# MULTI CLIENT NET SHARE IN LAN

PROJECT WORK DONE AT

**LAWRENCE & ASSOCIATES (INDIA) PRIVATE LIMITED,**
**CHENNAI**

**PROJECT REPORT** P-760

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
**MASTER OF COMPUTER APPLICATIONS**
OF BHARATHIAR UNIVERSITY, COIMBATORE

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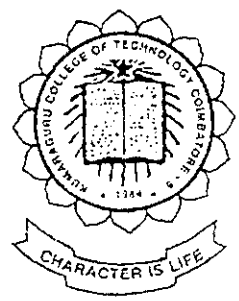


**Department of Computer Science and Engineering**
**KUMARAGURU COLLEGE OF TECHNOLOGY**
**Coimbatore – 641 006**

**May 2002**

Department of Computer Science and Engineering

**KUMARAGURU COLLEGE OF TECHNOLOGY**

(Affiliated to Bharathiar University)

Coimbatore – 641 006

# CERTIFICATE

This is to certify that the project work entitled

## "Multi Client Net Share in Local Area Network"

Done By

Mahesh Kumar.M.
Reg. No. : 9938M0617

Submitted in partial fulfillment of the requirements for the award of the degree of **Master of Computer Applications of Bharathiar University.**

Professor and Head

Internal Guide

Submitted to University Examination held on 9-05-2002

Internal Examiner

External Examiner

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March 9, 2002

The Head of the Department
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This is to certify that **Mr. M. Mahesh Kumar** has successfully completed his project work for his Master of Computer Application (Reg.No: 9938M0617) as a part of his curriculum in our Organization for a period of three months. During this period he has successfully completed the project work entitled "Multi Client Net share in LAN" using "Visual C++" under the guidance of Mr. Venkatraman and Mr. Hakkim Shah. This project has been partially implemented.

We wish him all success in his future endeavors.

**VISHNU PRIYA R.S.**
Manager-Human Resources

# DECLARATION

I hereby declare that the project entitled "**Multi Client Net Share in Local Area Netwok**" submitted to Bharathiar University as the project work of **Master of Computer Applications Degree**, is a record of original work done by me under the supervision and guidance of **Mr.Hakkim Shah and Mr.Venkatraman,** *Lawrence & Associate (INDIA) Private Limited, Chennai* and **Mrs.L.S.Jayashree,** *Department of Computer Science and Engineering, Kumaraguru College Of Technology, Coimbatore* and this project work has not found the basis for the award of any Degree/ Diploma/ Associate ship/ Fellowship or similar title to any candidate of any University.

Place: Coimbatore

Date: 30/4/2002

Signature of the student

**Countersigned By**

5/4/02

**(Internal Guide)**

# Acknowledgment

I express my profound respect and sincere gratitude to **Dr. K.K. Padmanaban Ph.D,** *Principal, Kumaraguru College of Technology, Coimbatore,* for his kind co-operation in allowing me to take up this project work.

I record my sincere thanks to **Dr. S. Thangasamy Ph.D,** *Head of the Department, Computer Science and Engineering, Kumaraguru College of Technology,* for allowing me to take up the project at *Lawrence and Associate (INDIA) private Limited., Chennai.*

I am greatly privileged to express my deep gratitude to my guide **Mrs. L.S Jayashree M.E,** *Dept of Computer Science and Engineering, Kumaraguru College of Technology*, for her valuable advice and encouragement.

I also owe my sincere thanks to **Mrs. Geetha Vellingiri,** *Course coordinator, Master of Computer Applications, Kumaraguru College Of Technology, Coimbatore* for her guidance and immense support throughout my project work.

I wish to extend my gratitude to **Mrs. Vishnu Priya,** *Manager Human-Resource Lawrence and Associate (INDIA) private Limited, Chennai,* for allowing me to carry out the project at their organization and guiding me in completing the project successfully.

I express my sincere and heart felt thanks to **Mr. Hakkim Shah MCA and Mr. Venkat B.E**, *Lawrence and Associate (INDIA) private Limited, Chennai*, for his support in finishing the project.

I also take immense pleasure in thanking everyone who were directly or indirectly involved in the success of this project.

***Mahesh Kumar.M***

# Synopsis

The project entitled *"Multi Client Net Share in Local Area Network (Net-LAN Server)"* is developed for Lawrence and Associate (INDIA) private limited.

Net-LAN is a server that acts as an intermediary between a workstation user and the Internet so that the enterprise can ensure security, administrative control, and caching service. Net-LAN Server is supposed to provide Internet Access to network clients and give equal service to all clients.

Net-LAN Server provide these three features:

1. Firewall and Filtering
2. Connection sharing
3. Caching

This product is developed using Visual C++ 6.0 in Windows platform.

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# 1. Introduction

## 1.1 Organization Profile

Lawrence & Associates,(LAI) was formed in 1996 in the state of Missouri, USA. LAI is an international staffing organization that provides personnel to Fortune 500 corporations worldwide. Our clients include members of the financial, telecommunication, insurance and civil engineering industries.

### 1.1.1 Lawrence & Associates - a Solution Provider

- At the technology center in Chennai, a dedicated team of IT professionals is put into vigorous clients specific training programs.
- The management of Lawrence & Associates, Inc. has assembled a team of professionals skilled in the delivery of our core competencies, which includes consulting services, software development and product development.
- Lawrence & Associates, Inc. is a guaranteed low cost provider.
- Lawrence & Associates, Inc. branch offices are located adjacent to client locations to provide optimum customer service.
- Lawrence & Associates is a growing organization, offering flexibility to do what it takes to provide IT staffing solutions that fit its client's needs.
- Lawrence & Associates has already won the confidence of its clients in great measure around the United States with its high quality professional dedication.

### 1.1.2 LAI is a member of :

- St. Louis Minority Business Council.
- St. Louis Regional & Commerce Growth Association.
- Dallas/Fort Worth Minority Development Council.
- Hawthorn Foundation.

### 1.1.3 LAI certifications:

- Computer Associates (CA) Strategic Partner.
- Siebel Systems Strategic Partner.
- IBM Global Services Partner

Mr. Norman Tice, Chairman Emeritus of MasterCard International has been elected as Chairman of the Board of Directors of Lawrence & Associates Inc.(LAI), announced Mr. Thomas Lawrence President and CEO of LAI.

Lawrence & Associates Inc. is a USA based Software Solution Development and Consulting Organization specializing in financial services, bankcard transactions, telecommunications and insurance payment systems. LAI had recently set up its First Technology Center at Tidel Park, Chennai. LAI has since opened its Offices at London, UK and Sydney, Australia.

LAI's clients include several Fortune 500 companies like MasterCard International, IBM, Excel Telecommunications, Maritz Corporation, Mosley Constructions etc. In addition to providing consultancy services, the Technology Center at Chennai also provides value added software solution development and product development. The Technology Center also undertakes Civil Engineering Projects for its overseas clients using the latest communication technologies. LAI has ambitious plans to open 11 Offices worldwide with over 1000 IT Professionals mainly from the Silicon valley of India.

Lawrence & Associates US Community Involvement includes:

- Rainbow Village
- Youth in Need
- Hawthorn Foundation
- Junior League
- Wyman Center
- Scouting of America
- Missouri Mental Health Association

## 1.2 Project Overview

The software is a Net-LAN server that enables the user in the network to work (or) gets connected to the Internet. This software should provide all possible routes to the destination requested by the user according to his reference. (It should also provide a safe browsing facility)

When a user enters the URL of the website. The requested page should be able to be received. The WebPages or sited should be able to be obtained without disaster. The software should not affect the speed of obtaining.

# 2. System Study & Analysis

## 2.1 Existing System

The existing system is developed in VC++, this existing system work as a helpful "middleman" or broker between you and your Internet connection. It also maintains the Log file, which stores the URL and the client IP address for each request.

### 2.1.1 Limitations of Existing System

- The Existing system has no filtering capability. The filtering capability allows network administrators to explicitly disallow access to any "unacceptable" domains.
- Caching of Web Pages is not done in Existing system.
- Response time of the system is very slow.
- Client IP restriction is not done in Existing system.

## 2.2 Proposed System

Net-LAN is a server that acts as an intermediary between a workstation user and the Internet so that the enterprise can ensure security, administrative control, and caching service.

A Net-LAN server receives a request for an Internet service (such as a Web page request) from a user. If it passes filtering requirements, the Net-LAN server, assuming it is also a cache server, looks in its local cache of previously downloaded Web pages. If it finds the page, it returns it to the user without needing to forward the request to the Internet. If the page is not in the cache, the Net-LAN server, acting as a client on behalf of the user, uses one of its own IP addresses to request the page from the server out on the Internet. When the page is returned, the Net-LAN server relates it to the original request and forwards it on to the user.

### 2.2.1 Configuring Web Browser to Net-LAN Server

To manually specify a Net-LAN server in the browser, two pieces of information are required. First, the host's IP address. Second, the port number is the TCP/IP port on which the server listens for requests.

A single port number is generally used for all the protocols. This port should not be confused with the standard ports used by the protocols themselves (port 80 for HTTP, port 21 for FTP, and so on). This is a Net-LAN port only, and it should never be assigned to one of the reserved numbers.

Unfortunately, a single standard port number does not exist. Some numbers like 8000 and 8080 are used more commonly than others, but the number can be any unassigned value up to 65535. Users manually configuring their browsers will need to be told this port number by their network administrator.

### 2.2.2 Advantages of proposed system

- The filtering capability of proxies allows network administrators to explicitly disallow access to any "unacceptable" domains.

- Net-LAN server offers a more scalable and cost-effective alternative for shared Internet access. Rather than give each client computer a direct Internet connection, all internal connections can be funneled through NetLAN server that in turn connect to the outside.

- The caching of Web pages by Net-LAN server can improve a network's "quality of service" in three ways.
  1) Caching may conserve bandwidth on the network.
  2) Caching can improve response time experienced by clients that download pages into their browsers.
  3) Cached Web pages remain accessible at the NetLAN server even if the originating source or an intermediate link goes down.
- Net-LAN also prevents certain user from accessing the server.

## 2.3 User Characteristics

The user would not be having any direct link with the software. So the user should have a basic idea of browsing through the Internet.

## 2.4 Requirements of New System

Net-LAN Server developed for Lawrence & Associate is supposed to provide Internet Access to network clients and give equal service to all clients. The system is being designed in order to overcome the limitations faced by the existing system and hence should possess the following features.

- Net-LAN Server should act like a "middleman" or broker between you and your Internet connection
- Net-LAN server should improve a network's "quality of service".

# 3. Programming Environment

## 3.1 Hardware Configuration

**Server Side**

- Intel Pentium III
- 10GB Hard Disk
- 64MB RAM
- Internet connection with modem
- Cache Memory 512 KB

**Client Side**

- Intel Pentium III
- 10GB Hard Disk
- 64MB RAM
- Cache Memory 512KB
- Network Interface Card

## 3.2 Description of Software & Tools Used

After a thorough analysis, Visual C++ has been selected for building this application. This application runs under Windows platform.

### 3.2.1 Reasons to choose VC++

- Visual C ++ has native support for all the win 32 API functions.
- Code developed in visual C ++ runs very fast when compared to RAD tools.
- DLL file required to run the VC++ program is MSVCRTD.Dll, which is just 220 K.B. whereas the MSVBVM50.dll, which runs the Visual Basic program, have the file size of about 1.5 M.B.

### 3.2.2 The Visual C++ Environment

An IDE, or Integrated Development Environment, is a program that hosts the compiler, debugger, and application-building tools. The central part of the Visual C++ package is Developer Studio; the Integrated Development Environment (IDE) Developer Studio is used to integrate the development tools and the Visual C++ compiler. You can create a Windows program, scan through an impressive amount of online help, and debug a program without leaving Developer Studio.

### 3.2.3 Developer Studio Tools

Once upon a time, Windows programmers used simple text editors and tools that were hosted on MS-DOS to create their Windows programs. Developing a program under those conditions was tedious and error-prone. Times have definitely changed; Developer Studio includes a number of tools that you might once have paid extra to purchase.

- An integrated editor offers drag-and-drop and syntax highlighting as two of its major features.
- A resource editor is used to create Windows resources, such as bitmaps, icons, dialog boxes, and menus.
- An integrated debugger enables you to run programs and check for errors. Because the debugger is part of Developer Studio, it's easy to find and correct bugs. If you find a programming error while debugging, you can correct the source code, recompile, and restart the debugger.

Developer Studio also features an online help system, which can be used to get context-sensitive help for all of the tools included in Developer Studio, as well as detailed help on the C++ language, the Windows programming interface, and the MFC class library.

### 3.2.4 Developer Studio Wizards

A *Wizard* is a tool that helps guide you through a series of steps. In addition to tools that are used for debugging, editing, and creating resources, Developer Studio includes several wizards that are used to simplify developing your Windows programs. The most commonly used ones are

- *AppWizard* (also referred to in some screens as MFC AppWizard) is used to create the basic outline of a Windows program. Three types of programs are supported by AppWizard: single document and multiple document applications based on the Document/View architecture and dialog box-based programs, in which a dialog box serves as the application's main window. Later in this section, you will use AppWizard to create a simple program.
- *ClassWizard* is used to define the classes in a program created with AppWizard. Using ClassWizard, you can add classes to your project. You can also add functions that control how messages received by each class are handled. ClassWizard also helps manage controls that are contained in

dialog boxes by enabling you to associate an MFC object or class member variable with each control.

### 3.2.5 MFC Libraries

A *library* is a collection of source code or compiled code that you can reuse in your programs. Libraries are available from compiler vendors such as Microsoft, as well as from third parties.

Visual C++ 6 includes Version 6.0 of *MFC*, the Microsoft Foundation Classes, a class By using the MFC classes when writing your programs for Windows, you can take advantage of a large amount of source code that has been written for you. This enables you to concentrate on the important parts of your code rather than worry about the details of Windows programming.

A recent addition to the C++ standard is the *Standard C++ Library*. This library includes a set of classes that were known as the Standard Template Library, or STL, during the standardization process. Unlike the MFC class library, which is used primarily for Windows programming, the standard C++ library is used for general-purpose programming. Library that makes programming for Windows much easier.

### 3.2.6 Dialog Box

A *dialog box* is a specialized window that is used to provide feedback or collect input from the user. Dialog boxes come in all shapes and sizes, ranging from simple message boxes that display single lines of text to large dialog boxes that contain sophisticated controls.

The most commonly used type of dialog box is a *modal dialog box*. A modal dialog box prevents the user from performing any other activity with the program until the dialog box is dismissed. Dialog boxes are also used for one-way communication with a user, such as "splash screens" used to display copyright and startup information as a program is launched. The opening screen displayed by the Visual C++ Developer Studio and Microsoft Word are two examples of dialog boxes used for one-way

communication. Dialog boxes are sometimes used to notify the user about the progress of a lengthy operation.

Dialog boxes provide a convenient way for users to interact with Windows programs. Users expect most interaction with a Windows program to take place through dialog boxes. All dialog boxes have certain things in common; these common characteristics make the user's life easier, because users don't need to learn and relearn how dialog boxes work from program to program.

There are several different types of dialog boxes, and each of them has a specific purpose. Three main types of dialog boxes:

- Message boxes
- Modal dialog boxes
- Modeless dialog boxes

### 3.2.6.1 CDialog Class

The CDialog class is the base class used for displaying dialog boxes on the screen. Dialog boxes are of two types: modal and modeless. The user must close a modal dialog box before the application continues. A modeless dialog box allows the user to display the dialog box and return to another task without canceling or removing the dialog box.

A CDialog object is a combination of a dialog template and a CDialog-derived class. Use the dialog editor to create the dialog template and store it in a resource, then use ClassWizard to create a class derived from CDialog. A dialog box, like any other window, receives messages from Windows. In a dialog box, you are particularly interested in handling notification messages from the dialog box's controls since that is how the user interacts with your dialog box. ClassWizard browses through the potential messages generated by each control in your dialog box, and you can select which messages you wish to handle. ClassWizard then adds the appropriate message-map entries and message-handler member functions to the new class for you. You only need to write application-specific code in the handler member functions.

To create a modal dialog box, construct an object on the stack using the constructor for your derived dialog class and then call DoModal to create the dialog window and its controls. If you wish to create a modeless dialog, call Create in the constructor of your dialog class.

### 3.2.7 Visual C++ Support for Document/View

MFC and AppWizard use the Document/View architecture to organize programs written for Windows. Document/View separates the program into four main classes:

- A document class derived from Cdocument
- A view class derived from Cview
- A frame class derived from CframeWnd
- An application class derived from CwinApp

Each of these classes has a specific role to play in an MFC Document/View application. The document class is responsible for the program's data. The view class handles interaction between the document and the user. The frame class contains the view and other user interface elements, such as the menu and toolbars. The application class is responsible for actually starting the program and handling some general-purpose interaction with Windows.

#### 3.2.7.1 The Document/View Architecture.

Although the name "Document/View" might seem to limit you to only word-processing applications, the architecture can be used in a wide variety of program types. There is no limitation as to the data managed by CDocument; it can be a word processing file, a spreadsheet, or a server at the other end of a network connection providing information to your program. Likewise, there are many types of views. A view can be a simple window, as used in the simple SDI applications presented so far, or it can be derived from CFormView, with all the capabilities of a dialog box.

#### 3.2.7.2 SDI and MDI Applications

There are two basic types of Document/View programs:

- SDI, or Single Document Interface
- MDI, or Multiple Document Interface

An SDI program supports a single type of document and almost always supports only a single view. Only one document can be open at a time. An SDI application focuses on a particular task and usually is fairly straightforward. Several different types of documents can be used in an MDI program, with each document having one or more views. Several documents can be open at a time, and the open document often uses a customized toolbar and menus that fit the needs of that particular document.

### 3.2.8 Introducing Property Sheets

One of the newest types of graphical objects is the tabbed dialog box, also known as a *property sheet.* A property sheet is a dialog box with two or more pages. Windows and NT are loaded with property sheets, which organize the many options that users can modify. You flip the pages by clicking labeled tabs at the top of the dialog box. Using such dialog boxes to organize complex groups of options enables users to more easily find the information and settings they need. As you've probably guessed, Visual C++ 6 supports property sheets, with the classes CPropertySheet and CPropertyPage.

#### 3.2.8.1 CPropertyPage Class

CPropertyPage represent individual pages of a property sheet, otherwise known as a tab dialog box. As with standard dialog boxes, you derive a class from CPropertyPage for each page in your property sheet. To use CPropertyPage-derived objects, first create a CPropertySheet object, and then create an object for each page that goes in the property sheet. Call CPropertySheet::AddPage for each page in the sheet, and then display the property sheet by calling CPropertySheet::DoModal for a modal property sheet, or CPropertySheet::Create for a modeless property sheet.

#### 3.2.8.2 CPropertySheet Class

CPropertySheet represent property sheets, otherwise known as tab dialog boxes. A property sheet consists of a CPropertySheet object and one or more CPropertyPage objects. A property sheet is displayed by the framework as a window with a set of tab indices, with which the user selects the current page, and an area for the currently selected page. Even though CPropertySheet is not derived from CDialog, managing a CPropertySheet object is similar to managing a CDialog object.

### 3.2.9 Windows Sockets in MFC

The Microsoft Foundation Class Library (MFC) supports programming with the Windows Sockets API by supplying two classes. One of these classes, CSocket, provides a high level of abstraction to simplify your network communications programming.

#### 3.2.9.1 Definition of a Socket

A socket is a communication endpoint — an object through which a Windows Sockets application sends or receives packets of data across a network. A socket has a type and is associated with a running process, and it may have a name. Currently, sockets generally exchange data only with other sockets in the same "communication domain," which uses the Internet Protocol Suite.

Two socket types are available:

- **Stream sockets**

  Stream sockets provide for a data flow without record boundaries — a stream of bytes. Streams are guaranteed to be delivered and to be correctly sequenced and unduplicated.

- **Datagram sockets**

  Datagram sockets support a record-oriented data flow that is not guaranteed to be delivered and may not be sequenced as sent or unduplicated.

### 3.2.10 Multithreading with MFC

The Microsoft Foundation Class Library (MFC) provides support for multithreaded applications. MFC distinguishes two types of threads:

- **User-interface thread**

  User-interface threads are commonly used to handle user input and respond to events and messages generated by the user.

- **Worker thread**

  Worker threads are commonly used to complete tasks, such as recalculation, that do not require user input.

The Win32 API does not distinguish between types of threads; it just needs to know the thread's starting address so it can begin to execute the thread. MFC handles user-interface threads specially by supplying a message pump for events in the user interface. CWinApp is an example of a user-interface thread object, as it derives from CWinThread and handles events and messages generated by the user.

#### 3.2.10.1 Multithreading: Creating Worker Threads

A worker thread is commonly used to handle background tasks that the user shouldn't have to wait for to continue using your application. Tasks such as recalculation and background printing are good examples of worker threads.

Creating a worker thread is a relatively simple task. There are two overloaded versions of AfxBeginThread: one for user-interface threads and one for worker threads. To begin execution of your worker thread, call AfxBeginThread. AfxBeginThread creates and initializes a CWinThread object for you, starts it, and returns its address so you can refer to it later.

# 4. System Design & Development

## 4.1 Input Design

The input design is the important phase in the design of software because the design for handling input data specifies how data are accepted for computer processing. Generally the computer System has intensive interaction with the outside world, mostly this interaction takes place through visual terminals such as monitors. So while developing a software system we have to take care of efficient development of interactive input design. The main objective of our input design is it should be interactive and user friendly.

## 4.2 Output Design

The output design of the Net-LAN server mainly serves two persons one is the client and the other one is the administrator of the server. Client receives the output, as web page for their request and administrator will get the information about the client IP Address, web pages visited with the date and time.

Generally three types of output are given to the clients the details are as follows

**Web page for authorized request**

For the authorized request, Net-LAN server will start process with the cache if the web page is not available in cache, server would then request the page from the web server and forward the response to the original requester.

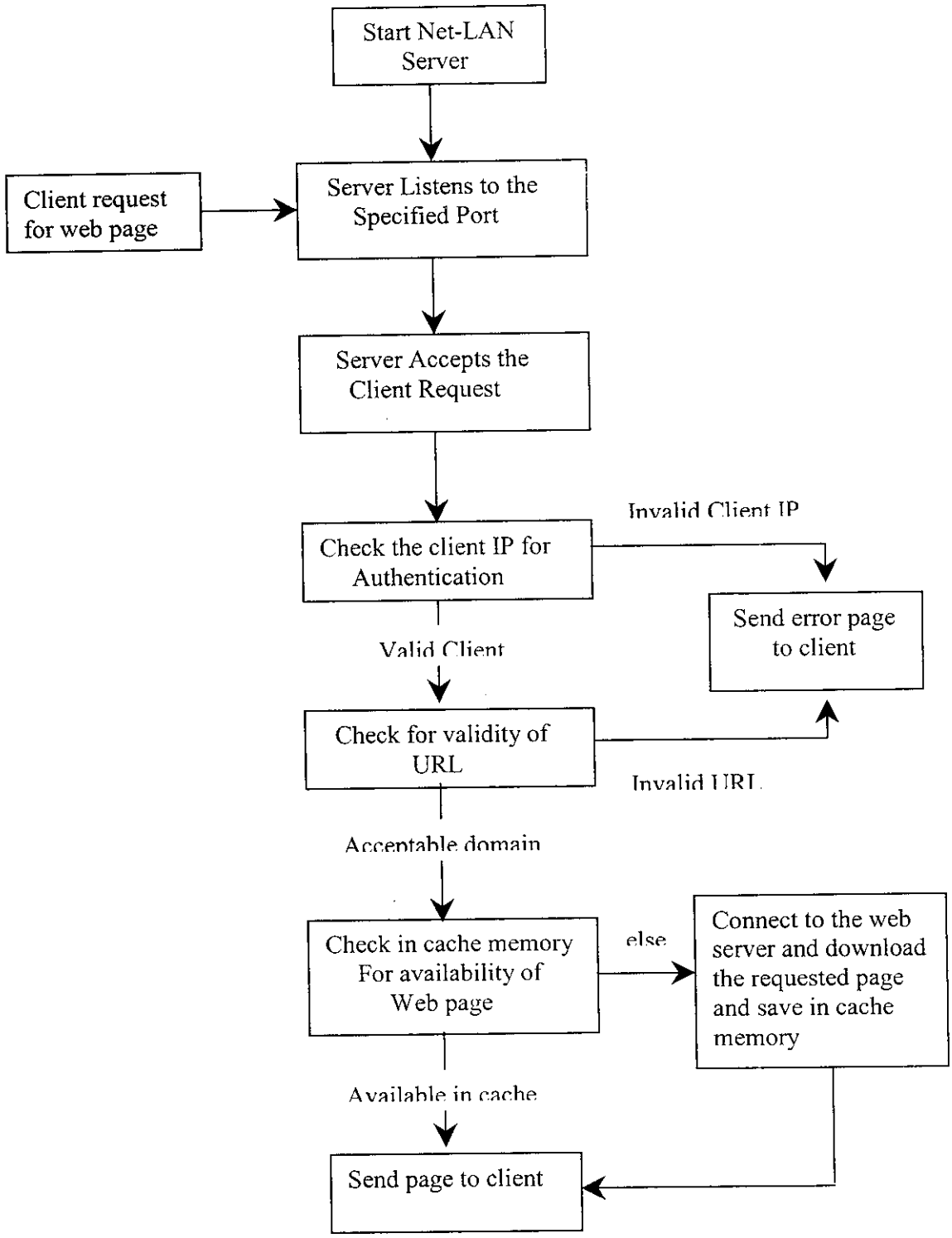
**Web page for unauthorized request**

For the unauthorized request like pruned web site proxy server forward the response to the original requester, stating that the request from the client is not valid and pruned.

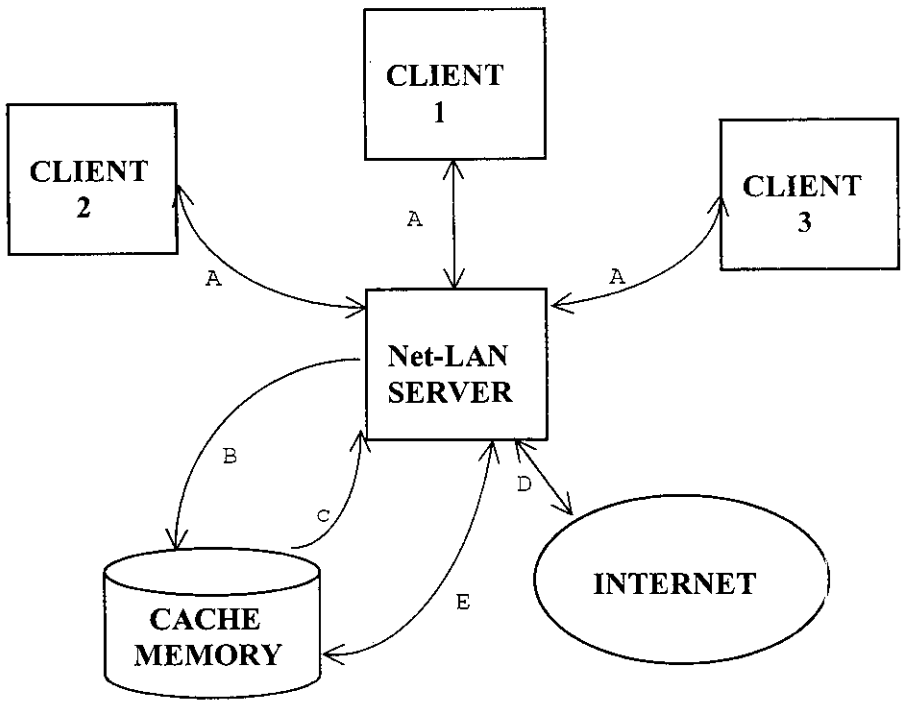
**Web page for unauthorized system**

If the request is from unauthorized client, server forward the response to the original requester, stating that the request that has been received is from the unauthorized client.

## 4.3 Process Design



## Net-LAN Architecture




**A: Client Connects to the Net-LAN server**

**B: Net-LAN Server Checks whether the requested page is in Cache memory**

**C: If the requested page is in cache memory the page is send to the client.**

**D: If the requested page is not found in the cache memory, Server establishes connection with the remote host and downloads the requested page.**

**E: Saves the downloaded page in Cache memory.**

# 5. System Implementation and Testing

## 5.1 System Implementation

Implementation is the stage of the project when the theoretical design is turned into a working system. At the stage the main workload, the greatest upheaval and the major impact on existing practices shift to the user department. If the implementation stage is not carefully planned and controlled, it can cause chaos. Thus it can be considered to be the most crucial stage in achieving a successful new system and in giving the users confidence that the new system will work and be effective.

The implementation stage is a system project in its own right. It involves careful planning, investigation of current system and its constraints on implementation, design of method to achieve the changeover, training of staff in the changeover procedure and evaluation of changeover methods.

The main task of implementation are classified as follows

Implementation planning

Computer system testing

Education and Training

### 5.1.1 Implementation Planning

The implementation of a system involves people from different department and we are confronted with the particular problem of controlling the activities of people outside their own data department. Because of this we have to plan carefully for accessing the respective staff members. This involves meeting the respective staff members only with the permission of their managers and without disturbing their usual routines. And our implementation process should not disturb or collapse the existing system.

## 5.2 System Testing

### 5.2.1 Testing Process

Except for small software, systems should not be tested as a single, monolithic unit. Large systems are built out of sub-systems, which are built out of sub-systems, which are composed of procedures and functions. The testing process should therefore proceed in stages where testing is carried our incrementally in conjunction with the system implementation.

There are the five test stages and defects are discovered at any stage, they require program modifications to correct them and this may require other stages in the testing process to be repeated. The process therefore is an iterative one with information being fed back from later stages to earlier parts of the process.

The stages in the testing process are:

Unit Testing

Module Testing

Sub-system Testing

System Testing

Acceptance testing

#### 5.2.1.1 Unit Testing

Individual components are tested to ensure that they operate correctly. Each component is tested independently, without other system components. With respect to this project, the individual functions are treated as component and were tested.

### 5.2.1.2 Module Testing

A module is a collection of dependent components such as an object class, an abstract data type or some looser collection of procedures and functions. A module encapsulates related components so it can be tested with other system components.

Tests carried out in this phase

- Test for connection between client and server for multiple requests.
- Test the client IP for authentication, URL validity and availability in cache.
- Test conducted for downloading the requested page.
- Test for saving the downloaded page in cache.
- Test for sending the requested page to client.

### 5.2.1.3 Sub-system Testing

This phase involves testing collection of modules, which have been integrated into sub-systems. Sub-systems may be independently designed and implemented. The most common problems that arise in large software system are sub-system interface mismatches. The sub-system test process should therefore concentrate on the detection of interface errors by rigorously exercising these interfaces. Both the modules are treated as a sub-system and tested in this stage.

Tests carried out in this phase

- Integration of communication module and authentication module forms a Sub-system. This interface is tested thoroughly.
- Integration of downloading module, Caching module and Response module forms another Sub-system. This interface is tested thoroughly.

#### 5.2.1.4 System Testing

The sub-systems are integrated to make up the entire system. The testing process is concerned with finding errors, which result from unanticipated interactions between sub-system and system components. It is also concerned with validating that the system meets its functional and non-functional.

Test carried out in this phase

- After integration of the above sub-systems with the whole system, the entire system is tested for errors.

#### 5.2.1.5 Acceptance Testing

This is the final stage in the testing process before the system is accepted for operational use. The system is tested with data supplied by the system procurer rather than simulated data. Acceptance testing may reveal errors and omissions in the system requirements definition because the real data exercises the system in different ways from testing the data. Acceptance testing may also reveal requirement problems were the system facilities do not really meet the users need or the system performance is unacceptable. Test and reveal data were provided to the system and checked for errors

### 5.2.2 Defect Testing

Defect testing is intended to exercise a system so that latent defects are exposed before the system is delivered. These contrasts with validation testing which is intended to demonstrate that the system meets its requirement. Validation testing requires the system to perform correctly using given acceptance test cases. A successful defect test is a test, which causes a system to perform incorrectly and hence exposes the defects. It demonstrates the presence, not absence of program faults.

Various values, within the limit and exceeding the limit were provided repeatedly to individual components of data acquisition. These brought out the defects in the system and were corrected.

Tests carried out in this phase

- Test for pruned web site is done and checks whether the client receives the error page.
- Test for unauthorized client IP is done and checks whether the client receives the error page.

### 5.2.3 Path Testing

Path testing is a white-box testing strategy whose objective is to exercise every independent execution path through the component. If every independent path is executed then all the statements in the program must have been executed at least one. Furthermore, all conditional statements are tested for both true and false cases. This helped to improve the program efficiency with respect to time complexity and memory usage.

# 6. Conclusion & Future Enhancement

The Net-LAN server has better results than the existing system. Thus it acts as an intermediary between a workstation user and the Internet so that the enterprise can ensure security, administrative control, and caching service. It has reduced the overall cost in the organizations to use the Internet. A good amount of user-friendly features have been incorporated in the system and it is possible for system administrator to exploit these features to get the maximum benefit.

The system has been developed well and when implemented, is bound to satisfy all the requirements. Efforts have been taken to make the software impeccable and upgradeable.

Though this application meets the requirements comprehensively, there is always some room for progress in the future. This Net-LAN server satisfies the features like cache and firewall. In future this server could be enhanced to respond other protocols like http secure and ftp. Net-LAN server does filtering for incoming requests (requests from client to server); in future filtering for outgoing traffic (response from server to client) can be incorporated. Though the Net-LAN server works fast, storing the details (Client IP address, Date & Time, Requested URL and content size) in the database further enhances security level.

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  "Introducing System Analysis and Design",
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  "Programming Visual C++", Microsoft Press,
  Fifth Edition, 1998
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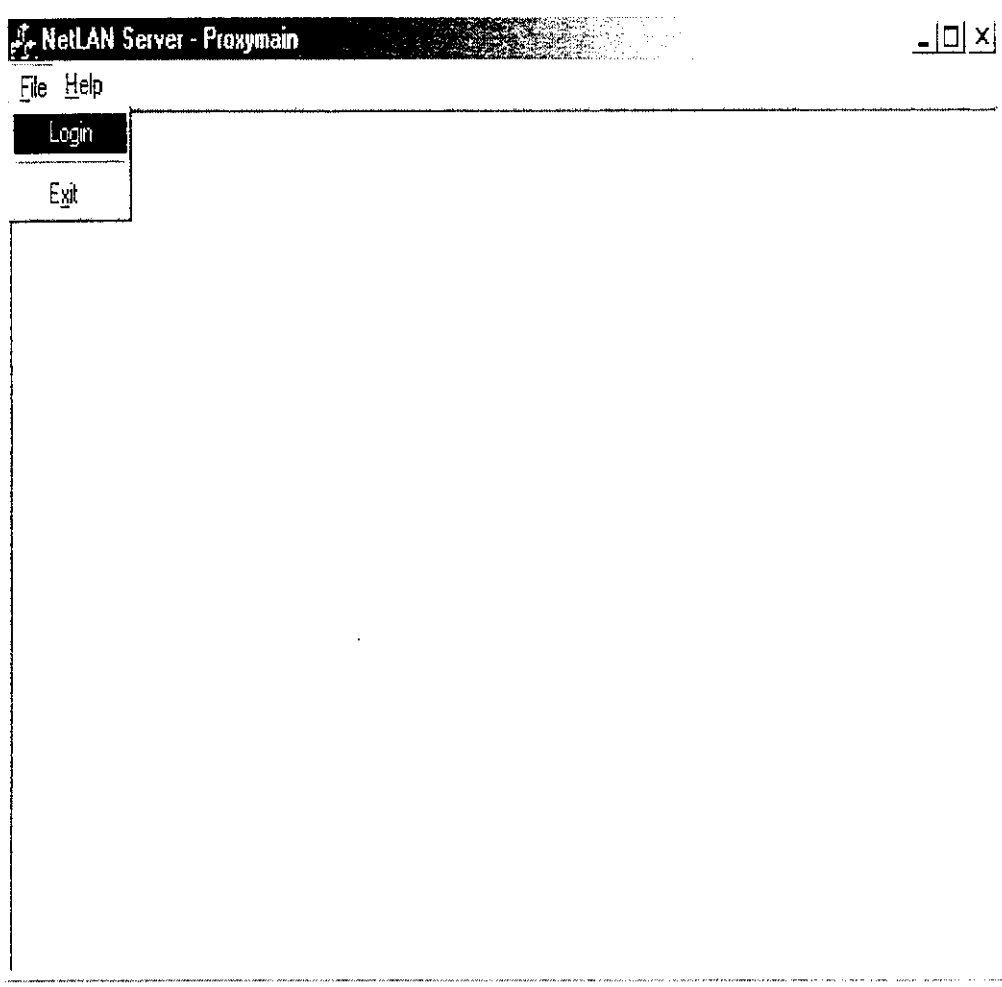
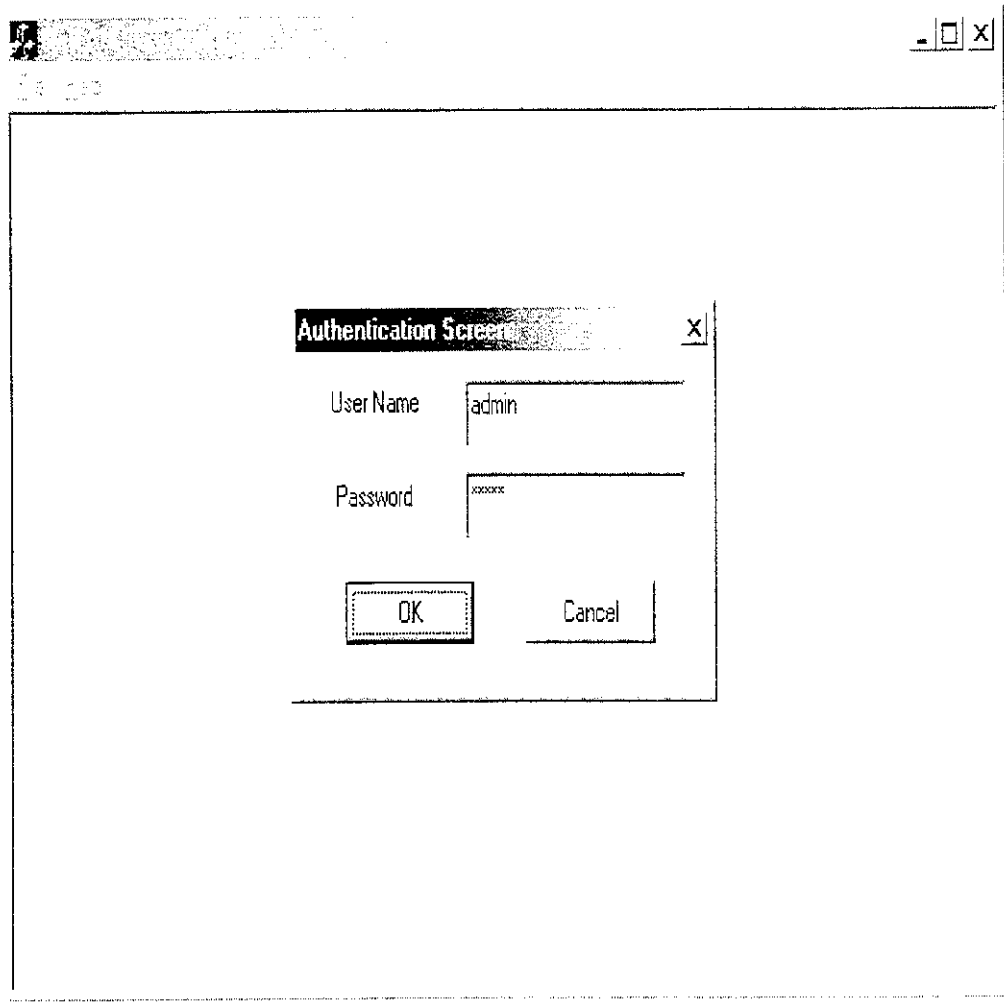
## Web sites


- www.experts-echange.com
- www.askme.com
- www.1001tutorials.com
- www.funducode.com
- www.codeguru.com

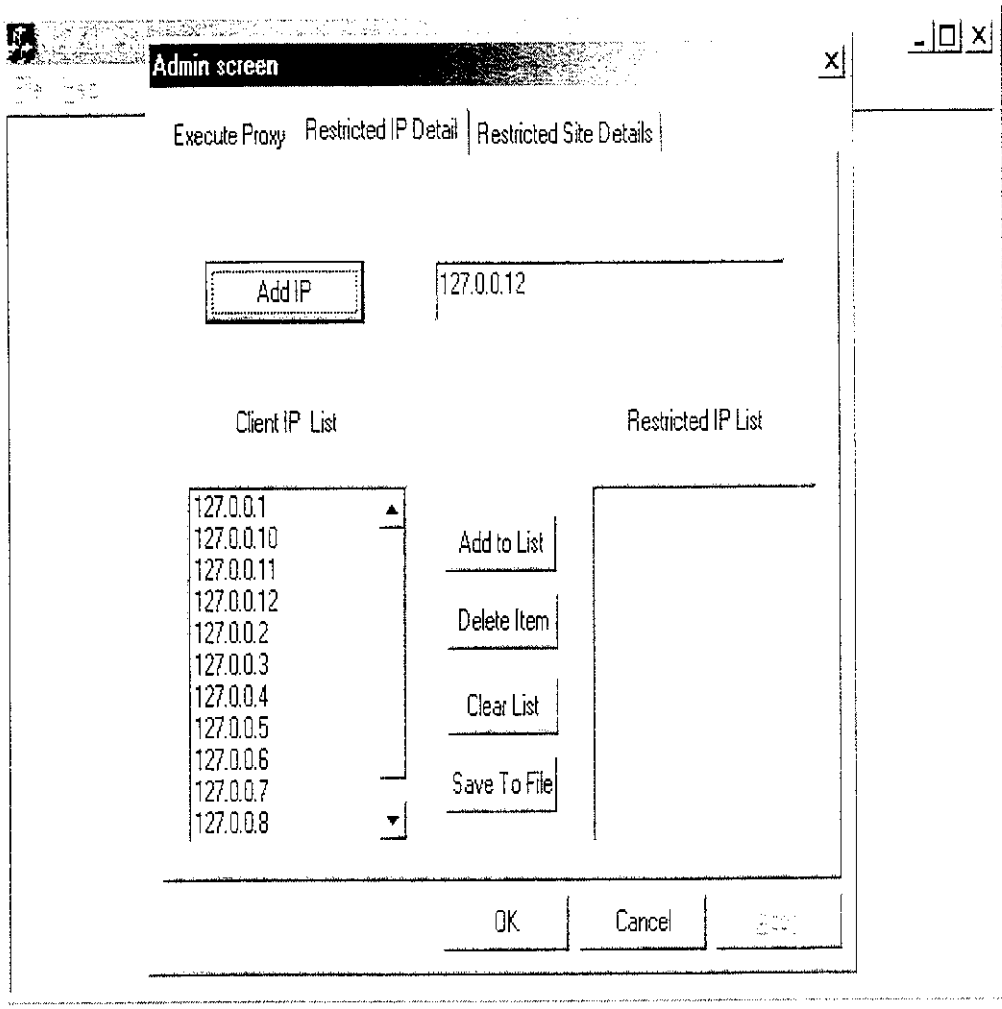
# Menu Screen



# Password Screen



# Restricted IP Details Screen 1



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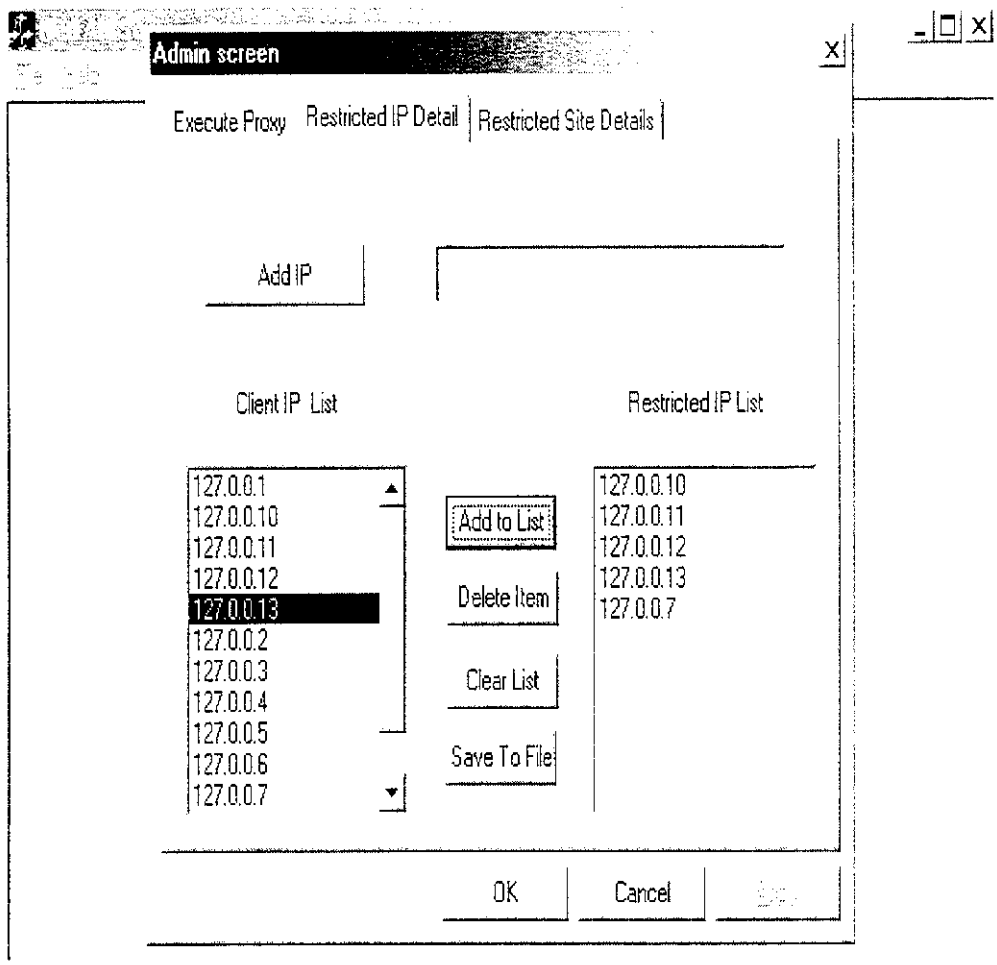
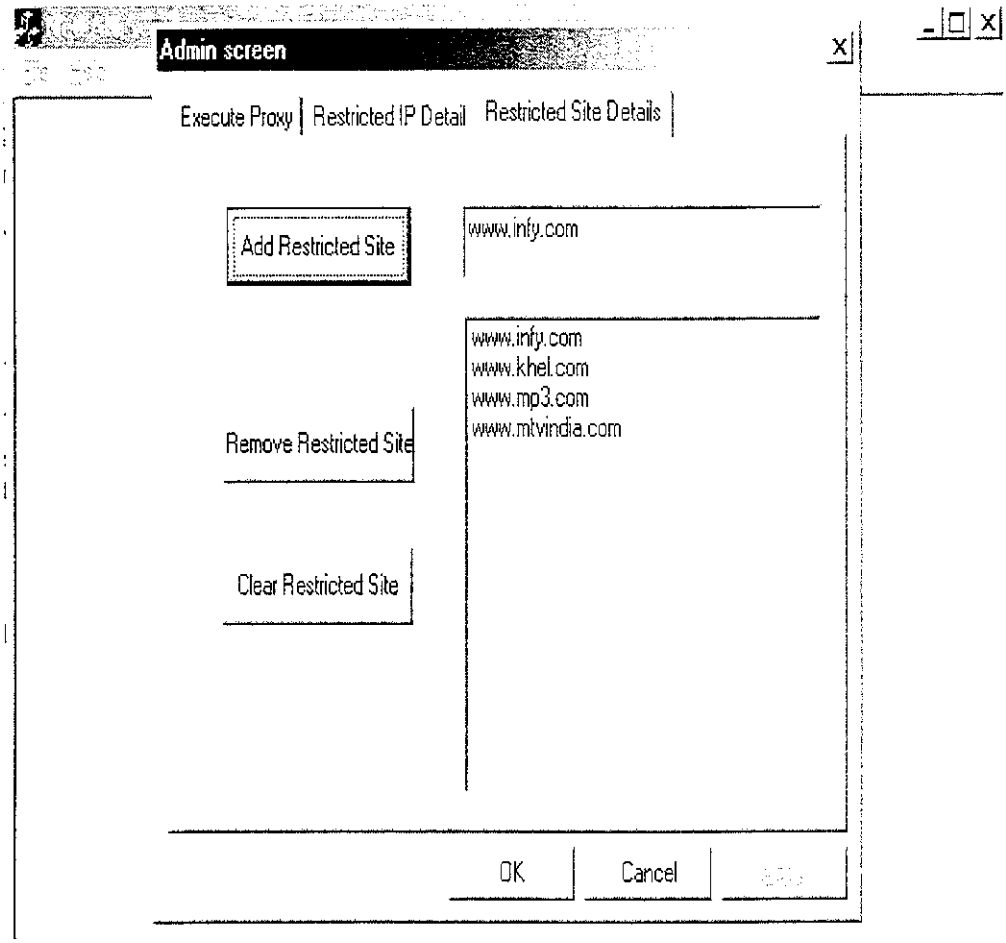


# Restricted Site Details Screen



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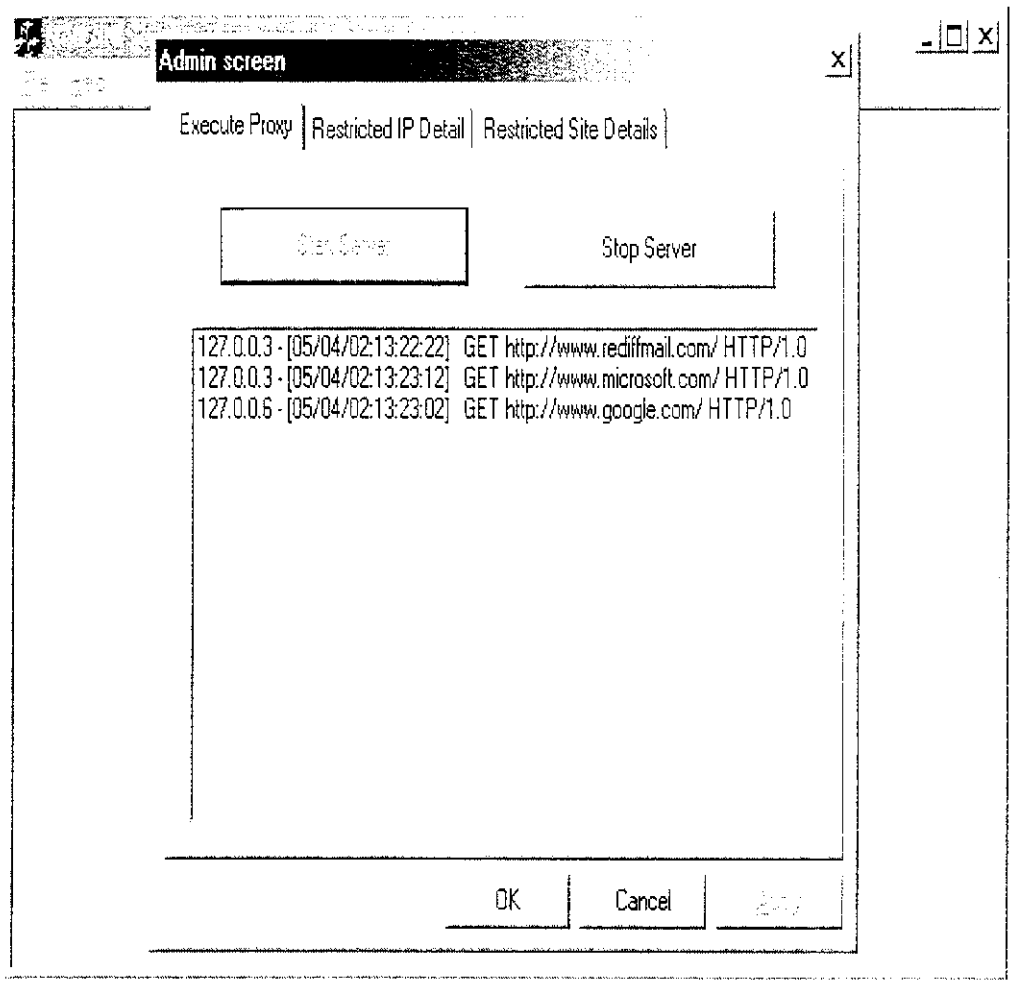

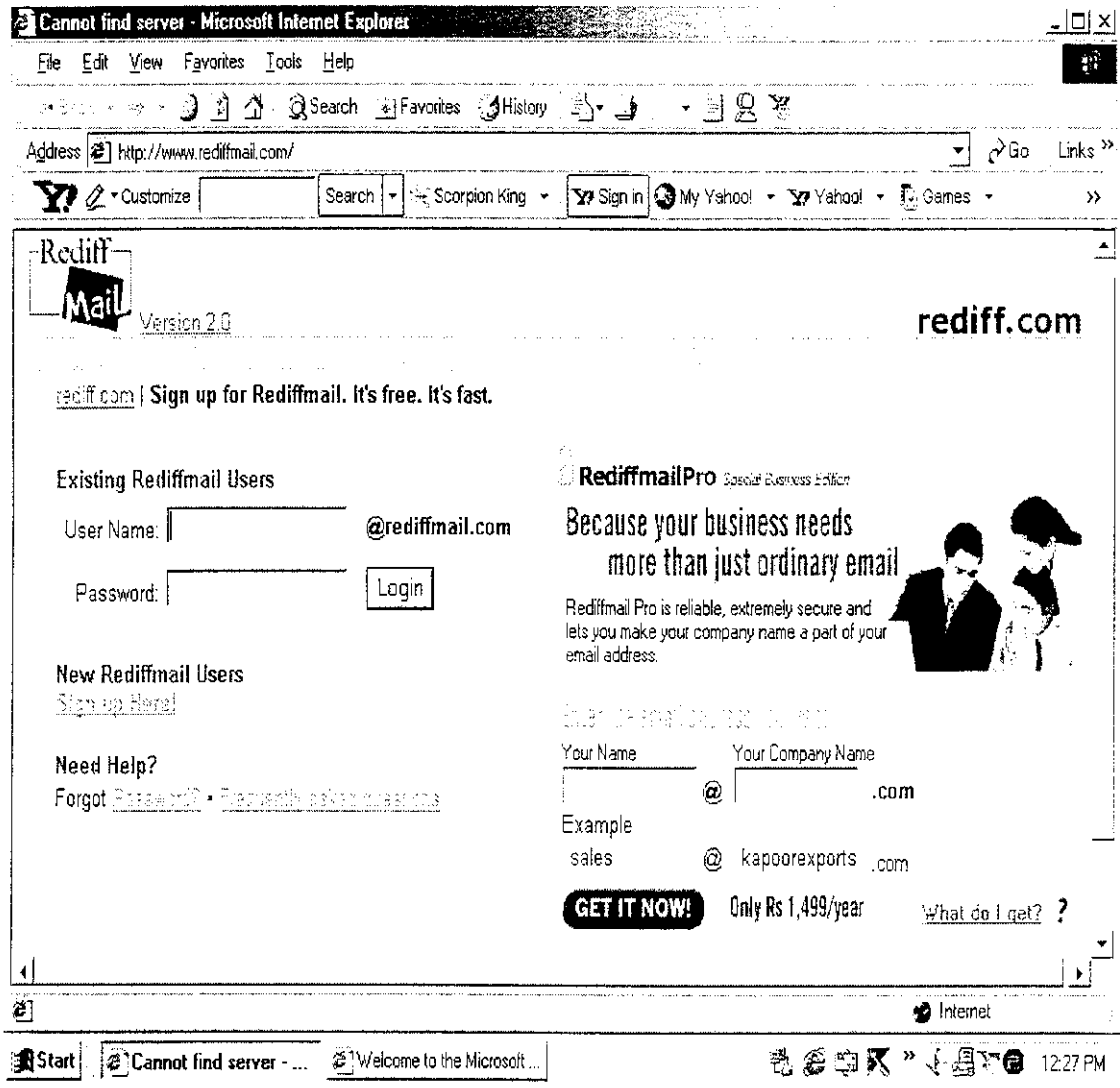
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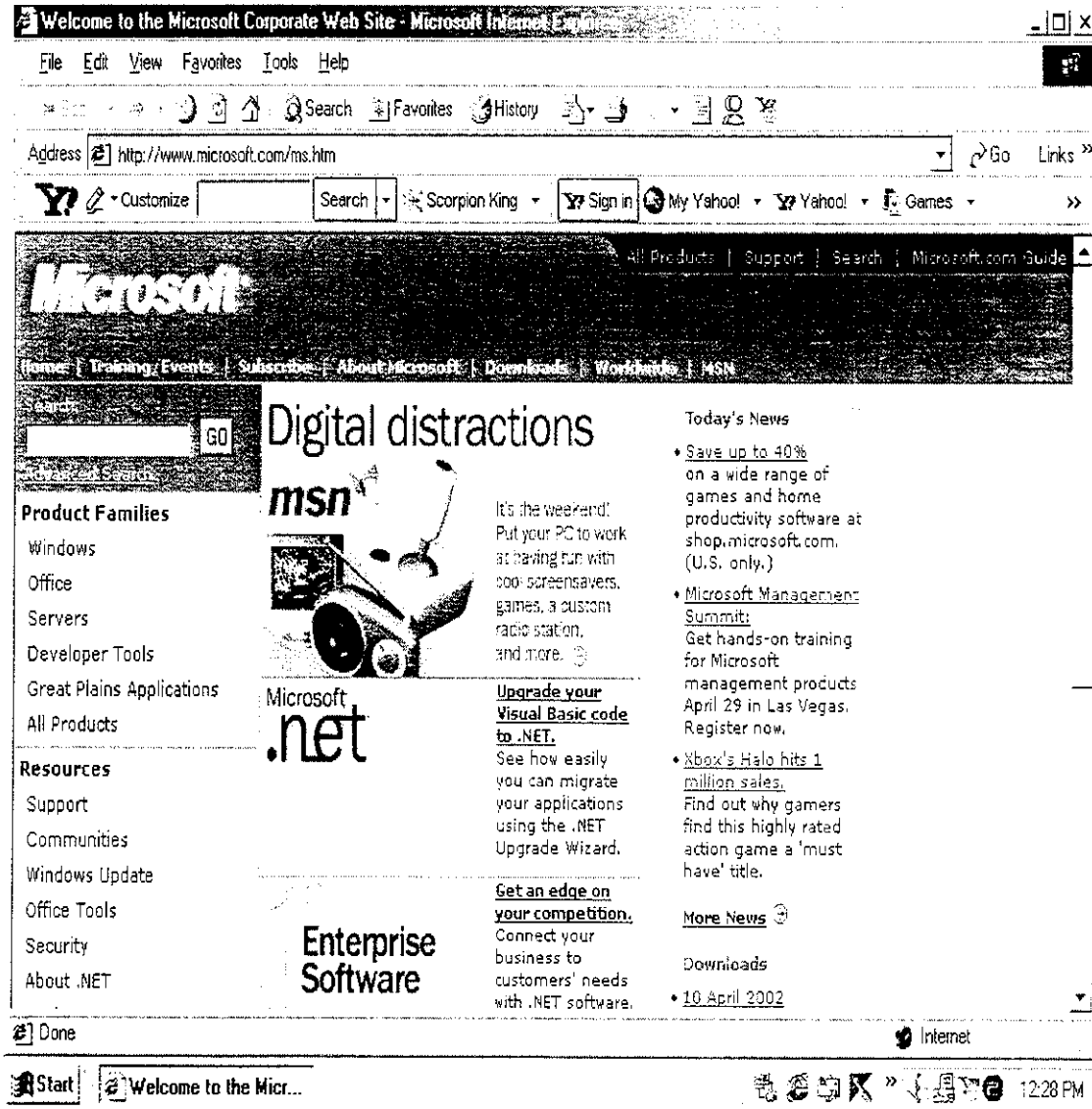
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Upgrade your Visual Basic code to .NET.
See how easily you can migrate your applications using the .NET Upgrade Wizard.
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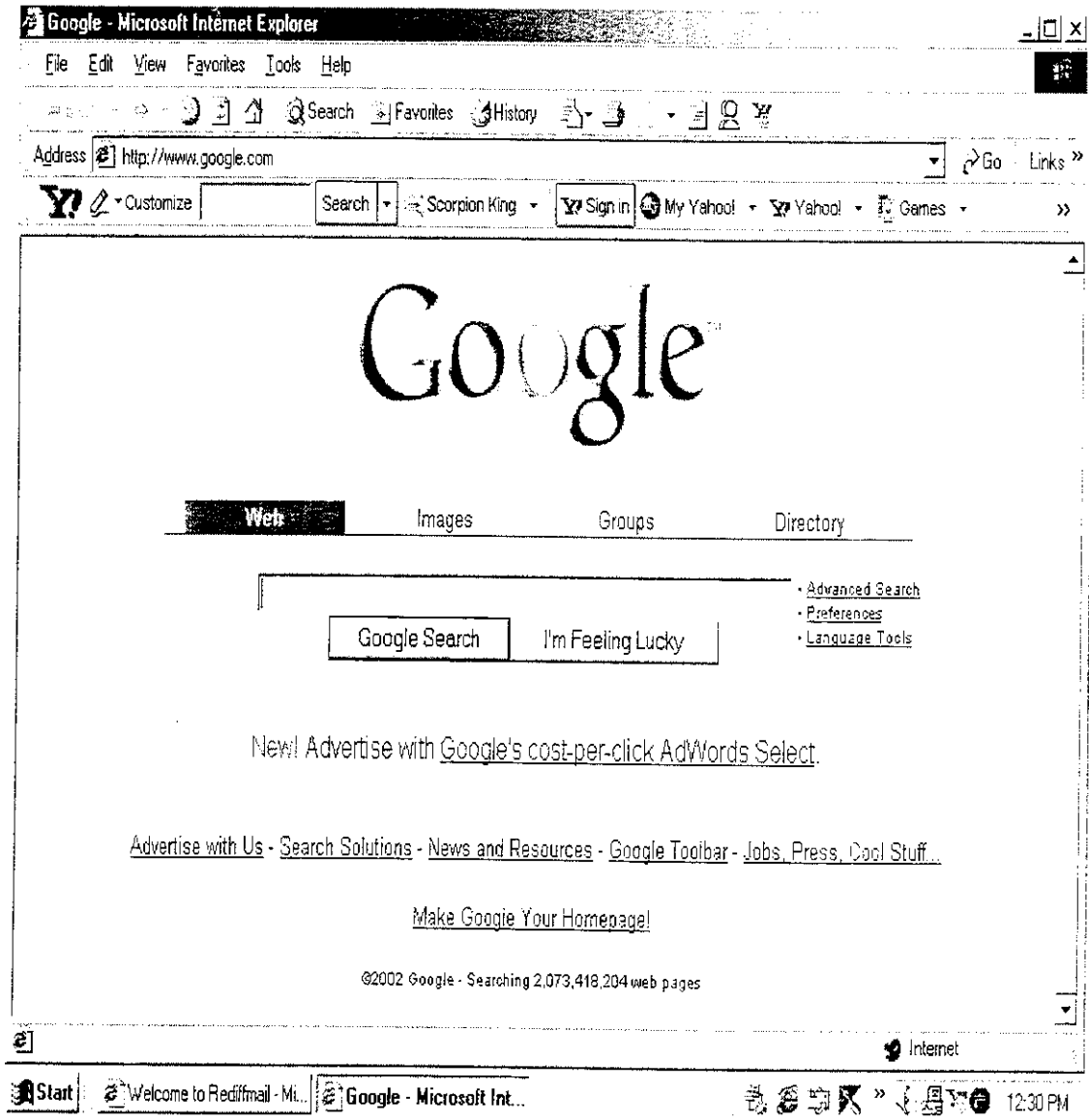
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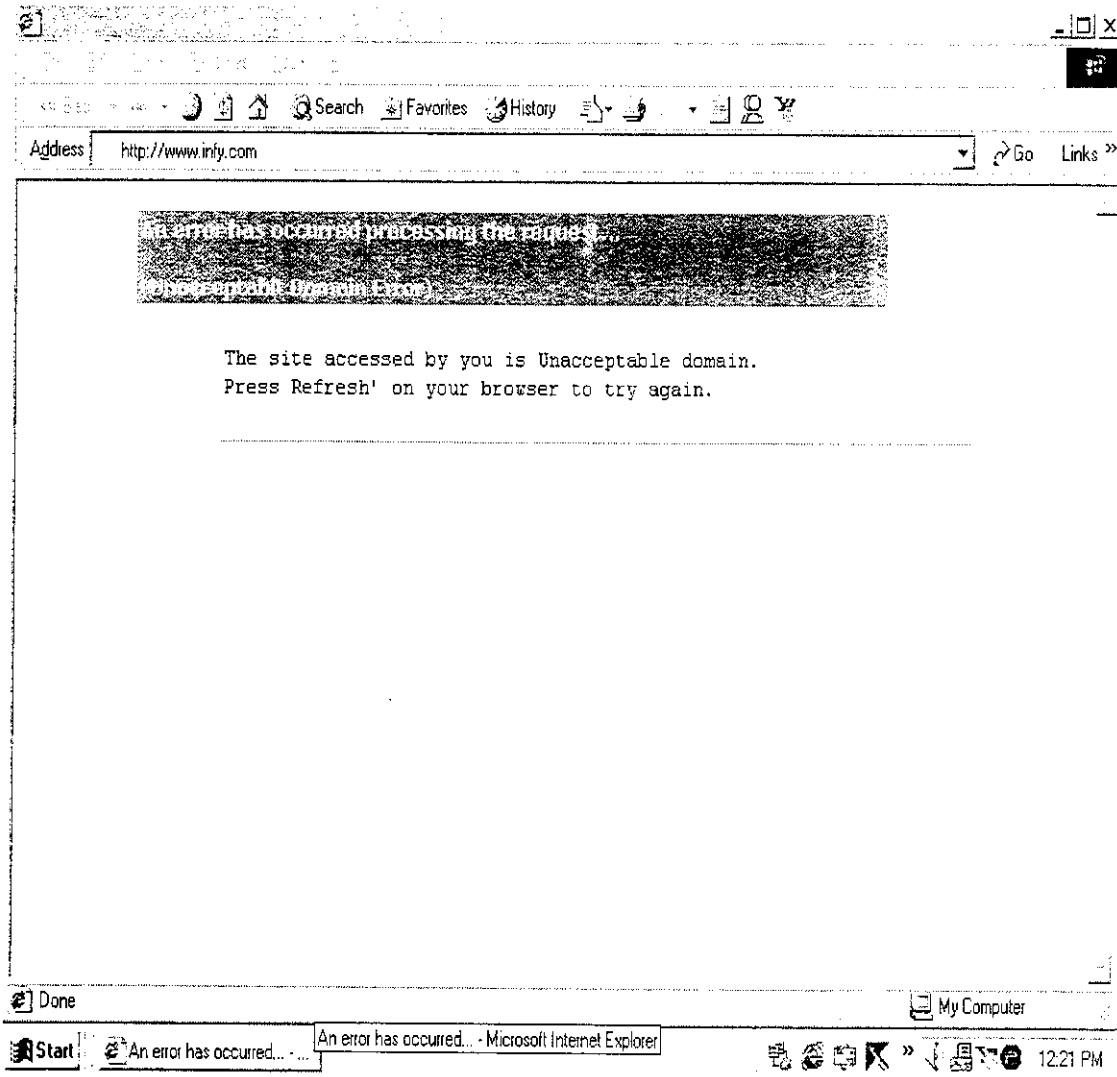
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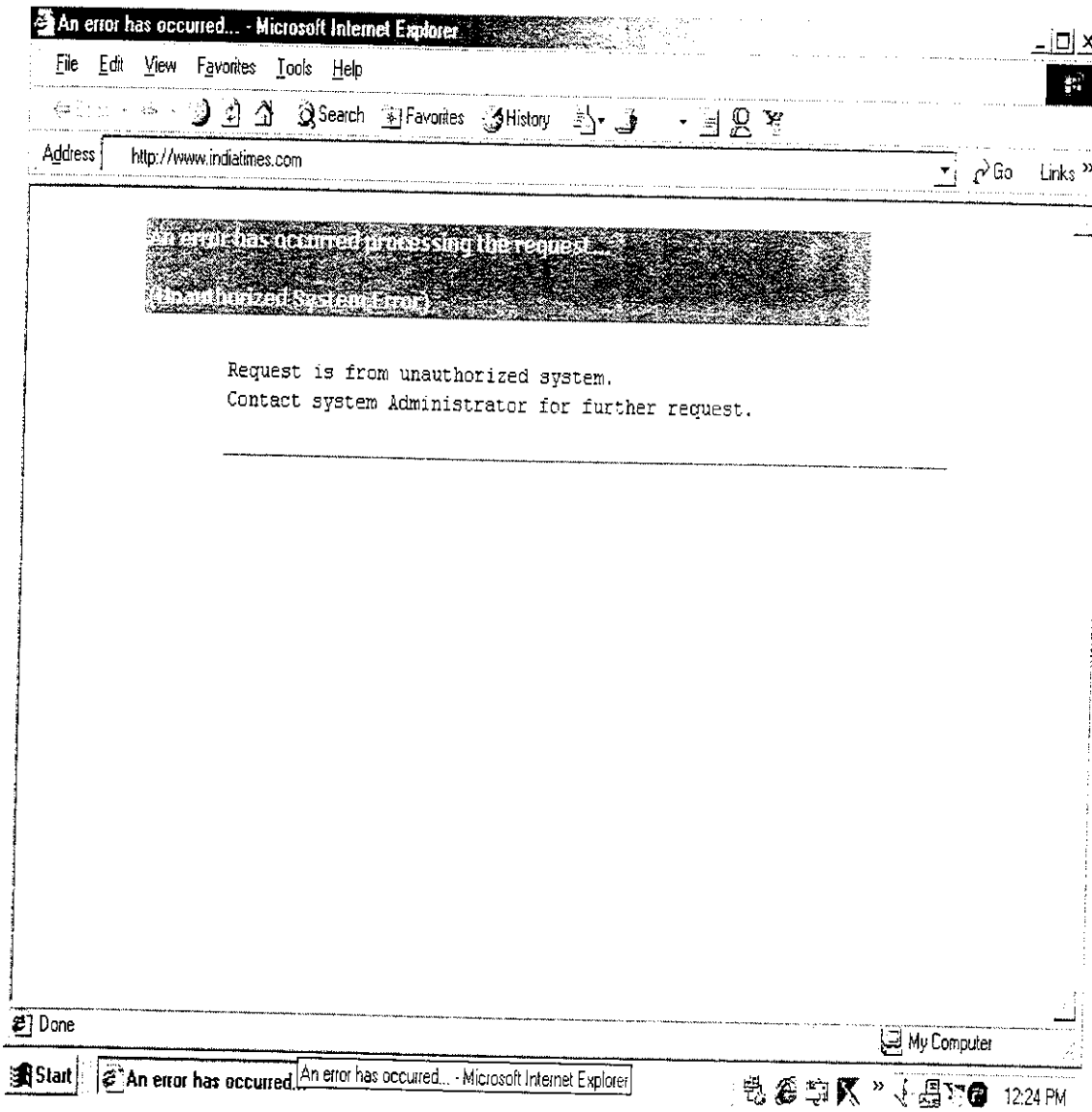
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Request is from unauthorized system.
Contact system Administrator for further request.
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An error has occured... - Microsoft Internet Explorer
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