

CLAIMS

What is claimed is:

1. A transient wireless communications network, comprising:
a first intelligent node having a processor, a memory communicatively coupled with the processor and storing a predetermined schedule of shipping data for at least one asset, and one or more network communications interfaces to communicate on the transient wireless communications network, the memory storing machine readable instructions that, when executed by the processor, cause the processor to:
identify, based on referencing the predetermined schedule, a second intelligent node of the transient wireless communication network that is available to communicate with the first intelligent node based on a time slot of the predetermined schedule defining communication between intelligent nodes within the network; and
transmit, by the network communication interface and during the time slot, data, from the first intelligent node to the second intelligent node.
2. The transient wireless communications network of claim 1, wherein the first intelligent node comprises a global positioning satellite (GPS) receiver and is designated to broadcast GPS location data, the memory storing further machine-readable instructions that, when executed by the processor, further cause the processor to:
transmit the received GPS location data to the second intelligent node within a proximity to the first intelligent node.
3. The transient wireless communications network of claim 1, wherein the first intelligent node includes a solid-state atomic clock, wherein times of each solid-state atomic clock across the transient wireless communications network is averaged to produce a current global-clock time.
4. The transient wireless communications network of claim 1, further comprising:
responsive to determining a collision between signal transmissions, during the time slot, between the first and second intelligent nodes, assigning, by one of the first and the second intelligent nodes, the other intelligent node to a time slot in the future by referencing the predetermined schedule of shipping data.

5. The transient wireless communications network of claim 1, wherein the first intelligent node comprises a global positioning satellite (GPS) receiver, the memory storing further machine-readable instructions that, when executed by the processor, further cause the processor to:
- determine, based on GPS coordinates received from the GPS receiver, that the first intelligent node is within an area; and
 - self-activate functionality corresponding to a sensor required to collect associated sensor data of the first intelligent node based on determining that the first intelligent node is within the area.
6. The transient wireless communications network of claim 1, wherein the first intelligent node is tasked with obtaining sensing data, the memory storing further machine-readable instructions that, when executed by the processor, further cause the processor to:
- reference, by the first intelligent node, the predetermined schedule that includes the task to obtain sensing data, to be performed at a specific time;
 - reference a solid-state atomic clock of the first intelligent node;
 - compare a time of the solid-state atomic to the specific time;
 - determine, based on the comparison of the time of the solid-state atomic clock and the specific time, that the comparison satisfies a threshold; and
 - self-activate, based on the time of the solid-state atomic and the specific time satisfying a threshold, a sensor of the first intelligent node required to perform the task of obtaining sensing data.
7. The transient wireless communications network of claim 1, the memory storing further machine-readable instructions that, when executed by the processor, further cause the processor to:
- prior to the first intelligent node transmitting data to the second intelligent node, exchange, by the first intelligent node with the second intelligent node, security credentials according to a handshaking protocol.
8. The transient wireless communications network of claim 1, the memory storing further machine-readable instructions that, when executed by the processor, further cause the processor to:

transmit, by the first intelligent node that includes an internal clock, a current time to the second intelligent node, to reference against the predetermined schedule.

9. The transient wireless communications network of claim 8, wherein the internal clock is a solid-state atomic clock.

10. The transient wireless communications network of claim 1, wherein the first intelligent node and the second intelligent node include solid-state atomic clocks, the memory storing further machine-readable instructions that, when executed by the processor, further cause the processor to:

responsive to the first intelligent node transmitting data to the second intelligent node, synchronize, based on an amount of battery life remaining in the first and second intelligent nodes, the solid-state atomic clocks of the first and second intelligent nodes.

11. The transient wireless communications network of claim 10, wherein the synchronizing of the solid-state atomic clocks of the first and second intelligent nodes is further based on a degree of drift satisfying a threshold, the memory storing further machine-readable instructions that, when executed by the processor, further cause the processor to:

compare a degree of drift between the first and second nodes to a predetermined degree of drift;

determine whether the comparison between the first and second nodes and the predetermined degree of drift satisfies a threshold; and

reduce the degree of drift between the first and second intelligent nodes.

12. A method, comprising:

broadcasting, by a first intelligent node, a request for a resource of a particular type that is required to complete a task;

receiving, by the first intelligent node, from a second intelligent node, a reply that the second intelligent node can provide the requested resource;

selecting, by the first intelligent node, the second intelligent node to perform the task using the resource of the particular type; and

receiving, by the first intelligent node, from the second intelligent node, a confirmation to perform the task using the resource of the particular type.

13. The method of claim 12, wherein the first intelligent node includes low-range wireless-communication capabilities to within a proximity of the first intelligent node and the second intelligent node includes long-range wireless-communication capabilities sufficient to contact a remote server, and wherein the requested resource is the long-range wireless-communication capabilities, the method further comprising:

instructing, by the first intelligent node, the second intelligent node to transmit a message to the remote server.

14. The method of claim 13, wherein the second intelligent node includes a vibration sensor, wherein the requested resource is vibration sensing capabilities, the method further comprising:

instructing, by the first intelligent node, the second intelligent node to collect and then transmit collected vibration data to the first intelligent node.

15. The method of claim 12, wherein the broadcasting the request for a resource of a particular type that is required to complete a task and the receiving the reply that the second intelligent node can provide the requested resource are performed within a time slot, wherein the first intelligent node is determined to broadcast and the second intelligent node is determined to receive the broadcast based on the MAC address of both the first and second intelligent nodes.

16. The method of claim 12, wherein the broadcasting the request for a resource of a particular type that is required to complete a task and the receiving the reply that the second intelligent node can provide the requested resource are performed within a time slot, wherein the first intelligent node is determined to broadcast and the second intelligent node is determined to receive the broadcast based the battery supply remaining on each intelligent node.

17. A network of intelligent nodes, comprising:

a master node that includes a low-power wireless-communication interface configured to communicate with intelligent nodes within a proximity of the low-power wireless-communication interface, the master node;

a secondary node configured to execute instructions received from the master node that includes a low-power wireless-communication interface and a medium-power wireless-

communication interface, the medium-power wireless-communication interface has a longer range of communication than the low-power wireless-communication interface; and

a tertiary node configured to execute instructions received from the master node that includes a low-power wireless-communication interface, a medium-power wireless-communication interface, and a high-power wireless-communication interface, the high-power wireless-communication interface has a longer range of communication than the low-power wireless-communication and medium-power wireless-communication interfaces and is configured to wirelessly communicate with a server associated with the network.

18. The system of claim 17, wherein the master node is configured to unilaterally control the secondary node and the tertiary node.

19. The system of claim 17, wherein the master node includes at least one of capacitive sensor, an altimeter, a gyroscope, an accelerometer, a temperature sensor, a strain sensor, a pressure sensor, a piezoelectric sensor, a weight sensor, an optical sensor, an acoustic sensor, a smoke detector, a radioactivity sensor, a chemical sensor, a biosensor, a magnetic sensor, an electromagnetic field sensor, and a humidity sensor.

20. The system of claim 17, wherein the master node is designated as having unilateral control of a second master node.

21. The system of claim 20, wherein the designated master node is designated based on battery capacity, power consumption in various modes of operation, desired latency, and the location of the master node.

22. The system of claim 20, wherein the designated master node can delegate tasks regarding sensor data collection to the second master node, the secondary node, and the tertiary node based on available resources of the second master node, the secondary node, and the tertiary node.