# Master's Thesis Defense Announcement
# Mechanical and Aerospace Engineering Department
# University of Texas at Arlington

## Thermal design analysis of server chassis manifolds for liquid cooled servers using CFD

By

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**Abstract**

Direct-to-chip liquid cooling is one of the most popular methods in data center thermal management when it comes to cooling high chip power densities. A cold plate-based liquid cooling system contains various components such as pumps, data center room, and rack-level manifolds, and server chassis-level manifold. Efficient coolant distribution to the heat-dissipating cold plates plays an important role in both the thermal and hydraulic performance of the server. It is, thus, very important to design and manufacture server chassis manifold geometry that can perform efficiently under the anticipated heat loads and coolant flow rates. In the present thesis, two such server chassis manifolds from two different vendors were characterized using CFD for various coolant inlet temperatures and flow rates. A grid independence study was carried out to select the best possible grid size for accurate results. Temperature- dependent properties of 25% propylene glycol were used to determine the pressure drops at different flow rates and inlet temperatures. The baseline results of manifold pressure drop were also validated with experimental results. Furthermore, the impact of kinks and bends in server manifold connecting pipes on the system pressure drop was also explored.