

A
Summer Internship Report
On
“Process Overview Of I.T. Department”
(IT346 – Summer Internship - I)

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At: Changa, Dist: Anand, Pin: 388421.
July, 2022



Accredited with Grade A+ by NAAC
Accredited with Grade A by KCG

CERTIFICATE

This is to certify that the report entitled “**Process Overview Of I.T. Department**” is a bonafied work carried out by **Raghavendrasinh.J.Jadeja(D21IT184)** under the guidance and supervision of **Dr. Purvi Prajapati & Mr. Parag Badiani** for the subject **Summer Internship – I (IT346)** of 5th Semester of Bachelor of Technology in **Department of Information** at Chandubhai S. Patel Institute of Technology (CSPIT), Faculty of Technology & Engineering (FTE) – CHARUSAT, Gujarat.

To the best of my knowledge and belief, this work embodies the work of candidate himself, has duly been completed, and fulfills the requirement of the ordinance relating to the B.Tech. Degree of the University and is up to the standard in respect of content, presentation and language for being referred by the examiner(s).

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ABSTRACT

Network management system (NMS) is important both in ensuring the correct operation of network devices and in maintaining the services that run on them. However, the relentless growth of DSL's users, meaning that IP traffic volumes nearly double every two years, renders real-time monitoring and analysis of every customer's service parameter is a very challenging problem. The most important problem is the bottleneck in centralized NMS which most of services provider use as SNMP-based system. This paper presents a new model which will be able to ease the problem from bandwidth consumption of SNMP-based by two main methods. Firstly, to ease the problem from bandwidth consumption of SNMP-based, this model will use the probabilistic data structure to decrease the number of packets of monitoring network device's parameter. Secondly, to ease the problem from the relentless growth of the number of the network's devices, this model is designed to support distributed network devices' operations in a distributed NMS fashion. Meaning that, the number of NMS's devices can be increased with the number of network's devices if it is necessary. By using both of two methods, customer expectations with bandwidth requirements and reliability requirements can be improved with this model.

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Thanks,

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COMPANY DESCRIPTION

About TCL – Mithapur

1. Company	Tata Chemicals
2. Location	Tata chemicals limited were established in the year 1939. The soda-ash plant was started in 1943 at TATA chemicals Ltd. Tata chemicals limited is located in Mithapur, a place at the extreme west of Gujarat nearby the coastline of Arabian sea and the gulf of Kutch. Mithapur is situated at about 9 km from Okha port in the south and 20 km from Dwarka in the North of Gujarat. Mithapur is the small town developed and maintained by Tata chemicals Ltd.
3. Products	<p>Chemicals:</p> <ol style="list-style-type: none"> 1. Soda ash 2. Sodium Bicarbonate 3. Caustic Soda 4. Liquid Chlorine 5. Hydrochloric Acid 6. Vacuum Iodized salt 7. Pure Salt 8. Bromine 9. Gypsum 10. Cement <p>Consumer products: Salt, cooking soda</p>
4. Plant info	<p>Installed capacity of 875,000 tpa – about 34 per cent of the country's capacity.</p> <p>One of the largest producers of synthetic soda ash in the world.</p> <p>It has a 5-star rating from the British Safety Council.</p>
5. Raw-Material	Tata chemicals limited takes various chemical combinations, their solar evaporated salts and water from the Arabian Sea located at about 3 km from the factory building as an input.

PRODUCTS

Tata Chemicals aims to touch people's lives in a way such that they can live better, eat better and work better. Through its wide range of products that find use in industries such as pharmaceuticals, food processing, food essentials, Tata Chemicals reaches out to millions of people across the world. The high quality of chemicals and ingredients made at Tata Chemicals go a long way in improving the lives of its people and that of the communities it operates out of. Its products at its manufacturing facilities in India, Africa, the UK and the US.

Tata Chemicals classifies its products under three categories:

1. Living essentials:

Basic products for daily living, such as salt, sodium bicarbonate or baking soda products and water-related products.

- ☐ Consumer salt: Tata Salt, I-Shakti, Tata Salt Lite, Tata Salt Flavoritz and Tata Salt Plus
- ☐ Pulses: I-Shakti
- ☐ Water purifier: Tata Swach

2. Industry essentials:

Products that form essential inputs to diverse industries across the glass, detergents, mining and chemical processing sectors

- ☐ Soda ash
- ☐ Allied chemicals: Caustic soda, chlorine based products, bromine based products, gypsum, sodium tripolyphosphate, phosphoric and sulphuric acids
- ☐ Industrial salt
- ☐ Sodium bicarbonate
- ☐ Cement: Tata Shudh

3. Farm essentials:

Farm inputs needed to improve crop health and productivity, such as fertilisers, pesticides, specialty nutrients, seeds and agri-services.

- ☐ Fertilisers
- ☐ Customised fertilisers
- ☐ Biofuel

VARIOUS DEPARTMENT AND PLANTS

- Human Resource Department
- I.T Department
- Personal Department
- Fire & Safety Department
- Electrical Department
- Instrument & control department
- Workshop, Foundry & Fabrication shop
- Bromine plant
- Water softening plant
- Power-plant
- Soda-Ash plant
- Cement Plant

Table of Contents

Abstract.....	i
Acknowledgement.....	ii
Description of company / organization.....	iii
Chapter 1 LAN Cables	1
1.1 What is LAN?.....	1
1.2 What are The Cables Used For LAN?	1
1.3 Types Of Cables	2
Chapter 2 Network Management	3
2.1 What is Network Management?	3
2.2 Features	4
Chapter 3 SAP NetWeaver Application Server	5
3.1 Architecture	6
Chapter 4 Server Room	8
4.1 Design Considerations.....	9
Chapter 5 HelpDesk	12
5.1 HelpDesk.....	12
5.2 Issues Handled By Helpdesk	13
5.3 Additional Services	13
Chapter 6 Conclusion.....	14

CHAPTER 1: LAN CABLES

1.1 What Is A LAN?

- A LAN stands for local area network and it is a computer network that interconnects computers in a certain area such as homes, universities, offices, commercial buildings, labs and just about any place with a range of computers in a close vicinity.
- LANs are vital in computer networking and just about any computer you use is connected to another device in some way.
- The beginning of a Local Area Network (LAN) began in the 1970's with the increase in the need for high speed interconnections of computers in universities and laboratories.
- With the introduction of ethernet by Xerox in 1973-1974 LAN would soon be off to the races. The first introduction of LAN is a major use case came with the install of it in 1977 at the Chase Bank in New York City.

1.2 What Are The Cables Used For LAN?

- With LAN being a connection of multiple computers and networking hardware there are various cables that be used.

1.3 Types Of Cabels

- Copper Twisted Pair (Also referred to as LAN, Ethernet or Networking cable)
- Coaxial Cable
- Fiber Cable

Copper Twisted Pair:-

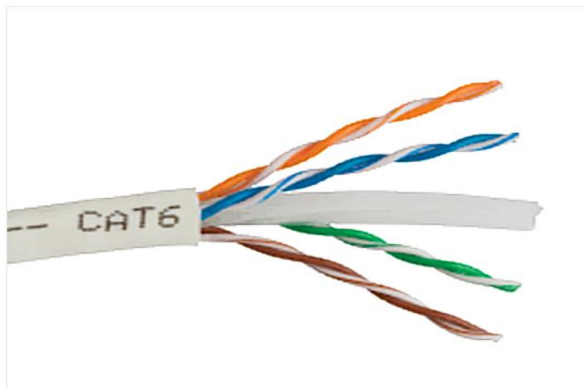
- Twisted pair copper cable is your most common cables used to connect your computers, routers, switches, printers, gaming systems, PoE devices, IP cameras and much more. They come in many different categories such as:

- Cat5e Cable
- Cat6 Cabl
- Cat6A Cable
- Cat8 Cable

- **Cat6 Cables are Used in TCL, Mithapur.**

Cat6 Cables:-

- Category 6 cable (Cat 6) is a standardized twisted pair cable for Ethernet and other network physical layers that is backward compatible with the Category 5/5e and Category 3 cable standards.
- Cat 6 must meet more stringent specifications for crosstalk and system noise than Cat 5 and Cat 5e. The cable standard specifies performance of up to 250 MHz, compared to 100 MHz for Cat 5 and Cat 5e.
- Whereas Category 6 cable has a reduced maximum length of 55 metres (180 ft) when used for 10GBASE-T, Category 6A cable is characterized to 500 MHz and has improved alien crosstalk characteristics, allowing 10GBASE-T to be run for the same 100-metre (330 ft) maximum distance as previous Ethernet variants.
- Cat 6, an unshielded twisted-pair (UTP) design, emerged as an advancement of the UTP Cat 5e, which was formalised in 2001.
- The design of Cat 6 required more stringent precision in manufacturing, and this enabled reduced noise and crosstalk, allowing improved performance.
- The Telecommunications Industry Association (TIA) published Cat 6 in June 2002.



CHAPTER 2: Network Management

2.1 What Is Network Management?

- Network management is the procedure of administering, managing and working a data network using a network management system. Current network management systems use software and hardware to constantly collect and analyse data and push out configuration changes for increasing performance, reliability, and security.
- It involves configuring monitoring and possibly reconfiguring components in a network with the goal of providing optimal performance, minimum downtime, proper security, accountability and flexibility.

2.2 Features:-

- **Network automation**
 - One defining feature of a modern network management system is network automation. This is the procedure of automating the configuring, handling, testing, deploying, and operating of physical and virtual devices inside a network. Network service availability increases when everyday network tasks and functions are automated and repetitive processes are controlled and managed automatically.
- **Network administration**
 - Network administration encompasses tracking network resources, including switches, routers, and servers. It also includes performance monitoring and software updates.

- **Network Operation**

- This contains smooth network functioning as created and intended, including close monitoring of activities to quickly and effectively address and fix problems as they occur and preferably even before users are aware of the problem.

- **Network assurance**

- Network assurance features are often included in modern network management systems. These features help improve network performance, customer experience, and security. Assurance systems help network analytics, application analytics, and policy analytics, as well as AI and ML, to achieve full network assurance.

- **Network provisioning**

- Network provisioning involves network resource configuration for the purposes of supporting any given service, like voice functions or accommodating additional users.

- **Network maintenance**

- Network maintenance covers upgrades and fixes to network resources. It also consists of proactive and remediation activities executed by working with network administrators, such as replacing network gear like routers and switches.

- **Network analytics**

- Network analytics is a software tool that compares incoming information against preprogrammed operational models and makes functional decisions for improving network performance

CHAPTER 3:SAP NetWeaver Application Server

- SAP NetWeaver Application Server or SAP Web Application Server is a component of SAP NetWeaver which works as a web application server for SAP products.
- All ABAP application servers including the message server represent the application layer of the multitier architecture of an ABAP-based SAP system. These application servers execute ABAP applications and communicate with the presentation components, the database, and also with each other, using the message server.

3.1 Architecture:-

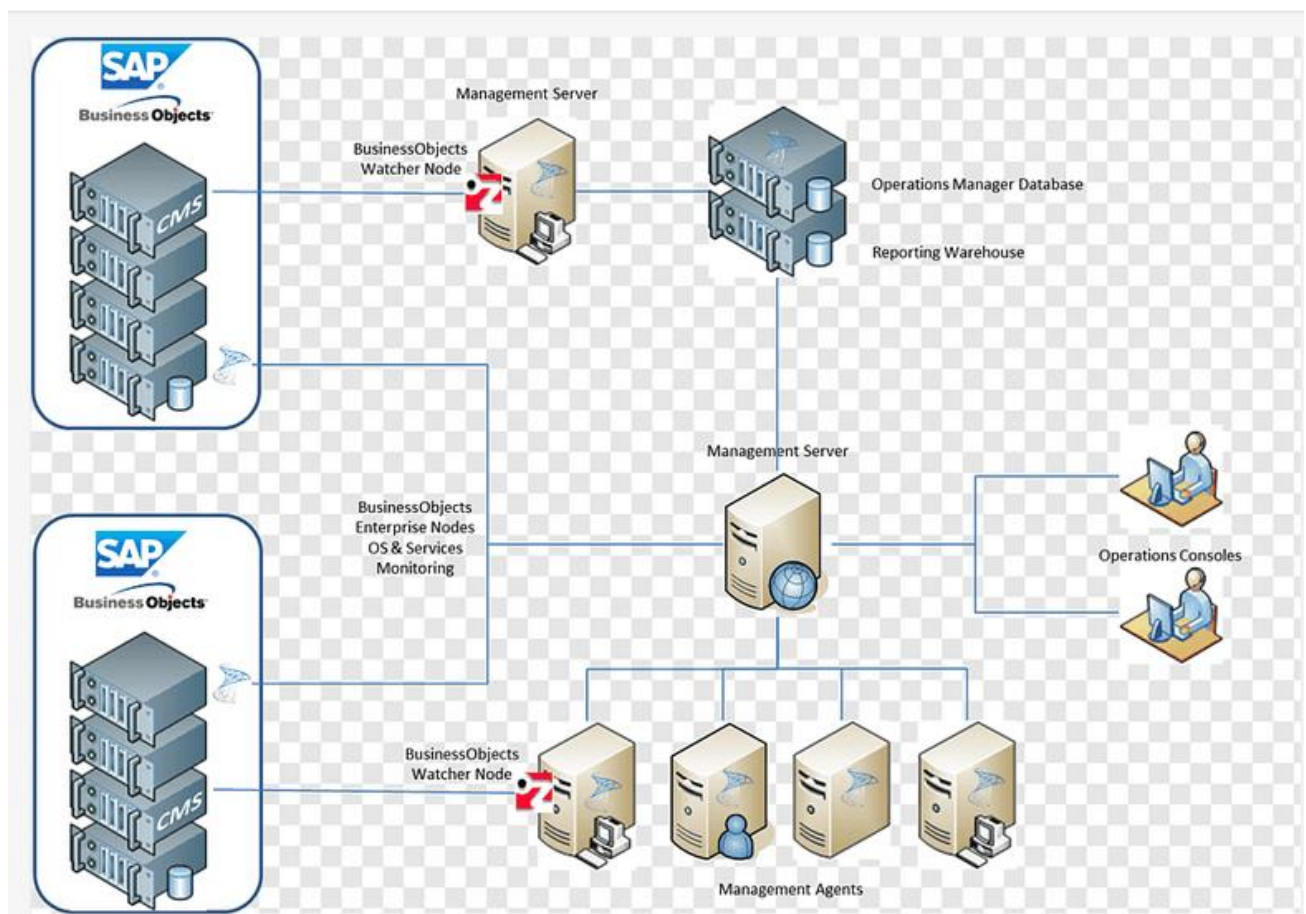
- **The architecture of SAP Web Application Server can be separated into 5 areas:**
 - Presentation layer
 - In the presentation layer, the user interface can be developed with JavaServer Pages (JSP), Business Server Pages (BSP), or with Web Dynpro technology. The underlying business layer provides the business content in Java or ABAP.
 - Business layer
 - The business layer consists of a J2EE certified run-time environment that processes the requests passed from the Internet Communication Manager (ICM) and dynamically generates the responses. The business logic can be written either in ABAP or in Java based on the J2EE standard.
 - Developers can implement business logic and persistence with Enterprise JavaBeans (EJB) using the J2EE environment. Developers can also access the business

objects of applications running in the ABAP environment to benefit from their business logic and persistence.

- Integration layer
 - The local integration engine is an integral part of SAP Web AS and allows instant connection to SAP NetWeaver Process Integration (SAP PI; formerly called SAP Exchange Infrastructure).
 - The local integration engine provides messaging services that exchange messages between the components that are connected in SAP PI.
- Connectivity layer
 - The Internet Communication Manager (ICM) dispatches user interface requests to the presentation layer and provides a single framework for connectivity using various communication protocols.
 - Currently, modules are available for Hypertext Transfer Protocol (HTTP), HTTPS (extension of HTTP running under the Secure Sockets Layer (SSL)), Simple Mail Transfer Protocol (SMTP), Simple Object Access Protocol (SOAP), and Fast Common Gateway Interface (FastCGI).
- Persistence layer
 - The persistence layer supports database independence and scalable transaction handling. Business logic can be developed completely independent of the underlying database and operating system. Database independence is also made possible by support for open standards.
 - The database interface ensures optimized data access from within the ABAP environment through Open SQL. SAP propagates the outstanding capabilities of Open SQL for ABAP to Open SQL for Java and offers a variety of

standard Application Programming Interfaces (APIs) to application programmers, such as SQLJ.

- Other technologies, such as Java Data Objects (JDO) and Container-Managed Persistence (CMP) for EJB, or the direct use of the Java Database Connectivity (JDBC) API, are also supported.



CHAPTER 4 : Server Room

- A server room is a room, usually air-conditioned, devoted to the continuous operation of computer servers. An entire building or station devoted to this purpose is a data center.
- The computers in server rooms are usually headless systems that can be operated remotely via KVM switch or remote administration software, such as Secure Shell, VNC, and remote desktop
- Climate is one of the factors that affects the energy consumption and environmental impact of a server room. In areas where climate favours cooling and an abundance of renewable electricity, the environmental effects will be more moderate.
- Thus, countries with favourable conditions such as Canada,[6] Finland,[7] Sweden,[8] and Switzerland[9] are trying to attract companies to site server rooms there.

4.1 Design considerations:-

Building a server or computer room requires detailed attention to five main design considerations:

- **Location**
 - Computer or server room location is the first consideration, even before considering the layout of the room's contents. Most designers agree that, where possible, the computer room should not be built where one of its walls is an exterior wall of the building.

- Exterior walls can often be quite damp and can contain water pipes that could burst and drench the equipment. Avoiding exterior windows means avoiding a security risk, and breakages. Avoiding both the top floors and basements means avoiding flooding, and leaks in the case of roofs.
- Lastly, server rooms should be centrally located because of the horizontal cabling involved which extends from this room to devices in other rooms.
- If a centralized computer room is not feasible, server closets on each floor may be an option. This is where computer, network and phone equipment are housed in closets and each closet is stacked above each other on the floor that they service.
- **Air Conditioning**
 - Computer equipment generates heat, and is sensitive to heat, humidity, and dust, but also the need for very high resilience and failover requirements. Maintaining a stable temperature and humidity within tight tolerances is critical to IT system reliability.
 - In most server rooms "close control air conditioning" systems, also known as PAC (precision air conditioning) systems, are installed.
 - These systems control temperature, humidity and particle filtration within tight tolerances 24 hours a day and can be remotely monitored. They can have built-in automatic alerts when conditions within the server room move outside defined tolerances.
 - Air conditioning designs for most computer or server rooms will vary depending on various design considerations, but they are generally one of two types: "up-flow" and "down-flow" configurations.

- **Fire Protection**

- The fire protection system's main goal should be to detect and alert of fire in the early stages, then bring fire under control without disrupting the flow of business and without threatening the personnel in the facility.
- Server room fire suppression technology has been around for as long as there have been server rooms. Traditionally, most computer rooms used Halon gas, but this has been shown to be environmentally unfriendly (ozone depleting) and unsafe for humans.
- Modern computer rooms use combinations of inert gases such as nitrogen, argon and carbon dioxide. Other solutions include clean chemical agents such as FM200 and also hypoxic air solutions that keep oxygen levels down.
- To prevent fires from spreading due to data cable and cord heat generation, organizations have also used plenum cable coated with FEP tubing. This plastic reduces heat generation and safeguards material metal efficiently.

- **Redundancy**

- If the computer systems in a server room are mission critical, removing single points of failure and common-mode failures may be of high importance.
- The level of desired redundancy is determined by factors such as whether the organisation can tolerate interruption whilst failover systems are activated, or must they be seamless without any business impacts.
- Other than computer hardware redundancy, the main consideration here is the provisioning of failover power supplies and cooling.



CHAPTER 5 : HelpDesk

5.1 Help Desk

- A help desk is a department or person that provides assistance and information usually for electronic or computer problems.
- In the mid-1990s, research by Iain Middleton of Robert Gordon University studied the value of an organization's help desks.
- It found that value was derived not only from a reactive response to user issues, but also from the help desk's unique position of communicating daily with numerous customers or employees.
- Information gained in areas such as technical problems, user preferences, and satisfaction can be valuable for the planning and development work of other information technology units.

5.2 Issues Handled By Help Desk:-

- Assisting with password resets, printer and other peripheral issues.
- Resolving issues related to computer, device, or application performance.
- Diagnosing and addressing internet connectivity issues or slowness.
- Handling IT security related events in a timely manner.
- Helping to make sure everyone has a productive and worry-free day.

5.3 Additional Services

- Help desk services are a core part of the wider range of options which are offered at Connections for Business.
- From discussing security challenges to implementing cloud-based IT solutions, IT team has access to an impressive knowledge base that

they will leverage on your behalf to solve a myriad of issues that may come up in the work environment.

- Their goal is to keep your business up and running 24/7. They're experts at planning, building and operating tech environments.
- IT Team can give assistance for concerns regarding:-
 - Recoverability
 - Reliability
 - Security
 - Productivity

CHAPTER 6 : CONCLUSION

Although network management appears to be a simple function, it is actually a complex set of functions with interesting architectural features. We decomposed network management into monitoring, instrumentation, and management and explored how each of these can be achieved within the network management architecture.

The essence of the network management architecture is in understanding what you want to monitor and manage, determining where you want to locate each network management function, and managing the flows of network management traffic. Depending on the characteristics of the network you are developing, you have a wide range of architectural solutions, from a simple single-platform system with preconfigured monitoring and management capabilities to a distributed, hierarchical system in which you determine and configure its monitoring and management capabilities.