the two export (unlined) and your own ip address'es set in.

**updating Ubuntu on the virtual box image:**

```
sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key
C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
```

ref: <http://wiki.ros.org/kinetic/Installation/Ubuntu>

på ubuntu virtualbox image:

```
sudo apt-get update
```

**and then install teleop** – for keyboard control of the robot:

```
sudo apt-get install ros-melodic-teleop-twist-keyboard
```

```
Run it  
Launch the robot  
roslaunch teleop_twist_keyboard teleop_twist_keyboard.py
```

then the robot can be controlled remotely using the keyboard - the file `teleop_twist_keyboard.py` is found under `catkin_ws/src` - open it and the format publish message is there

also publish in command prompt

<http://wiki.ros.org/ROS/Tutorials/UnderstandingTopics>

```
rostopic pub -1 /turtle1/cmd_vel geometry_msgs/Twist -- '[2.0, 0.0, 0.0]' '[0.0,  
0.0, 1.8]'
```

for the Icreate1 roomba: direct in terminal:

```
rostopic pub -1 /cmd_vel geometry_msgs/Twist -- '[2.0, 0.0, 0.0]' '[0.0, 0.0, 1.8]'
```

Install ret navigation stack

<https://github.com/tork-a/roomblock>

### **For time synchronization**

On both platform Pi and ubuntu

```
sudo apt install ntpdate  
sudo ntpdate ntp.ubuntu.com
```