

**Rukmini Devi Institute of Advanced Studies**

Madhuban Chowk, Rohini, Delhi-110085

(Approved By AICTE & Affiliated With GGSIP University)

# **DOSSIER**

**On**

## **SEMINAR**

**On**

**“System Engineering and  
Network Administration”**

**On**

**October 9, 2013**





<b>S. No.</b>	<b>Particulars</b>	<b>Pg. No.</b>
<b>1.</b>	<b>Form- A :</b> Proposal to organize an event	<b>3</b>
<b>2.</b>	<b>Form- B:</b> Part I - Aim of the event	<b>4</b>
	Part II – Abstract	<b>4-9</b>
	Part III - Conclusion	<b>9</b>

**Ms. Sneha Chopra**

**Ms. Amandeep Kaur**  
Chairperson, Literary Club

**Prof. Col. (Retd.) Mahander Singh**  
Director General, RDIAS



## **FORM A**

### **Proposal:**

- **Name of the event to be organized:** Guest Lecture on “System Engineering and Network Administration”
- **Date:** October 9, 2013
- **Time:** 11:00 am – 01:00 pm
- **Venue:** Lecture Theatre, RDIAS
- **Motivation for the activity:** The aim of the event was to acquaint all students & faculty members with the idea & understanding of system and network and its engineering, administration.
- **Organized by:** MCA Department
- **Resource Person:** Mr. Sachin Kataria, Technical Head (IT) and Mr. Yogesh Kumar, System Administrator, Crezone Technologies.



## **FORM B**

### **Part 1**

#### **Aim of the event:**

**Network Administration** means managing and maintaining network performance to enable users to maximize productivity. The job of Network Administrator was established for the purpose/s of designing, configuring, installing, maintaining, and repairing network systems, subsystems and servers; overseeing the computer/server room operation and environment; providing information, direction and/or recommendations regarding network installations and configurations; resolving network operational issues; and providing technical support.

**Systems engineering** is an interdisciplinary field of engineering that focuses on how to design and manage complex engineering projects over their life cycles. Issues such as reliability, logistics, coordination of different teams (requirements management), evaluation measurements, and other disciplines become more difficult when dealing with large, complex projects. System engineering deals with work-processes, optimization methods, and risk management tools in such projects. It overlaps technical and human-centered disciplines such as control engineering, industrial engineering, organizational studies, and project management. System Engineering ensures that all likely aspects of a project or system are considered, and integrated into a whole.

The aim of this session was to make students learn the concept, working, techniques and importance of Network Administration and System Engineering as career option.

### **Part 2**

#### **Abstract:**

The session was conducted by Mr. Sachin Kataria, Technical Head (IT) and Mr. Yogesh Kumar, System Administrator, Crezone Technologies.



The seminar presentation had the following discussion points:

- Subnet
- IP Address
- Switching in network
- IPv4 vs IPv6
- Virtual Private Network
- How to change windows password?
- How to check internet connection?
- How to check static and dynamic IP address?
- How to change MAC address?
- How to apply proxy on LAN card?
- How to check system performance?
- How to check system configuration?
- Troubleshooting
- Seven important windows file.

The lecture was initiated by Mr. Sachin Kataria and Mr. Yogesh Kumar took over the session by explaining the following details:-

### **1. IP Address & Version**

An **Internet Protocol address (IP address)** is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network that uses the Internet Protocol for communication. An IP address serves two principal functions: host or network interface identification and location addressing. Its role has been characterized as follows: "A name indicates what we seek. An address indicates where it is. A route indicates how to get there." The designers of the Internet Protocol defined an IP address as a 32-bit number and this system, known as Internet Protocol Version 4 (IPv4), is still in use today. However, due to the enormous growth of the Internet and the predicted depletion of available addresses, a new version of IP (IPv6), using 128



bits for the address, was developed in 1995. IPv6 was standardized as RFC 2460 in 1998, and its deployment has been ongoing since the mid-2000s.

IP addresses are binary numbers, but they are usually stored in text files and displayed in human-readable notations, such as 172.16.254.1 (for IPv4), and 2001:db8:0:1234:0:567:8:1 (for IPv6).

The Internet Assigned Numbers Authority (IANA) manages the IP address space allocations globally and delegates five regional Internet registries (RIRs) to allocate IP address blocks to local Internet registries (Internet service providers) and other entities.

Two versions of the Internet Protocol (IP) are in use: IP Version 4 and IP Version 6. Each version defines an IP address differently. Because of its prevalence, the generic term *IP address* typically still refers to the addresses defined by IPv4. The gap in version sequence between IPv4 and IPv6 resulted from the assignment of number 5 to the experimental Internet Stream Protocol in 1979, which however was never referred to as IPv5.

### ➤ **IP SUBNETWORK**

IP networks may be divided into sub-networks in both IPv4 and IPv6. For this purpose, an IP address is logically recognized as consisting of two parts: the *network prefix* and the *host identifier*, or *interface identifier* (IPv6). The subnet mask or the CIDR prefix determines how the IP address is divided into network and host parts.

The term *subnet mask* is only used within IPv4. Both IP versions however use the CIDR concept and notation. In this, the IP address is followed by a slash and the number (in decimal) of bits used for the network part, also called the *routing prefix*. For example, an IPv4 address and its subnet mask may be 192.0.2.1 and 255.255.255.0, respectively. The CIDR notation for the same IP address and subnet is 192.0.2.1/24, because the first 24 bits of the IP address indicate the network and subnet.

### ➤ **IP ADDRESS ASSIGNMENT**



Internet Protocol addresses are assigned to a host either anew at the time of booting, or permanently by fixed configuration of its hardware or software. Persistent configuration is also known as using a *static IP address*. In contrast, in situations when the computer's IP address is assigned newly each time, this is known as using a *dynamic IP address*.

Static IP addresses are manually assigned to a computer by an administrator. The exact procedure varies according to platform. This contrasts with dynamic IP addresses, which are assigned either by the computer interface or host software itself, as in Zeroconf, or assigned by a server using Dynamic Host Configuration Protocol (DHCP). Even though IP addresses assigned using DHCP may stay the same for long periods of time, they can generally change. In some cases, a network administrator may implement dynamically assigned static IP addresses. In this case, a DHCP server is used, but it is specifically configured to always assign the same IP address to a particular computer. This allows static IP addresses to be configured centrally, without having to specifically configure each computer on the network in a manual procedure.

## **2. Virtual Private Network (VPN)**

A **virtual private network (VPN)** extends a private network across a public network, such as the Internet. It enables a computer to send and receive data across shared or public networks as if it were directly connected to the private network, while benefiting from the functionality, security and management policies of the private network.<sup>[1]</sup> This is done by establishing a virtual point-to-point connection through the use of dedicated connections, encryption, or a combination of the two.

A VPN connection across the Internet is similar to a wide area network (WAN) link between the sites. From a user perspective, the extended network resources are accessed in the same way as resources available from the private network.

VPNs allow employees to securely access their company's intranet while traveling outside the office. Similarly, VPNs securely and cost-effectively connect geographically disparate offices of an organization, creating one cohesive virtual



network. VPN technology is also used by ordinary Internet users to connect to *proxy servers* for the purpose of protecting one's identity.

### **3. Troubleshooting**

**Troubleshooting** is a form of problem solving, often applied to repair failed products or processes. It is a logical, systematic search for the source of a problem so that it can be solved, and so the product or process can be made operational again. Troubleshooting is needed to develop and maintain complex systems where the symptoms of a problem can have many possible causes. Troubleshooting is used in many fields such as engineering, system administration, electronics, automotive repair, and diagnostic medicine. Troubleshooting requires identification of the malfunction(s) or symptoms within a system. Then, experience is commonly used to generate possible causes of the symptoms. Determining the most likely cause is a process of elimination - eliminating potential causes of a problem. Finally, troubleshooting requires confirmation that the solution restores the product or process to its working state.

In general, troubleshooting is the identification of, or diagnosis of "trouble" in the management flow of a corporation or a system caused by a failure of some kind. The problem is initially described as symptoms of malfunction, and troubleshooting is the process of determining and remedying the causes of these symptoms.

### **4. System performance and configuration**

A **system monitor** (SM) in systems engineering is a process within a distributed system for collecting and storing state data. This is a fundamental principle supporting Application Performance Management. **Configuration management** (CM) is a systems engineering process for establishing and maintaining consistency of a product's performance, functional and physical attributes with its requirements, design and operational information throughout its life. The CM process is widely used by military engineering organizations to manage complex systems, such as weapon systems, vehicles, and information systems. Outside the military, the CM process is also used with IT service management as defined by ITIL, resp. ISO/IEC 20000, and with other



domain models in the civil engineering and other industrial engineering segments such as roads, bridges, canals, dams, and buildings. To be used efficiently, all computer software needs certain hardware components or other software resources to be present on a computer. These prerequisites are known as (computer) **system requirements** and are often used as a guideline as opposed to an absolute rule. Most software defines two sets of system requirements: minimum and recommended. With increasing demand for higher processing power and resources in newer versions of software, system requirements tend to increase over time. Industry analysts suggest that this trend plays a bigger part in driving upgrades to existing computer systems than technological advancements. A second meaning of the term of System requirements is a generalization of this first definition, giving the requirements to be met in the design of a system or sub-system. Typically an organization starts with a set of Business requirements and then derives the System requirements from there.

### **Part 3**

#### **Conclusion**

It is important for the students to be well acquainted with these applications and should be aware of the intricacies of implementing this technology. Keeping this in mind a lecture was organized for the students of MCA. The session was very informative and technical for the students. The speaker explained all the points in detail and handled all the queries with expertise. It was a great experience as the guest lecture was motivational, informative, and interactive.

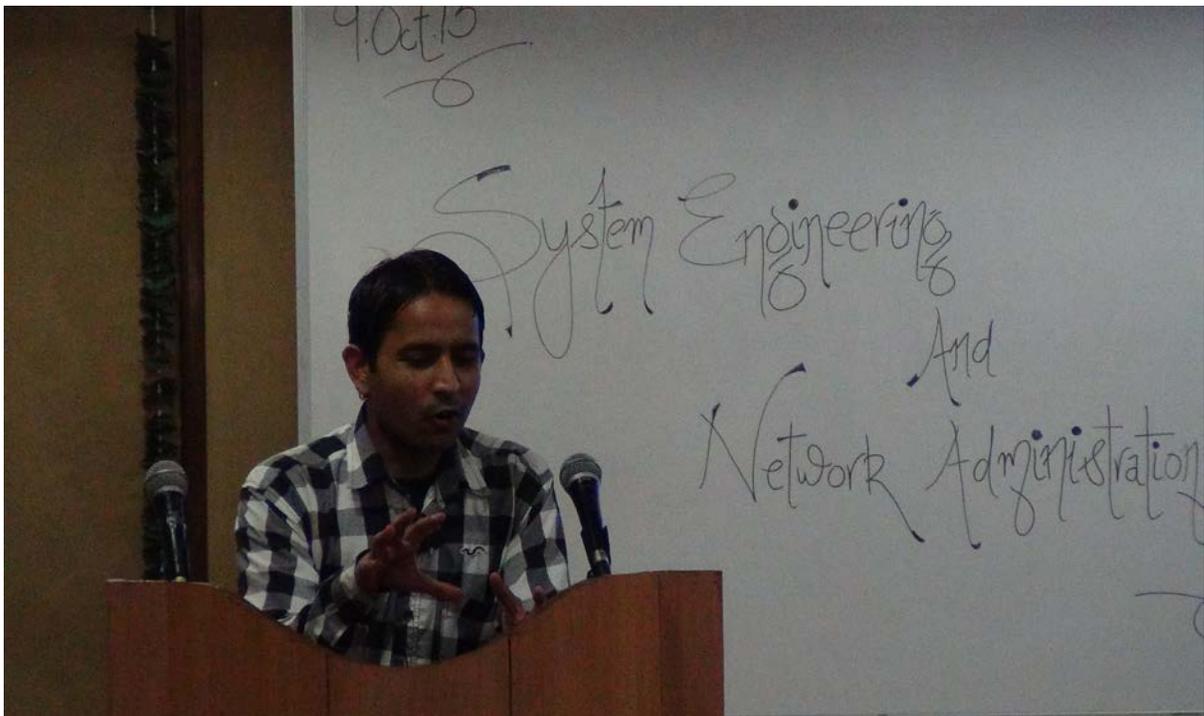
Session was an eye opener also for the students as they were able to see network administration as a career option.



## Lecture Moments



Student from MCA I (M) Sem (Saloni) introducing Mr. Sachin Kataria and Mr. Yogesh Kumar..!!



Mr. Yogesh kumar delivering the lecture on Network Administration..!!



Students are attentively listening the lecture..!!



Dr. Piyush Dua is giving memento to the speakers..!!