

Ex. F-3 - Invalidity of U.S. Patent No. 7,593,936 against U.S. Patent No. 6,327,550 to Vinberg et al. ("Vinberg")

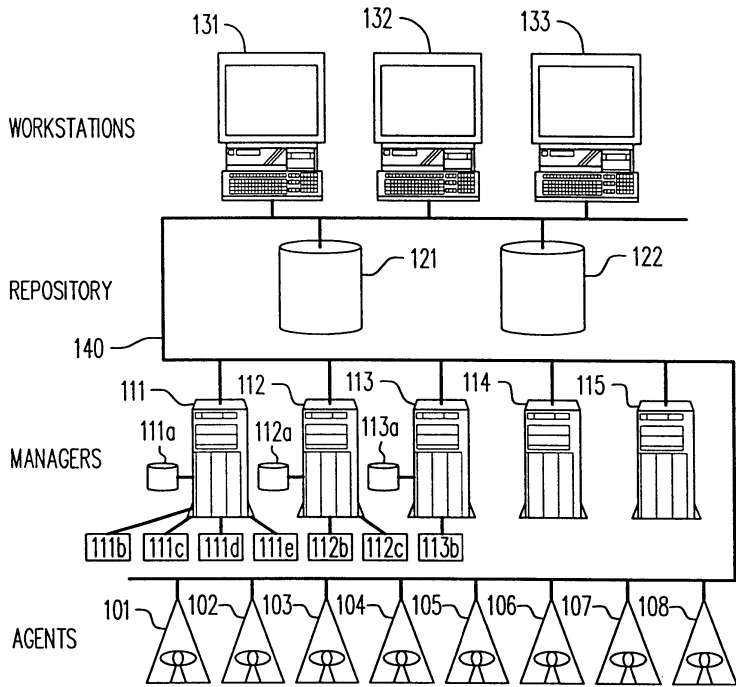
Fortinet, Inc. ("Fortinet") provides this chart subject to all reservations, objections, statements, and disclaimers set forth herein and in Fortinet's Preliminary Invalidity Contentions Cover Pleading, as well as any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety.

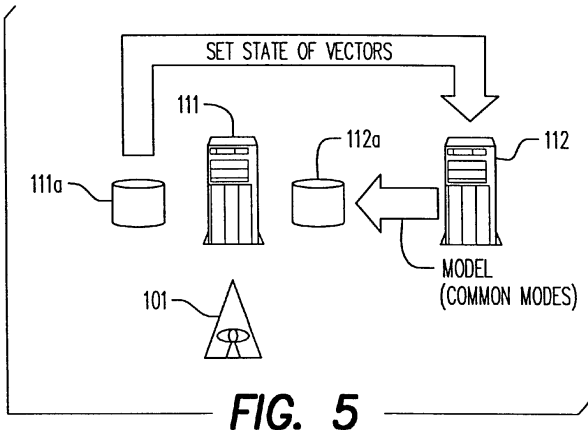
On information and belief, and subject to further investigation and discovery, Vinberg was filed on March 5, 2001, and issued December 4, 2001, and is thus available as prior art under at least §102(a), (b), and (e).

As illustrated in the chart below, Vinberg anticipates the asserted claims of the '936 Patent. To the extent the Vinberg is found not to expressly disclose certain limitations in the asserted claims, such limitations are inherent. To the extent the Vinberg is found not to anticipate any asserted claims or claim elements of the '936 Patent, the reference nevertheless renders those claims or claim elements obvious under 35 U.S.C. § 103, either alone or in combination with other art identified in the cover pleading or herein. These Preliminary Invalidity Contentions are not an admission by Fortinet that the accused products, including any current or past versions of the accused products, are covered by, or infringe the asserted claims, but are based instead on the recognition that if the claims are interpreted to be broad enough to encompass the accused products, the claims must also be construed to have that same scope when considering whether they are invalid.

The following chart is partially based on, but is not limited by, the claim constructions implicit in Plaintiff's Infringement Contentions, to the extent that such constructions are apparent from the Infringement Contentions. Fortinet notes that in many instances, Plaintiff's Infringement Contentions fail to provide adequate notice of Plaintiff's construction of the asserted claims and fail to comply with the Court's scheduling order and other applicable rules. Fortinet does not accept the assumptions concerning the scope and meaning implicit in Plaintiff's Infringement Contentions, to the extent those assumptions are discernible, and reserves the right to challenge Plaintiff's proposed (or implied) constructions. Fortinet also reserves the right to revise and supplement these charts if and when Plaintiff is permitted to provide revised Infringement Contentions or otherwise make its positions known. To the extent that these Preliminary Invalidity Contentions rely on or otherwise embody particular constructions of terms or phrases in the asserted claims, Fortinet does not necessarily advocate any such construction as proper constructions of those terms or phrase. Fortinet also reserves the right to revise and supplement these charts after the Court construes the claims. Citations given in the chart below are merely representative of the respective elements and are not meant to be exhaustive.

Claim	Exemplary Citation from Vinberg
[1PRE] A method of detecting abnormal system states in computers, comprising:	Vinberg discloses and/or renders obvious a method of detecting abnormal system states in computers with the following steps. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 1:23: "Prior art systems and network management systems monitor the state of system components by monitoring various metrics and comparing them with predefined threshold values. Data samples are typically gathered by monitoring agents, by probes inserted in software systems and by other management tools. The samples may be gathered on a regular basis, by intermittent polling over the network, or on an event basis, triggered by signals sent by an agent, probe or manager. In practice, an agent may monitor a thousand metrics for a single computer system. A state manager may monitor several logical systems operating within several networked computer systems and network components. A state manager typically determines the state of a monitored system by comparing the metrics with predefined threshold values. The determination may be based on logical combinations of several such comparisons. The state may be determined in response to events sent by an agent. The determination may be based on correlating events and conditions across several system components or over time. The aggregate of the rules that define how the information is collected and the state determination is made is generally referred to as a "policy". Such state managers are referred to as "policy-based state managers."" Vinberg at 8:6: "The system then enters the monitoring phase, illustrated in FIG. 6, when the monitoring manager 113 receives state information from the agents 101-108 on a continual basis, collected through the services of the data collection manager 113, and compares these state vectors with the common modes than make up the model stored in 112 a. When the state vector lies within a common mode as in FIG. 10, the monitoring manager recognizes this as a common situation that does not warrant an alarm. But if the state vector lies outside the common modes, as illustrated in FIG. 11, the monitoring

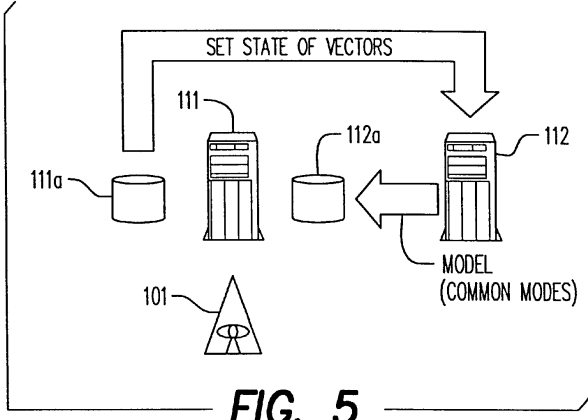
Claim	Exemplary Citation from Vinberg
	manager recognizes an uncommon or unprecedented situation and raises an alarm. The monitoring manager 113 constructs a message and sends it out using the standard messaging services provided by the infrastructure 140. This message includes the data defining the current state, and the boundaries of the nearest common mode." Vinberg at Fig. 3 and corresponding text:  The diagram illustrates a network architecture with four main layers. At the top, three workstations (131, 132, 133) are connected to a central repository (140) which contains two databases (121, 122). Below the repository is a layer of managers (111, 112, 113, 114, 115). Each manager has a sub-component (111a, 112a, 113a) and a set of sub-components (111b, 111c, 111d, 111e, 112b, 112c, 113b). At the bottom, eight agents (101-108) are connected to the managers. The agents are represented by icons of a computer monitor and a keyboard. FIG. 3

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 5 and corresponding text:  FIG. 5
[1A] receiving snapshots from a plurality of computers within a population of computers, wherein individual snapshots include data indicating a state of a respective computer;	Vinberg discloses and/or renders obvious receiving snapshots from a plurality of computers within a population of computers, wherein individual snapshots include data indicating a state of a respective computer. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 2:1: "The present invention is a software-implemented, state monitoring system. Instead of using a fixed set of threshold values and comparison rules, each manually and separately defined by a policy author, it uses artificial intelligence technology to do pattern recognition and then to decide the conditions that raise alarms, in order to monitor and to determine or predict the state of a networked system or any of its components or subsystems. A preferred embodiment of this invention uses neural

Claim	Exemplary Citation from Vinberg
	network techniques, a type of artificial intelligence, to do the pattern recognition. In typical usage, the inventive system is educated by watching the monitored system over a period during which the monitored system is exposed to common load patterns. This is the learning phase of the operation of the inventive system. Conventional agents, probes and managers collect data over a period such as a few weeks, depending on the load patterns on the monitored system. Once enough data has been collected, the inventive system analyses the data using a neural network or other technique capable of performing pattern recognition, to identify "common modes." Common modes are clusters of commonly occurring state vectors within n-dimensional space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 5:42: "FIGS. 1-3 show a simplified diagram of the architecture of a network and systems management system. Such systems generally have one or several agents 101-108 which operate on the managed systems and network components and report information on what is going on in the managed systems. (These agents may have other capabilities that are not relevant to this invention.) The system also includes one or several managers 111-115 that do most of the work of managing the systems. These managers may provide many capabilities that are not relevant to this invention, but they also collect information from the agents, determine the status of the managed systems according to some set of rules, and decide when to raise an alarm and propagate that alarm upwards in the system. The system also often contains some form of persistent store or repository 121-122 that stores the information about the managed systems and their status. There may be one or several such stores in the system. The system also includes one or several workstations 131-133 that provide the user interface that makes the information available to human operators and managers."

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 3 and corresponding text: The diagram illustrates a hierarchical network architecture. At the top, three workstations (131, 132, 133) are connected to a central bus (140). Below the bus is a repository (121, 122). Underneath the repository are five managers (111, 112, 113, 114, 115). Each manager has associated components: 111a, 112a, 113a, 111b, 111c, 111d, 111e, 112b, 112c, and 113b. At the bottom, eight agents (101-108) are connected to the managers. FIG. 3 Vinberg at 2:13: "In typical usage, the inventive System is educated by watching the monitored System over a period during which the monitored System is exposed to common load patterns. This is the learning phase of the operation of the inventive System. Conventional agents, probes and managers collect data over a period Such as a few weeks, depending on the load patterns on the monitored System. Once enough data has been collected, the inventive System analyses the data using a neural network or other technique capable of per forming pattern recognition, to identify "common modes." Common modes

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	are clusters of commonly occurring State vectors within n-dimensional Space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 6:26: "Agents 101-108 collect information from the managed network, hardware and software systems, and report that data through SNMP or other protocols. The agents may report their data synchronously, in response to poll requests from the management system, or asynchronously, as events that they fire off on their own volition. A manager 111 is in charge of this information traffic: it polls the agents as required, it receives the data coming back in response to polls or as independent events, and it does any post-processing of the messages that may be required, for example to translate data formats or compare a value with a previous value to derive a differential value." Vinberg at 7:26: "The System includes a connection between the traffic manager for data collection 111 and the neural network manager 113, So that the traffic manager can pass newly reported States to the neural network for analysis." Vinberg at 7:66: "In the learning phase, the system goes through two steps. First, as in FIG. 4, the data gathering management system 111 collects data from the agents 101-108 during a typical workload of the managed system, and stores it in the persistent store 111 a." Vinberg at 8:1: "In the learning phase, the System goes through two StepS. First, as in FIG. 4, the data gathering management System 111 collects data from the agents 101-108 during a typical Workload of the managed System, and Stores it in the persistent Store 111a." Vinberg at 8:16: "The System then enters the monitoring phase, illustrated in FIG. 6, when the monitoring manager 113 receives state information from the agents 101-108 on a continual basis, collected through the

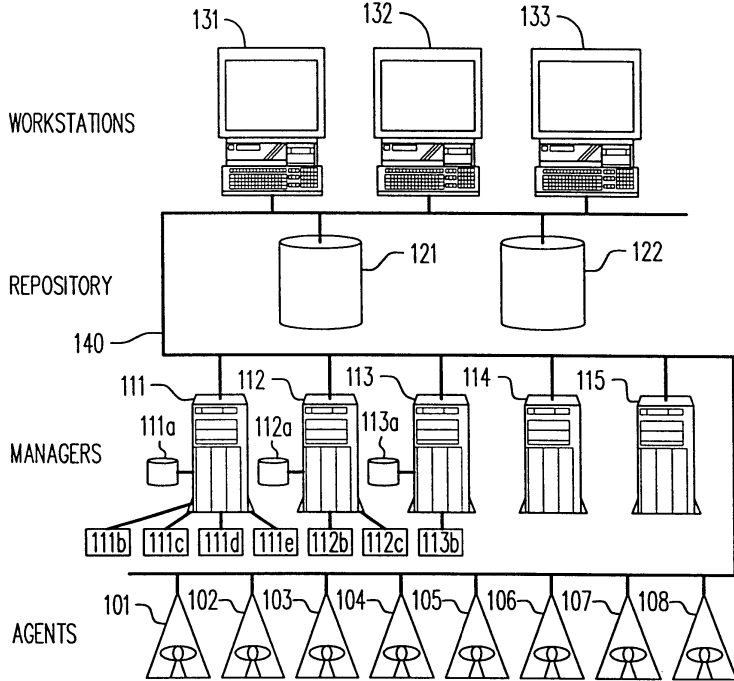
Claim	Exemplary Citation from Vinberg
	Services of the data collection manager 113, and compares these State vectors with the common modes than make up the model Stored in 112a." Vinberg at Fig. 5 and corresponding text:  FIG. 5
[1B] automatically generating an adaptive reference model comprising a rule set customized to characteristics of the population of computers, the rule set being developed by identifying patterns among the snapshots from the plurality of computers such that the adaptive reference model is indicative of normal states	Vinberg discloses and/or renders obvious automatically generating an adaptive reference model comprising a rule set customized to characteristics of the population of computers, the rule set being developed by identifying patterns among the snapshots from the plurality of computers such that the adaptive reference model is indicative of normal states in the computers within the population. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics."

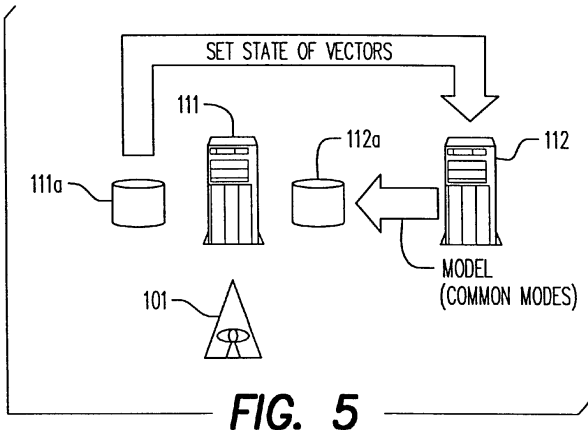
Claim	Exemplary Citation from Vinberg
in the computers within the population; and	Vinberg at 2:1: "The present invention is a software-implemented, state monitoring system. Instead of using a fixed set of threshold values and comparison rules, each manually and separately defined by a policy author, it uses artificial intelligence technology to do pattern recognition and then to decide the conditions that raise alarms, in order to monitor and to determine or predict the state of a networked system or any of its components or subsystems. A preferred embodiment of this invention uses neural network techniques, a type of artificial intelligence, to do the pattern recognition. In typical usage, the inventive system is educated by watching the monitored system over a period during which the monitored system is exposed to common load patterns. This is the learning phase of the operation of the inventive system. Conventional agents, probes and managers collect data over a period such as a few weeks, depending on the load patterns on the monitored system. Once enough data has been collected, the inventive system analyses the data using a neural network or other technique capable of performing pattern recognition, to identify "common modes." Common modes are clusters of commonly occurring state vectors within n-dimensional space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 2:38: "Incremental Learning. The inventive system continuously updates its degree of learning during its monitoring phase. A human manager or automated management tool studies the alarm message, and if necessary inspects the managed system in more detail, and then determines what should be done. If it is determined that the alarm message referred to a common situation that should be included among the common modes for future monitoring, the invention can add this data point to the set of data used for tutoring. If certain techniques such as neural networks are used for pattern recognition, the inventive system is able incrementally to learn a new state and add the new state to the set of common modes. Complete retraining of the system, which would require extensive computer time and resources, is not required. Other pattern recognition techniques may require that data point be added to the tutorial database which, as supplemented by the new data, must be re-analyzed to determine a new common mode. As defined above, the invention does not initially know if a state is "good" or "bad". It only knows that a state falls outside the common modes that have previously occurred. Indeed, it does not know if the recognized common modes are "good" or "bad"."

Claim	Exemplary Citation from Vinberg
	Vinberg at 2:62: "The invention can be extended to incorporate state labeling, the marking or labeling of a particular state: a human manager can manually label selected state vectors at selected time points as being good or bad. The invention can also do automatic state labeling which consists of correlating state vectors with metrics or events reported by management tools. With automatic state labeling, the invention can select more significant information: it can report that the monitored system or a component of the system, is in a good mode, a bad mode, or an unprecedented state. The inventive system may be further enriched by specifying degrees of goodness or badness of common modes." Vinberg at 6:37: "The manager has a persistent store 111 a for holding the long-term data that is used during the learning phase. This store may be a database management system, or simple files. The pattern recognition processing is done by a manager 112, which retrieves information from the persistent store 111 a, and performs the pattern recognition as described below. The pattern recognition manager 112 also has a persistent store 112 a for holding the model (common modes) that is generated by the invention during the learning phase. Again, this store may be a database management system, or simple files. The monitoring of the managed system, comparing it with the model generated in the learning phase, is done by a manager 113. It uses information retrieved from the managed systems by agents 101-108 by the data gathering manager 111, compares it with the model stored by the pattern recognition system 112 in the persistent store 112 a, and issues messages using standard messaging services provided by the infrastructure 140." Vinberg at 7:14: "Other components of the management system may include a classical, policy-based state determination system 114 . This technology, which is well known, is not directly relevant to the present invention. However, it should be noted that policy-based state management and state management based on pattern recognition may coexist in one management system, where the status of any managed system may be reported by either component, or possibly both in combination: either the pattern-based manager 113 or the policy-based manager 114 may determine that a managed system is in a troubled state and raise an alarm to that effect. The system includes a connection between the traffic manager for data collection 111 and the neural network manager 113, so that the traffic manager can pass newly reported states to the neural network for analysis. The system also

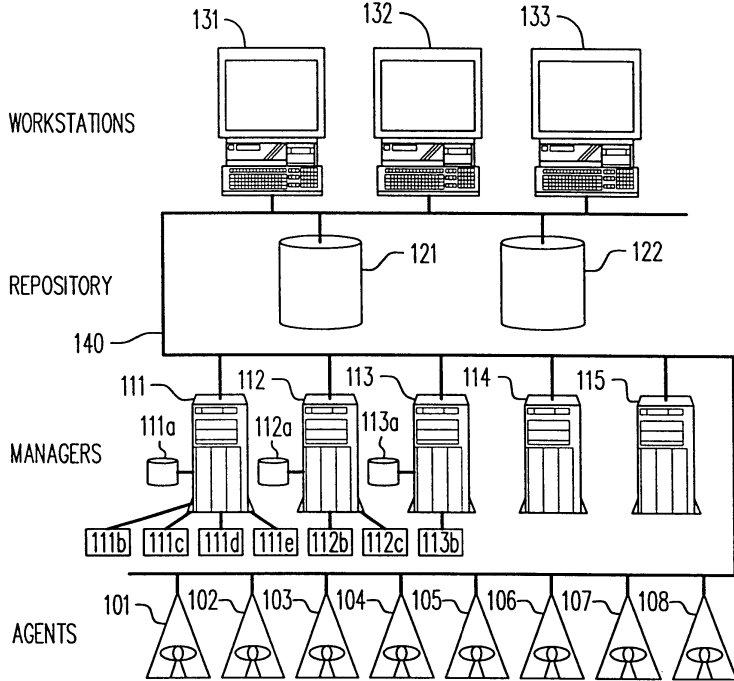
Claim	Exemplary Citation from Vinberg
	includes a connection between the state management complex 111 - 114 and the various consumers of the information determined by the state managers; other management tools 115 for automated response or disposition, repositories 121 - 122 that store this information persistently, or workstations 131 - 133 that present the information to human operators using a conventional management console or other user interface." Vinberg at 7:66: "In the learning phase, the system goes through two steps. First, as in FIG. 4, the data gathering management system 111 collects data from the agents 101-108 during a typical workload of the managed system, and stores it in the persistent store 111 a." Vinberg at 8:1: "When sufficient data has been collected, the pattern recognition manager 112 enters step two of the learning phase, illustrated in FIG. 5, when it analyzes this data with pattern recognition techniques to find "common modes" of the system operation. A common mode is a region in the n-dimensional space in which the state vectors appear that represents a cluster of commonly occurring state vectors. The pattern recognition manager stores the model it generated, representing the common modes, in its persistent store 112 a." Vinberg at 9:27: "The automatic State labeling component 112c derives the State label indirectly, by comparing the monitored metrics from the agents 101-108 with manually set thresholds or correlation rules, by Similarly analyzing metrics or event provided by other management Systems, or by reviewing information in help desk Systems or other information Sources. Thus, the automatic State labeling component 112c may be tailored to a specific environment, provided with rules of arbitrary Structure and complexity. Such rule-based Systems are well known in the industry, and constructing or incorporating Such a System is a task well understood by experienced practitioners skilled in the art. The details of how the automatic State labeling is done are not relevant to the present invention. With either manual or automatic State labeling, the pattern recognition System 112 uses the State labels to label the identified common modes, using simple averaging or worst case association, or optionally Some more complex analysis."

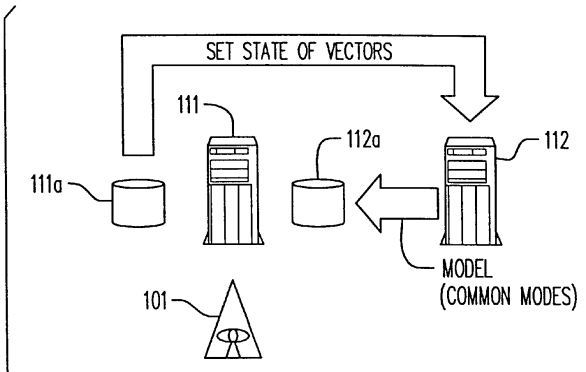
Claim	Exemplary Citation from Vinberg
	Vinberg at 10:4: "During monitoring of a system the invention may come across an unprecedented state, one that did not occur during the learning phase, but one that is nonetheless a "normal," non-problematic state. For example, the learning phase may have been based on data from the first month of the quarter, and the end-of-the-quarter processing appears strange to the monitoring manager 113 since it does not match any of the modes in the model. The warning message that the invention issues is therefore a false alarm, and the human manager who responds to the message may indicate this, essentially telling the invention that this a common mode, labeled "good." Of course, it is always possible to run through the learning phase again with the more complete set of data, including the end-of-the-quarter situations, but this may not always be attractive. In particular, in configurations where the monitoring manager 113 is separate from the pattern recognition manager 112 , it would be preferable if the new modes that would be derived from the new states could be incrementally added to the model in the store 113 a , as in FIG. 9 . Depending on the pattern recognition technology used in 112 , the invention may support such incremental learning directly into the model store 112 a or 113 a . After a long period with a lot of such incremental learning, it may be preferable to consolidate the model by rerunning the learning phase on the complete set of data. The foregoing inventive system and apparatus has been described generally and with reference to preferred and other embodiments. Those skilled in the art, upon reading of the specification, will understand that there are equivalent alterations, modifications and embodiments including systems that monitor the state of systems that may not be labeled "networked computer systems" but which substantively are networked computer systems. The present invention includes systems to monitor the state all networked computer systems, and various hardware or software components thereof, however labeled, and includes all such equivalent alterations, modifications and embodiments."

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 3 and corresponding text:  FIG. 3 The diagram illustrates a network architecture with four main layers. At the top, three WORKSTATIONS (131, 132, 133) are connected to a central REPOSITORY (140). The repository contains two data stores (121, 122). Below the repository is a layer of MANAGERS (111, 112, 113, 114, 115). Each manager has associated components: 111a, 112a, 113a are small circular icons; 111b, 111c, 111d, 111e, 112b, 112c, 113b are rectangular boxes. At the bottom, eight AGENTS (101-108) are connected to the managers. The agents are represented by stylized computer icons.

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 5 and corresponding text:  FIG. 5
[1C] comparing a snapshot from at least one of the computers to the adaptive reference model to determine whether an anomaly is present in the state of the at least one of the computers.	Vinberg discloses and/or renders obvious comparing a snapshot from at least one of the computers to the adaptive reference model to determine whether an anomaly is present in the state of the at least one of the computers. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 2:28: "Once educated during an initial learning phase, the invention enters its monitoring phase in which it continually monitors the system by comparing state vectors reported by the agents, probes and managers with the recognized common modes previously identified by pattern recognition in the learning period. When a state vector appears that does not lie in one of the common modes

Claim	Exemplary Citation from Vinberg
	recognized during the tutoring phase, the invention raises an alarm, reporting that the monitored system or a component or subsystem has entered an unusual or unprecedented state." Vinberg at 2:38: "Incremental Learning. The inventive system continuously updates its degree of learning during its monitoring phase. A human manager or automated management tool studies the alarm message, and if necessary inspects the managed system in more detail, and then determines what should be done. If it is determined that the alarm message referred to a common situation that should be included among the common modes for future monitoring, the invention can add this data point to the set of data used for tutoring. If certain techniques such as neural networks are used for pattern recognition, the inventive system is able incrementally to learn a new state and add the new state to the set of common modes. Complete retraining of the system, which would require extensive computer time and resources, is not required. Other pattern recognition techniques may require that data point be added to the tutorial database which, as supplemented by the new data, must be re-analyzed to determine a new common mode. As defined above, the invention does not initially know if a state is "good" or "bad". It only knows that a state falls outside the common modes that have previously occurred. Indeed, it does not know if the recognized common modes are "good" or "bad"." Vinberg at 2:62: "The invention can be extended to incorporate state labeling, the marking or labeling of a particular state: a human manager can manually label selected state vectors at selected time points as being good or bad. The invention can also do automatic state labeling which consists of correlating state vectors with metrics or events reported by management tools. With automatic state labeling, the invention can select more significant information: it can report that the monitored system or a component of the system, is in a good mode, a bad mode, or an unprecedented state. The inventive system may be further enriched by specifying degrees of goodness or badness of common modes."

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 3 and corresponding text:  FIG. 3 The diagram illustrates a network architecture with four main layers. At the top, three WORKSTATIONS (131, 132, 133) are connected to a central REPOSITORY (140). The repository consists of two database cylinders (121, 122). Below the repository is a layer of MANAGERS (111, 112, 113, 114, 115). Managers 111, 112, and 113 are each associated with a small database cylinder (111a, 112a, 113a) and a set of three smaller components (111b, 111c, 111d; 112b, 112c, 112d; 113b, 113c, 113d). Managers 114 and 115 are not associated with these smaller components. At the bottom, eight AGENTS (101-108) are connected to the managers. Agents 101-103 are connected to manager 111, agents 104-106 to manager 112, agent 107 to manager 113, and agent 108 to manager 114. Manager 115 is not connected to any agents.

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 5 and corresponding text:  FIG. 5 Vinberg at 6:37: "The manager has a persistent store 111 a for holding the long-term data that is used during the learning phase. This store may be a database management system, or simple files. The pattern recognition processing is done by a manager 112, which retrieves information from the persistent store 111 a, and performs the pattern recognition as described below. The pattern recognition manager 112 also has a persistent store 112 a for holding the model (common modes) that is generated by the invention during the learning phase. Again, this store may be a database management system, or simple files. The monitoring of the managed system, comparing it with the model generated in the learning phase, is done by a manager 113. It uses information retrieved from the managed systems by agents 101-108 by the data gathering manager 111, compares it with the model stored by the pattern recognition system 112 in the persistent store 112 a, and issues messages using standard messaging services provided by the infrastructure 140." Vinberg at 8:6: "The system then enters the monitoring phase, illustrated in FIG. 6, when the monitoring manager 113 receives state information from the agents 101-108 on a continual basis, collected through the

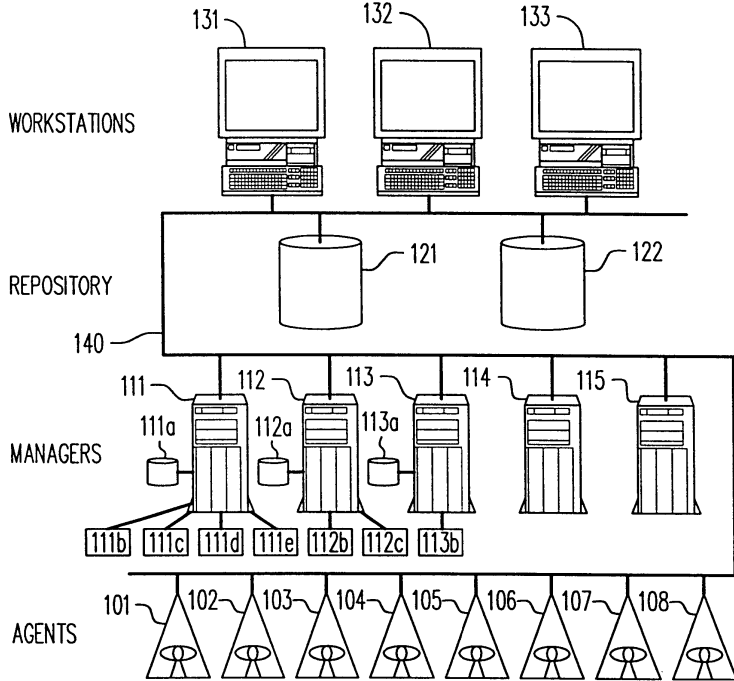
Claim	Exemplary Citation from Vinberg
	services of the data collection manager 113, and compares these state vectors with the common modes than make up the model stored in 112 a. When the state vector lies within a common mode as in FIG. 10, the monitoring manager recognizes this as a common situation that does not warrant an alarm. But if the state vector lies outside the common modes, as illustrated in FIG. 11, the monitoring manager recognizes an uncommon or unprecedented situation and raises an alarm. The monitoring manager 113 constructs a message and sends it out using the standard messaging services provided by the infrastructure 140. This message includes the data defining the current state, and the boundaries of the nearest common mode." Vinberg at 9:6: "As described above, the invention can determine when the system state vector enters an unprecedented state, outside of any common mode identified during the learning phase. The pattern recognition manager 112 can also include a manual state labeling component 112 b or an automatic state labeling component 112 c that associate the state labels with the identified common modes as good, bad or with some other classification. These labels are stored with the common modes that constitute the model in the persistent store 112 a. The automatic state labeling component 112 c derives the state label indirectly, by comparing the monitored metrics from the agents 101 - 108 with manually set thresholds or correlation rules, by similarly analyzing metrics or event provided by other management systems, or by reviewing information in help desk systems or other information sources. Thus, the automatic state labeling component 112 c may be tailored to a specific environment, provided with rules of arbitrary structure and complexity. Such rule-based systems are well known in the industry, and constructing or incorporating such a system is a task well understood by experienced practitioners skilled in the art. The details of how the automatic state labeling is done are not relevant to the present invention." Vinberg at 9:46: "Once the common modes in the persistent store 112 a have been labeled, the monitoring manager 113 generates a message when a state vector enters a state labeled as bad, or with some other label worthy of generating a message. Each label has a human-readable text description, as well as a severity code that tells the message generation whether a message should be generated."
[2PRE] The method of claim 1, further comprising:	See claim 1.

Claim	Exemplary Citation from Vinberg
[2A] comparing the anomaly to a recognition filter to diagnose a trouble condition on the at least one of the computers; and	Vinberg discloses and/or renders obvious comparing the anomaly to a recognition filter to diagnose a trouble condition on the at least one of the computers.
[2B] in the event of a trouble condition, generating an automated response to the trouble condition.	Vinberg discloses and/or renders obvious, in the event of a trouble condition, generating an automated response to the trouble condition.
[3PRE] The method of claim 2, wherein the automated response is a generic response not specific to a particular asset of the at least one computer, and wherein the method further comprises:	Vinberg discloses and/or renders obvious that the automated response is a generic response not specific to a particular asset of the at least one computer.
[3A] sending the generic response and a set of anomalies found in the snapshot to the at least one computer, the set of anomalies indicating assets of the at least one computer whose states are anomalous; and	Vinberg discloses and/or renders obvious sending the generic response and a set of anomalies found in the snapshot to the at least one computer, the set of anomalies indicating assets of the at least one computer whose states are anomalous.
[3B] applying the generic response to the anomalous assets to correct the trouble condition.	Vinberg discloses and/or renders obvious applying the generic response to the anomalous assets to correct the trouble condition.

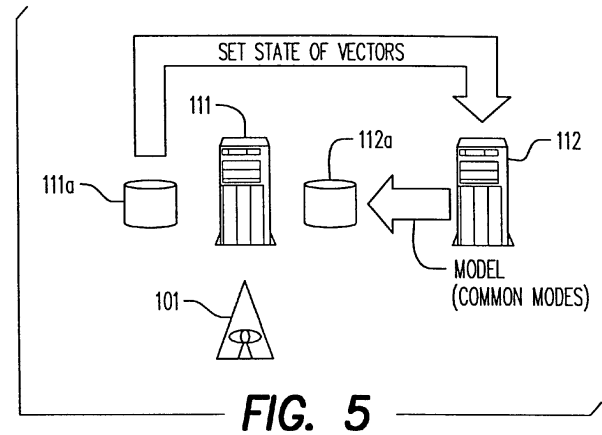
Claim	Exemplary Citation from Vinberg
[4] The method of claim 3, wherein the generic response includes at least one of: installing a missing software component, removing an undesirable software component, and restoring an incorrect registry setting.	Vinberg discloses and/or renders obvious that the generic response includes at least one of: installing a missing software component, removing an undesirable software component, and restoring an incorrect registry setting.
[5] The method of claim 2, wherein the recognition filter comprises a particular pattern of anomalies that indicates the presence of a particular root cause condition or a generic class of conditions.	Vinberg discloses and/or renders obvious that the recognition filter comprises a particular pattern of anomalies that indicates the presence of a particular root cause condition or a generic class of conditions.
[6PRE] The method of claim 1, further comprising:	<i>See Claim 1.</i>
[6A] comparing a plurality of anomalies associated with a particular snapshot with a recognition filter to diagnose a trouble condition; and	Vinberg discloses and/or renders obvious comparing a plurality of anomalies associated with a particular snapshot with a recognition filter to diagnose a trouble condition.
[6B] diagnosing a trouble condition on the at least one of the computers in response to at least a subset of the plurality of anomalies matching information in the recognition filter.	Vinberg discloses and/or renders obvious diagnosing a trouble condition on the at least one of the computers in response to at least a subset of the plurality of anomalies matching information in the recognition filter.

Claim	Exemplary Citation from Vinberg
[7] The method of claim 1, wherein individual snapshots include data associated with at least one of: system files, application files, a registry entry, a performance counter, a process, a communication port, a hardware configuration, a log file, a running task, services, and network connections.	Vinberg discloses and/or renders obvious that individual snapshots include data associated with at least one of: system files, application files, a registry entry, a performance counter, a process, a communication port, a hardware configuration, a log file, a running task, services, and network connections. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 2:1: "The present invention is a software-implemented, state monitoring system. Instead of using a fixed set of threshold values and comparison rules, each manually and separately defined by a policy author, it uses artificial intelligence technology to do pattern recognition and then to decide the conditions that raise alarms, in order to monitor and to determine or predict the state of a networked system or any of its components or subsystems. A preferred embodiment of this invention uses neural network techniques, a type of artificial intelligence, to do the pattern recognition. In typical usage, the inventive system is educated by watching the monitored system over a period during which the monitored system is exposed to common load patterns. This is the learning phase of the operation of the inventive system. Conventional agents, probes and managers collect data over a period such as a few weeks, depending on the load patterns on the monitored system. Once enough data has been collected, the inventive system analyses the data using a neural network or other technique capable of performing pattern recognition, to identify "common modes." Common modes are clusters of commonly occurring state vectors within n-dimensional space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 5:42: "FIGS. 1-3 show a simplified diagram of the architecture of a network and systems management system. Such systems generally have one or several agents 101-108 which operate on the managed systems and network components and report information on what is going on in the managed

Claim	Exemplary Citation from Vinberg
	systems. (These agents may have other capabilities that are not relevant to this invention.) The system also includes one or several managers 111-115 that do most of the work of managing the systems. These managers may provide many capabilities that are not relevant to this invention, but they also collect information from the agents, determine the status of the managed systems according to some set of rules, and decide when to raise an alarm and propagate that alarm upwards in the system. The system also often contains some form of persistent store or repository 121-122 that stores the information about the managed systems and their status. There may be one or several such stores in the system. The system also includes one or several workstations 131-133 that provide the user interface that makes the information available to human operators and managers."

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 3 and corresponding text:  FIG. 3 Vinberg at 2:13: "In typical usage, the inventive System is educated by watching the monitored System over a period during which the monitored System is exposed to common load patterns. This is the learning phase of the operation of the inventive System. Conventional agents, probes and managers collect data over a period Such as a few weeks, depending on the load patterns on the monitored System. Once enough data has been collected, the inventive System analyses the data using a neural network or other technique capable of per forming pattern recognition, to identify "common modes." Common modes

Claim	Exemplary Citation from Vinberg
	are clusters of commonly occurring State vectors within n-dimensional Space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 6:26: "Agents 101-108 collect information from the managed network, hardware and software systems, and report that data through SNMP or other protocols. The agents may report their data synchronously, in response to poll requests from the management system, or asynchronously, as events that they fire off on their own volition. A manager 111 is in charge of this information traffic: it polls the agents as required, it receives the data coming back in response to polls or as independent events, and it does any post-processing of the messages that may be required, for example to translate data formats or compare a value with a previous value to derive a differential value." Vinberg at 7:26: "The System includes a connection between the traffic manager for data collection 111 and the neural network manager 113, So that the traffic manager can pass newly reported States to the neural network for analysis." Vinberg at 7:66: "In the learning phase, the system goes through two steps. First, as in FIG. 4, the data gathering management system 111 collects data from the agents 101-108 during a typical workload of the managed system, and stores it in the persistent store 111 a." Vinberg at 8:1: "In the learning phase, the System goes through two StepS. First, as in FIG. 4, the data gathering management System 111 collects data from the agents 101-108 during a typical Workload of the managed System, and Stores it in the persistent Store 111a." Vinberg at 8:16: "The System then enters the monitoring phase, illustrated in FIG. 6, when the monitoring manager 113 receives state information from the agents 101-108 on a continual basis, collected through the

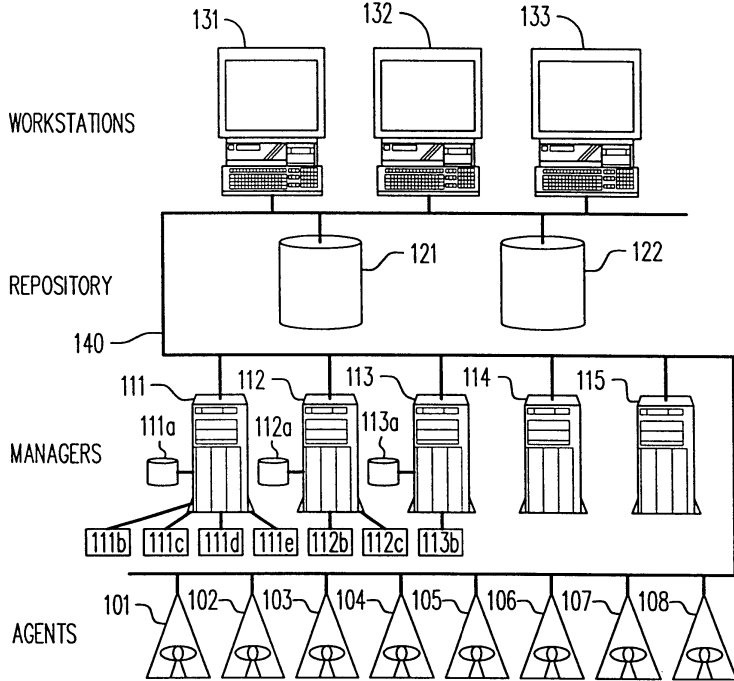
Claim	Exemplary Citation from Vinberg
	Services of the data collection manager 113, and compares these State vectors with the common modes than make up the model Stored in 112a." Vinberg at Fig. 5 and corresponding text:  FIG. 5
[8] The method of claim 1, further comprising: inserting rules into the rule set of the adaptive reference model to augment or override rules of the rule set automatically generated from the snapshots.	Vinberg discloses and/or renders obvious inserting rules into the rule set of the adaptive reference model to augment or override rules of the rule set automatically generated from the snapshots. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 2:1: "The present invention is a software-implemented, state monitoring system. Instead of using a fixed set of threshold values and comparison rules, each manually and separately defined by a policy author, it uses artificial intelligence technology to do pattern recognition and then to decide the

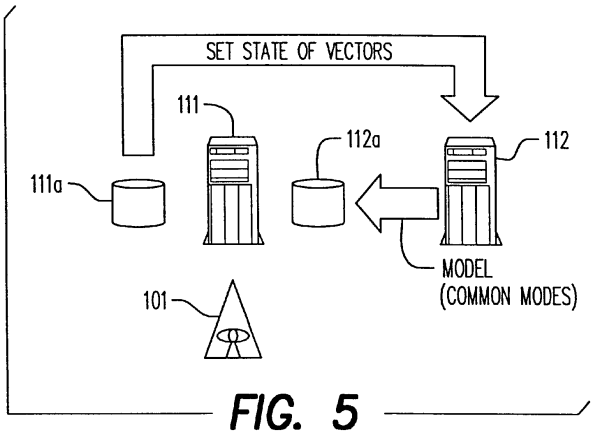
Claim	Exemplary Citation from Vinberg
	conditions that raise alarms, in order to monitor and to determine or predict the state of a networked system or any of its components or subsystems. A preferred embodiment of this invention uses neural network techniques, a type of artificial intelligence, to do the pattern recognition. In typical usage, the inventive system is educated by watching the monitored system over a period during which the monitored system is exposed to common load patterns. This is the learning phase of the operation of the inventive system. Conventional agents, probes and managers collect data over a period such as a few weeks, depending on the load patterns on the monitored system. Once enough data has been collected, the inventive system analyses the data using a neural network or other technique capable of performing pattern recognition, to identify "common modes." Common modes are clusters of commonly occurring state vectors within n-dimensional space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 2:38: "Incremental Learning. The inventive system continuously updates its degree of learning during its monitoring phase. A human manager or automated management tool studies the alarm message, and if necessary inspects the managed system in more detail, and then determines what should be done. If it is determined that the alarm message referred to a common situation that should be included among the common modes for future monitoring, the invention can add this data point to the set of data used for tutoring. If certain techniques such as neural networks are used for pattern recognition, the inventive system is able incrementally to learn a new state and add the new state to the set of common modes. Complete retraining of the system, which would require extensive computer time and resources, is not required. Other pattern recognition techniques may require that data point be added to the tutorial database which, as supplemented by the new data, must be re-analyzed to determine a new common mode. As defined above, the invention does not initially know if a state is "good" or "bad". It only knows that a state falls outside the common modes that have previously occurred. Indeed, it does not know if the recognized common modes are "good" or "bad"." Vinberg at 2:62: "The invention can be extended to incorporate state labeling, the marking or labeling of a particular state: a human manager can manually label selected state vectors at selected time points as being good or bad. The invention can also do automatic state labeling which consists of correlating state

Claim	Exemplary Citation from Vinberg
	vectors with metrics or events reported by management tools. With automatic state labeling, the invention can select more significant information: it can report that the monitored system or a component of the system, is in a good mode, a bad mode, or an unprecedented state. The inventive system may be further enriched by specifying degrees of goodness or badness of common modes." Vinberg at 6:37: "The manager has a persistent store 111 a for holding the long-term data that is used during the learning phase. This store may be a database management system, or simple files. The pattern recognition processing is done by a manager 112, which retrieves information from the persistent store 111 a, and performs the pattern recognition as described below. The pattern recognition manager 112 also has a persistent store 112 a for holding the model (common modes) that is generated by the invention during the learning phase. Again, this store may be a database management system, or simple files. The monitoring of the managed system, comparing it with the model generated in the learning phase, is done by a manager 113. It uses information retrieved from the managed systems by agents 101-108 by the data gathering manager 111, compares it with the model stored by the pattern recognition system 112 in the persistent store 112 a, and issues messages using standard messaging services provided by the infrastructure 140." Vinberg at 7:14: "Other components of the management system may include a classical, policy-based state determination system 114 . This technology, which is well known, is not directly relevant to the present invention. However, it should be noted that policy-based state management and state management based on pattern recognition may coexist in one management system, where the status of any managed system may be reported by either component, or possibly both in combination: either the pattern-based manager 113 or the policy-based manager 114 may determine that a managed system is in a troubled state and raise an alarm to that effect. The system includes a connection between the traffic manager for data collection 111 and the neural network manager 113, so that the traffic manager can pass newly reported states to the neural network for analysis. The system also includes a connection between the state management complex 111 - 114 and the various consumers of the information determined by the state managers; other management tools 115 for automated response or disposition, repositories 121 - 122 that store this information persistently, or workstations

Claim	Exemplary Citation from Vinberg
	131 - 133 that present the information to human operators using a conventional management console or other user interface." Vinberg at 7:66: "In the learning phase, the system goes through two steps. First, as in FIG. 4, the data gathering management system 111 collects data from the agents 101-108 during a typical workload of the managed system, and stores it in the persistent store 111 a." Vinberg at 8:1: "When sufficient data has been collected, the pattern recognition manager 112 enters step two of the learning phase, illustrated in FIG. 5, when it analyzes this data with pattern recognition techniques to find "common modes" of the system operation. A common mode is a region in the n-dimensional space in which the state vectors appear that represents a cluster of commonly occurring state vectors. The pattern recognition manager stores the model it generated, representing the common modes, in its persistent store 112 a." Vinberg at 9:27: "The automatic State labeling component 112c derives the State label indirectly, by comparing the monitored metrics from the agents 101-108 with manually set thresholds or correlation rules, by Similarly analyzing metrics or event provided by other management Systems, or by reviewing information in help desk Systems or other information Sources. Thus, the automatic State labeling component 112c may be tailored to a specific environment, provided with rules of arbitrary Structure and complexity. Such rule-based Systems are well known in the industry, and constructing or incorporating Such a System is a task well understood by experienced practitioners skilled in the art. The details of how the automatic State labeling is done are not relevant to the present invention. With either manual or automatic State labeling, the pattern recognition System 112 uses the State labels to label the identified common modes, using simple averaging or worst case association, or optionally Some more complex analysis." Vinberg at 10:4: "During monitoring of a system the invention may come across an unprecedented state, one that did not occur during the learning phase, but one that is nonetheless a "normal," non-problematic state.

Claim	Exemplary Citation from Vinberg
	For example, the learning phase may have been based on data from the first month of the quarter, and the end-of-the-quarter processing appears strange to the monitoring manager 113 since it does not match any of the modes in the model. The warning message that the invention issues is therefore a false alarm, and the human manager who responds to the message may indicate this, essentially telling the invention that this a common mode, labeled "good." Of course, it is always possible to run through the learning phase again with the more complete set of data, including the end-of-the-quarter situations, but this may not always be attractive. In particular, in configurations where the monitoring manager 113 is separate from the pattern recognition manager 112 , it would be preferable if the new modes that would be derived from the new states could be incrementally added to the model in the store 113 a , as in FIG. 9 . Depending on the pattern recognition technology used in 112 , the invention may support such incremental learning directly into the model store 112 a or 113 a . After a long period with a lot of such incremental learning, it may be preferable to consolidate the model by rerunning the learning phase on the complete set of data. The foregoing inventive system and apparatus has been described generally and with reference to preferred and other embodiments. Those skilled in the art, upon reading of the specification, will understand that there are equivalent alterations, modifications and embodiments including systems that monitor the state of systems that may not be labeled "networked computer systems" but which substantively are networked computer systems. The present invention includes systems to monitor the state all networked computer systems, and various hardware or software components thereof, however labeled, and includes all such equivalent alterations, modifications and embodiments."

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 3 and corresponding text:  FIG. 3 The diagram illustrates a network architecture with four main layers. At the top, three WORKSTATIONS (131, 132, 133) are connected to a central REPOSITORY (140). The repository consists of two database cylinders (121, 122). Below the repository is a layer of MANAGERS (111, 112, 113, 114, 115). Each manager has a small database icon (111a, 112a, 113a) and is connected to a set of smaller database icons (111b, 111c, 111d, 111e, 112b, 112c, 113b). At the bottom, eight AGENTS (101-108) are connected to the managers. The agents are represented by computer monitor icons.

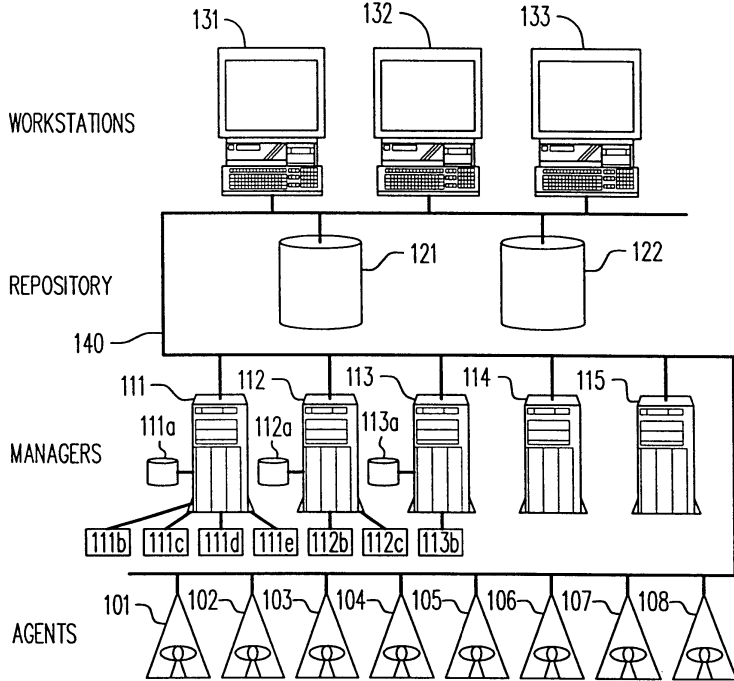
Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 5 and corresponding text:  FIG. 5
[9] The method of claim 1, wherein the adaptive reference model is generated to include a value layer that determines whether an asset value contained in a snapshot is anomalous.	Vinberg discloses and/or renders obvious that the adaptive reference model is generated to include a value layer that determines whether an asset value contained in a snapshot is anomalous. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 2:1: "The present invention is a software-implemented, state monitoring system. Instead of using a fixed set of threshold values and comparison rules, each manually and separately defined by a policy author, it uses artificial intelligence technology to do pattern recognition and then to decide the conditions that raise alarms, in order to monitor and to determine or predict the state of a networked system or any of its components or subsystems. A preferred embodiment of this invention uses neural network techniques, a type of artificial intelligence, to do the pattern recognition. In typical usage, the inventive system is educated by watching the monitored system over a period during which the

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	monitored system is exposed to common load patterns. This is the learning phase of the operation of the inventive system. Conventional agents, probes and managers collect data over a period such as a few weeks, depending on the load patterns on the monitored system. Once enough data has been collected, the inventive system analyses the data using a neural network or other technique capable of performing pattern recognition, to identify "common modes." Common modes are clusters of commonly occurring state vectors within n-dimensional space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 2:38: "Incremental Learning. The inventive system continuously updates its degree of learning during its monitoring phase. A human manager or automated management tool studies the alarm message, and if necessary inspects the managed system in more detail, and then determines what should be done. If it is determined that the alarm message referred to a common situation that should be included among the common modes for future monitoring, the invention can add this data point to the set of data used for tutoring. If certain techniques such as neural networks are used for pattern recognition, the inventive system is able incrementally to learn a new state and add the new state to the set of common modes. Complete retraining of the system, which would require extensive computer time and resources, is not required. Other pattern recognition techniques may require that data point be added to the tutorial database which, as supplemented by the new data, must be re-analyzed to determine a new common mode. As defined above, the invention does not initially know if a state is "good" or "bad". It only knows that a state falls outside the common modes that have previously occurred. Indeed, it does not know if the recognized common modes are "good" or "bad"." Vinberg at 2:62: "The invention can be extended to incorporate state labeling, the marking or labeling of a particular state: a human manager can manually label selected state vectors at selected time points as being good or bad. The invention can also do automatic state labeling which consists of correlating state vectors with metrics or events reported by management tools. With automatic state labeling, the invention can select more significant information: it can report that the monitored system or a component of the system, is in a good mode, a bad mode, or an unprecedented state. The inventive system may be further enriched by specifying degrees of goodness or badness of common modes."

Claim	Exemplary Citation from Vinberg
	Vinberg at 6:37: "The manager has a persistent store 111 a for holding the long-term data that is used during the learning phase. This store may be a database management system, or simple files. The pattern recognition processing is done by a manager 112, which retrieves information from the persistent store 111 a, and performs the pattern recognition as described below. The pattern recognition manager 112 also has a persistent store 112 a for holding the model (common modes) that is generated by the invention during the learning phase. Again, this store may be a database management system, or simple files. The monitoring of the managed system, comparing it with the model generated in the learning phase, is done by a manager 113. It uses information retrieved from the managed systems by agents 101-108 by the data gathering manager 111, compares it with the model stored by the pattern recognition system 112 in the persistent store 112 a, and issues messages using standard messaging services provided by the infrastructure 140." Vinberg at 7:14: "Other components of the management system may include a classical, policy-based state determination system 114 . This technology, which is well known, is not directly relevant to the present invention. However, it should be noted that policy-based state management and state management based on pattern recognition may coexist in one management system, where the status of any managed system may be reported by either component, or possibly both in combination: either the pattern-based manager 113 or the policy-based manager 114 may determine that a managed system is in a troubled state and raise an alarm to that effect. The system includes a connection between the traffic manager for data collection 111 and the neural network manager 113, so that the traffic manager can pass newly reported states to the neural network for analysis. The system also includes a connection between the state management complex 111 - 114 and the various consumers of the information determined by the state managers; other management tools 115 for automated response or disposition, repositories 121 - 122 that store this information persistently, or workstations 131 - 133 that present the information to human operators using a conventional management console or other user interface."

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	Vinberg at 7:66: "In the learning phase, the system goes through two steps. First, as in FIG. 4, the data gathering management system 111 collects data from the agents 101-108 during a typical workload of the managed system, and stores it in the persistent store 111 a." Vinberg at 8:1: "When sufficient data has been collected, the pattern recognition manager 112 enters step two of the learning phase, illustrated in FIG. 5, when it analyzes this data with pattern recognition techniques to find "common modes" of the system operation. A common mode is a region in the n-dimensional space in which the state vectors appear that represents a cluster of commonly occurring state vectors. The pattern recognition manager stores the model it generated, representing the common modes, in its persistent store 112 a." Vinberg at 9:27: "The automatic State labeling component 112c derives the State label indirectly, by comparing the monitored metrics from the agents 101-108 with manually set thresholds or correlation rules, by Similarly analyzing metrics or event provided by other management Systems, or by reviewing information in help desk Systems or other information Sources. Thus, the automatic State labeling component 112c may be tailored to a specific environment, provided with rules of arbitrary Structure and complexity. Such rule-based Systems are well known in the industry, and constructing or incorporating Such a System is a task well understood by experienced practitioners skilled in the art. The details of how the automatic State labeling is done are not relevant to the present invention. With either manual or automatic State labeling, the pattern recognition System 112 uses the State labels to label the identified common modes, using simple averaging or worst case association, or optionally Some more complex analysis." Vinberg at 10:4: "During monitoring of a system the invention may come across an unprecedented state, one that did not occur during the learning phase, but one that is nonetheless a "normal," non-problematic state. For example, the learning phase may have been based on data from the first month of the quarter, and the end-of-the-quarter processing appears strange to the monitoring manager 113 since it does not match any of the modes in the model. The warning message that the invention issues is therefore a

Claim	Exemplary Citation from Vinberg
	false alarm, and the human manager who responds to the message may indicate this, essentially telling the invention that this a common mode, labeled "good." Of course, it is always possible to run through the learning phase again with the more complete set of data, including the end-of-the-quarter situations, but this may not always be attractive. In particular, in configurations where the monitoring manager 113 is separate from the pattern recognition manager 112 , it would be preferable if the new modes that would be derived from the new states could be incrementally added to the model in the store 113 a , as in FIG. 9 . Depending on the pattern recognition technology used in 112 , the invention may support such incremental learning directly into the model store 112 a or 113 a . After a long period with a lot of such incremental learning, it may be preferable to consolidate the model by rerunning the learning phase on the complete set of data. The foregoing inventive system and apparatus has been described generally and with reference to preferred and other embodiments. Those skilled in the art, upon reading of the specification, will understand that there are equivalent alterations, modifications and embodiments including systems that monitor the state of systems that may not be labeled "networked computer systems" but which substantively are networked computer systems. The present invention includes systems to monitor the state all networked computer systems, and various hardware or software components thereof, however labeled, and includes all such equivalent alterations, modifications and embodiments."

Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 3 and corresponding text:  FIG. 3 The diagram illustrates a network architecture with four main layers. At the top, three WORKSTATIONS (131, 132, 133) are connected to a central REPOSITORY (140). The repository consists of two database cylinders (121, 122). Below the repository is a layer of MANAGERS (111, 112, 113, 114, 115). Each manager has a small local database (111a, 112a, 113a) and is connected to a set of data blocks (111b, 111c, 111d, 111e, 112b, 112c, 113b). At the bottom, eight AGENTS (101-108) are connected to the managers. The agents are represented by computer icons with a monitor and keyboard.

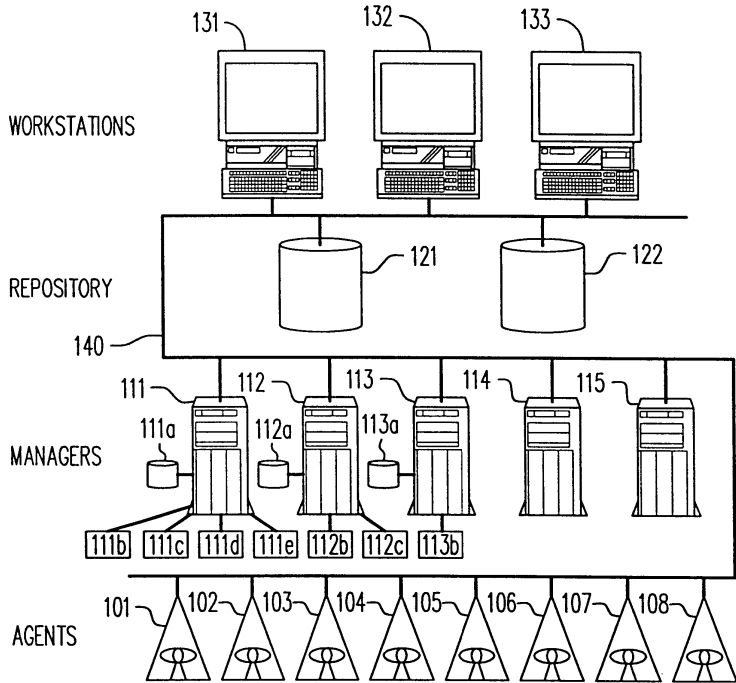
Claim	Exemplary Citation from Vinberg
	Vinberg at Fig. 5 and corresponding text: FIG. 5 Vinberg at 8:33: "In addition, to aid in the interpretation of the alarm, the monitoring manager 113 may also categorize the topology of the Situation in the n-dimensional State Space into one of Several predefined cases use a topological analysis compo nent 113b. The identified cases may include, for example: the State is just on the boundary of a common mode, the State contains a few metrics with unprecedented values, but is within the overall bounds of the historical data; the State contains many metrics with unprecedented values, but is within the overall bounds of the historical data; all metrics individually have familiar values but the combination of values is unprecedented, although Still within the overall bounds of the historical data; the State is far from any common mode, although Still within the bounds of the historical data; the state is outside the bounds of the historical data but near a common mode; or the state is outside the bounds of the historical data and far from any common mode. In addition, the pattern recognition manager 112 may identify redundant, Strongly correlated, or combinations of metrics during an initial Step of the learning phase. It then Stores this information with the model in the persistent Store 112a. It can then use this information to eliminate redundant data, reduce the amount of processing required for the pattern recognition."

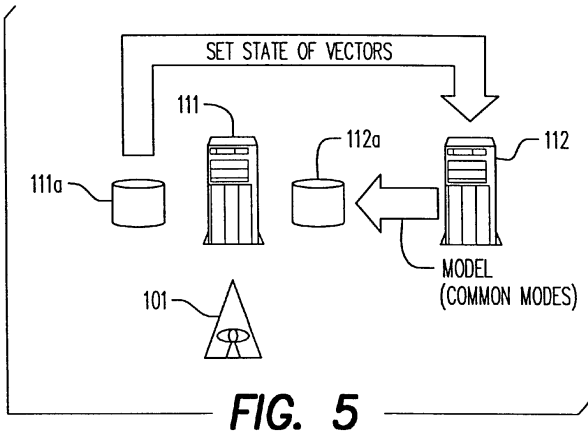
Claim	Exemplary Citation from Vinberg
[10] The method of claim 1, wherein the adaptive reference model is generated to include a cluster layer that tracks relationships between assets and identifies an anomaly in response to an asset being unexpectedly absent from or present in a set of assets in a snapshot.	Vinberg discloses and/or renders obvious that the adaptive reference model is generated to include a cluster layer that tracks relationships between assets and identifies an anomaly in response to an asset being unexpectedly absent from or present in a set of assets in a snapshot. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 2:1: "The present invention is a software-implemented, state monitoring system. Instead of using a fixed set of threshold values and comparison rules, each manually and separately defined by a policy author, it uses artificial intelligence technology to do pattern recognition and then to decide the conditions that raise alarms, in order to monitor and to determine or predict the state of a networked system or any of its components or subsystems. A preferred embodiment of this invention uses neural network techniques, a type of artificial intelligence, to do the pattern recognition. In typical usage, the inventive system is educated by watching the monitored system over a period during which the monitored system is exposed to common load patterns. This is the learning phase of the operation of the inventive system. Conventional agents, probes and managers collect data over a period such as a few weeks, depending on the load patterns on the monitored system. Once enough data has been collected, the inventive system analyses the data using a neural network or other technique capable of performing pattern recognition, to identify "common modes." Common modes are clusters of commonly occurring state vectors within n-dimensional space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 2:38: "Incremental Learning. The inventive system continuously updates its degree of learning during its monitoring phase. A human manager or automated management tool studies the alarm message, and if necessary inspects the managed system in more detail, and then determines what should be done. If it is determined that the alarm message referred to a common situation that should be included

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	among the common modes for future monitoring, the invention can add this data point to the set of data used for tutoring. If certain techniques such as neural networks are used for pattern recognition, the inventive system is able incrementally to learn a new state and add the new state to the set of common modes. Complete retraining of the system, which would require extensive computer time and resources, is not required. Other pattern recognition techniques may require that data point be added to the tutorial database which, as supplemented by the new data, must be re-analyzed to determine a new common mode. As defined above, the invention does not initially know if a state is "good" or "bad". It only knows that a state falls outside the common modes that have previously occurred. Indeed, it does not know if the recognized common modes are "good" or "bad". Vinberg at 2:62: "The invention can be extended to incorporate state labeling, the marking or labeling of a particular state: a human manager can manually label selected state vectors at selected time points as being good or bad. The invention can also do automatic state labeling which consists of correlating state vectors with metrics or events reported by management tools. With automatic state labeling, the invention can select more significant information: it can report that the monitored system or a component of the system, is in a good mode, a bad mode, or an unprecedented state. The inventive system may be further enriched by specifying degrees of goodness or badness of common modes." Vinberg at 6:37: "The manager has a persistent store 111 a for holding the long-term data that is used during the learning phase. This store may be a database management system, or simple files. The pattern recognition processing is done by a manager 112, which retrieves information from the persistent store 111 a, and performs the pattern recognition as described below. The pattern recognition manager 112 also has a persistent store 112 a for holding the model (common modes) that is generated by the invention during the learning phase. Again, this store may be a database management system, or simple files. The monitoring of the managed system, comparing it with the model generated in the learning phase, is done by a manager 113. It uses information retrieved from the managed systems by agents 101-108 by the data gathering manager 111, compares it with the model stored by the pattern recognition system 112 in the persistent store 112 a, and issues messages using standard messaging services provided by the infrastructure 140."

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	Vinberg at 7:14: "Other components of the management system may include a classical, policy-based state determination system 114 . This technology, which is well known, is not directly relevant to the present invention. However, it should be noted that policy-based state management and state management based on pattern recognition may coexist in one management system, where the status of any managed system may be reported by either component, or possibly both in combination: either the pattern-based manager 113 or the policy-based manager 114 may determine that a managed system is in a troubled state and raise an alarm to that effect. The system includes a connection between the traffic manager for data collection 111 and the neural network manager 113, so that the traffic manager can pass newly reported states to the neural network for analysis. The system also includes a connection between the state management complex 111 - 114 and the various consumers of the information determined by the state managers; other management tools 115 for automated response or disposition, repositories 121 - 122 that store this information persistently, or workstations 131 - 133 that present the information to human operators using a conventional management console or other user interface." Vinberg at 7:66: "In the learning phase, the system goes through two steps. First, as in FIG. 4, the data gathering management system 111 collects data from the agents 101-108 during a typical workload of the managed system, and stores it in the persistent store 111 a." Vinberg at 8:1: "When sufficient data has been collected, the pattern recognition manager 112 enters step two of the learning phase, illustrated in FIG. 5, when it analyzes this data with pattern recognition techniques to find "common modes" of the system operation. A common mode is a region in the n-dimensional space in which the state vectors appear that represents a cluster of commonly occurring state vectors. The pattern recognition manager stores the model it generated, representing the common modes, in its persistent store 112 a." Vinberg at 9:27: "The automatic State labeling component 112c derives the State label indirectly, by comparing the monitored metrics from the agents 101-108 with manually set thresholds or correlation rules, by

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	Similarly analyzing metrics or event provided by other management Systems, or by reviewing information in help desk Systems or other information Sources. Thus, the automatic State labeling component 112c may be tailored to a specific environment, provided with rules of arbitrary Structure and complexity. Such rule-based Systems are well known in the industry, and constructing or incorporating Such a System is a task well understood by experienced practitioners skilled in the art. The details of how the automatic State labeling is done are not relevant to the present invention. With either manual or automatic State labeling, the pattern recognition System 112 uses the State labels to label the identified common modes, using simple averaging or worst case association, or optionally Some more complex analysis." Vinberg at 10:4: "During monitoring of a system the invention may come across an unprecedented state, one that did not occur during the learning phase, but one that is nonetheless a "normal," non-problematic state. For example, the learning phase may have been based on data from the first month of the quarter, and the end-of-the-quarter processing appears strange to the monitoring manager 113 since it does not match any of the modes in the model. The warning message that the invention issues is therefore a false alarm, and the human manager who responds to the message may indicate this, essentially telling the invention that this a common mode, labeled "good." Of course, it is always possible to run through the learning phase again with the more complete set of data, including the end-of-the-quarter situations, but this may not always be attractive. In particular, in configurations where the monitoring manager 113 is separate from the pattern recognition manager 112 , it would be preferable if the new modes that would be derived from the new states could be incrementally added to the model in the store 113 a , as in FIG. 9 . Depending on the pattern recognition technology used in 112 , the invention may support such incremental learning directly into the model store 112 a or 113 a . After a long period with a lot of such incremental learning, it may be preferable to consolidate the model by rerunning the learning phase on the complete set of data. The foregoing inventive system and apparatus has been described generally and with reference to preferred and other embodiments. Those skilled in the art, upon reading of the specification, will understand that there are equivalent alterations, modifications and embodiments including systems that monitor the state of systems that may not be labeled "networked computer systems" but which substantively are networked computer systems. The present invention includes systems to monitor the state all networked computer

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	systems, and various hardware or software components thereof, however labeled, and includes all such equivalent alterations, modifications and embodiments." Vinberg at Fig. 3 and corresponding text:  The diagram illustrates a network architecture with four main layers. At the top, three workstations (131, 132, 133) are connected to a central repository (121, 122). Below the repository is a layer of managers (111, 112, 113, 114, 115). Each manager has associated components: 111a, 112a, 113a, 114, and 115. Below the managers are eight agents (101, 102, 103, 104, 105, 106, 107, 108). The agents are connected to the managers via a series of intermediate components labeled 111b, 111c, 111d, 111e, 112b, 112c, 113b, and 113c. The entire system is labeled 140. FIG. 3

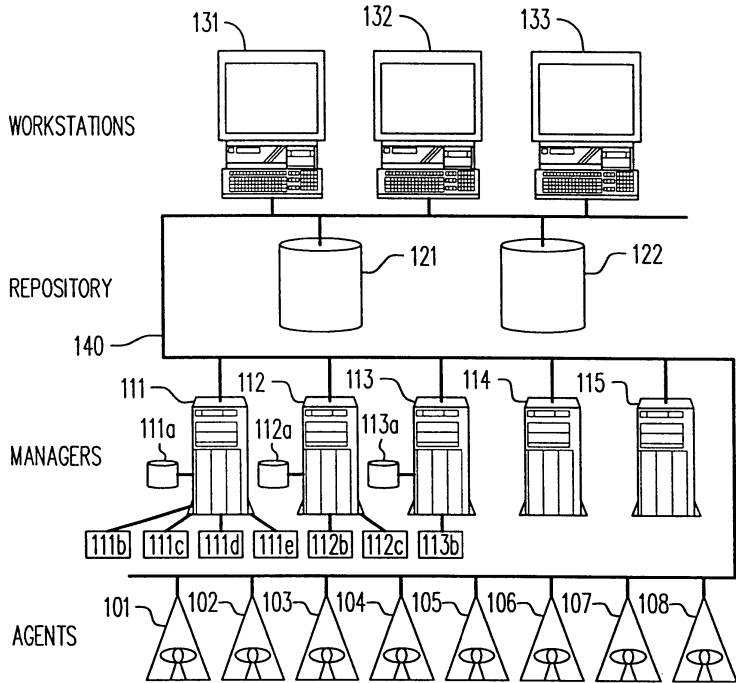
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	Vinberg at Fig. 5 and corresponding text:  FIG. 5 Vinberg at 8:33: "In addition, to aid in the interpretation of the alarm, the monitoring manager 113 may also categorize the topology of the Situation in the n-dimensional State Space into one of Several predefined cases use a topological analysis compo nent 113b. The identified cases may include, for example: the State is just on the boundary of a common mode, the State contains a few metrics with unprecedented values, but is within the overall bounds of the historical data; the State contains many metrics with unprecedented values, but is within the overall bounds of the historical data; all metrics individually have familiar values but the combination of values is unprecedented, although Still within the overall bounds of the historical data; the State is far from any common mode, although Still within the bounds of the historical data; the state is outside the bounds of the historical data but near a common mode; or the state is outside the bounds of the historical data and far from any common mode. In addition, the pattern recognition manager 112 may identify redundant, Strongly correlated, or combinations of metrics during an initial Step of the learning phase. It then Stores this information with the model in the persistent Store 112a. It can then use this information to eliminate redundant data, reduce the amount of processing required for the pattern recognition."

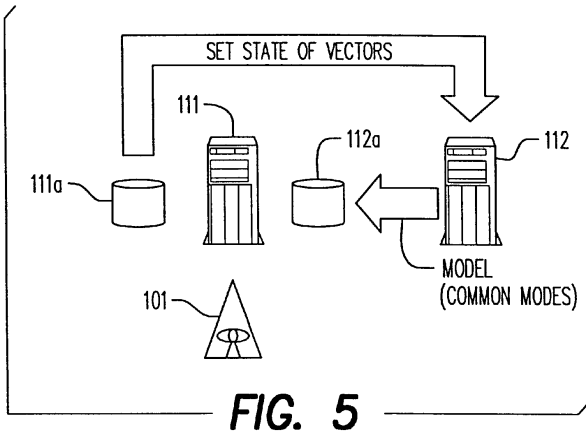
Claim	Exemplary Citation from Vinberg
[11] The method of claim 1, wherein the adaptive reference model is generated to include a profile layer that identifies anomalies in response to violation of relationships of clusters of assets in a snapshot.	Vinberg discloses and/or renders obvious that the adaptive reference model is generated to include a profile layer that identifies anomalies in response to violation of relationships of clusters of assets in a snapshot. Vinberg at Abstract: "Pattern recognition of common modes by neural networks and other techniques are used to monitor and determine or predict the state of networks, computers, software systems, logical networks or other components of an information system, to report actual or predicted states, and to report other state characteristics." Vinberg at 2:1: "The present invention is a software-implemented, state monitoring system. Instead of using a fixed set of threshold values and comparison rules, each manually and separately defined by a policy author, it uses artificial intelligence technology to do pattern recognition and then to decide the conditions that raise alarms, in order to monitor and to determine or predict the state of a networked system or any of its components or subsystems. A preferred embodiment of this invention uses neural network techniques, a type of artificial intelligence, to do the pattern recognition. In typical usage, the inventive system is educated by watching the monitored system over a period during which the monitored system is exposed to common load patterns. This is the learning phase of the operation of the inventive system. Conventional agents, probes and managers collect data over a period such as a few weeks, depending on the load patterns on the monitored system. Once enough data has been collected, the inventive system analyses the data using a neural network or other technique capable of performing pattern recognition, to identify "common modes." Common modes are clusters of commonly occurring state vectors within n-dimensional space defined by n metrics collected. Pattern recognition techniques and pattern recognition by neural networks are well known technologies in the art." Vinberg at 2:38: "Incremental Learning. The inventive system continuously updates its degree of learning during its monitoring phase. A human manager or automated management tool studies the alarm message, and if necessary inspects the managed system in more detail, and then determines what should be done. If it is determined that the alarm message referred to a common situation that should be included

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	among the common modes for future monitoring, the invention can add this data point to the set of data used for tutoring. If certain techniques such as neural networks are used for pattern recognition, the inventive system is able incrementally to learn a new state and add the new state to the set of common modes. Complete retraining of the system, which would require extensive computer time and resources, is not required. Other pattern recognition techniques may require that data point be added to the tutorial database which, as supplemented by the new data, must be re-analyzed to determine a new common mode. As defined above, the invention does not initially know if a state is "good" or "bad". It only knows that a state falls outside the common modes that have previously occurred. Indeed, it does not know if the recognized common modes are "good" or "bad". Vinberg at 2:62: "The invention can be extended to incorporate state labeling, the marking or labeling of a particular state: a human manager can manually label selected state vectors at selected time points as being good or bad. The invention can also do automatic state labeling which consists of correlating state vectors with metrics or events reported by management tools. With automatic state labeling, the invention can select more significant information: it can report that the monitored system or a component of the system, is in a good mode, a bad mode, or an unprecedented state. The inventive system may be further enriched by specifying degrees of goodness or badness of common modes." Vinberg at 6:37: "The manager has a persistent store 111 a for holding the long-term data that is used during the learning phase. This store may be a database management system, or simple files. The pattern recognition processing is done by a manager 112, which retrieves information from the persistent store 111 a, and performs the pattern recognition as described below. The pattern recognition manager 112 also has a persistent store 112 a for holding the model (common modes) that is generated by the invention during the learning phase. Again, this store may be a database management system, or simple files. The monitoring of the managed system, comparing it with the model generated in the learning phase, is done by a manager 113. It uses information retrieved from the managed systems by agents 101-108 by the data gathering manager 111, compares it with the model stored by the pattern recognition system 112 in the persistent store 112 a, and issues messages using standard messaging services provided by the infrastructure 140."

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Claim	Exemplary Citation from Vinberg
[12PRE] A computer readable medium storing instructions, that when executed by a computer, cause the computer to perform functions of:	<i>See</i> [1PRE].
[12A] receiving snapshots from a plurality of computers within a population of computers, wherein individual snapshots include data indicating a state of a respective computer;	<i>See</i> [1A].
[12B] automatically generating an adaptive reference model comprising a rule set customized to characteristics of the population of computers, the rule set being developed by identifying patterns among the snapshots from the plurality of computers such that the adaptive reference model is indicative of normal states in the computers within the population; and	<i>See</i> [1B].
[12C] comparing a snapshot from at least one of the computers to the adaptive	<i>See</i> [1C].

Claim	Exemplary Citation from Vinberg
reference model to determine whether an anomaly is present in the state of the at least one of the computers.	
[13] The computer readable medium of claim 12, further comprising instructions, that when executed, cause the computer to compare the anomaly to a recognition filter to diagnose a trouble condition on the at least one of the computers, and, in the event of a trouble condition, to generate an automated response to the trouble condition.	<i>See</i> Claim 2.
[14PRE] The computer readable medium of claim 13, wherein the automated response is a generic response not specific to a particular asset of the at least one computer, and wherein the computer readable medium further comprises instructions, that when executed, cause the computer to:	<i>See</i> [3PRE].
[14A] send the generic response and a set of	<i>See</i> [3A].

Claim	Exemplary Citation from Vinberg
anomalies found in the snapshot to the at least one computer, the set of anomalies indicating assets of the at least one computer whose states are anomalous; and	
[14B] apply the generic response to the anomalous assets to correct the trouble condition.	<i>See</i> [3B].
[15] The computer readable medium of claim 14, wherein the generic responses include at least one of: installing a missing software component, removing an undesirable software component, and restoring an incorrect registry setting.	<i>See</i> Claim 4.
[16] The computer readable medium of claim 13, wherein the recognition filter comprises a particular pattern of anomalies that indicates the presence of a particular root cause condition or a generic class of conditions.	<i>See</i> Claim 5.
[17] The computer readable medium of claim 12,	<i>See</i> Claim 9.

Claim	Exemplary Citation from Vinberg
wherein the instructions for comparing the snapshot to the adaptive reference model include instructions for determining whether an asset value contained in a snapshot is anomalous.	
[18] The computer readable medium of claim 12, wherein the instructions for comparing the snapshot to the adaptive reference model include instructions for tracking relationships between assets and identifying an anomaly in response to an asset being unexpectedly absent from or present in a set of assets in a snapshot.	<i>See</i> Claim 10.
[19] The computer readable medium of claim 12, wherein the instructions for comparing the snapshot to the adaptive reference model include instructions for identifying anomalies in response to violation of relationships of clusters of assets in a snapshot.	<i>See</i> Claim 11.
[20PRE] The computer readable medium of claim	<i>See</i> [6PRE].

Claim	Exemplary Citation from Vinberg
12, wherein the computer readable medium further comprises instructions, that when executed, cause the computer to:	
[20A] compare a plurality of anomalies associated with a particular snapshot with a recognition filter to diagnose a trouble condition; and	<i>See</i> [6A].
[20B] diagnose a trouble condition on the at least one of the computers in response to at least a subset of the plurality of anomalies matching information in the recognition filter.	<i>See</i> [6B].
[21] The computer readable medium of claim 12, wherein individual snapshots include data associated with at least one of: system files, application files, a registry entry, a performance counter, a process, a communication port, a hardware configuration, a log file, a running task, services, and network connections.	<i>See</i> Claim 7.

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[22] The computer readable medium of claim 12, wherein the computer readable medium further comprises instructions, that when executed, cause the computer to: insert rules into the rule set of the adaptive reference model to augment or override rules of the rule set automatically generated from the snapshots.	<i>See Claim 8.</i>