

THEMIS



CoolShell™ Blade Servers

Compact, Lightweight
Solutions for Demanding
Environments



As Commercial Off-The-Shelf (COTS) based computing products are becoming more widely integrated into government systems, Themis introduces its new family of CoolShell™ systems. Trend setting Themis CoolShell Technology combines standard motherboard economies of scale with the benefits of blade server architecture, in a configuration suitable for use in the most demanding environments.

High Compute Density

The principle barrier to higher compute density, in modular electronic packaging, is cooling of high temperature devices, most notably, the new breed of multi-core microprocessors. CoolShell technology provides a very efficient way to remove heat from processors and other high temperature devices. CoolShell is a consolidated server architecture deployed in an advanced thermal and kinetic design. The CoolShell design provides a stable, stiff, sealed and conduction cooled environment, complete with external air flow path, heat exchangers and impeller assembly – combined in a single, field replaceable unit (FRU).

Standard Commercial Components

CoolShell Technology leverages conventional motherboard's rapid technology refresh rate (early time to market) and economies of scale.

Rapid Migration to New Processor Technology

The design and validation cycle for new blade server processors, slows the rate of adoption for new processor and memory and switching technology. Standard server motherboards provide access to the newest processor technology, as soon as it is introduced by semiconductor vendors. Themis has pioneered a methodology to quickly design a CoolShell for new motherboards. As a consequence, CoolShell based blades can be fielded, shortly after commercial servers are brought to market.

Mechanical Integrity

CoolShell Technology surrounds standard motherboards with a shell made of a light aluminum alloy. The CoolShell provides mechanical rigidity and support for high shock and vibration environments. CoolShell technology is designed to withstand 30G, at 25 ms, shock events.

Lower Total Cost-of-Ownership

A CoolShell blade system combines the cost-of-ownership benefits of blade-server architectures, including cable management, maintainability and scalability with the value proposition of standard motherboards and I/O controllers.

Standard Form-Factor

CoolShell Technology Blades are 1RU high and the CoolShell Subrack conforms with 19" RETMA rack standards. The CoolShell Subrack is entirely passive, containing only high performance connector systems, backplanes and CoolShell FRU slots. CoolShell blades based on new processors are backward compatible with earlier Subracks and CoolShell blades.

Shallow-Depth and Reduced Acoustic and Electromagnetic Noise

CoolShell blade's integrated impeller assembly enable a 17" inch blade depth and a shallow, 17.75" chassis depth, with significantly lower noise than comparable rackmount chassis and blade servers. Reduced electromagnetic emissions, lower noise and compact size enable CoolShell based systems to be used in an office environment.

Themis CoolShell Systems Overview

Themis' new CoolShell servers are designed for applications that need a compact, lightweight computing solution that must operate in demanding environments. CoolShell uses commercial off-the-shelf components to bring blade server efficiency and total cost of ownership to environmentally challenging applications. To keep the CoolShell systems cool, every module has its own integrated fans for cooling and there are no difficult to access, chassis level fan modules. Themis CoolShell servers are available in a compact 3RU design or in 4RU design that provides the industry's highest compute density for COTS systems.

CoolShell CS-3U System

The CoolShell CS-3U is a completely modular system that packs a high amount of functionality into a compact 3U, 17.75 inch deep rackmountable CoolShell Subrack. All modules are replaceable from the front increasing uptime and significantly reducing maintenance costs. All cable connections are on the front, no rear access is required. The CoolShell CS-3U includes five replaceable modules; a dual socket processor blade, an I/O module, media Blade and two power supply modules. The CoolShell CS-3U fits in a standard 19" rack.



Figure 1: CoolShell CS-3U System

Processor Blade

The CoolShell CS-3U processor blade is based on a standard off-the-shelf motherboard. It includes two quad-core Intel® Xeon® processors and two audio ports accessible from the front. The CoolShell CS-3U can be quickly updated to the latest processor technology since it is based on standard off the shelf components. New CoolShell CS-3U processor blades can be available shortly after new technology standard motherboards are brought to market. The CoolShell CS-3U server is easily upgraded to the latest technology by replacing an older processor blade with one based on the newest technology.

I/O Blade

The CoolShell CS-3U I/O blade includes three 16-Lane PCI Express slots connected to the processor blade through the backplane of the CS-3U server. The I/O blade can accommodate three high performance graphics cards or other standard PCI Express cards. Access to the standard cards is through the front. The CoolShell CS-3U server's I/O can be quickly updated to the newest technology by replacing standard PCI Express cards. Also included are six USB 2.0 ports.

Media Module

The CoolShell CS-3U media module provides a wide variety of connectivity including:

- Seven optical or copper gigabit ethernet ports
- Six USB 2.0 ports
- DVD/CD
- Removable 2.5" SATA drive, solid state or rotating
- One internal 2.5" SSD
- The media module is removable from the front for simple maintenance

Power Supplies

The CoolShell CS-3U includes redundant, hot-swappable 850 Watt power supplies in an N+1 configuration.

Optional Storage Expansion Box

- Holds up to five 2.5-inch SAS/SATA drives

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