CLAIMS

[Claim 1]

An information processing system comprising:

an information processing apparatus and an information distribution apparatus,

wherein the information processing apparatus includes

receiving means for successively receiving a plurality of packets that configure distribution data from the information distribution apparatus,

reproducing means for reproducing the packets successively received by the receiving means,

calculating means for calculating a reproduction available remaining time, which is a remaining time available for reproduction with packets not reproduced yet by the reproducing means among the packets stored in the storing means,

difference time calculating means for calculating a difference time based on the difference between the reproduction available remaining time and the predetermined required time,

evaluation value calculating means for calculating an evaluation value, based on the difference time and a proportional coefficient, an amount of change of the difference time and a differential coefficient in a predetermined time range, and a cumulative value of the difference time and an integration constant in a predetermined time range, and

requesting means for requesting the information distribution apparatus to change a bit rate of the packets that configure the distribution data, based on the evaluation value calculated by the evaluation value calculating means, and

wherein the information distribution apparatus includes

updating means for updating the bit rate of the packets that configure the distribution data, in response to the request by the requesting means.

[Claim 2]

The information processing system according to claim 1,

wherein the information processing apparatus further includes

first judging means for judging whether or not congestion occurs in communication with the information distribution apparatus, based on a change in time interval from transmission to reception of each of the packets successively received by the receiving means, and

second judging means for judging whether or not a packet loss rate, which is a rate of a loss packet corresponding to a loss included in the packets transmitted from the information distribution apparatus and calculated based on the packets successively received by the receiving means, is increased as compared with a value obtained by multiplying a packet loss rate before the packets that configure the distribution data are received, by a predetermined weight, and

the requesting means requests the information distribution apparatus to change a bit rate of the packets based on a judgment result by the first judging means, a judgment result by the second judging means, and the evaluation value.

[Claim 3]

The information processing system according to claim 2,

wherein the information processing apparatus further includes

jitter calculating means for calculating a difference between a time interval from transmission to reception of a packet and a time interval from transmission to reception of a packet transmitted before the former packet, as a jitter, for each of the packets successively received by the receiving means, and

wherein the first judging means judges that the congestion occurs in the communication with the information distribution apparatus if an increase of a jitter of a packet newly received by the receiving means with respect to a jitter of a packet received in the past by the receiving means satisfies a predetermined condition.

[Claim 4]

The information processing system according to any one of claims 1 to 3, wherein the requesting means requests the information distribution apparatus to change the bit rate of the packets that configure the distribution data to a lower bit rate than a current bit rate if the first judging means judges that the congestion occurs in the communication, and if the second judging means judges that the packet loss rate, which is the rate of the loss packet corresponding to the loss included in the packets transmitted from the information distribution apparatus, is increased as compared with the value obtained by multiplying the packet loss rate before the packets that configure the distribution data are received, by the predetermined weight.

[Claim 5]

An information processing apparatus comprising:

receiving means for successively receiving a plurality of packets that configure distribution data from an information distribution apparatus;

reproducing means for reproducing the packets successively received by the receiving means,

calculating means for calculating a reproduction available remaining time, which is a remaining time available for reproduction with packets not reproduced yet by the reproducing means among the packets stored in the storing means, difference time calculating means for calculating a difference time based on the difference between the reproduction available remaining time and the predetermined required time, evaluation value calculating means for calculating an evaluation value, based on the difference time and a proportional coefficient, an amount of change of the difference time and a differential coefficient in a predetermined time range, and a cumulative value of the difference time and an integration constant in a predetermined time range; and

requesting means for requesting the information distribution apparatus to change a bit rate of the packets that configure the distribution data, based on the evaluation value calculated by the evaluation value calculating means.

[Claim 6]

A program for causing a computer to function as:

receiving means for successively receiving a plurality of packets that configure distribution data from an information distribution apparatus;

reproducing means for reproducing the packets successively received by the receiving means,

calculating means for calculating a reproduction available remaining time, which is a remaining time available for reproduction with packets not reproduced yet by the reproducing means among the packets stored in the storing means,

difference time calculating means for calculating a difference time based on the difference between the reproduction available remaining time and the predetermined required time,

evaluation value calculating means for calculating an evaluation value, based on the difference time and a proportional coefficient, an amount of change of the difference time and a differential coefficient in a predetermined time range, and a cumulative value of the difference time and an integration constant in a predetermined time range; and

requesting means for requesting the information distribution apparatus to change a bit rate of the packets that configure the distribution data, based on the evaluation value calculated by the evaluation value calculating means.