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(54) **MODULAR COOLING UNITS AND ADVANCED DISTRIBUTION HARDWARE FOR RACKS**

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(57) **ABSTRACT**

A rack cooling system includes a primary cooling condenser and a secondary cooling condenser. The primary cooling condenser is positioned above servers of a server rack and the secondary cooling condenser is position above the primary cooling condenser. Each of the severs, the primary cooling condenser, and the secondary cooling condenser is connected to a liquid manifold via one of a plurality of liquid ports on the liquid manifold, and to the vapor manifold via one of a plurality of vapor ports on the vapor manifold. A cooling capacity of the rack cooling system can be extended by switching on a vapor flow between the secondary cooling condenser and the primary cooling condenser using a first valve on the vapor manifold. Further, a second valve on a primary cooling loop can be used to control cooling fluid flowing into the secondary cooling condenser after the first valve is trigged open.