WHAT IS CLAIMED IS:

1. A method comprising:

under control of a one-hop neighbor node of a root node of a network:

receiving priority information from the root node, the priority information including:

a list of communication time slots corresponding to a communication channel; and

indication of one or more of the communication time slots during which the one-hop neighbor of the root node has communication priority relative to one or more other one-hop neighbors of the root node;

setting at least one of a contention window or an inter-frame spacing of the one-hop neighbor of the root node based on the priority information received from the root node;

waiting a predetermined period of time before transmitting information to the root node, wherein waiting the predetermined period of time comprises waiting the at least one of the contention window or the inter-frame spacing;

listening on the communication channel for transmissions by other nodes during the predetermined period of time; and

transmitting the information during an indicated time slot in response to expiration of the predetermined period of time without overhearing transmissions by other nodes during the predetermined period of time,

wherein the one-hop neighbor of the root node is configured to allow the one or more other one-hop neighbors of the root node to communicate with the root node via the communication channel during the indicated time slot when the one-hop neighbor of the root node does not have information to transmit to the root node.

2. The method of claim 1, further comprising setting a contention window and/or an inter-frame spacing of the one-hop neighbor of the root node to be shorter than those of the one or more other one-hop neighbors of the root node during the indicated communication time slot.

3. The method of claim 1, wherein the communication time slots on the list of

communication time slots are of a same duration.

4. The method of claim 1, wherein the communication time slots on the list of communication time slots include a first communication time slot having a first duration and a second communication time slot having a second duration, and wherein the second duration is different than the first duration.

5. The method of claim 1, wherein each one-hop neighbor of the root node has an equal number of time slots during which the respective one-hop neighbor has priority relative to other one-hop neighbors of the root node.

6. The method of claim 1, wherein the one-hop neighbor of the root node has a greater number of time slots, during which it has priority relative to other one-hop neighbors of the root node, than the other one-hop neighbors of the root node.

7. A network computing device of a communication network comprising:

one or more processors;

memory communicatively coupled to the one or more processors, the memory storing:

contention window settings and/or inter-frame spacing settings;

a list of communication time slots;

priority information, including an indication of one or more of the communication time slots during which the network computing device has communication priority relative to other one-hop neighbors of a root node: and

a media access control (MAC) module executable by the one or more processors to control transmission of communications between the network computing device and one or more other nodes of the communication network, the MAC module comprising a protocol defining how communications are to be transmitted from the network computing device to the root node of the communication network, wherein the MAC module is configured to adjust the contention window settings and/or the inter-frame spacing settings of the

network computing device to be shorter than those of the other one-hop neighbors of the root node during the communication time slot(s) when the network computing device has communication priority.

8. The network computing device of claim 7, wherein the MAC module is further configured to:

determine that the network computing device does not have further information to transmit to the root node; and

allow one of the other one-hop neighbors of the root node to communicate with the root node during the time slot(s) when the network computing device has communication priority.

9. The network computing device of claim 7, further comprising:

a multi-channel radio capable of sending and receiving communications on multiple different channels; and

a frequency hopping module configured to switch between the multiple different channels in accordance with a predefined frequency hopping pattern of the multi-channel communication network.

10. The network computing device of claim 7, further comprising a metrology module stored in the memory and executable by the one or more processors to collect resource consumption data, the resource consumption data comprising electricity consumption data, water consumption data, and/or natural gas consumption data.

11. One or more computer-readable media storing instructions that, when executed by one or more processors of a root node of a communication network, configure the root node to perform acts comprising:

transmitting priority information from the root node to one or more one-hop neighbors of the root node, the priority information including:

a list of communication time slots;

indication of one or more of the communication time slots during which a one-hop neighbor of the root node has priority to communicate with the root node via a communication channel relative to one or more other one-hop neighbors of the root node; and

an instruction to set at least one of a contention window or an inter-frame spacing of the one-hop neighbor of the root node to be shorter than those of the one or more other one-hop neighbors of the root node during the indicated one or more communication time slots such that the one-hop neighbor is instructed to wait a predetermined period of time before transmitting information to the root node, wherein the predetermined period of time comprises the at least one of the contention window or the inter-frame spacing.

12. The one or more computer-readable media of claim 11, the acts further comprising:

receiving a transmission from a first one-hop neighbor of the root node via the communication channel during an indicated communication time slot; and

receiving a transmission from a second one-hop neighbor of the root node during the indicated communication time slot when the first one-hop neighbor has no information to transmit to the root node.

13. The one or more computer-readable media of claim 11, wherein the communication time slots on the list of communication time slots are of a same duration.

14. The one or more computer-readable media of claim 11, wherein the communication time slots on the list of communication time slots include a first communication time slot having a first duration and a second communication time slot having a second duration, and wherein the second duration is different than the first duration.

15. The method of claim 1, further comprising maintaining communication priority with respect to the communication channel throughout the indicated time slot regardless of whether

one or more of the other one-hop neighbors of the root node have communicated with the root node via the communication channel during the indicated time slot.

16. The method of claim 1, further comprising transmitting information to the root node via the communication channel during the indicated time slot after one or more of the other one-hop neighbors of the root node have communicated with the root node via the communication channel during the indicated time slot.

17. The method of claim 1, wherein the communication channel comprises a control channel.

18. The one or more computer-readable media of claim 11, wherein the root node transmits priority information to a one-hop neighbor of the root node when the one-hop neighbor becomes associated with the root node.

19. The network computing device of claim 7, wherein the MAC module is further configured to cause the network computing device to wait a predetermined period of time before transmitting a communication to the root node, and wherein the predetermined period of time is based on the priority information.

20. The network computing device of claim 7, wherein:

the protocol comprises an upstream protocol;

the MAC module further comprises a downstream protocol, which is different than the upstream protocol, and which defines how communications are to be transmitted from the network computing device to downstream nodes of the communication network.

WHAT IS CLAIMED IS:

1. A method comprising:

under control of a one-hop neighbor node of a root node of a network configured with computer-executable instructions:

receiving priority information from the root node, the priority information including:

a list of communication time slots; and

indication of one or more of the communication time slots during which the one-hop neighbor of the root node has communication priority relative to other one-hop neighbors of the root node;

determining that the one-hop neighbor of the root node has information to transmit to the root node;

waiting a predetermined period of time before transmitting the information to the root node, the predetermined period of time being based at least in part on the priority information received from the root node;

listening on a control channel of the network for transmissions by other nodes during the predetermined period of time; and

transmitting the information in response to expiration of the predetermined period of time without overhearing transmissions by other nodes during the predetermined period of time.

2. The method of claim 1, further comprising:

setting a contention window and/or an inter-frame spacing of the one-hop neighbor of the root node based at least in part on the priority information received from the root node, and

wherein waiting the predetermined period of time comprises waiting the inter-frame spacing and/or the contention window.

3. The method of claim 1, further comprising setting a contention window and/or an inter-frame spacing of the one-hop neighbor of the root node to be shorter than those of the other one-hop neighbors of the root node during the communication time slot(s) when the one-hop neighbor of the root node has communication priority.

4. The method of claim 3, further comprising:

determining that the one-hop neighbor of the root node does not have further information to transmit to the root node; and

allowing one of the other one-hop neighbors of the root node to communicate with the root node during the time slot(s) when the one-hop neighbor of the root node has communication priority.

5. The method of claim 1, wherein the communication time slots on the list of communication time slots are of a same duration.

6. The method of claim 1, wherein the communication time slots on the list of communication time slots include at least one communication time slot having a first duration and at least one time slot having a second duration, which is different than the first duration.

7. The method of claim 1, wherein each one-hop neighbor of the root node has an equal number of time slots during which the respective one-hop neighbor has priority relative to other one-hop neighbors of the root node.

8. The method of claim 1, wherein the one-hop neighbor of the root node has a greater number of time slots, during which it has priority relative to other one-hop neighbors of the root node, than the other one-hop neighbors of the root node.

9. A network computing device of a communication network comprising:

one or more processors;

memory communicatively coupled to the one or more processors;

a media access control (MAC) module stored in the memory and executable by the one or more processors to control transmission of communications between the network computing device and one or more other nodes of the communication network, the MAC module comprising:

an upstream protocol defining how communications are to be transmitted from the network computing device to an upstream node of the communication network, the upstream protocol including:

a list of communication time slots; and

an indication of one or more of the communication time slots during which the network computing device has communication priority relative to other one-hop neighbors of the upstream node.

10. The network computing device of claim 9, further comprising:

contention window settings and/or inter-frame spacing settings stored in the memory,

wherein the MAC module is further configured to adjust the contention window settings and/or an inter-frame spacing settings of the network computing device to be shorter than those of the other one-hop neighbors of the upstream node during the communication time slot(s) when the network computing device has communication priority.

11. The network computing device of claim 10, wherein the MAC module is further configured to:

determine that the network computing device does not have further information to transmit to the upstream node; and

allow one of the other one-hop neighbors of the upstream node to communicate with the upstream node during the time slot(s) when the network computing device has communication priority.

12. The network computing device of claim 9, wherein the upstream node of the network computing device comprises a root node of the communication network, and the upstream protocol defines how communications are to be transmitted from the network computing device to the root node of the communication network.

13. The network computing device of claim 9, wherein the MAC module further comprises a downstream protocol, which is different than the upstream protocol, and which definines how communications are to be transmitted from the network computing device to downstream nodes of the communication network.

14. The network computing device of claim 9, further comprising:

a multi-channel radio capable of sending and receiving communications on multiple different channels; and

a frequency hopping module configured to switch between the multiple different channels in accordance with a predefined frequency hopping pattern of the multi-channel communication network.

15. The network computing device of claim 9, further comprising a metrology module stored in the memory and executable by the one or more processors to collect resource consumption data, the resource consumption data comprising electricity consumption data, water consumption data, and/or natural gas consumption data.

16. One or more computer-readable media storing instructions that, when executed by one or more processors of a root node of a communication network, configure the root node to perform acts comprising:

transmitting priority information from the root node to one or more one-hop neighbors of the root node, the priority information including:

a list of communication time slots; and

indication of one or more of the communication time slots during which each one-hop neighbor of the root node has communication priority relative to other one-hop neighbors of the root node.

17. The one or more computer-readable media of claim 16, the acts further comprising:

receiving a transmission from a first one-hop neighbor of the root node during a time slot when the first node has communication priority and has information to transmit to the root node; and

receiving a transmission from a second one-hop neighbor of the root node during the time slot when the first node has communication priority but has no information to transmit to the root node.

18. The one or more computer-readable media of claim 16, wherein the priority information further comprises an instruction to set a contention window and/or an inter-frame spacing of the one-hop neighbors of the root node having communication priority during each communication time slot to be shorter than those of the other one-hop neighbors of the root node during the respective communication time slot.

19. The one or more computer-readable media of claim 16, wherein the communication time slots on the list of communication time slots are of a same duration.

20. The one or more computer-readable media of claim 16, wherein the communication time slots on the list of communication time slots include at least one communication time slot having a first duration and at least one time slot having a second duration, which is different than the first duration.