CLAIMS:

1. A method for cooling computer processing units comprising:

providing in a tank a cooling liquid which isformed of a dielectric material;

the tank containing a plurality of computer processing units, each comprising:

an exterior housing having a bottom opening at a bottom end and a top opening at a top end and defining a closed peripheral wall between the top and bottom ends;

at least one computer processing unitboard carrying electrical components mounted within the exterior housing which operates to carry out computer processing operations while generating heat;

the tank having a dividing sheet in the tank dividing the tank into a bottom manifold below the dividing sheet and a main portion of the tank above the dividing sheet;

the exterior housing of each computer processing unit being mounted on the dividing sheet with the bottom opening located at the dividing sheet and the peripheral wall upstanding within the tank to the top end which spaced from the dividing sheet;

a plurality of liquid transfer opening arrangements in the dividing sheet where each of the liquid transfer opening arrangement is associated with a respective one of the exterior housings to allow the cooling liquid from the bottom manifold to enter the exterior housing and pass through the bottom opening;

introducing the cooling liquid into the bottom manifold;

arranging a top surface of the cooling liquid within the tank at a location which is above the top end of the exterior housings;

causing the cooling liquid to enter through the liquid transfer opening arrangements into the exterior housings and to rise within the exterior housings by convection caused by the heat within the exterior housings and to exit from the exterior housings through the top end into the tank;

the cooling liquid exiting from the top ends of the exterior housings forming a heated layer in the tank between the top surface and the top ends;

extracting the cooling liquid from the heated layer;

and extracting heat from the extracted cooling liquid to create a heat supply and to return cooled cooling liquid to the bottom manifold.

2. The method according to claim 1 wherein the top ends of the exterior housings lie in a common plane defining a bottom of the heated layer.

3. The method according to claim 1 or 2 wherein the extracted cooling liquid ~~i~~is returned to the bottom manifold by a pump.

4. The method according to claim 3 wherein the pump is arranged to create a slight positive pressure such that the cooling liquid is caused to flow through the exterior housings substantially wholly by convection.

5. The method according to any one of claims 1 to 4 wherein the liquid transfer opening arrangements are located at the exterior housings such that

the cooling liquid only enters the exterior housings and not between the exterior housings.

6. The method according to any one of claims 1 to 5 wherein the liquid transfer opening arrangements each provide an array which is shaped to match the interior shape of the exterior housing to generate a smooth flow rising in the exterior housings.

7. The method according to claim 6 wherein the exterior housings are rectangular in cross-section and the array is rectangular.

8. The method according to claim 6 or 7 wherein the array is formed by a series of parallel slots.

9. The method according to any one of claims 1 to 8 wherein the exterior housings are arranged in rows and columns.

10. The method according to any one of claims 1 to 9 wherein the cooling liquid is extracted through an opening at one side of the tank.

11. The method according to claim 9 or 10 wherein the opening is arranged at a height above the top ends and below the top surface so as to extract the cooling liquid only from the heated layer.

12. The method according to any one of claims 1 to 11 wherein the cooling liquid is a mineral oil.

13. The method according to any one of claims 1 to 12 wherein the cooling liquid has the one or more of the following characteristics:

Density: Near or in the range of 0.92 g/m3 (7.667 lbs/gal)

Kinematic Viscosity: Near or in the range of 33-35 mm^2/s @ 40°C or near or in the range of 15 cSt @ 70°C

Dielectric Breakdown: 2mm [kV] ≥35 (ASTM D6871)

Boiling point: ≥360°C

Flash point: ≥265°C (Closed Cup)

Auto/self-ignition temperature: 401-404°C (ASTM E659)

Vapor Pressure: Near or in the range 0 PA @ ≤200°C

Thermal Conductivity: Near or in the range of 0.15089 W/mK @ 70°C

Specific Heat: Near or in the range of 2.3472 kJ/kgK @ 70°C

14. The method according to ~~any~~ claim 13 wherein the cooling ~~dielectric~~ liquid is selected with the characteristics to cause very intense stratified temperature zone due to the inherent thermal insulating properties.

15. The method according to claim 13 wherein the cooling ~~dielectric~~ liquid has properties that allow: a maximum heat transfer, a high working fluid temperature (above 50 degrees C) and an efficient heat transfer.

16. The method according to any one of claims 1 to 15 wherein the flow of the cooling liquid into the bottom manifold and through the exterior housings is arranged such that the temperature in the heated layer is in the range 10-60°C.~~.~~

17. The method according to any one of claims 1 to 16 wherein the flow of the cooling liquid into the bottom manifold and through the exterior housings is arranged such that the temperature returned to the bottom manifold is in the range 30-85°C.

18. The method according to any one of claims 1 to 17 wherein each computer processing unit is associated with an adjacent power supply which is contained within the tank alongside an associated exterior housing where the power supply is located in and cooled by the cooling liquid between the exterior housings without any flow of the cooling liquid from the bottom manifold.

19. The method according to any one of claims 1 to 18 wherein the computer processing units are dropped out when a peak demand situation occurs.

20. The method according to any one of claims 1 to 19 wherein the computer processing units are connected to utility smart meters to aid in peak demand management.

21. The method according to claim 18 wherein there is provided a U-shaped holder mounted on the dividing sheet and arranged to hold the exterior housing and the power supply supported upright.

22. The method according to any one of claims 1 to 20 wherein the tank has a head zone above the cooling liquid that also acts as an expansion area to accommodate fluid level fluctuations.

23. The method according to claim 22 wherein the head zone is kept free from any moisture and includes a filter system to filter out particulate matter as well as moisture.

24. The method according to claim 22 wherein the tank is sealed ~~and vapour tight~~.