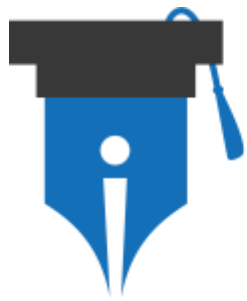


REPORT ON INDUSTRIAL VISIT –IMEDETIA

**A REPORT ON  
INDUSTRIAL VISIT AT  
“I-Medita”**

**Scheduled on:-7<sup>th</sup> & 8<sup>th</sup> MARCH,2019**



**I-MEDITA**  
LEADER IN IT TRAININGS

**Department of Electronics and Communication Engineering**



**Department of Electronics and Communication Engineering**

**VIVA INSTITUTE OF TECHNOLOGY**

**At. Shirgaon, Virar(East), Taluka-Vasai, Thane District – 401303, Maharashtra**

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**A.Y. 2018-2019**

## Acknowledgement

We shall be failing in our duty, if we will not express our sincere gratitude to all those distinguished personalities with help of whom we successfully completed our visit.

Our deep gratitude to our **Principal Dr. Arun kumar** and our **The Head Of EXTC Department Prof. Archana Ingle**, Viva Institute Of Technology, who always been playing a great role in all round development of the student.

We would also like to thank our **Faculty In charge Prof.Chitra Takle** and all teaching and non teaching staff for their kind support, help and assistance, which they extended as and when required particularly for taking keen interest in us to give us excellent and unforgettable facilities.

Last but not the least we wish to thank our friends for cooperating with everyone. We hope that this industrial report would meet the high standards of all concerned people and for their continuous co-operation during the whole period of visit that helped us in enhancement of our knowledge.

Industrial visit at **IMEDITA** organized on 7<sup>th</sup> and 8<sup>th</sup> March 2019 has been a successful visit and a pleasant experience of knowledge in its application. This report is the conclusion of the experience shared by the the professional's at IMEDITA .

**About I-MEDITA**

I-Medita, is an ISO 9001:2008 certified Training, development and placement Company registered by Ministry of Corporate affairs as an Educational Service Provider. I-Medita is also a Cisco Registered Partner. I-Medita is considered as India's Most Trusted Cisco Training Centre. I-Medita is a Global firm offering various Educational training services across the globe. They provide Technical Hand on Training to Colleges, Universities and they also run Training Program at our Pune Main Office.

## INTRODUCTION

### **Networking**

A computer network is a digital telecommunications network which allows nodes to share resources. In computer networks, computing devices exchange data with each other using connections between nodes. These data links are established over cable media such as wires or optic cables, or wireless media such as Wi-Fi.

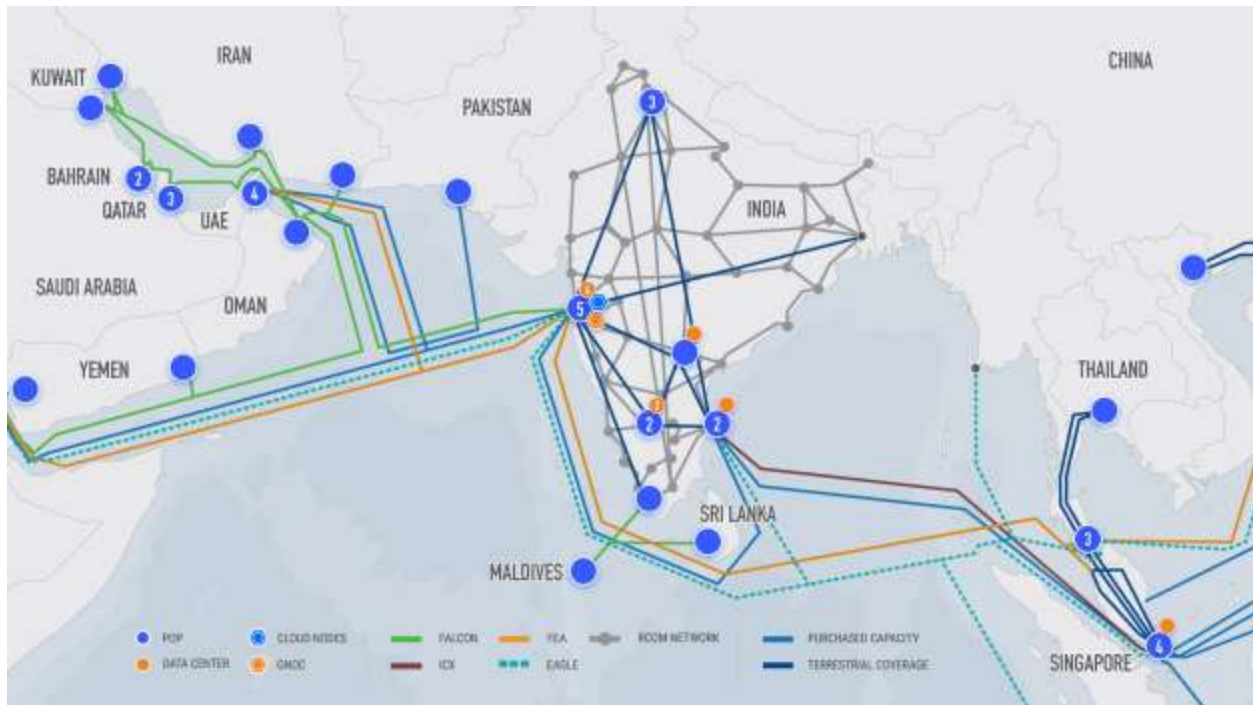


Fig.1 Map of Network cable connections in India

### **Types of networking**

There are two primary types of computer networking: wired networking and wireless networking.

Wired networking requires the use of a physical medium for transport between nodes. Copper-based Ethernet cabling, popular due to its low cost and durability, is commonly used for digital communications in businesses and homes. Alternatively, optical fiber is used to transport data over greater distances and at faster speeds, but it has several tradeoffs, including higher costs and more fragile components.

Wireless networking uses radio waves to transport data over the air, enabling devices to be connected to a network without any cabling. Wireless LANs are the most well-known and widely deployed form of wireless networking. Alternatives include microwave, satellite, cellular and Bluetooth, among others.

### Internet

The Internet, sometimes called simply "the Net," is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). It was conceived by the Advanced Research Projects Agency (ARPA) of the U.S. government in 1969 and was first known as the Arpanet. The original aim was to create a network that would allow users of a research computer at one university to "talk to" research computers at other universities. A side benefit of ARPANet's design was that, because messages could be routed or rerouted in more than one direction, the network could continue to function even if parts of it were destroyed in the event of a military attack or other disaster.

### Addresses

The Internet is really the interconnection of many individual networks (it's sometimes referred to as an *internetwork*). So the Internet Protocol (IP) is basically the set of rules for one network communicating with any other (or occasionally, for broadcast messages, all other networks). Each network must know its own address on the Internet and that of any other networks with which it communicates. To be part of the Internet, an organization needs an Internet network number, which it can request from the Network Information Center (NIC). This unique network number is included in any packet sent out of the network onto the Internet.

### How much of the world is connected to the internet:

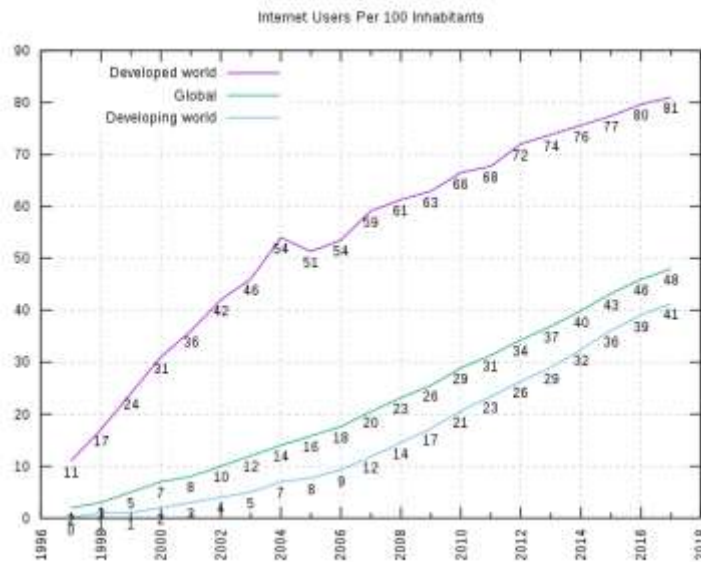


Fig.2 Graph of rise in Internet usage

**Global Internet usage** refers to the number of people who use the Internet worldwide, which can be displayed using tables, charts, maps and articles which contain more detailed information on a wide range of usage measures.

As of June 2018, 55.1% of the world's population has internet access. In 2015, the International Telecommunication Union estimated about 3.2 billion people, or almost half of the world's population, would be online by the end of the year. Of them, about 2 billion would be from developing countries, including 89 million from least developed countries.

**Internet access** is the ability of individuals and organizations to connect to the Internet using computer terminals, computers, and other devices; and to access services such as email and the World Wide Web. Internet access is sold by Internet service providers (ISPs) delivering connectivity at a wide range of data transfer rates via various networking technologies. Many organizations, including a growing number of municipal entities, also provide cost-free **wireless access**.

The history of the internet in India began with the launch of the Educational Research Network (ERNET) in 1986. The first publicly available internet service in India was launched by state-owned Videsh Sanchar Nigam Limited (VSNL) on 14 August 1995. As of May 2014, the Internet was delivered to India mainly by 9 different undersea fibres, including SEA-ME-WE 3, Bay of Bengal Gateway and Europe India Gateway, arriving at 5 different landing points. India also has one overland internet connection, at the city of Agartala near the border with Bangladesh.

As of 31 December 2018, India had a population of 130 crore people (1.3 billion), 123 crore (1.23 billion) Aadhaar digital biometric identity cards, 121 crore (1.21 billion) mobile phones, 44.6 crore (446 million) smartphones, 56 crore (560 million) internet users up from 481 million people (35% of the country's total population) in December 2017, and 51 per cent growth in e-commerce.

### **Statistics internet usage via e-commerce in India**

No. of Indian consumers who purchased something online in 2018: **120 Million**

No. of Indian consumers who are expected to purchase something online in 2020: **175 Million**

Indian e-commerce Industry in 2017: **\$38.5 Billion**

Indian e-commerce Industry is expected to grow by 2026: **\$200 Billion**

### **Why 5 to 6 Years are crucial for Networking**

In the future the role of network administrators will change, because rather than just focusing on how applications and devices connect to the network, they will have to look at the

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performance of the application on the network, make adjustments to packet transfer rates and integrate virtualisation into the network operating system.

Technology trends in enterprise computing are increasingly testing the limits of yesterday's networks - many that were 'good' for yesterday are not 'good enough' for tomorrow. Consumerisation of IT, mobility, virtualisation and cloud computing along with a massive increase in video traffic are putting rising demands on the network. It is expected that by 2014, internet video alone will account for 57 per cent of all consumer traffic. Businesses are also increasingly using video technologies for surveillance, conferencing and digital signage. This demands a need to ensure that networking investments provide the needed intelligence to preplan, auto-configure and troubleshoot video endpoints and video flows.

Likewise mobility has progressed from an employee demand to a business necessity. Smartphones, tablet PCs and other mobile devices have not only revolutionised personal communication, but are also helping to increase productivity and keep businesses operating around the clock. By 2015, it is expected that there will be nearly one mobile-connected device for every person on earth. That's 7.1 billion devices.

According to research firm Ovum, the numbers of smartphones in use will more than double and reach 600 million by 2015. Many of these devices will be used to access corporate data, which will be media rich, include video and other high-resolution picture-based features. Ovum also estimates that the personal mobile market will grow to 7.5 billion by end of 2015 and anticipates that more and more businesses will have moved to bring your own device (BYOD) policies and the proportion of companies providing employees with device like laptops and smartphones is expected to increase to 30 per cent within two years.

According to the Cisco's visual networking index forecast, 54 per cent of workers say their mobile device is the most important technology in their lives, and that more than half of college students and employees want to use them in their work or school activities, feeding into the BYOD trend.

The increased complexity of the computing environment is introducing new vulnerabilities, resulting in more network attacks and increased demand for strong network performance and secure connectivity dramatically. Given the above, IT must find a way to accommodate multiple device types, multiple operating systems and enable secure access to network resources while protecting corporate assets. Along with the network, it is also necessary to secure the variety of devices in use.

### **Growth in traffic from 2015**

Internet usage in India ,With over 460 million internet users, India is the second largest online market, ranked only behind China. By 2021, there will be about 635.8 million internet users in India. Despite the large base of internet users in India, only 26 percent of the Indian population accessed the internet in 2015. This is a significant increase in comparison to the previous years, considering the internet penetration rate in India stood at about 10 percent in 2011. Furthermore, men dominated internet usage in India with 71 percent to women's 29 percent.

Indians often turn to mobile internet, as the large majority of the digital population in India were mobile internet users in 2016. About 323 million people in India accessed the internet through their mobile phones in 2016, which corresponds to about 24.3 percent of the country's population. Both figures are forecast to increase in the coming years, with projections to amount to 524.5 million and around 37.4 percent respectively in 2021. Mobile internet usage in India varies according to people's living areas. As of 2016, India had an estimate of 262 million mobile internet users living in urban communities, and 109 million living in rural areas.

One aspect whereby India shares the characteristics of other global internet users is its passion for social media. In 2021, it is estimated that there will be around 358.2 million social network users in India, a significant increase from 2016, when this figure stood at about 216.5 million. This means that the share of the Indian population that access social networks is expected to jump from around 16.3 percent in 2016 to just over 25 percent. Facebook is the most popular social networking site in the country. There were about 195 million Facebook users in India as 2016, placing India as the country with the largest Facebook user base in the world. Other popular networks include WhatsApp, Google+, and Skype.

With an estimate of 43.8 percent digital buyer penetration in 2016, online shopping is also a popular online activity of Indian internet users. Retail e-commerce sales in India amounted to about 16 billion U.S. dollars that year and are projected to surpass 45 billion U.S. dollars in 2021. Mobile shopping has gained space in the country as well. About 49 percent of Indian consumers stated using their mobiles for purchasing goods or services. This share is above global average – which stood at 38 percent as of 2016 – and the second highest figure in the world, only behind China.



### **Big player investing in India**

E-commerce in the FMCG (fast-moving consumer goods) space can potentially grow to up to \$6 billion by 2020, from less than \$1 billion now, a report recently released by Google and the Boston Consulting Group (BCG) Reports. By 2020, there will be “very high penetration of over 10% in categories like nutraceuticals and colour cosmetics, high penetration of 7-10% in categories like weight management and baby care, moderate penetration of 3-7% in categories like hair care and laundry, and low penetration of less than 3% in dairy products and confectionery,” according to that report. Given all this potential, it’s no surprise that several global companies are trying to tap the market. In particular, India has become a battleground for America’s largest online retailer, Amazon, and China’s biggest e-tailer, Alibaba.

While Amazon operates in India through its India arm Amazon.in, Alibaba has bought significant stakes in digital wallet Paytm and e-commerce portal Snapdeal. Alibaba’s largest shareholder, Softbank, also recently picked up a stake in Flipkart. But winning in India won’t be all that easy for the two players. “India is a more complicated market than China, and Alibaba has no operational experience in the market,” Morgan Stanley said. “The results of Alibaba’s initiatives will be affected by product localisation, strategy execution, and various other factors, some of which may be out of the company’s control.”

But in the long-term, India will be a “material driver” for Amazon’s growth, it added. “Amazon India currently has 160 million products listed on its platform, versus over 400 million for Amazon in the US. We expect the numbers in India to increase meaningfully as more merchants enter the formal economy and have better access to credit,” Morgan Stanley said.



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This is how the report ranks e-commerce players in India :

<b>Rank</b>	<b>App</b>	<b>Category</b>
1	Paytm	General merchandise/Digital wallets
2	Amazon India	General merchandise
3	Flipkart	General merchandise
4	Snapdeal	General merchandise
5	Myntra	Fashion/Apparel
6	Limeroad	Fashion/Apparel
7	Voonik	Fashion/Apparel
8	Shopclues	General merchandise

**Hands on experience in LABS:**

**Network**

A **network** is a collection of computers, servers, mainframes, network devices, peripherals, or other devices connected to one another to allow the sharing of data. An excellent example of a network is the Internet, which connects millions of people all over the world.



Fig.3 Actual network setup at I-Medita.

**Models**

Network Models basically represent the graphical representation of a network in a infrastructure .Some of the example of Models at I-Medita are given below:

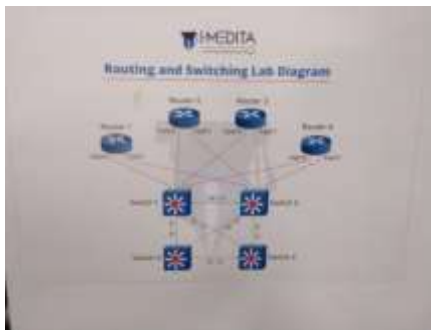


Fig.4 NetworkModels at I-Medita.

## **Racks**

Known by many names, a **network rack** is a metal frame chassis that holds, stacks, organizes, secures and protects various computer **network** and server hardware devices. The term “**network**” refers to the **rack** being used to house **network** hardware like routers, switches, access points, and modems.

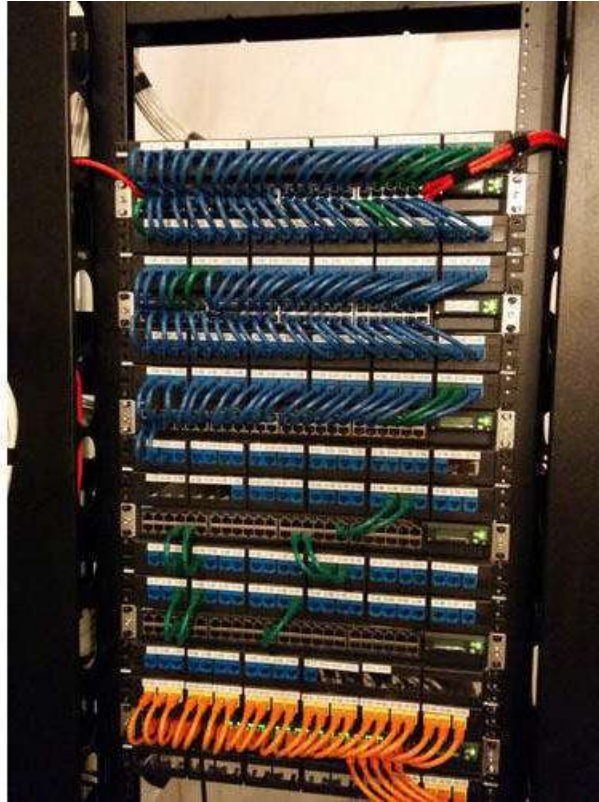


Fig.5 Rack setup

- **Layer 1 components**

## **Cables**

Cable is the medium through which information usually moves from one network device to another. There are several types of cable which are commonly used with LANs. In some cases, a network will utilize only one type of cable, other networks will use a variety of cable types. The type of cable chosen for a network is related to the network's topology, protocol, and size.

**Unshielded twisted pair**

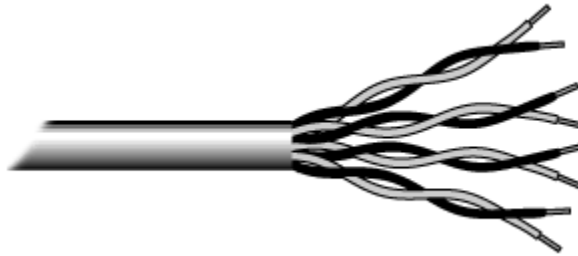


Fig.6 Unshielded twisted pair

The quality of UTP may vary from telephone-grade wire to extremely high-speed cable. The cable has four pairs of wires inside the jacket.

**Coaxial cable**



Fig.7 Coaxial cable

Coaxial cabling has a single copper conductor at its center. A plastic layer provides insulation between the center conductor and a braided metal shield.

**Fiber optic cable**



Fig.8 Fiber optic cable

Fiber optic cabling consists of a center glass core surrounded by several layers of protective materials (See fig. 5). It transmits light rather than electronic signals eliminating the problem of electrical interference.

- **Layer 2 components**

### **Switches**

A network switch is a computer networking device that connects devices on a computer network by using packet switching to receive, process, and forward data to the destination device. Below shown are some of switches from I-Medita.



Fig.9 Switches at I-Medita

- **Layer 3 components**

### **Routers**

A **router** is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. Data sent through the internet, such as a web page or email, is in the form of data packets. A packet is typically forwarded from one router to another router through the networks that constitute an internetwork until it reaches its destination node.

## **VOIP**

Voice over Internet Protocol, also called IP telephony, is a methodology and group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol networks, such as the Internet. VOIP at Imedetia.



Fig.10 VoIP setup at I-Medita

**VoIP** is basically a telephone connection over the Internet. The data is sent digitally, using the Internet Protocol (IP) instead of analog telephone lines. This allows people to talk to one another long-distance and around the world without having to pay long distance or international phone charges.

## SECURITY SETUP

In terms of computer security, a **firewall** is a piece of software. This software monitors the network traffic. A firewall has a set of rules which are applied to each packet. The rules decide if a packet can pass, or whether it is discarded. Usually a firewall is placed between a network that is trusted, and one that is less trusted. When a large network needs to be protected, the firewall software often runs on a computer that does nothing else.

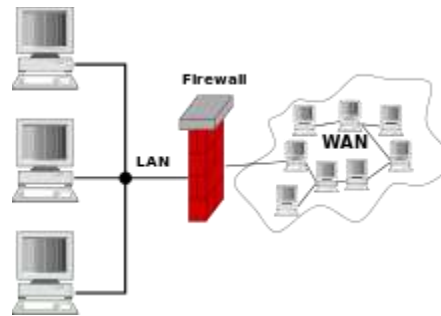


Fig.11 Firewall

In general, there are two types of firewalls:

- Software-based firewalls: these are often run as additional programs on computers that are used for other things. They are often known as *personal firewalls* which can be updates on personal computers.
- Hardware-based firewalls: Hardware based firewalls run on a dedicated computer (or appliance). Often, these offer a better performance than software firewalls, but they are also more expensive.



Fig.12 Hardware Firewall



## **CAREER IN NETWORKING**

One of the largest categories for IT certifications, and thus IT careers, has to be networking. Without applying more specific criteria, a networking cert could cover local wired and wireless IP network design, connectivity, routing, and administration, but also mobile communications technologies like LTE and Mobile WiMAX.

In addition, data center networking falls under this umbrella, as well as wide area network (WAN) connectivity and quality of service, as do traditional long-haul technologies such as carrier Ethernet, optical fiber, and so on. This survey whittled the list down mainly to the most popular local wired and wireless networking certifications. A handful of certs in this article overlap general networking with Multiprotocol Label Switching (MPLS) and mobility, but they're exceptions to the rule.

### **Networking job types**

For those just starting a career in networking, here is a short list of the available types of positions and networking jobs:

- Network Specialist
- Network Technician
- Network Administrator
- Network Analyst
- Network Manager
- Network Engineer
- Network Solutions Architect

As you develop your networking career further, you might decide to specialize in one or more areas of networking. At this point, the networking jobs you would be applying for might include:

- Network Security Specialist
- Cloud Networking Architect
- Networking Research and Development Specialist
- Wireless Networking QA Engineer
- Wireless Infrastructure and Mobility Specialist
- Mobility Solutions Architect

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- VoIP Engineer
- Telecom Project Manager
- Data Center Networking Specialist

There are also plenty of networking jobs in sales and consulting, such as

- Networking Sales Specialist
- Networking Account Manager
- Networking Consultant
- Networking Program Manager

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Fig.13 I-Medita Office at Pune



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