Vess™ R2000 Tech Brief

Perfect Rebuild

- Reduces rebuild time
- Frees up CPU for faster I/O and other functions
- Only sectors where write changes occurred are rebuilt

Feature

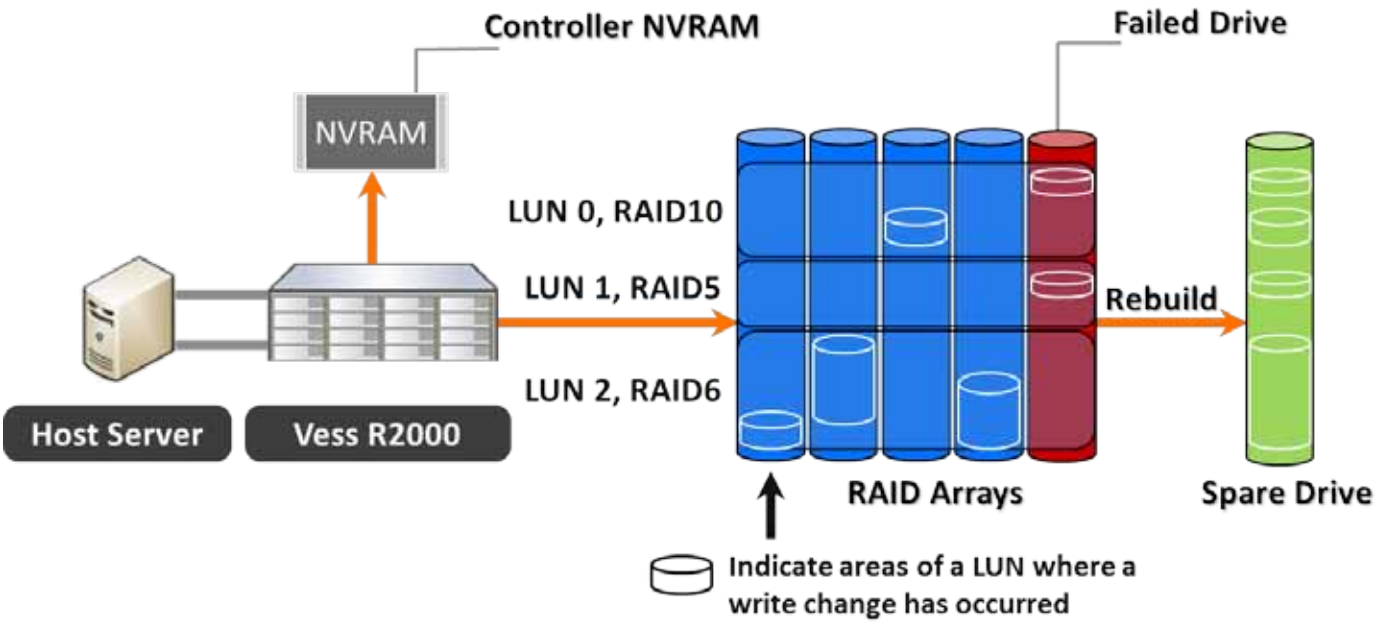
The Perfect Rebuild feature uses a different approach to rebuilding a RAID array in order to greatly reduce the amount of time needed for the completion of the task. This reduces the time required for the array to transition from degraded to healthy status, greatly reducing the risk of having a dead logical drive, and frees up CPU resources more quickly to be available for I/O and other demands. The maximum number of LUNs the RAID controller allows with the PerfectRebuild feature enabled is 16.

The Problem

A standard logical drive rebuild can be time consuming and sap CPU resources that otherwise might be available to boost performance. The longer the array remains in degraded status, the greater the risk of having a dead logical disk problem. If the amount of time needed for a rebuild is reduced, the risk of a dead LD is reduced and the affected period of lower performance is also reduced.

The Fix

The Perfect Rebuild mechanism ignores any portion of the logical drive where no write changes have occurred, focusing only on the parts that have changed. The reduction in the amount of time needed for a rebuild is especially significant for very large drives.



The Results

In order to more clearly illustrate the advantage of the Perfect Rebuild feature, here is a test result that compares the time required for a full rebuild to the time required for Perfect Rebuild using different sized LUNs and different levels of LUN capacity utilization. Significant improvements with the Perfect Rebuild feature can clearly be seen compared to the traditional Full Rebuild.

LUN Capacity	LUN Usage	Time required		% Improved
		Full rebuild	Perfect Rebuild	
250GB	25%	67m 56s	16m 20s	416%
500GB	50%	68m 13s	34m 17s	198%
750GB	75%	68m 22s	49m 57s	137%

Note: The results listed here were from a test setup using Windows Server 2008 R2 Enterprise (Full Installation) 64bit SP1 (OS size: 8GB). The total capacity of the test LUN was 1 TB (1000 GB).

For all test scenarios a mix of file types was used, including operating system, Microsoft Office, music, video and miscellaneous non-OS software.

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