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(54) **AUTOMATED ENTERPRISE RISK ASSESSMENT**

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G06Q 30/00 (2006.01)

(52) **U.S. Cl.** **705/38**; 705/39; 705/42; 705/44

(58) **Field of Classification Search** 705/38–44; 700/90; 713/150–194
See application file for complete search history.

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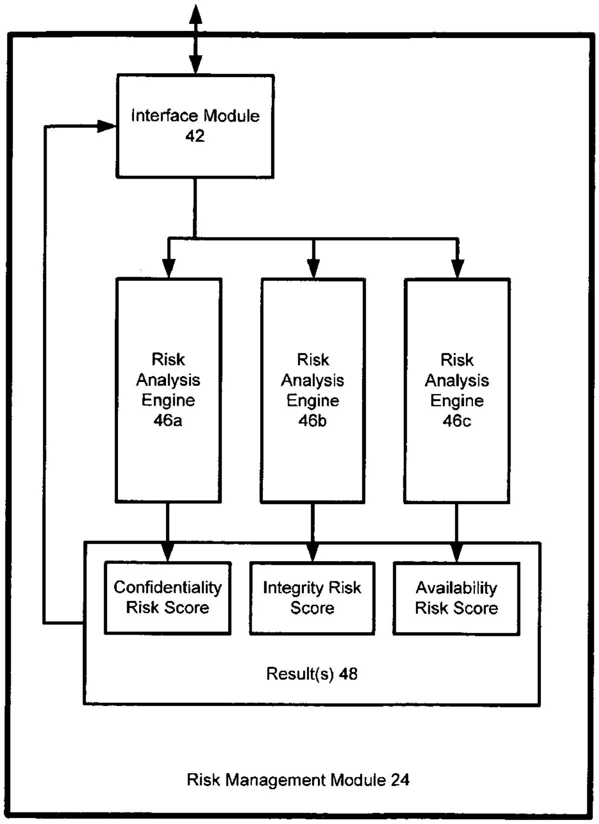
(57) **ABSTRACT**

A modern business enterprise will have a large number of heterogeneous assets. The risk associated with a selected asset from the heterogeneous assets can be assessed. In one embodiment, the present invention includes selecting the asset from a plurality of heterogeneous assets for risk analysis, and collecting a plurality of risk factors associated with the selected asset. The risk associated with the asset can be determined by providing the plurality of risk factors to a non-linear statistical data model to derive a risk score associated with the asset.

35 Claims, 6 Drawing Sheets



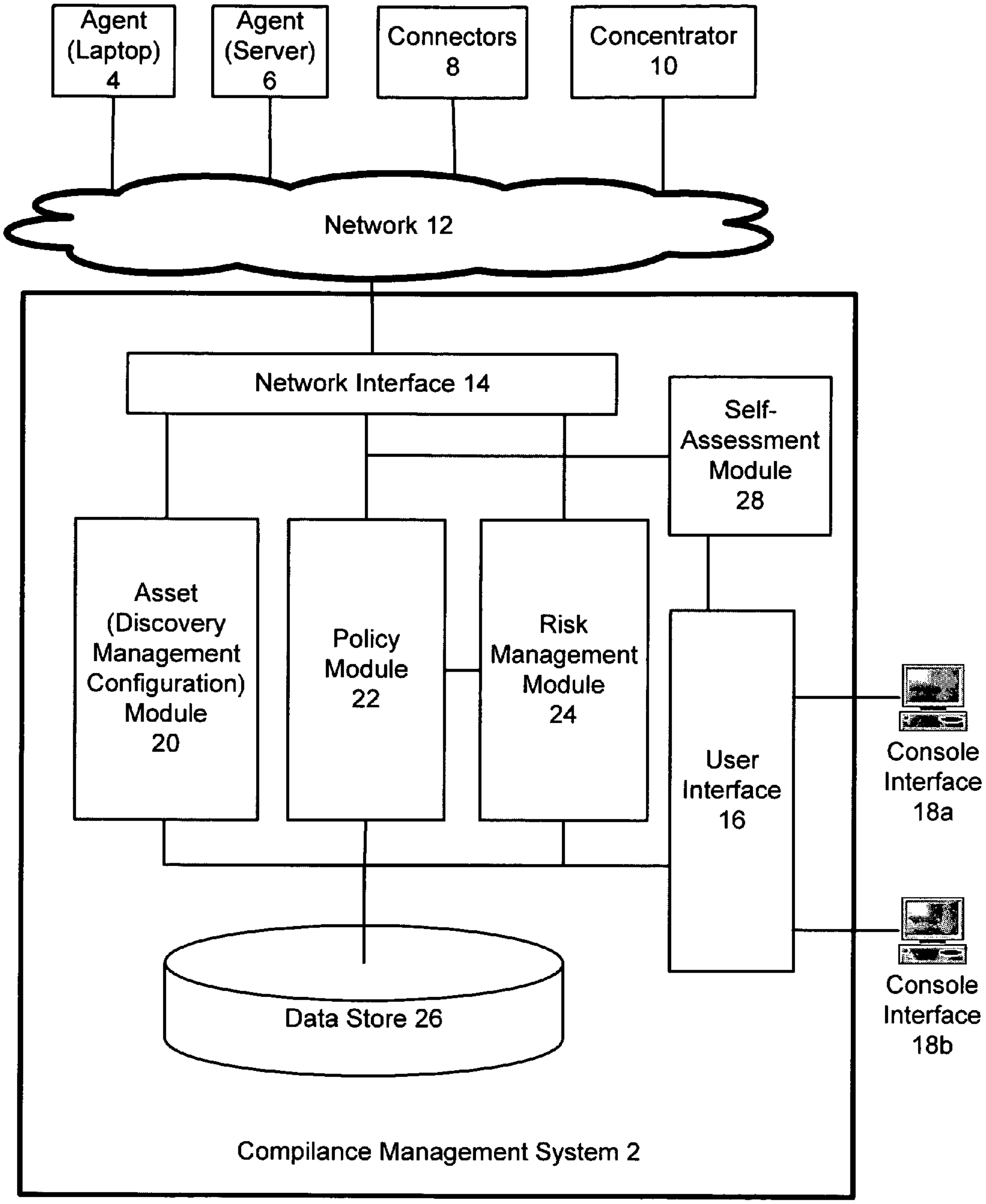

Agent (Laptop) 4
Agent (Server) 6
Connectors 8
Concentrator 10
Network 12
Network Interface 14
Self-Assessment Module 28
Asset (Discovery Management Configuration) Module 20
Policy Module 22
Risk Management Module 24
User Interface 16
Console Interface 18a
Console Interface 18b
Data Store 26
Compilance Management System 2

Figure 1

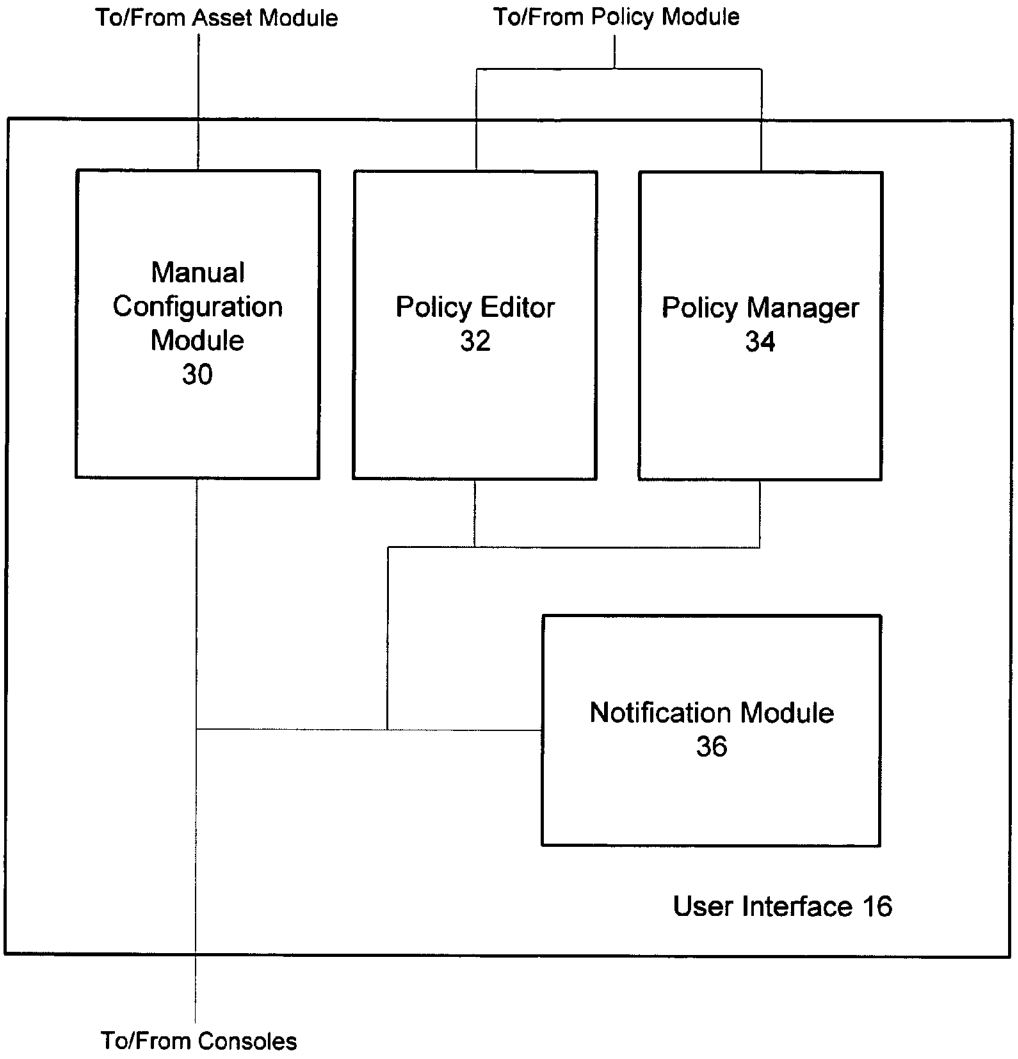

To/From Asset Module
To/From Policy Module
Manual Configuration Module 30
Policy Editor 32
Policy Manager 34
Notification Module 36
User Interface 16
To/From Consoles

Figure 2

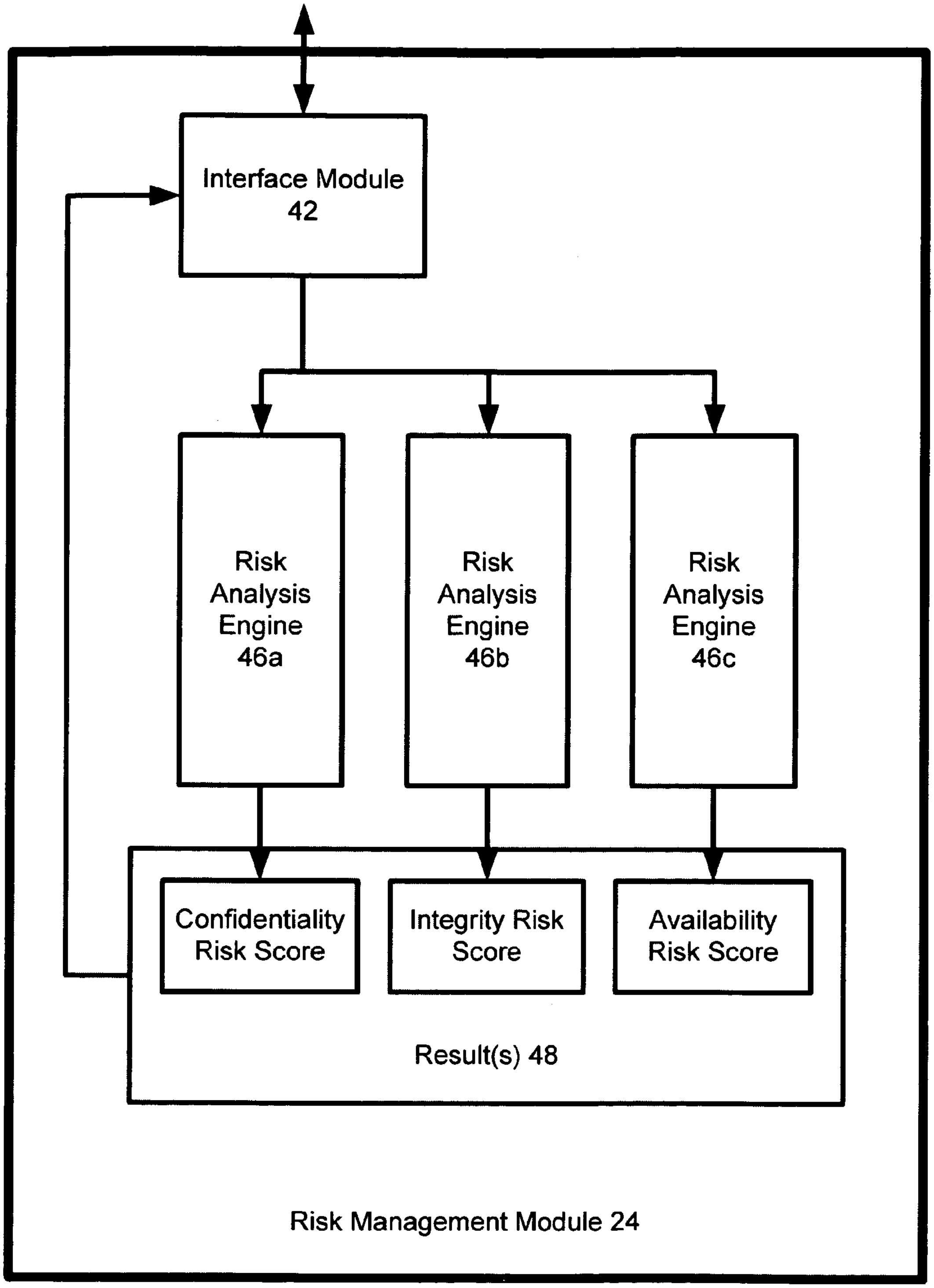

Interface Module
42
Risk
Analysis
Engine
46a
Risk
Analysis
Engine
46b
Risk
Analysis
Engine
46c
Confidentiality
Risk Score
Integrity Risk
Score
Availability
Risk Score
Result(s) 48
Risk Management Module 24

Figure 3

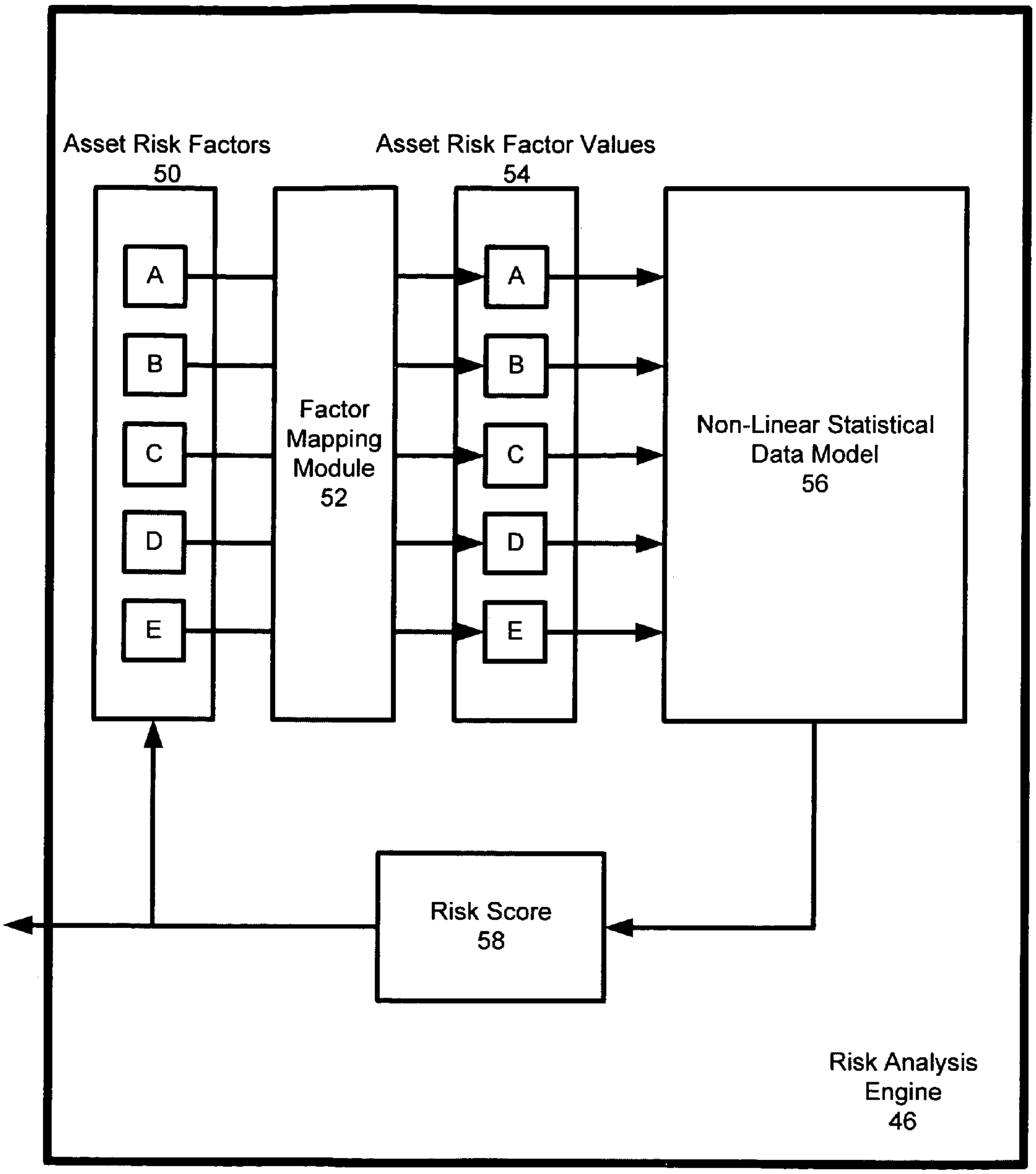

Asset Risk Factors
50
A
B
C
D
E
Factor
Mapping
Module
52
Asset Risk Factor Values
54
A
B
C
D
E
Non-Linear Statistical
Data Model
56
Risk Score
58
Risk Analysis
Engine
46

Figure 4

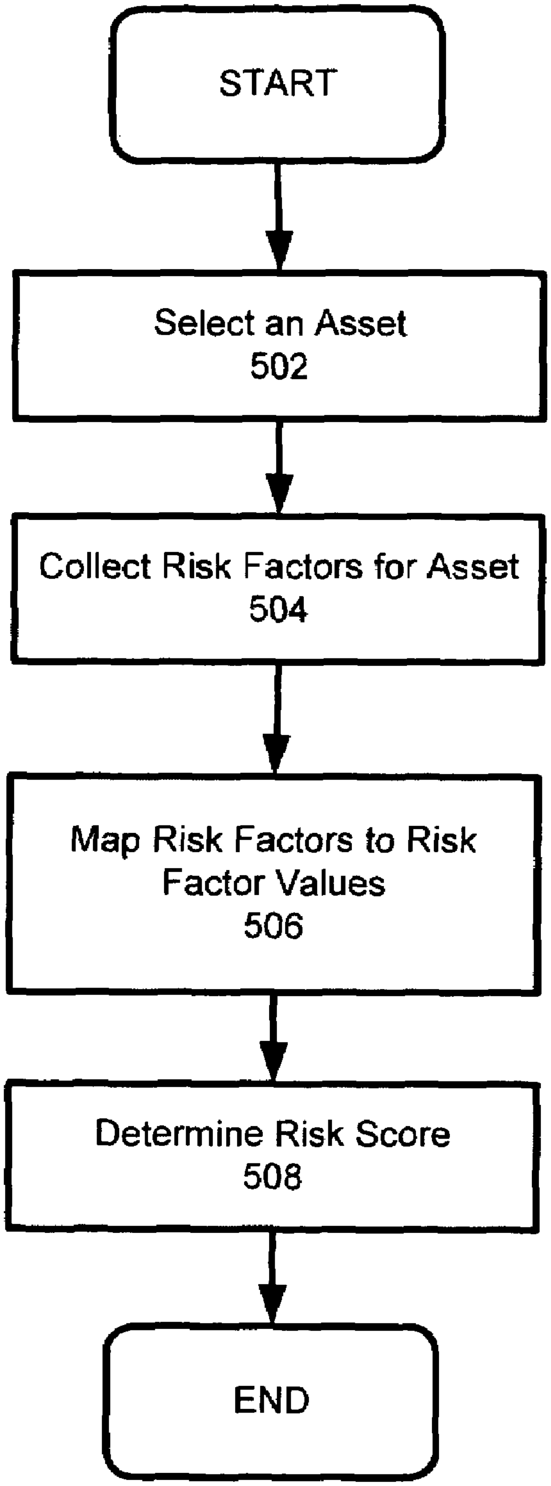

START
Select an Asset
502
Collect Risk Factors for Asset
504
Map Risk Factors to Risk Factor Values
506
Determine Risk Score
508
END

Figure 5

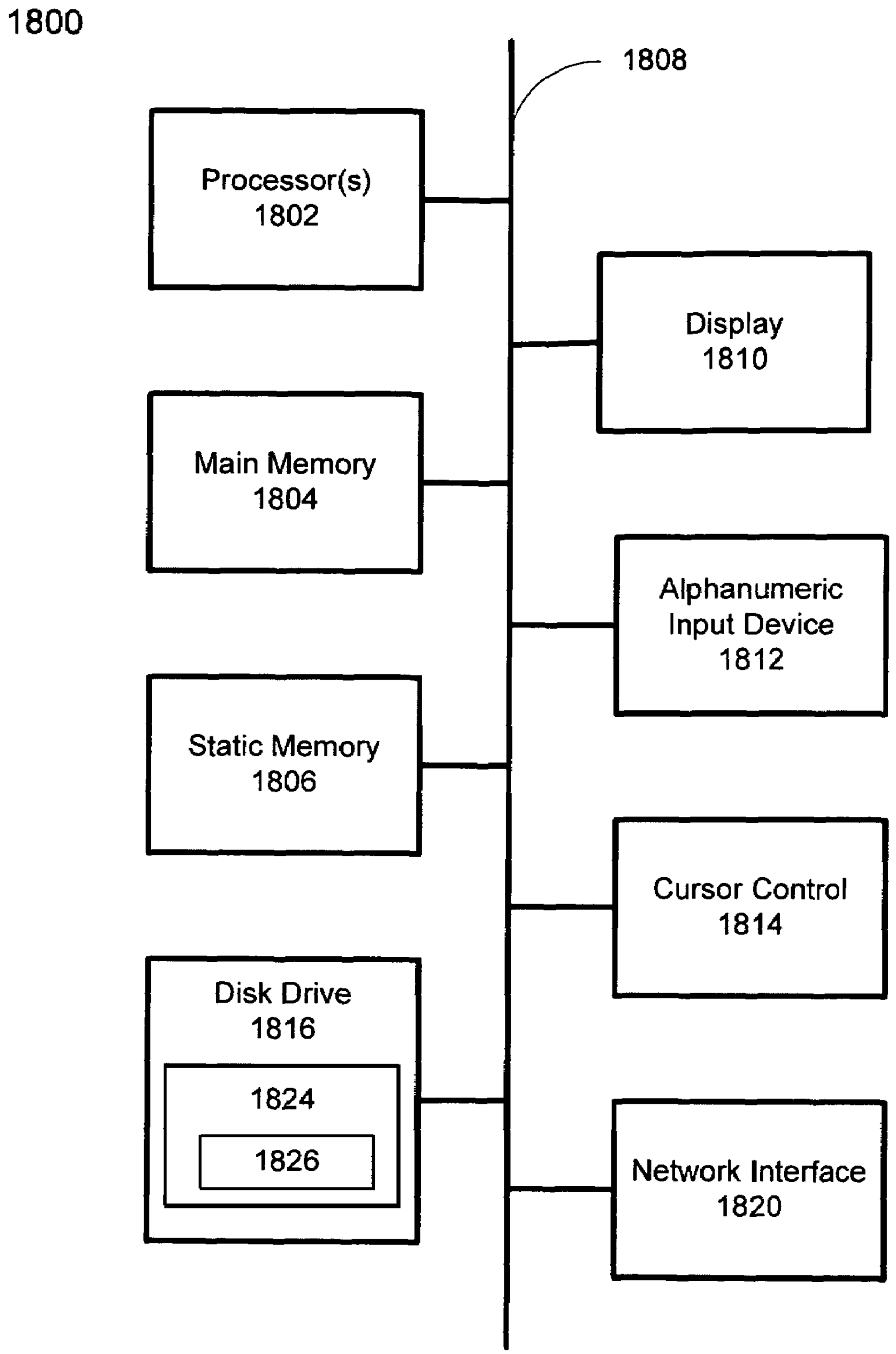

1800
1808
Processor(s)
1802
Display
1810
Main Memory
1804
Alphanumeric
Input Device
1812
Static Memory
1806
Cursor Control
1814
Disk Drive
1816
1824
1826
Network Interface
1820

Figure 6

AUTOMATED ENTERPRISE RISK ASSESSMENT

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BACKGROUND

1. Field

Embodiments of the present invention apply to the field of network security and risk assessment, more specifically enterprise risk assessment.

2. Description of the Related Art

Modern business enterprises operate in a complex regulatory environment. Many enterprises must comply with various government regulations both on the federal level and on the state and local levels. For example, most public corporations (at the present time any publicly traded corporation with fifty million or more market capitalization) must comply with the Sarbanes-Oxley Act of 2002. Financial enterprises, heath related enterprises, and other more stringently regulated industries have their own regulatory frameworks.

Furthermore, many business enterprises have internal policies and controls independent of government regulation. These controls and policies may be concerned with security, confidentiality maintenance, trade secret protection, access control, best practices, accounting standards, business process policies, and other such internal rules and controls. The cost of complying with all regulations, rules, policies, and other requirements can be substantial for a large scale business enterprise.

One common problem faced by business enterprises in the control/policy/regulation compliance area is risk assessment. To satisfy either governmental regulations or internal policies, enterprises are often required to assess risk on many levels. Such risk assessment is traditionally done by risk assessment experts who collect evidence from various parts of the enterprise and come up with risks associated with various assets. Often, these experts, or rudimentary automated systems, will use pre-defined formulas to calculate risk. One problem with such calculations is that a formula that works well for one type of asset will generally not work well for other types of assets.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention are illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:

FIG. **1** is a block diagram illustrating a compliance management system according to one embodiment of the present invention;

FIG. **2** is a block diagram illustrating a user interface module for a compliance management system according to one embodiment of the present invention;

FIG. **3** is a block diagram illustrating a risk management module according to one embodiment of the present invention;

FIG. **4** is a block diagram illustrating a risk analysis engine according to one embodiment of the present invention;

FIG. **5** is a flow diagram illustrating operation of the risk management module according to one embodiment of the present invention; and

FIG. **6** is a block diagram illustrating an example computer system according to one embodiment of the present invention.

DETAILED DESCRIPTION

Compliance Management System

One embodiment of the invention is now described with reference to FIG. **1**. FIG. **1** shows a compliance management system **2**. In one embodiment, the compliance management system **2** is provided as a stand-alone appliance that connects to a network, but the compliance management system **2** can be provided in other ways, such as software running on a server, distributed software, or various software and hardware packages operating together.

The compliance management system **2** connects to a network **12**—such as a local area network (LAN), Intranet network segment, or the Internet—and can collect data from various sources. For example, the compliance management system **2** can collect data from agents **4** and **6**. Agent **4** is an agent associated with and overseeing a laptop (in this example) and agent **6** is associated with a server. In a real-world embodiment, there could be thousands of agents associated with thousands of separate assets.

The compliance management system **2** can also collect information from various collectors **8**. Collectors **8** can be custom designed connectors to connect to various network devices and network management and security products already installed by the enterprise. For example, the connectors **8** can enable the compliance management system **2** to connect to, and collect data from, routers, firewalls, directories (such as Microsoft's Active Directory), vulnerability scanners, security information management (SIM) products, enterprise risk management (ERM) products and other such products and applications. Also, some deployments of the compliance management system **2** may not use distributed agents at all, in which case information regarding various assets can be collected via an agent-less concentrator (also referred to sometimes as an aggregator) **10**.

In one embodiment, the compliance management system **2** implements asset discovery, configuration, and management functionalities. Such functionality can be provided in the asset module **20** shown in FIG. **1**. In one embodiment, the asset module interfaces with the various agents, connectors, and concentrators **2-10** (referred to collectively as "software interfaces" or "distributed software interfaces" for simplicity) via the network interface **14** that connects the compliance management system **2** to the network **12**. The asset module **20** performs asset discovery by collecting information about all assets connected to and/or visible to the network **12**.

Such assets can include, but are not limited to, laptops, desktops, workstations, operating systems and other applications, servers, users, routers, intrusions detection devices (IDS), firewalls, printers, and storage systems. Assets can be imported from various connected applications, such as vulnerability scanners, directory applications, ERM, SIM, and other security-related products, and so on. Assets can also be non-information technology assets, such as people, users, buildings, and so on. Some assets, such as buildings, departments, and networks include other assets.

In one embodiment, the asset module **20** can also be used to configure asset attributes. This can be done by an operator of the compliance management system **2** via the user interface

16 exposed to the user by consoles **18***a* and **18***b*. There may be more or less consoles, which will be collectively referred to as console interface **18**.

For example, an agent can report a newly discovered laptop computer. The agent can automatically report back on available attributes, such as central processing unity (CPU) type, the operating system running on the laptop, the types of memory installed, and so on. A user (typically a system administrator) can then add extra attributes to the laptop, such as business owner, business classification, group, and other similar attributes.

The discovered and configured assets can be stored, in one embodiment, in data store **26**. Data store **26** can be implemented as a disk, a data server, or some other physical storage means. It can reside inside or outside of the compliance management system **2**. The data store **26** can include various databases. One such database can be an asset database, having records corresponding with managed assets. The assets discovered and stored in the asset database can be managed, in one embodiment, from the console interface **18** by editing various attributes of the assets.

In one embodiment, policy compliance functionality is provided by the system **2** by implementing a policy module **22**. The policy module **22** can enable a user—via the user interface **16**—to author and edit policies and policy templates and apply policies to various assets. The policy module **22** also maintains a policy database in the data store **22**. In one embodiment, policies can also be labeled, grouped and organized according to certain predefined roles for personnel. For example, "engineer level 1" can be a role that has a list of specific policies associated with it.

In one embodiment, the compliance management system **2** also provides risk management functionality by implementing a risk management module **24**. Such system could be called a compliance/risk management system, or risk management system, but to avoid confusion, the system will be referred to as a compliance management system **2**. The risk assessment module **24** analyzes multiple sources of information, including the compliance management system **2**, to determine the risk the enterprise is exposed to. In one embodiment, the risk management module collects information—in addition to the compliance management system—from the enterprise's vulnerability assessment systems, SIM systems, asset configurations, and network traffic reports. Other sources of information may be used as well. In one embodiment, the risk management module determines a simple metric to express the enterprise's risk profile using all the collected information.

As mentioned above, the compliance management system **2** also includes a user interface **16** which is exposed to users of the system **2** by consoles **18**. In one embodiment the consoles **18** are browser-based, allowing for administration and use of the system **2** from any network-attached work station, or through a remote network connection. In one embodiment, the user interface enables an administrator to select from a list of regulations—such as Sarbanes-Oxley (SOX), Gramm-Leach-Bliley Act (GLBA), Health Insurance Portability and Accountability Act (HIPPA), Card Holder Information Regulation Program (CISP)—and display functionality relevant to the selected regulation. Similarly, the user interface can enable an administrator to select from a list of standard frameworks—such as ISO-17799, Control Objectives for Information and related Technologies (COBIT)—and display functionality relevant to the selected regulation or framework. FIG. **2** provides a more detailed view of the user interface **16** according to one embodiment of the present invention.

The user interface **16** can implement a manual configuration module **30** that allows the user to manually configure asset attributes, as described in the example of the laptop being assigned to a business owner (and other user-defined attributes) above. The user interface can also implement a policy editor **32**. The policy editor **32** can assist users in naming and authoring policies.

The policy editor **32** can also provide access to a policy template database stored on the data store **26** having template policies. A user can then create a specific policy instance using a preconfigured template by saving the policy instance as a policy. The policy editor **32**, in one embodiment, also includes access to a script-based policy language that allows for highly flexible authoring of almost any type of desired policy. In addition, the policy editor **32** can be used to edit saved policies and policies from various preconfigured policy databases as well as author and edit policy templates.

In one embodiment, the policies that can be authored by the policy editor **32** are highly flexible. Such policies include technology-based policies, such as password length and firewall configurations. Furthermore, some policies can be process related, ensuring that certain process owners take certain actions. Yet other types of polices can include some that cannot be automatically enforced in an information technology sense. For example, risk assessment surveys must be manually filled out by someone responsible for the domain being surveyed, and a policy can include the requiring of such a survey being filled out periodically. Since such policies require at least some human interaction, they are sometimes referred to herein as "manual" policies.

The user interface **16** can also implement a policy manager **34**. The policy manager **34** allows the user to organize and apply policies. Policies can be associated with controls that are designed to mitigate against specific threats, as defined in various standards, such as ISO-17799. In one embodiment, the policy manager can be used to identify threats, define (or import) controls, and associate policies to controls to implement the controls. One control may be implemented using several policies, and a policy may be occasionally used in multiple controls. In one embodiment, policies are applied directly to assets or groups of assets. The user interface **16** can also include a notification module **36** to send alerts and reports regarding compliance management and risk analysis.

Returning to referencing FIG. **1**, the compliance management system **2** can also include a self-assessment module **28**. The self-assessment module **28** maintains and accesses various self-assessment surveys that can be stored in data store **26**. The self-assessment module **28** may periodically, or under the direction of the policy module **22** or the user interface **16**, send surveys to various individuals for completion. The self-assessment module **28** can analyze the results of such surveys and provide feedback to various other parts of the system **2**.

Risk Assessment

As described above, one embodiment of the present invention includes risk assessment, analysis, reporting, and management functionality provided by the risk management module **24**. One embodiment of the risk management module is now described with reference to FIG. **3**. Risk management module **24** includes an interface module **42** to allow communications between the risk management module **24** and the various other modules of the compliance management system **2**, as will be discussed in more detail below.

In one embodiment, the interface module collects **42** collects data from the asset module **20**, the policy module **22**, and the self assessment module **28**, and is managed and produces results vial the user interface **16**. In one embodiment, risk is associated with individual assets, such as machines (laptops, desktops, servers, routers), applications (ESM, SAP), people, and other asset types. Thus, in one embodiment, when the risk of an asset is to be assessed, the interface module collects various risk factors for the asset.

Various embodiments of the present invention can use different risk factors for risk assessment; the invention is not limited to any specific factor or set of factors. In one embodiment, the risk factors collected include the impact of the asset, a measurement of the assets importance to the business. The impact, or business impact, of an asset can be broken down into three categories. One impact category is confidentiality; an asset whose confidentiality is very important would have a higher impact than one that does not contain any secrets. Another impact category is integrity, a measure of the business impact of compromise in the authenticity of information or data related to the asset. Yet another impact category is availability, a measure of the business impact of the asset being "offline," or otherwise unavailable. There could be additional categories, or different impact categorizations used.

Another risk factor can be the vulnerability of the asset. A measure of asset vulnerability can be imported by the compliance management system **2** through one of its software interfaces, and collected by the interface module **42** from the compliance management system **2**. For example, a vulnerability score for the asset can be imported from a vulnerability scanner such as Nessus.

Another risk factor can be the number of SIM incidents associated with the asset by some SIM product. This measurement may be of SIM trouble tickets or security event within some time window, or for a real-time risk measurement, this measurement can be the number of open tickets in the SIM product for the asset. Another risk factor can be the compliance score associated with the asset by the policy module **22**, which itself in a measure of the compliance of the asset with the policies being enforced by the compliance management system **2**. Yet another risk factor can be the result of a risk assessment survey completed by a person about the asset. There can be various other risk factors related to an asset, such as whether the asset is managed by the compliance management system **2** using an agent resident on the asset, whether the asset is internal (behind a firewall and not exposed to the outside) or external, and other such considerations.

In one embodiment, the collected data representing the various risk factors is provided to one or more risk analysis engines **46**. In one embodiment—illustrated in FIG. **3**—three risk analysis engines **46***a-c* are used, but the invention is not limited to any specific number of risk analysis engines **46**, which could range from 1 to any number, although in a real world system their numbers are likely to be between 1 and 10. The risk analysis engine **46** calculates a risk score of the asset. The risk score can be expressed as a percentage, with higher percentages indicating higher risk.

In one embodiment using three risk analysis engines, each risk analysis engine **46** outputs one of a confidentiality risk score, an integrity risk score, and an availability risk score, representing the risk associated with these asset impacts described above. For example in FIG. **3**, risk analysis engine **46***a* is given the confidentiality impact of the asset as an input and thus outputs the confidentiality risk score of the asset. Similarly, in FIG. **3**, risk analysis engine **46***b* is given the integrity impact of the asset as an input and thus outputs the integrity risk score of the asset, and risk analysis engine **46***c* is given the availability impact of the asset as an input and thus outputs the availability risk score of the asset.

These determined risk scores are the results **48** of the risk management module. The results can be combined to produce a single result **48** if desired, or all separate results produced can be delivered to the interface module **42** for presentation to an administrator or risk analysis professional via the user interface **16**. In another embodiment, all the various categories of impact scores can be provided as input to a singe risk analysis engine **46** to provide a singe risk score for the asset. In yet another embodiment, inputs for the various risk analysis engines **46** may not overlap at all, or only overlap partially.

Risk Factor Mapping and Statistical Modeling

In one embodiment, described with reference to FIG. **4**, the present invention uses a non-linear statistical data model to calculate the risk associated with an asset. Such non-linear statistical data models include neural networks, decision trees, Bayesian networks, genetic algorithms, and several other types of non-linear statistical data models. In one embodiment, the non-linear statistical data model **56** used by the risk analysis engine **46** is a neural network (sometimes referred to as a neural net). Neural network have numerous applications, for example, they are used to determine people's credit scores based on information about them such as number of credit cards, late payments, income, and so on. The concept of neural networks and other such statistical data models are well-known and familiar to one skilled in the art.

In one embodiment, the various asset risk factors **50** collected by the interface module **42** are first mapped to asset risk factor value **54** to facilitate their input into the non-linear statistical data model **56**. In one embodiment, mapping the asset risk factors **50** to the asset risk factor values is performed by the factor mapping module **52**. The map performed by the factor mapping module **52** may be user configurable, and it can be specific to the type of asset.

One function of the factor mapping module **52** is to convert the asset risk factors to a format that is usable by the non-linear statistical data model **56**. For example, a vulnerability factor may return a "medium" vulnerability for the asset. However, in one embodiment, the non-linear statistical data model **56** works on numbers. Thus, the factor mapping module **52** can convert the "medium" vulnerability into a vulnerability value. In this manner, non-numeric asset risk factors **50** can be mapped to numeric asset risk factor values **54**.

However, the factor mapping module **52** can also map numeric asset risk factors **50** to numeric asset risk factor values **54**. This can be useful to limit inputs to a specific range or a specific set of values. For example, one asset risk factor discussed above is the number of SIM incidents related to the asset. While this risk factor is numeric, it can be more useful to convert this number to a value expressing the relative number of incidents for this asset, for example on a scale of 1 to 10.

In one embodiment, the factor mapping module's **52** map is configurable by the system administrator. For example, whether 1000 SIM incidents maps to 6 or 8 (or any other value), or whether a "medium" vulnerability is twice or ten times as important as a "low" vulnerability, can all be configured. In this manner each administrator can configure the risk analysis engine **46** according to his need.

In one embodiment, the asset risk factor values are provided as input for the non-linear statistical data model **56**, which produces an output. The output of the non-linear statistical data model **56** is the risk score **58** determined by the risk analysis engine **46**. The risk score **58** may be any one of the results **48** shown in FIG. **3**, such as the confidentiality risk score, integrity risk score, availability risk score, some other risk score, or one unified risk score for the asset.

As mentioned above, in one embodiment, the non-linear statistical data model **56** is implemented as a neural network. There are numerous software-implemented neural networks available including both proprietary software and open-source software. In one embodiment, the non-linear statistical data model **56** is implemented using the open-source neural network Joone. A neural network is defined largely by the number of inputs, the output layer, and the hidden layers. In one embodiment, the neural network of the non-linear statistical data model **56** has one input for each of the risk factors listed above (with one risk factor associated with impact whose category depends on which risk analysis engine is used), thus having seven inputs, a linear output layer, and two sigmoid hidden layers of ten nodes each. However, the neural network can be set up in numerous other ways, with different number of inputs, layers, and layer types.

In one embodiment, the neural network making up the non-linear statistical data model **56** needs to be trained before it functions accurately. One way to train the non-linear statistical data model **56** is to provide various information technology, network security, and compliance expert with various sets of sample data to evaluate. The sample data and the expert evaluations can then be fed into the non-linear statistical data model **56** which can train itself using a feedback mechanism. In this manner, the risk management module **24** is able to express a consensus of expert opinion rather that the opinion of just one expert. Furthermore, the non-linear statistical data model **56** can be continuously trained and refined with additional expert training.

One embodiment of the operation of the risk management module **24** is now described with reference to FIG. **5**. In block **502** one of the enterprises' assets is selected for risk assessment. In one embodiment, the asset is selected from a pool of heterogeneous assets, since the enterprise will have assets of many types and categories, such as various types of machines, applications, facilities, and other assets. However, as described above, the risk analysis engine of one embodiment of the present invention can handle various types of assets, unlike the prior art pre-defined formula type risk analysis.

Asset selection can be performed in a number of ways. For example, a system administrator, risk assessment expert, or other user of the system can indicate the selection via the user or console interface. The user interface can provide a graphical browser interface to allow a user to graphically select a representation of an asset for risk analysis. Thus, in one embodiment, selecting the asset is block **502** means receiving such a selective indication from a system user. The selection can also be performed by a scheduler or other application that conducts periodic risk assessments of various assets.

In block **504**, the risk factors for the asset are collected. These can include all the risk factors discussed above, or any additional risk factors. Any attribute associated with an asset can be a risk factor; risk factor is merely a term describing those asset attributes or related information that is deemed relevant for risk analysis. As assets may develop new attributes or may have new information available about them, all such attributes and information may be considered a risk factor.

In block **508**, the collected risk factors for the asset are mapped to the risk factor values discussed above. In one embodiment, the mapping is configurable. The risk factor values are in a format that can be provided as input to a neural network, or some other type of non-linear statistical data model, such as genetic algorithm or a Bayesian network. In this manner, in block **508**, a risk score is determined using the neural network of other type of non-linear statistical data model. The risk score can represent one specific type of risk, or may be an aggregate risk score. It may be in the form of a percentage, or on any other scale. Before delivered to the system user, the risk score can be converted to a verbal status, such as MEDIUM RISK, a color code, or some other indicator.

Example Computer System

Various embodiments of the present invention have been described in the context of a server that performs compliance, security, and risk management functionalities, and a browser/console interface operable to access and view those functionalities. An example computer system on which such server and/or console interface can be implemented in now described with reference to FIG. **6**. Numerous features described with reference to FIG. **6** can be omitted, e.g., a server will generally not include video display unit **1810**. Computer system **1800** that may be used to perform one or more of the operations described herein. In alternative embodiments, the machine may comprise a network router, a network switch, a network bridge, Personal Digital Assistant (PDA), a cellular telephone, a web appliance or any machine capable of executing a sequence of instructions that specify actions to be taken by that machine.

The computer system **1800** includes a processor **1802**, a main memory **1804** and a static memory **1806**, which communicate with each other via a bus **1808**. The computer system **1800** may further include a video display unit **1810** (e.g., a liquid crystal display (LCD) or a cathode ray tube (CRT)). The computer system **1800** also includes an alpha-numeric input device **1812** (e.g., a keyboard), a cursor control device **1814** (e.g., a mouse), a disk drive unit **1816**, and a network interface device **1820**.

The disk drive unit **1816** includes a machine-readable medium **1824** on which is stored a set of instructions (i.e., software) **1826** embodying any one, or all, of the methodologies described above. The software **1826** is also shown to reside, completely or at least partially, within the main memory **1804** and/or within the processor **1802**. The software **1826** may further be transmitted or received via the network interface device **1822**. For the purposes of this specification, the term "machine-readable medium" shall be taken to include any medium that is capable of storing or encoding a sequence of instructions for execution by the computer and that cause the computer to perform any one of the methodologies of the present invention. The term "machine-readable medium" shall accordingly be taken to include, but not be limited to, solid-state memories, optical and magnetic disks, and carrier wave signals.

General Matters

In the description above, for the purposes of explanation, numerous specific details have been set forth. However, it is understood that embodiments of the invention may be practiced without these specific details. In other instances, well-known circuits, structures and techniques have not been shown in detail in order not to obscure the understanding of this description.

Embodiments of the present invention include various processes. The processes may be performed by hardware components or may be embodied in machine-executable instructions, which may be used to cause one or more processors programmed with the instructions to perform the processes. Alternatively, the processes may be performed by a combination of hardware and software.

Embodiments of the present invention may be provided as a computer program product that may include a machine-readable medium having stored thereon instructions, which may be used to program a computer (or other electronic device) to perform a process according to one or more embodiments of the present invention. The machine-readable medium may include, but is not limited to, floppy diskettes, optical disks, compact disc read-only memories (CD-ROMs), and magneto-optical disks, read-only memories (ROMs), random access memories (RAMs), erasable programmable read-only memories (EPROMs), electrically erasable programmable read-only memories (EEPROMs), magnetic or optical cards, flash memory, or other type of media/machine-readable medium suitable for storing instructions. Moreover, embodiments of the present invention may also be downloaded as a computer program product, wherein the program may be transferred from a remote computer to a requesting computer by way of data signals embodied in a carrier wave or other propagation medium via a communication link (e.g., a modem or network connection).

While the invention has been described in terms of several embodiments, those skilled in the art will recognize that the invention is not limited to the embodiments described, but can be practiced with modification and alteration within the spirit and scope of the appended claims. The description is thus to be regarded as illustrative instead of limiting.

What is claimed is:

1. A computer implemented method of automatically assessing risk associated with one or more assets, comprising the steps of:

providing a compliance management system on said computer, wherein said computer is connected to a network comprising said assets for allowing said compliance management system to access said network;

discovering said assets on said network by an asset module of the compliance management system, wherein said discovered assets comprise one or more previously discovered assets and recently added assets;

selecting an asset from the discovered assets through said compliance management system, wherein the asset comprises one or more attributes, and wherein the asset and the attributes associated with the asset are automatically reported back to the compliance management system;

collecting a plurality of risk factors associated with said selected asset through an interface module associated with the compliance management system, wherein one or more of said risk factors are collected in real-time by a risk management module of the compliance management system;

mapping the collected risk factors to a plurality of risk factor values that are input to a non-linear statistical data model;

calculating a risk score based on one or more of said mapped risk factor values using the non-linear statistical data model, wherein said non-linear statistical data model is self trainable using a feedback mechanism; and

automatically assessing said risk using said calculated risk score;

whereby the calculated risk score allows automatic assessment of the risk associated with one or more of the assets.

2. The method of claim **1**, wherein selecting the asset comprises receiving an asset selection from a user through a console interface of the compliance management system.

3. The method of claim **1**, wherein the plurality of risk factors associated with the asset comprises an impact value of the asset, the impact value representing an importance of the asset to the business enterprise.

4. The method of claim **3**, wherein the impact value comprises a confidentiality impact value representing an importance that confidential information contained by the asset is not shared without authorization.

5. The method of claim **4**, wherein the risk score comprises a confidentiality risk score, the confidentiality risk score being a measure of risk of the asset sharing confidential information without authorization.

6. The method of claim **3**, wherein the impact value comprises an integrity impact value representing an importance that information contained by the asset authentic original content.

7. The method of claim **6**, wherein the risk score comprises an integrity risk score, the integrity risk score being a measure of risk of the asset having compromised information.

8. The method of claim **3**, wherein the impact value comprises an availability impact value representing an importance that the asset is accessible.

9. The method of claim **8**, wherein the risk score comprises an availability risk score, the availability risk score being a measure of risk of the asset will become inaccessible.

10. The method of claim **1**, wherein the plurality of risk factors associated with the asset comprises a vulnerability value of the asset, the vulnerability value representing a weakness of the asset that can be exploited.

11. The method of claim **10**, wherein collecting the vulnerability value comprises querying a vulnerability scanner, wherein the vulnerability value is imported from said vulnerability scanner by said interface module associated with the compliance management system.

12. The method of claim **1**, wherein the plurality of risk factors associated with the asset comprises a security information management factor of the asset, wherein the security information management factor represents number of security incidents associated with the asset.

13. The method of claim **12**, wherein collecting the security information management factor comprises querying a security information management (SIM) product.

14. The method of claim **1**, wherein the plurality of risk factors associated with the asset comprises a compliance score of the asset, the compliance score representing a compliance of the asset with policies of the business enterprise.

15. The method of claim **14**, wherein the compliance score comprises querying a policy module of a compliance management system.

16. The method of claim **1**, wherein the plurality of risk factors associated with the asset comprises a determination whether the asset is managed using a distributed software agent.

17. The method of claim **1**, wherein the non-linear statistical data model comprises a neural network.

18. The method of claim **1**, wherein the plurality of risk factors are mapped to the plurality of risk factor values using a configurable map.

19. A computer system for compliance management, comprising:

a processor connected to a network for accessing a plurality of assets;

a network interface module for connecting said compliance management computer system to said assets accessible by said processor through said network;

an asset module in communication with said network interface for discovering said assets connected to said network, storing said discovered assets in a data base, and for selecting one or more of said stored assets, wherein said asset module is used to configure one or more attributes associated with each of the selected assets via a user interface;

a policy module in communication with said network interface for associating one or more policies stored in a policy database with the assets and for determining a compliance score for the assets based on said associated policies, wherein said policy module enables a user of the compliance management module to manually compile risk assessment surveys through said user interface;

a self assessment module in communication with said network interface for maintaining and accessing self assessment surveys in a data store, wherein said self assessment module provides feed back to said policy module and a risk management module based on said self assessment surveys; and

said risk management module in communication with said network interface, comprising:

an interface module for collecting a plurality of risk factors and a compliance score associated with an asset;

a factor mapping module for mapping said collected risk factors to a plurality of risk factor values; and

a risk analysis engine comprising a non-linear statistical data model for analyzing risk associated with said asset; wherein said mapped risk factor values are provided as input to said non-linear statistical data model.

20. The computer system for compliance management of claim **19**, wherein the non-linear statistical data model comprises a neural network.

21. A machine-readable medium having stored thereon data representing instructions that, when executed by a processor of a risk management system, cause the processor to perform operations comprising:

discovering one or more by a compliance management system, wherein said discovered assets comprise one or more previously discovered assets and recently added assets;

selecting an asset from the discovered assets through said compliance management system;

collecting a plurality of risk factors associated with said selected asset through the compliance management system;

mapping said collected risk factors to a plurality of risk factor values that are input to a non-linear statistical data model;

calculating a risk score based on said mapped risk factor values using said non-linear statistical data model, wherein said non-linear statistical data model is self trainable using a feedback mechanism; and

automatically assessing said risk using said calculated risk score.

22. The machine-readable medium of claim **21**, wherein the plurality of risk factors associated with the asset comprises an impact value of the asset, the impact value representing an importance of the asset to the business enterprise.

23. The machine-readable medium of claim **22**, wherein the impact value comprises a confidentiality impact value representing an importance that confidential information contained by the asset is not shared without authorization.

24. The machine-readable medium of claim **22**, wherein the impact value comprises an integrity impact value representing an importance that information contained by the asset authentic original content.

25. The machine-readable medium of claim **22**, wherein the impact value comprises an availability impact value representing an importance that the asset is accessible.

26. The machine-readable medium of claim **21**, wherein the plurality of risk factors associated with the asset comprises a vulnerability value of the asset, the vulnerability value representing a weakness of the asset that can be exploited.

27. The machine-readable medium of claim **21**, wherein the plurality of risk factors associated with the asset comprises an incident value of the asset, the incident value representing a number of security incidents associated with the asset.

28. The machine-readable medium of claim **21**, wherein the plurality of risk factors associated with the asset comprises a compliance score of the asset, the compliance score representing a compliance of the asset with policies of the business enterprise.

29. The machine-readable medium of claim **21**, wherein the non-linear statistical data model comprises a neural network.

30. The machine-readable medium of claim **21**, wherein the plurality of risk factors are mapped to a plurality of risk factor values using a configurable map.

31. A computer implemented method of automatically assessing risk of one or more assets, comprising the steps of:

providing a compliance management system operating on said computer and connecting said computer to a network comprising said assets using a network interface;

discovering said assets on said network by an asset module of the compliance management system, wherein said discovered assets comprise one or more previously discovered assets and recently added assets;

selecting an asset from the discovered assets through said compliance management system, wherein the asset comprises one or more attributes, and wherein the asset and the attributes associated with the asset are automatically reported back to the compliance management;

collecting a plurality of risk factors associated with the selected asset through an interface module associated with the compliance management system, wherein one or more of said risk factors are collected in real-time by a risk management module of the compliance management system;

mapping said determined risk factors to a plurality of risk factor values that are input to one or more non-linear statistical data models;

calculating a risk score based on one or more of said mapped risk factor values using said non-linear statistical data models, wherein the non-linear statistical data models are self trainable using a feedback mechanism; and

automatically assessing said risk using said calculated risk score;

whereby the calculated risk score allows automatic assessment of the risk associated with one or more of the assets.

32. The method of claim **31**, wherein the non-linear statistical data models utilize one or more of a neural network, a decision tree, a Bayesian network, and a genetic algorithm.

33. A computer implemented system for automatically assessing risk of one or more assets based on compliance of said assets, comprising:

a compliance management system implemented on one or more computers, comprising:

a network interface module for connecting said one or more computers implementing said compliance management system to said assets via a network;

an asset module in communication with said network interface module for selecting the assets and for determining a plurality of risk factors associated with the assets, wherein said asset module is used to configure one or more attributes associated with each of the assets, and wherein said configured attributes reduce said risk of the assets;

a policy module in communication with said network interface module for associating one or more policies with the assets and for determining a compliance score for the assets based on said associated policies;

a self assessment module in communication with said network interface module for maintaining and accessing self assessment surveys, wherein said self assessment module provides feed back to said policy module and a risk management module based on said self assessment surveys; and

a risk management module in communication with said network interface module for mapping said determined risk factors to a plurality of risk factor values and for calculating a risk score based on one or more of said mapped risk factor values using one or more non-linear statistical data models, wherein said risk score is used to automatically assess the risk associated with the assets.

34. The computer implemented system of claim **32**, wherein said compliance management system comprises a self-assessment module for maintaining and accessing a plurality of self-assessment surveys.

35. The computer implemented system of claim **32**, wherein said compliance management system comprises a user interface comprising a plurality of consoles, exposed to users for interacting with said compliance management system, wherein said user interface further comprises a notification module for sending alerts and reports regarding compliance management and risk analysis.

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