

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 that are vertically positioned and spaced apart from each other in the chassis, wherein each cassette of the plurality of cassettes is slidable in and out of the chassis, and wherein each a first 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 formed below a bottom surface of the chassis for storing a liquid to be supplied to the plurality of heat generating components;

a first pump placed below the chassis 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 fluidly connected to the plumbing system to receive the liquid, wherein a first tube plate of the plurality of tube plates is vertically positioned ~~placed~~ between a the first cassette and a second cassette of the plurality of cassettes, and wherein the first tube plate of the plurality of tube plates directly sprays the liquid onto the plurality of one or more heat generating components by way of nozzles embedded thereon on the plurality of tube plates, whereby and wherein a portion of the liquid that is sprayed onto the one or more heat generating components is collected in the sump due to vertical orientation of the first cassette and remaining portion of the liquid is evaporated into vapors upon contact with the plurality of one or more heat generating components; and

a heat exchanger, placed below the chassis and fluidly connected to the first pump, to for transferring heat from the liquid that is collected from the sump and condensing the vapors into condensed liquid upon contact with the heat exchanger, whereby wherein the condensed liquid is collected in the sump, and wherein the enclosure is hermetically sealed to prevent the vapors of the liquid from escaping the enclosure.

2. The enclosure of claim 1, wherein the chassis ~~further comprises~~ houses at least one a power supply unit to supply power to the one or more heat generating components and ~~at least one a~~

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~~ further comprising a backplane housed at a back end of the chassis to allow the plurality of ~~cassettes~~ heat generating components to share a ~~common~~ power and data bus with the ~~at least one~~ power supply unit 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~~ 1, wherein the plumbing system is equipped with back flow check valves to prevent the liquid from circulating back ~~through~~ to 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 that are positioned ~~connected~~ between the plumbing system and the plurality of tube plates to control a flow of the liquid in the plurality of tube plates.

7. The enclosure of claim 1, wherein the plurality of tube plates ~~further provides condensation of~~ condenses the vapors that come in contact therewith into the condensed liquid which is collected in the sump ~~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 a 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.~~