WHAT IS CLAIMED IS:

1. A computer program product for syntonizing machines in a network, the computer program product comprising a non-transitory machine-readable medium storing computer program code for performing a method, the method comprising:

accessing probe records for probes transmitted at different times between pairs of machines in the network; each probe record identifying the machine that transmitted the probe, identifying the machine that received the probe, and sufficient to determine a transit time of the probe based on a transmit timestamp from the transmitting machine and a receive timestamp from the receiving machine; and one of the machines produces timestamps based on a reference clock;

for different pairs of machines, estimating a drift between the pair of machines based on the transit times of probes transmitted between the pair of machines;

for different loops of at least three machines in the network, calculating a loop drift error based on a sum of the estimated drifts between pairs of machines around the loop;

adjusting estimated absolute drifts of the machines based on the loop drift errors, wherein the absolute drift of a machine is defined relative to the reference clock; and

causing at least one of the machines to adjust a frequency of that machine's local clock based on the estimated absolute drift for that machine, wherein adjusting the frequency of that machine's local clock comprises applying adaptive stochastic control to adjust the frequency of that machine's local clock.

2. The computer program product of claim 1 wherein the probe records comprise, for pairs of machines, probe records for probes transmitted in both directions between the machines in each of the pairs.

3. The computer program product of claim 1, wherein estimating the drift between the pair of machines is based on the transit times of coded probes, wherein coded probes are pairs of probes transmitted from one of the machines in the pair to the other of the machines in the pair, the transmit timestamps of the pair of probes are within a predetermined time interval of each other, and the transit times of the pair of probes are also within a predetermined deviation of each other.

4. The computer program product of claim 3, wherein estimating the drift between the pair of machines comprises applying a support vector machine classifier to probe records for the coded probes for the pair of machines.

5. The computer program product of claim 1, wherein which machines transmit probes between each other changes based on network conditions.

6. The computer program product of claim 1, wherein each machine in the network transmits probes to a predefined maximum number of other machines.

7. The computer program product of claim 1, further comprising:
determining and instructing the machines as to which machines transmit probes to which other machines.

8. The computer program product of claim 1, wherein the method further comprises estimating an absolute offset for each machine based on the transit times of probes transmitted between pairs of machines.

9. The computer program product of claim 1 wherein the absolute offsets are estimated to an accuracy of nanoseconds or better.

10. The computer program product of claim 1, wherein a state of the local clock is determined by an absolute offset and the absolute drift of that machine.

11. The computer program product of claim 1, wherein the adaptive stochastic control includes a Kalman filter.

12. The computer program product of claim 1, wherein the adaptive stochastic control includes an adaptive filter bank.

13. The computer program product of claim 1, wherein at least one of the transmit timestamps and the receive timestamps includes at least one of a network interface card

(NIC) timestamp, a computer processor unit (CPU) timestamp, a virtual machine (VM) timestamp, a container timestamp, and an antenna timestamp.

14. The computer program product of claim 1, wherein the absolute drifts are estimated to an accuracy of ten nanoseconds per second or better.

15. The computer program product of claim 1 wherein the network is a mesh network.

16. The computer program product of claim 1, wherein the machines in the network form a group of machines, wherein the network comprises a plurality of groups of machines including the group of machines, and wherein input from an administrator defines the groups of machines.

17. The computer program product of claim 16, wherein the administrator defines at least one of the reference clock, and a reference group of machines.