

CLAIMS

We claim:

- 5 1. An apparatus comprising:
 a plurality of computational resources that are connected to one another to form a distributed computing system;
 logic, implemented at least partly in one or more of configurable logic or fixed-functionality logic hardware, to:
10 characterize each of a plurality of similar components of the distributed computing system based on a thermal design power (TDP) level that is a maximum safe operation level associated with each component and store characterization data based on the TDP levels in a database;
 determine, for each component, a ratio of component TDP level to a sum of the
15 TDP levels for all components;
 determine a factor equal to total power available to all components; and
 allocate non-uniform power to each similar component equal to the factor multiplied by the ratio based at least in part on the characterization data in the database to substantially equalize performance of the components.
20 2. The apparatus of claim 1, wherein the components are processors.

 3. The apparatus of claim 1, wherein the plurality of similar components are to be characterized while the distributed computing system is running.
25 4. The apparatus of claim 1, further including running average power limiting firmware and hardware to enforce non-uniform power allocations.

 5. The apparatus of claim 1, further including logic to scale the TDP level for each
30 component by a reducing scaling factor.

 6. A method comprising:
 characterizing each of a plurality of similar components of a distributed computing system based on a thermal design power (TDP) level that is a maximum safe operation level

associated with each component and storing characterization data based on said TDP levels in a database;

determining, for each component, a ratio of the component's TDP level to a sum of TDP levels for all components;

5 determining a factor equal to total power available to all components; and

allocating non-uniform power to each similar component equal to the factor multiplied by the ratio based at least in part on the characterization data in the database to substantially equalize performance of the components.

10 7. The method of claim 6, wherein processors are characterized.

8. The method of claim 6, wherein the plurality of similar components are to be characterized while the distributed computing system is running.

15 9. The method of claim 6, wherein the plurality of similar components are to be characterized at the time of manufacture of the components.

10. The method of claim 6, further including running average power limiting firmware and hardware to enforce non-uniform power allocations.

20 11. The method of claim 6, further including scaling the TDP level for each component by a reducing scaling factor.

12. At least one computer readable storage medium comprising a set of instructions,
25 wherein the instructions, when executed, cause a computing device in a distributing computing system to:

characterize each of a plurality of similar components of the distributed computing system based on a thermal design power (TDP) level that is a maximum safe operation level associated with each component and storing characterization data based on said TDP levels in a database;

30 determine, for each component, a ratio of the TDP level of the component to a sum of TDP levels for all components;

determine a factor equal to total power available to all components; and

allocate non-uniform power to each similar component equal to the factor multiplied by the ratio based at least in part on the characterization data in the database to substantially equalize
35 performance of the components.

13. The medium of claim 12, wherein processors are to be characterized.

14. The medium of claim 12, wherein the instructions, when executed, cause the
5 computing device to characterize the components while the distributed computing system is running.

15. The medium of claim 12, wherein the instructions, when executed, cause the
10 computing device to allocate power through running average power limiting firmware and hardware.

16. The medium of claim 12, wherein the instructions, when executed, cause the
15 computing device to allocate power by scaling the TDP level for each component by a reducing scaling factor.

17. The medium of claim 12, wherein the instructions, when executed allocates non-uniform power through a non-linear model.