CLAIMS

1. A service chain fault detection method, wherein the method comprises:

obtaining, by a service forwarding entity (SFE), a first fault tracing detection request packet, and then determining to communicate with a first service function (SF) node, wherein the first fault tracing detection request packet comprises a path identifier (ID) and an address of a device for initiating fault detection, and the path ID is used to identify a path of a service chain;

obtaining, by the SFE, an ID of the first SF node; and

sending, by the SFE, a first fault tracing detection response packet to the device for initiating fault detection, wherein the first fault tracing detection response packet comprises the path ID, the ID of the first SF node, and the address of the device for initiating fault detection.

2. The method according to claim 1, wherein the determining, by an SFE, to communicate with a first SF node on the service chain comprises:

determining, by the SFE according to the path ID, to forward the first fault tracing detection request packet according to a first forwarding entry, wherein the first forwarding entry comprises the path ID and an address of the first SF node;

sending, by the SFE, the first fault tracing detection request packet to the first SF node according to the address of the first SF node; and

receiving, by the SFE, a second fault tracing detection request packet from the first SF node, wherein the second fault tracing detection request packet comprises the path ID and the address of the device for initiating fault detection.

3. The method according to claim 2, wherein the first fault tracing detection request packet further comprises a first parameter, the first parameter is used to identify the first SF node or is used to identify a previous-hop SF node of the first SF node on the service chain, and the first forwarding entry further comprises the first parameter; and

the determining, by the SFE according to the path ID, to forward the first fault tracing detection request packet according to a first forwarding entry comprises: determining, by the SFE according to the first parameter and the path ID, to forward the first fault tracing detection request packet according to the first forwarding entry.

4. The method according to claim 3, wherein the first fault tracing detection

request packet further comprises a time to live (TTL) field;

after the receiving, by the SFE, a second fault tracing detection request packet from the first SF node, the method further comprises: obtaining, by the SFE, a TTL parameter, wherein the TTL parameter is data obtained after a value of the TTL field in the first fault tracing detection request packet is updated; and

the sending, by the SFE, a first fault tracing detection response packet to the device for initiating fault detection further comprises: when the TTL parameter is equal to a preset value, sending, by the SFE, the first fault tracing detection response packet to the device for initiating fault detection.

5. The method according to claim 4, wherein the method further comprises:

when the TTL parameter is not equal to the preset value, obtaining, by the SFE, a third fault tracing detection request packet, wherein the third fault tracing detection request packet comprises a second parameter, the path ID, a TTL field, and the address of the device for initiating fault detection, and the second parameter is used to identify a next-hop SF node of an SF node, on the service chain, identified by using the first parameter;

determining, by the SFE according to the second parameter and the path ID, to forward the third fault tracing detection request packet according to a second forwarding entry, wherein the second forwarding entry comprises the path ID, the second parameter, and an address of a first device, the first device is a next-hop SFE of the SFE on the service chain or a second SF node, and the second SF node is a next-hop SF node of the first SF node on the service chain; and

sending, by the SFE, the third fault tracing detection request packet to the first device according to the address of the first device.

6. The method according to claim 3, wherein before the sending, by the SFE, a first fault tracing detection response packet to the device for initiating fault detection, the method further comprises:

sending, by the SFE, a second fault tracing detection response packet to the device for initiating fault detection, wherein the second fault tracing detection response packet comprises the path ID, an ID of the SFE, and the address of the device for initiating fault detection.

7. The method according to claim 3, wherein after the sending, by the SFE, a first fault tracing detection response packet to the device for initiating fault detection, the method further comprises:

obtaining, by the SFE, a fourth fault tracing detection request packet, wherein the fourth fault tracing detection request packet comprises a second parameter, the path ID, and the address of the device for initiating fault detection, and the second parameter is used to identify a next-hop SF node of an SF node, on the service chain, identified by using the first parameter;

determining, by the SFE according to the second parameter and the path ID, to forward the fourth fault tracing detection request packet according to a second forwarding entry, wherein the second forwarding entry comprises the path ID, the second parameter, and an address of a first device, the first device is a next-hop SFE of the SFE on the service chain or a second SF node, and the second SF node is a next-hop SF node of the first SF node on the service chain; and

sending, by the SFE, the fourth fault tracing detection request packet to the first device according to the address of the first device.

8. The method according to claim 7, wherein the first device is the second SF node, and the method further comprises:

receiving, by the SFE, a fifth fault tracing detection request packet from the second SF node, wherein the fifth fault tracing detection request packet comprises the path ID and the address of the device for initiating fault detection;

obtaining, by the SFE, an ID of the second SF node according to the fifth fault tracing detection request packet; and

sending, by the SFE, a third fault tracing detection response packet to the device for initiating fault detection, wherein the third fault tracing detection response packet comprises the path ID, the ID of the second SF node, and the address of the device for initiating fault detection.

9. The method according to claim 2, wherein the first fault tracing detection request packet further comprises a node list, and the node list comprises an ID of the previous-hop SF node of the first SF node on the service chain; and

before the sending, by the SFE, a first fault tracing detection response packet to the device for initiating fault detection, the method further comprises:

obtaining, by the SFE, an updated node list, wherein the updated node list is a list generated after the ID of the first SF node is added to the node list, and an order of all SF nodes comprised in the updated node list is the same as an order of all the SF nodes on the service chain; and

adding, by the SFE, the updated node list to the first fault tracing detection

response packet.

10. A service forwarding apparatus, wherein the service forwarding apparatus comprising:

a memory storing instructions; and

a processor coupled to the memory to execute the instructions to:

obtain a first fault tracing detection request packet, and then determine to communicate with a first service function (SF) node, wherein the first fault tracing detection request packet comprises a path identifier (ID) and an address of a device for initiating fault detection, and the path ID is used to identify a path of a service chain;

obtain an ID of the first SF node; and

send a first fault tracing detection response packet to the device for initiating fault detection, wherein the first fault tracing detection response packet comprises the path ID, the ID of the first SF node, and the address of the device for initiating fault detection.

11. The service forwarding apparatus according to claim 10, wherein the processor is instructed to:

determine, according to the path ID, to forward the first fault tracing detection request packet according to a first forwarding entry, wherein the first forwarding entry comprises the path ID and an address of the first SF node;

send the first fault tracing detection request packet to the first SF node according to the address of the first SF node; and

receive a second fault tracing detection request packet from the first SF node, wherein the second fault tracing detection request packet comprises the path ID and the address of the device for initiating fault detection.

12. The service forwarding apparatus according to claim 11, wherein the first fault tracing detection request packet further comprises a first parameter, the first parameter is used to identify the first SF node or is used to identify a previous-hop SF node of the first SF node on the service chain, and the first forwarding entry further comprises the first parameter; and

wherein the processor is further instructed to determine, according to the first parameter and the path ID, to forward the first fault tracing detection request packet according to the first forwarding entry.

13. The service forwarding apparatus according to claim 12, wherein the first

fault tracing detection request packet further comprises a time to live (TTL) field;

wherein the processor is further instructed to:

obtain a TTL parameter, wherein the TTL parameter is data obtained after a value of the TTL field in the first fault tracing detection request packet is updated; and

when the TTL parameter is equal to a preset value, send the first fault tracing detection response packet to the device for initiating fault detection.

14. The service forwarding apparatus according to claim 13, wherein the processor is further instructed to:

when the TTL parameter is not equal to the preset value, obtain a third fault tracing detection request packet, wherein the third fault tracing detection request packet comprises a second parameter, the path ID, a TTL field, and the address of the device for initiating fault detection, the second parameter is used to identify a next-hop SF node of an SF node, on the service chain, identified by using the first parameter, and a value of the TTL field in the third fault tracing detection request packet is the TTL parameter;

determine, according to the second parameter and the path ID, to forward the third fault tracing detection request packet according to a second forwarding entry, wherein the second forwarding entry comprises the path ID, the second parameter, and an address of a first device, the first device is a next-hop service forwarding entity (SFE) of the service forwarding apparatus on the service chain or a second SF node, and the second SF node is a next-hop SF node of the first SF node on the service chain; and

send the third fault tracing detection request packet to the first device according to the address of the first device.

15. The service forwarding apparatus according to claim 12, wherein the processor is further instructed to send a second fault tracing detection response packet to the device for initiating fault detection, wherein the second fault tracing detection response packet comprises the path ID, an ID of the service forwarding apparatus, and the address of the device for initiating fault detection.

16. The service forwarding apparatus according to claim 12, wherein the processor is further instructed to::

obtain a fourth fault tracing detection request packet, wherein the fourth fault tracing detection request packet comprises a second parameter, the path ID, and the address of the device for initiating fault detection, and the second parameter is used to

identify a next-hop SF node of an SF node, on the service chain, identified by using the first parameter;

determine, according to the second parameter and the path ID, to forward the fourth fault tracing detection request packet according to a second forwarding entry, wherein the second forwarding entry comprises the path ID, the second parameter, and an address of a first device, the first device is a next-hop service forwarding entity (SFE) of the service forwarding apparatus on the service chain or a second SF node, and the second SF node is a next-hop SF node of the first SF node on the service chain; and

send the fourth fault tracing detection request packet to the first device according to the address of the first device.

17. The service forwarding apparatus according to claim 16, wherein the first device is the second SF node, and the processor is further instructed to::

receive a fifth fault tracing detection request packet from the second SF node, wherein the fifth fault tracing detection request packet comprises the path ID and the address of the device for initiating fault detection; and

obtain an ID of the second SF node according to the fifth fault tracing detection request packet; and

send a third fault tracing detection response packet to the device for initiating fault detection, wherein the third fault tracing detection response packet comprises the path ID, the ID of the second SF node, and the address of the device for initiating fault detection.

18. The service forwarding apparatus according to claim 11, wherein the first fault tracing detection request packet further comprises a node list, and the node list comprises an ID of the previous-hop SF node of the first SF node on the service chain;

wherein the processor is further instructed to:

obtain an updated node list, wherein the updated node list is a list generated after the ID of the first SF node is added to the node list, and an order of all SF nodes comprised in the updated node list is the same as an order of all the SF nodes on the service chain; and

add the updated node list to the first fault tracing detection response packet.

19. A service function (SF) apparatus, wherein the SF apparatus comprising:

a memory storing instructions; and

a processor coupled to the memory to execute the instructions to:

receive a first fault tracing detection request packet from a service forwarding entity (SFE), wherein the first fault tracing detection request packet comprises a path identifier ID and an address of a device for initiating fault detection, and the path ID is used to identify a path of a service chain; and

send a second fault tracing detection request packet to the SFE, wherein the second fault tracing detection request packet comprises the path ID and the address of the device for initiating fault detection.

20. The SF apparatus according to claim 19, wherein the first fault tracing detection request packet and the second fault tracing detection request packet each further comprises a time to live TTL field;

wherein the processor is further instructed to:

obtain a TTL parameter, wherein the TTL parameter is data obtained after a value of the TTL field comprised in the first fault tracing detection request packet is updated; and

use the TTL parameter as a value of the TTL field comprised in the second fault tracing detection request packet.

21. The SF apparatus according to claim 19, wherein the first fault tracing detection request packet further comprises a node list, and the node list comprises an ID of the previous-hop SF node of the SF apparatus on the service chain;

wherein the processor is further instructed to:

obtain an updated node list, wherein the updated node list is a list generated after the ID of the SF apparatus is added to the node list, and an order of all SF nodes in the updated node list is the same as an order of all the SF nodes on the service chain; and

add the updated node list to the second fault tracing detection request packet.