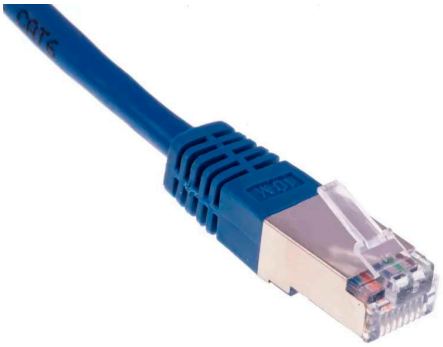
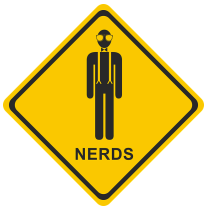
Hostel Zone LAN Manual

Introduction

Familiarize yourself with the following terminology:

Ethernet / RJ45 port 	Ethernet / LAN cable of type CAT6 or CAT7 
USB-to-RJ45 adapter / dongle 	WiFi Router (only for nerds !) 

You are advised to connect your laptop to the network port provided in the hostel room using ethernet cable. If your laptop does not have a network port, you can procure a USB to ethernet adapter and connect. You can procure and own an ethernet cable to connect your laptop with the network port. The recommended use of LAN in the hostel is through a direct connection from your laptop to the LAN port provided in your room using an ethernet cable.

Recommended configuration

You need to enable “DHCP mode” or “Automatic configuration” for the network adapter on your laptop to let the network configuration get assigned to your laptop automatically from the DHCP server in the computer center. Please do not assign IP addresses statically. It will lead to address clashes and subsequent network issues for you and a few other users in the network.

If your configuration is working properly, then the IPV4 address assigned to your laptop will be in the series 10.X.Y.Z where X,Y,Z are numbers in the range 0 to 255. X is usually 22 for hostel zone and 21 for academic zone. The address is assigned to be unique for each device. You will also be able to access the website https://netaccess.iitm.ac.in from your computer without any additional change of configuration. If your IPV4 address appears to be anything else, it means your network configuration is not proper and you will not be able to connect to the internet or the LAN.

You can disable IPV6 mode unless you know why you need it.

You need to disable any proxy in the browser while you connect to the network from within the campus.

You can enable Mobile HotSpot on your Windows OS to connect your phone or tab or other devices to the internet via your laptop. Look at the following link for help:

https://support.microsoft.com/en-us/windows/use-your-windows-pc-as-a-mobile-hotspot-c89b0fad-72d5-41e8-f7ea-406ad9036b85

If you do not possess a laptop at all and the only device you have to connect with the internet is a tablet or a similar device then you may need a WiFi connection. Currently, IITMWiFi is provided at the following locations: Himalaya, Gymkhana, CCW Office, Ganga Entrance, Ellora in the hostel zone and at multiple locations across the academic zone.

Warning

If you wish to use your own WiFi router in your room, you need to first learn how to configure it and connect to it properly. Please note that a wrongly configured router when plugged into the LAN could potentially bring down the network for everyone else connected to the same network switch in the hostel. Thus, it is the collective responsibility of all the residents of a hostel to ensure that any router connected to the LAN is configured properly. Documentation on configuring a router correctly is provided separately.

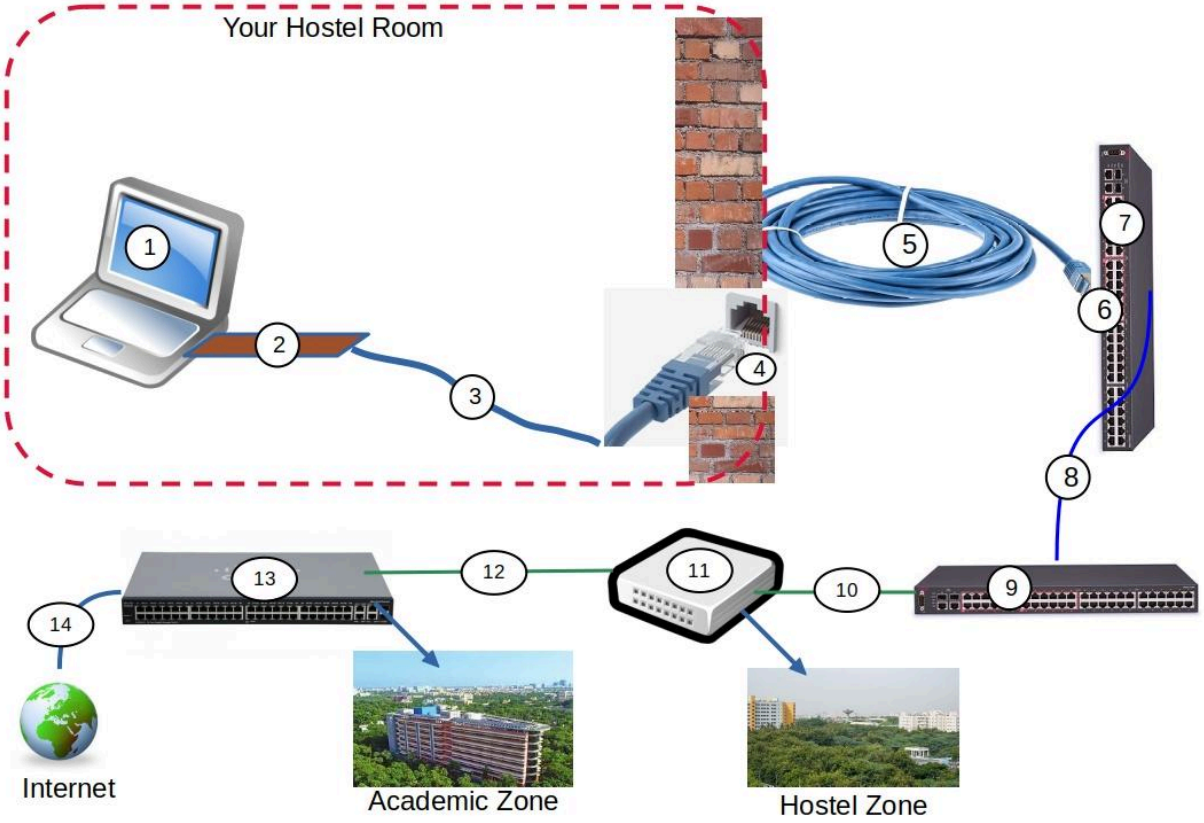
Connection details

In situations when you need to seek help for any network related issue, the following details are necessary as part of filing a helpdesk ticket. Please learn to figure out the following details on the network connection at your earliest convenience:

Location	At which physical location are you facing the problem? Eg., hostel name, room number
Connection Type	How is your device connected when you face a problem? Is it over ethernet / LAN cable or is it over WiFi. If it is WiFi using your own WiFi router then details of that router and a photograph of the way it is connected to the LAN port on the wall will also help. If it's IITMWiFi or Eduroam, mention the same.
IPV4 address	This is a four part number that looks like 10.X.Y.Z where X, Y, and Z are numbers between 0 and 255. This address is unique to the device you are connecting with and the physical location from where you are connecting. If you are connecting over WiFi using your own WiFi router, then this address is assigned to your router (not your computer or tab connected to the router) and you can find it out by connecting with the configuration page of the router. The URL of the configuration page of the router is often printed on the label of the router and is different for each brand of the router.
MAC address	This is the hardware address of the device you are connecting with. It is a six part number that looks like A:B:C:D:E:F where A, B, C, D, E and F are hexadecimal numbers containing digits from 0 to 9 and characters a to f only. If you are connecting over WiFi using your own WiFi router, then this address is that of the WiFi router. You can find it out by connecting to the configuration page of the router. Sometimes, it is printed on the label of the router.

Network Path

In the following schematic, the network flow is indicated starting from your laptop in your hostel room to the destination site you are connected to.



The numbers in the circles indicate the sequence in the network path. For each of these points along the path, potential issues that could disrupt your network connectivity and some tips are given in the table below.

Sl.No.	Location	Remarks / Potential Issues
1	Operating System on your Laptop	System configuration, Firewall settings, Anti-virus software can modify network settings. Effect is only on the device and reproducible in any other room. Dual booting to another OS could show a different behavior. A working laptop from a friend could help in showing that the rest of the network path from the room is working fine. Get help from a nerdy friend, a labmate or your vendor to get the OS configuration fixed.
2	Network adaptor – either internal or external (eg., USB-to-RJ45 dongle)	Physical adaptors can malfunction due to hardware failure. Effect is reproducible in any other room. Using an alternate adaptor can help resolve the issue. A working adaptor (or laptop) from a friend could help in showing that the rest of the network path is working fine. Replace your adaptor as necessary. If the

		adapter is internal, reach out to your vendor for repair.
3	CAT6 or CAT7 ethernet cable in your room	Cable could be damaged physically. Effect due to faulty cable is reproducible in any other room. Replacing the cable could help resolve the issue. Get yourself a new 3 meter long RJ45 LAN/ethernet cable from the market.
4	LAN port on the wall of your room	Port could be damaged physically. Your laptop along with the cable should work fine in any other room. Raise ticket with helpdesk for repair. Network team will demonstrate the LAN connection working before closing the ticket.
5	CAT5E/CAT6A ethernet cable from your room to the nearest network switch	Cable could be damaged physically during unsupervised civil work in the hostel wing. Check if there was any repair work recently. Your laptop along with the cable should work fine in any other room. As an end user, you can raise a ticket with the network helpdesk for repair and request the hostel office to follow it up with the computer center.
6	Ethernet port where the cable from your room is plugged in.	Port failure could happen in some old switches. Port may be blocked by the network administrator if your device was faulty and disrupting the LAN. As an end user, you can raise a ticket with the network helpdesk. If vacant ports are available, they would change the port and the issue could be resolved. Request hostel office to follow up. If it is the case of a blocked port, the network team will need to check your device before unblocking the port.
7	1 Gigabit Network switch (usually on the same floor or one floor just above or below)	Switch failure could happen due to power fluctuations. This would affect the whole wing i.e., every room that is connected to the switch. Network team can detect this remotely by looking at the live network traffic statistics. Request your hostel office to raise a ticket with helpdesk and escalate to netadmin to initiate switch replacement. Request hostel office to coordinate the switch replacement with the office of CCW (for a spare switch if in stock) and the Computer Center.
8	CAT5E/CAT6A ethernet cable from network switch to distribution switch	Cable cut is possible during unsupervised civil work within the hostel. Check if there was any repair work recently. This would affect multiple

		wings that will not have any network connectivity at all. Network team can detect this remotely by looking at the live network traffic statistics. Request your hostel office to raise a ticket with helpdesk and escalate to netadmin to initiate cable replacement. Request hostel office to follow up with the computer center.
9	1 Gigabit Distribution Switch of the hostel	Switch failure could happen due to power fluctuations. This would affect multiple wings that will not have any network connectivity at all. Network team can detect this remotely by looking at the live network traffic statistics. Request your hostel office to raise a ticket with helpdesk and escalate to netadmin to initiate switch replacement.
10	Fibre optic cable from the distribution switch to a nearby core switch.	Cable cut is possible during unsupervised civil work in the hostel zone. This would affect multiple hostels that will not have any network connectivity at all. Network team can detect this remotely by looking at the live network traffic statistics. Request your hostel office to inform the network administrators to initiate cable replacement. This issue usually does not require the end user to follow up and is addressed by network administrators themselves.
11	Core switch for a group of hostels (located in Cauvery, Jamuna, Tamiraparani, Central Library)	Switch failure could happen due to power fluctuations. Entire group of hostels will have no network connectivity at all. Network team can detect this remotely by looking at the live network traffic statistics. Request your hostel office to alert network administrators to initiate cable replacement.
12	Fibre optic cable from core switch to computer center	Cable cut is possible during unsupervised civil work in the campus. Entire group of hostels will have no network connectivity at all. Network team can detect this remotely by looking at the live network traffic statistics. This issue usually does not require the end user to follow up and is addressed by network administrators themselves.
13	Core switch of the institute (located in Computer Centre)	Switch failure. Very unlikely as it would bring the whole campus network down. We usually have redundant network paths working and a quick replacement of the faulty switch by the vendor. Live network traffic monitoring will bring this to the attention of netadmin immediately. Our

		netadmin will be on top of this issue immediately if it comes up at all. You don’t have to do anything as an end user.
14	National Knowledge Network (NKN) connection	Cable cuts or failure of switches along the path to the internet gateway. This happens when there is civil work on public roads where the cables are laid. From one or more educational institutes in the city to potentially the whole of south India could face network outage. This is detected by the ERNET team that manages the NKN and the issue gets resolved immediately as their teams respond fast. Our netadmin is generally in touch with the ERNET team on this aspect when it arises and will alert the campus community about the timeline for restoration of connectivity. You don’t have to do anything as an end user.

Helpful info while opening a ticket

Here are a few tips if you wish to learn more and help make the ticket you open more easy for the network staff to resolve and close fast.

- Identify users who are connected to the same network switch in your hostel and check how many of them face a similar issue. Try connecting from a different location and see if the issue is reproducible. Report these details in your ticket.
- Learn to use the shell or command line to use utilities such as “ipconfig”, “ping”, “nslookup”, “netstat”, “route” etc., to compare your configuration with that of a friend’s working laptop and see what is different. Reporting these while filing a helpdesk ticket will help save time in resolving the issue for you.
- Take screenshots of your desktop to show your network configuration, any error you have faced while using the network and details on which site you were trying to open etc., will help in debugging the issue.
- Collect users who face similar issues and talk to the network staff together so that they can see the pattern and explore ways to resolve it with the guidance of network administrators.

Frequently Asked Questions

Is there a limit on the bandwidth assigned to a student?
Currently, there is no limit set or assigned on the bandwidth for any device on the campus. The available bandwidth for the NKN connection is about 10 Gbps and we are

using about 7 to 8 Gbps on an average. When a large number of students in the same hostel use OTT, the network speed could get saturated at 1 Gbps temporarily. This is observed occasionally in a couple of switches across the hostel zone and that too only around 12 midnight. For most part of the day, all the network switches in the hostel zone report a bandwidth consumption that is a small fraction of the rated capacity (1 Gbps) of the switch.

Is my network port blocked?

The network team monitors the LAN for any device that is misbehaving i.e., sending out a large number of broadcast packets (or) using an address range different from what is assigned by the DHCP server of the computer center (or) violating network protocol etc. Network ports that are connected to such malfunctioning devices are blocked to ensure that the rest of the users can continue to use the LAN.

If your port is blocked, then your laptop would have internet connectivity from other rooms in the hostel but not from your room. If you notice this, file a helpdesk ticket with the connection details as outlined above. The network team will debug the situation and resolve it at the earliest.

Is it possible to use multiple devices from my room?

Yes. If you connect your laptop using ethernet cable to the LAN port in your room and configure your laptop as a hotspot, you can connect the rest of the devices through it and thus access the internet from multiple devices from your room using a single ethernet port. This is the recommended way for using multiple devices from a single LAN connection in the hostel zone.

If you configure a router properly, that will also enable the same. However, misconfigured routers will lead to network issues not just for you but also other users connected to the same switch in the hostel.

Who is paying for what?

The 10 Gbps NKN link is provided free by the Govt of India to IIT Madras along with other centrally funded technical institutes and universities. An additional 200 Mbps link is procured by the institute from its budget for accessing journal websites and library resources. First time installation of switches are provided by the institute from its budget. The project staff working for the IT services are all paid by the institute in a project given to the computer center. Expensive and high capacity infrastructure such as core switches, network firewall etc., are all provided by the institute from its budget.

The hostel administration pays only for the replacement of switches in the hostel as and when they fail.

Escalation Matrix

When you face an issue and it does not seem to get resolved within a reasonable timeframe, you are welcome to escalate the issue. The sequence of steps is as given below:

Step-1	Filing a ticket using the helpdesk of computer center, reachable at helpdesknetworks@iitm.ac.in	Network staff will look at the details, contact the end user, address the issue and close the ticket after the issue is resolved. It usually takes 1 or 2 days to complete this process.
Step-2	Network administrators (Mr. Selvaraju and Mr. Mahesh reachable at netadmin@iitm.ac.in)	If the issue is not resolved, forward the details of the ticket along with additional information on why the ticket should not be closed. The network administrators will guide their staff to debug and resolve the issue appropriately. They would also analyse issues that get escalated to them for a pattern and plan necessary configuration changes to avoid the same in future.
Step-3	Faculty In-charges (Prof. G. Phanikumar as Chairman of Computer Center reachable at cchead@iitm.ac.in)	Network administrators report to the faculty i/c of networks at the computer center (currently the chairman). If the issue is still not resolved, you can email the chairman with the ticket details and the email conversation that followed after that. Chairman looks at the pattern of issues that are escalated and would discuss with the network administrators for any policy change or procurement required and help follow up the issue to resolution. He would prepare policy documents and reach out to the Deans Committee for approval and will implement them as part of follow up.

Step-4	Dean (Planning) Prof. R. Sarathi, reachable at deanplan@iitm.ac.in.	Chairman of the computer center reports to the Dean(Planning). On issues where policy changes or budget allocations necessary for procurement required to address the issues, Dean (Planning) takes decisions and instructs Chairman, Computer Center to take necessary action.
Step-5	Director Prof. V. Kamakoti, reachable at director@iitm.ac.in	Dean (Planning) reports to the Director. On issues that require major policy changes or major procurement, the Director will take his decision and convey the same to the Dean (Planning) along with instructions for the Chairman, Computer Center to implement.

As you can note, following the escalation protocol will help get the issues resolved in a way that allows for analysis, planning, modification of policies, necessary procurement and so on. Writing directly to all the administrators is not an efficient use of the time and effort of the respective individuals.

Proper Channel

What is usually meant by proper channel for a student, staff member or faculty member is not articulated in an explicit manner but is implicit in the way persons holding different administrative roles report to their higher authorities. As an illustration, the following sequence can be considered, subject to the hierarchy being still valid.

On academic matters or issues in the academic zone:

Student →Faculty Advisor → Head of the Department →Dean (AC) or Dean (AR) as appropriate →Director.

On hostel matters or issues in the hostel zone:

Student →Warden →Chairman, Council of Wardens →Dean (Students) →Director.

There are several such proper channels for different aspects of a student's life during the course of their program at the institute. It is a good idea to discuss with the immediate higher authority (Faculty advisor or Warden) about the issues you are facing and seek guidance on the way forward. Needless to say, Computer Center is committed to provide a

productive IT environment for the education and research of all the students of the institute.

About this document

This document is authored by Prof. G. Phanikumar in his capacity as Chairman, Computer Center. This document will be modified from time to time as the requirements emerge. Please write to him at cchead@iitm.ac.in for any issue related to this document. Your constructive feedback to help make a productive IT environment for all students is welcome.

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