WHAT IS CLAIMED IS:

1. A communication method with multiple links, performed by an access point that supports a multi-link communication, and comprising:

determining a first message frame, wherein the first message frame comprises: information indicating that a fast initial link-setup (FILS) is performed with at least one link in the multiple links, wherein the information comprises: a reduced neighbor report element (RNRE) configured to identify relevant information of the multiple links supported by the access point that supports the multi-link communication; and

sending the first message frame.

2. The communication method according to claim 1, wherein the reduced neighbor report element (RNRE) comprises: a multi-link device identifier, configured to identify an address of the access point that supports the multi-link communication.

3. The communication method according to claim 2, wherein the reduced neighbor report element (RNRE) further comprises at least one of: a plurality of link identifiers respectively configured to identify the multiple links supported by the access point that supports the multi-link communication.; or

~~4. The communication method according to claim 2 or 3, wherein the reduced neighbor report element (RNRE) further comprises:~~

a plurality of offset time identifiers,

wherein each of the offset time identifiers is configured to identify a time offset of a target beacon transmission time (TBTT) beacon frame sent by the access point with a corresponding link.

~~5~~4. The communication method according to ~~any one of~~ claims ~~1~~ 1 or 2 ~~to 4~~, wherein the information further comprises: a FILS discovery information field,

wherein the FILS discovery information field may comprise an identification bit configured to indicate that the access point may support the multi-link communication.

~~6~~5. A communication method with multiple links, performed by a station that supports the multiple links, and comprising:

receiving a first message frame, wherein the first message frame comprises: information indicating that a fast initial link-setup (FILS) is performed with at least one link in the multiple links, wherein the information comprises: a reduced neighbor report element (RNRE) configured to identify relevant information of the multiple links supported by an access point

that supports a multi-link communication; and

performing a communication operation based on the first message frame.

~~7~~6. The communication method according to claim ~~6~~5, wherein the reduced neighbor report element (RNRE) comprises at least one of: a multi-link device identifier, configured to identify an address of the access point that supports the multi-link communication~~.~~; or

~~8. The communication method according to claim 7, wherein the reduced neighbor report element (RNRE) further comprises:~~ a plurality of link identifiers respectively configured to identify the multiple links supported by the access point that supports the multi-link communication~~.~~

~~9. The communication method according to claim 7 or 8, wherein the reduced neighbor report element (RNRE) further comprises:~~; or

~~-~~a plurality of offset time identifiers,

wherein each of the offset time identifiers is configured to identify a time offset of a target beacon transmission time (TBTT) beacon frame sent by the access point with a corresponding link.

~~10~~7. The communication method according to ~~any one of~~ claims ~~6 to 9~~5 or 6, wherein the information further comprises: a FILS discovery information field,

wherein the FILS discovery information field may comprise an identification bit configured to indicate the access point that supports the multi-link communication.

~~11~~8. A communication apparatus with multiple links, applied to an access point that supports a multi-link communication, and comprising:

a processing module configured to determine a first message frame, wherein the first message frame comprises: information indicating that a fast initial link-setup (FILS) is performed with at least one link in the multiple links, wherein the information comprises: a reduced neighbor report element (RNRE) configured to identify relevant information of the multiple links supported by the access point that supports the multi-link communication; and

a transceiving module configured to send the first message frame.

~~12~~9. A communication apparatus with multiple links, applied to a station that supports the multiple links, and comprising:

a transceiving module configured to receive a first message frame, wherein the first message frame comprises: information indicating that a fast initial link-setup (FILS) is performed with at least one link in the multiple links, wherein the information comprises: a reduced neighbor report element (RNRE) configured to identify relevant information of the

multiple links supported by an access point that supports a multi-link communication; and

a processing module configured to perform a communication operation based on the first message frame.

~~13~~10. An electronic device, comprising a memory, a processor, and a computer program stored in the memory and runnable on the processor, wherein the processor implements the method according to any one of claims 1 to ~~5~~ 4 or according to any one of claims ~~6~~ 5 to ~~10~~ 7 when executing the computer program.

~~14. A computer readable storage medium having stored therein a computer program that, when executed by a processor, causes the method according to any one of claims 1 to 5 or according to any one of claims 6 to 10 to be implemented.~~