US00RE49392E

(19) **United States**

(12) **Reissued Patent**

Bartlett

(10) **Patent Number: US RE49,392 E**

(45) **Date of Reissued Patent: Jan. 24, 2023**

(54) **SYSTEM AND METHOD FOR MONITORING NETWORK CONNECTION QUALITY BY EXECUTING COMPUTER-EXECUTABLE INSTRUCTIONS STORED ON A NON-TRANSITORY COMPUTER-READABLE MEDIUM**

(71) Applicant: **AAA Internet Publishing, Inc.**, Kelowna (CA)

(72) Inventor: **Robert Michael Norman Bartlett**, West Kelowna (CA)

(73) Assignee: **AAA INTERNET PUBLISHING, INC.**, Kelowna (CA)

(21) Appl. No.: **15/825,849**

(22) Filed: **Nov. 29, 2017**

Related U.S. Patent Documents

Reissue of:

(64) Patent No.: **9,742,646**
Issued: **Aug. 22, 2017**
Appl. No.: **15/399,303**
Filed: **Jan. 5, 2017**

U.S. Applications:

(63) Continuation-in-part of application No. 15/335,304, filed on Oct. 26, 2016, now Pat. No. 10,525,343, and

(Continued)

(51) **Int. Cl.**
H04L 43/08 (2022.01)
H04L 41/5009 (2022.01)

(Continued)

(52) **U.S. Cl.**
CPC ***H04L 43/08*** (2013.01); ***H04L 41/5009*** (2013.01); ***H04L 43/16*** (2013.01); *H04L 43/062* (2013.01)

(58) **Field of Classification Search**
CPC H04L 41/5009; H04L 43/08; H04L 43/16; H04L 43/062
See application file for complete search history.

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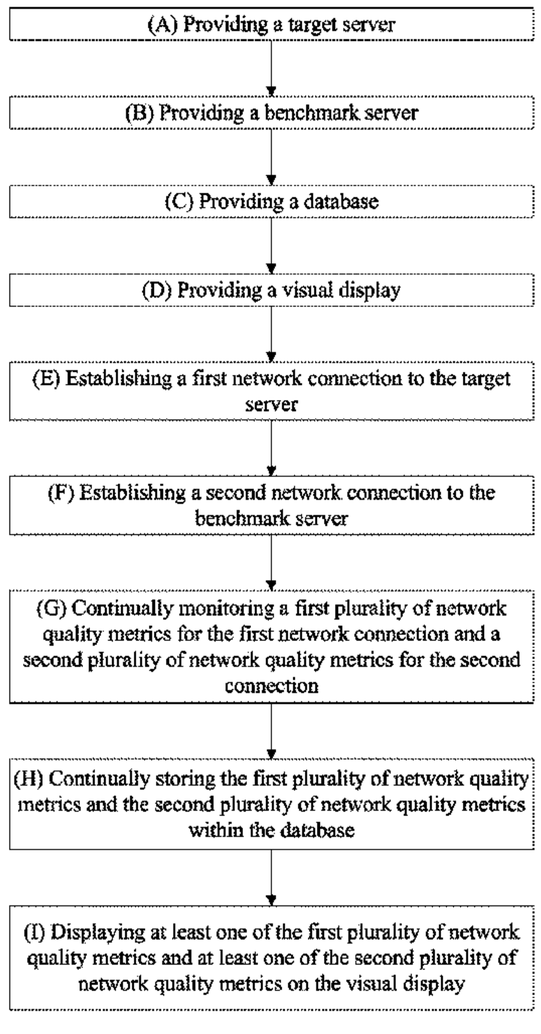
Primary Examiner — Peng Ke

(74) *Attorney, Agent, or Firm* — Michele V. Frank; Venable LLP

(57) **ABSTRACT**

A system and method for monitoring network connection quality utilizes software installed on a user computer to monitor a first network connection to a target server used for a desired activity and a second network connection to a benchmark server. Various network quality metrics are recorded and compared for each of the connections and displayed on a visual display so that the user may easily and accurately judge the health of the connection to the target server.

23 Claims, 11 Drawing Sheets



Related U.S. Application Data

a continuation-in-part of application No. 15/335,308, filed on Oct. 26, 2016, now Pat. No. 10,917,299, and a continuation-in-part of application No. 14/812,968, filed on Jul. 29, 2015, now Pat. No. 9,729,504, and a continuation-in-part of application No. 14/731,286, filed on Jun. 4, 2015, now Pat. No. 9,614,870, and a continuation of application No. 14/066,277, filed on Oct. 29, 2013, now Pat. No. 9,571,359, and a continuation-in-part of application No. 14/047,678, filed on Oct. 7, 2013, now Pat. No. 11,050,669.

(60) Provisional application No. 62/246,397, filed on Oct. 26, 2015, provisional application No. 62/246,304, filed on Oct. 26, 2015, provisional application No. 62/030,384, filed on Jul. 29, 2014, provisional application No. 62/007,787, filed on Jun. 4, 2014, provisional application No. 61/720,232, filed on Oct. 30, 2012, provisional application No. 61/719,602, filed on Oct. 29, 2012, provisional application No. 61/710,026, filed on Oct. 5, 2012.

(51) **Int. Cl.**
H04L 43/16 (2022.01)
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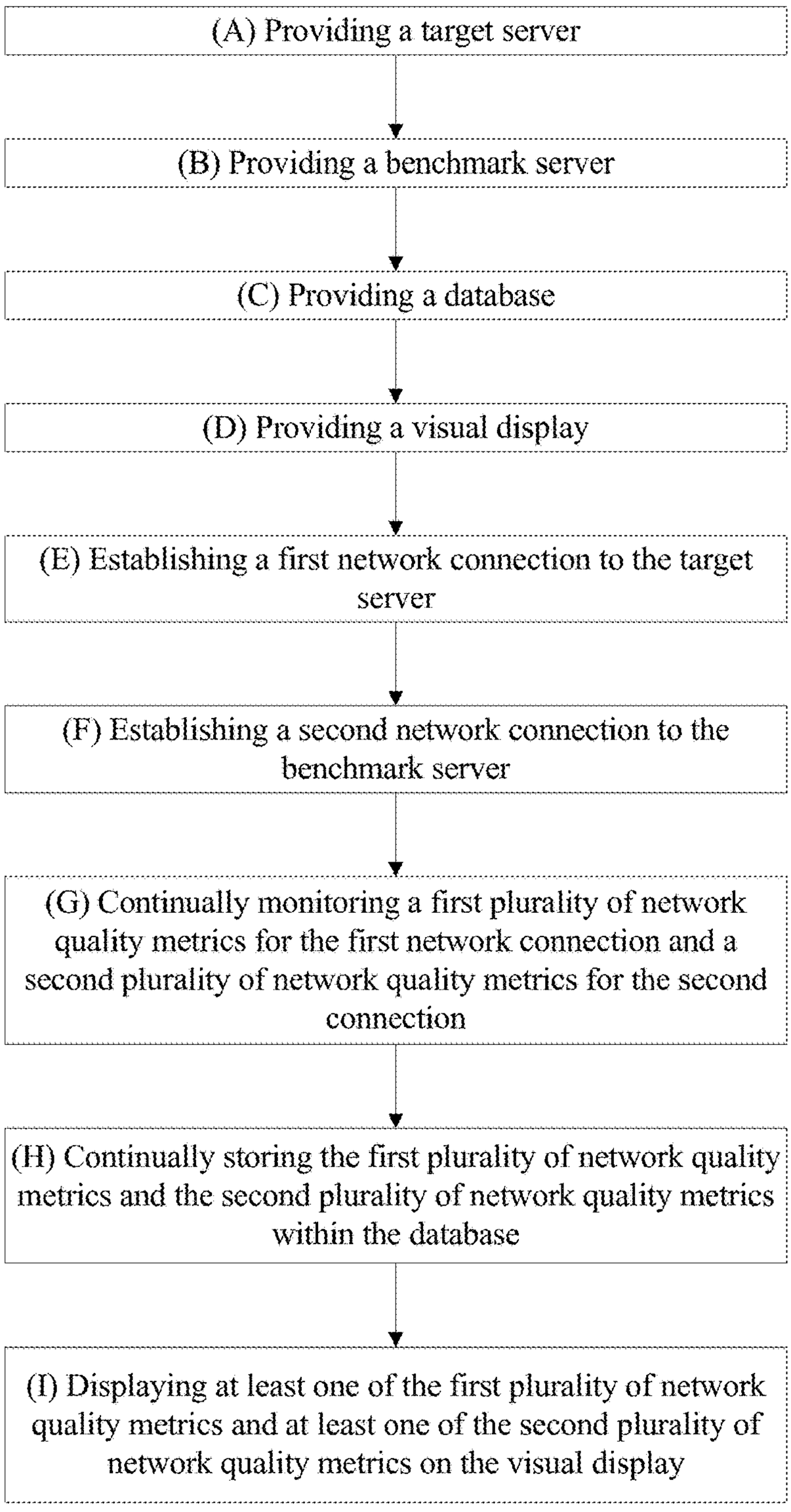
(A) Providing a target server
(B) Providing a benchmark server
(C) Providing a database
(D) Providing a visual display
(E) Establishing a first network connection to the target server
(F) Establishing a second network connection to the benchmark server
(G) Continually monitoring a first plurality of network quality metrics for the first network connection and a second plurality of network quality metrics for the second connection
(H) Continually storing the first plurality of network quality metrics and the second plurality of network quality metrics within the database
(I) Displaying at least one of the first plurality of network quality metrics and at least one of the second plurality of network quality metrics on the visual display

FIG. 1

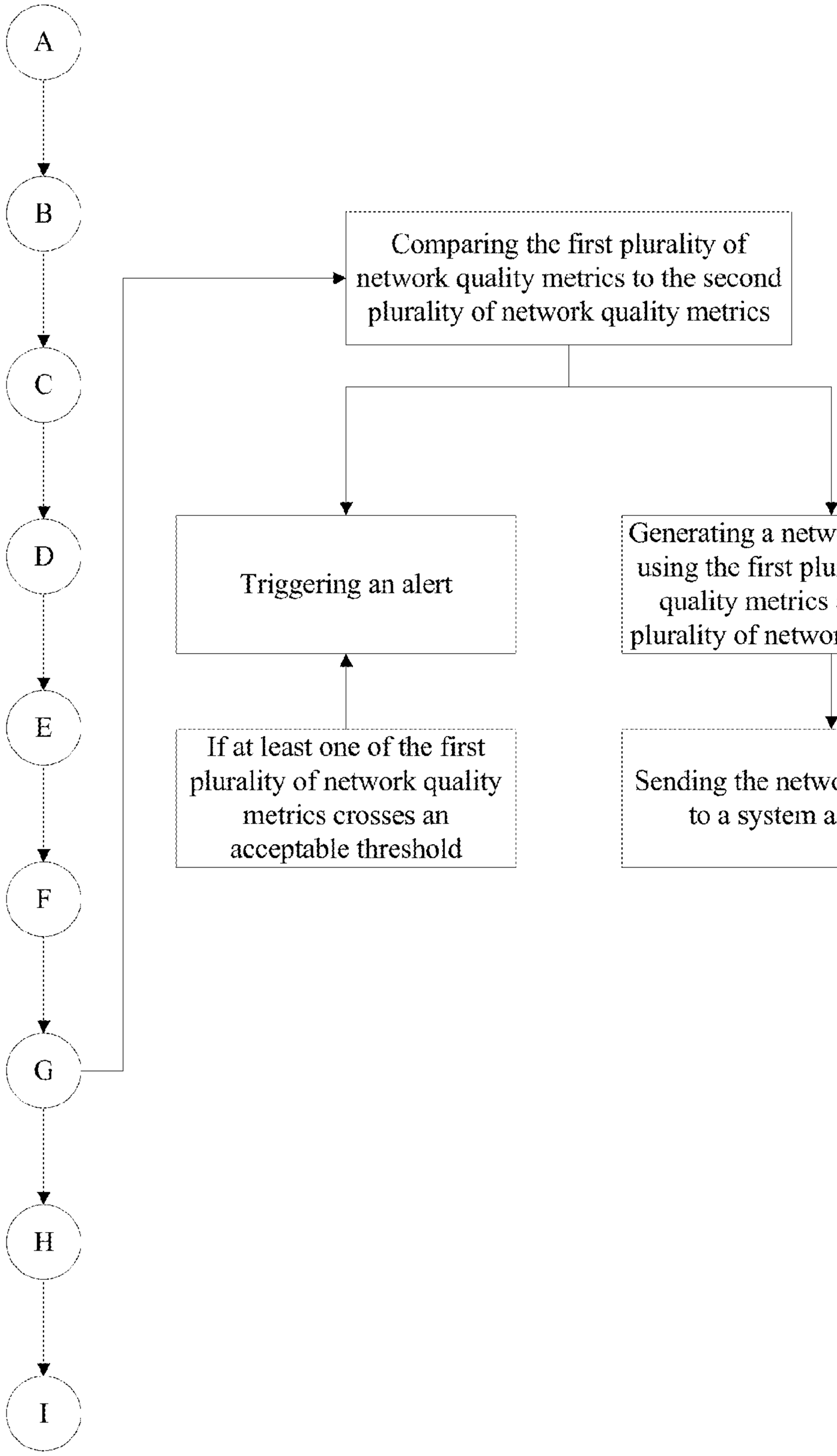
A
B
C
D
E
F
G
H
I
Comparing the first plurality of network quality metrics to the second plurality of network quality metrics
Triggering an alert
If at least one of the first plurality of network quality metrics crosses an acceptable threshold
Generating a network quality report using the first plurality of network quality metrics and the second plurality of network quality metrics
Sending the network quality report to a system administrator

FIG. 2

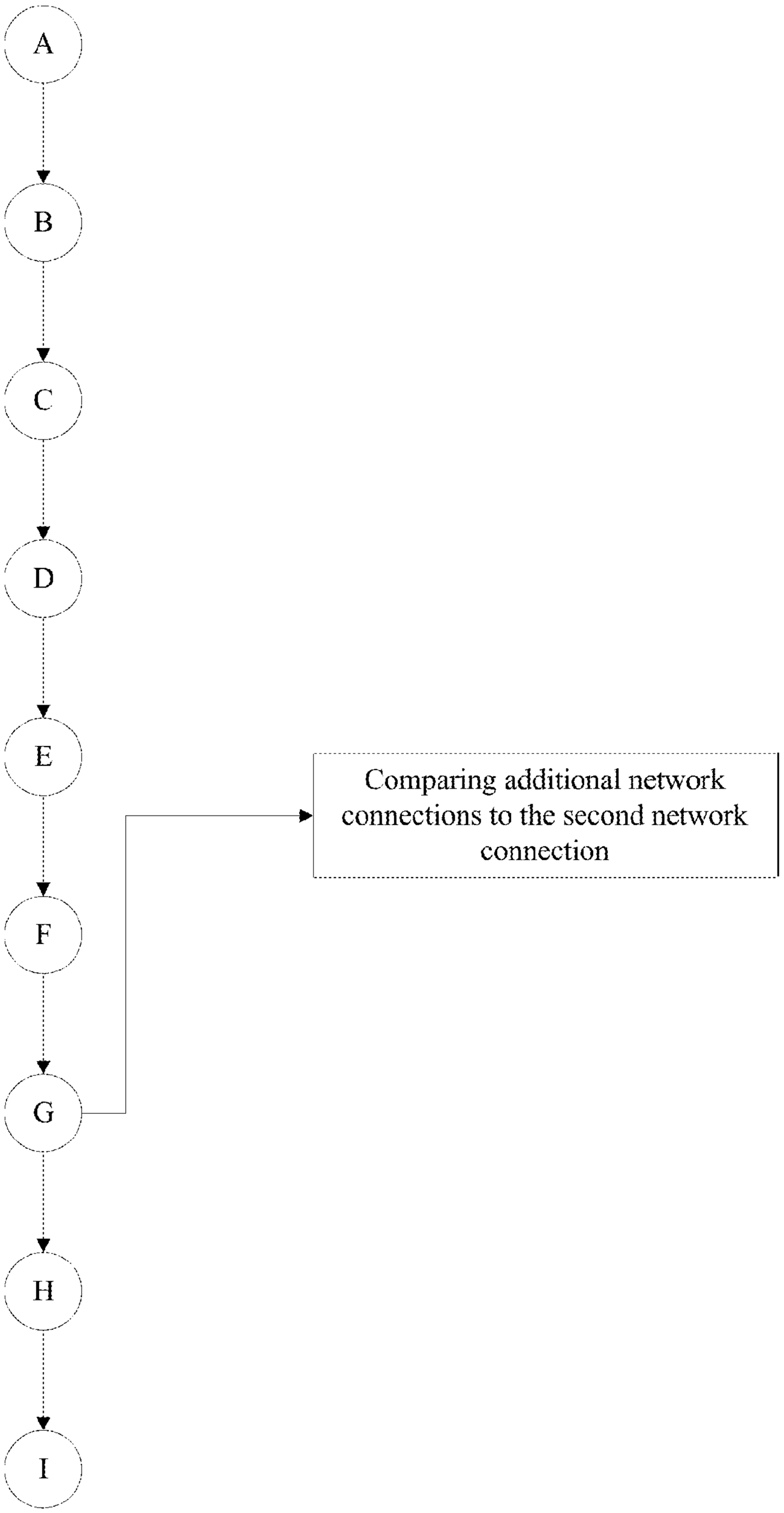
A
B
C
D
E
F
G
H
I
Comparing additional network connections to the second network connection

FIG. 3

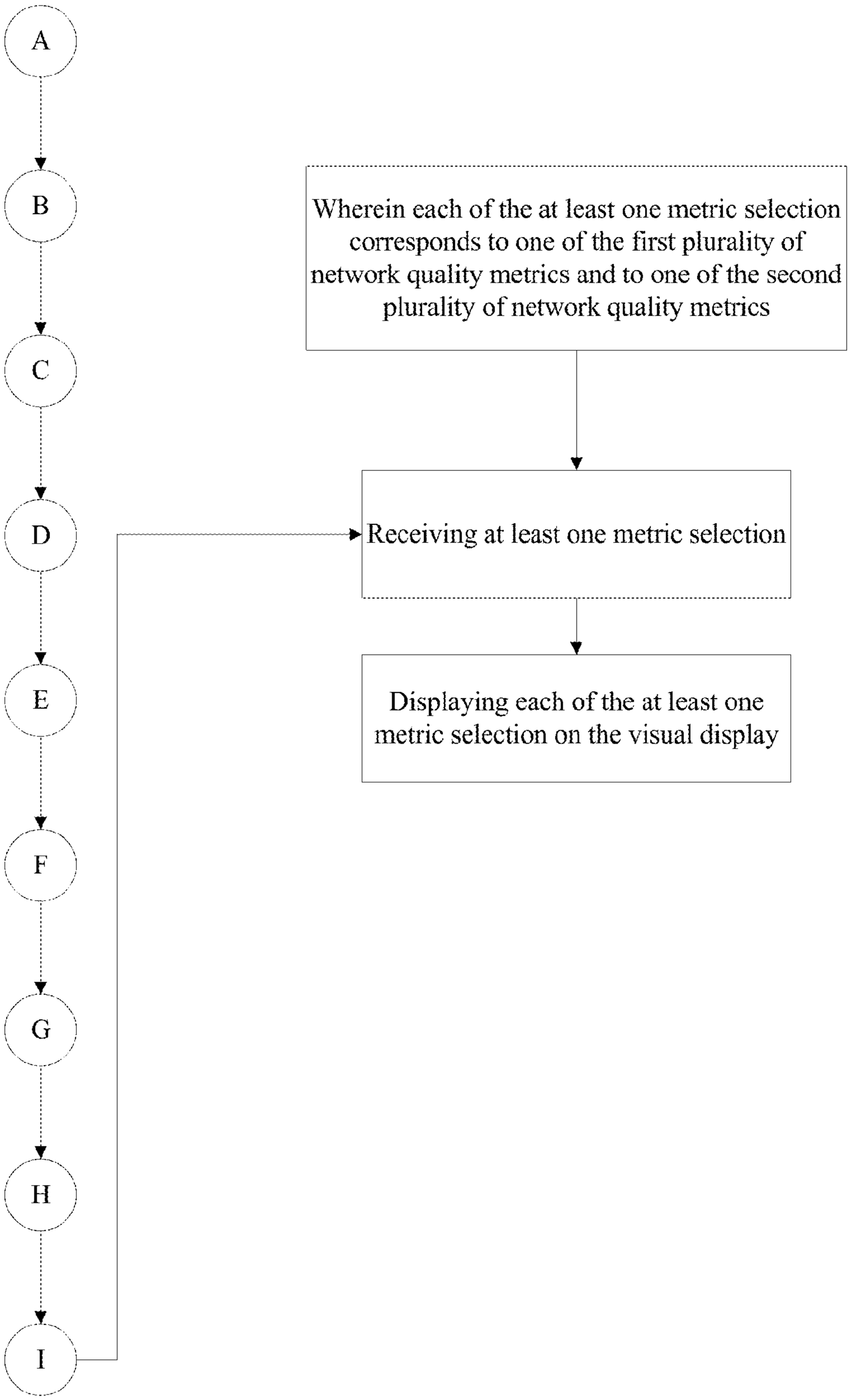
A
B
C
D
E
F
G
H
I
Wherein each of the at least one metric selection corresponds to one of the first plurality of network quality metrics and to one of the second plurality of network quality metrics
Receiving at least one metric selection
Displaying each of the at least one metric selection on the visual display

FIG. 4

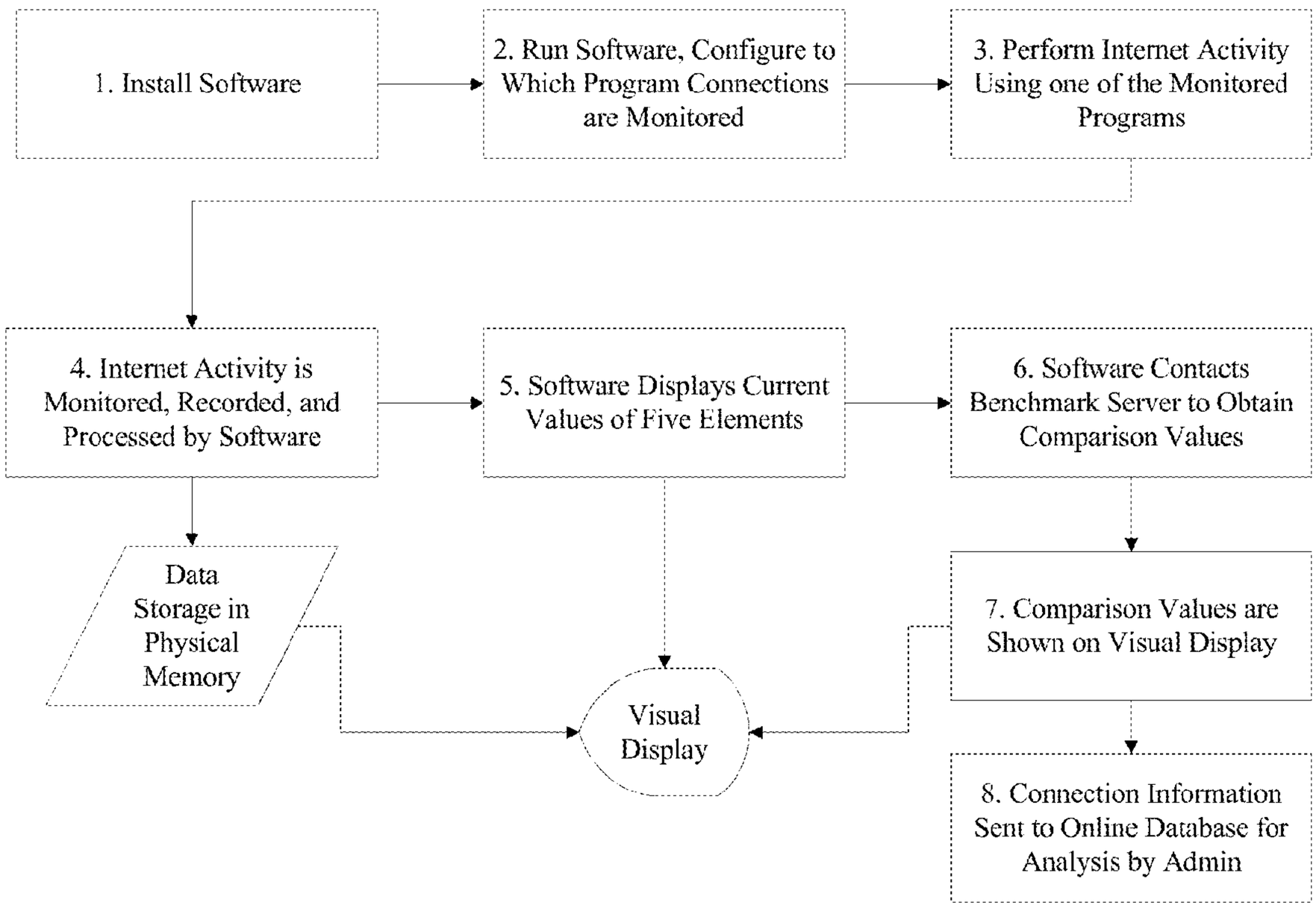
1. Install Software
2. Run Software, Configure to Which Program Connections are Monitored
3. Perform Internet Activity Using one of the Monitored Programs
4. Internet Activity is Monitored, Recorded, and Processed by Software
5. Software Displays Current Values of Five Elements
6. Software Contacts Benchmark Server to Obtain Comparison Values
Data Storage in Physical Memory
Visual Display
7. Comparison Values are Shown on Visual Display
8. Connection Information Sent to Online Database for Analysis by Admin

FIG. 5

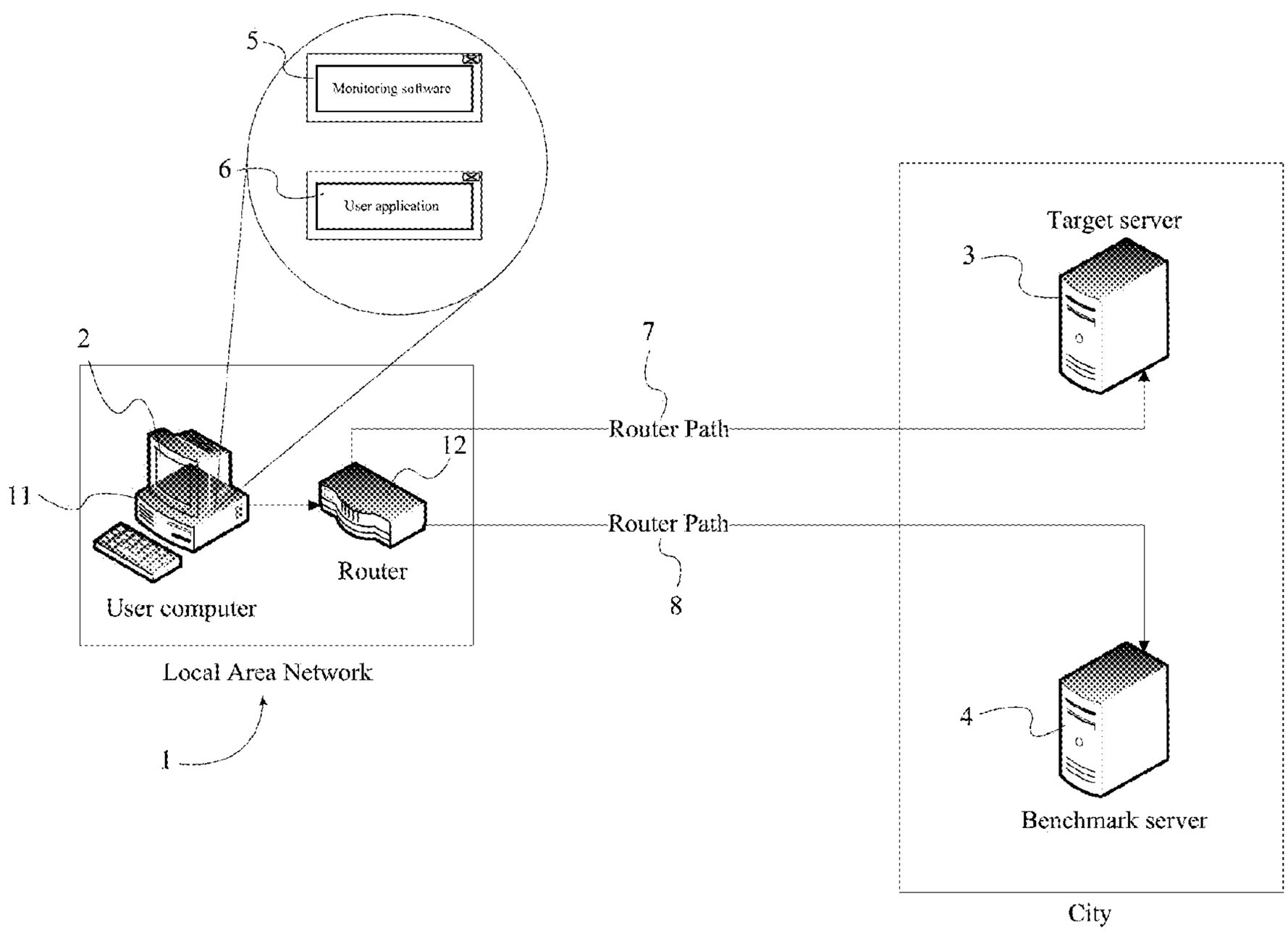
5
Monitoring software
6
User application
2
11
12
User computer
Router
Local Area Network
1
7
Router Path
Router Path
8
Target server
3
4
Benchmark server
City

FIG. 6

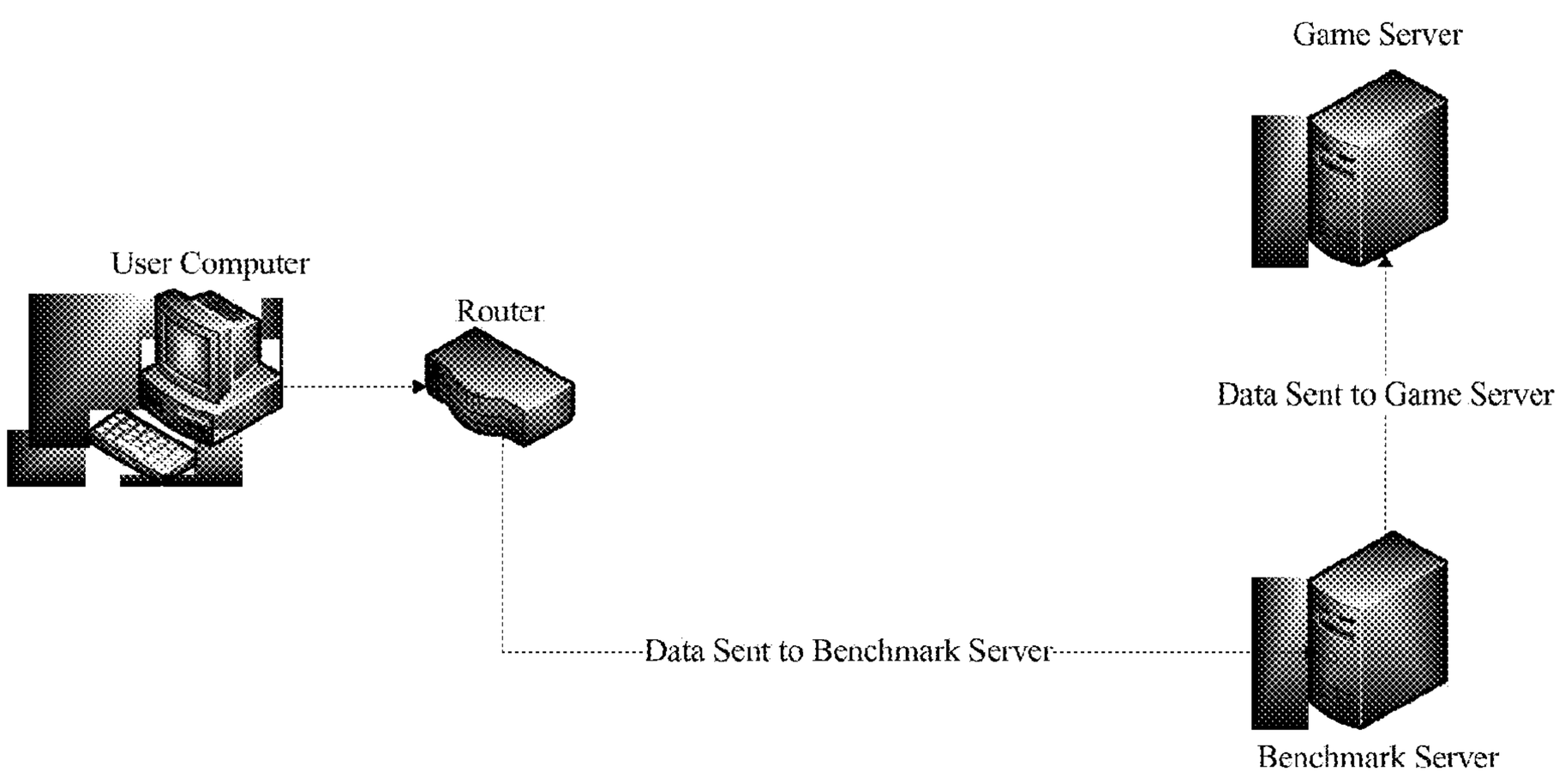
Game Server
User Computer
Router
Data Sent to Game Server
Data Sent to Benchmark Server
Benchmark Server

FIG. 7

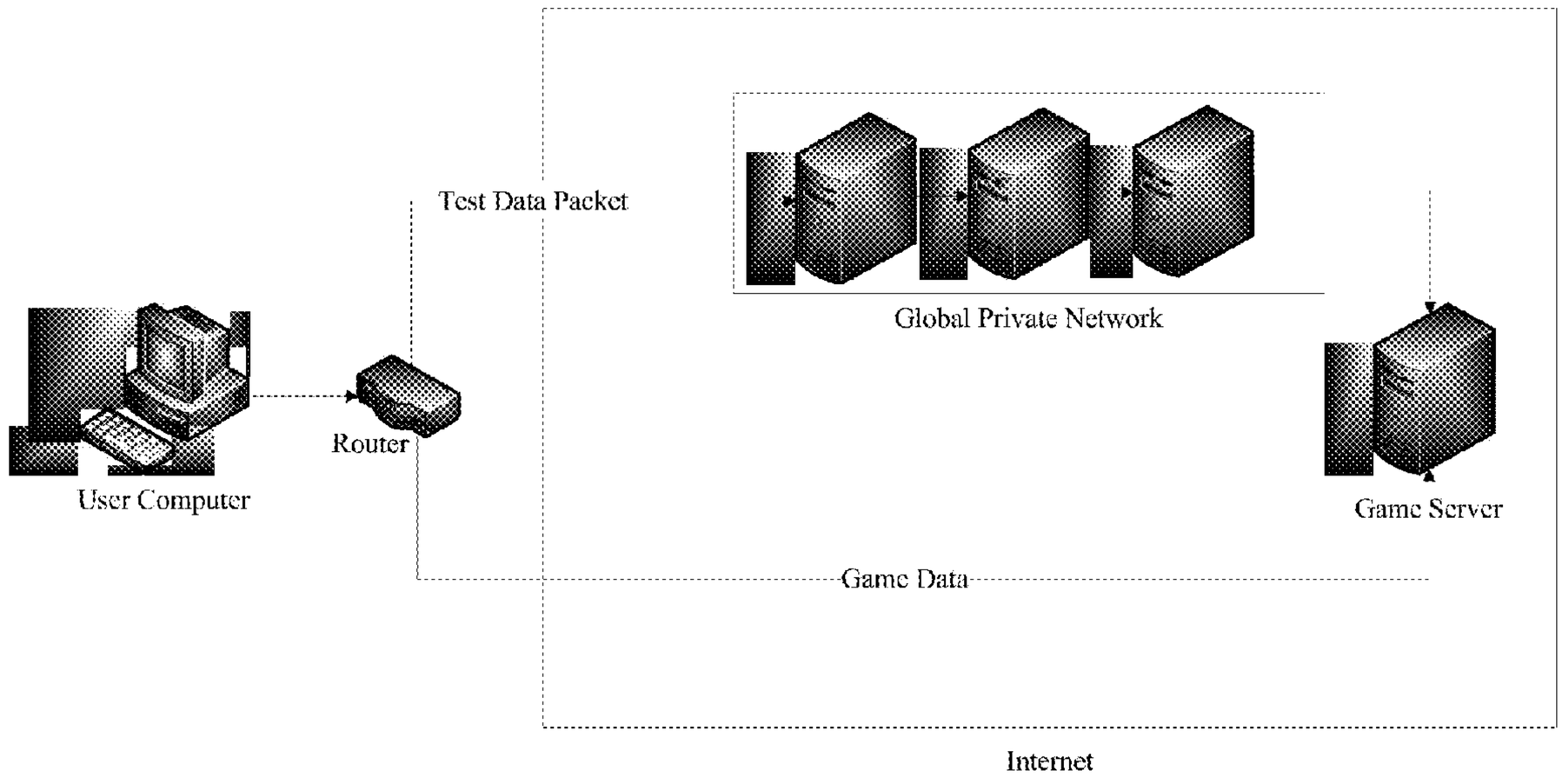
Test Data Packet
Global Private Network
User Computer
Router
Game Server
Game Data
Internet

FIG. 8

Software Name

Game Connection Meter ▽ Continue Test Exit

Game Connection Stat...

Connection Speed, Strength & Smoothness	Benchmark	Current Connection	% Difference
Average Ping	67ms	77ms	12%
Current Ping	71ms	81ms	12%
Ping Deviation	2ms	12ms	83%
Number of Hops:	13	18	27%
Number of Bad Hops:	0	11	100%

Your Network Connection Statistics...

Description of the game connection elements and what each represents to connection quality goes here.

FIG. 9

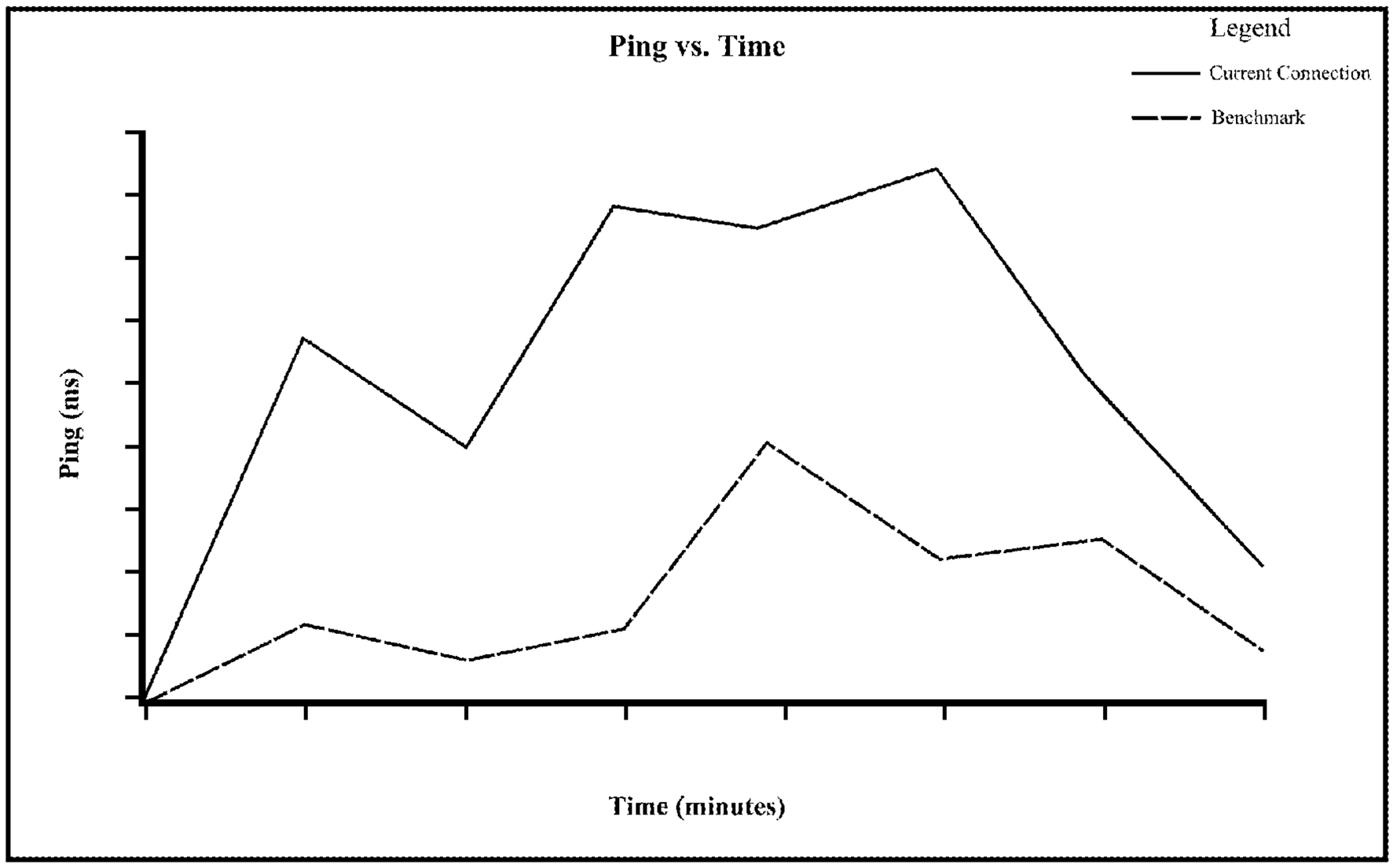
Ping vs. Time
Legend
Current Connection
Benchmark
Ping (ms)
Time (minutes)

FIG. 10

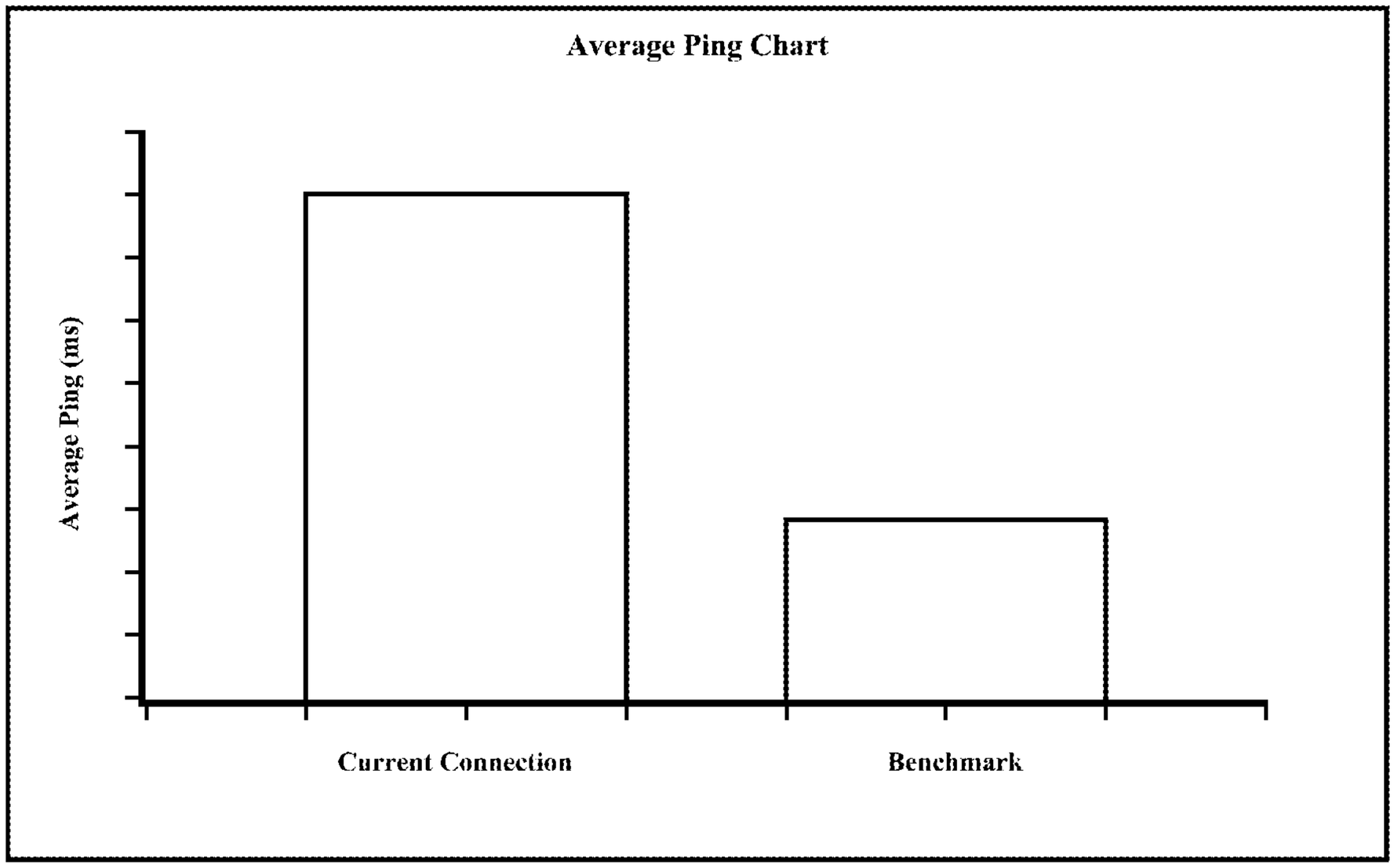
Average Ping Chart
Average Ping (ms)
Current Connection
Benchmark

FIG. 11

SYSTEM AND METHOD FOR MONITORING NETWORK CONNECTION QUALITY BY EXECUTING COMPUTER-EXECUTABLE INSTRUCTIONS STORED ON A NON-TRANSITORY COMPUTER-READABLE MEDIUM

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue; a claim printed with strikethrough indicates that the claim was canceled, disclaimed, or held invalid by a prior post-patent action or proceeding.

The current application is a continuation of U.S. patent application Ser. No. 14/066,277 filed Oct. 29, 2013 which claims a priority to the U.S. Provisional Patent application Ser. No. 61/719,602 filed on Oct. 29, 2012, and to the U.S. Provisional Patent application Ser. No. 61/720,232 filed on Oct. 30, 2012.

The current application is a continuation in part of U.S. patent application Ser. No. 14/047,678 filed Oct. 7, 2013 which claims benefit of Provisional Patent Application 61/710,026 filed Oct. 5, 2012.

The current application is a continuation in part of U.S. patent application Ser. No. 14/731,286 filed Jun. 4, 2015 which claims benefit of Provisional Patent Application 62/007,787 filed Jun. 4, 2014.

The current application is a continuation in part of U.S. patent application Ser. No. 14/812,968 filed Jul. 29, 2015 which claims benefit of Provisional Patent Application 62/030,384 filed Jul. 29, 2014.

The current application is a continuation in part of U.S. patent application Ser. No. 15/335,304 filed Oct. 26, 2016 which claims benefit of Provisional Patent Application 62/246,304 filed Oct. 26, 2015.

The current application is a continuation in part of U.S. patent application Ser. No. 15/335,308 filed Oct. 26, 2016 which claims benefit of Provisional Patent Application 62/246,397 filed Oct. 26, 2015.

FIELD OF THE INVENTION

The present invention relates generally to network connections. More specifically, the present invention is a system and method to display the quality of a network connection which evaluates and displays several criteria that influence the quality of a network connection.

BACKGROUND OF THE INVENTION

The quality of a network connection can drastically affect the quality of the activities that are carried out over that network connection. Activities that are especially sensitive to connection quality include gaming and voice communication over IP, or VoIP for short. Online gaming is an extremely common form of recreation in the modern world and can often be very competitive. Competitive gaming is even performed in a professional setting where players vie for position and monetary prizes. In all forms of online gaming, be it recreational or competitive, a good network connection is crucial to the performance of the players. Poor network connection quality can result in performance problems known as lag and rubber banding. In lag, the actions taken by the player are not processed for a noticeable time

delay, hence the term lag. Lag is most often caused by high latency between the player's machine and the game server. In rubber banding, the actions that are perceived as taking place by the user do not actually register with the game sever. This can result in the player ending up in a position in the game world they were in several moments ago and had since progressed. This effect can be perceived by players as what appears to be teleportation from point to point as if the player is being pulled around by a rubber band, hence the terminology used to describe this effect. As expected, issues such as lag and rubber banding can have a drastic impact on player performance which can ultimately result in losing the game and much less enjoyment gained from playing the game. VoIP is another activity occurring over network connections that can be greatly affected by a poor network connection. VoIP is a form of communication which allows for communication by voice over the internet. When using VoIP, latency issues can make it difficult for participants in a conversation to communicate effectively, causing unnecessary delays that can result in participants unintentionally talking over each other. Additionally, packet loss can result in poor communication quality which can make it difficult for participants to understand each other. These issues can make it very difficult to communicate using VoIP.

It comes as no surprise that many gamers playing online games also use VoIP to communicate with other players to form and carry out complex strategies and plans. When a poor network connection is being used, both the actions of the gamer in the game and the communication with other players can be completely scrambled. When this happens, the gaming experience suffers and the game becomes barely worth playing as little enjoyment is gained. There are ways to fix and or bypass poor network connections to ensure that the connection problems as described earlier are not suffered by the gamer, however common knowledge dictates this fact; if the problem cannot be identified, then it cannot be solved.

Many games and VoIP programs incorporate a built in latency or ping meters that displays the latency value of the network connection to the user. These ping meters can assist a user in determining when a problem is being caused by the network connection. Unfortunately, as effective as such meters are at displaying latency, they suffer from several major flaws. The first and foremost of those flaws is the fact that almost all ping meters incorporated into games and other applications only display the instantaneous value for the latency of the connection. What this means is that, at any given moment, the latency displayed by the ping meter is the latency experienced by the last packet of data sent by the game to the game server. Because of this, the latency as displayed by the ping meter fluctuates over time, and so the reading on the ping meter at any given time is not an accurate representation of the quality of the network connection being used for that activity. The second problem of such ping meters is the simple fact that they only keep track of one particular metric; latency. Unfortunately, the quality of the network connection can be influenced by metrics other than an instantaneous latency score such as the latency deviation, the number of hops between sender and destination, and packet loss experience. Such metrics can be very telling about the overall quality of a network connection and they are not displayed by ping meters.

It is an object of the present invention to create a network connection quality meter that solves the issues discussed above. The present invention solves the issues discussed above by tracking latency of a network connection over time as well as other performance metrics such as number of hops

and packet loss. Additionally, it is an object of the present invention to use a system that enables comparison between the network connection currently being utilized and a benchmark connection. Through this set up, a user is able to see how poor their network connection is when compared to a benchmark connection. Implementing the present invention may help a user identify network connection problems and determine how to correct or bypass those problems, ultimately improving the experience of performing online activities such as gaming and VoIP over network connections.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a flowchart describing the main steps of the method of the present invention.

FIG. **2** is a flowchart describing additional steps in the method of the present invention for comparing a network connection to a benchmark connection.

FIG. **3** is a flowchart describing an additional embodiment where multiple network connections are monitored.

FIG. **4** is a flowchart describing steps for customizing the visual display.

FIG. **5** is a flowchart describing the basic steps followed by the method of the present invention.

FIG. **6** is a visual flowchart depicting how the benchmark server may be set up.

FIG. **7** is a visual flowchart depicting how a round trip may be used to determine the latency difference between the game server and the benchmark server.

FIG. **8** is a visual flowchart depicting how a chained server connection or global private network can be used to compare values of the five elements to help determine the quality of the network connections.

FIG. **9** is a mock up of how the visual display of the present invention may look.

FIG. **10** is a mock up of how one of the five elements may be graphically displayed.

FIG. **11** is a mock up of how another one of the five elements may be graphically displayed.

DETAIL DESCRIPTIONS OF THE INVENTION

All illustrations of the drawings are for the purpose of describing selected versions of the present invention and are not intended to limit the scope of the present invention.

The present invention is a system and method for monitoring the quality of an internet network connection. This helps a user or an internet service provider (ISP) to diagnose and fix problems with an internet connection that result in bad performance of the connection.

As illustrated in FIG. **6**, in the preferred embodiment of the present invention, the system comprises a local area network **1**, a visual display **2**, a target server **3**, a benchmark server **4**, monitoring software **5**, and a user application **6**. The user application **6** is a game, VoIP application, or another application which depends on a network connection to a remote server. The local area network **1** is electronically connected to the target server **3** and to the benchmark server **4**. The local area network **1** comprises a user computer **11** and a router **12**, which are electronically connected to each other. The monitoring software **5** and the user application **6** are installed on the user computer **11**. The router **12**, and thereby the user computer **11**, is electronically connected to the target server **3** by a first network connection **7**, and is electronically connected to the benchmark server **4** by a second network connection **8**.

The benchmark server **4** should be physically positioned such that the benchmark server **4** is near the target server **3** of internet data sent and received by the user application **6**. This enables a comparison test to be made from the user's computer as a network connection is simultaneously made to both the target server **3** and the benchmark server **4**. It is important that the benchmark server **4** be located in the same city as the target server **3** but that the benchmark server **4** is in a different data center. If the benchmark and the target server **3** are in the same data center, then almost no difference would be present between recorded values of network connection quality for network connections to each server. Additionally, the fact that the benchmark sever and the target server **3** are close together but still potentially several milliseconds apart enables another ping to be made between the benchmark server **4** and the target server **3**. Granted that the benchmark sever is either a proxy or a virtual private network, an accurate calculation of a roundtrip taken by data may be determined; the roundtrip being data sent from the user, to the proxy server, and then to the target server **3**. It is important to note that this comparison system could also be implemented with a private server system that is comprised of a plurality of servers across the globe, as illustrated in FIGS. **7** and **8**. In this fashion, comparison may be made between round trip values of network connection quality for data sent through the private server system and data that is sent normally through regular network connections. In this way, comparisons may be made that show the impact on quality that is experienced when the private server system is used as opposed to allowing the internet data to be sent regularly through internet routers.

The monitoring software **5** is the central component of the present invention, and continually monitors and records one or more first network quality metrics for the first network connection **7** and one or more second network quality metrics for the second network connection **8**. Network quality metrics are various elements relevant to measuring the quality of a network connection.

In the preferred embodiment of the present invention, the network quality metrics include, but are not limited to, current ping, average ping, ping deviation, number of hops, number of bad hops, and flux. The ping deviation and average ping elements are based upon historical data recorded by the monitoring software **5** over the course of the online activity. The average ping element is based upon recorded values of the current ping. Ping deviation is based upon maximum and minimum values of the current ping as recorded by the monitoring software **5**. Number of hops is defined as the number of routers internet data must travel through before reaching the destination server. A higher number of hops can mean higher latency and higher chances of experiencing packet loss that can result from bad hops. The number of bad hops is defined as the number of hops that take place which cause internet data to experience packet loss or high latency deviation. Bad hops can be the primary cause of high latency deviation and rubber banding, both of which are highly detrimental to online gaming. Flux is defined in regards to the present invention as the number of average ping spikes, or lag, minus the average latency.

The monitoring software **5** continually compares the one or more first network quality metrics and the one or more second network quality metrics. This data provides the user with a great deal of information on the overall quality of the network connection they are using to perform their online activities, and is saved such that it can be viewed later by the user, or alternatively may be reported to a central database server for analysis by an administrator. Although the values

of the network quality metrics are telling about the quality of the network connection, it is much more meaningful to have control or benchmark values to which comparisons may be made. For this purpose, the monitoring software **5** also monitors and records network quality metrics for the second network connection **8** to the benchmark server **4**. This allows for comparison between the network quality metrics of the first network connection **7** being used by the online activity and the second network connection **8** to the benchmark server **4**.

Comparison between the two sets of values is facilitated by the visual display **2**. The visual display **2** can show the one or more first network quality metrics and the one or more second network quality metrics side by side or in any other configuration that is conducive to comparison between them. The monitoring software **5** displays at least one of the one or more first network quality metrics on the visual display **2**, and preferably displays at least one of the one or more second network quality metrics, wherein each of the at least one of the one or more first network quality metrics corresponds to one of the at least one of the one or more second network quality metrics. Thus, the quality of the first network connection **7** may easily be visually compared to the quality of the second network connection **8**. Various embodiments of the visual display can be seen in FIGS. **9-11**.

In the preferred embodiment of the present invention, the visual display **2** of the monitoring software **5** can be accessed by the user at any time and allows the user to view current values of network quality metrics as recorded and calculated by the monitoring software **5**. It should be noted that the monitoring software **5** may be its own standalone application that is installed onto the user computer **11** and configured to monitor various network connections used by specific applications such as games and VoIP programs. Alternatively, the monitoring software **5** may be incorporated into pre existing applications, like games and VoIP programs, as a system that can be quickly and easily accessed by the user without having to minimize the user application **6** while performing the online activity.

The visual display **2** may additionally incorporate features for advanced data viewing and benchmark comparison, such as, but not limited to, a graphical display of one or more of the network quality metrics over the time during which the online activity is being carried out.

Referring to FIGS. **1-4**, the method of the present invention is as follows. In the preferred embodiment of the present invention, a target server **3** and a benchmark sever are provided, as well as a database and a visual display **2**. A first network connection **7** is established to the target server **3**, and a second network connection **8** is established to the benchmark server **4**. One or more first network quality metrics are monitored by the monitoring software **5** for the first network connection **7**, and one or more second network quality metrics are monitored by the monitoring software **5** for the second network connection **8**. Each of the one or more second network quality metrics corresponds to one of the one or more first network quality metrics; that is, each of the one or more first network quality metrics is the same as one of the one or more second network quality metrics, but measured for a different network connection.

The one or more first network quality metrics and the one or more second network quality metrics are stored within the database. Then, at least one of the one or more first network quality metrics and at least one of the one or more second network quality metrics are retrieved from the database and displayed on the visual display **2**. The user may customize which of the network quality metrics are displayed on the visual display **2**. To this end, at least one metric selection is received from the user through the monitoring software **5**, wherein each of the at least one metric selection corresponds to one of the one or more first network quality metrics and to one of the second network quality metrics, wherein the one of the one or more first network quality metrics corresponds to the one of the one or more second network quality metrics. Each of the at least one metric selection is displayed on the visual display **2**.

The monitoring software **5** compares the one or more first network quality metrics to the one or more second network quality metrics. That is, the first network connection **7** to the target server **3** is continually compared to the second network connection **8** to the benchmark server **4**. To facilitate diagnosing bad connections, the monitoring software **5** is capable of being configured to trigger an alert if at least one of the one or more first network quality metrics crosses an acceptable threshold. The alert may be an audio or visual alert on the user computer **11**, or the alert may be embodied in the form of an electronic message that is sent to an ISP, network administrator or another relevant entity.

Alternatively or additionally, a network quality report may be generated using the one or more first network quality metrics and the one or more second network quality metrics, and the network quality report is then sent to an ISP, system administrator or another relevant entity. The network quality report is preferably formatted such that the network quality report may be conveniently sent to a local internet service provider. The network quality report can be especially helpful in identifying problem routers that are affecting a wide range of outgoing internet traffic due to close proximity to the origin of the traffic. Using this, problems only solvable by the internet service provider can be identified and brought to their attention such that action can be taken to correct said problems.

The present invention may be utilized with multiple services or applications on the user computer **11**. To this end, additional network connections to additional target server **3**s may be monitored and compared to the second network connection **8** to the benchmark server **4**, or to additional benchmark server **4**s as needed if different applications connect to target server **3**s in significantly distinct locations.

As illustrated in FIG. **5**, another perspective of the process of using the present invention is as follows.

Step one; the user installs the monitoring software **5** onto the user computer **11** on which the user intends to perform online activities such as gaming and VoIP communication.

Step two; the user runs the monitoring software **5** and chooses what programs on the user computer **11** for which the user wants the monitoring software **5** to track network connections. Alternatively, the monitoring software **5** may be pre configured to track network connections for specific programs, or the monitoring software **5** may be pre configured to integrate with certain programs that are already present on the computer.

Step three; the user performs internet activity with one of the programs that is set to be tracked by the monitoring software **5**. The internet activity is performed over the first network connection **7** to the target server **3**.

Step four; the internet activity is monitored and recorded by the monitoring software **5**. The network quality metrics described above are key values that are monitored and recorded by the monitoring software **5**.

Step five; the monitoring software **5** analyzes values collected for the one or more first network quality metrics

and generates whatever values that are based on historical information such as average ping and ping deviation.

Step six; the monitoring software **5** collects and generates values for the one or more second network quality metrics through the second network connection **8** to the benchmark server **4**. The one or more second network quality metrics is used for comparison to the one or more first network quality metrics.

Step seven; all or some of the information collected and generated by the monitoring software **5** is displayed to the user through the visual display **2**, which organizes the information into a format that is concise and easy for even a non technical user to understand. The visual display **2** may be either a separate application from the program performing the internet activity, or it may be brought into the program as an overlay. Using the information provided in the visual display **2**, the user can act accordingly in response to the level of quality the first network connection **7** is providing.

Step eight; information collected and generated by the monitoring software **5** may be reported to an online database for centralized collection and review for many users and analysis of network results by region or Internet/backbone provider. The information may alternatively be reported to another appropriate entity such as a system or network administrator.

Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. A method for monitoring network connection quality by executing computer-executable instructions stored on a non-transitory computer-readable medium, *the instructions being executed by a user computer,* the method comprising:

[providing a target server;**]**

[providing a database;**]**

[providing a visual display;**]**

[establishing a first network connection to the target server;**]**

continually monitoring, *by the user computer,* one or more first network quality metrics for **[**the**]** *a* first network connection *through the internet from the user computer to a target server*;

[continually**]** storing the one or more first network quality metrics within **[**the**]** *a* database;

[retrieving at least one of the one or more first network quality metrics from the database;**]**

[displaying the at least one of the one or more first network quality metrics on the visual display;**]**

[providing a private server system;**]**

establishing **[**an additional**]** *simultaneously with the first network connection a second* network connection *additional to the first network connection from the user computer* to the target server *through the internet and* through **[**the**]** *a* private server system;

continually monitoring, *by the user computer,* one or more second network quality metrics for the **[**additional**]** *second* network connection *through the internet*, **[**each**]** *at least one* of the one or more second network quality metrics corresponding to one of the one or more first network quality metrics;

continually storing, *by the user computer,* the one or more second network quality metrics within the database;

retrieving, *by the user computer,* at least one of the one or more second network quality metrics from the database;

displaying the at least one of the one or more second network quality metrics on **[**the**]** *a* visual display *of the user computer*;

simultaneously monitoring, *by the user computer,* the one or more first network quality metrics for the first network connection and the one or more second network quality metrics for the **[**additional**]** *second* network connection;

comparing continually, by the user computer, the one or more first network quality metrics of the first network connection through the internet to the one or more second network quality metrics of the second network connection through the internet to determine how much each of the first and second network quality metrics has improved or degraded in the first or the second network connection to the target server;

the first network quality metrics being at least one member of the group consisting of a first current ping, a first average ping, a first ping deviation, number of first hops, number of first bad hops, a first flux, number of first ping spikes, and number of first packet loss, and any other network quality metric *measuring real-time communications*;

and the second network quality metrics being at least one member of the group consisting of a second current ping, a second average ping, a second ping deviation, number of second hops, number of second bad hops, a second flux, number of second ping spikes, and number of second packet loss, and any other network quality metric *measuring real-time communications*.

2. The method of claim **1** **[**further comprising**]**, *wherein*:

the private server system **[**comprising**]** *comprises* a plurality of proxy servers.

3. The method of claim **1**, further comprising:

triggering an alert when the at least one of the one or more first network quality metrics crosses an acceptable threshold.

4. The method of claim **3** **[**further comprising**]**, *wherein*:

the alert **[**being of**]** *comprises* an audio form.

5. The method of claim **3** **[**further comprising**]**, *wherein*:

the alert **[**being of**]** *comprises* a visual form.

6. The method of claim **1**, further comprising:

generating a network quality report by using the one or more first network quality metrics and the one or more second network quality metrics.

7. The method of claim **6**, further comprising:

sending the network quality report to a system administrator.

8. The method of claim **1**, further comprising:

receiving at least one metric selection in response to continually comparing the one or more first network quality metrics with the one or more second network quality metrics; and

corresponding each of the at least one metric selection to one of the one or more first network quality metrics and to one of the one or more second network quality metrics.

9. The method of claim **8**, further comprising:

displaying each of the at least one metric selection on the visual display.

10. A system for monitoring network connection quality comprising:

[a local area network comprising a user computer and a router, the user computer being electronically connected to the router;**]**

a monitoring software *configured to be* installed on **[**the**]** *a* user computer *electronically connected to a router*;

a user application *configured to be* installed on the user computer;

[a target server;**]**

[a database;**]**

[a visual display;**]**

a first network connection**[**, the router being**]** *configured to* electronically **[**connected**]** *connect the router* to **[**the**]** *a* target server by the first network connection *through the internet*;

a one or more first network quality metrics for the first network connection, the one or more first network quality metrics being **[**continually**]** monitored by the monitoring software *on the user computer*, the one or more first network quality metrics being **[**continually**]** stored within **[**the**]** *a* database**[**, at least one of the one or more first network quality metrics being retrieved from the database, the at least one of the one or more first network quality metrics being displayed on the visual display by the monitoring software**]**;

[a private server system;**]**

[an additional**]** *a second* network connection**[**, the router being**]** *additional to the first connection configured to* electronically **[**connected**]** *connect the router* to the target server by the **[**additional**]** *second* network connection through **[**the**]** *a* private server system *through the internet, wherein the second network connection and the first network connection are established simultaneously*;

a one or more second network quality metrics for the **[**additional**]** *second* network connection, the one or more second network quality metrics being continually monitored by the monitoring software *on the user computer*, **[**each**]** *at least one* of the one or more second network quality metrics corresponding to one of the one or more first network quality metrics, the one or more second network quality metrics being continually stored within the database, at least one of the one or more second network quality metrics being retrieved from the database, the at least one of the one or more second network quality metrics being displayed on the visual display by the monitoring software;

the one or more first network quality metrics for the first network connection and the one or more second network quality metrics for the **[**additional**]** *second* network connection being simultaneously monitored *by the user computer*;

the one or more first network quality metrics of the first network connection through the internet being continually compared to the one or more second network quality metrics of the second network connection through the internet by the user computer to determine how much each of the first and second network quality metrics has improved or degraded in the first or the second network connection to the target server;

the first network quality metrics being at least one member of the group consisting of a first current ping, a first average ping, a first ping deviation, number of first hops, number of first bad hops, a first flux, number of first ping spikes, and number of first packet loss, and any other network quality metric *measuring real-time communications*;

and the second network quality metrics being at least one member of the group consisting of a second current ping, a second average ping, a second ping deviation, number of second hops, number of second bad hops, a second flux, number of second ping spikes, and number of second packet loss, and any other network quality metric *measuring real-time communications*.

11. The system of claim **10** **[**further comprising**]**, *wherein*:

the private server system **[**comprising**]** *comprises* a one or more first proxy servers.

12. The system of claim **10**, further comprising:

an alert triggered by the monitoring software when the at least one of the one or more first network quality metrics crosses an acceptable threshold.

13. The system of claim **12** **[**further comprising**]**, *wherein*:

the alert **[**being of**]** *comprises* an audio form transmitted from the user computer.

14. The system of claim **12** **[**further comprising**]**, *wherein*:

the alert **[**being of**]** *comprises* a visual form transmitted from the user computer.

15. The system of claim **10**, further comprising:

a network quality report generated by using the one or more first network quality metrics and the one or more second network quality metrics.

16. The system of claim **15** **[**further comprising**]**, *wherein*:

the network quality report **[**being**]** *is* sent to a system administrator.

17. The system of claim **10**, further comprising:

at least one metric selection received in response to continually comparing the one or more first network quality metrics with the one or more second network quality metrics by the monitoring software; and

each of the at least one metric selection corresponding to one of the one or more first network quality metrics and to one of the one or more second network quality metrics.

18. The system of claim **17** **[**further comprising**]**, *wherein*:

each of the at least one metric selection **[**being**]** *is* displayed on the visual display.

19. A method for monitoring network connection quality by executing computer-executable instructions stored on a non-transitory computer-readable medium, the instructions being executed by a user computer, the method comprising:

establishing a private server system;

monitoring, by the user computer, one or more first network quality metrics for a first network connection from the user computer to a target server through the internet during a first time duration of an online activity;

establishing simultaneously with the first network connection a second network connection from the user computer to the target server through the private server system through the internet, wherein the second network connection is different from the first network connection;

continually monitoring, by the user computer, one or more second network quality metrics for the second network connection through the internet during a second time duration of the online activity, at least one of the one or more second network quality metrics corresponding to one of the one or more first network quality metrics;

continually storing, by the user computer, the one or more second network quality metrics within the database;

retrieving, by the user computer, at least one of the one or more second network quality metrics from the database;

displaying on a visual display the at least one of the one or more second network quality metrics over the second time duration of the online activity;

comparing continually, by the user computer, the one or more first network quality metrics of the first network connection through the internet to the one or more second network quality metrics of the second network connection through the internet to determine how much each of the first and second network quality metrics has improved or degraded in the first or the second network connection to the target server;

wherein the first network quality metrics comprise at least one member of the group consisting of a first current ping, a first average ping, a first ping deviation, number of first hops, number of first bad hops, a first flux, number of first ping spikes, and number of first packet loss, and any other network quality metric measuring real-time communications;

wherein the second network quality metrics comprise at least one member of the group consisting of a second current ping, a second average ping, a second ping deviation, number of second hops, number of second bad hops, a second flux, number of second ping spikes, and number of second packet loss, and any other network quality metric measuring real-time communications.

20. The method of claim 19, further comprising:

displaying on the visual display the at least one of the one or more first network quality metrics over the first time duration of the online activity.

21. The method of claim 20, wherein:

the first time duration of the online activity and the second time duration of the online activity correspond to the same time duration of the online activity.

22. The method of claim 20, wherein:

establishing the private server system comprises providing the private server system.

23. The method of claim 1,

wherein continually monitoring, by the user computer, the one or more first network quality metrics for the first network connection through the internet from the user computer to the target server comprises continually monitoring, by the user computer, the one or more first network quality metrics for the first network connection through a first route in the internet from the user computer to the target server, and

wherein establishing simultaneously with the first network connection the second network connection additional to the first network connection from the user computer to the target server through the internet and through the private server system comprises establishing simultaneously with the first network connection the second network connection additional to the first network connection from the user computer to the target server through a second route in the internet and through the private server system,

wherein continually monitoring, by the user computer, one or more second network quality metrics for the second network connection through the internet during the second time duration of the online activity, at least one of the one or more second network quality metrics corresponding to the one of the one or more first network quality metrics comprises continually monitoring, by the user computer, the one or more second network quality metrics for the second network connection through the second route in the internet during the second time duration of the online activity, at least one of the one or more second network quality metrics corresponding to the one of the one or more first network quality metrics.

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