



Department of Empowerment of Persons with Disabilities (Divyangjan)
Ministry of Social Justice & Empowerment



योग्यता शक्तमुपाय चात्ताप्रगति



सत्यमेव जयते
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SCPwD
Skill Council for Persons with Disability

Participant Handbook

Sector
IT-ITes

Sub-Sector
IT Services

Occupation
IT Support Services/Helpdesk

SCPwD Reference ID :PWD/SSC/Q0110

Reference Id: SSC/Q0110, Version 3.0

NSQF Level: 3



Scan/Click this QR Code to access eBook

Domestic IT
Helpdesk Attendant
Divyangjan
For Locomotor Disability

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IT – ITeS Sector Skill Council NASSCOM

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Note: SCPwD

SCPwD has borrowed the qualification of Domestic IT Helpdesk Attendant (Divyangjan) which is approved by NCVET in the 5th meeting of NSQC on 29th January 2021 (Link of MOM <https://ncvet.gov.in/wp-content/uploads/2023/01/Minutes-of-5th-NSQC-Meeting.pdf> And uploaded on NQR WWW.nqr.gov.in

The book caters to the job role aligned to the following disabilities as per the NQR codes mentioned below:

LD - 2020/PWD/SCPWD/04069



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Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

Skill Council for Persons with Disability

for

SKILLING CONTENT: PARTICIPANT HANDBOOK

Complying to National Occupational Standards of

Job Role/ Qualification Pack: Domestic IT Helpdesk Attendant (Divyangjan)

QP No PWD/SSC/Q0110 NSQF Level 3

Date of Issuance: January 27th, 2022

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*Valid up to the next review date of the Qualification Pack or the
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Authorised Signatory
(Skill Council for Persons with Disability)

Acknowledgements

NASSCOM would like to express its gratitude towards IT, especially towards its company representatives, who believe in our vision of improving employability for the available pool of engineering students. SSC NASSCOM makes the process easier by developing and implementing courses that are relevant to the projected industry requirements.

The aim is to close the industry-academia skill gap and create a talent pool that can withstand upcoming externalities within the IT industry.

This initiative is the belief of NASSCOM and concerns every stakeholder – students, academia, and industries. The ceaseless support and tremendous amount of work offered by IT members to strategize meaningful program training materials, both from the context of content and design are truly admirable.

We would also like to show our appreciation to Words-Worth Solutions for their persistent effort, and also for the production of this course publication.

About This Book

This participant Handbook has been designed to serve as a guide for participants who aim to obtain the required knowledge and skills to undertake various activities in the role of a Domestic IT Helpdesk Attendant. Its content has been aligned with the latest Qualification Pack (QP) prepared for the job role. With a qualified trainer's guidance, participants will be equipped with the following for working efficiently in the job role:

Knowledge and Understanding: The relevant operational knowledge and understanding to perform the required tasks.

- **Performance Criteria:** The essential skills through hands-on training to perform the required operations to the applicable quality standards.
- **Professional Skills:** The ability to make appropriate operational decisions about the field of work.

The Participant Handbook details the relevant activities to be carried out by a Domestic IT Helpdesk Attendant. After studying this handbook, job holders will be adequately skilled in carrying out their duties according to the applicable quality standards. The handbook is aligned with the following National Occupational Standard (NOS) detailed in the latest and approved version of Domestic IT Helpdesk Attendant QP.

- SSC/N3021 - Deal remotely with customer queries - Domestic
- DGT/VSQ/ N0102 - Practice Employability Skills

The Handbook has been divided into appropriate number of units and sub-units based on the content of the relevant QP. We hope it will facilitate easy and structured learning for the participants, allowing them to obtain enhanced knowledge and skills.

Symbols Used



Key Learning
Outcomes



Unit
Objectives



Exercise



Tips



Notes



Activity



Summary

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1. Introduction to the Job Role of Domestic IT Helpdesk Attendant



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Unit 1.1 - Job Roles and Responsibilities of Domestic IT Helpdesk Attendant

Unit 1.2 - An Introduction to the ITeS Sector



Key Learning Outcomes

At the end of this module, participants will be able to:

1. Discuss the relevance of IT-ITeS support services
2. Identify the career path of IT help desk staff
3. List the different subsectors of the IT support services industry

UNIT 1.1: Job Roles and Responsibilities of Domestic IT Helpdesk Attendant

Unit Objectives

At the end of this unit, participants will be able to:

1. Assess the role of the Domestic IT Helpdesk Staff
2. Discuss the skills needed to be a successful home computer support worker.

1.1.1 Evaluate Key Applications Where IT Helpdesk Services are Used

- A help desk is a resource intended to provide customers or end users with information and support related to an organization's products and services.
- The purpose of a computer help desk is usually to solve problems or give advice about computers and related products such as computer hardware, system administration and maintenance, or software.
- Organizations that provide support services to their customers through a variety of channels, namely toll-free numbers, websites, instant messages or email. Likewise, in-office helpdesk departments provide support to employees.
- The advent of new technologies and the demand for innovative, ready-to-use products in all possible industries has changed the face of IT services, both globally and internationally.
- In today's competitive age, earning and maintaining customer satisfaction is the primary goal of any business and business organization.
- Quality of customer satisfaction can also help strengthen brand image, further influencing customer loyalty.
- An efficient help desk organization system (commonly referred to as a ticketing system) is a proactive and complete solution that allows your business and service providers to provide support and assistance qualified customers within the agreed SLAs.
- Such a help desk software solution can truly automate the entire customer service or complaint resolution cycle efficiently and accurately as soon as possible. Additionally, a help desk management solution enables your organization to track and resolve customer complaints within the enterprise.
- Delivered products are intelligently and creatively managed, submitted on time, helping to make their mark in the minds of potential target industries.
- It requires transparent and flawless business, supported by robust IT infrastructure and fast ticket resolution.
- IT Helpdesk Attendant is one of the fastest growing and coveted career options in the world, and in turn, in India.
- IT departments have gone beyond known conventions and should embrace the importance of proactive customer services and real-time ticketing and problem solving.

The 6 main benefits of Help Desk are:



Fig 1.1.1: Benefits of Domestic IT Helpdesk Attendant

1.1.2 Domestic IT Help Desk Attendant - Job Responsibilities

- Individuals at this job are mainly responsible for the smooth running of computer systems and ensuring users get maximum benefits from them.
- Individual tasks vary depending on the size and structure of the organization, but may include installing and configuring computer hardware operating systems and applications.
- Monitoring and maintaining computer systems and networks
- Taking staff/clients through a series of actions, either face to face or over the telephone to help set up systems or resolve issues
- Troubleshooting system and network problems and diagnosing and solving hardware/ software faults
- This job requires the individual to have thorough understanding of various technology trends and processes as well as have updated knowledge about IT initiatives.
- The individual should be highly motivated and energetic.
- The individual should have good analytical and logical skills. (Source: www.pmkvyofficial.org)

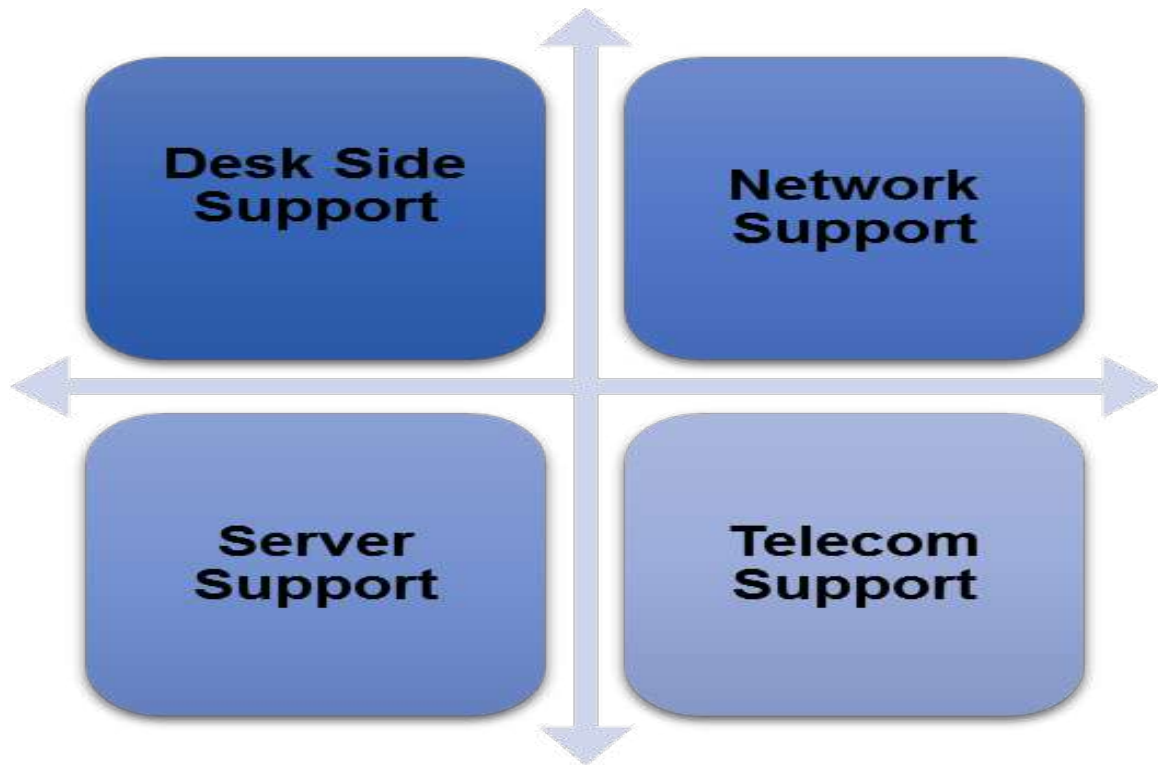


Fig 1.1.2: Components of Domestic IT Helpdesk Attendant

UNIT 1.2: An Introduction to the ITeS Sector

Unit Objectives

At the end of this unit, participants will be able to:

1. Analyse the key factors of the IT-ITeS sector
2. Discuss the current trends of the sector

1.2.1 An Overview of the IT- ITeS Sector

IT Helpdesk is part of the ITeS field. This field is aimed at communicating with customers to answer their questions, requests and complaints or also to recommend the company's products and services. These interactions are also used to market and sell ITeS products and services. India's IT services industry is one of the fastest growing, showing rapid and steady growth over the past few years.

ITeS (Information Technology Enabled Services)

Information Technology Enabled Services (ITeS), is a form of outsourced service that has emerged due to the involvement of IT in various fields such as telecommunications, banking, finance, telecommunications, insurance and travel among other. Some examples of ITeS are chat-based interaction, medical transcription, in-office accounting, insurance claims, and credit card processing.

India's IT and Information Technology (ITeS) industry goes hand in hand in every respect. This industry is not only changing the image of India on a global basis, but it is also driving economic growth by boosting the higher education sector (especially in engineering and IT). These industries employ more than 10 million Indians and thus have contributed significantly to the economic growth and social transformation of our country.

About ITeS in India

- Call Centres provide customer interaction and communication services
- Back office operations of various large Companies are done in BPOs, eg. British Airways has its reservation system running out of India
- Most of the top international banks channel their data- churning needs to their units in India
- ITeS sector includes services ranging from
 - Call Centres
 - Claims processing, e.g. Insurance
 - Office operations such as accounting, data processing, data mining
 - Billing and collection, e.g. Telephone bills
 - Internal audit and pay roll, e.g. Salary bills on monthly basis
 - Cash and investment management, e.g.
 - Routine jobs given to a third party and giving importance to core business
- With more emphasis on international market penetration and exploitation, while paying attention to diversification and profitability, companies in the IT sector have resorted to outsourcing

- This talent pool is carefully selected, based on predefined criteria by on-site HR
- Offsite staff must be highly skilled and up-to-date with technological capabilities. up-to-date, and must be able to communicate fluently in English and other local languages, depending on location off-site
- They should be well-versed with ground-breaking technical solutions like the SMAC (Social Media, Mobility, Analytics and Cloud-Computing), Artificial Intelligence (AI), Robotics and Embedded Systems

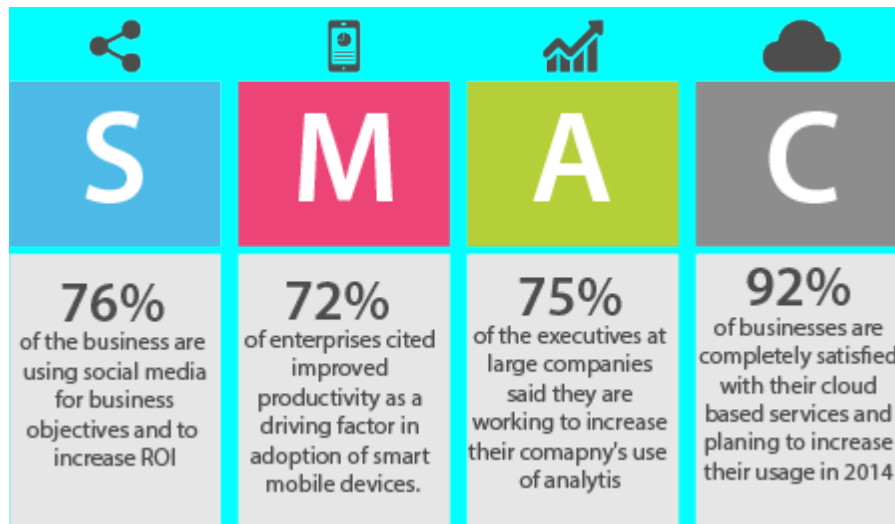


Fig 1.2.1: SMAC Model (Image courtesy: www.socialdnalabs.com)

Information technology (IT) is the application of computers and telecommunications equipment to store, retrieve, transmit, or analyze data, often in the context of a business or other business activity. The term is often used as a synonym for computers and computer networks, but it also includes other information delivery technologies such as television and telephone.

Today, a country's IT potential is essential to its progress towards global competitiveness, generating a healthy Gross Domestic Product (GDP) and meeting energy and energy challenges and environment.

India is one of the fastest growing IT services markets in the world. It is also the largest outsourcing destination in the world. The country's cost competitiveness in providing IT services continues to be its USP in the global procurement market.

India has the potential to build a \$100 billion software products industry by 2025, according to the Indian Software Products Industry Roundtable (ISPIRT).

Why is the IT sector growing?

- Rapid industrialization
- Partial privatization of telecommunication
- Growth of IT parks in the country
- Development of SEZ; which also help IT companies get tax benefits
- A large number of resources readily available in the country
- Low operating costs
- Tax breaks and cooperative policies offered by the government

Summary

- A Help Desk is a resource aimed at providing the customer or end user with information and support related to an organization's products and services
- The purpose of an IT Help Desk is usually to troubleshoot problems or provide guidance about IT and IT related products such as computer hardware, system administration and maintenance or software
- Organizations provide help desk support to their customers through various channels, namely, toll-free numbers, websites, instant messaging, or email. Likewise, in-house help desks in offices provide assistance to employees
- The advent of new technology and the demand for creative, out-of-the-box deliverables in every possible industry has changed the face of IT Services, on both global and domestic fronts
- Individuals at this job are mainly responsible for the smooth running of computer systems and ensuring users get maximum benefits from them
- Individual tasks vary depending on the size and structure of the organization, but may include installing and configuring computer hardware operating systems and applications.
- Monitoring and maintaining computer systems and networks
- Taking staff/clients through a series of actions, either face to face or over the telephone to help set up systems or resolve issues.

Notes

Exercise



Fill in the blanks:

1. A _____ is a resource aimed at providing the customer or end user with information and support related to an organization's products and services.
2. Client satisfaction can also help in strengthening the _____.
3. Troubleshooting system and network problems is one of the key responsibilities for an _____.
4. An efficient help desk organization system is also known as _____.
5. AI stands for _____.

Activity



- This activity is in the form of “Expert Session”
- The trainer will invite an industry expert to share his/ her experience, set of desired skills and work-life at an IT hub with the students
- The trainees must wear Student’s ID and carry pen and notebook
- They should take down the important notes
- If they have any doubt, they will raise their hand and ask the question to the expert
- After the session the trainer and the trainees will thank the expert for spending his/ her valuable time
- The trainer will recap the session in the next class to ensure that the trainees have understood the points shared by the industry expert.

Scan the QR codes or click on the link to watch the related videos



youtu.be/1NizRxLcHEI

Job Role of Domestic IT Helpdesk Attendant

2. Concept of Service Requests/Incidents



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Unit 2.1 - Nature and Types of Service Requests



Key Learning Outcomes

At the end of this module, participants will be able to:

1. List general policies, procedures, and processes for dealing with basic IT service requests or incidents
2. Discuss the guidelines for categorizing and prioritizing service requests

UNIT 2.1: Nature and Types of Service Requests

Unit Objectives

At the end of this unit, participants will be able to:

1. Evaluate the nature and types of service requests
2. Demonstrate methods to resolve common incidents related to account maintenance/ access problems networking, connectivity problems, hardware problems

2.1.1 Assess the Nature and Types of Service Requests

IT companies, especially those that deal directly with customers, provide specific services. For example: Company A is associated with a telecommunications service provider and Company A deals with customers of that telecommunications organization. Company A needs to communicate directly with customers and take care of various customer problems. To do the same, Company A needs to have a reasonable and strong backup source to be able to provide better service. Handling service requests is one of the important roles of such a business. Customers may experience network connection problems and should contact Company A, which represents a telecommunications organization. Leaders should address the problem the customer is experiencing and issue a properly documented, appropriate service request to the logistics team. The logistics team includes technical support staff who will look into the problem and resolve it. Therefore, a service request plays an important role in noting and solving various problems.

As defined by the Information Technology Infrastructure Library or ITIL v3:

A Service Request is a request from a user for information or advice, or a change to a standard (a pre-approved change with low risk, relatively common and follow a process) or access an IT service. A good example of a standard requirement is a password reset. Requests are normally handled by Service Department and do not require the submission of an RFC (Request for Change).

Construct a demo incident management process flow with any disruption of IT services

Common examples of IT Service Requests are:

- Password Reset
- Password Change
- Password Retrieval
- User ID Creation
- Granting Access to a particular IT Service, say, the HRMS site of the company

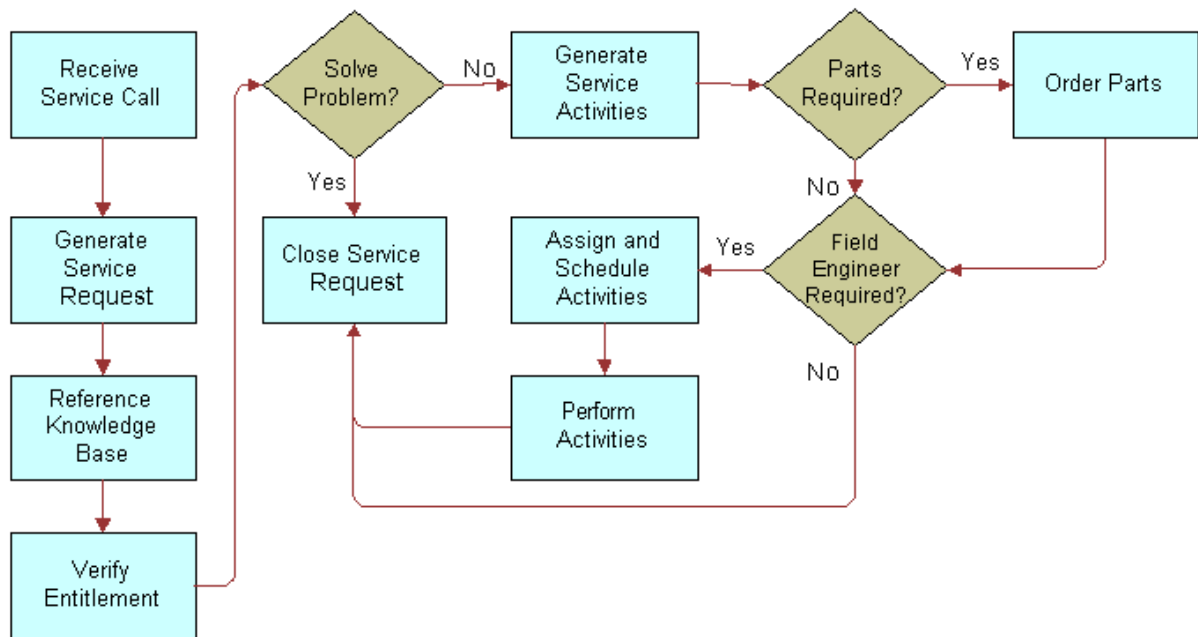


Fig 2.1.1: Flowchart of IT Service Request Management Process
(Pic courtesy: <https://docs.oracle.com>)

Demonstrate key operating principles for incidents related to operating system, installation/configuration problems

Service Requests generally include the following scope:

- Access Management
- Application Installation
- Peripheral Installation
- Anti-virus Installation
- Security Hardening
- Employee Triggered Requests (related to employees like Colleagues, Line Managers and Subject Matter Expert)

According to the Information Technology Infrastructure Library (ITIL) framework, the IT Service Operations process includes the following elements:

- **Event management Purpose of the process:** To ensure CIs and The service is continuously monitored, and events are filtered and classified to decide on the appropriate choice of actions.
- **Incident management Process goal:** Manage the lifecycle of all Incidents. The primary goal of incident management is to return IT services to users as quickly as possible.
- **Processing Requests Purpose of the process:** to respond to service requests, which in most cases are minor (standard) changes (e.g. request to change password) or request information.
- **Access Management Process Purpose:** Grant authorized users the right to use the service, while preventing unauthorized user access. Access management processes essentially enforce the policies defined in information security management. Access rights management is also sometimes called rights management or identity management.

- **Problem management Process objective:** Manage the lifecycle of all issues. The primary goals of incident management are to prevent incidents from occurring and to minimize the impact of unavoidable incidents. Proactive incident management analyzes incident records and uses data collected by other IT service management processes to identify significant trends or issues.
- **IT operations and control Process objective:** Monitor and control IT services and their underlying infrastructure. The IT Operations Control Process performs routine tasks related to the operation of infrastructure components and applications. This includes job scheduling, backup and restore operations, print and output management, and routine maintenance.

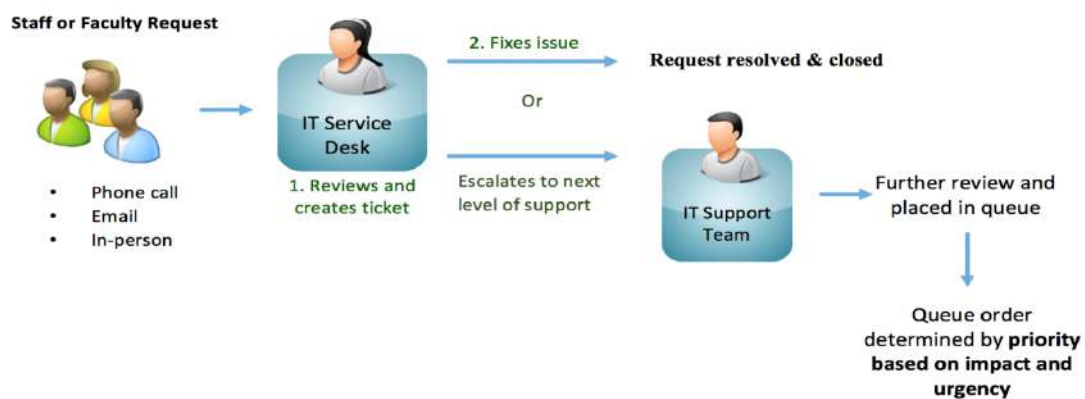


Fig 2.1.2: Process flow of a Service Request

An Incident, in general terms, can be defined as an occurrence that takes place outside the normal scope or routine of the system. This might be something that is not working properly or could be broken.

IT Incidents can be broadly classified into:

1. Application based
2. Hardware based

IT Incidents may involve:

- Servers
- Storage
- Network
- Databases
- Applications
- Security
- Batch Jobs

Common examples of Application based Incidents are:

- Service Unavailable
- Data Issue
- Application Bug
- Report Not Coming Up

- Excel not downloading
- Disk-usage Threshold Exceeded

Common examples of Hardware based Incidents are:

- System-down (Server Issue)
- Network Issue
- System Alert
- Printer Not Printing
- Booting Issues

A crash alert will be generated directly if the problem that originally caused the alert is not logged as an incident. For example, a significant installation issue might not have been documented as a system problem, but an alert could still be required.

Incident Alert [Update] [Delete]

Number: IA0001003 Severity: Medium

Source incident: INC00008 State: New

Source CI: *CAROL-IBM Assignment group:

Event type: Outage Assigned to: Alissa Mountjoy

Business/Service impact: Yes

Short description: Network Server 3 damaged

Details | Activity

Details

Opened: 2013-06-21 02:45:51

Opened by: System Administrator

Estimated disruption time: Days 0 Hours 05 :00 :00

Description: Water leakage in the server room caused minor damage to Network Server 3.

Background: The recent thunderstorms caused maintenance problems with the facilities in the head office. The server room was affected by these, with some water leakage over the course of Thursday evening.

Fig 2.1.3: Creation of an Alert

(Pic courtesy: <http://wiki.servicenow.com>)

Creating an incident alert from an ongoing incident log will automatically import and populate the alert with information from that incident. The steps involved in generating and triggering an incident alert, in the incident management system, from an existing incident are:

- Open an existing incident
- Select the Create new incident alert related link

- A new incident alert record is created and populated with data from the incident
- The original incident becomes the source incident of this alert
- Other fields populated with data from the source incident are: Source CI, Short description, Background
- Fill in other fields as required, as described for creating alerts directly
- Click Submit

The activities involved in the Incidence Management process, which help in resolving Incidents are:

- Incident Detection and Recording
- Classification and Initial Support
- Investigation and Analysis
- Resolution and Record
- Incident Closure
- Incident Ownership, Monitoring, Tracking and Communication
- Establish Incident Framework Management
- Evaluation of Incident Framework Management

The mandatory fields in a Service Request template / form are:

Field	Description
Summary	A short description of the request.
Reporter	The person who submitted the request.
Component/s	Segments of your IT infrastructure that relate to the request. For example, "Billing services" or "VPN server". These are used for labelling, categorization, and reporting.
Attachment	Files or images added to the request.
Description	A long, detailed description of the request.
Linked Issues	A list of other requests that affect or are effected by the request. If your business uses other multiple products, this list may include linked development issues.
Assignee	The service desk agent assigned to fulfill the request.
Request participants	A list of extra customers or vendors who take part in resolving the request.
Approvers	A list of business or financial contacts responsible for approving the service request.

Field	Description
Organizations	A list of customer or vendor groups interested in the request's resolution.
Impact	The effect of the service request, usually in regards to service level agreements.
Urgency	The time available before the business feels the service request's impact.
Pending reason	A short description or code that indicates why the service request is not progressing.
Product categorization	A category of IT asset or system that the request effects.
Operational categorization	A category of action or function required to fulfill the request.

Table 2.1.1: Mandatory fields of a service request

2.1.2 How to Handle Employee or Employee Service Requests

Requests

A Ticket is an acknowledgment token generated when a user requests service or reports an issue. Incident is an event, and tickets are documents of the event. It is the digital tool by which your service desk is alerted to a problem and responds to it.

Each ticket must be created with a unique reference number, called a "case". This allows the user or helpdesk to quickly locate, add, or notify the status of the user's problem or request. This is a running report of a specific issue, its resolution status, and other related data.

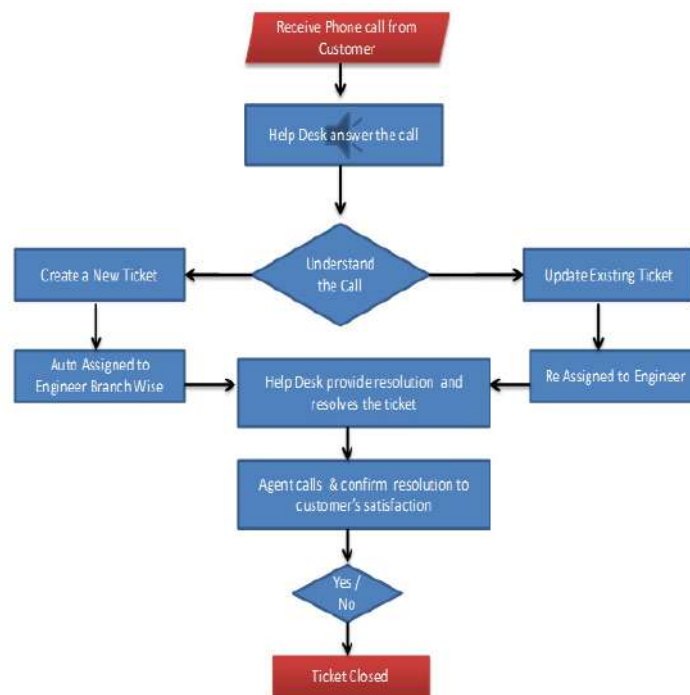


Fig 2.1.4: Flowchart of ticket resolution

Activities involved in Change Management are:

- Filtering and prioritizing Changes
- Managing Changes and the Change process
- Chairing the CAB (Change Advisory Board) and the CAB/Emergency committee
- Reviewing and closing of Requests for Change (RFCs)
- Management reporting and providing management information

The steps involved in resolving the issue are as follows:

- An IT help desk representative receives a call, email, or other communication from a customer or employee about an issue.
- Some applications provide built-in messaging and automatic error reporting from exception handling blocks.
- IT support staff verify that the problem is real and not just perceived.
- They will also make sure the customer has enough information about the problem. This information typically includes the customer's environment, when and how the problem occurred, and any other relevant circumstances.
- The agent that creates the problem in the system, enters all relevant data, provided by the customer.
- As work is done on this, the system is being updated with new data by a technician. Any attempt to resolve the issue must be logged into the issue management system. Ticket status will most likely change from open to pending.
- When the issue is resolved, it is marked as resolved in the issue tracker.
- If the issue is still not fully resolved, the ticket will be re-opened once the technician receives new information from the customer.

The basic functions of the problem management system are:

- Capture malfunctions, errors and requests (eg: Manual or e-mail response management system)
- Distributing and assigning issues to managers
- Monitoring processing, time spent and quality of work
- Ensures monitoring of internal processes by forcible control using workflow
- Statistical analysis of votes
- Automated ticket generation using an alarm system, e.g. network monitoring
- Compliance with external service agreements (Service Level Agreements, SLAs)
- Volumes Systematic aggregation of questions and answers to FAQ
- Assign priority to each issue according to the overall importance of the issue, customer, date of submission, SLA
- Include detailed description of the problem encountered, tried solutions or workarounds, and other pertinent information
- Maintain a history of each change

Exercise



Look at the following examples and classify them in different types of IT incident

1. MS Excel not downloading
2. Printer not working
3. Network wrongly configured
4. Service unavailable
5. System not booting

Activity



Activity 1

- This activity is in the form of “Industry Visit”
- The Trainer will take the Trainees to an IT Hub
- The Trainees must carry Student’s ID, Notebook and Pen
- The Trainer will introduce an industry expert who will take the Trainees to the workstation
- The Expert will show how a Service Request is created and how to handle the requests
- The Trainees should observe and note down the vital steps of the process
- The Trainer will explain the steps again in the classroom
- The Trainer and Trainees will thank the Expert for allowing them to observe the real-life scenario on working with Service Requests.

Activity 2

- This activity is in the form of “Role Play”
- The Trainer will ask each Trainee to suppose that they have received a Service Request which involves installation of third party software/ application
- Each Trainee will work on the Service Request by filling in necessary fields and escalating the matter as it falls outside the competence level
- The Trainer will act as the management who will decide whether to permit the installation or to deny
- The Trainer will say Yes to few Trainees and No to others
- The Trainees will accept the decision and will take further steps
- If installation is approved, the trainees will go ahead with the procedure
- In case the installation is declined, the Trainees will respond to the Service Request explaining why he/ she is unable to install the same
- The Trainer will supervise the session and will guide the trainees accordingly.

Scan the QR codes or click on the link to watch the related videos



youtu.be/yBebf3jWiWE

Nature and Types of Service Requests

3. Monitoring and Validation of Service Requests



IT - ITeS SSC
NASSCOM

Unit 3.1 - Monitor Automated Alerts and Customer Service Requests

Unit 3.2 - Validate Automated Alerts



Key Learning Outcomes

At the end of this module, participants will be able to:

1. Collect service requests/issues using technical tools and processes
2. Identify solutions/workarounds for service requests/issues

UNIT 3.1: Monitor Automated Alerts and Customer Service Requests

Unit Objectives

At the end of this unit, participants will be able to:

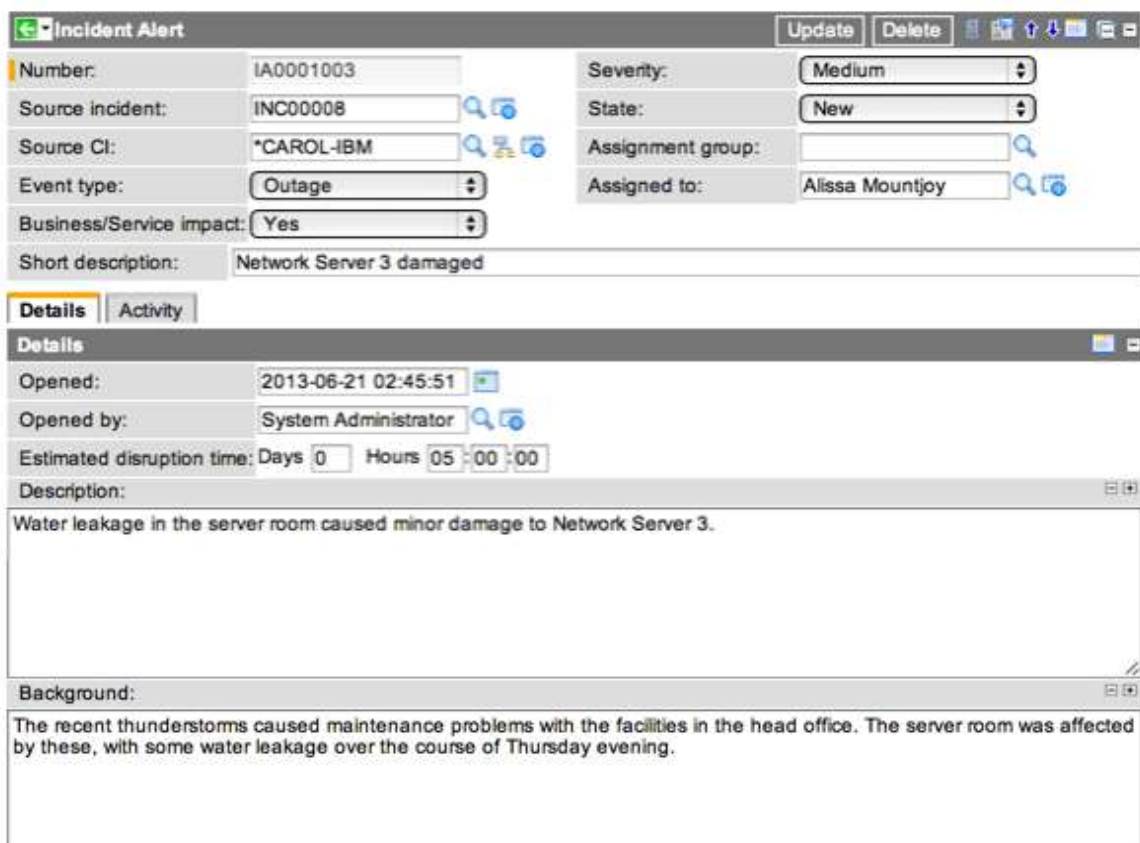
1. Collect requirements / service breakdown using engineering tools and engineering processes

3.1.1 Collate Service Requests/Incidents Using Technical Tools and Procedures

Alert Management comprises of:

- Creating Alerts Directly (Standalone Alerts)
- Creating Alerts Directly from an Active Incident
- Validating the Automated Alerts
- Accessing and Monitoring the Automated Alerts

An incident alert will be generated directly if the problem that originally caused the alert is not logged as an incident. For example, a significant installation issue might not have been documented as a system problem, but an alert could still be required.



Incident Alert [Update] [Delete]

Number: IA0001003 Severity: Medium

Source incident: INC00008 State: New

Source CI: *CAROL-IBM Assignment group:

Event type: Outage Assigned to: Alissa Mountjoy

Business/Service impact: Yes

Short description: Network Server 3 damaged

Details | Activity

Details

Opened: 2013-06-21 02:45:51

Opened by: System Administrator

Estimated disruption time: Days 0 Hours 05 :00 :00

Description: Water leakage in the server room caused minor damage to Network Server 3.

Background: The recent thunderstorms caused maintenance problems with the facilities in the head office. The server room was affected by these, with some water leakage over the course of Thursday evening.

Fig 3.1.1: Creation of an Alert (Pic courtesy: <http://wiki.servicenow.com>)

Field	Description
Summary	Automatically generated incident alert ID, in the format IAXXXXXXXXX.
Severity	The severity for the incident alert. Values are Major, High, Medium, or Low.
Source incident	The source incident for this alert, if any. If you select a source incident, the Source CI, Short description, and Background fields are populated with data from this incident, unless there is existing data in those fields.
State	The state of the alert. Values are New, WorkIn Progress, Resolved, Cancelled, or Closed.
Source CI	The source CI for this alert, if any. If there is a source incident selected, this field is populated with the source CI attached to that incident. If there is no source incident selected, select the source CI manually, if applicable. If the source CI has related CIs, these are automatically listed in the Impacted CIs related list.
Assignment group	The assignment group, if any, for that incident alert. For example, there might be a group that represents a crisis management team, including a number of IncidentManagers, DutyDirectors and DutyManagers.
Event type	The type of event. Values are: Outage, Degradation, Capacity, SLA / Delay, or Fail-Over.
Assigned to	The assigned user for the alert. This can be an ITIL user or an incident alert administrator, and defaults to the user who creates the alert.
Business / Service impact	Value should be Yes or No to indicate if the business or a service is impacted.
Details Section	
Opened	When the alert was created.
Opened by	The creator of the alert. This defaults to the user who creates the alert.
Estimated disruption time	The estimated duration of the disruption.
Description	More detailed information for the alert.
Background	Background information about the alert.
Activity Section	
Actions taken	The details of all actions taken while working on the alert.
Work notes	Any separate work notes relevant to the alert that might help in communications.

Table 3.1.1: Creation of alerts

3.1.2 Creating Alerts From an Existing Incident

Creating an incident alert from an ongoing incident log will automatically import and populate the alert with information from that incident. The steps involved in generating and triggering an incident alert, in the incident management system, from an existing incident are:

- Open an existing incident.
- Select the link related to create a new crash alert.
- A new crash alarm log is created and filled with crash data.
- The original problem becomes the source problem for this alert.
- Other fields populated with data from the source incident are: CI Source, Brief Description, and Context.
- Fill in other fields as needed, as described to generate the alert directly.
- Click Submit.

Few related information

After successfully generating a crash alert, multiple related lists are added to the form, namely,

- Affected CIs (configuration items)
- User Contacts User (Service Manager, Service Manager, and Issue Manager)
- Related Issues and Related Issues (Shows Issues and Related Issues, based on the source of the issue) alarms)

The following table lists the most common types of alarms triggered by computer systems and other devices.

Alert Related To	Alert Description
Workstation	This includes a predefined selection of alerts commonly assigned to workstations. The package contains the following alerts: Application - Crashes, Starts, and Stops Hardware Inventory - Memory Added and Memory Removed Event - Failed Login
Server	This includes a predefined selection of alerts commonly assigned to servers. The package contains the following alerts: Event - Failed Login CPU Utilization - CPU Utilization Computer - Offline 10 minutes Software Inventory - Uninstalled software
Kiosk	This includes a predefined selection of alerts to computers running in the kiosk mode, like a dedicated public display. The package contains the following alerts: Application - Crashes, Starts, and Stops Computer - Offline 10 minutes Software Inventory - Installed and Uninstalled software

Alert Related To	Alert Description
CPU Utilization	CPU Usage Alerts are used to monitor CPU usage on a single computer or a group of computers. If a device has multiple CPUs, the user can configure an alert to check the usage of an individual CPU or all CPUs. CPU usage performance is measured as a percentage of the overall population. The warning is triggered when the usage threshold is exceeded and is maintained for the specified period of time.
Memory Usage	Memory Usage Alerts is used to monitor the memory usage of a single computer or a group of computers. Memory usage is measured as a percentage of the population. The warning is triggered when the usage threshold is exceeded and is maintained for the specified period of time.
Free Disk Space	The Free Disk Space alert is used to monitor the space remaining on a defined disk drive on a computer or across a group of computers. An alert is triggered when free disk space falls below the defined minimum as expressed in MB or as a percentage of the total size of the disk.
Folder Size	Folder Size Alert to monitor the total size of a specific folder on a computer or on a group of computers. The folder path must be the same on each computer in a group. If the directory path is not valid for a certain computer, the warning will be ignored for that particular device. The warning is triggered when the folder size exceeds the maximum size.
File Size	File Size Warning is used to keep track of the total size of a particular file on a single computer or a group of computers. The file path must be the same on each computer in a group. If the file path is not valid for a certain computer, the warning will be ignored for that particular device. The warning is triggered when the file size exceeds the maximum size.
Computer (Online/Offline)	The Computer alert is used to monitor the availability of computers in the user's account. An alert is triggered when a particular computer goes offline and stays offline for the specified Duration or comes online and stays online for the specified Duration.
Application	Application Alerts are used to monitor the activity of a particular program on a computer or on a group of computers. Alerts are triggered when the application starts, stops, or crashes. Name the application. The full path to the executable is optional. If the app is not found on a given computer, the warning will be ignored for that particular device.

Alert Related To	Alert Description
Service	The Service alert is used to monitor the activity of a particular service running on a computer or across a group of computers. An alert is triggered when a service stops or crashes. The user should define the full name of the service. If the service is not found on a given computer, then the alert will be ignored for that particular device.
Event	This warning can only be used on Windows host computers. Users should take advantage of event alerts to monitor event code activity on a single computer or group of computers. This will trigger an alert when an event log entry that matches the specified criteria is logged in one of the standard Windows event logs. Users can define multiple event sources, event categories, or event identifiers to search, and you can also define exceptions. Wildcards can be used, where text can be typed, e.g. an asterisk (*) will match any substring, while a question mark (?) will match any single character.
Hardware Inventory	The Hardware Inventory alert is used to monitor changes to hardware components on a computer or across a group of computers. An alert is triggered when the selected component is added or removed.
Software Inventory	The Software Inventory alert is used to monitor changes to software components on a computer or across a group of computers. An alert is triggered when a component is installed or uninstalled.
System Inventory	The System Inventory alert is used to monitor changes to the Windows profiles, Local Users, and Settings on a computer or across a group of computers. An alert is triggered when the selected system component is added or removed.
Anti-Virus	Antivirus warnings are used to notify users of problems with the antivirus software on a single computer or a group of computers. Additional warnings can be generated for situations, when the system detects that there is no anti-virus installed, an outdated definition file, a high priority threat that requires immediate attention (threat threat red) or when real-time protection is disabled.
Windows Update	This alert is for Windows hosts only. This helps in monitoring the status of Windows Update. An alert is triggered when the system detects a Windows Update report and the specified criteria are met.

Table 3.1.2: Different types of alerts

UNIT 3.2: Validate Automated Alerts

Unit Objectives

At the end of this unit, participants will be able to:

1. Validate automated alerts to ensure they are genuine incidents and report for alerts that are false
2. Demonstrate the process flow for rule-based transactions for validated incidents

3.2.1 Demonstrate the Process Flow for Rule-Based Transactions for Validated Incidents

There are 2 types of Alert Monitoring processes, namely,

- Active Monitoring of Components and Services: Pro-active actions to define the behaviour of the system or service
- Passive Monitoring of Components and Services: Passive acknowledgment of the behaviour of the system or service

Monitoring of Automated Alerts is accomplished by executing the below roles and functions:

1. Static Process Roles

Alert Process Owner

- Initiator of the process
- Accountable for defining the process strategic goals and allocating all required process resources

Alert Process Manager

- Manager of the entire process
- Responsible for its effectiveness and efficiency

2. Dynamic Process Roles

These roles are dynamically created during the Alert Management Process.

Alert Owner

- The attribute in the records contains the value of the Role / Function currently accountable for the Alert.

Alert Agent

- The attribute in the records contains the value of the Role / Function currently responsible for either an activity or task within the overall activity of the Alert.

3. Service Specific Roles

Service Expert/Service Specialist

They can consult and/or act as

- Alert Analyser and Classifier

- Alert Action Reviewer / Auditor
- Service Owner

The process of accessing and validating Automated Alerts involves the following:

1. Categorization and Filtering of Alerts
2. Recording of Alerts
3. Adherence to Alert Guidelines
4. Controlling and Authorizing Alerts
5. Defining the Critical Success Factors (CSF)
6. Defining the Key Performance Indicators (KPI)
7. Effecting Documentation
8. Facilitating Evaluation and Closure

1. Alert classification and filtering

The purpose of alarm classification and filtering is to provide a control factor for a specific alarm, which will be used for demand-based decision-making for alert handling. The hardest activity in alert processing is sorting and filtering the alerts. Thresholds set too high can lead to dangerous situations where problems are detected too late, while thresholds set too low lead to information overload and warning messages, thereby exceeding the predefined capacity of the system, monitoring and personalization tools.

- Info Alerts - Alerts are logged so no further steps are needed.
- Special Alerts - Alerts upgraded to Incident, Incident or Change Management, generate RFCs, Incident Logs or Incident Logs.
- Warning - The warning is continued to the next step of the process.

2. Recording of Alerts

The following information are required, in predefined formats, for appropriate recording of alerts.

- Unique Identifier - Alert ID
- Alert Device - Name / Type / ID Number of device alerting and device being affected by the alert
- Alert Component - Name of component alerting and component being effected by alert
- Type of Alert / Type of Failure - Incident / Change / Problem / Failure occurred
- Alert Time / Date - Date and Time of Alert
- Status - Status of the Alert, which is set while passing a Control Activity
- Services - Service(s) affected by this Alert
- Alert Description - The description of the Alert including the Alert Argument
- Alert Log - Log comprising of all Alert Notifiers and Records for a certain time period. Time period to be defined in Security Management or other Service Process

Additional information items (artefacts), such as the Request for Alert / Change (RFC) or the Forward Schedule of Alert / Change(FSC), typically can be realized by considering the information out of one or more process records and either filtering, merging, correlating or interpreting these information.

3. Adherence to Alert Guidelines

The accessing and validating process of Alerts needs to adhere to few basic guidelines, namely,

- Every Incident in IT service or IT infrastructure triggers the creation of a new Alert Record.
- The Alert Agent is responsible for documenting each activity in the Event & Alert Record.
- The Alert Owner has to control the Alert Agent.
- The Alert Owner and Alert Agent can only transfer their duties if the new person or group agrees.
- The subsequent Alert Owner or Agents have to be recorded in the appropriate attribute in the Alert Record.
- The Alert Owner and Alert Agent should preferably be a person rather than a group.
- Refer to the Service Description and Service Level Agreement in order to consider Service-specific and Customer-specific rules for the definition of thresholds and actions.

4. Controlling and Authorizing Alerts

In day-to-day IT operations, system and service monitoring is continuously performed, generating alerts. Alerts generated by automated tools and manual actions are displayed, logged and logged for classification. The following activities are:

- **Authorization Check** - Is the Alert Triggering System or person authorized to provide that information?
- **Documentation and Verification** - Alert Record is filled in and checked for completeness and formal correctness, i.e. it is verified that all mandatory information has been provided. If this is not the case, or if the Alert generating system or person is not authorized to send Alerts, the said Alert record can be rejected.
- **Status Update** - The Alert Record is then shifted to the status "recorded-accepted" or "recorded-rejected".

The Activity specific guidelines are:

- **Alert Provider** is set to the person or systems who triggered the Alert.
- **Alert Sponsor** is set to the person who triggered the Alert, if no other sponsor is known.
- **Alert Agent** is set to Alert Management Team, if the Alert Agent is unavailable.
- **Alert Owner** is set to Alert Management Team, if the Alert owner is unavailable.
- **Alert Description** must contain a crisp and meaningful description of the Alert.
- The **Process Instance**, which triggered the Alert, should be referred to as the Unique Identifier of the Alert.

5. Defining the Critical Success Factors

Critical Success Factors (CSF) involved are:

- Defining the correct level of filtering of alerts
- Closely integrating Alert Monitoring in the Service Management Processes

- Defining Thresholds together with Service Design and Service Operations through a Trial and Error process
- Dedicating appropriate tools for Alert Monitoring for supporting the automated monitoring of systems and services

6. Defining the Key Performance Indicators (KPI)

The Key performance Indicators defined in the Alert Management System are:

- Number of Alerts over a given period of time
- Number of Alerts that required human intervention
- Number of Alerts that could be solved without human intervention
- Number of Alerts that defined incidents and problems
- Number of Alerts triggered by Known Incidents
- Number of Alerts repeated
- Number of Alerts indicating issues in other Service Operation Processes, namely, Availability, Continuity and Performance etc.

7. Effecting Documentation

The Alert Management Documentation process involves adherence to a predefined set of guidelines, namely,

- The Alert Agent has to update documentation.
- Alert Owner has to verify the documentation.
- If the verification stage returns dissatisfactory results, the Alert Agent is requested to improve the documentation.
- Process Interface - Information about Services and Configuration Items affected by the Alert are updated in the CMDB (Configuration Management Database), via the help of Configuration Management.

8. Facilitating Evaluation and Closure

This phase is also known as Post Implementation Review (PIR). This stage is performed according to the regular level of SLA quality defined in the Service Description.

- A PIR is performed, and its results are recorded.
- If the PIR does not attest a successful Alert counter action, a rollback must be triggered.
- Consequently, Change Management needs to be informed.
- The Alert record is updated to the status "closed-verified" or "closed-failed", depending on the success of the Alert reflected by the post implementation review and the necessity of a rollback.

Successful Evaluation of the Alert System involves answering the following Questionnaire:

- Does the Alert, classified as an issue, recur?
- Did the Alert counter action meet the desired targets (In terms of KPIs like TAT)?
- Was the Alert counter action implemented on time?
- Did any incident occur while the Alert counter action passed through the process?
- Was the Alert counter action performed, without exceeding the allocated financial budget?
- Has the Alert been documented and the CMDB (in some cases) updated respectively?

- Did everyone involved in the Event & Alert counter action stick to the process SLAs and guidelines?
- Was any information missing, which was essential to take decision at any stage of the process?

Summary

- The 2 types of Alert Monitoring process, namely: Active and Passive
- Service Requests can be broadly categorized into Assistance Service Request and Enhancement Change Request
- All Service Requests have to be accessed, monitored and validated
- Alert Management comprises of:
 - Creating Alerts Directly (Standalone Alerts)
 - Creating Alerts Directly from an Active Incident
 - Validating the Automated Alerts
 - Accessing and Monitoring the Automated Alerts
- The steps involved in creating and triggering an Incident Alert, in the Incident Management System, from an existing Incident are:
 - Open an existing incident
 - Select the Create new incident alert related link
 - A new incident alert record is created and populated with data from the incident
 - The original incident becomes the source incident of this alert
 - Other fields populated with data from the source incident are: Source CI, Short description, Background
 - Fill in other fields as required, as described for creating alerts directly
 - Click Submit
- There are 2 types of Alert Monitoring processes, namely,
 - **Active Monitoring** of Components and Services: Pro-active actions to define the behaviour of the system or service
 - **Passive Monitoring** of Components and Services: Passive acknowledgment of the behaviour of the system or service.

Notes

Exercise



Look at the following examples and classify them in different types of IT incident

1. All Service Requests have to be _____.
2. Service Requests can be broadly categorized into _____.
3. There are _____ types of Alert Monitoring processes.
4. An Incident Alert requires to be created directly if _____.
5. The Classification and Filtering of an Alert aims at _____.

Activity



Activity 1

- This activity is in the form of “Working with Alerts”
- The Trainer will take Trainees to the Lab and will show them how to access, validate and monitor alerts
- The Trainees will take down notes of the steps
- Post that, the Trainer will create mock alerts for every Trainee
- The Trainees will work on the alerts, filling in necessary fields and processing the same
- The Trainer will create a few fake alerts to check if the Trainees are able to distinguish the genuine alerts from the fake ones
- The best performers will be appreciated by the class.

Scan the QR codes or click on the link to watch the related videos



youtu.be/Picbz7diupA

Monitoring and Validation of Service Requests



4. Technical Specifications Related to Service Requests



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Unit 4.1 - Organization's Tools and Processes for Incident
Management and Escalation Support



Key Learning Outcomes

At the end of this module, participants will be able to:

1. Identify the latest changes and procedures in the area of expertise related to service upgrades
2. List the organization's tools and processes for incident management and escalation support

UNIT 4.1: Organization's Tools and Processes for Incident Management and Escalation Support



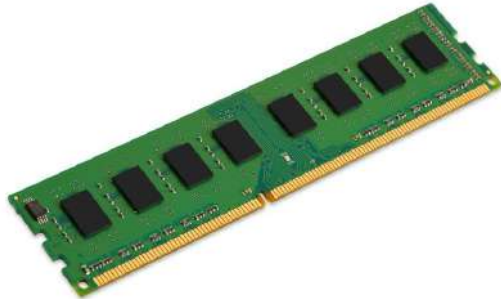
Unit Objectives





At the end of this unit, participants will be able to:

1. Demonstrate proper process knowledge related to the functioning of technologies related to hardware devices

4.1.1 Demonstrate Proper Process Knowledge

Hardware Devices

Component	Description
Motherboard 	The motherboard is the core of the system. It really is the PC; everything else is connected to it, and it controls everything in the system.
Processor 	The processor is often thought of as the "engine" of the computer. It's also called the CPU (central processing unit).
Processor 	The processor is often thought of as the "engine" of the computer. It's also called the CPU (central processing unit).

Component	Description
<p data-bbox="228 383 379 412">Case/chassis</p> 	<p data-bbox="847 501 1337 636">The case is the frame or chassis that houses the motherboard, power supply, disk drives, adapter cards, and any other physical components in the system.</p>
<p data-bbox="228 792 389 822">Power supply</p> 	<p data-bbox="847 1008 1342 1075">The power supply is what feeds electrical power to every single part in the PC.</p>
<p data-bbox="228 1308 373 1337">Floppy drive</p> 	<p data-bbox="847 1438 1350 1538">The floppy drive is a simple, inexpensive, low-capacity, removable-media, magnetic storage device.</p>
<p data-bbox="228 1688 363 1718">Hard drive</p> 	<p data-bbox="847 1821 1278 1888">The hard disk is the primary archival storage memory for the system.</p>

Component	Description
<p data-bbox="228 360 467 389">CD-ROM/DVD-ROM</p> 	<p data-bbox="847 504 1326 640">CD-ROM (compact disc read-only) and DVD-ROM (digital versatile disc read-only) drives are relatively high-capacity, removable media, and optical drives.</p>
<p data-bbox="228 853 344 882">Keyboard</p> 	<p data-bbox="847 907 1337 1010">The keyboard is the primary device on a PC that is used by a human to communicate with and control a system.</p>
<p data-bbox="228 1151 312 1180">Mouse</p> 	<p data-bbox="847 1263 1337 1400">Although many types of pointing devices are on the market today, the first and most popular device for this purpose is the mouse.</p>
<p data-bbox="228 1570 357 1599">Video card</p> 	<p data-bbox="847 1727 1326 1794">The video card controls the information you see on the monitor.</p>

Component	Description
<p>Monitor</p> 	<p>Monitors are display boards (output unit) of the system.</p>
<p>Power supply</p> 	<p>The power supply is what feeds electrical power to every single part in the PC.</p>
<p>Sound card</p> 	<p>It enables the PC to generate complex sounds.</p>

Table 4.1.1: Common hardware devices

Common Types of Portable Computer




Type of Portable Computer	Description	Image
Palmtop	A palmtop is a personal computer or other electronic device that has many of the same features as a calculator and fits in the palm of your hand. A good example of an early handheld computer is the PalmPilot.	
Tab	Tablet PC is an alternative name for graphics tablet. A tablet, tablet or tablet computer is a portable computing device designed to be held with one or two hands. It is usually about the size of a book (7 inches or more) and looks like a full-sized smartphone. Many of the components contained in tablets are similar to those found in computers today.	
Laptop	A laptop computer is a computer that has most, if not all, of the same features as a desktop computer, but is small enough to be easily portable. The laptop runs on AC power or a battery, such as NiMH, Nicad, or Li-ion, for several hours.	

Table 4.1.2: Portable computers

Comparison between Laptop and Desktop

Parameter of Comparison	Desktop	Laptop
Portability	Desktop computers are large and have their own screens. While it's possible to carry a desktop from one place to another, it's bulky and not a portable option. They are designed to be used in one place and do not have to be moved much, if at all.	Laptops are very portable due to their compact size. They were designed to be taken from place to place, carried in a backpack or laptop carrying case. They are great for on-the-go use.

Parameter of Comparison	Desktop	Laptop
Processor	Desktop processors are slightly larger, but that also means desktop processors can be more powerful than laptop processors. New advanced processors on the market are usually first available on desktop computers.	Laptop processors have nearly caught up to desktop processors, but are still limited when compared to desktop processors. Gaming laptops can have an equal performance, but have a much higher price.
Ease of assembly	Setting up a desktop takes a little more work to get everything plugged in, up and running. It also requires more space to install. While it's not difficult to connect everything together, it's still bulkier than a laptop.	Laptops are built to be easy to use, requiring little time to get running. Take it out of the box, plug it in and press the power button. Within minutes, the laptop is ready to use.
Keyboard	Desktops can make use of full size keyboards, including a number pad. There are really no limitations.	Smaller laptops with the 14" and 15" screens typically have smaller keyboards and don't feature a number pad on the right side. Larger laptops with 17" screens do have larger keyboards and may include a number pad, but the laptops are bulkier and heavier.
Screen size	Desktop monitors can be 19 inches or larger. It is even possible to connect a desktop computer to a TV, so the screen size can be as large as the TV. This provides great flexibility as to what the desktop is used for and in what environment.	Since portability is a big feature of laptops, smaller screen sizes are necessary and screen sizes typically range from 10" to 17". However, a laptop can still be connected to an external display and support any size of monitor, screen, or projector.
Power Usage	Desktop computers typically consume more power than laptops. They need a more powerful power supply, some components inside the computer and the monitor. If there is a power outage or power failure, including the display screens, all unsaved and in-process documents may be lost.	Laptops consume less power than desktop computers. Smaller components mean less power is needed to run them. Laptops also have batteries, so power fluctuations and crashes won't cost you unsaved work. The battery starts up immediately when power is lost or power is lost.

Parameter of Comparison	Desktop	Laptop
Upgrading	Most components in a desktop are easily removable, making it easier to upgrade and since desktop cases are usually much bigger they're easier to work in when doing any upgrading.	Memory and hard drive are the only upgradeable components in the laptop. The remaining components are either built-in, non-removable, or the laptop is not designed to work with an upgraded version of the component. The need to upgrade something other than the hard drive and memory often requires a new laptop.

Table 4.1.3: Computer vs Laptop

Operating systems

Microsoft Windows

Microsoft created the Windows operating system in the mid-1980s. Over the years there have been many different versions of Windows, but the most recent are Windows10 (released in 2015), Windows8 (2012), Windows 7 (2009) and Windows Vista (2007). Windows comes pre-installed on most new PCs, making it the most popular operating system in the world.

Mac OS X

Mac OS is a line of operating systems created by Apple. It comes pre-installed on all new Macintosh or Mac computers. All of the recent versions are known as OSX (pronounced O-S Ten), and the specific versions include El Capitan (released in 2015), (2014), Mavericks (2013), MountainLion (2012), and Lion (2011).

According to StatCounter Global Stat, Mac OS X users account for less than 10% of global operating systems—much lower than the percentage of Windows users (more than 80%). One reason for this is that Apple computers tend to be more expensive. However, many people do prefer the look and feel of Mac OS X over Windows.

Linux

Linux (pronounced LINN-ux) is a family of open-source operating systems, which means they can be modified and distributed by anyone around the world. This is different from proprietary software like Windows, which can only be modified by the company that owns it. The advantage of Linux is that it's free and there are many different distributions or versions you can choose from.

According to StatCounter Global Stat, Linux users represent less than 2% of operating systems worldwide. However, most servers run Linux because it is relatively easy to customize.

Networks

A network connects computers, mobile phones, peripherals, and even IoT devices. Switches, routers, and wireless access points are the essential networking basics. Through them, devices connected to your network can communicate with one another and with other networks, like the Internet.

Server

In a technical sense, a server is an instance of a computer program that accepts and responds to requests from another program, called a client. Less formally, any device running server software can also be considered a server. The server is used to manage network resources. For example, a user can set up a server to control access to the network, send/receive email, manage print jobs, or host a web page.

Since they are often used to provide continuously requested services, most servers never go down. Therefore, when servers fail, they can cause many problems for network users and businesses.

The following list contains links to various server types.

- Application server
- Blade server
- Cloud server
- Database server
- Dedicated server
- File server
- Mail server
- Print server
- Proxy server
- Standalone server
- Web server

Host

Also known as an Internet node, a host is a computer or other device connected to a computer network that delegates to other nodes. A network server that handles user requests; provide services, software applications, and information resources to users or other network nodes. A server can provide many different services. For example, it may be responsible for sending information to players of online computer games. Or it can serve web pages on the Internet. Each device connected to the server that receives the data is called a client.

Workstation

Workstation is the name given to a single computer that is connected to another computer (host computer) or network. The workstation has no critical functionality and is not essential for the operation of the network. A workstation needs only one user to connect to the network. For example, almost all users who use computers at work or school use workstations.

Local Area Network (LAN)

In today's business environment, businesses need information to survive. With technology, this has been done, it is very important to use new methods of communication such as using voice, video, data transmitted over the network. Therefore, we must design the local area network with these needs in mind. In this chapter, we will discuss some considerations to keep in mind when designing a LAN. We will look at the hierarchical LAN model and its benefits, some design considerations, and the benefits of well-designed LANs. This chapter is intended to introduce you to the world of local area networks.

LAN Design Concepts

CISCO not only designs and produces network equipment, but also they focus on developing the most optimal way to use their devices, as such when designing a LAN network, they recommend that a hierarchical model. In this type of architecture, there are a few things that have to be observed:

Network segmentation and broadcast traffic management – this is mainly through the use of VLANs

- Security

Easy configuration and management of the switches

Redundancy

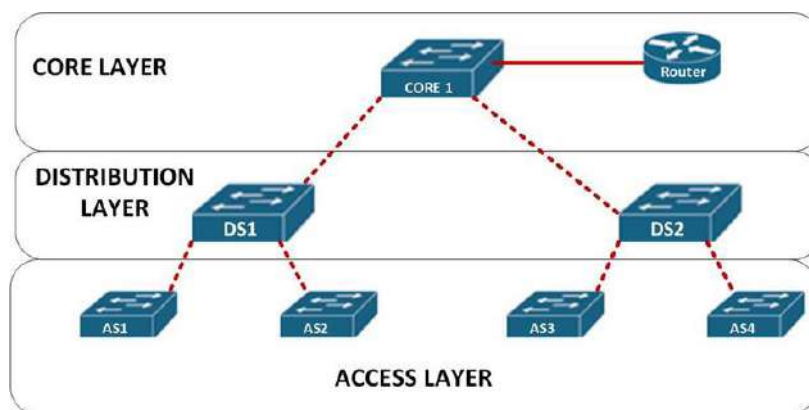


Fig 4.1.1: Hierarchical Layered Model in LAN Design

Access Layer Switch Features

There are a number of features that a switch at each level of the hierarchy should have. As mentioned earlier, the access layer is the lowest level of the hierarchical LAN architecture. At this level, the user's device accesses the network through several devices. As such, features at this level include: VLAN support on the switch, Fast Ethernet and Gigabit Ethernet links, PoE, and link aggregation support for increased switching speed.

Security is very important in our network, at this layer we can implement some security measures like port security to control network access.

CISCO recommends that VLANs be placed on a switch, switches at this level should support VLANs for different purposes. Link Aggregation is the ability to use multiple links at the same time. This is a more efficient way to use the available bandwidth on the switches.

To support multiple devices on one port, PoE is an important feature, it allows us to use the switch to power several devices in our network such as IP phones and wireless controllers.

The access layer switch port should be fast enough to support the changing bandwidth requirements of the enterprise. Therefore, it is recommended to use Fast Ethernet that provides speeds up to 100 Mbps and Gigabit Ethernet links that provide speeds up to 1 Gbps.

Wide Area Network (WAN)

The WAN operates outside the geographical scope of the LAN. WANs are used to connect corporate LANs to remote LANs in branch offices and telecommunications locations. The WAN is owned by

a service provider. Users pay a fee to use the provider's network services to connect remote sites. WAN service providers include service providers, such as telephone networks, cable TV companies, or satellite services. Service providers provide links to interconnected remote sites for data, voice, and video transmission.

On the other hand, LANs are usually owned by an organization. They are used to connect local computers, peripherals, and other devices within the same building or other small geographical area.

Are WANs Necessary?

Without a WAN, LANs would be a bunch of isolated networks. LANs offer both speed and cost-effectiveness for transferring data over relatively small geographic areas. However, as organizations grow, businesses need to communicate across geographically distant locations. Here are some examples:

- An organization's regional or branch offices must be able to communicate and share data with the central website
- Organizations must share information with other organizations. For example, software manufacturers regularly communicate product information and promotions to distributors who sell their products to end users
- Employees who travel frequently on business need to access information on their corporate network

Home computer users also have to send and receive data over increasing distances. Here are a few examples:

- Today's consumers frequently communicate over the Internet with banks, stores and other suppliers of goods and services
- Students study courses by degree how to access library indexes and publications in other parts of their country and in other parts of the world.

Network Address Translation (NAT)

NAT stands for Network Address Translation. NAT allows a single device, such as a router, to act as an agent between the Internet (or public network) and the local network (or private network), which means only a single IP address is required to represent an entire group of computers for anything outside of their network.

Network Address Translation (NAT) is designed to preserve IP addresses. It allows private IP networks using unregistered IP addresses to connect to the Internet. NAT works on a router, usually connecting two networks together and converting the private (not globally unique) addresses of the internal network into legitimate addresses, before packets are forwarded to another network.

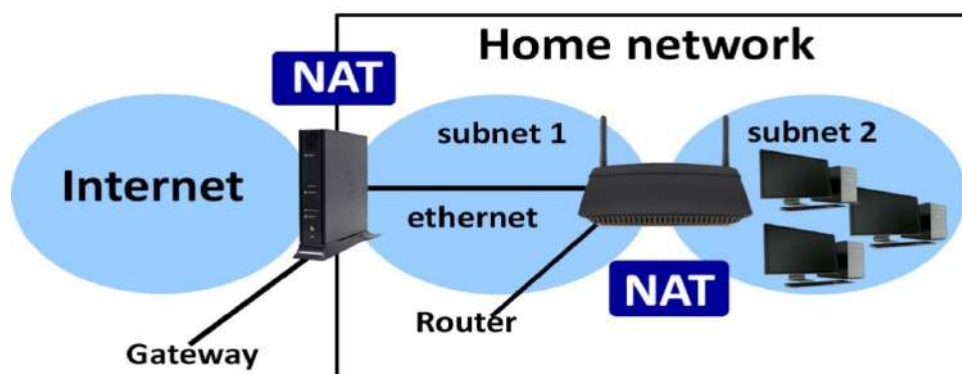


Fig 4.1.2: NAT designing

Configuring Wireless Devices

A wireless network at home lets you get online from more places in your house. This article describes the basic steps for setting up a wireless network and starting to use it.

Before you can set up your wireless network, here's what are essential to set up a wireless network:

- **Broadband Internet Connection and modem:** A broadband Internet connection is a high-speed Internet connection. Digital Subscriber Line (DSL) and cable are two of the most common broadband connections. You can get a broadband connection by contacting an Internet service provider (ISP). Typically, ISPs that provide DSL are telephone companies and ISPs that provide cable are cable TV companies. ISPs frequently offer broadband modems. Some ISPs also offer combination modem/wireless routers. You can also find these at computer or electronics stores, and online.
- **Wireless Router:** A router sends info between your network and the Internet. With a wireless router, you can connect PCs to your network using radio signals instead of wires. There are several different kinds of wireless network technologies, which include 802.11a, 802.11b, 802.11g, 802.11n, and 802.11ac.
- **Wireless Network Adapter:** A wireless network adapter is a device that connects your PC to a wireless network. To connect your portable or desktop PC to your wireless network, the PC must have a wireless network adapter. Most laptops and tablets—and some desktop PCs—come with a wireless network adapter already installed.

To check whether PC has a wireless network adapter:

1. Select the Start button, type device manager in the search box, and then select Device Manager
2. Expand Network adapters
3. Look for a network adapter that might have wireless in the name

Setting up the modem and Internet connection:

After you have all the equipment, you'll need to set up your modem and Internet connection. If your modem wasn't set up for you by your Internet service provider (ISP), follow the instructions that came with your modem to connect it to your PC and the Internet. If you're using Digital Subscriber Line (DSL), connect your modem to a phone jack. If you're using cable, connect your modem to a cable jack.

Locate the wireless router:

1. Place your wireless router where it will receive the strongest signal with the least interference. For best results, follow these tips:
2. Place your wireless router in a central location. Place the router as close to the center of your home as possible to increase wireless signal strength throughout your home
3. Place the wireless router on the floor and away from walls and metal objects, such as metal filing cabinets. The less physical obstructions between your PC and your router's signal, the more likely you are to use the full strength of your router's signal.
4. Some network devices use the 2.4 gigahertz (GHz) radio frequency. This is the same frequency as most microwave ovens and many cordless phones. If you turn on the microwave oven or receive calls on a cordless phone, your wireless signal may be temporarily interrupted. You can avoid most of these problems by using a cordless phone with a higher frequency, such as 5.8 GHz.

Messaging

Microsoft Outlook: Microsoft Outlook is the preferred email client used to access email. It also includes calendar, contact, and task management features. Organizations can also integrate Outlook with Microsoft's SharePoint platform to share project notes, documents, collaborate with colleagues, send reminders, and more.

Microsoft Outlook can be used as a standalone application, but is also part of the Microsoft Office suite. The current version of Outlook is Microsoft Outlook 2010. Outlook is also available for Apple Mac; It's current version is Outlook 2011.

BlackBerry Messenger or BBM: BlackBerry Messenger, also known as BBM, is a messaging service on BlackBerry mobile devices. BBM enables instant messaging and video calling on BlackBerry, Windows Phone, Android and iPhone mobile devices. Users can send files, images, recorded voice notes, QR codes, map locations, and emojis through the service, as well as GIF animations up to 32 KB in size. In May 2019, the BBM service will no longer be available for Android and iPhone.

Lotus Notes: Lotus Notes is a groupware brand now owned by IBM. Lotus Notes is used with a variety of local and collaborative server applications, including email, calendar, personal information manager (PIM), and web. Developed in the 1970s, the first version of Lotus Notes were message strings used to facilitate the management of contact databases. Recent versions of help desk systems, customer relationship management (CRM) tools, and blogs.

Servers

Windows Server 2012 Active Directory

Windows Server 2012, formerly codenamed Windows Server 8, is the latest version of Windows Server. The successor of Windows Server 2008 R2, its improvements include overall upgrades in cloud computing and storage infrastructure.

Installation of Windows Server 2012

1. Insert the Windows Server 2012 R2 DVD-ROM and turn on your computer. You should see a message informing you that Windows is copying temporary files; if not, you should access the BIOS setup program included with your computer and modify the boot sequence so that the computer boots from the DVD.
2. After a few minutes, you receive the Windows Server 2012 R2 screen. Click Install now to begin the installation.
3. Windows copies temporary files and then displays the Get important updates for Windows Setup screen shown in. If you're connected to the Internet, select Go online to install updates now (recommended).
4. On the next Install Windows screen, click Install now.
5. You receive the options, which enable you to install the complete Standard or Datacenter version of Windows Server 2012 R2 with a GUI or Windows Server 2012 R2 Server Core. Select the Windows Server 2012 R2 Datacenter (Server Core Installation) option and then click Next.
6. You are asked to accept the license terms. Select the check box labeled I accept the license terms and then click Next.
7. You receive the options to upgrade or install a clean copy of Windows Server 2012 R2. Select Custom

(advanced) to install a clean copy of Windows Server 2012 R2. The upgrade option is available only if you have started the installation from within Windows Server 2008, Windows Server 2008 R2, or the original version of Windows Server 2012.

8. Select the disk on which you want to install Windows and then click Next.
9. This takes some time (particularly when installing on a virtual machine), and the computer restarts several times.
10. After 15–30 minutes (depending on your hardware), Windows restarts a last time and informs you that your password must be changed before logging on for the first time. Click OK.
11. Type and confirm a strong password. When informed that the password is changed, click OK. After a minute or so, the desktop appears, containing a command window but no Start screen or desktop icons. This is the standard Windows Server Core interface.
12. To set the correct time, type `control timedate.cpl`. By default, Server Core sets the time zone to Pacific Time. If you are in a different time zone, you will need to change this. Set the appropriate time zone, change the date and time if necessary, and then click OK.
13. Windows installs Server Core with a randomly generated computer name. To set a name of your choice, type `netdom renamecomputer %computername% /newname: ServerC1` (where, in this instance, ServerC1 is the name you're assigning; substitute your desired server name).
14. Windows warns you that the rename process might have an adverse impact on some services. Type Y to proceed.
15. You are informed that the computer needs to be restarted in order to complete the rename. Type `shutdown /r /t 0` to reboot your server.
16. After the server reboots, press Ctrl+ Alt+ Delete and log on using the password you set in step

Upgrading Windows Server 2012

You can upgrade a computer running Windows Server 2008 R2 with Service Pack 1 (SP1) or later to Windows Server 2012 R2, provided that the computer meets the hardware requirements for Windows Server 2012 R2. You cannot upgrade a Windows Server 2003 or older computer or a computer running any client version of Windows to Windows Server 2012 R2.

To upgrade to Windows Server 2012 R2, proceed as follows:

1. While logged on to Windows Server 2008 R2 as an administrator, insert the Windows Server 2012 R2 DVD-ROM.
2. When the Install Windows screen appears, click Install now.
3. Select your operating system, either the standard or Windows Core version of Windows Server 2012 R2; then click Next.
4. Accept the licensing terms and then click Next.
5. On the Which Type of Installation Do You Want? page, select Upgrade.
6. Windows checks compatibility of your hardware and software and displays a compatibility report that informs you of any potential upgrade problems. Review this report and make any changes you feel are required. When you are ready to proceed, click Next.
7. Take a lunch break while the upgrade proceeds. This will take 60 minutes or longer, depending on your hardware configuration or use of virtual computing software. The server will reboot three or four times.

8. After the final reboot, log on using the password previously used in Windows Server 2008 R2. Windows prepares your desktop and displays the Server Manager tool
 - The server running Active Directory Domain Services (AD DS) is called a domain controller. It authenticates and authorizes all users and computers in a Windows domain-style network, assigns and enforces security policies for all computers, and installs or updates software.
 - Active Directory performs a variety of tasks including providing information about objects such as hardware and printers and services to end users on the network such as webmail and other applications.
 - Network object: A network object is anything associated with the network, such as printers, end-user applications, and security applications deployed by the network administrator. Network objects can also contain additional objects in their file structure identified by the directory name. Each object has its own unique identity by the specific information contained in the object.
 - Scheme: Since each network object has its own identity, also known as a property descriptor scheme, the identity type is what determines how each object will be used on the network.
 - Hierarchy: The hierarchy defines how each object can be viewed in a hierarchy consisting of three different levels called forests, trees, and domains, with forest being the top level allowed. The network administrator views all objects in the active directory. A tree is the second level of a hierarchy, each level can contain multiple domains.

VMware

VMware is a software company, famous in the field of system virtualization and cloud computing. VMware's software allows users to create multiple virtual environments, or virtual computing systems, on a single computer or server. Basically, a single computer or server can be used to host or manage multiple virtual computing systems, sometimes up to hundreds or more.

This cloud computing system is designed to support Java, Ruby on Rails, Sinatra, and others based applications, as well as provide support for MySQL, MongoDB, and database platforms other. Today, VMware develops and markets a wide variety of virtualization software, mainly for business purposes, but home users can also use some of their software. Les titres de logiciels đáng chú ý VMware ESX et VMware ESXi, VMware vCloud, VMware ACE et VMware ThinApp.

Citrix

Citrix Server refers to Citrix's line of desktop virtualization products: XenDesktop and XenApp. These products allow IT departments to host centralized desktops and applications, respectively. These products enable users to access applications from anywhere, no matter what hardware they are using, including tablets. Citrix touts XenApp and XenDesktop to cut IT costs and increase security while providing a standardized environment.

The advantage of a Citrix Server is that organizations with heterogeneous environments can have the same applications. Users with Windows, Mac and Linux desktops can have a standard environment.

Remote Troubleshooting Tools

pcAnywhere

pcAnywhere Solution uses remote control technology. One can connect to another computer or server and work as though he is sitting in front of it. pcAnywhere Solution supports network connections over a local area network (LAN), wide area network (WAN), or the Internet.

pcAnywhere Solution provides you with the following features:

- Role-based security through console pages
- Control settings of the managed host
- Audit log and reporting
- Security and scoping mechanism supports
- VNC and RDP integration

It might be helpful to understand some pcAnywhere terminology. For example, the client computer is called the host computer because it hosts the connection. The administrator's computer is called the remote computer or the console. This terminology comes from mainframe computing, where a remote user usually connected to a server or a mainframe computer. In pcAnywhere, the in-session frame is called the viewer.

In most cases, a remote user initiates the connection. They provide the information that is needed to connect to the host computer. The remote user can also select options to increase security or optimize performance. To make a connection, the host computer must be set up to wait for incoming pcAnywhere Solution connections.

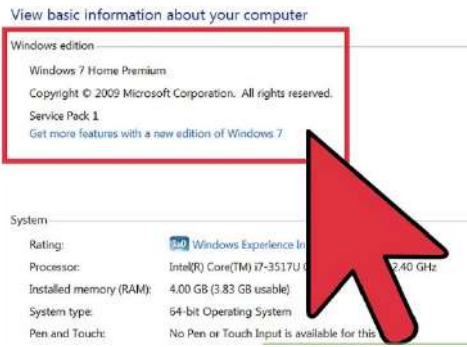
Remote Desktop


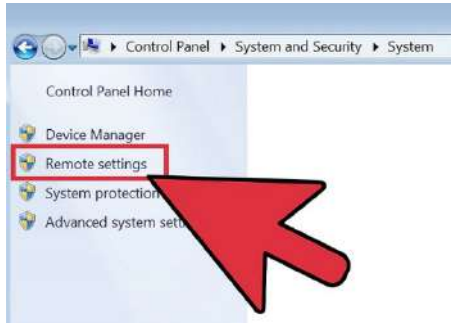
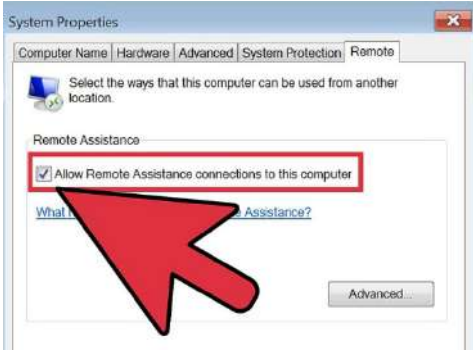
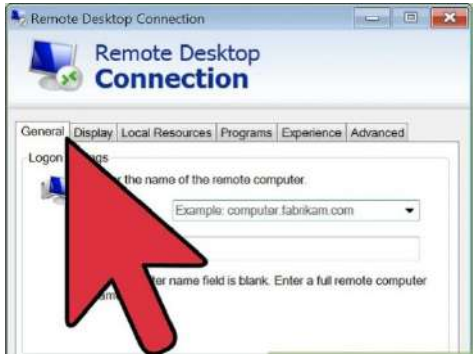
Remote desktop is a program or an operating system feature that allows a user to connect to a computer in another location, see that computer's desktop and interact with it as if it were local.

People use remote desktop access capabilities to do a variety of things, including the following:

- Access a workplace computer from home or when traveling
- Access a home computer from other locations
- Fix a computer problem
- Perform administrative tasks
- Demonstrate something, such as a process or a software application

Remote Desktop Connection Establishment

Steps	Images
<p>Double-check the version of Windows on the target computer. The computer receiving the connection from your Windows 7 computer should have one of the following operating systems installed:</p> <ul style="list-style-type: none"> • Windows 10 • Windows 8.1 (Professional or Enterprise) • Windows 7 (Professional, Home Premium Ultimate or Enterprise) 	 <p>View basic information about your computer</p> <p>Windows edition</p> <p>Windows 7 Home Premium Copyright © 2009 Microsoft Corporation. All rights reserved. Service Pack 1 Get more features with a new edition of Windows 7.</p> <p>System</p> <p>Rating: Windows Experience Index 7.0</p> <p>Processor: Intel(R) Core(TM) i7-3517U @ 2.40 GHz</p> <p>Installed memory (RAM): 4.00 GB (3.83 GB usable)</p> <p>System type: 64-bit Operating System</p> <p>Pen and Touch: No Pen or Touch Input is available for this device.</p>

Steps	Images
<p>Open the System control panel. Open the control panel and select “System and Security.” Click “System.”</p>	
<p>Click “Remote Settings.” This will open the System Properties panel.</p>	
<p>Allow connections from other computers. Toward the bottom of the panel, you'll see several options for Remote Desktop.</p> <ul style="list-style-type: none"> • Select “Allow connections from computers running any version of Remote Desktop” if you're not sure of the version of Windows installed on the system that will be making a connection • Select “Allow connections only from computers running Remote Desktop with Network Level Authentication” if both computers are running Windows 7. You'll only see this option on a Windows 7 computer, so don't panic if you don't see it in another version 	
<p>Click “Select Users.” You'll be brought to a screen where you can add a new user account.</p>	

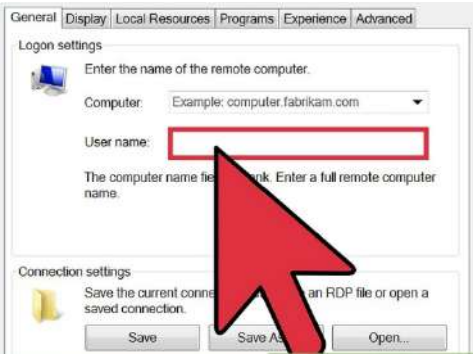

Steps	Images
<p>Click "Add." You can select any of the computer's existing user accounts by typing a username and clicking on "Check Names." Select the account you wish to use and click "OK."</p>	
<p>Click "OK." Remote Desktop is now enabled on the target system.</p>	

Table 4.1.4: Remote access

TeamViewer

TeamViewer is one of the best remote access control systems for computers. It's free for non-commercial home use, it has a pretty simple system of remote connection through its own servers. When we install this program on our computer or on the computer that we want to access, we will see that this program has a very simple interface divided into two columns: on the left we will see information of the computer and to the right - the access information of another computer.

VNC Viewer

In computing, Virtual Network Computing (VNC) is a graphical desktop sharing system that uses the Remote Frame Buffer protocol (RFB) to remotely control another computer. ... Multiple clients may connect to a VNC server at the same time.

Ammy Admin

Ammy (sometimes called AMMY) is a software company which created the remote desktop software called Ammy Admin. It is often used by scam artists who cold-call homes to try to gain access to their computer.

PC Lifecycle management tools

Preventive maintenance is a regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems. Preventive maintenance helps to prevent failure of parts, materials, and systems by ensuring that they are in good working order.

Preventive maintenance reduces the probability of hardware or software problems by systematically and periodically checking hardware and software to ensure proper operation.

Hardware:

Check the condition of cables, components, and peripherals. Clean components to reduce the likelihood of overheating. Repair or replace any components that show signs of damage or excessive wear.

Use the following tasks as a guide to create a hardware maintenance program:

- Remove dust from fan intakes
- Remove dust from the power supply
- Remove dust from components inside the computer
- Clean the mouse and keyboard
- Check and secure loose cables

Software:

Verify that installed software is current. Follow the policies of the organization when installing security updates, operating system updates, and program updates. Many organizations do not allow updates until extensive testing has been completed. This testing is done to confirm that the update will not cause problems with the operating system and software.

Use the tasks listed as a guide to create a software maintenance schedule that fits the needs of your computer equipment:

- Review security updates
- Review software updates
- Review driver updates
- Update virus definition files
- Scan for viruses and spyware
- Remove unwanted programs
- Scan hard drives for errors
- Defragment hard drives

Benefits:

Be proactive in maintaining computer equipment and protecting data. By performing regular maintenance procedures, you can minimize potential hardware and software problems. Regular maintenance routines help reduce computer downtime and repair costs.

A preventive maintenance plan is developed based on equipment needs. A computer exposed to a lot of dust, such as a construction site, requires more attention than a device in an office environment. High-traffic networks, such as school networks, may require additional scanning and removal of malware or junk files. Record the routine maintenance tasks that need to be performed on IT equipment and the frequency of each task. This task list can then be used to create a maintenance schedule.

The benefits of preventive maintenance are:

- Increased data protection
- Extended component life
- Increased equipment stability
- Reduced repair costs
- Reduced equipment failure bag

UNIT 4.2: Escalation Required for Remote Troubleshooting Tools

Unit Objectives

At the end of this unit, participants will be able to:

1. Analyse the correct level of escalation required for remote troubleshooting tools

4.2.1 The Correct Way of Escalation

Once you've decided to climb, it's important to do it expertly and expertly. Here are six tips for effectively reporting problems to your supervisor.

- You need to find the right person to talk to. Immediate superiors may not be the people they need, especially in a matrix organization.
- Elevate to an appropriate level of hierarchy in which there is one person with decision-making or intervention authority. Raising “too high” may result in your request being sent to a lower-level employee.
- Provide a brief summary of the problem and also indicate where to find detailed information. Don't assume that the people you're reporting to all have the necessary background information.
- Clearly state what you need. Leave no ambiguity. Be sure to say when you need it and the impact or consequences if the planned action is not taken in time.

Prioritization Guidelines for Service Requests

Priority is used to establish timescales, set deadlines, access TATS and effort to respond to and resolve an issue (Service Request). Priority is derived from an Impact and Urgency Priority Matrix.

- **Impact** - Measures the effect of a Service Request (For ex, Number of Customers Affected / Influenced by the Service Request).
- **Urgency** - Measures how long it will be until the Service Request has a significant impact on the business (For ex, the server may go temporarily down, if all employees request for e-mail password change on the same day).

Category	Description
High (H)	<ul style="list-style-type: none"> • A large number of staff are affected and / or not able to do their job without the Request getting closed. • A large number of customers are affected and /or acutely disadvantaged, without the Request getting closed. • The financial impact of the Incident is high. • The damage to the reputation of the business is likely to be high, in case the Request is not closed promptly.

Category	Description
Medium (M)	<ul style="list-style-type: none"> • A moderate number of staff are affected and / or not able to do their job without the Request getting closed. • A moderate number of customers are affected and /or acutely disadvantaged, without the Request getting closed. • The financial impact of the Incident is moderate. • The damage to the reputation of the business is likely to be moderate, in case the Request is not closed promptly.
Low (L)	<ul style="list-style-type: none"> • A minimal number of staff are affected and / or able to deliver an acceptable service but this requires extra effort. • A minimal number of customers are affected and / or inconvenienced but not in a significant way. • The financial impact of the Incident is minimal. • The damage to the reputation of the business is likely to be minimal.

Table 4.2.1: Request Impact Matrix

Category	Description
High (H)	<ul style="list-style-type: none"> • The effect of the Request aggravates and increases rapidly. • Work that cannot be completed by staff is highly time-bound. • A minor Request can be prevented from becoming a major Incident by acting immediately on it. • Several users with VIP status have requested for this service.
Medium (M)	<ul style="list-style-type: none"> • The damage caused by the Incident increases considerably over time. • A single user with VIP status has requested for this service.
Low (L)	<ul style="list-style-type: none"> • The damage caused by the Incident only marginally increases over time. • Work that cannot be completed by the Help Desk Attendants is not time sensitive.

Table 4.2.2: Request Urgency Matrix

		Impact		
		H	M	N
Urgency	H	1	2	3
	M	2	3	4
	L	3	4	5

Priority Code	Description	Target Response Time	Target Resolution Time
1	Critical	Immediate	1 Hour
2	High	10 Minutes	4 Hours
3	Medium	1 Hour	8 Hours
4	Low	4 Hours	24 Hours
5	Very low	1 Day	1 Week

Fig 4.2.1: Priority code and interpretation (Image courtesy: <https://wiki.en.it-processmaps.com>)

Steps involved in Prioritizing a Service Request

- Select a Service Request Priority by clicking the Priority drop-down magnifier to reveal the Priority Matrix (determined by invoked SLA) and then click a priority number.

Priority: 4

Impact / Urgency			
	High Impact request	Medium Impact request	Low Impact request
High Urgency request	1	2	3
Medium Urgency request	2	3	4
Low Urgency request	3	4	5

Service Request Priority Matrix

Fig 4.2.2: Service request priority matrix

- The priority is displayed in the Priority alert bar of the Quick Info Tile. The Priority bar displays the Incident or Service Request priority. The different priorities are colour coded as follows:

Priority: 1

Impact: High

Urgency: High

Priority: 2

Impact: Medium

Urgency: High

Priority: 3

Impact: Low

Urgency: High

Priority: 4

Impact: Medium

Urgency: Low

Priority: 5

Impact: Low

Urgency: Low

- After a priority is selected, respond by and resolve by target times are calculated based on the defined priority target times in the invoked SLA, and are then displayed in the SLA section of the Quick Info Tile.

Few Examples of Service Request Prioritization

Priority 1: High priority person(s) service request or activity with a strict deadline

Priority 2: Core office request for information for upcoming (but not as strict) deadline

Priority 3: Role request for ARS to complete job tasks

Priority 4: Request to add a new mailbox for new user (with an upcoming but not immediate deadline)

Priority 5: Information about a new service with no urgency specified

Two specific goals will be associated with all support service requests, which will help the ITIL system to access and monitor the ticketing and service claim processes. They are:

Response - time until a service request is specified in the service provider group. It is calculated by subtracting the case date/time assigned to the provider group from the case date/time assigned to an individual in the group.

Resolution - the time required to respond to the request. This is not the same as closing time, as the

case may remain open for several days after implementation to ensure that customer needs are met. It is calculated by subtracting the date/time the directory was created from the solution date/time stored in the directory.

Assistance Service Request Targets

Standard Service Requests are routine. The targets may vary by specific request type within a service. Also, these targets may need to be adjusted over time as technologies change and processes become more refined. Defined targets are as follows:

Response	Response
Resolve	5 business days

Requests for Password Resets are an exception, thus defining the targets as given below:

Response	10 minutes
Resolve	20 minutes

Summary

- Every process or wing must have a support material to resolve customers' issues
- The executives must refer to the supporting materials and consult it before providing any resolution
- Priority is used to establish timescales, set deadlines, access TATS and effort to respond to and resolve an issue (Service Request). Priority is derived from an Impact and Urgency Priority Matrix
- Customer retention is the activity that an organization undertakes in order to reduce customer defections
- Troubleshooting is a systematic approach to problem solving that is often used to find and correct issues with complex machines, electronics, computers and software systems
- Most of the time, problems can be fixed using simple troubleshooting techniques, like closing and reopening the program. It's important to try these simple solutions before resorting to more extreme measures
- Databases are enabling companies to use data to inform real-time decisions about their business as well as to use predictive analytics to make better informed, real-time decisions.

Exercise



Consider the following scenarios and evaluate the priority of the issues. After detecting the priority level of the issues, rearrange them from High to Low.

1. A system is affected by virus which has apparently zero impact on the productivity of the organization
2. The server room gets impacted owing to major fault. All the systems in the organization are vulnerable which associates the risk of data leakage
3. The power supply of a particular wing is damaged and thus the employees of that wing are unable to work
4. An employee has forgotten his password and raised a service request to resolve the issue.
5. The router of the workplace is not working fine and as a result the productivity of the employees is getting hampered.

Activity



Activity 1

- This activity is in the form of “Quiz Competition”
- The Trainer will divide the class into three groups viz. Group A, Group B and Group C
- The Trainer will conduct a quiz competition to evaluate the understanding of the topic
- The questions will be based on the troubleshooting steps as discussed in Unit 4.1
- There will be 10 points for correct responses and -5 for incorrect responses or no responses
- The group with highest point will be adjudged the winner.

Activity 2

- This activity is in the form of practical session
- The Trainer will take the Trainees to a computer lab and show different parts of a computer both hardware and software
- The Trainer must explain the functions of the parts and how to assemble or dismantle them
- The Trainees will take down important notes
- Now the Trainer will allocate a computer to the Trainees
- Each Trainee should come forward and explain various parts
- The Trainer will ask impromptu questions
- Best performers will be appreciated by the class.

Scan the QR codes or click on the link to watch the related videos



youtu.be/4nI95AxtbE4

Tools and Processes for Incident Management and Escalation Support

5. Deal Directly with IT Service Requests/ Incidents



IT - ITeS SSC
NASSCOM

Unit 5.1 - Technicalities of Service Requests/Incidents



Key Learning Outcomes

At the end of this module, participants will be able to:

1. List standard guidelines and scenarios for dealing with service requests/issues in your skill and authority level
2. Discuss the technical aspects of translation requests/issues Services beyond skill and authority level with experts

UNIT 5.1: Technicalities of Service Requests/Incidents

Unit Objectives

At the end of this unit, participants will be able to:

1. Discuss technical aspects of service request/incident beyond skill and authority level with experts
2. Present demonstrates error mitigation techniques related to access management, application installation, network settings, and more.
3. Build a documented solution of service requests/issues correctly
4. Create a confirmation process to capture that service requests/issues have been resolved

5.1.1 Design Suitability of Solutions/ Workarounds, for Handling Direct Service Requests

Account Access/Management Issues

Every organization loves to have secure systems. Setting a password is a fundamental action to prevent unauthorized access to the system. Password protect personal information stored in the system. This is the process of setting a password and username.

Set Password

1. Click the "Start" button. Click "Control Panel," and then click "Add or remove user accounts" under the section titled "User Accounts and Family Safety"
2. Click "Continue" if the User Accounts Control asks for permission to make the change
3. Click your account name in the list, and then click "Create a password"
4. Enter a password in the text bars. To create a strong password, create a combination of random letters, number and symbols that is at least eight characters long
5. Avoid using your name, your company's name, identifiable information such as your pet's name or a complete word
6. Type a password hint into the text bar, and then click "Create password"
7. Reboot your computer and log in to your account with your new password

Change Password

1. Open Control Panel
2. Click Add or remove user accounts
3. Click the account you want to change
4. Click Change the password

How to set or change your user Account Name?

1. Click the Windows Start Menu Orb and Type in user accounts then Select the User Accounts link from the list

2. Under your account, Click Change your account name
3. Type in a new name you would like to use from now on in Windows 7 and Click Change Name

Network/connection problems

Troubleshooting is a systematic approach to problem solving commonly used to find and resolve problems with machinery, electronic equipment, computers and complex software systems. The first step in troubleshooting is to gather information about the problem, such as unexpected behavior or expected lack of functionality.

Essential tools Network troubleshooting tools

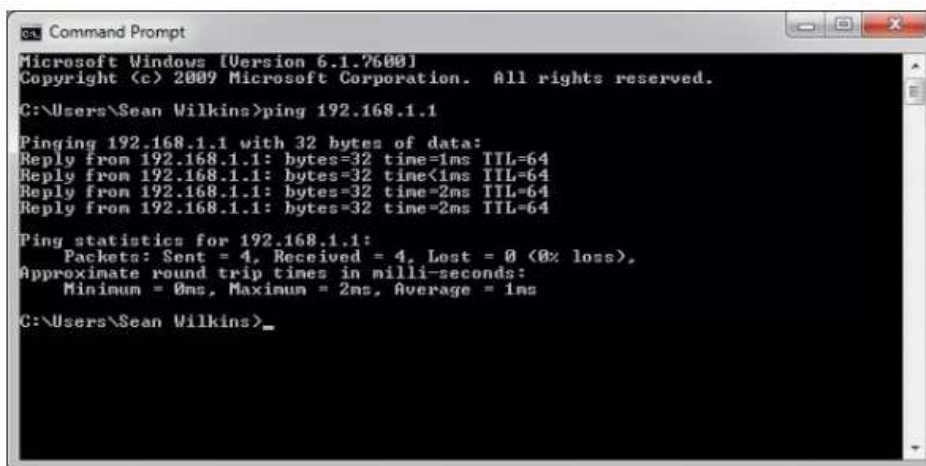
These are essential for any network administrator. When you are new to networking, it is important to accumulate a number of tools that can be used to troubleshoot various network conditions.

While it is true that the use of specific tools can be subjective and at the discretion of the engineer, the selection of tools in this article has been made on the basis of generality and commonality of them. This article reviews the top 10 basic tools that can help you solve most network problems.

1. Ping

The most commonly used network tool is the ping utility. This utility is used to provide basic connectivity testing between the requesting server and the destination server. This is done using Internet Control Message Protocol (ICMP) which is capable of sending an echo packet to a destination host and a mechanism to listen for a response from that server. Simply put, if the requesting server receives a response from the destination server, that server can be reached

This utility is often used to provide a basic picture of where a particular network problem might exist. For example, if the Internet connection is interrupted in the office, the ping utility can be used to determine if the problem exists in the office or in the Internet service provider's network.



```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Sean Wilkins>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 1ms

C:\Users\Sean Wilkins>_

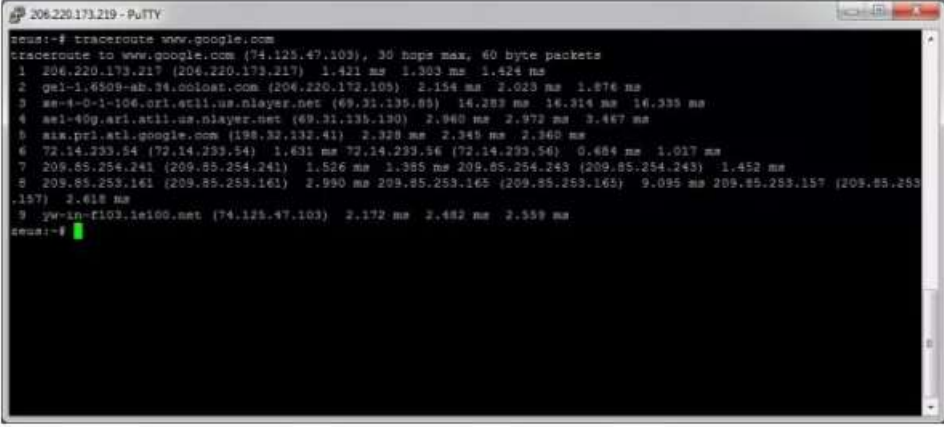
```

Fig 5.1.1: Ping sample

2. Tracert / Traceroute

In general, once the ping utility has been used to determine the underlying connection, the tracert / traceroute utility can be used to determine more specific path information to the machine purpose, including route. This is done by the packet and response times of these intermediate servers. Figure 2 below shows an example of the tracert utility used to find the path from a server inside the office to www.google.com. The tracert utility and tracing utilities perform the same function but run on different

operating systems, Tracert for Windows machines and tracing for Linux/UNIX machines.



```

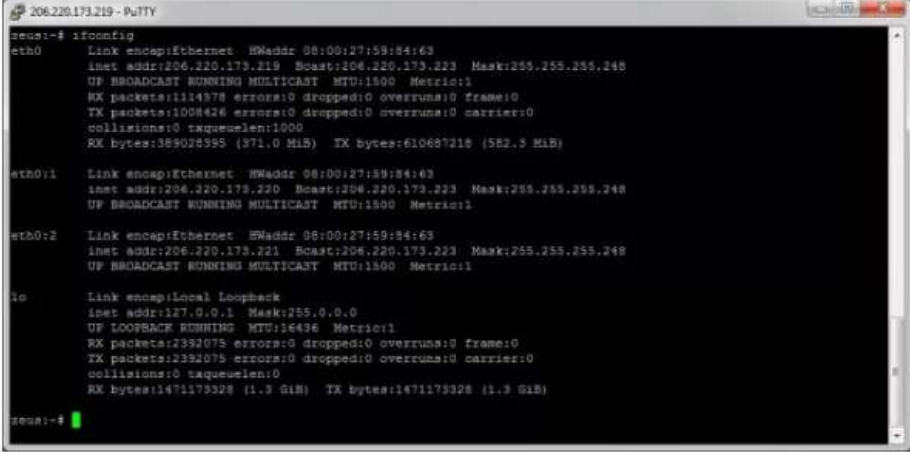
206.220.173.219 - PuTTY
sema:~$ traceroute www.google.com
traceroute to www.google.com (74.125.47.103), 30 hops max, 60 byte packets
 1 206.220.173.217 (206.220.173.217) 1.421 ms 1.303 ms 1.424 ms
 2 gel-1-6509-ab.34.coloast.com (206.220.172.105) 2.154 ms 2.023 ms 1.876 ms
 3 se-4-0-1-104.ari.atll.us.nlayer.net (69.31.135.88) 14.283 ms 14.314 ms 14.335 ms
 4 se1-409.ari.atll.us.nlayer.net (69.31.135.130) 2.980 ms 2.972 ms 3.467 ms
 5 s1x.pr1.atl.google.com (198.32.132.41) 2.328 ms 2.345 ms 2.360 ms
 6 72.14.233.54 (72.14.233.54) 1.631 ms 72.14.233.56 (72.14.233.56) 0.484 ms 1.017 ms
 7 209.85.254.241 (209.85.254.241) 1.526 ms 1.385 ms 209.85.254.243 (209.85.254.243) 1.452 ms
 8 209.85.253.161 (209.85.253.161) 2.990 ms 209.85.253.165 (209.85.253.165) 9.095 ms 209.85.253.157 (209.85.253.157) 2.618 ms
 9 yw-in-f103.1e100.net (74.125.47.103) 2.172 ms 2.482 ms 2.559 ms
sema:~$

```

Fig 5.1.2 Tracert sample

3. Ipconfig / Ifconfig

One of the most important things to do when troubleshooting a network is to know the specific IP configurations of the various servers involved. Sometimes this information is known when the addressing is configured statically, but when using dynamic addressing, the IP address of each server can change frequently. Utilities that can be used to find this IP configuration information include the ipconfig utility on Windows machines and the ifconfig utility on Linux/Unix machines.



```

206.220.173.219 - PuTTY
sema:~$ ifconfig
eth0      Link encap:Ethernet HWaddr 08:00:27:59:84:63
          inet addr:206.220.173.219 Bcast:206.220.173.223 Mask:255.255.255.248
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:1114978 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1008426 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:389028395 (371.0 MiB) TX bytes:610697218 (582.3 MiB)

eth0:1    Link encap:Ethernet HWaddr 08:00:27:59:84:63
          inet addr:206.220.173.220 Bcast:206.220.173.223 Mask:255.255.255.248
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth0:2    Link encap:Ethernet HWaddr 08:00:27:59:84:63
          inet addr:206.220.173.221 Bcast:206.220.173.223 Mask:255.255.255.248
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:2392075 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2392075 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1471179328 (1.3 GiB) TX bytes:1471179328 (1.3 GiB)

sema:~$

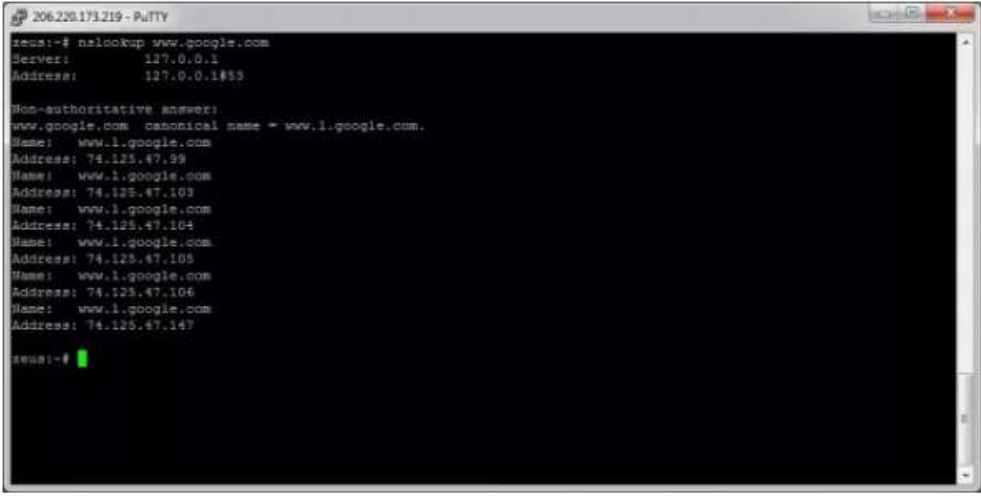
```

Fig 5.1.3 Ipconfig screenshot

4. Nslookup

Some of the most common network problems are related to Dynamic Name System (DNS) address resolution issues.

DNS is used by anyone using the Internet to resolve commonly known domain names (i.e. google.com) to generally unknown IP addresses (i.e. 74.125.115.15). When this system is down, most of the functions that people are used to will disappear, as there is no way to deal with this information. The nslookup utility can be used to look up specific IP addresses associated with domain names. If this extension does not resolve this information, then there is a DNS problem. In addition to a simple lookup, the nslookup utility can query specific DNS servers to identify problems with the default DNS server configured on the host.



```

206.220.173.219 - PuTTY
zeus:~# nslookup www.google.com
Server:      127.0.0.1
Address:     127.0.0.1#53

Non-authoritative answer:
www.google.com canonical name = www.l.google.com.
Name:   www.l.google.com
Address: 74.125.47.99
Name:   www.l.google.com
Address: 74.125.47.103
Name:   www.l.google.com
Address: 74.125.47.104
Name:   www.l.google.com
Address: 74.125.47.105
Name:   www.l.google.com
Address: 74.125.47.106
Name:   www.l.google.com
Address: 74.125.47.147

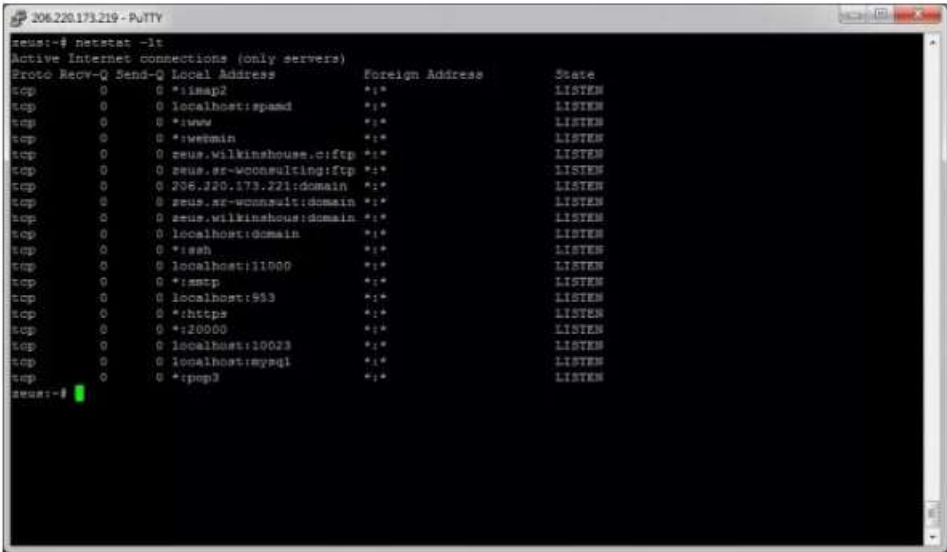
zeus:~#

```

Fig 5.1.4 Nslookup screenshot

5. Netstat

Usually one of the things to determine is the current state of active network connections on the server. This is very important information to learn for a number of reasons. For example, when checking the status of a listening port on a server, or to check and see which remote server is connected to the localhost on a particular port. The netstat utility can also be used to determine which services on the server are associated with specific active ports.



```

206.220.173.219 - PuTTY
zeus:~# netstat -lt
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:imap2           0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:spamd           0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:www             0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:vsftpd           0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:zeus.wilkinshouse.c:ftp 0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:zeus.sr-wconsulting:ftp 0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:206.220.173.221:domain 0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:zeus.sr-wconsult:domain 0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:zeus.wilkinshous:domain 0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:domain      0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:ssh                   0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:11000       0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:11000       0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:953         0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:https       0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:20000       0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:10023       0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:mysqld       0.0.0.0:*                 LISTEN
tcp        0      0 0.0.0.0:localhost:pop3         0.0.0.0:*                 LISTEN

zeus:~#

```

Fig 5.1.5 Netstat sample

6. IP Computers and Subnets

One of the most important tools in a junior network engineer's belt is the IP network calculator. They can be used to ensure correct IP address selection and with correct IP address configuration. Although this type of tool is used by senior network engineers, most of the information gained from this tool makes it easier to calculate how long and long you have experienced in the field this. Two of the most commonly used free IP calculators are the Wildpackets Network Calculator (Bitcricket) and the Solarwinds Advanced Subnet Calculator.

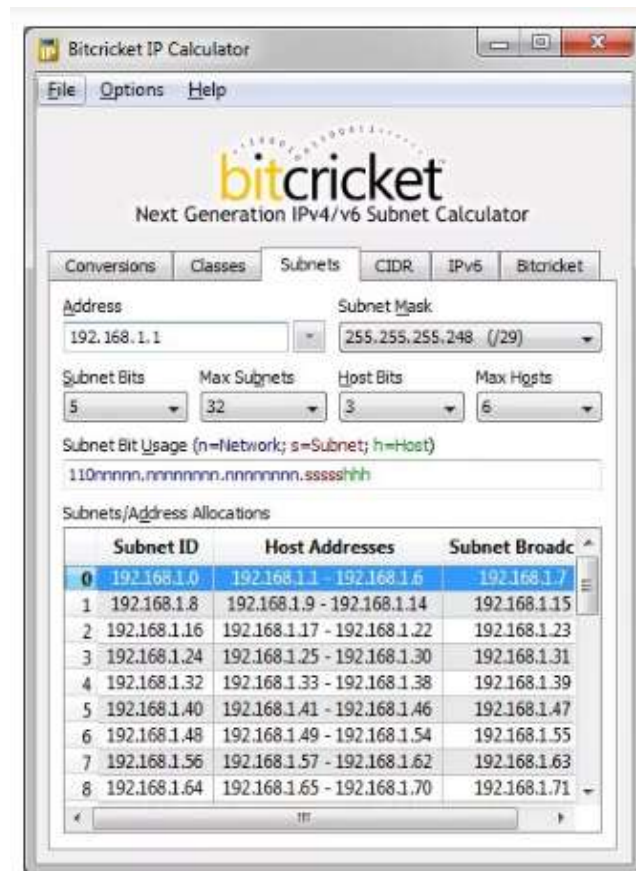


Fig 5.1.6 Subnet screenshot

7. Route

The final tool discussed in this article is the routing utility. This utility is used to display the current state of the routing table on the server. While the use of the routing utility is limited in common cases where the host has only one IP address with one port, it is important in other situations where there are multiple IP addresses and multiple ports.

Basic Troubleshooting for network problems

Due to the variety of network hardware, network configurations, operating systems, and configurations, all of the information below may not apply to your network or computer system you are operating.

Adapter resources

- ▷ Mice and other pointing devices
- ▷ Monitors
- ▶ Network adapters
 - ▷ Broadcom 802.11n Network Adapter
 - ▷ Broadcom NetLink (TM) Gigabit Ethernet
 - ▷ Microsoft Kernel Debug Network Adapter
- ▷ Print queues
- ▷ Processors

Fig 5.1.7 Adapter set-up

Verify that the network adapter is properly installed and detected by the computer with no conflicts. In Microsoft Windows, open the Device Manager and verify there are no errors. "Network adapters" should be present for each network adapter installed in the computer, similar to the example on the right.

Wired Network



Fig 5.1.8 LAN set-up

If this is a wired network, check that the network cable is properly connected and make sure that the light next to the network socket is lit correctly. For example, a network card with one or more solid green lights usually indicates that the card is connected or receiving a signal. If the green light is blinking, it indicates that data is being sent or received. The image on the right is an example of a LAN port with two LEDs next to the RJ-45 port. With this port, one LED will light if connected properly and the other will blink when transferring data.

If there is no LED, or if the LED is amber or red, the card may be faulty, improperly connected, or not receiving a signal from the network. If you are on a small network or LAN and have the ability to test a hub, switch or router, check that the cables are properly connected and powered on. If, after checking the connections, the lights appear incorrect, the network adapter, port, or cable may be faulty.

Wireless Network

Laptop Wi-Fi button



Laptop Wi-Fi Function Key

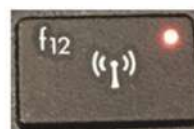


Fig 5.1.9 Wireless set-up

If you're using a laptop with a wireless network, find the laptop's Wi-Fi button and make sure it's turned on. Many laptops have a Wi-Fi button to turn the wireless network on and off. The Wi-Fi button is usually located just above the keyboard or on the front edge of the laptop, but it can also be integrated into the F key. The image on the right is an example of the Wi-Fi and Wi-Fi buttons - Fi. On the F key is on.

If the button is enabled, make sure you're using the correct Wi-Fi hotspot by right-clicking the Network icon in the Windows notification and clicking "Connect to Network". Usually the network with the strongest connection (most bars) will be your wireless router.

Finally, when connecting to most wireless networks, you must enter the correct SSID password to connect to the network. If you enter the wrong password, you will not be able to access the network.

Adapter Functionality

Verify that the network card is capable of pinging itself by using the ping command. Windows users can ping the computer from a Windows Command Line Unix and Linux users can ping from the shell.

To ping the card or the local host, type either of the following commands:

```
ping 127.0.0.1
```

or

```
ping localhost
```

Fig 5.1.10 Adapter set-up

Connect to the Router

If all of the above steps have been checked, and your network has a router, make sure the computer can connect to the router by performing the below commands.

Determine the Routers Address

Using the ipconfig command (or ifconfig command for Linux), determine the router's address by looking at the Gateway address. Below are the steps for Microsoft Windows users. Linux users can substitute ipconfig for ifconfig.

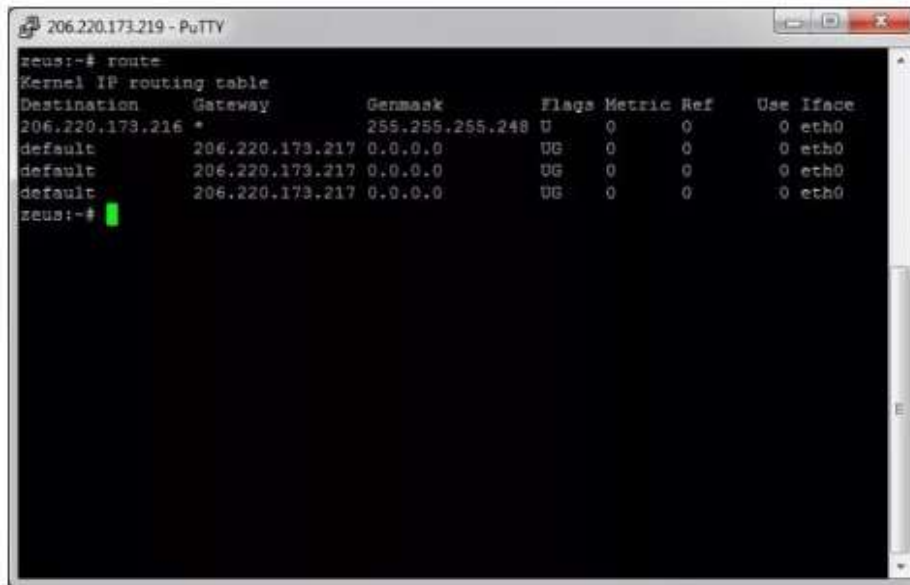
1. Open the Windows command line
2. At the command prompt, type ipconfig and press Enter. You should see output similar to the example below.

The Default Gateway is the address of your router. Most home routers have a gateway address that starts with 192.168, like the address shown above. Assuming your gateway address is 192.168.1.1, attempt to ping the router to see if it can send and receive information by running the below command.

ping 192.168.1.1

- If you get replies back from the router, the connection between your router and computer are good, and you can skip to the next step.
- If you do not receive any replies back from the router, either the router is not set up properly, or your connection between the router and the computer is not correct. Reset your router to make sure it is not a problem with your router by following the steps below.
 1. Turn off the power to the computer and leave it off.
 2. Unplug the power to your router and cable modem or DSL modem.\
 3. Leave the power cables disconnected for 10-15 seconds and then plug in your modem and then your router again.
 4. Finally, turn on your computer again and repeat this step to see if you can ping your router.

If you have a wireless network and followed the above steps, but cannot ping the router, turn the computer off again and connect the computer to the router using a network cable instead of wirelessly. If a wire also does not work, contact the manufacturer of the router for additional support or replacement.



```

206.220.173.219 - PuTTY
zeus:~# route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
206.220.173.216 * 255.255.255.248 U 0 0 0 eth0
default 206.220.173.217 0.0.0.0 UG 0 0 0 eth0
default 206.220.173.217 0.0.0.0 UG 0 0 0 eth0
default 206.220.173.217 0.0.0.0 UG 0 0 0 eth0
zeus:~#

```

Fig 5.1.11 Router ping set-up

Hardware Problems

Most of the time, problems can be fixed using simple troubleshooting techniques, like closing and reopening the program. It's important to try these simple solutions before resorting to more extreme measures. If the problem still isn't fixed, you can try other troubleshooting techniques.

- **Power Button Will Not Start Computer:**

Solution 1: If the computer won't start, check the power cord first to make sure it's securely plugged into the back of the computer case and into the power outlet.

Solution 2: If it is plugged into an outlet, make sure it is a working socket. To test the outlet, plug in another electrical device, such as a light.

Solution 3: If the computer is plugged into a surge protector, verify that the power is turned on. This may require resetting the surge arrester by turning it off and then back on. You can also plug a light or other device into the surge arrester to verify that it's working properly.

Solution 4: If you are using a laptop, the battery may not be charged. Plug the AC adapter into the wall and then try to turn on the laptop. If it still won't start, you may need to wait a few minutes and try again.

- **All Programs on The Computer Run Slowly:**

Solution 1: Run a virus scanner. You may have malware running in the background that is slowing things down.

Solution 2: Your computer may be running out of hard drive space. Try deleting any files or programs you don't need.

Solution 3: If you're using a PC, you can run Disk Defragmenter.

- **The Computer Is Frozen:**

Solution 1 (Windows only): Restart Windows Explorer. To do this, press and hold Ctrl+Alt+Delete on your keyboard to open the Task Manager. Next, locate and select Windows Explorer from the

Processes tab and click Restart. You may need to click MoreDetails at the bottom of the window to see the Processes tab.

Solution 2: Press and hold the Power button. The Power button is usually located on the front or side of the computer, typically indicated by the power symbol. Press and hold the Power button for 5 to 10 seconds to force the computer to shut down.

Solution 3: If the computer still won't shut down, you can unplug the power cable from the electrical outlet. If you're using a laptop, you may be able to remove the battery to force the computer to turn off.

- **The Screen Is Blank:**

Solution 1: The computer may be in sleep mode. Click or press any key on the keyboard to wake it up.

Solution 2: Make sure the monitor is plugged in and turned on.

Solution 3: Make sure that the computer is plugged in and turned on.

Solution 4: If you are using a desktop computer, make sure the display cable is properly connected to the computer tower and the monitor.

The Mouse or Keyboard Has Stopped Working:

Solution 1: If you're using a wired mouse or keyboard, make sure it's correctly plugged into the computer.

Solution 2: If you're using a wireless mouse or keyboard, make sure it's turned on and that its batteries are charged.

- **The Sound Isn't Working:**

Solution 1: Check the volume level. Click the sound button in the upper right or lower right corner of the screen to make sure the sound is on and the volume is loud.

Solution 2: Check the audio player controls. Many audio and video players will have separate audio controls. Make sure to turn on the sound and increase the volume in the player.

Solution 3: Check the cables. Make sure that external speakers are plugged in, turned on, and connected to the correct audio or USB port. If your computer has color-coded ports, the audio-out port will usually be green.

Solution 4: Connect the headset to the computer to see if you can hear the sound through the headset.

Operating System Problems

Memory management is a function of the operating system that manages or manages main memory and moves processes between main memory and disk during execution. Memory management keeps track of every memory location, whether allocated to a process or free. It checks how much memory to

allocate to processes. It decides which process gets the memory when. It keeps track of whenever some memory is freed or unallocated and accordingly it updates the state.

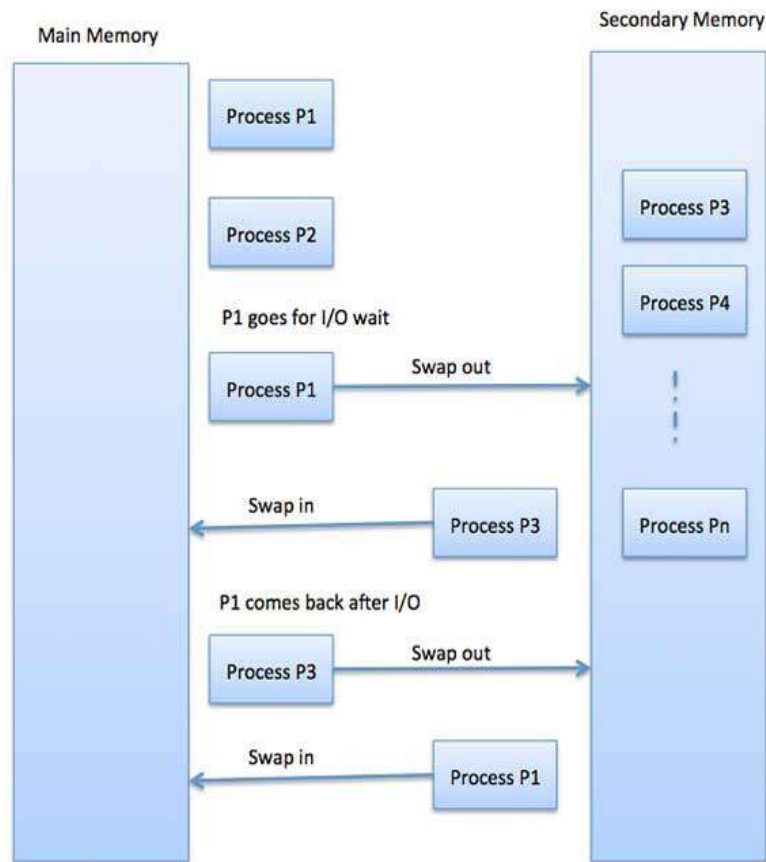


Fig 5.1.12: Memory management for OS

Swapping

Swapping is a mechanism by which a process can be temporarily moved out of main memory (or moved) to secondary memory (disk) and make that memory available to other processes. The system then switches the process back from secondary memory to main memory.

Although performance is often affected by swapping, it helps to run many large and large processes in parallel and this is why swapping is also known as memory compression technique.

The total execution time of the swap includes the time it takes to move the entire process to the secondary disk and then copy the process to memory, as well as the time it takes the process to get back to main memory.

Assuming the user process is 2048 KB in size, and on the standard hard disk where the swap will take place, there is a data transfer rate of about 1 MB per second. The actual process will transfer 1000K to or from memory.

$$\begin{aligned}
 &2048\text{KB} / 1024\text{KB per second} \\
 &= 2 \text{ seconds} \\
 &= 2000 \text{ milliseconds}
 \end{aligned}$$

Now considering in and out time, it will take complete 4000 milliseconds plus other overhead where the process competes to regain main memory.

Memory Allocation

Main memory usually has two partitions –

- Low Memory – Operating system resides in this memory
- High Memory – User processes are held in high memory

Operating system uses the following memory allocation mechanism.

S.N.	Memory Allocation & Description
1	<p>Single-partition allocation</p> <p>In this type of allocation, relocation-register scheme is used to protect user processes from each other, and from changing operating-system code and data. Relocation register contains value of smallest physical address whereas limit register contains range of logical addresses. Each logical address must be less than the limit register.</p>
2	<p>Multiple-partition allocation</p> <p>In this type of allocation, main memory is divided into a number of fixed-sized partitions where each partition should contain only one process. When a partition is free, a process is selected from the input queue and is loaded into the free partition. When the process terminates, the partition becomes available for another process.</p>

Fragmentation

As processes are loaded and removed from memory, the free memory space is broken into little pieces. It happens after sometimes that processes cannot be allocated to memory blocks considering their small size and memory blocks remains unused. This problem is known as Fragmentation.

Fragmentation is of two types –

S.N.	Fragmentation & Description
1	<p>External fragmentation</p> <p>Total memory space is enough to satisfy a request or to reside a process in it, but it is not contiguous, so it cannot be used.</p>
2	<p>Internal fragmentation</p> <p>Memory block assigned to process is bigger. Some portion of memory is left unused, as it cannot be used by another process.</p>

The following diagram shows how fragmentation can cause waste of memory and a compaction technique can be used to create more free memory out of fragmented memory –

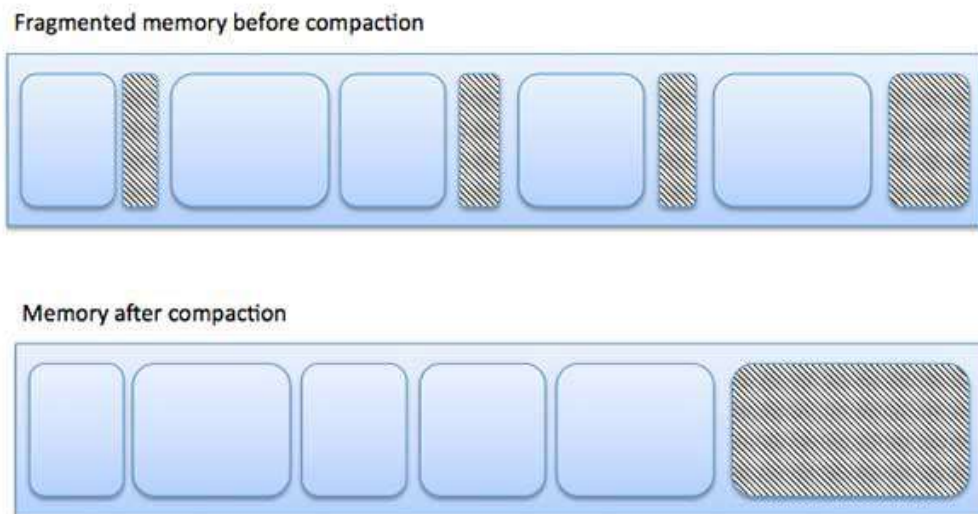


Fig 5.1.13 Memory Fragmentation

External fragmentation can be reduced by compaction or shuffle memory contents to place all free memory together in one large block. To make compaction feasible, relocation should be dynamic.

The internal fragmentation can be reduced by effectively assigning the smallest partition but large enough for the process.

Voice, Telephone or Video-Related Problems

Voice, telephone or video related problems occur due to hardware malfunction.

- Video or the display is dependent on the Video Graphics card of the system. The VGA card is placed in the motherboard within the CPU. Monitor, which is the video output or the display unit of the system is connected to the VGA port via VGA cable. Video or display gets distorted if either of the VGA cable or VGA port is faulty. Check the port and cable before replacing or troubleshooting
- Voice, like video, is also dependent on the sound card which is present in the motherboard. However, voice or audio may be input or output. For example, if someone is recording audio using mic/ telephone, then it is considered as input. On the contrary, sound or audio of music or movies is output. Both of them are connected to the motherboard through two different cables. To troubleshoot voice related issues, the first things to examine are sound card and cables. However, for both video and audio, if the motherboard is damaged, functioning cables, ports or cards will not work properly

Database Problems

Databases are enabling companies to use data to inform real-time decisions about their business as well as to use predictive analytics to make better informed, real-time decisions. Here are three of the biggest challenges, as well as the solutions for each.

1. Unstructured Growth of Data

As companies have started to gather more and more data, they've often seen that data being stored or used in ways they didn't quite expect.

Some of them put it into databases that aren't actually designed to reference it, while others fail to properly organize it in a way that makes it useful. A few unlucky companies have even run out of storage space, rendering them unable to continue acquiring data.

This kind of unstructured growth represents a fundamental flaw in the company's database design—if your system can't adequately handle all of the data its being given, then quite frankly, it's not good enough.

Solution:

A redesigned, all-in-one database designed to handle and store new kinds of information—even when it's not expected. This kind of future-proofing allows a company to immediately begin collecting and using certain kinds of data when they realize they need it.

2. Unsecured Databases

Along with the sprawling growth of systems, many companies have seen that their data—and more importantly, their customers' data—isn't as secure as it ought to be. Every additional system and piece of software is fundamentally a vulnerability that hackers could exploit to gain access to the network, and most add-ons aren't nearly as secure as the main database.

Solution:

Rather than being stored in disparate "silos," all information should be contained in one central location, with a single point of entry that can be used to stop unauthorized access. If your previous system was built well for its time, it may be possible to simply add the new security measures—otherwise, a new database may be necessary.

3. Finding Qualified Database Administrators

A database administrator (DBA) is an individual charged with overseeing the company's database system on every level. This includes everything from deciding when to replace it to being responsible for its security... and quite frankly, people with the right skills for the job are hard to find.

Fundamentally, a DBA needs to have enough technical expertise to understand the system and enough management skill to be put in charge of managing one of the core parts of the company's operations. Furthermore, since database designs can vary so widely, there's no guarantee anyone with the perfect skill set is walking around.

5.1.2 Construct a Documented Resolution of Service Requests/Incidents Accurately

Document exactly how problems are resolved using your organization's incident management tools

- Start the process with the most common requests. Choose things that are simple and easy to accomplish. This provides immediate value to the customer. It allows the service desk team to learn as they build future phases of the service portfolio
- Record all requirements of a service request before adding it to the catalog. These include question data, approval process, execution process, implementation team, process owner, SLA, reports, and more. This allows the IT team to better manage the type of request over time
- Capture the data needed to initiate a request response. But don't overload the customer with too many questions. Work with stakeholders to standardize the approval process, where possible. For example, pre-approve all requests for new screens. Or assign software approvals to customer managers.
- Record all knowledge base information that can help customers meet their own requirements. Save

this to the associated Confluence space. If you do, customers can view articles while they search your portal. Learn more about building a knowledge base

- Evaluate your team's performance in handling requests. Tailor your SLAs, requirements, and training to improve customer satisfaction. Generate reports to facilitate and manage the lifecycle of a service request offer.

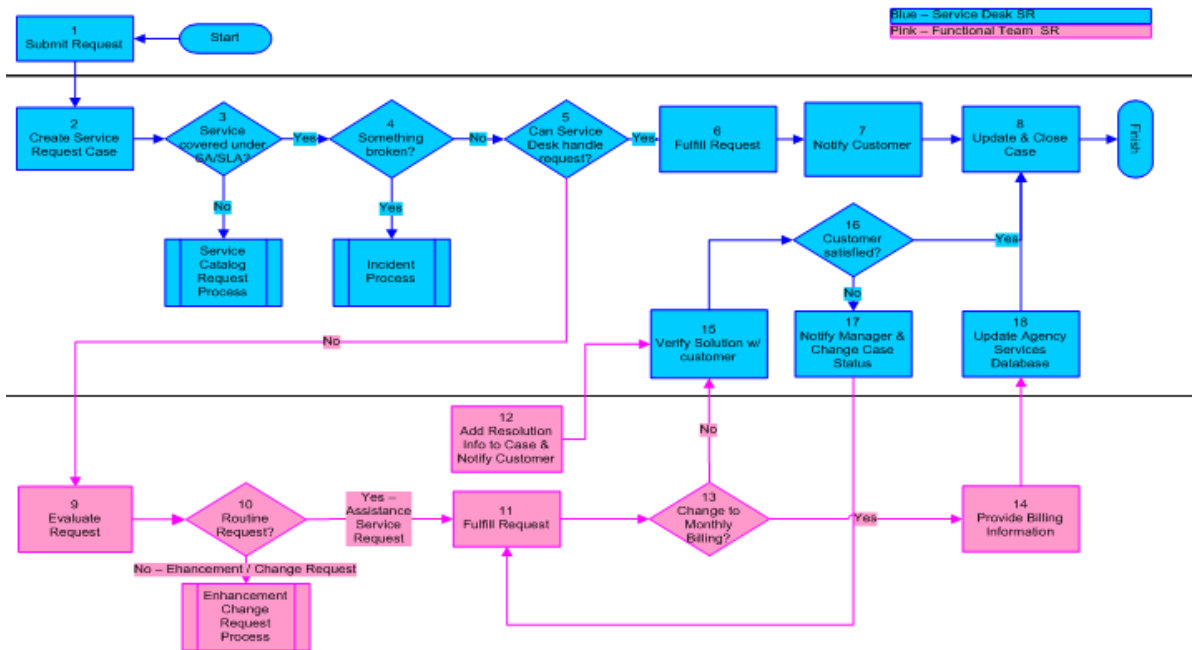


Fig 5.1.14: Service request management workflow
(Image courtesy: The Open Software Forum or OSF)

Summary

- Every process or wing must have a support material to resolve customers' issues
- The executives must refer to the supporting materials and consult it before providing any resolution
- Priority is used to establish timescales, set deadlines, access TATS and effort to respond to and resolve an issue (Service Request). Priority is derived from an Impact and Urgency Priority Matrix
- Customer retention is the activity that an organization undertakes in order to reduce customer defections
- Troubleshooting is a systematic approach to problem solving that is often used to find and correct issues with complex machines, electronics, computers and software systems
- Most of the time, problems can be fixed using simple troubleshooting techniques, like closing and reopening the program. It's important to try these simple solutions before resorting to more extreme measures
- Databases are enabling companies to use data to inform real-time decisions about their business as well as to use predictive analytics to make better informed, real-time decisions.

Exercise

Fill in the blank columns with appropriate responses:

Name of the Component	Uses
Motherboard	
	It is the video output of the system
Keyboard	
Processor	
	It enables the PC to generate complex sounds
Memory	

Activity

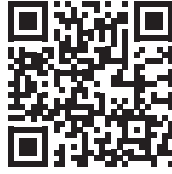
Activity 1

- In this session, the Trainer will divide the class into few groups
- The Trainer will take the Trainees to a computer lab where they will be given their topics on Common problems in the IT Field and Solutions
- Each group will be given a specific topic on which they have to work.
- The 1st group will work on Accounts related issues
- The 2nd group will work on Operating System related issues
- The 3rd group will work on Database related issues
- The teams will get 20 minutes to complete their given work
- The Trainees must work with essential tools and use the methods as discussed to resolve respective issues
- The trainer will take 10 minutes to evaluate the work of Trainees
- The team that can complete their given work with finesse will be appreciated with accolades.

Activity 2

- This activity is in the form of “Hands On”
- The Trainer will take the Trainees to the lab where they will work on Network Infrastructure
- The Trainer will first demonstrate the process of connecting systems using both LAN and Wireless devices
- The Trainees will observe the procedure and take down the steps as shown by the Trainer
- After the demonstration, the Trainer will ask if anyone has any doubt
- Post that, the Trainer will ask each Trainee to perform the same
- The Trainer will supervise the entire session and will guide the Trainees accordingly
- The best performers will be appreciated by the class.

Scan the QR codes or click on the link to watch the related videos



youtu.be/U5X4Mx1EHRw

Technicalities of Service Requests

6. Technical Skills for Handling Incidents



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Unit 6.1 - Mechanism of Source Coding Standards, Ticketing Tools and Utilities/Tools



Key Learning Outcomes

At the end of this module, participants will be able to:

1. Discuss how to store and retrieve information related to service requests
2. List the latest changes, procedures, and practices in incident management process

UNIT 6.1: Mechanism of Source Coding Standards, Ticketing Tools and Utilities/Tools

Unit Objectives

At the end of this unit, participants will be able to:

1. Evaluate the mechanism of source coding standards, ticketing tools and utilities/tools for handling service requests
2. Deploy information technology effectively to input and/or extract data

6.1.1 Evaluate the Mechanism of Source Coding Standards, Ticketing Tools and Utilities/Tools for Handling Service Requests

Identifying and evaluating new solutions and making important decisions based on them can be explained using tools and techniques such as cause-and-effect analysis. Cause-and-effect analysis was devised in the 1960s by Professor Kaoru Ishikawa, a pioneer in the field of quality management. The technique was later published in his legendary book, "Introduction on Quality Control".



Fig 6.1.1: Prof. Kaoru Ishikawa, Founder of the Cause-Effect Analysis

The most popular tools used for Cause-Effect Analysis and Quality Control are:

- Fishbone Diagram
- Decision Tree

Fishbone Diagram

The complete Fishbone Diagram resembles the skeleton of a Fish, hence, the name. The functions of the Fishbone Diagram are to:

- Discover the root cause of a Problem
- Identify and eliminate the bottlenecks in your processes
- Identify where and why the process is not working

Fishbone Diagrams are generally worked right to left, with each large "bone" of the fish branching out to include smaller bones containing more detail. Fishbone Diagrams are used in the "analyse" phase of Six Sigma's DMAIC (Define, Measure, Analyse, Improve, and Control) approach to problem solving.



What is the problem?	What data is available?	What are the root causes of the problem?	Do we have the right solutions?	What do we recommend?
What is the scope?	Is the data accurate?	Have the root causes been verified?	How will we verify the solutions work?	Is there support for our suggestions?
What key metric is important?	How should we stratify the data?	Where should we focus our efforts?	Have the solutions been piloted?	What is our plan to implement?
Who are the stakeholders?	What graphs should we make?	What clues have we uncovered?	Have we reduced variation?	Are results sustainable?

Fig 6.1.2: Fishbone Diagram

Image courtesy: <https://supplychainlogistics.wordpress.com>

The steps involved in constructing a fishbone diagram are:

1. Create the head, hint to the problem or research question
2. Create the backbone of the fish (the line leading to the head).)
3. Identify at least four "causes" that contribute to the problem. Connect these four causes with arrows to the spine. These will form the first bones of the fish
4. Think around each "cause" to record what contributed to that cause. Use the 5 Whys or another questioning process like the 4Ps (Policies, Procedures, People, and Plants) to keep the conversation focused
5. Continue to break down each cause until identified. Identify the root cause

Decision Tree

The Decision Tree is a flowchart-like diagram that shows the various outcomes from a series of decisions.

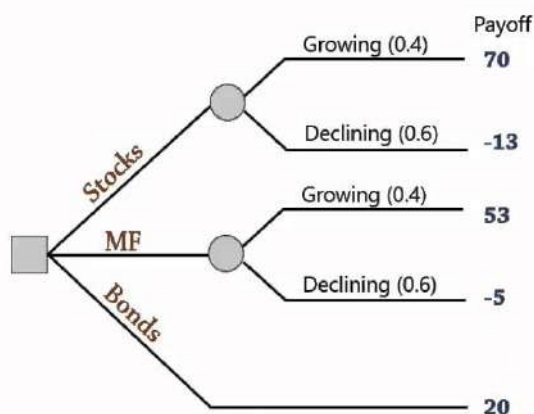
It can be used as a decision-making tool, for research analysis, or for planning strategy. It is very easy to understand.

Decision trees have three main parts:

- Root Node
- Leaf Nodes
- Branches

The root node is the starting point of the tree, and the root and leaf nodes contain questions or criteria that must be answered. Branches are arrows connecting nodes, showing the flow from question to answer. Each node usually has two or more nodes extending from it. For example, if the first node's question asked for a "yes" or "no" answer, there would be a leaf node for a "yes" answer and another for a "no". Decision trees can be used either predictively or descriptively. In both cases, they are constructed in the same way and are always used to visualize all possible outcomes and decision points in chronological order. Decision trees are most commonly used in the financial world for areas such as loan approval, portfolio management, and spending. Decision trees can also be useful when looking at the viability of a new product or identifying new markets for an existing product.

Decision Tree



Alternatives	Growing	Declining
Stocks	70	-13
Mutual Funds	53	-5
Bonds	20	20
Probability	0.4	0.6

Fig 6.1.3: Decision Tree (Image courtesy: <https://www.youtube.com>)

The steps involved in constructing a Decision Tree are:

- 1. Start the tree:** Draw a rectangle near the left edge of the page to represent the first node. In this rectangle, write the first question, main idea, or criterion that will lead to a decision
- 2. Add branches:** For every possible alternative draw a separate line that begins at the node and moves away toward the right of the page. Using a loan approval process as an example, the first node may have been "Income", and the associated branches might be <\$50K, \$51K - \$100K, >\$101K
- 3. Add leaves:** The bulk of the decision tree will be leaf nodes. At the end of each branch add a leaf node. Fill each of these leaf nodes with another question or criterion

4. **Add more branches:** Repeat the process of adding a branch for each possible alternative leading from a leaf. Label each branch just as before
5. **Complete the Decision Tree:** Continue adding leaves and branches until every question or criterion has been resolved and an outcome has been reached
6. **Terminate a branch:** Continue adding leaves and branches until every question or criterion has been resolved and an outcome has been reached
7. **Verify accuracy:** Consult with all stakeholders to verify accuracy

Case Study: Identify methods and importance of data configuration for disseminating relevant information

Suppose Rohit is an IT Helpdesk Attendant entry level employee at ABC Pvt. Ltd. He receives 15 service requests on an average daily. Most of them are related to hardware and software malfunction. This fall inside the competence level of Rohit and he investigates the issues and resolves those without escalating.

One day, he receives a Service Request from an employee asking him to install an application which is unauthorized. However, the employee describes the usability of the application in details. Installing and configuring the app will enhance the productivity and will save more time. Now, Rohit cannot blatantly deny the prospect of installing the app as it is unauthorized. What should Rohit do?

The best practice will be to ask his immediate boss first. In most of the cases, asking the team lead is a good approach. However, if the team lead has no solution for the same, Rohit should escalate the issue to the higher authority with the permission of his team lead. Raising such an escalation will keep everyone on the same page. The employee who has raises the service request will not feel left out as well. If the management thinks that installing such an application is necessary, they will let the IT department know that. If the management gives a green signal, Rohit should go ahead and install the app. Rohit should not make any decision regarding an issue which falls outside his competency level.

Summary

- Identifying and evaluating new solutions and making important decisions on the basis of those, can be explained with the help of tools and techniques like Cause - Effect Analysis
- Cause and Effect Analysis was devised by Professor Kaoru Ishikawa, a pioneer of quality management, in the 1960s
- The technique was then published in his legendary book, "Introduction to Quality Control"
- The most popular tools used for Cause-Effect Analysis and Quality Control are:
 - Fishbone Diagram
 - Decision Tree
- The steps involved in constructing a Fishbone diagram are:
 - Create a head, which enlists the problem or issue to be studied
 - Create a backbone for the fish (straight line, which leads to the head)
 - Identify at least four "causes" that contribute to the problem. Connect these four causes with arrows to the spine. These will create the first bones of the fish

Exercise



Fill in the blank columns with appropriate responses:

1. System Alert Management was devised by Professor Kaoru Ishikawa.
2. The Decision Tree is a flowchart-like diagram that shows the various outcomes from a series of decisions.
3. Decision Trees are used in the "analyse" phase of Six Sigma's **DMAIC**.
4. Fishbone Diagrams are generally worked from left to right.
5. A decision tree can be used in either a predictive manner or a descriptive manner.

Activity



- This activity is based on "Cause-Effect Analysis"
- The Trainer divides the class into few teams, depending on the batch strength
- Each team will have an even number of Trainees
- The Trainer will instruct the Trainees that each of the teams must prepare a fishbone diagram and a decision tree for Cause-Effect analysis
- After the team of Trainees create the same, they will submit it to the Trainer
- The Trainer will evaluate the submissions and select the best one
- The Trainer will show the appreciated submission in front of the class
- The most extensive and detailed list shall be appreciated with accolades.

Scan the QR codes or click on the link to watch the related videos



youtu.be/-NxLacqn1T8

Technical Skills for Handling Incidents

7. Process of Database Management



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Unit 7.1 - Rule-Based Analysis



Key Learning Outcomes

At the end of this module, participants will be able to:

1. Design the appropriate data/information that needs to be provided, the formats in which it should be provided
2. Discuss the purpose and specifics of CRM database for extracting information

UNIT 7.1: Rule-Based Analysis

Unit Objectives

At the end of this unit, participants will be able to:

1. Examine outcome of rule-based analysis of data/information for database management
2. Compile documentation of the data/ information into requisite formats

7.1.1 How to Carry Out Rule-Based Analysis on the Data/Information

Real-world rule-based learning involves decision-making or conditional ramifications. It is a methodological production design, the basis of which lies in the software element - analyzing techniques to make the right decision for a new project.

In this rule we will find the presence of three or more conditions such as pseudocode or if statement. The performance requirement is an adaptation of the rule engine solution.

Process of Application

1. Select the input variables

As there are many variables present in a new project, creation of a matrix is essential between methodologies and factors. We can see the presence of factors in methodologies.

2. Bad Sub Rules

There are certain types of factors that cannot be connected with other types of factors. If they are combined, this step cannot lead to the creation of bad sub rules. In this case, two rule categories are recognised. They are:

- System rules with high requirement stability, low complexity and small size system
- System rules with low requirement stability, medium complexity and size system

3. Variable Reduction

These factors are identified but their elimination doesn't make any impact. These generally comprise application domain and project type.

4. Category Merge

For methodology identification, formation of many categories takes place and its foundation can be on project type.

5. Hypothetical Examples

We can see the beginning of hypothetical example sets if we look at extreme cases. The rule-based analysis is based on the acknowledgment of factors like less complexity, high requirement stability, and small size.

Who to contact in case of incorrect data/information and how to report it

Hierarchy in an organization usually involves a single group/power at the top with successive levels of power outside below. It is the main mode of organization among large organizations; most business, government, and organized religions are hierarchical organizations with varying levels of management and power or authority.

Compile documentation of the data/ information into requisite formats

Before starting any new process, it is important that an IT Helpdesk Attendant has a proper briefing of the process. Additionally, it is also significantly important that he or she is given all the data, required materials and their sources.

The required information involves:

- Collecting essential requirements and analysis of those
- Any specific implementation procedure
- The client/s requirements
- Software related to the new process

Sample is the standard format for recording observations. Observation covers different aspects of the business. Model type or key parameters vary depending on the part. For example, the model used by a company's transportation department must be radically different from that of the engineering department that handles operations.

The information provided in the form is used for performance evaluation.

- **Case Studies**

This method basically maintains that the information that is collected is based on the experience of the clients.

- **Focus Groups**

This data or information method is reliant on group discussions with in-depth topic assessment. This can be about marketing tactics, evolutionary aspects related to data, their sources, and searches, codes, programming languages or even any form of bugs.

7.1.2 Deliver Complete, Accurate and Up-To-Date Data/Information for Review

Perform validation and updating of data into database, once approved

Every project has a stipulated timeline. A project commences with setting a goal followed by other aspects like developing, testing, and quality analysis and final deployment.

Set-up Goals

Every stage has its own format where information has to be filled in precisely. A project goal template must be implemented and details must be filled in regularly. A sample format is given below:

PROJECT GOAL AND OBJECTIVES WORKSHEET

PROJECT NAME		PROJECT MGR.	
DATE CREATED		VERSION NO.	0.0.0
TEST GOALS & OBJECTIVES AGAINST SMART CRITERIA SPECIFIC • MEASURABLE • ACHIEVABLE • RELEVANT • TIME-BOUND			
GOAL STATEMENT			
OBJECTIVE NO.	An objective should look like this: "To increase the native plants between 1st and 3rd Streets by 50% by March 31st."		
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Fig 7.1.1: Project goal template

Summary

- The rule-based study practically involves decision-making process or conditional branching
- Every project has a stipulated timeline
- Every stage has its own format where information has to be filled in precisely.

Exercise



Fill in the blank columns with appropriate responses:

1. The rule-based study practically involves _____.
2. As there are many variables present in a new project, creation of a _____ is essential between methodologies and factors.
3. Templates are standard formats for _____.
4. The information provided in the template is used for _____.
5. A project goal template must be implemented and details must be filled in _____.

Activity



Activity 1

- The trainer will divide the class in few groups depending on the strength of the batch
- The trainees will prepare mock reports on the shared format
- The trainer will share a format on which trainees should the report
- Each box should be filled with accurate information
- The trainer will check the mock reports generated by each trainee
- The best performers will be recognized by the class.

Activity 2

- In this activity, the Trainer will divide the class into 3 groups
- Each group will be given 3 different topics on which they have to provide a broad explanation
- Group A will require writing on Reporting method of Inaccurate Data/Information and whom to report
- Group B will require writing on Anomalies That May Occur In Data/Information
- Group C will require writing on Different Techniques Used To Obtain Data/Information
- It is important that the Trainees present their answers not only rich in information but also supported by hand-drawn diagrams
- The group which can present their answers in the best way within 30 minutes will be awarded appreciation and accolades.

8. Employability Skills



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Employability skills can be defined as those soft skills which employers look for in a potential employee. These skills equip the employees to carry out their role to the best of their ability and client satisfaction. For example, the ability to explain what you mean in a clear and concise way through written and spoken means helps to build a better relationship with the client or the customer. Similarly, handling stress that comes with deadlines for finishing work and ensuring that you meet the deadlines can be done through effective self-management training. It can also be done by working well with other people from different disciplines, backgrounds, and expertise to accomplish a task or goal. In today's digital age, employers expect that the employees should be able to make use of elementary functions of information and communication technology to retrieve, access, store, and produce, present and exchange information in collaborative networks via the Internet. Students need to develop entrepreneurial skills, so that they can develop necessary knowledge and skills to start their own business, thus becoming job creators rather than job seekers. Potential employees need to develop green skills, which are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community. Thus, students are expected to acquire a range of skills so that you can meet the skill demands of the organisation that you would work for or to set up and run your own business.

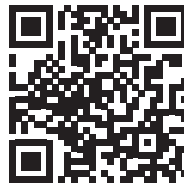
This chapter is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

The scope covers the following:

- Introduction to Employability Skills
- Constitutional values – Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs.

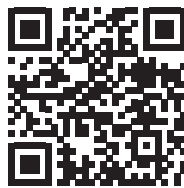
<https://eskillindia.org/NewEmployability>

Scan the QR codes or click on the link to watch the related videos



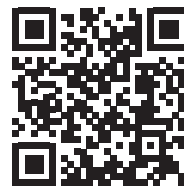
youtu.be/PI8U2W2pnHQ

Work ethics to Follow



youtu.be/1Rfrgd-eyhU

Evacuation Procedures



youtu.be/N4kgu1qi9_A

Health Safety and Accident Reporting



<https://www.youtube.com/watch?v=zJyKTpOVTm8>

Healthy team bonding in ideal work culture



youtube.com/watch?v=YHIkZSTLAhc

Process flow to analyze data



youtube.com/watch?v=s1qhuM4N7P8







Health Safety and Accident Reporting








9. Annexure



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Sr. No	Module No.	Unit No.	Topic Name	Page No.	URL	QR Code (s)
1			Sub-sector oriented video		youtu.be/ltl23mbEjzo	
2	Module 1: Introduction to the Job Role of Customer Care Executive – Domestic (Voice)	Unit 1.1: Job Role of a Customer Care Executive – Domestic (Voice)	Job Role of Domestic IT Helpdesk Attendant	9	youtu.be/1NizRxLcHEI	
3	Module 2: Concept of Service Requests/ Incidents (SSC/N0202)	Unit 2.1: Nature and Types of Service Requests	Nature and Types of Service Requests	22	youtu.be/yBebf3jWiWE	
4	Module 3: Monitoring and Validation of Service Requests (SSC/N0202)	Unit 3.1: Monitor Automated Alerts and Customer Service Requests	Monitoring and Validation of Service Requests	35	youtu.be/Picbz7diupA	
5	Module 4: Technical Specifications related to Service Requests (SSC/N0202)	Unit 4.1: Organization's Tools and Processes for Incident Management and Escalation Support	Tools and Processes for Incident Management and Escalation Support	64	youtu.be/4nl95AxtbE4	
6	Module 5: Deal Directly with IT Service Requests/ Incidents (SSC/N0202)	Unit 5.1: Technicalities of Service Requests/ Incidents	Technicalities of Service Requests	83	youtu.be/U5X4Mx1EHrw	

Sr. No	Module No.	Unit No.	Topic Name	Page No.	URL	QR Code (s)
7	Module 6: Technical Skills for Handling Incidents (SSC/ N0202)	Unit 6.1: Mechanism of Source Coding Standards, Ticketing Tools and Utilities/Tools	Technical Skills for Handling Incidents	92	youtu.be/-NxLacqn1T8	
8	Practice Employability Skills (DGT/ VSQ/N0102)	Employability Skills	Work ethics to Follow	103	youtu.be/Nk938_2Tspg	
			Evacuation Procedures	103	youtu.be/GiztWPz3rwU	
			Health Safety and Accident Reporting	103	youtu.be/5lotFNidZ14	
			Healthy team bonding in ideal work culture	103	https://www.youtube.com/watch?v=zJyKtpOVTm8	
			Process flow to analyze data	103	https://www.youtube.com/watch?v=YHIkZSTLAhc	
			Sustainable practices	103	https://www.youtube.com/watch?v=s1qhuM4N7P8	





Department of Empowerment of Persons with Disabilities (Divyangjan)
Ministry of Social Justice & Empowerment



सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



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Corporation

Transforming the skill landscape



कोशल शलगुणव ताताप्रगति



दिव्यांग व्यक्तियों के लिए कोशल परिषद्
Skill Council for Persons with Disability

Skill Council for Persons with Disability

Sector Skill Council Contact Details:

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Website: www.scpwd.in

Phone: 01120892791