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(54) **ADAPTIVE BITRATE MANAGEMENT FOR STREAMING MEDIA OVER PACKET NETWORKS**

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H04N 21/6437	(2011.01)
H04N 21/658	(2011.01)

(52) **U.S. Cl.**

CPC ***H04L 47/2416*** (2013.01); ***H04L 47/10*** (2013.01); ***H04L 47/25*** (2013.01); ***H04L 47/263*** (2013.01); ***H04L 47/283*** (2013.01); ***H04L 47/32*** (2013.01); ***H04N 19/115*** (2014.11); ***H04N 19/152*** (2014.11); ***H04N 19/97*** (2014.11); ***H04N 21/23406*** (2013.01); ***H04N 21/2343*** (2013.01); ***H04N 21/234381*** (2013.01); ***H04N 21/2402*** (2013.01); ***H04N 21/2662*** (2013.01); ***H04N 21/44004*** (2013.01); ***H04N 21/6377*** (2013.01); ***H04N 21/6437*** (2013.01); ***H04N 21/658*** (2013.01); ***H04N 21/6582*** (2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

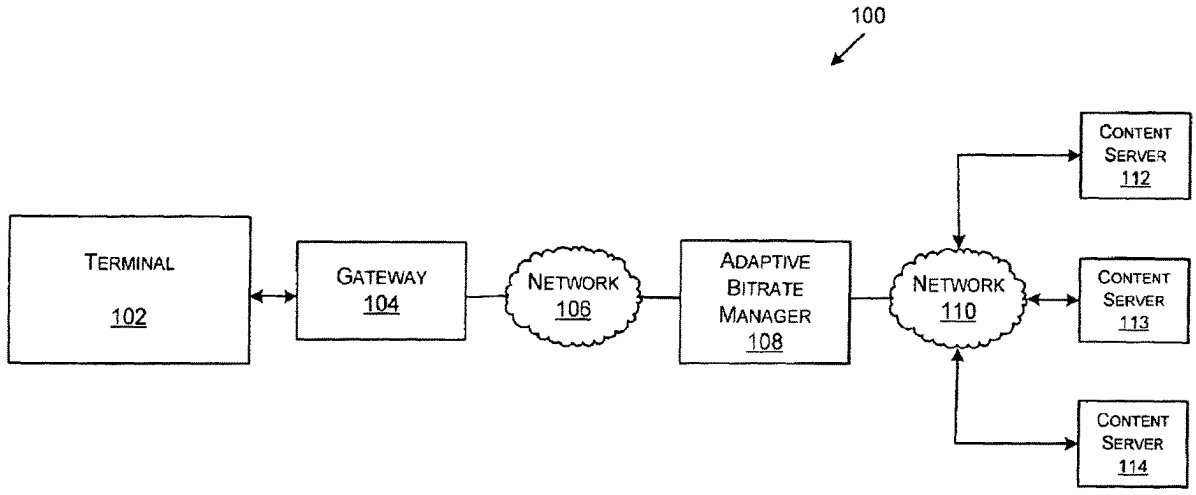
(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/019,523, please refer to the USPTO's Patent Electronic System.

Primary Examiner — Michael Roswell

(57) **ABSTRACT**

A method including receiving a receiver report from a terminal; estimating one or more network conditions of a media network based at least in part on the receiver report; determining an optimal session bitrate based on the estimated one or more network conditions; and providing media data to the terminal based on the optimal session bitrate.



EX PARTE REEXAMINATION CERTIFICATE

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **6** is confirmed.

Claims **1**, **9-11**, **14** and **15** are cancelled.

New claims **17-19** are added and determined to be patentable.

Claims **2-5**, **7**, **8**, **12**, **13**, and **16** were not reexamined.

17. A method comprising:

receiving a receiver report from a terminal;

estimating one or more network conditions of a media network using the receiver report;

determining an optimal session bitrate using the estimated one or more network conditions, wherein determining the optimal session bitrate further comprises:

determining stability criterion using the estimated one or more network conditions, wherein determining stability criterion includes at least one of:

(i) comparing a media time in transit and a round trip time estimate: and

(ii) comparing a bitrate received with a current bitrate session; determining the stability of the media network; and

providing to an encoder the optimal session bitrate based at least in part on the media-network-stability determination;

encoding media data according to the optimal session bitrate; and

providing media data to the terminal according to the optimal session bitrate.

18. A system comprising:

a terminal, having a media player, configured to provide a receiver report; and

an adaptive bitrate manager configured to:

receive the receiver report.

estimate one or more network conditions using the receiver report,

determine stability criterion using the estimated one or more network conditions, wherein determine stability criterion includes at least one of:

(i) comparing a media time in transit and a round trip estimate, and

(ii) comparing a bitrate received with a current bitrate session,

determine the stability of the media network.

determine an optimal session bitrate based at least in part on the media-network-stability determination.

encode media data according to the optimal session bitrate, and

provide media data to the terminal according to the optimal session bitrate.

19. A non-transitory computer readable storage medium storing instruction that, when executed by a computer, cause the computer to perform a method for processing a receiver report, the method comprising:

receiving the receiver report from a terminal;

estimating one or more network conditions of a media network using the receiver report;

determining stability criterion, wherein determining stability criterion comprises at least one of:

(i) comparing a media time in transit and a round trip time estimate; and

(ii) comparing a bitrate received with a current bitrate session;

determining the stability of the media network using the determined stability criterion;

controlling a session bitrate based at least in part on the media-network-stability determination;

encoding media data according to the session bitrate; and

providing the session bitrate to an encoder for transmitting media data according to the provided session bitrate.

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