CDNs and the Importance of Selecting the Right SSD

CDNs: What Are They and Why Are They Useful?

CDNs, or Content Delivery Networks, are exactly as described: networked servers that exist to deliver content to the end-user. Specifically, these servers are geographically dispersed in order to ensure rapid delivery of content regardless of location or network difficulties, providing multiple routes to the data while being able to cache

requests as needed. As such, CDNs lie between the user and source content to act as a larger content distribution hub. CDNs are therefore related to both edge computing and the cloud as they are utilized, for example, with multimedia and other Internet content. This includes high-traffic websites that people rely on daily.

CDNs exist with several goals in mind: rapidity of access, reliability, security, and affordability. Rapidity of access is ensured by having localized versions of the content and cached content, reducing transit times and perceived latency. Content is more reliably delivered as failover conditions – where a request must be switched to an alternate or backup server – are handled through smart redundancy and load balancing, reducing interruptions of service. Content is protected from DDOS and other forms of attacks while ensuring DRM and copyright measures are respected. CDNs also reduce costs through the use of less bandwidth and more efficient traffic routing.

Selecting the Right SSD for CDNs

When choosing SSDs for CDN storage the consideration should focus on meeting the higher-end needs with as little interference as possible. For example, the M.2 and U.2 form factors are most convenient and are best supplied at the 2TB and 4TB capacities. Although reliability is always a primary concern, the fact that CDNs are inherently redundant and that storage SSDs will also have redundancy means that power-loss protection (PLP) is not necessarily a requirement. This is especially true as CDNs tend to have especially read-heavy, rather than write-heavy, workloads, which also means that more expensive flash or NAND may not be necessary. In many cases, consumer TLC (cTLC) with a relatively low drive writes per day (DWPD) rating is sufficient.

With regard to the M.2 form factor, 2280 (22x80mm) remains the most common and universal format, and it is quite possible to attain the desired capacities with that flash in that form factor. Current drives can easily saturate four lanes of PCIe™ 3.0 bandwidth or, for that matter, four lanes of PCIe™ 4.0, as again the workloads are read-intensive; keeping it simple also means backward compatibility and upgradeability simultaneously. In order for the storage solution to be as least-intrusive as possible on the higher-end CDN workings, the emphasis should be on quality of service (QoS) especially in regard to the latency. Regardless of conditions, the storage should have a low but predictable latency response without hitting a wall when under certain loads.

When scaling up to many drives, power consumption does become an important factor for maintenance and cost but unwanted throttling should be avoided. Drives should be tuned with specific workloads in mind, for example,

sequential reads, with performance consistency taking priority over power efficiency. In this way, the storage should reflect the CDN goals by having load balancing along with NVMe™ management that places content with intelligent locality, for example as with the streams directive. Requests are therefore best served also with proper implementation of an overall storage framework.

Summary

CDNs form the backbone of the modern Internet and provide fast and reliable access to the media and products people love. For the content providers, they allow efficient expansion of bandwidth and redundancy without relying on any single point of failure. Of particular importance is the ability to quickly read data, cached or otherwise, including at the edge; this requires SSDs that are effectively invisible, adding no negative impact to the content chain. Such SSDs do not have to be complicated – rather, simplification of the storage stack is ideal through the use of cheaper but consistent hardware. With proper management, the storage becomes transparent to the larger goal of providing content without obstruction, with intelligent balancing for power and performance.

Solid State Storage Technology Corp. has several SSD solutions that are a great fit for CDNs. Please contact us for more information.

Our SSD Solution

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