

CLAIMS

What is claimed is:

1. A clock synchronization mode indication method, comprising:

obtaining, by a session management function network element, first indication information,

5 wherein the first indication information indicates a clock synchronization mode used in a communication system in which a terminal device and a user plane function network element are located, wherein the clock synchronization mode comprises a peer-to-peer transparent clock type, an end-to-end transparent clock type, or a boundary clock type; and

10 sending, by the session management function network element, the first indication information to the terminal device.

2. The method according to claim 1, further comprising:

obtaining, by the session management function network element, an identifier of a clock domain, wherein the identifier of the clock domain and the first indication information indicate a clock synchronization mode used in the clock domain by the communication system in which the terminal device and the user plane function network element are located; and

15 sending, by the session management function network element, the identifier of the clock domain to the terminal device.

3. The method according to claim 2, further comprising:

20 sending, by the session management function network element, the identifier of the clock domain to the user plane function network element.

4. The method according to any one of claims 1 to 3, further comprising:

sending, by the session management function network element, the first indication information to the user plane function network element.

5. The method according to any one of claims 1 to 4, further comprising:

25 determining, by the session management function network element, fourth indication information based on second indication information and third indication information, wherein the second indication information indicates a clock synchronization mode supported by the terminal device, the third indication information indicates a clock synchronization mode supported by the user plane function network element, and the fourth indication information indicates a clock synchronization mode supported by a session between the terminal device and the user plane

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function network element; and

sending, by the session management function network element, the fourth indication information to an application function network element.

6. The method according to any one of claims 1 to 4, further comprising:

5 determining, by the session management function network element, fifth indication information based on second indication information and third indication information, wherein the second indication information indicates a clock synchronization mode supported by the terminal device, the third indication information indicates a clock synchronization mode supported by the user plane function network element, and the fifth indication information indicates a clock
10 synchronization mode supported by the communication system in which the terminal device and the user plane function network element are located; and

sending, by the session management function network element, the fifth indication information to an application function network element.

7. The method according to claim 5 or 6, further comprising:

15 receiving, by the session management function network element, the second indication information from the terminal device.

8. The method according to claim 5 or 6, further comprising:

receiving, by the session management function network element, the third indication information from the user plane function network element.

20 9. The method according to any one of claims 1 to 8, wherein the sending, by the session management function network element, the first indication information to the terminal device comprises:

sending, by the session management function network element, the first indication information to the terminal device in a protocol data unit PDU session establishment procedure.

25 10. The method according to any one of claims 1 to 8, wherein the sending, by the session management function network element, the first indication information to the terminal device comprises:

sending, by the session management function network element, the first indication information to the terminal device in a PDU session modification procedure.

30 11. A clock synchronization mode indication method, comprising:

obtaining, by a first communication device, first indication information, wherein the first

indication information indicates a clock synchronization mode used in a communication system in which the first communication device and a second communication device are located, wherein the clock synchronization mode comprises a peer-to-peer transparent clock type, an end-to-end transparent clock type, or a boundary clock type, and the first communication device is a terminal device, and the second communication device is a user plane function network element; or the first communication device is a user plane function network element, and the second communication device is a terminal device; and

processing, by the first communication device, a precision time protocol PTP packet based on the first indication information.

12. The method according to claim 11, wherein the obtaining, by a first communication device, first indication information comprises:

receiving, by the first communication device, the first indication information from a session management function network element.

13. The method according to claim 11 or 12, further comprising:

obtaining, by the first communication device, an identifier of a clock domain, wherein the identifier of the clock domain and the first indication information indicate a clock synchronization mode used in the clock domain by the communication system in which the first communication device and the second communication device are located.

14. The method according to claim 13, wherein the obtaining, by the first communication device, an identifier of a clock domain comprises:

receiving, by the first communication device, the identifier of the clock domain from the session management function network element.

15. The method according to claim 13 or 14, wherein the processing, by the first communication device, a precision time protocol PTP packet based on the first indication information comprises:

processing, by the first communication device, the PTP packet based on the identifier of the clock domain and the first indication information.

16. The method according to any one of claims 11 to 15, wherein the first communication device is the terminal device, and the method further comprises:

sending, by the first communication device, second indication information to the session management function network element in a protocol data unit PDU session establishment

procedure, wherein the second indication information indicates a clock synchronization mode supported by the first communication device.

17. The method according to any one of claims 11 to 15, wherein the first communication device is the terminal device, and the method further comprises:

5 sending, by the first communication device, second indication information to an access and mobility management function network element in a registration procedure, wherein the second indication information indicates a clock synchronization mode supported by the first communication device.

10 18. The method according to any one of claims 11 to 15, wherein the first communication device is the user plane function network element, and the method further comprises:

 sending, by the first communication device, third indication information to the session management function network element in an N4 association setup procedure, an N4 session establishment procedure, or an N4 session modification procedure, wherein the third indication information indicates a clock synchronization mode supported by the first communication device.

15 19. The method according to any one of claims 11 to 18, wherein the first indication information indicates that the clock synchronization mode is an end-to-end transparent clock type, wherein the processing, by the first communication device, a precision time protocol PTP packet based on the first indication information comprises:

20 receiving, by the first communication device, a first synchronization packet from an upstream node that is in the communication system, and sending a second synchronization packet corresponding to the first synchronization packet to the second communication device, wherein a suffix field of the second synchronization packet comprises precise time of the first communication device receiving the first synchronization packet; or,

25 receiving, by the first communication device, a synchronization packet from an upstream node that is in the communication system, and sending a follow up packet corresponding to the synchronization packet to the second communication device, wherein a suffix field of the follow up packet comprises precise time of the first communication device receiving the synchronization packet.

30 20. The method according to any one of claims 11 to 18, wherein if the first indication information indicates that the clock synchronization mode is a peer-to-peer transparent clock type, the processing, by the first communication device, a precision time protocol PTP packet based on

the first indication information comprises:

receiving, by the first communication device, the PTP packet from an upstream node that is in the communication system, updating a correction field or a suffix field of the PTP packet based on a PTP link delay between the first communication device and the upstream node, and sending
5 an updated PTP packet to the second communication device, wherein the PTP packet comprises a synchronization packet or a follow up packet corresponding to the synchronization packet, and the suffix field is for updating the correction field.

21. A communication apparatus, comprising at least one processor configured to carry out the method of any one of claims 1 to 10.

10 22. A communication apparatus, comprising at least one processor configured to carry out the method of any one of claims 11 to 20.

23. A computer readable storage medium, wherein the computer readable storage medium stores a computer program, and when the computer program is run on a computer, the computer is enabled to perform the method according to any one of claims 1 to 20.

15 24. A clock synchronization mode indication method, comprising:

receiving, by a session management function network element, indication information indicating a clock synchronization mode supported by a user plane function network element from the user plane function network element, wherein the clock synchronization mode comprises a peer-to-peer transparent clock type, an end-to-end transparent clock type, or a boundary clock type;

20 determining, by the session management function network element, a clock synchronization mode used in a communication system in which the user plane function network element and a terminal device are located based on the indication information;

obtaining, by the user plane function network element, the clock synchronization mode; and

25 processing, by the user plane function network element, a precision time protocol PTP packet based on the clock synchronization mode.

25. The method according to claim 24, wherein the receiving, by a session management function network element, indication information indicating a clock synchronization mode supported by a user plane function network element from the user plane function network element comprises:

30 receiving, by a session management function network element, the indication information from the user plane function network element in an N4 association setup procedure, an N4 session

establishment procedure, or an N4 session modification procedure.

26. A communication system, comprising:

a session management function network element configured to receive indication information indicating a clock synchronization mode supported by a user plane function network element from the user plane function network element, wherein the clock synchronization mode comprises a peer-to-peer transparent clock type, an end-to-end transparent clock type, or a boundary clock type;

determine a clock synchronization mode used in a communication system in which the user plane function network element and a terminal device are located based on the indication information;

the user plane function network element configured to obtain the clock synchronization mode; and process a precision time protocol PTP packet based on the clock synchronization mode.

27. The communication system according to claim 26, wherein the session management function network element is configured to receive the indication information from the user plane function network element in an N4 association setup procedure, an N4 session establishment procedure, or an N4 session modification procedure.