

What is claimed is:

1. An enclosure for providing liquid film cooling to a plurality of heat generating components, the enclosure comprising:
 - a chassis comprising a plurality of cassettes, wherein each cassette of the plurality of cassettes includes one or more heat generating components of the plurality of heat generating components, wherein the plurality of cassettes is slidably attached to the chassis;
 - a sump for storing a liquid to be supplied to the plurality of heat generating components;
 - a first pump for drawing the liquid from the sump;
 - a plumbing system to receive the liquid from the sump by way of the first pump;
 - a plurality of tube plates connected to the plumbing system to receive the liquid, wherein a tube plate of the plurality of tube plates is placed between a first cassette and a second cassette of the plurality of cassettes, and wherein the plurality of tube plates directly spray the liquid onto the plurality of heat generating components by way of nozzles embedded on the plurality of tube plates, whereby the liquid is evaporated into vapors upon contact with the plurality of heat generating components; and
 - a heat exchanger, placed below the chassis, to condense the vapors into condensed liquid upon contact with the heat exchanger, whereby the condensed liquid is collected in the sump.
2. The enclosure of claim 1, wherein the chassis further comprises at least one power supply unit to supply power to the one or more heat generating components and at least one network switch to provide network connectivity externally to at least a local area network or an Internet.
3. The enclosure of claim 2, wherein the chassis further comprises a backplane housed at a back end of the chassis to allow the plurality of cassettes to share a common power and data bus with the at least one power supply and the at least one network switch.
4. The enclosure of claim 1, further comprising a second pump for drawing the liquid from the sump, wherein at least one of the first and second pumps is operational at a time instant.

5. The enclosure of claim 4, wherein the plumbing system is equipped with back flow check valves to prevent the liquid from circulating back through the first and second pumps when at least one of the first and second pumps is non-operational.
6. The enclosure of claim 1, further comprising bypass valves connected between the plumbing system and the plurality of tube plates to control a flow of liquid in the plurality of tube plates.
7. The enclosure of claim 1, wherein the plurality of tube plates further provides condensation of the vapors into the condensed liquid when the vapors come in contact with the plurality of tube plates.
8. The enclosure of claim 1, wherein the plurality of tube plates further absorb heat from the plurality of heat generating components by way of radiation and transfer the heat to the liquid circulating inside the plurality of tube plates.
9. The enclosure of claim 1, further comprising a plurality of sensors to monitor health and operating parameters of the enclosure, wherein the plurality of sensors includes at least one of a temperature sensor, a flow sensor, a pump sensor, a humidity sensor, a fouling sensor, a voltage sensor, an accelerometer, a door sensor, a backplane sensor, a pressure sensor, or humidity and vapor saturation sensors.
10. The enclosure of claim 9, further comprising a management control system to monitor and manage the enclosure based on outputs received from the plurality of sensors.
11. The enclosure of claim 1, further comprising a cartridge to purge non-vapor gases outside the enclosure and prevent the vapors from venting outside the enclosure.
12. A rack having a plurality of shelves, the rack comprising:

a plurality of enclosures positioned on a shelf of the plurality of shelves, wherein a first enclosure of the plurality of enclosures is accessible from a front end of the rack and a second enclosure of the plurality of enclosures is accessible from a back end of the rack, and wherein each of the first and second enclosures of the plurality of enclosures comprises:

a chassis comprising a plurality of cassettes, wherein each cassette of the plurality of cassettes includes one or more heat generating components, wherein the plurality of cassettes is slidably removable from the chassis;

a sump for storing liquid to be supplied to the one or more heat generating components;

a first pump for drawing the liquid from the sump;

a plumbing system to receive the liquid from the sump by way of the first pump; and

a plurality of tube plates connected to the plumbing system to receive the liquid, wherein a tube plate of the plurality of tube plates is placed between first and second cassettes of the plurality of cassettes, and wherein the plurality of tube plates directly spray the liquid onto the one or more heat generating components by way of nozzles embedded on the plurality of tube plates, whereby the liquid is evaporated into vapors upon contact with the one or more heat generating components.

13. The rack of claim 12, further comprising a heat exchanger, placed below the chassis, to condense the vapors into condensed liquid upon contact with the heat exchanger, whereby the condensed liquid is collected in the sump.
14. The rack of claim 12, wherein the chassis further comprises at least one power supply unit to supply power to the one or more heat generating components and at least one network switch to provide network connectivity externally to at least a local area network or an Internet.
15. The rack of claim 14, wherein the chassis further comprises a backplane housed at a back end of the chassis to allow the plurality of cassettes to share a common power and data bus with the at least one power supply and the at least one network switch.

16. The rack of claim 12, further comprising a second pump for drawing the liquid from the sump, wherein at least one of the first and second pumps is operational at a time instant.
17. The rack of claim 12, wherein the plurality of tube plates further provides condensation of the vapors into condensed liquid when the vapors come in contact with the plurality of tube plates.
18. The rack of claim 12, wherein the plurality of tube plates further absorb heat from the one or more heat generating components by way of radiation and transfer the heat to the liquid circulating inside the plurality of tube plates.
19. The rack of claim 12, further comprising a plurality of sensors to monitor health and operating parameters of the enclosure, wherein the plurality of sensors includes at least one of a temperature sensor, a flow sensor, a pump sensor, a humidity sensor, a fouling sensor, a voltage sensor, an accelerometer, a door sensor, a backplane sensor, a pressure sensor, or humidity and vapor saturation sensors.
20. The rack of claim 19, further comprising a management control system to monitor and manage the enclosure based on outputs received from the plurality of sensors.