

CLAIMS

1. A method, comprising:

transmitting, according to a schedule, a broadcast transmission to a plurality of devices
at a first event start-time offset from among a plurality of event start-time offsets indicated by
5 the schedule;

transmitting, according to the schedule, a first unicast transmission to a device from
among the plurality of devices at a second time indicated by a second event start-time offset
from among the plurality of event start-time offsets indicated by the schedule; and

transmitting a plurality of unicast transmissions to the plurality of devices, wherein the
10 transmitting is performed according to the schedule, and wherein a distribution of numbers
of devices associated with event start-time offsets dedicated to unicast transmissions is
substantially uniform.

2. The method of claim 1, additionally comprising:

15 assigning devices to event start-time offsets such that a variance of the distribution of
numbers of devices associated with each of the plurality of event start-time offsets is under a
threshold value.

3. The method of claim 1, additionally comprising:

20 assigning devices to event start-time offsets within the schedule such that a difference
between a number of devices assigned to a third event start-time offset and a number of
devices assigned to a fourth event start-time offset is within a threshold value.

4. The method of claim 1, additionally comprising:

25 assigning devices to event start-time offsets within the schedule in a manner that results
in each event start-time offset being associated with “n” number of devices or “n” plus 1
number of devices, wherein “n” is an integer that is zero or greater.

5. The method of claim 1, wherein a number of event start-time offsets defined within the schedule is based at least in part on one or more factors, comprising:

a number of battery-powered devices expected to communicate with a mains-power device;

5 an expected message length used in communications between the battery-powered devices and the mains-powered device;

an expected data rate used by the battery-powered devices and the mains-powered device.

10 6. The method of claim 1, additionally comprising:

transmitting, according to the schedule, a multicast transmission to at least two devices, wherein the multicast transmission is sent at a third time indicated by a third event start-time offset from among the plurality of event start-time offsets.

15 7. The method of claim 1, additionally comprising:

detecting that a first device from among the plurality of devices has left a network including the plurality of devices; and

changing an event start-time offset of a second device from among the plurality of devices that is not leaving the network to an event start-time offset previously used by the

20 first device.

8. The method of claim 1, additionally comprising:

receiving a request from a device to join a network of the plurality of devices; and

assigning the device to an event start-time offset such that a number of devices

25 assigned to each event start-time offset is substantially uniform.

9. The method of claim 1, additionally comprising:
receiving requests from additional devices to join a network;
assigning the additional devices to event start-time offsets within the schedule in a
manner that results in each event start-time offset being associated with “n” number of devices
5 or “n” plus 1 number of devices, wherein “n” is an integer that is zero or greater.

10. The method of claim 1, wherein:
a device transmitting according to the schedule is a mains-powered device (MPD); and
devices of the plurality of devices are battery-powered devices (BPDs).

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11. The method of claim 1, additionally comprising:
transmitting a preamble of a packet of the first unicast transmission at the first event
start-time offset associated with a first battery-powered device; and
transmitting portions of the packet other than the preamble of the packet after the
15 second event start-time offset associated with a second battery-powered device.

12. The method of claim 1, additionally comprising:
sending a second unicast transmission to a second device at a time indicated by a third
event start-time offset;
20 wherein a radio frequency of the second unicast transmission is based at least in part
on a media access control (MAC) address of the third device.

13. The method of claim 1, additionally comprising:
transmitting to a first battery-powered device from among the plurality of devices
25 according to a first event start-time offset of the schedule during a high-power-use period of
the first battery-powered device; and

transmitting to a second battery-powered device from among the plurality of devices according to a second event start-time offset of the schedule during a low-power-use period of the first battery-powered device.

5 14. A method, comprising:

receiving a broadcast transmission at each of two or more devices according to a first event start-time offset indicated by a schedule;

receiving data in a first unicast transmission at a first device from among the two or more devices according to a second event start-time offset indicated by the schedule; and

10 receiving data in a second unicast transmission at a second device from among the two or more devices according to a third event start-time offset indicated by the schedule;

wherein the schedule associates numbers of devices to event start-time offsets dedicated to unicast transmissions in a substantially uniform manner.

15 15. The method of claim 14, wherein:

a battery-powered device from among the two or more devices communicates according to an event start-time offset of the schedule during a high-power-use period of the battery-powered device; and

20 the battery-powered device alternates high-power-use periods and low-power-use periods according event start-time offsets.

16. The method of claim 14, wherein:

at least two battery-powered devices, from among the two or more devices, are associated with a same event start-time offset within the schedule; and

25 at the same event start-time offset, each of the at least two battery-powered devices determine if a message is available.

17. The method of claim 14, additionally comprising:
changing the schedule to move one of the two or more devices from a first event start-time offset to a second event start-time offset;
wherein the changing of the schedule reduces a variance of the distribution of numbers
5 of devices associated with each of a plurality of event start-time offsets.

18. A method, comprising:
receiving a request to add a device to a network;
selecting an event start-time offset for assignment to the device, wherein the selected
10 event start-time offset is selected such that such that a distribution of numbers of devices
associated with each of a plurality of event start-time offsets is substantially uniform;
instructing the device to transmit and/or receive data according to a schedule based at
least in part on the selected event start-time offset, wherein the schedule associates numbers
of devices on the network to event start-time offsets dedicated to unicast transmissions in a
15 substantially uniform manner; and
sending a unicast message to the device at a time indicated by the schedule.

19. The method of claim 18, wherein the device is a first device, the method
additionally comprising:
20 receiving a second request to add a second device to the network; and
selecting the event start-time offset, already assigned to the first device for assignment
to the second device.

20. The method of claim 18, wherein the device is a first device, and the method additionally comprises:

determining that the first device has left the network; and

reassigning the selected event start-time offset to a second device that is part of the
5 network;

wherein the reassigning is performed such that the distribution of numbers of devices associated with each of the plurality of event start-time offsets used by devices connected to the network has a variance that is less than a threshold value.

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