IBM SERVER MAINTANECE, SERVICING AND NETWORKING OF AN ORGANIZATION

BY

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ID: 123-15-2025

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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DHAKA, BANGLADESH
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APPROVAL

This Internship titled **"IBM Server Maintenance, Servicing and Networking of an Organization"**, submitted by **Md. Azimul Hoque Tamim** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 20 August 2015.

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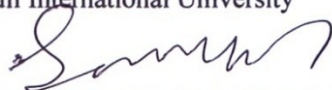Faculty of Science & Information Technology
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DECLARATION

I hereby declare that, the work presented in this internship report titled "IBM server maintenance, servicing and networking of an organization" is done by me under the supervision of **Mr. Narayan Ranjan Chakraborty Senior Lecturer, Department of Computer Science and Engineering,** Daffodil International University, in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering. I am declaring this report is my original work. I ensure that neither this report nor any part has been submitted elsewhere for the award of any degree or diploma.
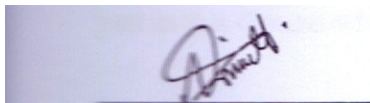
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I would like to thanks my complete course mate in Daffodil International University, whose took part in this discuss while completing the course work.

Finally, I would like to thanks my family especially my parents for their continuous supports and encouragements throughout the whole period of this internship.

ABSTRACT

This internship report is the primary gateway to understand of IBM Server maintenance. Conceptually, I think server maintenance is very need for all ICT Company's, Bank, Industry, Insurance Company, Government and Non-Government office, Mobile Operator Company etc. At the ICT level, Server is a most important for ICT Sector Because We also see a dream for digital world. Server maintenance & servicing is a part of IT Specialist. Now-a-days we can change our country because it is a challenge of all CSE Student. I have shown all the steps that are required to solve the Server System. IBM server is mainly used for their employee management, Office management, Bank Account management, Data Center Management, Data Store, sharing, security and Maintenance. It also give fulfill requirement for Customer. Finally, my documentation of this internship indicates successful completion of the tasks that assign to me.

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CHAPTER 1

INTRODUCTION

1.1 Objective

We know Computer Science and Engineering idea for theory topics. But we don't have practical experience for field area. So it is practical user interface for a corporate level and ICT sector. AnIT engineers must know research, test, diagnose and install computer, server, router, switch, modems etc. This career is particularly geared in the direction of those with strong analytical, critical thinking, and problem solving skills. It makes a platform for IT engineers.

1.2 Motivation

The primary motivation of the Server System is to present effort and open IT Sector to build an effective Carrier. Server is made with Hardware and Software systems that are currently used in telecommunication and IT sectors. These server systems are monolithic hardware, software and applications integrated very compactly and operate well as a unit. However, they are hard to maintain and scale for IT companies. That has to utilize the services of the vendor for even relatively minor enrichments to the system.

1.3 Internship Goals

To lead in the field of local and global market, implement supported to development, good and effective solutions to our clients. Extremely consistent group of dedicated, dynamic and result oriented people with a clear focus of serving the customers globally. Always soaring high in search of latest trends and challenges in the world of IT. Also dedication to every client's success, Innovation that's matters for our company and for the world and trust and personal responsibility in all relationships.

Platforms a level of knowledge for IT specialist who can acquire a stage allowing to develop, servicing, maintain, problem determining and solving, run and achieve Server systems without any complexity. To construction and maintaining the infrastructure normally associated with developing and launching a technical support. It controls software deployment and configuration settings. The sage as a person must know the networks, servers, storage and other services and applications. An IT specialist must know hardware & software installation data centers and public infrastructure to provides service and manage by IT departments.

1.4 Report Layout

Internship program has become a significant aspect of postgraduate requirement. In practice, it is of great importance in changing the field of theoretical learning. Its significance is effective in satisfying the requirement of graduate degree.

In **Chapter 1** I have described objective of internship, Motivation of internship and internship goal.

In **Chapter 2** I have covered the company overview. And this chapter gives the information about where the internship has been attached to undertake this program. Also included about how did perform the internship works, about the company, what are the IT service offered in Bangladesh. What is the performance of this company?

In **Chapter 3**I have shown about server hardware systems. What is component used for a server. That's essential for a server. This chapter shows hardware equipment of a server.

I have to also show Integrated Management Module. Where working remote control by Ethernet cable for sever management port. It is very effective of a server.

I have to show about Redundant Array of Inexpensive Disks (RAID).This Chapter Show different types of RAID.

In **Chapter 4**is Internship Outcomes. This is chapter explain for Case study of this working Experience.   Here included Problems and Solutions, Learning Outcomes and Challenges.

In **Chapter 5**is Conclusion and Future Scope. I discuss Future Scopes of Server systems and write conclusion.

CHAPTER 2

Internship Enterprise

2.1 About the Company

Thakral Information Systemwas founded in January 1998 in Dhaka, Bangladesh.**Mr.ShahjahanMazumdar** is **CEO** of This Origination.Fig: 2.1This Company is include BASIS Membership (Membership Number G097). It also Membership with FICI, BCS.**Thakral Information System Pvt. Ltd** is vendor Authorized of IBM and Lenovo products. The International presence of India, Nepal, Bhutan, Afghanistan and more. The customers of this company are Banking and Financial sector (40), Governments and Military-Nations (45), Telecommunications (4), Education (12), Manufacturing and Engineering (10) and so on.   Originally established to provide training to develop IT professionals, shortly afterward, the many opportunities in the ICT field were followed[1].

Fig:2.1 Thakral Information Systems Pvt. Ltd.

In 1998, Thakral Information System launched its business to sell IBM Compatible PCs & and developing customized to input all IBM Equipment's as added in business for tits varied clients. Thakral Information System is a leading source of intelligent information for businesses and

professionals. We combine industry skill with innovative technology to deliver critical information to leading decision makers in the financial and accounting solutions as well as complete network & hardware solution.

Fig:2.1 Service Centre

We believe that the success of any project depends on the strength of the engineer's team that is working on it; therefore the team members to be assigned on a not only specific project but have a strong technical skills and experience with minimum required skills. Our technical team consists of IT & Business Experts are System Analysts, Project Management, Network Engineers, Hardware Engineers, Technicians and Software.

Fig: 2.1Service Centre

2.2IT Services Offered

Hardware Development and Network Department

- Technical Support Service.
- Remote Support Service.
- Trouble Shooting & Problem Definition Service.
- Outsource Service
- Solve & Delivery Service.

Technical Support Service

This department is Support, Maintain and Develop innovative and high quality IT engineers and business Policy that help our clients reduce their work opportunity of business operation. All engineers strongly believe that this increases business value much more than the simple development of the Sector.

♣ Remote Support Service

All engineers are remotely support their client and they are strongly and confidently working in the remote area for all Bangladesh.

Our expertise lies in clearly perceiving the business goals of our customers, choosing the most appropriate technology and efficiently designing and developing solutions that cater to the business needs identified.

We strongly believe that this increases business value much more than the simple development of the Hardware and Network application Sector. Fig: 2.2 We understand our business goals and will deployment the appropriate technology solution.
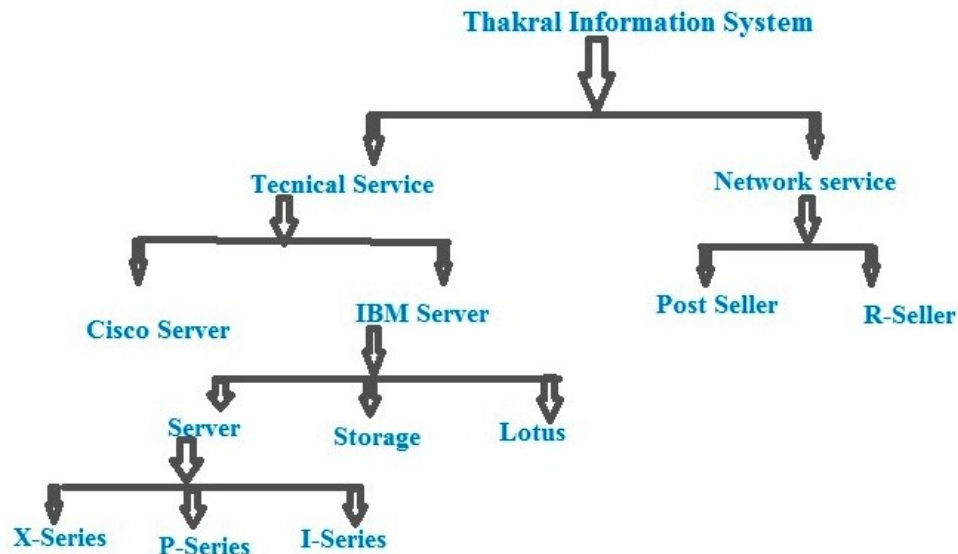
Fig: 2.2 Flowchart

2.5 Role of Job Market

There are currently an estimated 96,000 Computer Engineer in the Bangladesh. The Computer hardware Engineer job market is expected to grow by 2000-2015. The majority of job opportunities exists in Dhaka, Chittagong and as a percentage of the population. Different Companies in Bangladesh have different needs regarding their ICT Systems. An IT Company may require specialized inventory tracking abilities, invoicing, payment, Support, Problem definition and solving, idea create, innovating thinking etc. A government and non-government origination will entirely different needs depending upon the services it offers.

Chapter 3

Internship Role and Responsibility

3.1 Trained Attended:

First Month: In the first month of internship on Thakral Information system limited.

 I have learned and performed the following tasks:

- Learn and understanding about this company.
- Learn and understanding about company employee and staff.
- Learn and understanding about Department. (Whose department are working responsibility)
- Learn and understanding about our working department.

Second Month: In the second month of internship on Thakral Information system limited

I have learned and performed the following tasks:

- Learn and understanding about hardware equipment of a server.
- What is server?
- Why can use server?
- About know different equipment of a server
- Which is System Board is needed of a server?
- How can Installing Procedure of a System board?
- How can Installing Procedure of a Hard Disk?
- How can Installing Procedure of a Processor?
- How can Installing Procedure of a PCI Adapters?
- How can Installing Procedure of a Power Supply?
- How can Installing Procedure of a Light Path Diagnostics?
- How can Installing Procedure of a DVD Drive?
- How can Installing Procedure of a Raid Controller?
- How can Installing Procedure of a Cooling Fans?

- How can Installing Procedure of a Tape Driver?
- How can Installing Procedure of a DIMM Memory?
- How can Installing Procedure of an Air baffle?

Third Month: In the Third month of internship on Thakral Information system limited.

I have learned and performed the following tasks:

- Learn and knowing about how can fully ready to a server?
- Learn and knowing about Configuration.
- Learn and knowing Model and Feature.
- How can install software and operating System.

Fourth Month: In the fourth month of internship on Thakral Information system limited.

I have learned and performed the following tasks:

- Learn and knowing how can find problem.
- Learn and knowing how can analysis problem.
- Learn and knowing how can make decision make.
- Learn and knowing how can apply best way.
- Learn and knowing if critical problem is handling.
- Learn and knowing when help Senior Engineer.

Fifth Month: In the fifth month of internship on Thakral Information system limited.

I have learned and performed the following tasks:

- Knowing about software information.
- Knowing about operating system.
- Knowing about Boot Manager.

- Knowing about Firmware.
- Knowing about Integrate Management Port.

Fifth Month: In the fifth month of internship on Thakral Information system limited.

I have learned and performed the following tasks

- Support for office service department.
- Support for client area with senior Engineer.
- Support for client area to solve problem ready their server.
- Support for Critical area for customer space.

3.3 Work Environment:

My work place was situated at BDBL Bhaban (11th Floor), Kawran Bazar, Dhaka-1215. The company concerns also provide necessary training to develop individual skills which make the employees feel more confident in their respective area of works. One of the objectives of company is to grow together along with its employees, which signifies the value it provides to the employees who are potential and dedicated to the company. Thakral Information system limited cherishes people who are energetic, enthusiastic, challenging, smart and self-driven. The group provides each employee of its concerns with a lot of challenges which, if they can meet, are awarded with many facilities and benefits including professional advancement and financial support. The Company concerns are very transparent in evaluating the employees and maintain friendly environment which encourages the employees to express their opinion and ideas to the higher authorities. The Company is a very friendly and relaxed environment in the office

3.4 Performed Tasks

Server: A **server** is a running instance of an application (software) capable of accepting requests from the client and giving responses accordingly. Fig 3.4.1Servers can run on any computer including dedicated computers, which individually are also often referred to as "the server"[2].

Fig 3.4.1 Server

A Servers operate within a client-server architecture. Servers are computer programs running to serve the requests of other programs, the clients. Fig 3.4.2Thus, the server performs some tasks on behalf of clients. It facilitates the clients to share data, information or any hardware and software resources.
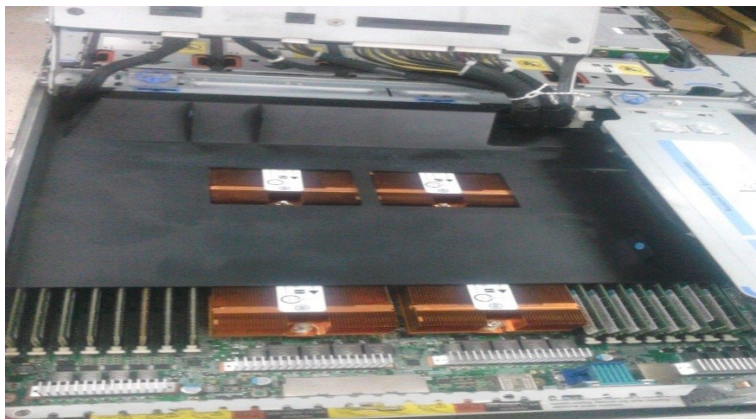
Fig 3.4.2 Server

The clients typically connect to the server through the network but may run on the same computer.Fig 3.4.3 In the context of Internet Protocol (IP) networking, a server is a program that operates as a socket listener.

Fig 3.4.3 Server

Servers often provide essential services across a network, either to private users inside a large organization or to public users via the Internet. Typical computing servers are database server, file server, mail server, print server, web server, gaming server, and application server. Fig 3.4.4 Several systems use this client server networking model including Web sites and email services. An alternative model, peer-to-peer networking enables all computers to act as either a server or client as needed.


Fig 3.4.4 Server

System Hardware Information of a server:

1. System Board
2. Hard Disk
3. Processor
4. PCI Adapters
5. Power Supply
6. Light Path Diagnostics
7. DVD Drive
8. Raid Controller
9. Cooling Fans
10. Tape Driver
11. DIMM Memory
12. Air Baffle

3.4.2 Integrated Management Module:

In IBM System x servers, the Integrated Management Module (IMM) consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities in a single chip on the server system board. Fig: 3.4.2 The IMM consolidates service processor functionality previously provided in the BMC and the Remote Supervisor Adapter II in IBM System x and Blade Center products[3].
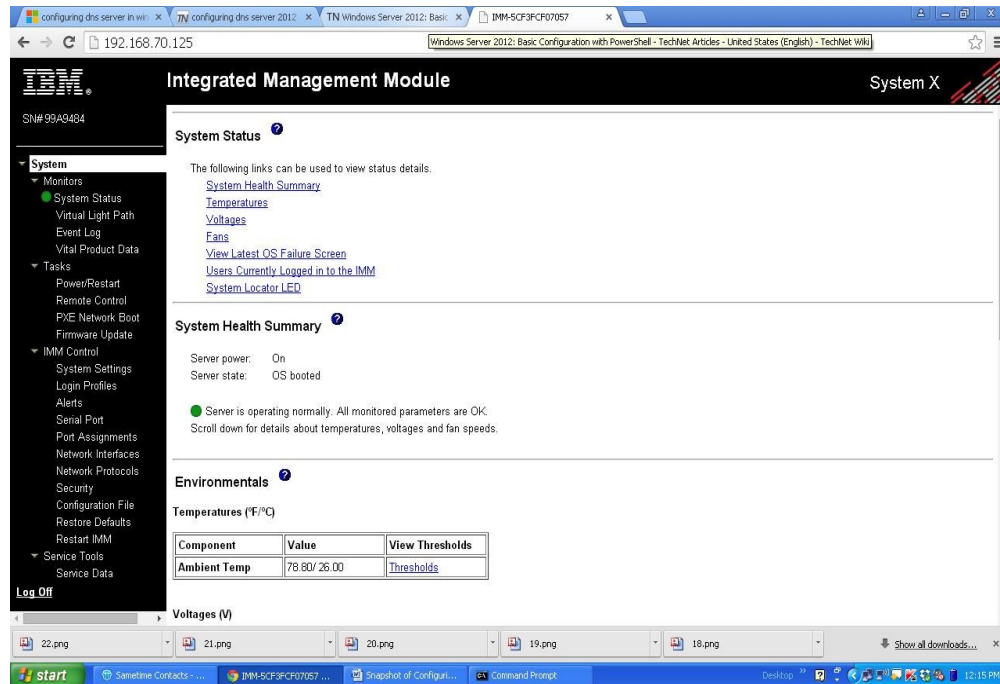

Fig: 3.4.2 Integrated Management Module

IBM offers two levels of IMM, Standard and Premium. If the server has IMM Standard functionality, it can be upgraded to IMM Premium by purchasing and installing a Virtual Media Key on the server system board. Fig: 3.4.3This key is a physical component. However, no new firmware is required. IMM Premium provides Remote Presence and Virtual Media capabilities. Where the Virtual Media Key is installed in one of the supported servers.
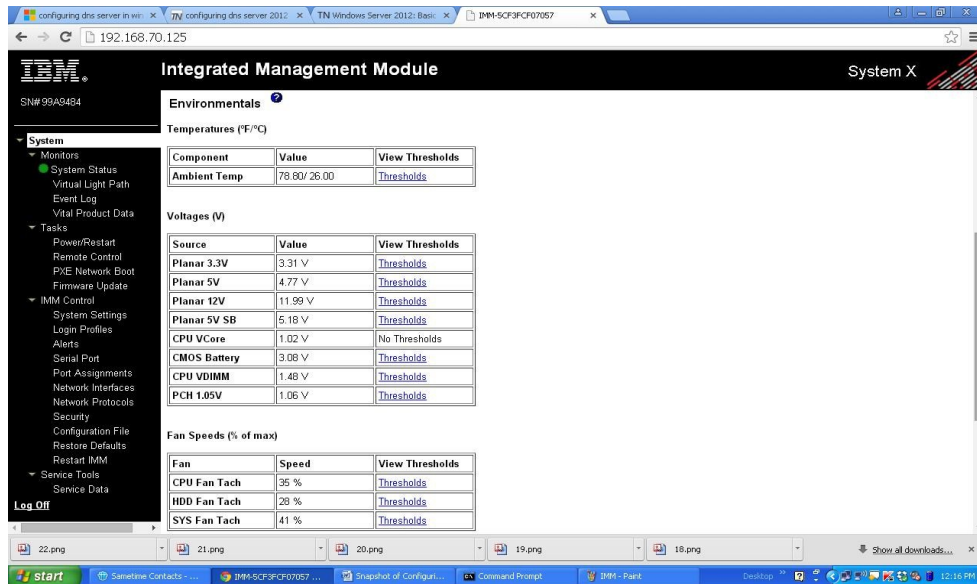
Fig: 3.4.3Integrated Management Module

Virtual Light Path: Where can see have any Fault, CPU1 status, CPU Fan status, HDD Fan Status, System Fan Status, DIMM Memory Status, PCI Status, PCIE SAS Status, Planar Status, Battery Status, BMC Heart Beat Status. Fig: 3. 4.4
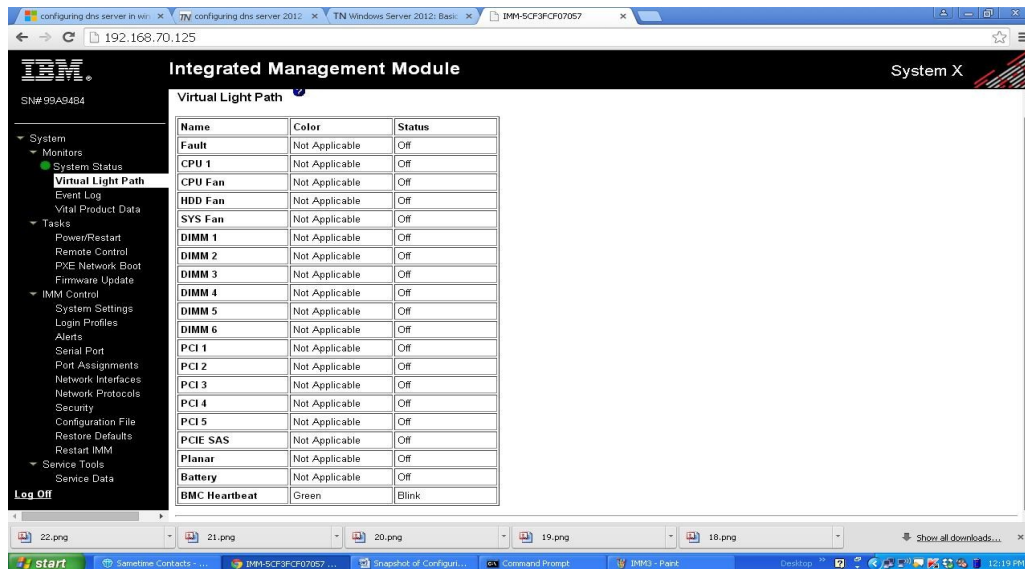
Fig: 3.4.4Virtual Light Path

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1. **Event Log:**Event logs are special files that record significant events on your computer, such as when a user logs on to the computer or when a program encounters an error.Fig: 3.4.5 Whenever these types of events occur, Windows records the event in an event log that you can read by using Event Viewer.
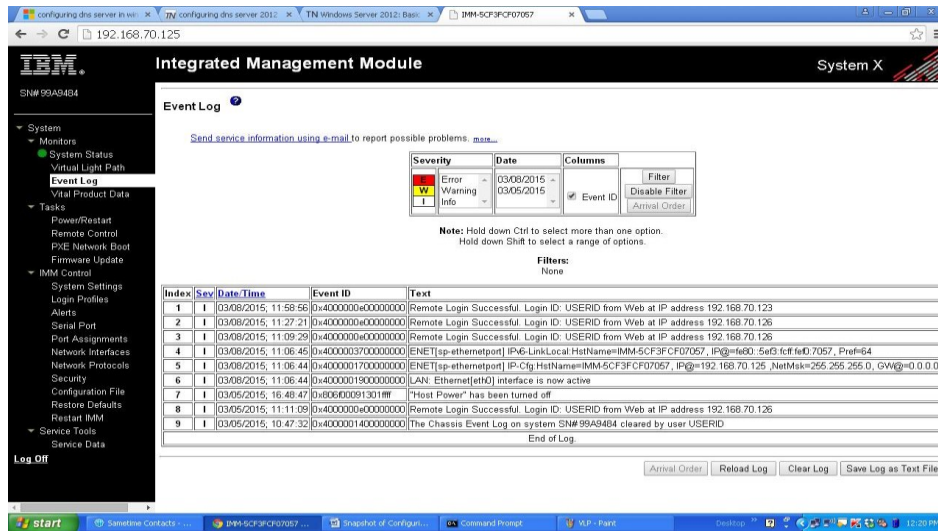

Fig: 3.4.5Event Log

Vital Product Data: Vital Product Data (VPD) is a collection of configuration and informational data associated with a particular set of hardware or software. Fig: 3.4.6 Vital product data (VPD) stores information such as part numbers, serial numbers, and engineering change levels.
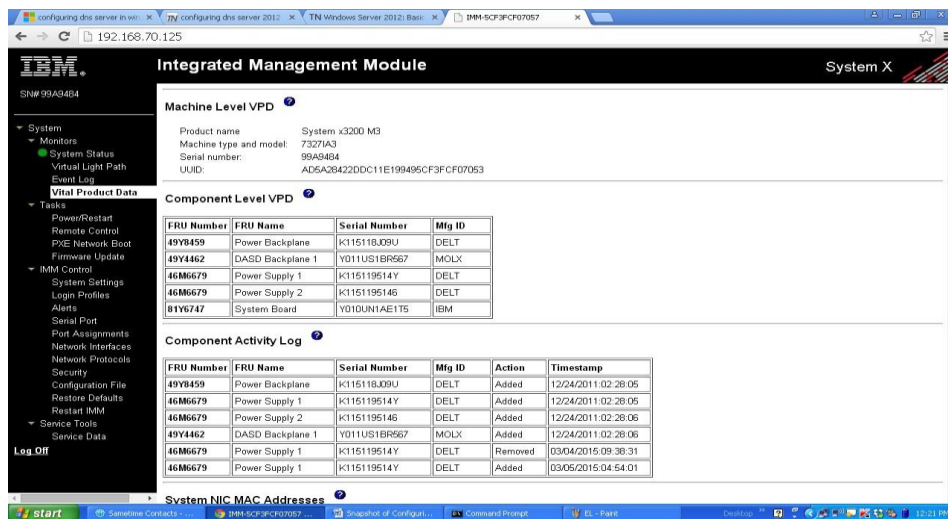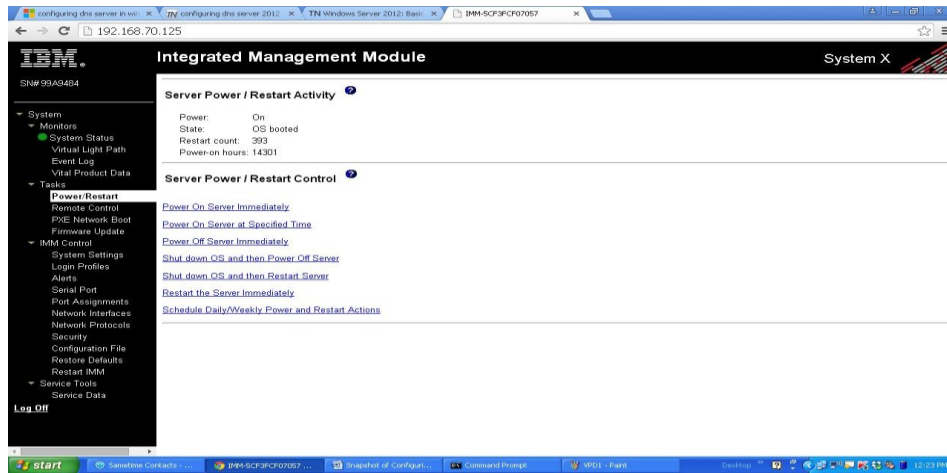

Fig: 3.4.6 Virtual Product Data

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Power / Restart: The IMM provides full remote power control over your server with power-on, power-off, and restart actions.Fig: 3.4.7 In addition, power-on and restart statistics are captured and displayed to show server hardware availability.


Fig: 3.4.7Power /Restart

Remote Control: Remote controls commonly operate via infrared signals but sometimes by radio frequency signals Fig: 3.4.8 The remote control may control a variety of functions such as volume, channel, track number and other functions. Modern remote control devices often have more controlling functions than are found on the device itself, which may have only a few primary essential controls.



Fig: 3.4.8Remote Control

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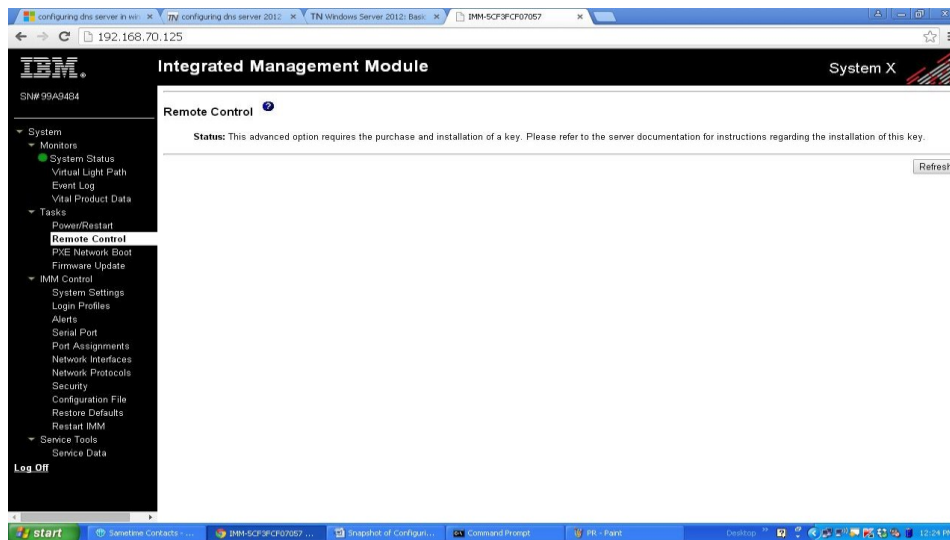
PXE Network Boot: Short for Pre-Boot Execution Environment. Pronounced pixie, PXE is one of the components of Intel's WFM specification. Fig: 3.4.9It allows a workstation to boot from a Server on a network prior to booting the operating system on the local hard drive**.**
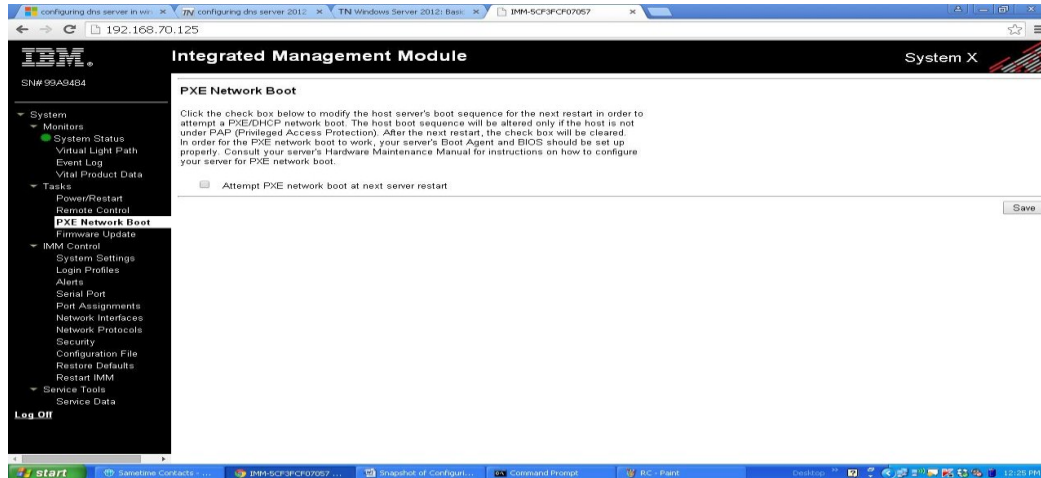

Fig: 3.4.9PXE Network Boot

Firmware Update: Firmware is software that is loaded onto the hardware components of your NETGEAR router. Fig 3.4.10NETGEAR regularly releases new firmware versions to improve product performance, and add new features. It is highly recommended to check and update your router firmware version periodically.
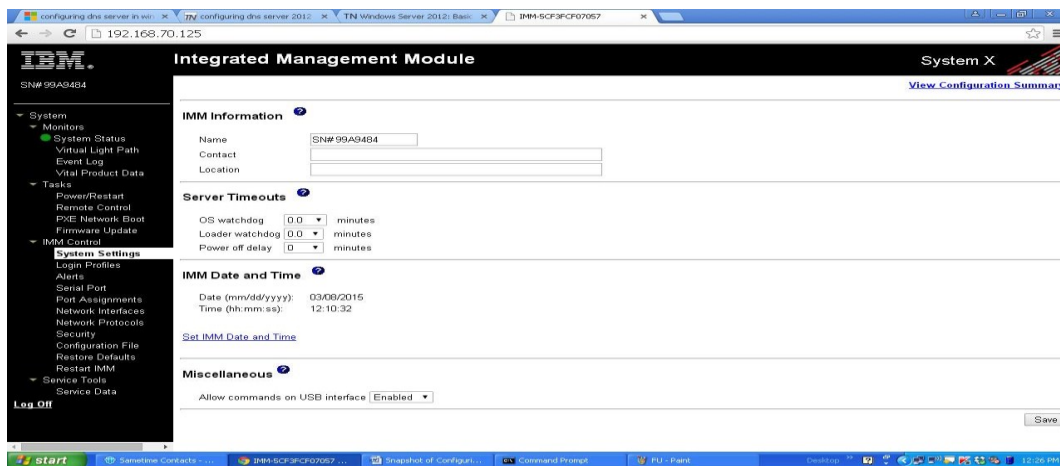

Fig: 3.4.10Firmware Update

System Setting: You can configure common operating system settings and computer settings in the Forefront TMG Management console. Fig:3.4.11These settings include modifying the computer name and domain membership, viewing certificates installed on the computer, configuring local users and groups, adjusting date and time settings, and restarting the computer.
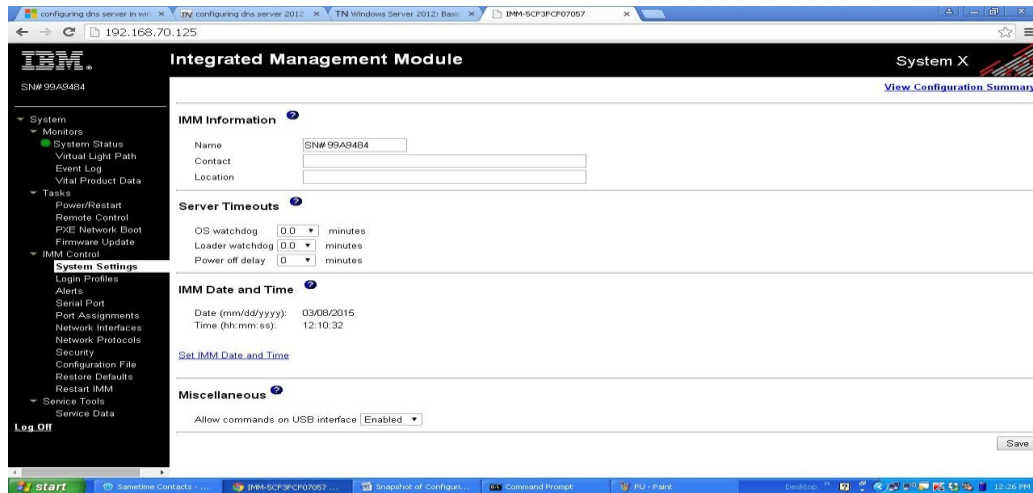

Fig: 3.4.11System Setting

Login Profiles: Use the Login Profiles table to view, configure, or change individual login profiles. Use the links in the Login ID column to configure individual login profiles.

IPMI.
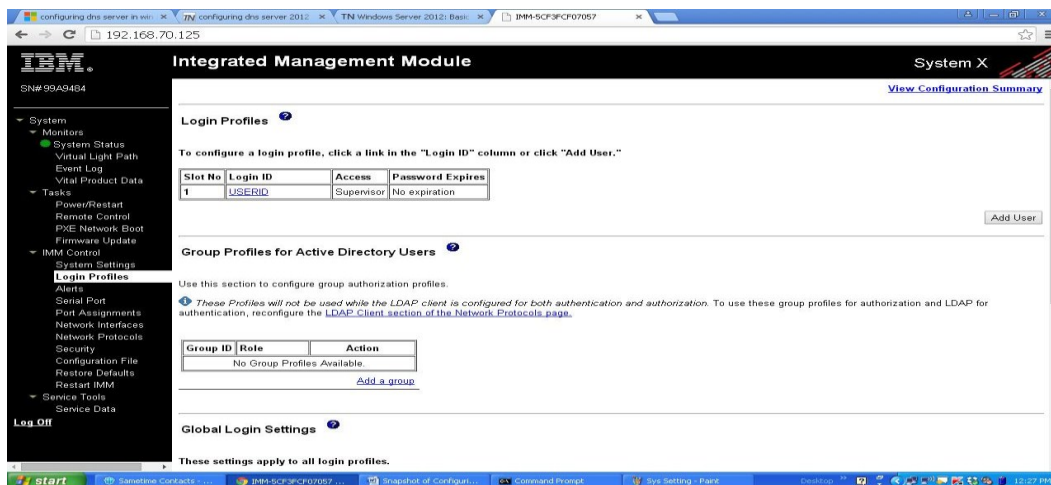
You can define up to 12 unique profiles. Each link in the Login ID column is labeled with the configured login ID of the associated profile.Fig3.4.12

Certain login profiles are shared with the IPMI user IDs, providing a single set of local user accounts (username/password) that work with all of the IMM user interfaces, including
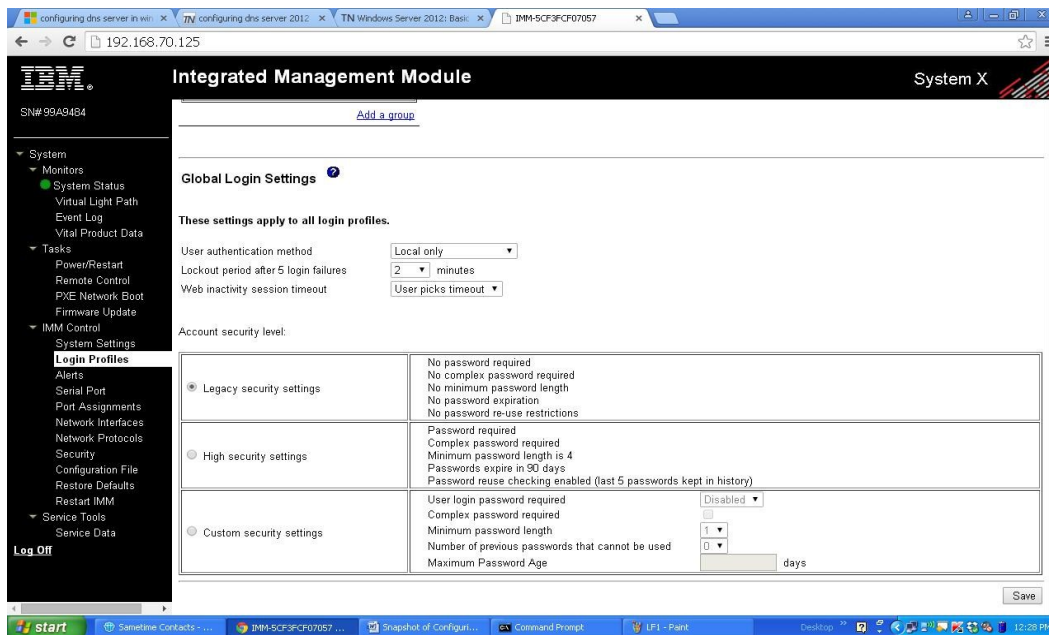
Fig: 3.4.12 Login profile

Alert: You can configure remote alert recipients, the number of alert attempts, incidents that trigger remote alerts, and local alerts from the Alerts link on the navigation pane.Fig 3.4.13

After you configure a remote alert recipient, the IMM sends an alert to that recipient through a network connection when any event selected from the Monitored Alerts group occurs

Fig: 3.4.13Alert

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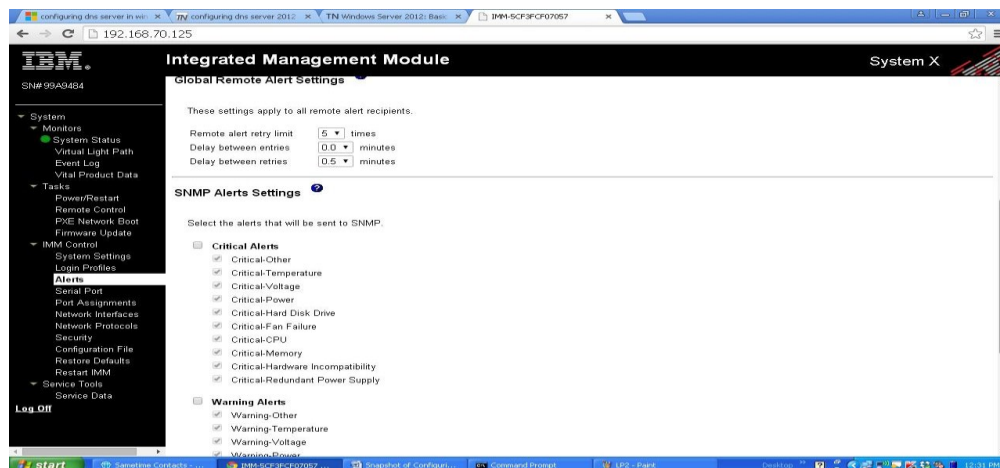
Port assignment: From the Port Assignments page, you can view and change the port numbers assigned to the IMM protocols (for example, HTTP, HTTPS, Telnet, and SNMP).Fig 3.4.14
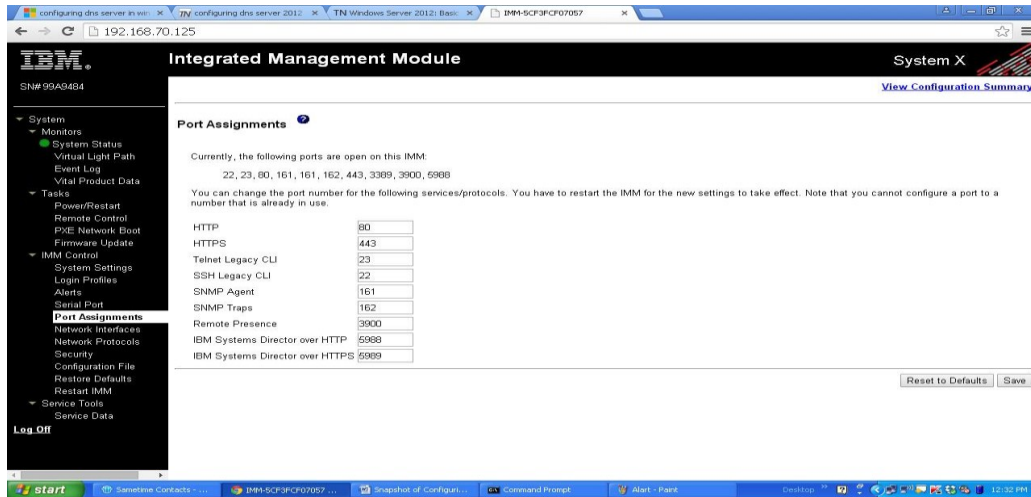
Fig: 3.4.14Port Assignment

Network Interface: the Network Interfaces page, you can configure network-access settings for the Ethernet connection on the IMM. Fig: 3.4.15
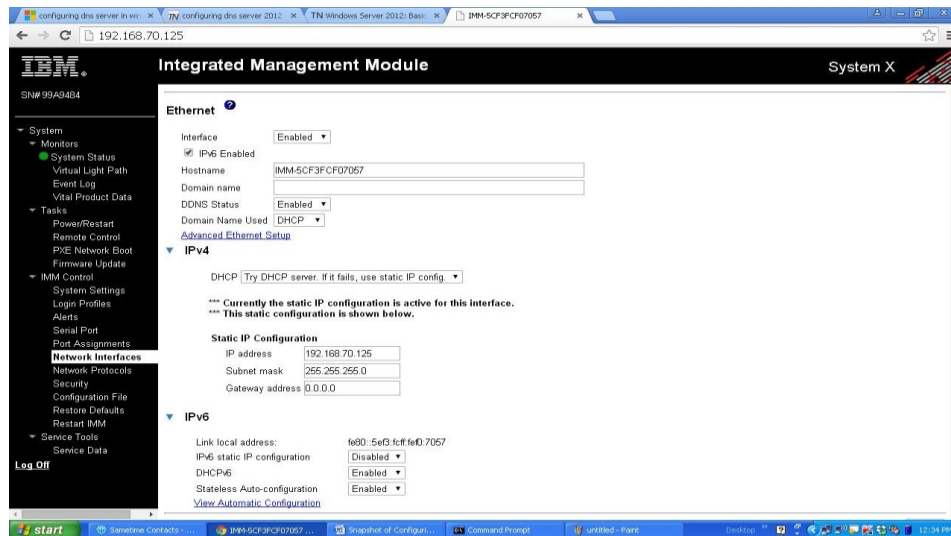
Fig: 3.4.15Network Interface

Configuration Files: You can back up, modify, and restore the configuration of the IMM, and view a configuration summary, from the Configuration File page. Fig: 3.4.16
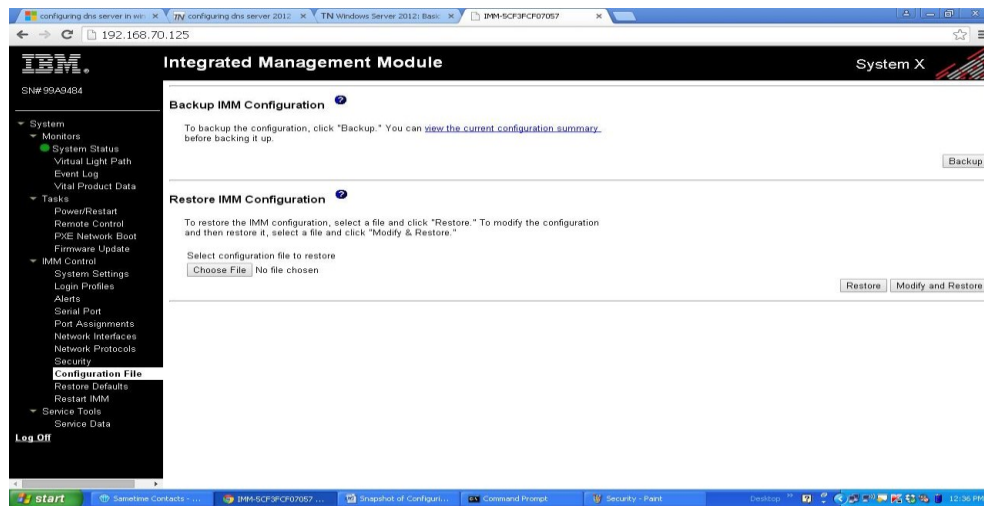
Fig: 3.4.16Configuration Files

Services Data: Where can Downloaded Update features for hardware, software requirement. Fig: 3.4.17

Fig: 3.4.17Service data

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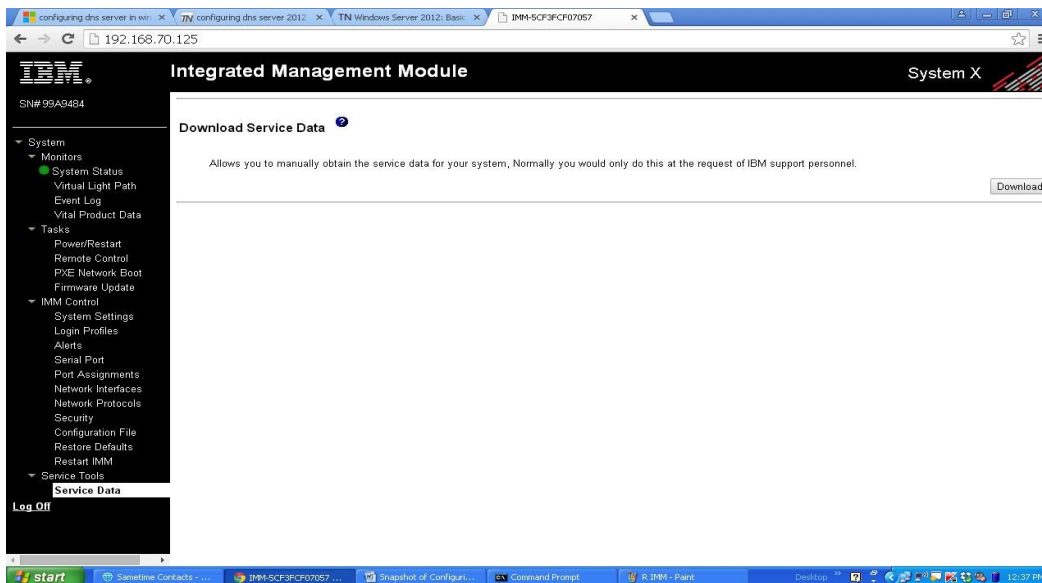
3.4.3 Redundant Array of Inexpensive Disks(RAID)

RAID: RAID is a data storage virtualization technology that combines multiple disk drive components into a logical unit for the purposes of data redundancy or performance improvement. Fig: 3.4.3

Data is distributed across the drives in one of several ways, referred to as levels, depending on the specific level of redundancy and performance required. The different schemes or architectures are named by the word RAID followed by a number RAID 0, RAID 1 etc.

Each scheme provides a different balance between the key
Goals: reliability, availability, performance, and capacity. RAID levels greater than RAID 0 provide protection against unrecoverable read errors, as well as whole disk failure.

Explain Several Types of RAID
- **RAID 0**
- **RAID 1**
- **RAID 5**
- **RAID 6**
- **RAID 10**
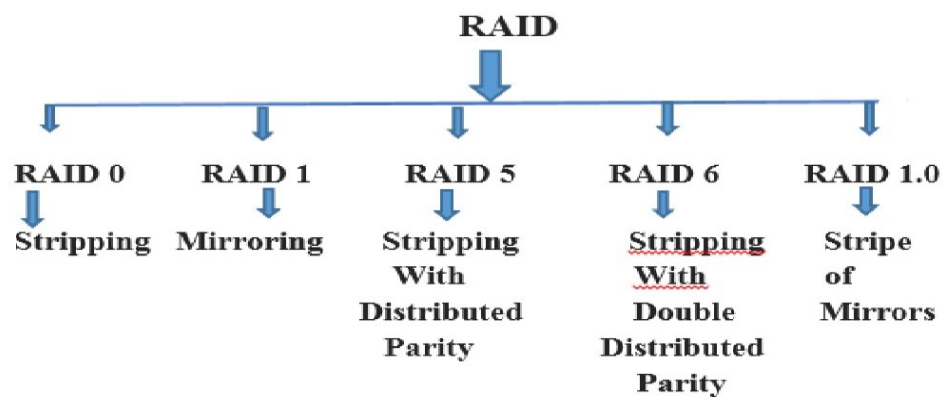
Fig: 3.4.3 RAID

RAID 0: RAID 0 consists of striping, without mirroring or parity. The capacity of a RAID 0 volume is the sum of the capacities of the disks in the set, the same as with spanned. Fig: 3.4.4There is no added redundancy for handling disk failures, just as with a spanned volume. Thus, failure of one disk causes the loss of the entire RAID 0 volume, with reduced possibilities of data recovery when compared to a broken spanned volume. Striping distributes the contents of files roughly equally among all disks in the set, which makes concurrent read or write operations on the multiple disks almost inevitable. The concurrent operations make the throughput of most read and write operations equal to the th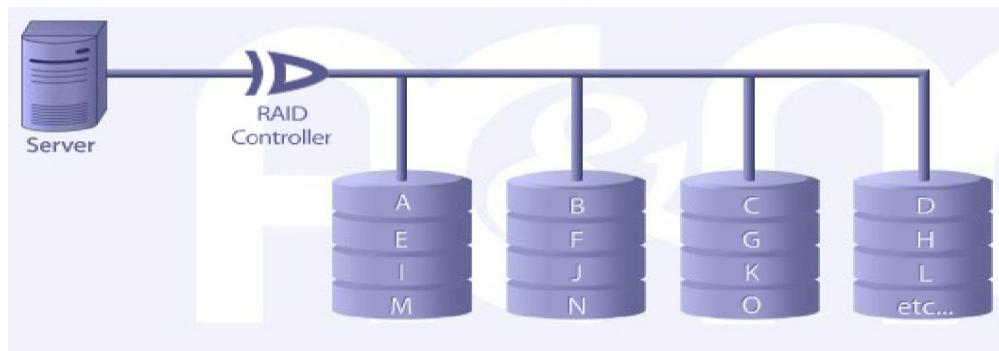roughput of one disk multiplied by the number of disks. Increased throughput is the big benefit of RAID 0 versus spanned volume[4].

Fig: 3.4.4RAID 0

RAID 1:RAID 1 consists of mirroring, without parity or striping. Data is written identically to two drives, thereby producing a "mirrored set". Fig: 3.4.5Thus, any read request can be serviced by any drive in the set. If a request is broadcast to every drive in the set, it can be serviced by the drive that accesses the data first, improving performance. Sustained read throughput, if the controller or software is optimized for it, approaches the sum of throughputs of every drive in the set, just as for RAID 0. Actual read throughput of most RAID 1 impel-
Mentation is slower than the fastest drive. Write throughput is always slower because every drive must be updated, and the slowest drive limits the write performance. The array continues to operate as long as at least one drive is functioning.

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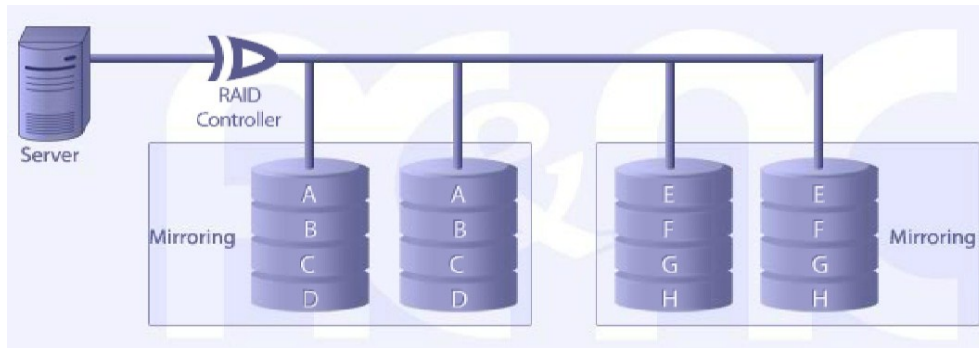
Fig: 3.4.5RAID 1

RAID 5:RAID 5 consists of block-level striping with distributed parity. Unlike in RAID 4, parity information is distributed among the drives. Fig: 3.4.6It requires that all drives but one be present to operate. Upon failure of a single drive, subsequent reads can be calculated from the distributed parity such that no data is lost. RAID 5 requires at least three disks.
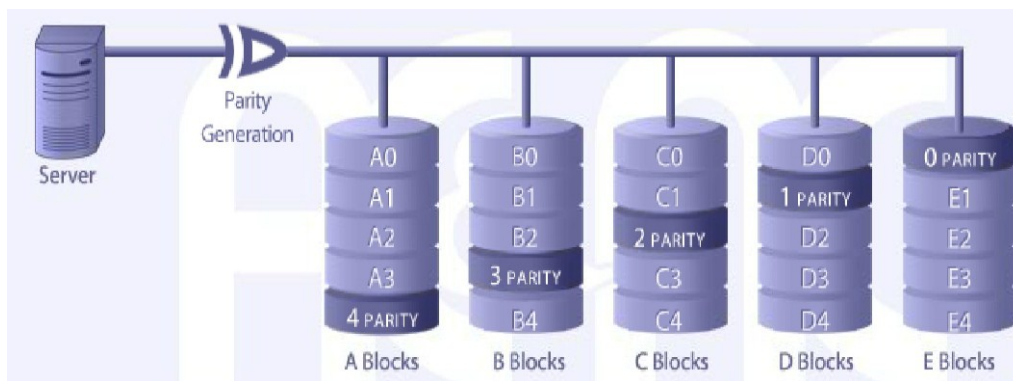
Fig: 3.4.6RAID 5

RAID 6: RAID 6 consists of block-level striping with double distributed parity. Double parity provides fault tolerance up to two failed drives. Fig: 3.4.7This makes larger RAID groups more practical, especially for high-availability systems, as large-capacity drives take longer to restore. As with RAID 5, a single drive failure results in reduced performance of the entire array until the failed drive has been replaced.[11] With a RAID 6 array, using drives from multiple sources and manufacturers, it is possible to mitigate most of the problems associated with RAID 5.
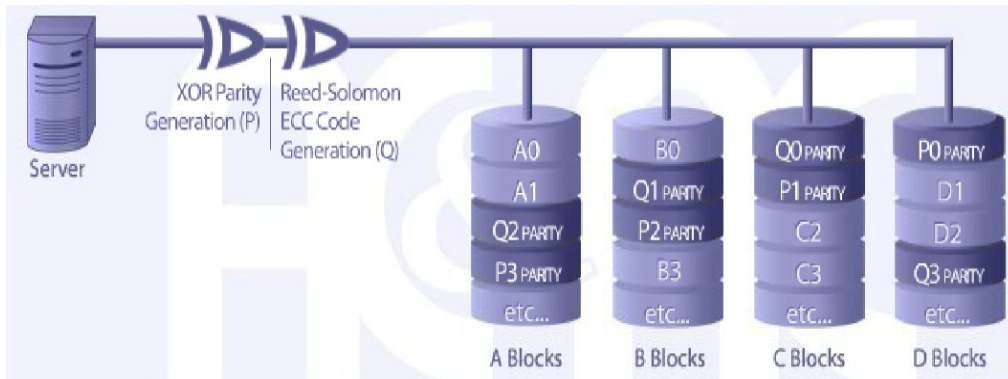
Fig: 3.4.7RAID 6

RAID 10:RAID 10 works by striping and mirroring your data across at least two disks. Mirroring, or RAID 1, means writing your data to two or more disks at the same time.

Fig: 3.4.8Even if one disk fails completely, the mirror preserves the information. Striping, or RAID 0, means breaking your data up into chunks and writing the chunks to different disks in succession. It improves performance because the computer can get data off more than one disk simultaneously.
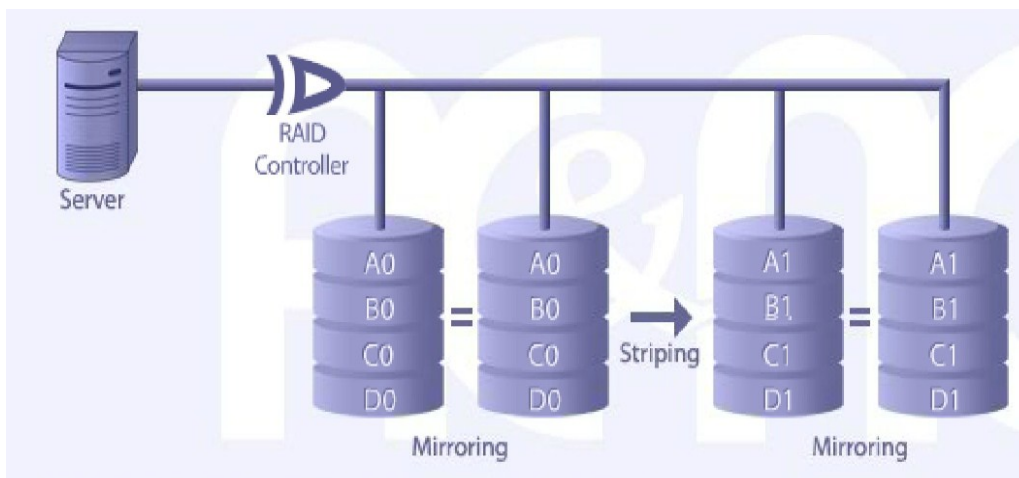
Fig: 3.4.8RAID 10

Chapter 4

Internship Outcomes

4.1 Problem and solutions

Case Study 1:

Model: IBM Server X-3550 M3, [Fig: 4.1.1]

Fig: 4.1.1 X-3550 M3

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: Installation a new system. Give for windows Server 2008 R2 Slandered.

Hardware analysis:

- The server cover and air baffle Remove.
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections).
- Finally Check all cable connection and close server cover.
- Assemble all hardware.
- Give power for this server.

Software analysis

- If we saw server have given power and show display[5].

- Then we should enter BOOT menu and check everything.

- Then go to BIOS menu and select RAID.

- Create an array for RAID 1 save and back BOOT menu.

- Save Setting and enter the OS installation process.

- Give Sever guide for Operating System installation

- When work is complete for server guide

- Then replace OS installation CD/DVD.

- When complete OS installation then go to Desktop.

Application analysis:

- Install update Driver.Fig: 4.1.2

- Give necessary software.
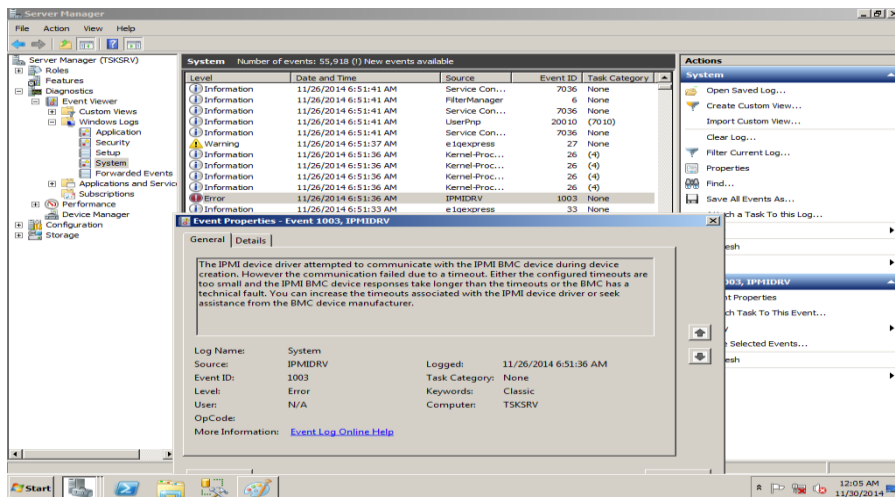
Fig: 4.1.2 X-3550 M3

Result /Remarks:

- The IBM Server X-3550 M3 is ready for using.

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Case Study 2:

Model: IBM Server X-3400 M3, [Fig: 4.2.1]

Fig: 4.2.1 X-3400 M3

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: Server was restart several time continuously.

Hardware analysis:

- Remove the server cover and air baffle [6].
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
- If we have any fault or Damage parts then repair or Change it.
- Finally Check all cable connection and close server cover.
- Give power for this server.
- At first we can help light path Diagnostic and saw have any yellow error ember in the LPD. Fig: 4.2.2
- If there are see no ember then we can check power passing system.
- Then check DIMM memory and RAID controller.

+ Check System board.

Fig: 4.2.2 X-3400 M3

Software analysis

+ If we saw server have given power and show display.
+ Then we should enter BIOS and check everything.
+ Clear event log.
+ Save Setting and enter the OS.

Application analysis: All Application is working properly.Fig 4.2.3
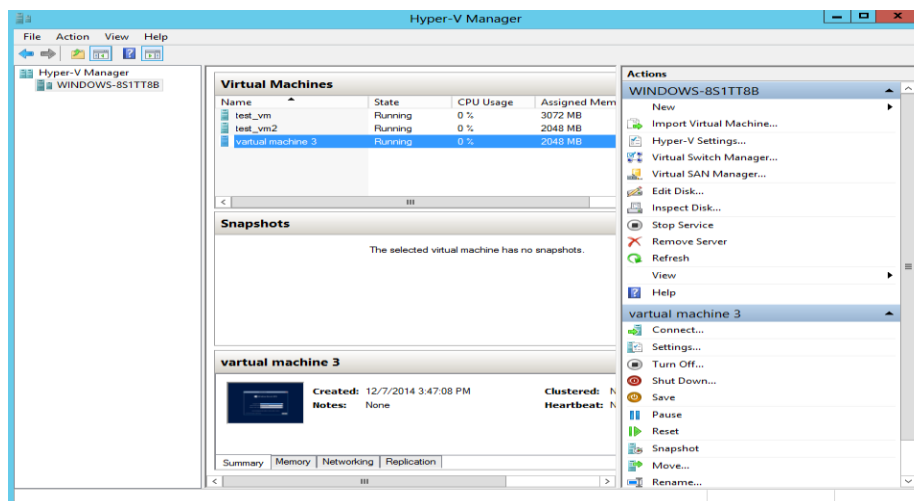
Fig 4.2.3 Application

Problem Determination: We can check all hardware, software and application program. But finally get a major problem. System board is not working properly.

Requirement: We can repair the system board by system board repair Section. Otherwise Change a new system board by warranty based.

Action Taken:
- Remove the server cover and all hardware accessories.
- Change system board and check all cables.
- Check everything.

Result /Remarks:

- The System Board is damage or not working properly.

Case Study 3:
Model: IBM Server X- 3650 M3, [Fig: 4.3.1]

Fig: 4.3.1X- 3650 M3

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: One HDD Dead which was hot spare.

Hardware analysis:
- Remove the server cover and air baffle.
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?Fig: 4.3.2
- If we have any fault or Damage parts then repair or Change it.
- Finally Check all cable connection and close server cover.

Fig: 4.3.2X- 3650 M3Hardware

- Give power for this server.
- At first we can help light path Diagnostic and saw have any yellow error ember in the LPD.
- If there are see no ember then we can check power passing system.
- Then check DIMM memory and RAID controller.
- Check System board.

Software analysis:

- If we saw server have given power and don't show display.

Problem Determination: We can check all hardware, and software program. But finally get a major problem. One HDD Dead which was hot spare.

Requirement: Require a new HDD.

Action Taken:
- Remove the server Font cover.
- Change a new HDD and HDD back panel.
- Check everything.

Result /Remarks:

- Replaced the dead HDD by a new one and declare it as hot spare. The system is working fine now.

Case Study 4:

Model: IBM Server X- 3500 M2,Fig 4.4.1

Fig 4.4.1 X- 3500 M2

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: Booting problem and Memory problem.

Hardware analysis:

- Remove the server cover and air baffle.Fig 4.4.2
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
- If we have any fault or Damage parts then repair or Change it.
- Finally Check all cable connection and close server cover.
- Give power for this server.
- At first we can help light path Diagnostic and saw have any yellow error ember in the LPD.
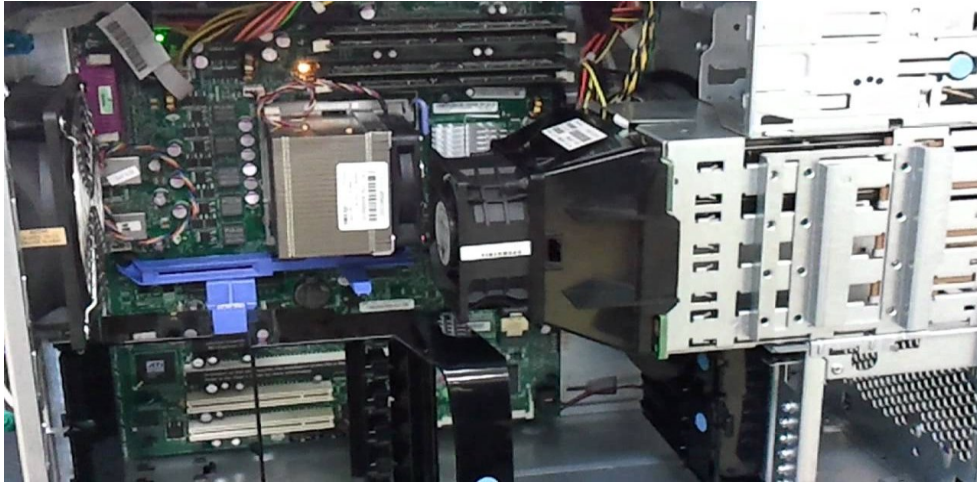
Fig 4.4.2 X- 3500 M2 Hardware

Software analysis:

+ If we saw server have given power and show display initial boot kernel not passing.

Problem Determination: We can check all hardware, and software program. But finally get a more major problem by light path Diagnostics. The problem is booting problem and memory problem. No working abnormally.

Requirement: Require a new DIMM memory and need update IMM and UEFI.

Action Taken:

+ Remove the server Font cover.
+ Change a new DIMM memory.
+ Update IMM and UEFI.
+ Update firmware and clear even log by BIOS.

Result /Remarks:

+ Replaced a new DIMM memory. The system is working properly now.

Case Study 5:

Model: IBM Server X- 3500 M2,Fig: 4.5.1


Fig:4.5.1 X- 3500 M2

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: Unavailable PCI hardware interrupts and Fixed disk error.

+ **Hardware analysis:**
+ The server cover and air baffle remove. Fig: 4.5.2
+ Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
+ If we have any fault or Damage parts then repair or Change it.
+ Finally Check all cable connection and close server cover.

Software analysis

+ Remove each adapter one at a time,

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- Restarting the server each time, until the problem is isolated.
- Again reseat the hard disk drive cables.

Fig: 4.5.2X- 3500 M2

- Replace the hard disk drive cables
- Run the hard disk drive diagnostic tests.
- Reseat the following components:
- Optional Server RAID 8i adapter
- Hard disk drive and System board.
- Replace the components listed in pervious Step one at a time, in the order shown, restarting the server each time.

Problem Determination: We can check all hardware, and software program. But finally get a problem. .Unavailable PCI hardware interrupts and Fixed disk error.

Requirement: Require Run the Configuration/Setup Utility program and adjust the adapter settings.

Action Taken:
- Give power for this server.
- At first we can help light path Diagnostic and saw have any yellow error ember in the LPD.

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- If there are see no ember.
- Then we can Configure Utility program and adjust the adapter settings.

Result /Remarks:

- Configuring Utility program and other application. The system is working properly condition is so good now.

Case Study 6:

Model: IBM Server X- 3500 M2,Fig: 4.6.1

Fig:4.6.1X- 3500 M2

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

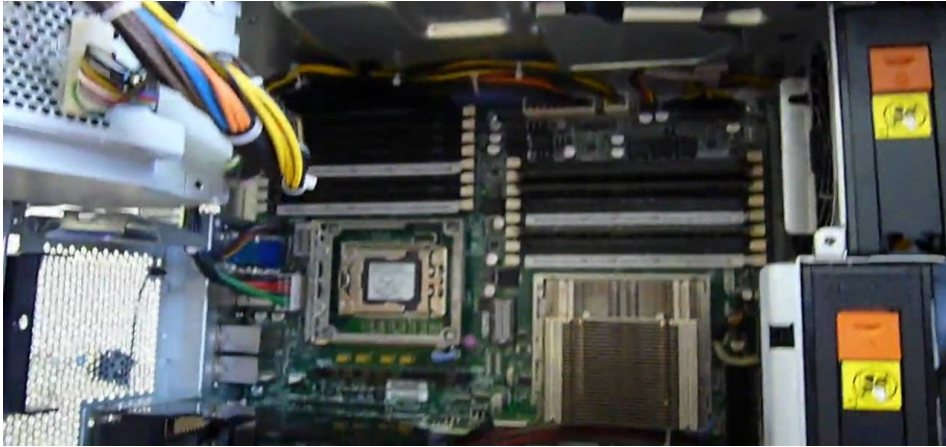**Observation:** Unavailable PCI hardware interrupts and Fixed disk error.

- **Hardware analysis:**
- The server cover and air baffle remove. Fig: 4.6.2
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
- If we have any fault or Damage parts then repair or Change it.
- Finally Check all cable connection and close server cover.

Software analysis

- Remove each adapter one at a time,
- Restarting the server each time, until the problem is isolated.

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- Again reseat the hard disk drive cables.

Fig: 4.6.2X- 3500 M2

- Replace the hard disk drive cables
- Run the hard disk drive diagnostic tests.
- Reseat the following components:
- Optional Server RAID 8i adapter
- Hard disk drive and System board.
- Replace the components listed in pervious Step one at a time, in the order shown, restarting the server each time.

Problem Determination: We can check all hardware, and software program. But finally get a problem. .Unavailable PCI hardware interrupts and Fixed disk error.

Requirement: Require Run the Configuration/Setup Utility program and adjust the adapter settings.

Action Taken:

- Give power for this server.
- At first we can help light path Diagnostic and saw have any yellow error ember in the LPD.
- If there are see no ember.

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➕ Then we can Configure Utility program and adjust the adapter settings. .

Result /Remarks:

➕ Configuring Utility program and other application. The system is working properly condition is so good now.

Case Study 7:

Model: IBM Server X- 3755 M3,Fig: 4.7.1

Fig: 4.7.1X- 3755 M3

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: LPD Show PCI error and problem of connecting through telnet.

Hardware analysis:

- The server cover and air baffle remove. Fig: 4.7.2
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
- We can re-assemble the PCI adapter.
- Finally Check all cable connection and close server cover.

Software analysis

- Put the power open the server normally.
- Check Boot and clear event log.
- Also check BIOS but everything is ok.

Fig: 4.7.2X- 3755 M3

Problem Determination: LPD Show PCI error and problem of connecting through telnet..

Requirement: check manually and analysis.

Action Taken:

- Give power for this server.
- At first we can help light path Diagnostic and saw have any yellow error ember in the LPD.
- There are see no ember.
- The system can connect through telnet to local server,
- But cannot connect to any remote server.
- It is actually not a hardware issue.
- It is an issue of their network connection.

Result /Remarks:

The system is working properly but their problem is customer network connection.

Case Study 8:

Model: IBM Server X- 3655,Fig: 4.8.1

Fig: 4.8.1 X- 3655

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: one continue beep the server.

Hardware analysis:

- The server cover and air baffle remove.Fig: 4.8.2
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
- Reseat the following components, one at a time, in the order shown, restarting the server each time:

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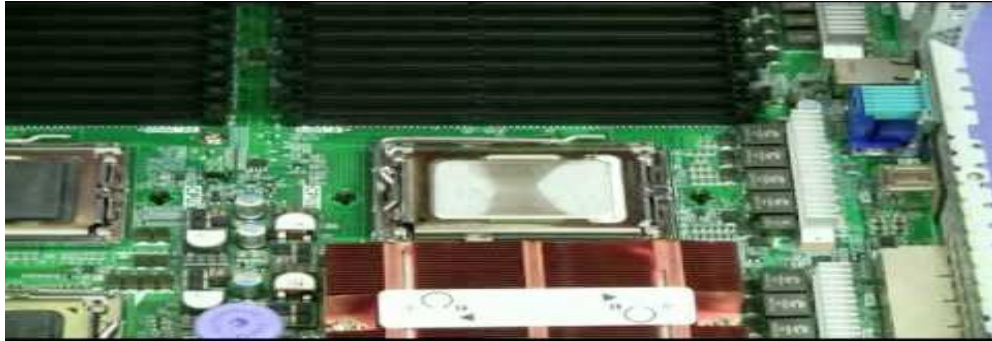
Fig: 4.8.2 X- 3655

- Remove microprocessor 2 and its VRM and restart the server.
- If no beep code occurs, microprocessor 2 might have failed; replace the microprocessor.
- If the beep code remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server. If no beep code occurs, microprocessor 1 might have failed; replace the microprocessor.

- Replace the following components, one at a time, in the order shown, restarting the server each time: Microprocessor 1 and Microprocessor 2 into System board.

Software analysis

- No need have to analysis software.
- Log collection from IMM.
- For future using DSA log.

Problem Determination: Microprocessor error.

Requirement: Change a microprocessor and require a new microprocessor..

Action Taken:

- At first we can remove all hardware equipment.
- Changed one processor from System board.
- Then assembly all hardware and give power.

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- Check show processor if there show one processor
- Then again remove all hardware
- Put a new processor and assemble all hardware.
- Then give power and check BOOT menu which processor have shown or not?
- When server show 2 processors and there is no problem now.

Result /Remarks:

The system is hardware equipment is working fine and 2 processors are working smoothly.

Case Study 9:

Model: IBM Server X- 3650 M2,Fig: 4.9.1

Fig: 4.9.1 X-3650 M2

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: Light path Diagnostics HDD errors.

Hardware analysis:

- The server cover and air baffle remove.Fig: 4.9.2
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
- Check HDD Back Panel and all cable connection.
- HDD open from server and adjust same place.
- Check everything and give power this server.

Fig: 4.9.2 X-3650 M2

Software analysis

- 3 HDD go to dead state and 1 HDD show PFA.
- RAID goes at offline.
- Not possible to improve the configuration.

Problem Determination: Hard Disk Drive errors.

Requirement: Replaced the HDD (which have shown PFA).

Action Taken:

- At first we can remove all hardware equipment.
- Changed one HDD from Server.
- Then assembly all hardware and give power.
- Now have HDD available 5 and replaced one HDD Total 6 HDD.
- Create RAID 5 and declared two hot-spare newly.
- Install OS windows server 2003 R2 enterprise edition.

Result /Remarks:

The system is now working good performance and available to use everything.

4.1.10 Case Study 10:

Model: IBM Server X- 3100 M2, Fig: 4.10.1

Fig: 4.10.1 X-3100 M2

Location: Thakral information System, In-house Service room

Cautious: Carefully handle hardware installing and software installing by helping server installation Guides.

Observation: Power supply errors and OS running very slowly.

Hardware analysis:
- The server cover and air baffle remove. Fig: 4.10.2
- Check all Hardware Equipment (RAM, Raiser Card, RAID Controller, All cable connections) and Inquiry have any damage equipment?
- Replaced power supply.

＋ Check boot menu and clear event log.

Software analysis

＋ OS have not run properly.

＋ So RAID controller is not show physically.

Fig: 4.10.2 X-3100 M2

Problem Determination: RAID Controller Damage.

Requirement: replaced RAID controller and Update frame ware.

Action Taken:

＋ At first we can remove all hardware equipment.

＋ Changed RAID controller from Server. Then assembly all hardware and give power.

＋ Setting BOOT menu and change needed working and save setting.

＋ Update frame ware and check everything.

Result /Remarks:

The system is now working fine now and available to use everything.

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4.2.1 Learning Outcomes:

This Course provides students with the knowledge and skills necessary to install, Configure, Mange, and Support and administer windows Server and Linux Server. Topics include server deployment, Server management, and monitor and maintain servers, application and data provisioning and business continuity and high availability. I can also achieve the opportunity to become familiar with IBM's origination, work style, culture and global reach to client.

During this course, I learn the following concepts and skills fundamental to understanding Centos:

- Basic Concept of Server Installation and Configuration.
- Understand to implement server installation and upgrades.
- Understand to infrastructure services and server roles including IP address, network, Directory services, Application services etc.
- Server management strategies including remote services and server management technologies.
- Working know any atmosphere to solve server problem.
- To know how can maintain remote access, network access, Server security, data security and more.

4.2.2 Challenge

While there are many advantages of using server maintenance system, it can also be challenging to switch to something new and different and less mainstream. Because an IT specialist can get any challenge of anywhere any atmosphere. I can provide any challenge for any server system to find problem and solve this problem. Challenging and stimulating work assignments in leading-edge technology and services operation.

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 Discussion and Conclusion: The followed information is collected by studying from the link mentioned, discussing with departmental engineer and practical experience .In case of internship everyone has to do some routine work on existing system for that organization. I have hardly enough power in decision making for that organization and usually he does not allow modifying the existing system. Again, configuration of various if anyone gets the opportunity to configure electricity billing and cash software, design network and implement ,he should utilized. Though I successfully completed my internship in Thakral Information System Pvt. Ltd, I have to do some routine work on their existing system. This report generation includes report generation and customer technical support. This report generation includes how to design and implement software. In this report I tried to discuss my responsibility in Thakral Information System Pvt. Ltd, with both theoretical and technical explanations.

5.2 Future Scopes

Future scope for Hardware and Server Management is really very good and bright for ICT System. It has been almost a year since the first reports surfaced that IBM was looking to sell off its IBM X-Series server business and that Lenovo Group emerged as the front runner given the politics and national security issues involved, it will probably take some time before Lenovo closes the acquisition. But with Lenovo having a strong presence in North Carolina and being committed to expanding that presence in the wake of the IBM deal, it stands to reason that US government regulators will eventually approve the sale. The fact that Lenovo has actually been a licensee of a number of System x designs since 2008, when the two companies first formed a server partnership, will no doubt help IBM's and Lenovo's cause. So will the fact that Google will be arguing that Lenovo should be allowed.

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