

Understanding the Dynamic Cooling Mechanism of Infortrend Storage

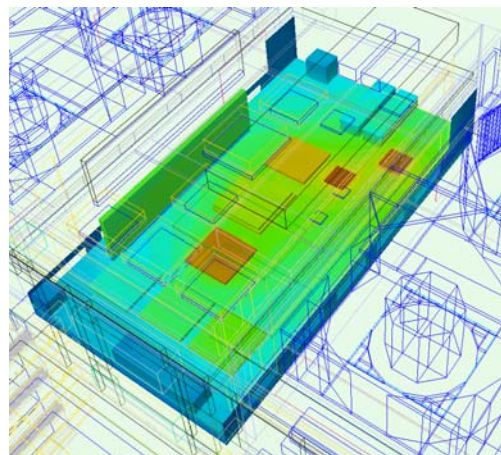
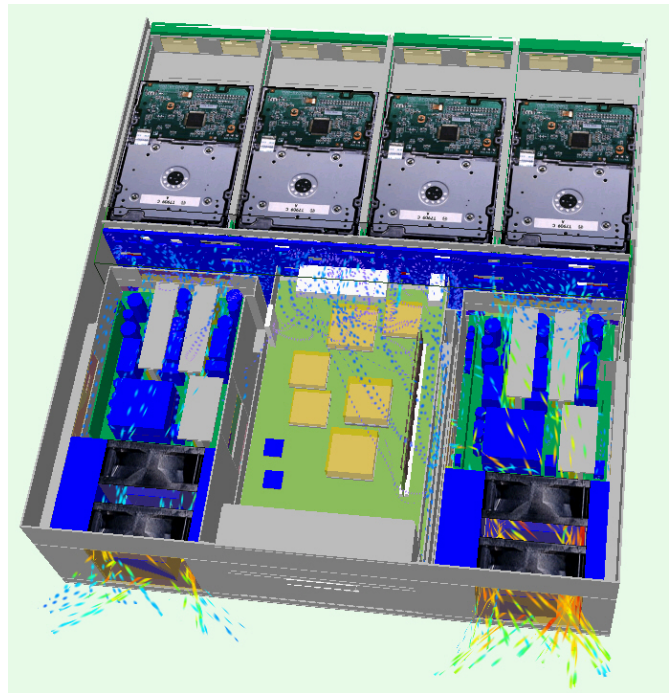
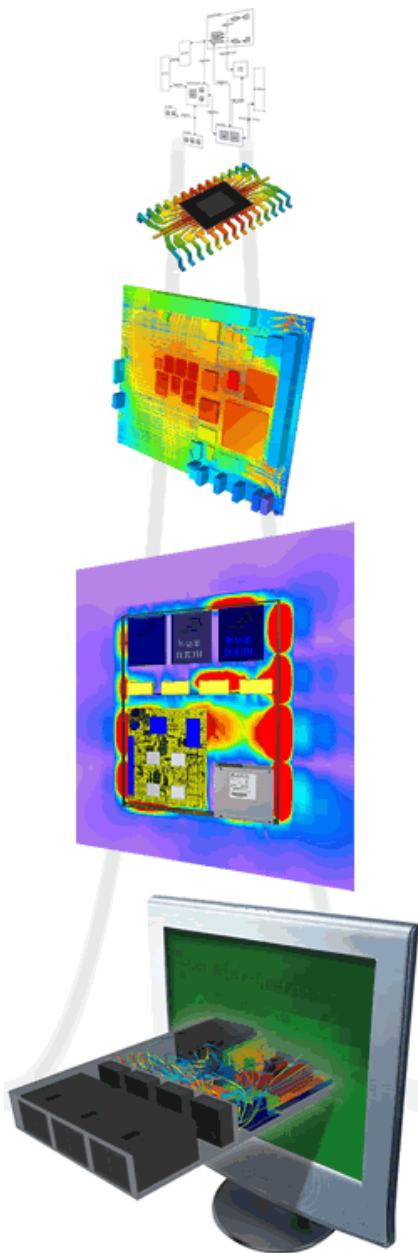
Technical Brief

Abstract

This application note explains how the dynamic cooling mechanism is implanted on Infortrend storage to increase system energy efficiency.

Hardware Design

First of all, we utilize CFD (Computational Fluid Dynamics) techniques to simulate and predict airflow, temperature, and heat transfer through components, boards, modules, and the entire system. We then acquainted ourselves with the airflow requirements during normal operations or in the event of a single module failure, making our enclosures ideal for high-availability purposes.



The screenshot displays the Infortrend storage management interface. At the top, there is an 'Enclosure View' showing a RAID array and a server rack. Below this is the 'Information Summary' section, which provides details about the controller, channels, and logical drives. The 'System Information' section is a table listing various system parameters and their status.

Device Name	Value	Status
CPU Type	PPC750FX/PL	
Total Cache Size	1024MB (ECC DDR)	
Firmware Version	3.49D.12	
Bootrecord Version	1.22D	
Serial Number	2f768a	
PSU0 status		PSU0 status functioning normally
PSU1 status		PSU1 status functioning normally
Cooling Fan0		Cooling fan0 is in low speed
Cooling Fan1		Cooling fan1 is in low speed
Cooling Fan2		Cooling fan2 is in low speed
C Middle Backplane Inner Temp 0	26.0 C	Temp. within safe range
C CPU Temp Sensor	42.0 C	Temp. within safe range
C Board1 Temp Sensor	40.5 C	Temp. within safe range
C Board2 Temp Sensor	40.0 C	Temp. within safe range
+3.3V Value	3.336 V	Voltage within acceptable range
+5V Value	5.099 V	Voltage within acceptable range
+12V Value	12.26 V	Voltage within acceptable range
Battery-Backup Battery		Battery-Backup Battery is disabled

Event-triggered Operations

Several conditions can be used as triggers for system firmware to enter a conservative and self-protective state. They include:

- * Controller failure,
- * BBU low or failed
- * Power supply failure
- * Fan failure
- * Temperature exceeds threshold

When these triggering conditions are enabled and one of them does occur, firmware will

- 1). Change caching mode from “write-back” to the conservative “write-through.”
- 2). Flush all cached data to reduce the chance of data loss.
- 3). Raise the rotation speed of cooling fans.

