

# IT304: Computer Networks

## Network Statistics Project

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### 1 Introduction:

The DAIICT network is spread around over a large campus. Over the years, there have been many changes in the network with respect to the quality and speed of the network and also the network access points like the LAN, Wi-Fi, etc. But there is no proper quantification of the network parameters. Hence this project is very important with regards to understanding the network statistics. At the same time, the statistics analyzed are related to and studied in the course IT304: Computer Networks, so it gives a live example of the concepts learned.

### 2 Objective:

To measure the network statistics in the DAIICT campus.

### 3 Experimental Procedure:

The procedure has been divided into three parts:

#### 3.1 Parameters Measured:

Since this project has a limited scope, the parameters measured have also been limited. Three parameters have been included for analysis, namely,

1. Downlink Bandwidth
2. Uplink Bandwidth
3. Round Trip Time (RTT)

The purpose of these parameters is self-explanatory and these are the most essential parameters to know in any given network for a good analysis

#### 3.2 Tools Used:

##### 3.2.1 Application Used: ICSI Netalyzr

ICSI Netalyzr is a service maintained by the Networking Group at the International Computer Science Institute, an affiliate with the University of California, Berkeley.

The Netalyzr analyzes various properties of the Internet connection. Along with the above mentioned parameter, it also measures parameters like NAT detection and proxy settings, as well as latency measurements and various delays which have been taught in the course. It reports its findings in a detailed report and provides it back to the user and also stores it on a server.

To perform these tests, the Netalyzr runs a Java applet on computer or it directly performs the tests through an android application.

### 3.2.2 Hardware Information:

Two devices were used for the measurement,

- **Laptop: Lenovo G505s**

Processor: AMD A10

OS: Ubuntu 14.04 64-bit

Wired Network Adapter: QCA8172 Fast Ethernet

Wireless Network Adapter: QCA9565 / AR9565 Wireless Network Adapter

- **Smartphone: Xiaomi Redmi 1S**

Processor: Qualcomm Snapdragon 400 - ARM Cortex-A7

OS: Android 4.4.4-Kitkat

Wireless Network Adapter: Specification not available but supports all the Wi-Fi 802.11 b/g/n standards.

### 3.3 Method of Measurement:

#### 3.3.1 Locations and Duration:

The measurements were taken at 4 different locations:

1. Hostel - Majority of the readings were taken on laptop connected to network through a LAN.
2. Canteen - Majority of the readings were taken on mobile connected to network through Wi-Fi.
3. Resource Centre - Readings were taken on laptop connected to network through Wi-Fi.
4. Lab building - Readings were taken on laptop connected to network through either LAN or Wi-Fi.

All the reading took varying amount of time 7 mins to 20 mins based on the traffic on the network. The readings were taken once or twice a day in all the locations.

#### 3.3.2 Problems Faced:

The readings in the Lab building are not complete because the application was unable to get the uplink or downlink bandwidth. This was checked again and again but the result was same.

The android application, in general, is very unreliable and many times, it takes the readings for 10 mins and then it shows some error and is unable to get the data. This happened many (approx 50%) times when the readings were being taken in the Canteen.

The network in the Resource Centre is pathetic and every time it takes 15-20 mins to take the complete readings.

## 4 Observations:

### 4.1 Graph 1:

Figure 1: Graph for Downlink Bandwidth

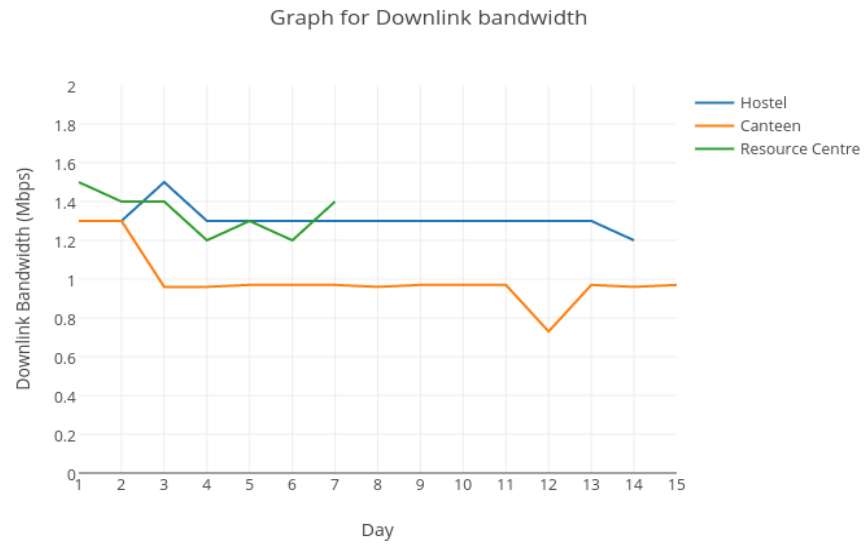


Figure 2: Graph for Uplink Bandwidth

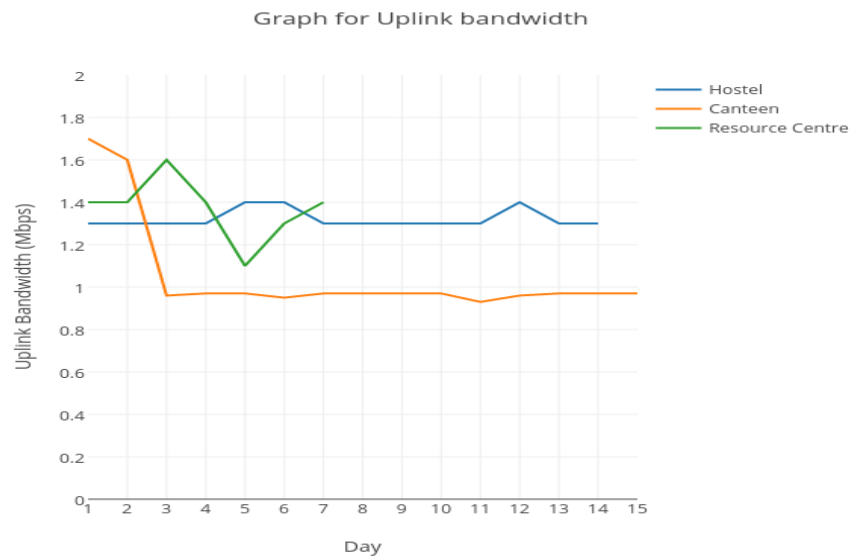
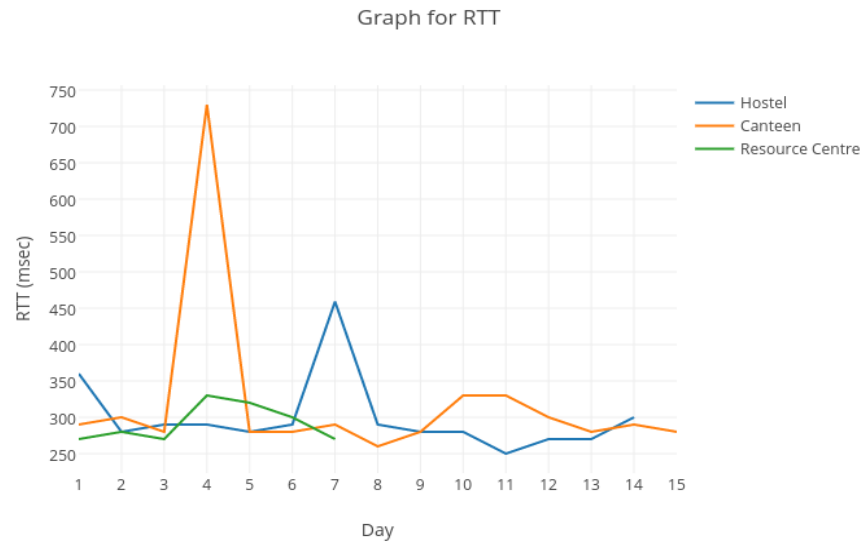


Figure 3: Graph for RTT



## 4.2 Graph 2:

Figure 4: Graph for Downlink Bandwidth (Time 11 a.m. to 2 p.m.)

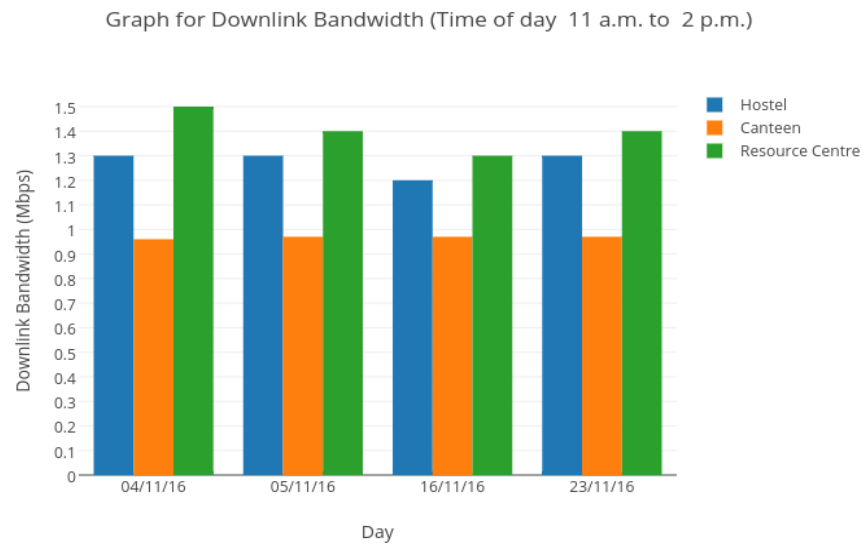


Figure 5: Graph for Uplink Bandwidth (Time 11 a.m. to 2 p.m.)

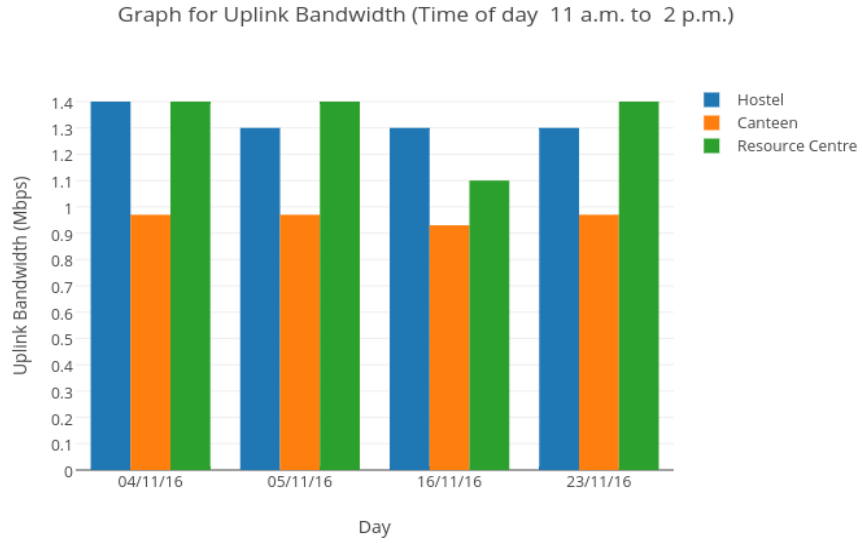
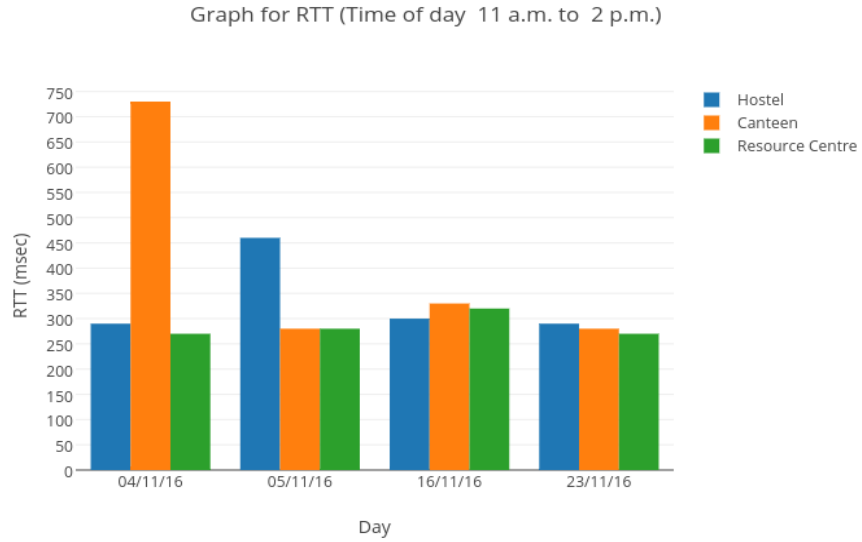


Figure 6: Graph for RTT (Time 11 a.m. to 2 p.m.)



## 5 Discussion:

### 5.1 Graphs for downlink and uplink bandwidth:

On the whole, the bandwidth got in the canteen is less than the bandwidth in the hostel and resource centre. This may be because Canteen has Wi-Fi which may have a limited bandwidth available to allocate to the users. Also among the above three, the Wi-Fi network of the canteen seems to have most user density w.r.t its capability.

Also, There is slight change in the bandwidths at all the locations which may be because of the traffic in the network.

## 5.2 Graphs for RTT:

There are certain extreme variations in the RTT graph but on the whole, the RTT is almost similar at all the three locations.

## 5.3 Some other observations:

There seems to be no relationship between the RTT and the bandwidth because, although the bandwidth in the Canteen is less than the other two, the RTTs are comparable.

## 6 Conclusion:

This experiment of finding out the network statistics for the DAIICT network with the help of Uplink and Downlink bandwidth and the RTT was a very good experience from the academic point of view. It actually covered many of the concepts taught in the course. There were some interesting observations and the observations changed according to the type of network and the traffic and capacity of the network even though all the locations are in the same campus and use the same internet connection.

## 7 References:

1. The Netalyzr web application link: <http://netalyzr.icsi.berkeley.edu/>
2. More information about Netalyzr: <http://www.freewaregenius.com/icsi-netalyzr-know-your-connection/>
3. Netalyzr Android application.