

MEASURING RESPONSE TRENDS IN A DIGITAL TELEVISION NETWORK

PRIORITY CLAIM AND RELATED PATENT APPLICATION

[0001] This document claims the benefit of priority from United States Patent Application Serial Number 13/952,471, entitled “Measuring Response Trends in a Digital Television Network,” filed July 26, 2013. The entire disclosure of the above-referenced application is incorporated by reference as part of the specification of this PCT application.

[0002] This document relates to digital content networks, including monitoring a content network based on message trends.

BACKGROUND

[0003] With the advent of connectivity technologies such as the World Wide Web, multimedia content is ubiquitously present and accessible from practically any location where a user can be. To meet the increasing user demands, content service providers have deployed networks that have steadily increased in size and complexity. Being able to provide content that a user wants at the time and location the user wants it, and be able to bill the user correctly can provide competitive advantage to content service providers.

[0004] Better techniques for monitoring operation of a content network for any irregularities are desirable.

SUMMARY

[0005] Techniques and systems for providing a trend server outside a content provider network to communicate with the content provider network to build a trend record based on responses received from the content provider network for monitoring certain activity trend or tendency in the content provider network and provide an alert when the content provider network behaves abnormally.

[0005a] According to a first aspect of the present invention, there is provided a computer-implemented method to monitor status of a content provider network, comprising: sending, from a trending server, a first request message to the content provider network, wherein the first request message has an associated type value; receiving, at the trending server, a first response message from the content provider network; determining, by the trending server, whether or not the first response message is normal by comparing with a trend record for the type value associated with the first request message; selectively updating

the trend record based on the first response message; and generating an alert when it is determined that the first response message is abnormal.

[0005b] According to a second aspect of the present invention, there is provided an apparatus for monitoring operation of a content provider's network, comprising: a status request transmission module that transmits a plurality of status requests to the content provider's network, each status request having an associated request type; a status response reception module that receives status responses from the content provider's network; a response sorting module that assigns, for every received status response, a corresponding request type based on a status request for which the status response was received; a trending record-keeping module that maintains trend records based on a predetermined number of prior status responses received for each request type; a trending estimation module that estimates a trend for each request type, based on the status response and a user setting for that request type; a trend checker module that checks, for each received status response, whether or not the received status response is within the trend for the corresponding request type; and a trend alert module that issues an alert when the received status response is not within the trend for the corresponding request type.

[0005c] According to a third aspect of the present invention, there is provided a computer program product comprising a computer-readable storage medium having code stored thereupon, the code, when executed by a processor, causing the processor to implement a method of monitoring operation of a content provider's network, the method comprising: receiving a first message from the content provider's network; determining whether the first message is normal by comparing with a trend of previously received messages having a same message type as the first message; selectively updating, based on the first message, the trend for the message type of the first message; and generating an alert when the first message is determined to be not normal.

[0005d] According to a fourth aspect of the present invention, there is provided a system for monitoring operation of a web service provider, the system comprising: one or more web servers under management of the web service provider, the one or more web servers located inside the web service provider's network; a plurality of monitoring servers positioned external to the web service provider's network and geographically separated from each other;

wherein each monitoring server is configured to: transmit sync messages to the one or more web servers; maintain a record of expected responses to the sync messages; receive a status response messages from the one or more web servers; issue an alert when the status response message is not an expected response.

[0006] In one ~~disclosed aspect~~embodiment, a method of monitoring status of a content provider network is provided. The method may be implemented by a trending server and includes sending a first request message to the content provider network, where the first request message has an associated type value, receiving a first response message from the content provider network, determining whether or not the first response message is normal by comparing with a trend record for the type value associated with the first request message, selectively updating the trend record based on the first response message and generating an alert when it is determined that the first response message is abnormal.

[0007] In another ~~aspect~~embodiment, an apparatus for monitoring operation of a content provider's network is disclosed. The apparatus includes a status response reception module that receives status responses from the content provider's network, a response sorting module that assigns, for every received status response, a corresponding request type based on a status request for which the status response was received, a trending record-keeping module that maintains trend records based on a predetermined number of prior status responses received for each request type, a trending estimation module that estimates a trend for each request type based on the status response and a user setting for that request type, a trend checker module that checks, for each received status response, whether or not the received status response is within the trend for the corresponding request type, and a trend alert module that issues an alert when the received status response is not within the trend for the corresponding request type.

[0008] In yet another ~~aspect~~embodiment, a computer program product comprising a computer-readable storage medium having code stored thereupon is disclosed. The code, when executed by a processor, causes the processor to implement a method of monitoring operation of a content provider's network. The method includes receiving a first message from the content provider's network, determining whether the first message is normal by comparing with a trend of previously received messages having a same message type as the

first message, selectively updating, based on the first message, the trend for the message type of the first message, and generating an alert when the first message is determined to be not normal.

[0009] In a further ~~aspect~~embodiment, a system for monitoring operation of a web service provider is disclosed. The system includes one or more web servers under management of the web service provider, the one or more web servers located inside the web service provider's network and a plurality of monitoring servers positioned external to the web service provider's network and geographically separated from each other. Each monitoring server is configured to transmit sync messages to the one or more web servers, maintain a record of expected responses to the sync messages, receive a status response messages from the one or more web servers, and issue an alert, when the status response message is not an expected response.