

Installing Your Basestation

ROS + PR2 Training Workshop

Introduction

1. Why do we use a basestation?

- Seamless transition between wired and wireless networking
- Servicing the PR2
- Intermediate storage for HW logs

Network Requirements

1. Basestation needs “static” IP

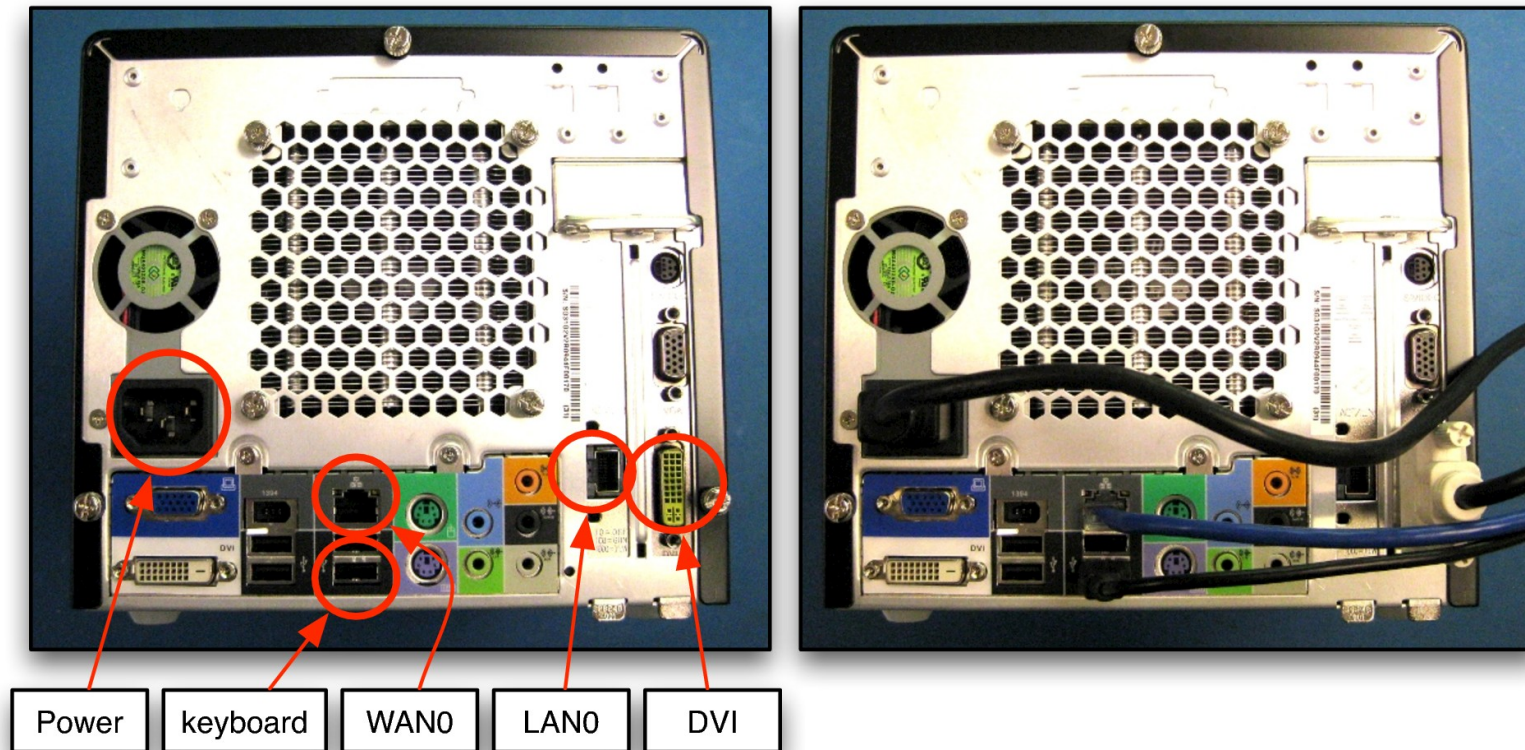
- Must be visible on wired and wirelessly
- Only necessary on VPN port (default: 1194)

2. Basestation needs an additional 2 Ips

- Will be forwarded to robot

3. Robot must be able to acquire DHCP address on both wired and wireless networks

Basestation Setup: physical



Basestation Setup: computer

1. Default hostname is “basestation.”

To change name you must edit:

- /etc/hostname
- /etc/hosts
- /etc/dhcp3/dhclient.conf (Only if using DHCP)

2. To set static IP, edit:

- /etc/network/interfaces
- /etc/resolv.conf

3. If you use DHCP:

- DHCP server MUST assign consistent IP address via client-id

4. To configure the basestation VPN certificate, run:

- `sudo /etc/openvpn/gen_server_key`

Configuring the Robot

1. To use the basestation to configure a robot, plug it into the robot service port.

Configuring Robot Wireless

1. The robot comes equipped with a Linksys WRT610n router running ddwrt
2. To configure it, plug the basestation into the robot service port
3. Use firefox to go to: <http://10.68.0.5>
4. The router must stay at that address, but other settings can be changed as necessary to connect to your wireless

Pairing a Robot

Pairing a robot with a basestation is a mostly automated with the “robot-brand” command:

```
$ sudo robot-brand <ROBOT-NAME> <C1-NAME> <C2-NAME> <SUBNET> [<IP>]
$ sudo robot-brand green green1 green2 10.68.1.0
$ sudo robot-brand green green1 green2 10.68.1.0 192.168.1.100
```

- c1 and c2 will end up named green1 and green2, but the c1 and c2 hostnames will continue to work internally.
- <SUBNET> is the vpn subnet to use, this can almost always be 10.68.1.0 unless you are using multiple robots with the same basestation
- <IP> is the static IP of your basestation

Pairing a robot: forwarding

1. It is convenient (but not necessary) to set up the basestation to forward a specific IP address to the robot computers.

2. Edit the file: `/etc/robot-forward.conf`:

```
<C1-NAME> 10.68.1.1 <ROBOT-IP1>
<C2-NAME> 10.68.1.2 <ROBOT-IP2>

green1 10.68.1.1 192.168.1.101 # Static IP setup
green2 10.68.1.2 192.168.1.102 # Static IP setup

red1 10.68.1.1 dhcp # dhcp setup
red2 10.68.1.2 dhcp # dhcp setup
```

3. NOTE: if using dhcp, the dhcp-server must respect the client-id field and will use the name of the computer as the client-id.

4. To turn on forwarding run:

```
$sudo robot-forward start
```

Generating User VPN Keys

1.If you don't want to forward traffic to the robot, you will need to allow users onto the robot VPN network

2.Run:

```
$sudo /etc/openvpn/gen_user_key <NAME>
```

3.This will create a file: /etc/openvpn/<NAME>.tgz

4.If a user has openvpn set up on their computer, they should be able to untar this file in their openvpn directory and start openvpn

Using the KVM

1. Plug the basestation into the robot service port
2. Go to: <http://10.68.0.91> (or <http://10.68.0.92>)
3. Choose “Advance Console” and click Launch
4. Let it run “JavaRSM.jnlp”
5. Click the + and login to:
 - 10.68.0.91, root, changeme
 - 10.68.0.92, root, changeme
6. Click on the “Remote KVM Console” Tab
7. Click on one of the servers to connect to

Bagfile Upload Policy

1. Once per day, a cron-job on the robot will push the contents from the robot: “/hwlog” directory to basestation via rsync
2. The basestation will then attempt to send these log-files back to WG for processing
3. If your robot/basestation does not have network access, you will be responsible for doing this step manually.
 - Copy the contents of hwlog and the “sendhwlog” python script to another machine with internet access
 - Run sendhwlog:

```
$sudo sendhwlog --path /path/to/bagfiles --id <wan0 mac address> --wg
```

```
$sudo sendhwlog --path /mnt/disk/bags --id 001517b19217 --wg
```
 - Make sure to get the id correct

Where To Get More Help

1. Everything covered here should be mentioned in the PR2 Manual
2. The PR2-documentation website contains additional FAQ information
3. Mailing list:
 - pr2-admin@lists.willowgarage.com

Practice