CLAIMS

What is claimed is:

1. A fragmented packet traffic rate limiting method, comprising:

performing pre-coloring processing on a target fragmented packet based on a preset packet fragment coloring table such that the target fragmented packet is provided with a color mark, wherein the color mark comprises: a discarded color and a reserved color;

performing traffic evaluation on the pre-colored target fragmented packet based on a color-aware token bucket algorithm to perform secondary coloring processing on the target fragmented packet, and updating the packet fragment coloring table based on the color mark of the target fragmented packet subjected to secondary coloring; and

when a current color mark of the target fragmented packet is the discarded color, performing rate limiting processing on the target fragmented packet, or when a current color mark of the target fragmented packet is the reserved color, performing forwarding processing on the target fragmented packet,

wherein before the performing pre-coloring processing on a target fragmented packet based on a preset packet fragment coloring table, the method further comprises:

creating a packet fragment coloring table used to store a correspondence between an identifier of an original data packet to which a fragmented packet belongs and a color identifier, wherein

the identifier of the original data packet comprises a source IP, a destination IP, a protocol type, and a unique identification.

2. The fragmented packet traffic rate limiting method according to claim 1, wherein the performing pre-coloring processing on a target fragmented packet based on a preset packet fragment coloring table such that the target fragmented packet is provided with a color mark further comprises:

obtaining an identifier of an original data packet to which a currently received target fragmented packet belongs; and

searching the packet fragment coloring table to determine whether the identifier of the original data packet to which the target fragmented packet belongs is comprised, and when the identifier of the original data packet to which the target fragmented packet belongs is comprised, performing pre-coloring processing on the target fragmented packet based on a color mark

corresponding to the identifier of the original data packet.

3. The fragmented packet traffic rate limiting method according to claim 2, further comprising:

when the identifier of the original data packet to which the target fragmented packet belongs is not found in the packet fragment coloring table, using the reserved color as a default color to pre-color the target fragmented packet, and storing, in the packet fragment coloring table, a correspondence between the identifier of the original data packet to which the target fragmented packet belongs and a color mark that is the reserved color.

4. The fragmented packet traffic rate limiting method according to claim 1, wherein the performing traffic evaluation on the pre-colored target fragmented packet based on a color-aware token bucket algorithm to perform secondary coloring processing on the target fragmented packet, and updating the packet fragment coloring table based on the color mark of the target fragmented packet subjected to secondary coloring comprises:

identifying the current color mark of the target fragmented packet based on the color-aware token bucket algorithm, and when it is identified that the color mark of the target fragmented packet is the discarded color, determining that a color mark for the secondary coloring of the target fragmented packet remains unchanged;

when the color mark of the target fragmented packet is the reserved color, determining whether a quantity of tokens in a corresponding token bucket meets a packet length of the target fragmented packet, and when the quantity of tokens in the corresponding token bucket meets the packet length of the target fragmented packet, determining that the color mark for the secondary coloring of the target fragmented packet remains unchanged, and reducing, in the token bucket, the quantity of tokens that meet the packet length of the target fragmented packet; or

when it is determined that the quantity of tokens in the token bucket does not meet the packet length of the target fragmented packet, changing the color mark for the secondary coloring of the target fragmented packet to the discarded color, and updating, in the packet fragment coloring table, a color mark of the original data packet to which the target fragmented packet belongs.

5. The fragmented packet traffic rate limiting method according to any one of claims 1 to 4, wherein before the performing forwarding processing on the target fragmented packet, the method further comprises:

determining whether the target fragmented packet subjected to traffic evaluation is a last fragmented packet of the original data packet to which the target fragmented packet belongs; and

when the target fragmented packet subjected to traffic evaluation is the last fragmented packet of the original data packet to which the target fragmented packet belongs, deleting a record of the original data packet to which the target fragmented packet belongs from the packet fragment coloring table.

6. A DPU fragmented packet forwarding method, comprising:

locally receiving a to-be-forwarded target fragmented packet at a DPU; and

processing the received target fragmented packet according to the fragmented packet traffic rate limiting method according to any one of claims 1 to 5, and performing forwarding processing on the target fragmented packet when the current color mark of the target fragmented packet is the reserved color.

7. The DPU fragmented packet forwarding method according to claim 6, wherein the packet fragment coloring table is configured to store a correspondence between keyword information of an original data packet to which the fragmented packet belongs and a color identifier, wherein

keyword information of the fragmented packet comprises a unique identification and a local flow label, and the local flow label is preset based on the identifier of the original data packet.

8. A fragmented packet traffic rate limiting apparatus, comprising:

a pre-coloring module, configured to perform pre-coloring processing on a target fragmented packet based on a preset packet fragment coloring table such that the target fragmented packet is provided with a color mark, wherein the color mark comprises: a discarded color and a reserved color;

a traffic evaluation module, configured to perform traffic evaluation on the pre-colored target fragmented packet based on a color-aware token bucket algorithm to perform secondary coloring processing on the target fragmented packet, and update the packet fragment coloring table based on the color mark of the target fragmented packet subjected to secondary coloring; and

a fragment rate limiting module, configured to: when a current color mark of the target fragmented packet is the discarded color, perform rate limiting processing on the target fragmented packet, or when a current color mark of the target fragmented packet is the reserved color, perform

forwarding processing on the target fragmented packet.

9. An electronic device, comprising a memory, a processor, and a computer program that is stored in the memory and runnable on the processor, wherein the processor is configured to implement, when executing the computer program, the fragmented packet traffic rate limiting method according to any one of claims 1 to 5, or the DPU fragmented packet forwarding method according to claim 6.

10. A computer-readable storage medium having stored thereon a computer program, the computer program causes, when executed by a processor, the processor to implement the fragmented packet traffic rate limiting method according to any one of claims 1 to 5, or the DPU fragmented packet forwarding method according to claim 6.