# DEPARTMENT OF DIVINEGUMA DEVELOPMENT

# E-BANKING SYSTEM

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# OBJECTIVES

- Explain the e-Banking System and its Contents.
- Describe Hardware Environment. (N-Computing, Thin-Client)
- Describe basic networking concepts and technologies
- Describe the physical components of a network
- Identify and apply common preventive maintenance techniques used for networks
- Troubleshoot a network

# E- BANKING SYSTEM

- Customer Registration
- Account opening
- Account Balances
- Loans

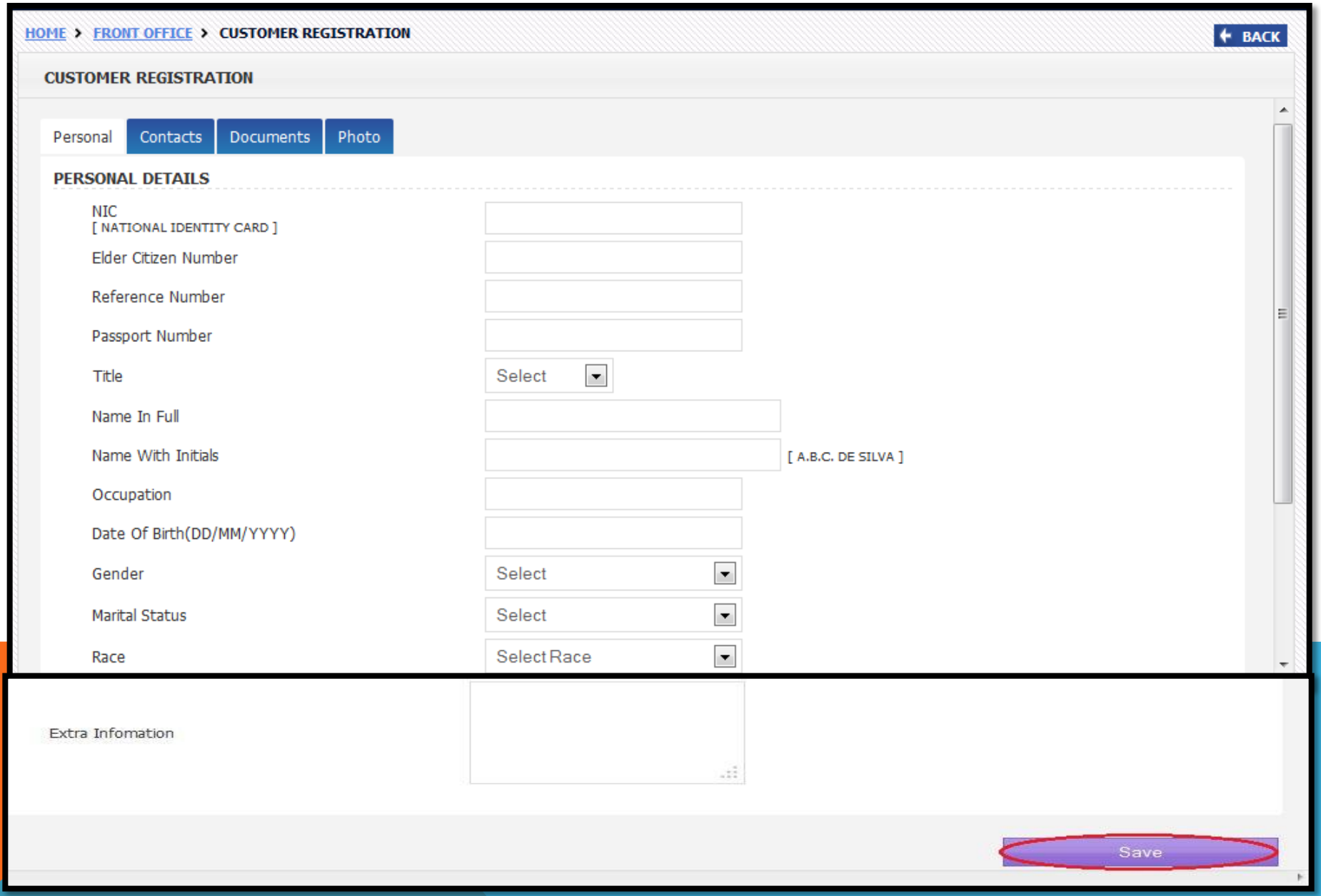
# E- BANKING SYSTEM URL

http://220.247.243.51:8090/EASYBANK/main.action

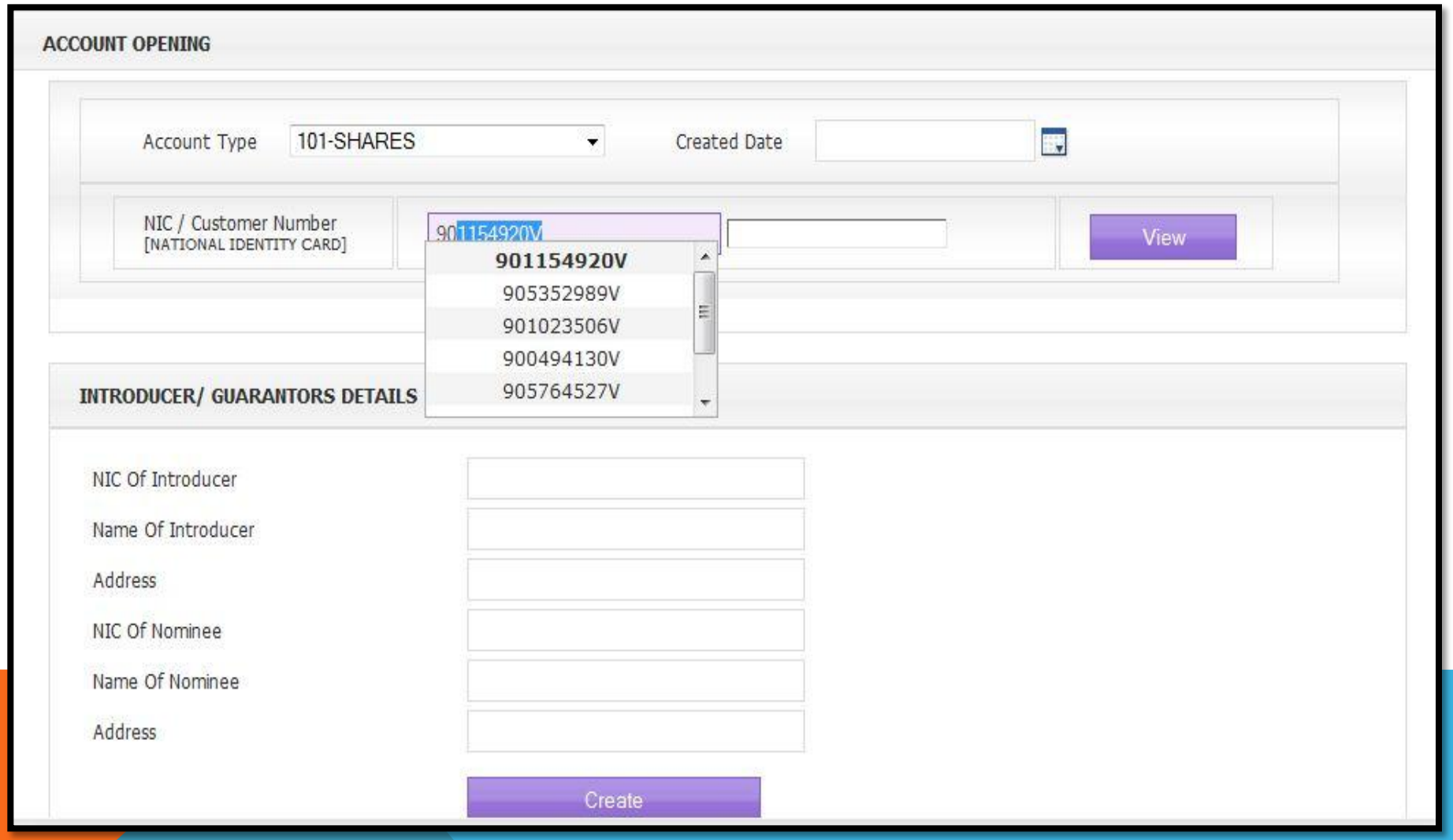
# DASH BOARD


Front Office
Global
Administration
Standing Order
Investment Management
Share Management
Stamp Management
Refinance Loans
Loan Management
My Profile
Pawning
General Ledger
Micro Insurance
MIS Reporting
Backups/ Retrieve
Micro Leasing
Cash Insurance
Fixed Deposits
Savings
Print Documents

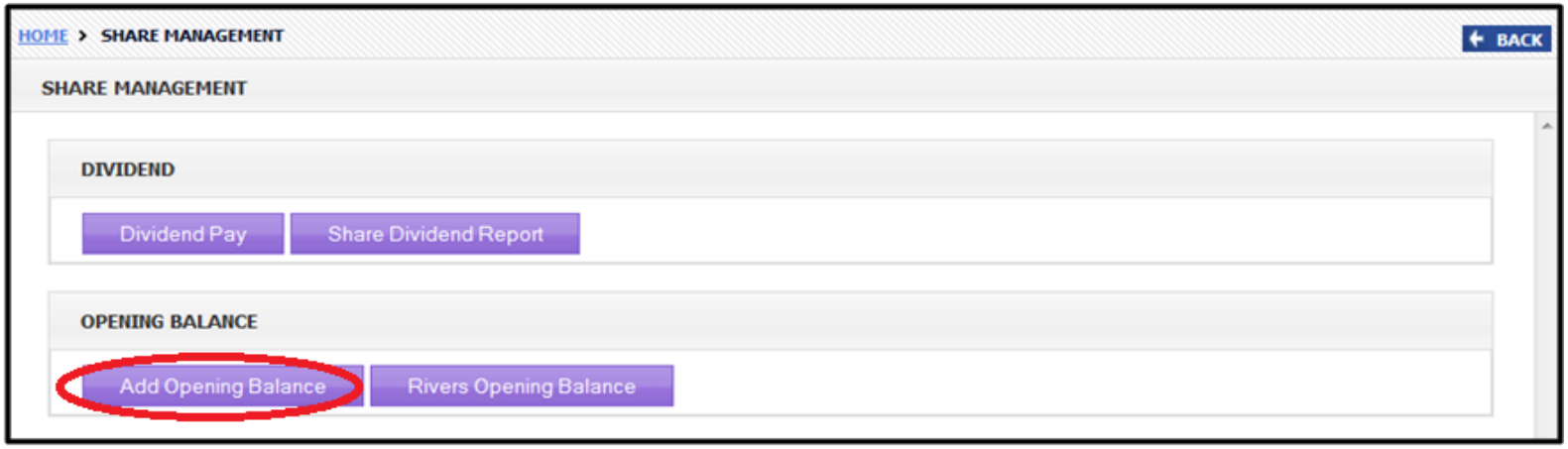
# CUSTOMER REGISTRATION

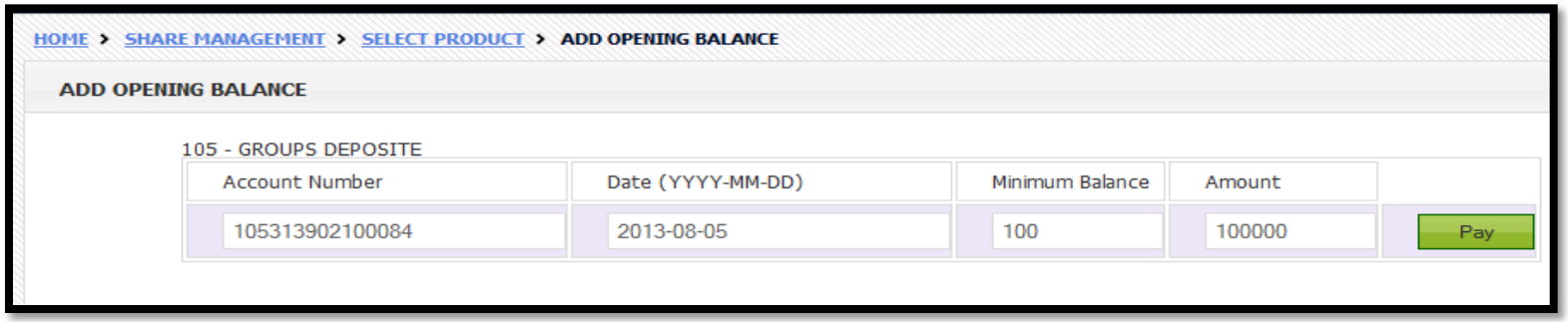


# ACCOUNT OPENING

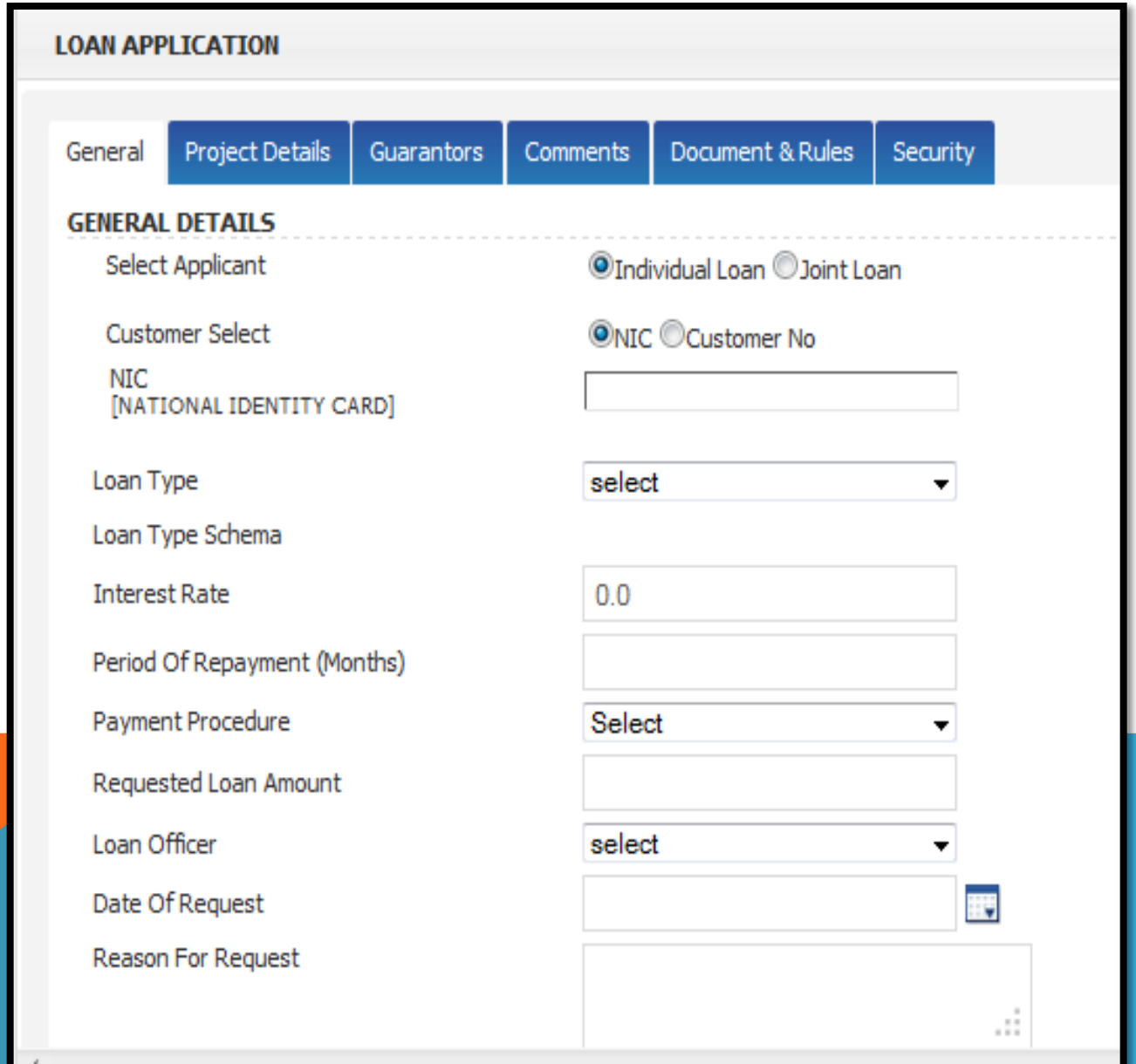


# ACCOUNT BALANCES



# LOAN


LOAN APPLICATION
General
Project Details
Guarantors
Comments
Document & Rules
Security
GENERAL DETAILS
Select Applicant
Individual Loan
Joint Loan
Customer Select
NIC
Customer No
NIC
[NATIONAL IDENTITY CARD]
Loan Type
select
Loan Type Schema
Interest Rate
0.0
Period Of Repayment (Months)
Payment Procedure
Select
Requested Loan Amount
Loan Officer
select
Date Of Request
Reason For Request

# OPEN SOURCE SOFTWARE

What is open source?

The term "open source" refers to something that can be modified because its design is publicly accessible.

Open source software is software whose source code is available for modification or enhancement by anyone.

# SOFTWARE USES FOR E-BANK SYSTEM

- **As the Operating System uses Ubuntu-12.04.3-server-amd64**

❑ An operating system (OS) is a collection of software that manages computer hardware resources and provides common services for computer programs. The operating system is an essential component of the system software in a computer system. Application programs usually require an operating system to function.

# SOFTWARE USES FOR E-BANK SYSTEM (CONTD.)

**As the Backend database management system My SQL 5.5 is used.**

*MySQL* is a *database* system used on the web; *MySQL* is a *database* system that runs on a server; *MySQL* is ideal for both small and large applications

# SOFTWARE USES FOR E-BANK SYSTEM (CONTD.)

**As the Programming Language JDK 1.6 is used.**

Java is a computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. It is intended to let application developers “write once, run anywhere" (WORA), meaning that code that runs on one platform does not need to be recompiled to run on another. Java applications are typically compiled to byte code (class file) that can run on any Java virtual machine (JVM) regardless of computer architecture.

# PRINCIPLES OF NETWORKING

Networks are systems that are formed by links.

People use different types of networks every day:

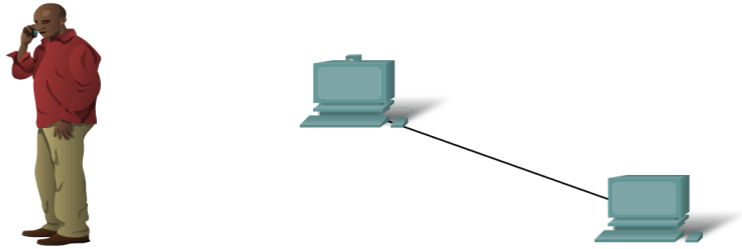
- Mail delivery system
- Telephone system
- Public transportation system
- Corporate computer network
- The Internet


Computers can be linked by networks to share data and resources.

A network can be as simple as two computers connected by a single cable or as complex as hundreds of computers connected to devices that control the flow of information.

# 3 COMMON ELEMENTS OF COMMUNICATION

- **Message source**
  - people, or electronic devices, that need to send a message to other individuals or devices
- **The channel**
  - consists of the media that provides the pathway over which the message can travel from source to destination.
- **Message destination**
  - receiver, of the message. destination receives the message and interprets it.

# COMPUTER NETWORKS

A computer data network is a collection of hosts connected by networking devices such as computers, printers, scanners, smart phones and file and print servers.

Resources shared across networks include different types of services, storage devices and applications.

Network devices link together using a variety of connections:

- Copper cabling
- Fiber-optic cabling
- Wireless connection

Some benefits from networking includes:

- Fewer peripherals needed
- Increased communication capabilities
- Avoid file duplication and corruption
- Lower cost licensing
- Centralized administration
- Conserve resources

# TYPES OF NETWORKS

A computer network is identified by:

The type of media used to connect the devices

The type of networking devices used

How the resources are managed

How the network is organized

How the data is stored

The area it serves


- Networks infrastructures can vary greatly in terms of:
  - The size of the area covered
  - The number of users connected
  - The number and types of services available

# TYPES OF NETWORKS

LAN: A group of interconnected computers under one administrative control group that governs the security and access control policies that are in force on the network.

WAN: A networks that connects LANs in geographically separated locations.

WLAN: Group of wireless devices that connect to access points within a specified area. Access points are typically connected to the network using copper cabling.

# TYPES OF NETWORKS (CONTINUED)

Peer-to-peer networks:

Devices which are connected directly to each other without any additional networking devices between them. Each device has equivalent capabilities and responsibilities.

Client/server networks:

In a client/server model, the client requests information or services from the server. The server provides the requested information or service to the client.

# SERVER MACHINE

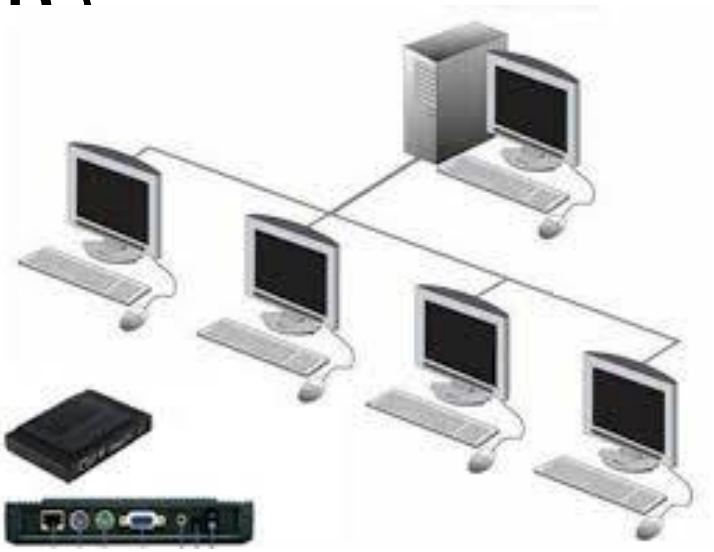
It is a computer that performs a service for other computers on the internet.

# CLIENT MACHINES

- Two different types of client machines are used in the e-Bank solution:
  - N- Computing
  - Thin-Client

# CLIENT MACHINES (CONTD.)

N- Computing

# CLIENT MACHINES (CONTD.)

Thin-Client

# OTHER DEVICES USED IN THE E-BANK SOLUTION

- ❑ NETWORK SWITCH
- ❑ ADSL ROUTER
- ❑ VPN ROUTER ETC.

# OTHER DEVICES USED IN THE E-BANK SOLUTION (CONTD.)

- NETWORK SWITCH


# OTHER DEVICES USED IN THE E-BANK SOLUTION (CONTD.)

- ADSL ROUTER

# OTHER DEVICES USED IN THE E-BANK SOLUTION (CONTD.)

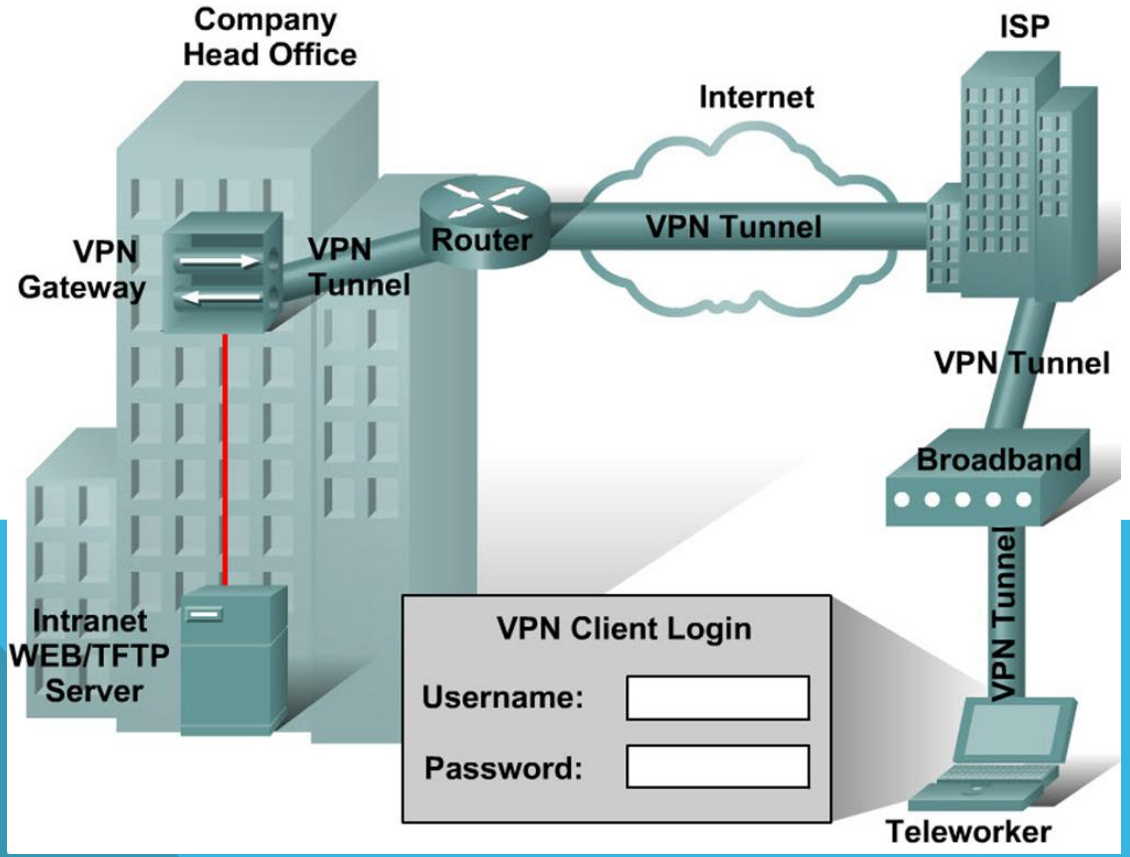
- VPN ROUTER

# VPN TECHNOLOGY

A VPN in also known as virtual private network, utilizes public telecommunications networks to conduct private data communications. Most VPN implementations use the Internet as the public infrastructure and a variety of specialized protocols to support private communications through the Internet. VPN follows a client and server approach. VPN clients authenticate users, encrypt data, and otherwise manage sessions with VPN servers utilizing a technique called tunneling.

# USAGE OF VPN TECHNOLOGY IN E-BANK SYSTEM

The purpose of VPN Network for e-Bank system is to secure transmission of data into the server located in the Head Office. As such at the end of the day, the backup of every bank in the island is taken in to the server automatically.



# IP ADDRESS

An IP address is a unique number that is used to identify a network device and is represented as a 32-bit binary number, divided into four octets (groups of eight bits):

- Example: 10111110.01100100.00000101.00110110

An IP address is also represented in a dotted decimal format.

- Example: 190.100.5.54

When a host is configured with an IP address, it is entered as a dotted decimal number, such as 192.168.1.5. This IP address must be unique on a network to ensure data can be sent/received.

IP Classes

- Class A: Large networks, implemented by large companies and some countries
- Class B: Medium-sized networks, implemented by universities
- Class C: Small networks, implemented by ISP for customer subscriptions
- Class D: Special use for multicasting
- Class E: Used for experimental testing

# SUBNET MASKS

IP address used to indicate the network and the host portion of an IP address.

Usually, all hosts within a broadcast domain of a LAN (bounded by routers) use the same subnet mask.

The default subnet masks for three classes of IP addresses.

An IP address can be configured:

- **Manually:** typing the proper IP address and subnet mask
- **Dynamically:** Using a **Dynamic Host Configuration Protocol (DHCP)** server.

Network Interface Card (NIC) is the hardware that enables a computer to connect to a network and it has two addresses:

The IP address is a logical address that can be changed.

The **Media Access Control (MAC)** address that is "burned-in" or permanently programmed into the NIC when manufactured.

# PHYSICAL NETWORK COMPONENTS

**Network devices:**

- Computers
- Hubs
- Switches
- Routers
- Wireless access points

**Network media:**

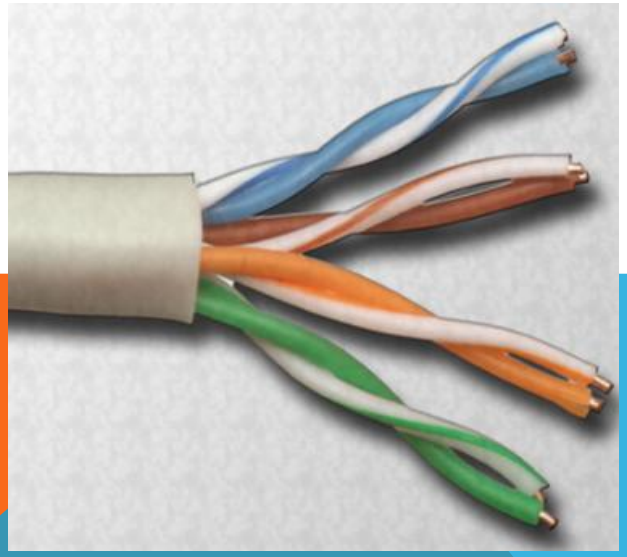
- Twisted-pair copper cabling
- Fiber-optic cabling
- Radio waves

# TWISTED-PAIR CABLING

A pair of twisted wires forms a circuit that transmits data.

The twisted wires provide protection against crosstalk (electrical noise) because of the cancellation effect.

- Pairs of copper wires are encased in color-coded plastic insulation and twisted together.



- An outer jacket of poly-vinyl chloride (PVC) protects the bundles of twisted pairs.
- There are two types of this cable:
  - **Unshielded twisted-pair (UTP)**

    (Cat 3, Cat 5, 5e and Cat 6)
  - **Shielded twisted-pair (STP)**

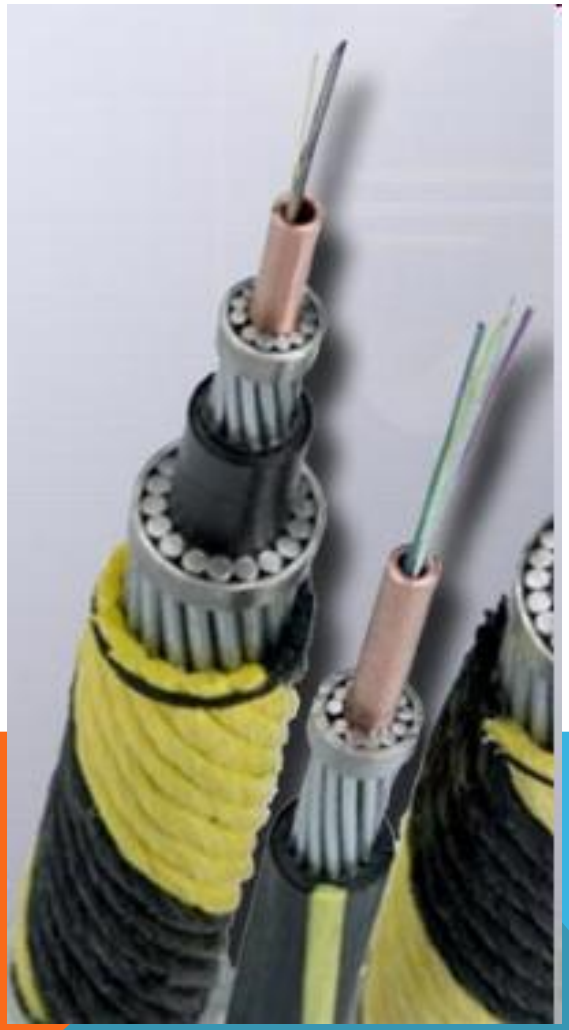
# COAXIAL CABLE

## A copper-cored network cable surrounded by a heavy shielding

## Types of coaxial cable:

- **Thicknet or 10Base5** - Coax cable that was used in networks and operated at 10 megabits per second with a maximum length of 500 m
- **Thinnet or 10Base2** - Coax cable that was used in networks and operated at 10 megabits per second with a maximum length of 185 m
- **RG-59** - Most commonly used for cable television in the US
- **RG-6** - Higher quality cable than RG-59 with more bandwidth and less susceptibility to interference

# FIBER-OPTIC CABLE



A glass or plastic strand that transmits information using light and is made up of one or more optical fibers enclosed together in a sheath or jacket.

Not affected by electromagnetic or radio frequency interference.

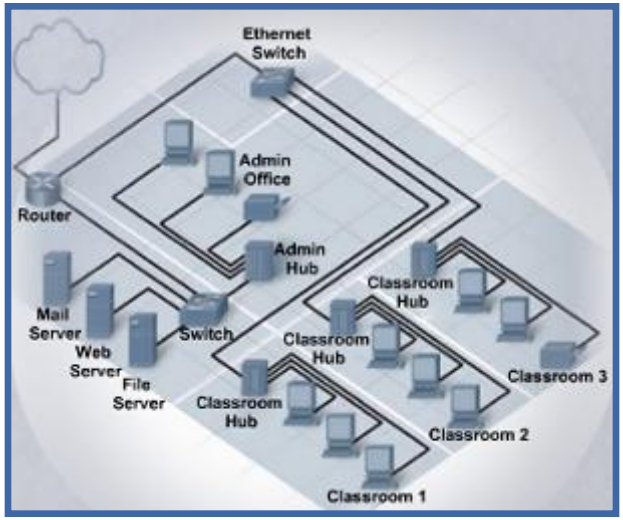
Signals are clearer, can go farther, and have greater bandwidth than with copper cable.

Usually more expensive than copper cabling and the connectors are more costly and harder to assemble.

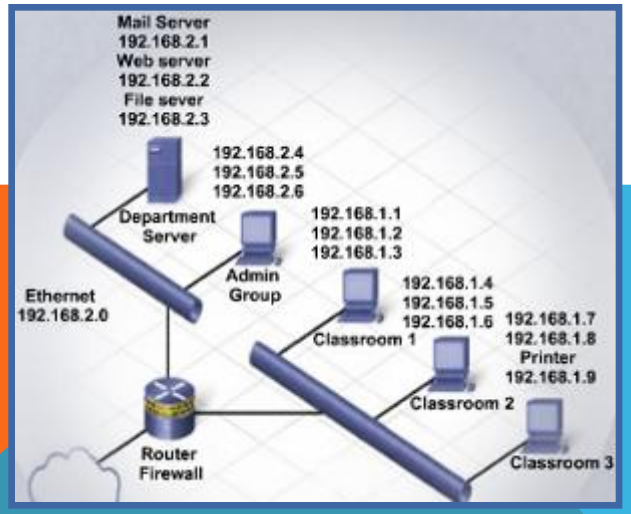
Two types of glass fiber-optic cable:

**Multimode** and **Single-mode**

# TWO TYPES OF LAN TOPOLOGIES




Physical topology is the physical layout of the components on the network




**Logical topology**

determines how the hosts access the medium to communicate across the network

# ATTACH COMPUTER TO EXISTING NETWORK

After connecting the network cable, activity should be verified by looking at the LEDs.

Every NIC must be configured with the following information:

- Protocols
- IP address
- MAC address

Networks connection should be tested. Commands are available to run this type of tests and to obtain information:

- ping
- ipconfig

telnet

# PREVENTIVE MAINTENANCE FOR NETWORKS

**Common preventive maintenance techniques should continually be performed for a network to operate properly.**

- Keep network rooms clean and change air filters often.
- Checking the various components of a network for wear.
- Check the condition of network cables because they are often moved, unplugged, and kicked.
- Label the cables to save troubleshooting time later. Refer to wiring diagrams and always follow your company's cable labeling guidelines.
- AC power adapters should be checked regularly.
- The **uninterruptible power supply (UPS)** should be tested to ensure that you have power in the case of an outage.

# TROUBLESHOOTING PRINTERS AND SCANNERS

**Step 1** Identify the problem

**Step 2** Establish a theory of probable causes

**Step 3** Determine an exact cause

**Step 4** Implement a solution

**Step 5** Verify solution and full system functionality

**Step 6** Document findings

# STEP 2 - ESTABLISH A THEORY OF PROBABLE CAUSES

Problem may be simpler than the customer thinks.

Create a list of the most common reasons why the error would occur.

- Loose cable connections
- Improperly installed NIC
- ISP is down
- Low wireless signal strength
- Invalid IP address

# STEP 3 - DETERMINE THE EXACT CAUSE

**Testing your theories of probable causes one at a time, starting with the quickest and easiest.**

- Check that all cables are connected to the proper locations.
- Unseat and then reconnect cables and connectors.
- Reboot the computer or network device.
- Login as a different user.
- Repair or re-enable the network connection.
- Contact the network administrator.
- Ping your default gateway.
- Access a remote web pages.

**Exact cause of the problem has not been determined after you have tested all your theories, establish a new theory of probable causes and test it.**

# STEP 4 - IMPLEMENT A SOLUTION

Sometimes quick procedures can determine the exact cause of the problem or even correct the problem.

If a quick procedure does not correct the problem, you might need to research the problem further to establish the exact cause.

Divide larger problems into smaller problems that can be analyzed and solved individually.

# STEP 5 - VERIFY SOLUTION AND SYSTEM FUNCTIONALITY

Verifying full system functionality and implementing any preventive measures if needed.

- **Ping** is used to check network connectivity.
- **Nslookup** is used to query Internet domain name server.
- **Tracert** is used to determine the route taken by packets when they travel across the network.
- **Net View** is used to display a list of computers in a workgroup.

Have the customer verify the solution and system functionality.

# COMMON PROBLEMS AND SOLUTIONS

Printer and scanner problems can be attributed to hardware, software, networks, or some combination of the three. You will resolve some types of printer and scanner problems more often than others.

# EQUIPMENT SUPPLIED BY SUPPLIERS

The relevant goods will be supplied by the each supplier as follows.

1.For District Samurdhi Offices

| Item | Quantity |
|---|---|
| Computer | 1. |
| Laser printer | 1 |
| UPS | 1 |
| | |

2.ForMahaSangams and Samurdhi Bank Societies

| Item | Quantity |
|---|---|
| Monitors | 7 |
| End Computing Unit/Thin cleint | 7 |
| Web Camara | 1 |
| Pass book printers | 2 |
| Multi Function Printer | 1 |
| CPU | 2 |
| UPS | 1 |
| Key Board | 7 |
| Mouse | 7 |

For the partially equipped MahaSangams will be supplied goods by the supplier as follows. Such MahaSangams can be identified with * Marks.

| Item | Quantity |
|---|---|
| Monitors | 6 |
| End Computing Unit/Thin client | 6 |
| Web Camara | 1 |
| Pass book printers | 2 |
| CPU | 1 |
| Key Board | 6 |
| Mouse | 6 |

In additionally we have given the order to establish the Power wiring and Net work cabling to the above all
MahaSangams and Bank Societies except District Samurdhi offices to Sri Lanka Telecom (Services)Ltd.

1.Following parts must be comprised with Power wiring.

| Item | Quantity |
|---|---|
| Power outlet | 30 |
| Surge protector | 1 |
| Required cabling and Accessories | |

2.Following parts must be comprised with Net work wiring

| Item | Quantity |
|---|---|
| Net work Port | 10 |
| 16 Port switch | 1 |
| SERVER Rack | 1 |
| Patch panel | 1 |
| 3 in patch code | 10 |
| Required cabling | |

# ONLINE SOURCES

www.wikipedia.org

www.cisco.com