WHAT IS CLAIMED IS:

1. A system comprising:

a processing unit configured to perform acts comprising:

receiving a message from a requesting device;

analyzing the message to determine that the requesting device requests to join a network to which the system belongs;

inserting an address of a controlling device as a destination address in the message, the controlling device being responsible for controlling addition of a new device to the network;

relaying the request to the controlling device;

receiving a response from the controlling device; and

relaying the response to the requesting device.

2. The system as recited in claim 1, further comprising recording an identity of the requesting device, wherein relaying the response comprises relaying the response from the controlling device to the requesting device based on the recorded identity of the requesting device.

3. The system as recited in claim 1, wherein relaying the response comprises broadcasting the response in a neighborhood of the system within a predetermined frequency range, the neighborhood comprising a location of the requesting device.

4. The system as recited in claim 1, wherein relaying the response comprises relaying the response to the requesting device using a same channel through which the message is received from the requesting device.

5. The system as recited in claim 1, wherein the response comprises a group key associated with the network that is encrypted using a symmetry key of the requesting device, a global address assigned to the requesting device and/or configuration information for the requesting device to set up to join the network.

6. The system as recited in claim 1, wherein the message and the response follow a Dynamic Host Configuration Protocol for Internet Protocol version 6 (DHCPv6) or a Dynamic Host Configuration Protocol for Internet Protocol version 4 (DHCPv4).

7. A method implemented by a processing unit, the method comprising:

receiving a message from a requesting device;

analyzing the message to determine that the requesting device requests to join a network to which the system belongs;

inserting an address of a controlling device as a destination address in the message, the controlling device being responsible for controlling addition of a new device to the network;

relaying the request to the controlling device;

receiving a response from the controlling device; and

relaying the response to the requesting device.

8. The method as recited in claim 7, further comprising recording an identity of the requesting device, wherein relaying the response comprises relaying the response from the controlling device to the requesting device based on the recorded identity of the requesting device.

9. The method as recited in claim 7, wherein relaying the response comprises broadcasting the response in a neighborhood of the system within a predetermined frequency range, the neighborhood comprising a location of the requesting device.

10. The method as recited in claim 7, wherein relaying the response comprises relaying the response to the requesting device using a same channel through which the message is received from the requesting device.

11. The method as recited in claim 7, wherein the response comprises a group key associated with the network that is encrypted using a symmetry key of the requesting device, a global address assigned to the requesting device and/or configuration information for the requesting device to set up to join the network.

12. The method as recited in claim 7, wherein the message and the response follow a Dynamic Host Configuration Protocol for Internet Protocol version 6 (DHCPv6) or a Dynamic Host Configuration Protocol for Internet Protocol version 4 (DHCPv4).

13. One or more memory storage devices storing executable instructions that, when executed by one or more processing units, cause the one or more processing units to perform acts comprising:

receiving a message from a requesting device;

analyzing the message to determine that the requesting device requests to join a network to which the system belongs;

inserting an address of a controlling device as a destination address in the message, the controlling device being responsible for controlling addition of a new device to the network;

relaying the request to the controlling device;

receiving a response from the controlling device; and

relaying the response to the requesting device.

14. The one or more memory storage devices as recited in claim 13, the acts further comprising recording an identity of the requesting device, wherein relaying the response comprises relaying the response from the controlling device to the requesting device based on the recorded identity of the requesting device.

15. The one or more memory storage devices as recited in claim 13, wherein relaying the response comprises broadcasting the response in a neighborhood of the system within a predetermined frequency range, the neighborhood comprising a location of the requesting device.

16. The one or more memory storage devices as recited in claim 13, wherein relaying the response comprises relaying the response to the requesting device using a same channel through which the message is received from the requesting device.

17. The one or more memory storage devices as recited in claim 13, wherein the response comprises a group key associated with the network that is encrypted using a symmetry key of the requesting device, a global address assigned to the requesting device and/or configuration information for the requesting device to set up to join the network.

18. The one or more memory storage devices as recited in claim 13, wherein the message and the response follow a Dynamic Host Configuration Protocol for Internet Protocol version 6 (DHCPv6) or a Dynamic Host Configuration Protocol for Internet Protocol version 4 (DHCPv4).

WHAT IS CLAIMED IS:

1. A method comprising:

under control of a requesting device:

discovering, by the requesting device, a neighboring device in a neighborhood of the requesting device, the neighboring device belonging to an autonomous routing network;

sending, by the requesting device, a request to the neighboring device to join the autonomous routing network using a protocol, the protocol enabling the requesting device to perform a single handshake with the autonomous routing network to achieve an authentication of the requesting device, a receipt of a group key associated with the autonomous routing network and configuration information for the requesting device to set up with the autonomous routing network; and

receiving feedback from the autonomous routing network via the neighboring device.

2. The method as recited in claim 1, wherein the group key is encrypted using a symmetry key of the requesting device that is supposed to be known only to the requesting device and an authentication server associated with one or more autonomous routing networks to which the requesting device is supposed to join, and wherein the protocol further enables the requesting device to authenticate the autonomous routing network.

3. The method as recited in claim 1, wherein the protocol comprises a Dynamic Host Configuration Protocol for Internet Protocol version 6 (DHCPv6) or or a Dynamic Host Configuration Protocol for Internet Protocol version 4 (DHCPv4).

4. The method as recited in claim 1, further comprising prior to the discovering, detecting a signal of the neighboring device broadcasted within a predetermined frequency range.

5. The method as recited in claim 1, wherein the feedback comprises a group key associated with the autonomous routing network and configuration information for the requesting device to set up with the autonomous routing network.

6. The method as recited in claim 5, wherein the feedback further comprises a global address assigned to the requesting device, a prefix of the global address being common across devices in the autonomous routing network.

7. The method as recited in claim 1, further comprising:

prior to the sending, encrypting the request using an encryption key of the requesting device; and

upon the receiving, decrypting the feedback using a decryption key of the requesting device.

8. The method as recited in claim 1, wherein the autonomous routing network comprises a network of utility metering devices.

9. The method as recited in claim 1, wherein the requesting device comprises a device that is newly deployed in a neighborhood of the neighboring device, a device that is migrated from another autonomous routing network or a device that has previously joined and left the autonomous routing network.

10. One or more computer-readable media storing instructions that, when executed by one or more processors, perform the method of any one of the preceding claims.

11. A system comprising:

a processing unit configured to perform acts comprising:

receiving a message from a requesting device;

analyzing the message to determine that the requesting device requests to join a network to which the system belongs;

inserting an address of a controlling device as a destination address in the message, the controlling device being responsible for controlling addition of a new device to the network;

relaying the request to the controlling device;

receiving a response from the controlling device; and

relaying the response to the requesting device.

12. The system as recited in claim 11, further comprising recording an identity of the requesting device, wherein relaying the response comprises relaying the response from the controlling device to the requesting device based on the recorded identity of the requesting device.

13. The system as recited in claim 11, wherein relaying the response comprises:

broadcasting the response in a neighborhood of the system within a predetermined frequency range, the neighborhood comprising a location of the requesting device; and/or

relaying the response to the requesting device using a same channel through which the message is received from the requesting device.

14. The system as recited in claim 11, wherein the response comprises a group key associated with the network that is encrypted using a symmetry key of the

requesting device, a global address assigned to the requesting device and/or configuration information for the requesting device to set up to join the network.

15. The system as recited in claim 11, wherein the message and the response follow a Dynamic Host Configuration Protocol for Internet Protocol version 6 (DHCPv6) or a Dynamic Host Configuration Protocol for Internet Protocol version 4 (DHCPv4).