Enhancing Network Performance: The Importance of An Effective Monitoring System

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Abstract- *Most of the organization they connect more numbers of systems to form a network to make their work easier to share their files and folders. While connecting we want to monitor the network system activities for secure purpose. This Project deals with monitoring the Network Screen Activities. It has two methodologies one for Client and another for Server. In the proposed system we introduce current session option to monitor the network systems at the same time and in the accesses folder option shows the username and user accessed folders.*

I. INTRODUCTION

Most of the organization they connect more numbers of systems to form a network to make their work easier to share their files and folders. While connecting we want to monitor the network system activities for secure purpose. This Project deals with monitoring the Network Screen Activities. It has two methodologies one for Client and another for Server. In the proposed system we introduce current session option to monitor the network systems at the same time and in the accesses folder option shows the username and user accessed folders. While client logins to the server, the Client IP Address and System names are added to the server. Server will display all the user names, from server we can monitor the particular Client Screen Activities like that currently opened screens, what are all the files created, modified and deleted.

Remote Desktop Services is one of Microsoft Windows components to access a remote computer through the network. Only the user interface of the application is presented at the client. Any input is redirected over to the remote computer over the network. At work, we use Remote Desktop a great deal. It allows us to login to a remote server to perform health checks, deploy applications, troubleshoot problems, etc. We also use remote desktop often when we do WFH (work from home).

This project is an effort in to develop a simple IP Subnet Calculator tool only for class C IP. The IP Subnet Calculator was to give the user a quick and interactive method to calculate available subnet and hosts. Due to the repetitiveness of such calculates, tools such as an IP Subnet Calculator were developed to eliminate common mathematical mistakes. Furthermore, these tools also provide a means for the user to do such calculations without actually understanding the details behind calculating IP subnets.

Objection of the project

In Order to be able to define our system architecture, we must first dearly state what our objective that will driver system behavior at the same one of our objective is to create an experience, which is not only unique to the (user) client, but also makes him feel that he has loyal attachment to the system and approaches us whenever he she needs.

To achieve better results and success by implement computerized process instead of manual process.

Module and their Description

This project having Five Modules

1. Admin
2. Network Monitoring System
3. Remote Desktop Monitoring
4. E-Mail Client
5. IP Calculator

1.Admin

The Login module consists of username and password. This process is for authenisation.The user name and password is correct it is link into next page. This process is done in login.

2. Network Monitoring System:

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another for Server. In the proposed system we introduce current session option to monitor the network systems at the same time and in the accesses folder option shows the username and user accessed folders. While client logins to the server, the Client IP Address and System names are added to the server. Server will display all the user names, from server we can monitor the particular Client Screen Activities like that currently opened screens, what are all the files created, modified and deleted

3. Remote Desktop Monitoring

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4. E-Mail Client

You have several choices for your email client application, including a range of web email services. However, many people prefer to use a stand-alone application designed specifically for email since they sometimes have a better focus and features. Some people avoid the Microsoft Outlook application because of its historic vulnerability to viruses. An application that runs on a personal computer or workstation and enables you to send, receive and organize e-mail. It's called a client because e-mail systems are based on a client-server architecture. Mail is sent from many clients to a central server, which re-routes the mail to its intended destination.

5. IP CALCULATOR SUBNET

The calculator module certain process

- **Internet protocol**
- **Network type**
- **Calculate**

Internet protocol:

The Internet protocol is used to know about the network type. The protocol is enter in the textbox and calculates. It will show the network type. If wrong protocol is entering in the textbox. It will show the error message.

Network type:

The Network used to describes the class.

- **Class A:0: 127 255**
- **Class B:128:191 255**
- **ClassC:192:223 255**
- **ClassD:224:239 255**
- **ClassE:239:254 255**

Calculate:

The Calculate is used to calculate the internet protocol and network type.In this system Maximum number of subnet is display.

CUSTOMER REQUIREMENTS DETERMINATION

Existing system

The existing system has been maintained manually. The system, which has been maintained manually, had been complex and complicated. There were many chances to loss the data and the work wouldn't be an effective and efficient one. Manual operation is always been complicated to the organizations for maintaining the records. In the existing system

- In this system we can't monitor who all are accessing the files at the same time.
- It's difficult to find which are the files are updated and renamed.

Drawbacks of the existing system

- Maintenance of the system is very difficult.
- Employee's attentions are needed for maintaining the system.
- There is a possibility for getting inaccurate results.
- User friendliness is very less.
- It consumes more time for processing the activities.

Proposed system

- Considering the anomalies in the existing system computerization of the whole activity is being suggested after initial analysis by the organization.
- In this system we can monitor who all are accessing the files in the network at the same time.
- When monitoring the connected systems, we can easily found what are the files updated and renamed.

ADVANTAGES OF THE PROPOSED SYSTEM

- Fully Secured
- Role based access
- Ease in maintenance
- Notification about the modification

SOFTWARE REQUIREMENTS SPECIFICATION

Software Requirements Specification (SRS) is the starting point of the software development activity. Little importance was given to this phases in the early days of software development. The emphasis was first on coding and then shifted to design.

As systems grew more complex, it become evident that the goal of the entire system cannot be easily comprehended. Hence need for the requirements analysis phase arose. Now, for large software systems, requirements analysis is perhaps the most difficult activity and also the most error prone.

Some of the difficulty is due to the scope of this phase. The software project is imitated by the client needs. In the beginning these needs are in the minds of various people in the client organization. The requirement analyst has to identify the requirements by tacking to these people and understanding their needs. In situations where the software is to automated a currently manuals process, most of the needs can be understood by observing the current practice.

The SRS is a means of translating the ideas in the minds of the clients (the output) into formal document (the output of the requirements phase). Thus the output of the phase is a set of formally specified requirements, which hopefully are complete and consistent, while the input has none of these properties.

Performance Requirements

The project must the end user requirements. Accuracy and fast must be imposed in the Project. The project is development as easy as possible for the sake of end user. The project has to be developed with view of satisfying the future requirements and future enhancement.

The tool has been finally implemented satisfying the needs specified by the company.

The system is designed in such a way that even when large amount of data used for processing there would less performance degradation.

Interface requirements

Hardware Interface

The stranded input device like keyboard and mouse are to get input. The output will be generated and display in the monitor. The reports can also be exported to a SQL-server document are text file. The stranded printer in used to take outputs.

Software Interface

The design part and interface id done the front end ASP.Net and SQL server as a backend of the project.

Operational requirements

The database or databases that are being failed over to the stand by server cannot be used for anything else. But databases on the standby server not being used for failover can still be used normally.

When it comes time for actual failover, you much one of two things to make your application work either rename the standby server the same name as the failed production server(and the IP address),or re-point your user's applications to new standby server in some cases, neither of this option is practical.

Security Requirements

Web application are available via network access, it is a difficult. If not possible, to limit the population of the end-user who may access the applications? In order to product sensitive connect and provide secure mode be implemented throughout the infrastructure that the supports web application and within the application itself.

Web Application have become heavy integrated with critical corporate and database.

E-commerce application extracts and then store sensitive customer information.

Design Requirements

To create project, add base masters and masters to the project, assign behaviors to the master, create and assign

behavior sets, and then apply, test and validate those behaviors. It also shows how to create and build a stencil to hold the shapes.

Quality and Reliability Requirements

A software component that is developed for reuse would be correct and would contain no defects. In reality, formal verification is not carried out routinely, and defects can add to occur.However,with each reuse,,defects are found eliminated, and a components qualify improve as a result. Over time the components virtually defect free.

Software reliability is defined in statical term as" the probability of faultier-free operation of a computer program in a specified environment for specified tine". The software quality and reliability, failure is nonconformance to software requirements. Failure can be only anything or catastrophic. one failure can be corrected within seconds while another requirements week even mouths to correct. Complicating the issue even further, the correction of the one failure may in fact result in the introduction of the errors that ultimately result in other failure.

SYSTEM ANALYSIS

In this section discussed about data flow diagram, Entity relationship diagram. these things are represented as diagrams with proper notation.

Data Flow Diagram

The data flow diagram is one of the most improvement tools used by the system analyst DeMacro (1978) Nad Gand Sarson (1979) popularized the use if the data flow diagram as modeling tools through their structured system analysis methodologies.

A data flow diagram should be the first tool used by system analyst to model system components. These components are the system processes; the data used by this processes and external entities that interact with the system and the information flows in the system.

Data Stores

File or data store is depositary of data. They contain data that is retained in the system. Processes can enter the data into a data store or retrieve data from the data store. Each data store is represented by thin line in the data flow diagram and each data store has a unique name.

External Entities

External entities are outside the system but they either supply input data into the system or use the system output, they are entities which the designer has no control. Square or rectangle may represent external entities that supply data into a system or some times called sources. External entities that use the system data are sometimes called sinks.

SYSTEM DESIGN

Design is multi-step process that focuses on data structure software architecture, procedural details, (algorithms etc.) and interface between modules. The design process also translates the requirements into the presentation of software that can be accessed for quality before coding begins.

Computer software design changes continuously as new methods; better analysis and broader understanding evolved. Software Design is at relatively early stage in its revolution.

Therefore, Software Design methodology lacks the depth, flexibility and quantitative nature that are normally associated with more classical engineering disciplines. However techniques for software designs do exist, criteria for design qualities are available and design notation can be applied.

INPUT DESIGN

Input design is the process of converting user-originated inputs to a computer-based format. Input design is one of the most expensive phases of the operation of computerized system and is often the major problem of a system.

In the project, the input design is made in various web forms with various methods. For example, in the Admin form, the empty username and password is not allowed. The username if exists in the database, the input is considered to be invalid and is not accepted.

OUTPUT DESIGN

Output design generally refers to the results and information that are generated by the system for many end-users; output is the main reason for developing the system and the basis on which they evaluate the usefulness of the application.

In the project, if the employee has to communicate with other employees they can communicate through send and receive message.

INTERFACE DESIGN

The ODBC (Open Database Connectivity) interface is a pure .NET to execute SQL statement. The ODBC provides a set classes and interfaces that can be used by developers to write database applications. Basic ODBC interactions in its simplest form, can be broken down into four steps:

1. Open a connection to the database.
2. Execute a SQL statement
3. Process the result
4. Close the connection to the database

TABLE AND DATABASE DESIGN:

Normalization:

Normalization is the process of strutting relational database schema such that most ambiguity is removed. The stage of normalization are referred to as forms and progress from the least restrictive(first normal form)through the most restrictive(Fifth normal form), generally , most database designers do not attempt to implement anything higher then normal form of Boyce code Normal Form.

FIRST NORMAL FORM:

A relation is said to be in First normal form (INF) if and each attributed of the relation is atomic. More simply, to be INF, each column must contain only a single value and each now contain in the same column.

SECOND NORMAL FORM:

In the Second normal Form, a relation must first fulfill the requirement to be in first Normal Form. Additional, each donkey attribute in the relation must be functionality dependent upon the primary key**.**

THIRD NORMAL FORM:

A table is said to be in third normal form and every non key attribute is functionality dependent only on the primary key. This normalization process is applied to this system and the normalized tables are given in the above section.

1 COMPONENTS OF .NET FRAMEWORK

THE COMMON LANGUAGE RUNTIME (CLR)

The common language runtime is the foundation of the .NET Framework. It manages code at execution time, providing important services such as memory management, thread management, and remoting and also ensures more security and robustness. The concept of code management is a fundamental principle of the runtime. Code that targets the runtime is known as managed code, while code that does not target the runtime is known as unmanaged code

THE .NET FRAME WORK CLASS LIBRARY

It is a comprehensive, object-oriented collection of reusable types used to develop applications ranging from traditional command-line or graphical user interface (GUI) applications to applications based on the latest innovations provided by ASP.NET, such as Web Forms and XML Web services.

The .NET Framework can be hosted by unmanaged components that load the common language runtime into their processes and initiate the execution of managed code, thereby creating a software environment that can exploit both managed and unmanaged features. The .NET Framework not only provides several runtime hosts, but also supports the development of third-party runtime hosts.

Internet Explorer is an example of an unmanaged application that hosts the runtime (in the form of a MIME type extension). Using Internet Explorer to host the runtime to enables embeds managed components or Windows Forms controls in HTML documents.

FEATURES OF THE COMMON LANGUAGE RUNTIME

The common language runtime manages memory; thread execution, code execution, code safety verification, compilation, and other system services these are all run on CLR.

Security.
Robustness.
Productivity.
Performance.

Security

The runtime enforces code access security. The security features of the runtime thus enable legitimate Internet-deployed software to be exceptionally feature rich.

With regards to security, managed components are awarded varying degrees of trust, depending on a number of factors that include their origin to perform file-access operations, registry-access operations, or other sensitive functions.

ROBUSTNESS

The runtime also enforces code robustness by implementing a strict type- and code-verification infrastructure called the common type system(CTS). The CTS ensures that all managed code is self-describing. The managed environment of the runtime eliminates many common software issues

PRODUCTIVITY

The runtime also accelerates developer productivity. For example, programmers can write applications in their development language of choice, yet take full advantage of the runtime, the class library, and components written in other languages by other developers.

PERFORMANCE

The runtime is designed to enhance performance. Although the common language runtime provides many standard runtime services, managed code is never interpreted. A feature called just-in-time (JIT) compiling enables all managed code to run in the native machine language of the system on which it is executing. Finally, the runtime can be hosted by high-performance, server-side applications, such as Microsoft® SQL Server™ and Internet Information Services (IIS).

Algorithm Used

Step1: The username and password is entered it redirectly to the nexT page.
Step2: To view the main network page, after it may be share folder to the current session.
Step3: The next page contsins the details of the client of sharing other systems.
Step4: After the form contains the uset details may be view of the current session.
Step5: The next page contains the IP Subnet calculator, you must enter the IP address and then calculate the range of netmask.
Step6: In the above page may contains the some information prefix, netmask, network, broadcast, maximum numbers of subnets.
Step7: In another form contains "Remote desktop, you must enter the Server Name, Username, and Password and then connect or disconnect.
Step8: After the user must access to the server using Remote Desktop.

SYSTEM TESTING

System testing involves user training system testing and successful running of the developed proposed system. The user tests the developed system and changes are made according to their needs. The testing phase involves the testing of developed system using various kinds of data.
An elaborate testing of data is prepared and the system is tested using the test data. While testing, errors are noted and the corrections are made. The corrections are also noted for the future use. The users are trained to operate the developed system.

2 TESTING

System testing is the stage of implementation that is aimed at ensuring that the system works accurately and efficiently before live operation commences. Testing is vital to the success of the system. System testing makes logical assumption that if all the parts of the system are correct, then the goal will be successfully achieved. A series of testing are done for the proposed system before the system is ready for the user acceptance testing.

3 The following are the types of Testing

1. Unit Testing
2. Integration Testing
3. Validation Testing
4. Verification testing
5. User acceptance testing

4 Unit Testing

Unit testing focuses verification efforts on the smallest unit of the software design, the module. This is also known as "module testing". The modules are tested separately. This testing was carried out during programming stage itself. In this testing each module is found to be working satisfactorily as regards to the expected output from the module.

Integration Testing

Data can be lost across an interface: one module can have adverse efforts on another. Integration testing is the systematic testing for construction of program structure, while

at the same time conducting tests to uncover errors associated within the interface. Here correction is difficult because the isolation of cause is complicated by the cast expense of the entire program. Thus in the integration testing step, all the errors uncovered are corrected for the next testing steps.

5 Validation Testing

At the conclusion of integration testing, software is completely assembled as a package, interfacing errors have been uncovered and corrected and a final series of software tests begins validation test has been conducted one of the two possible conditions exists. One is the function or performance characteristics confirm to specification and are accepted and the other is deviation from specification is uncovered and a deficiency list is created.

Verification Testing

Verification is a fundamental concept in software design. This is the bridge between customer requirements and an implementation that satisfies those requirements.

This is verifiable if it can be demonstrated that the testing will result in an implementation that satisfies the customer requirements.

6 **User Acceptance Testing**

User acceptance testing of a system is the key factor of the success of any system. The system under study is tested for the user acceptance by constantly keeping in touch with the prospective system users at any time of developing and making changes whenever required.

PROBLEMS FACED

When there is a clear goal in sight but no clear set of directions or means to attain that goal, then it is called a problem. problems can be broken down into four aspects; goal, givens, means of transforming conditions, and obstacles.

Goal – the goal is the desired end state which the problem solving is being directed toward.

The hope is to reach that end state and be able to assess whether or not you achieved what you wanted.

Givens- these are the objects , conditions ,and constraints that accompany a problem ,and can be either explicit or implicit.

Means of transforming conditions- there should be a way of changing the initial stateof the problem.this is most usually a person's knowledge or skill level. For instance ,a computer programmer presented with a problem would utilize his or her knowledge of programming language to transform the state of the problem.

Obstacles- the problem should present a challenge.if there are no challenges involved and the situation can be easily solved then it is not so a problem so much as a rountine task.

Every problem has a **problem faced**, which is the whole range of possible states and operators.only some of these states and operators will bring the person closer to the goal state. The problem starts at the **initial state** and **operators** are applied to change the state, creating a series of intermediate states that should hopefully lead to the final goal state.

II. CONCLUSION

It is concluded that the application works well and satisfy the company and students. The application is tested very well and errors are properly debugged. The application is simultaneously accessed from more than one system. Simultaneous login from more than one place is tested.

The application works according to the restrictions provided in their respective browsers. Further enhancements can be made to the application, so that the application functions very interactive and useful to existing application .The application satisfies both the company and students by eliminating more input. The speed of the transactions become more enough now.

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