



Optimizing Storage for all Workloads in Modern Datacentres



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Meeting the technology needs of the modern enterprise is often a trade-off between delivering demanding Service Levels, Performance/Availability/Scalability and managing aggressive cost targets to drive business profitability. Not only do we have to worry about today, but also the future and the new challenges that we cannot foresee.

Data storage underpins all aspects of enterprise IT, but typical storage solutions on the market today are similar to a Swiss Army pen knife, they do many things at a mediocre/reasonable level in a single package. In the modern datacentre, the application workload is king, as this is the portion of IT that delivers the real value to a business, therefore it is important to understand what the underpinning infrastructure needs to deliver so that the applications operate as efficiently as possible to deliver the most value to an organization.

Broadly speaking, we can separate workloads into two categories; Performance optimized or Capacity optimized.

Performance optimized Workloads

- Production VM infrastructure
- Structured Data
- OLTP databases
- Email
- ERP and CRM systems
- Cloud Primary storage
- VDI

Capacity optimized Workloads

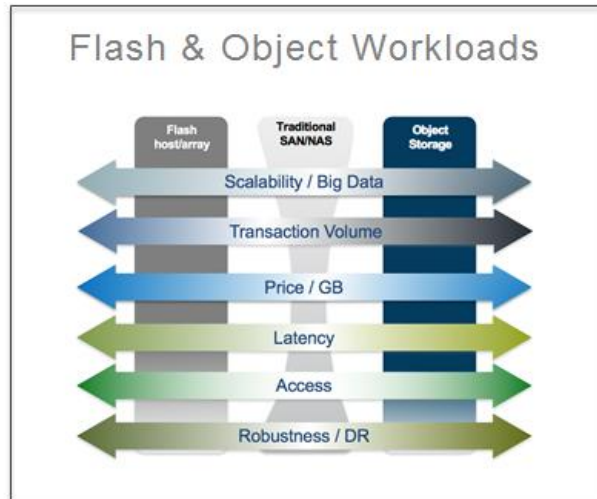
- Unstructured Data – not in databases
- Backup and snapshots
- Email Archives
- Archives
- Cloud Secondary storage
- Big Data
- Log

For cost efficiency each type of workload should be maximized to address the greatest return on investment for the job the technology is deployed to deliver. Performance storage should be measured on £/Transactions (reads and writes), how many operations can be processed in a second. Capacity storage should be measured on £/GB, how much storage space do you get for your money. Of course other service level affecting considerations need to be factored in such as system up time, data protection, disaster recovery, global access, security etc.

Most organisations that are assessing their applications workloads are looking to move applications & data that do not require the performance characteristics delivered by flash to more costs effective cloud/object storage, as represented by the diagram below. For example backup & archive system performance isn't typically measured in terms of read/writes, but the cost of the capacity. It's in areas like this that organisations typically start with Cloud/Object storage as the performance characteristics work well at a price point that is attractive.



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Cloudian HyperStore® is a fully S3 API compliant, multi-tenant, multi-datacentre hybrid cloud storage solution that provides storage and access for data that scales into the multi PB region through a scale out model supporting 1000s of nodes providing support for geographically dispersed data protection and access capabilities.

Organisations looking to optimise the workload/price performance of their applications and storage typically consider the following 7 criteria:

Workload optimised storage

Deploying flash storage for the IO intensive workloads and Cloudian HyperStore for the capacity intensive workloads ensures that the appropriate workloads are served by the most appropriate storage platform. For example, we can ensure that the IO hungry Oracle database is being served data quick enough from the flash storage to deliver the best end user experience, and ensure that a large backup stream is written quickly and safely to disk storage at an appropriate price point with Cloudian HyperStore.

Cost efficiency

To ensure the best return on investment, applications should be assessed for performance and capacity characteristics to determine which storage profile should be considered, enabling a decision to be made whether to deploy storage focused on £/IOP or £/GB. Storage is not just about Gigabytes these days, the responsiveness to end users is crucial. Flash based arrays enable users to optimize the £/IOPs metric and provide the performance that the most IO intensive application requires, whereas Cloudians object storage platform offers massive data sets at public cloud pricing levels.



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Scale-out performance and capacity scale for now and the future

The one thing that is constant in IT is uncertainty. How will a particular service or product take off in the market? What new widget does a CEO want to develop? How do marketing want to view their data from a different perspective? What hot new technology has been brought to market?

Typical storage platforms (scale up) are bound by limited scalability, both performance and capacity constraints, typically imposed by the fundamental architecture of these solutions. (Dual storage controllers with SAS attached JBODs). At the upper limits of these platforms, organizations have no other choice than to introduce more boxes and ultimately end up with a data and device management nightmare, data in silos and an ineffective cost model as management software needs to be purchased over and over again as additional boxes are added to reach the scalability required.

Cloudian on the other hand provides a scale out architecture, adding additional performance and capacity is as easy as adding the next node into the existing cluster. Smart data balancing technology ensures that data is re-distributed across the new nodes to eliminate hot spots within the cluster and of course the additional nodes are all part of the same system, so still only one system to manage and license.

Ultimately this provides the IT department with one less headache as they can be confident that whatever is thrown at them next, they have storage platforms in place that can deal with the new challenges.

Multi-tenancy – single platform for hosting multiple applications/clients

With any technology acquisition you want to utilize the resources efficiently and effectively which typically means that you will run multiple workloads and support lots of users on the same platform. This is where security is key and one user cannot access the data of another sharing the same platform. This is especially true in a hosting environment where different users could actually be from different organizations and indeed in competition with each other.

The Cloudian platform however have been designed to ensure that the infrastructure can be shared amongst many users and workloads in order to support multiple use cases simultaneously without concern of data being accessed by the wrong users or groups of users. This means our customers can use the same platform as a backup target, a common store for media files and a global network file share.



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Quality of service – limits on noisy neighbour.

Similarly to the above, in a multi user/workload environment the noisy neighbour issue can arise, where one user or workload runs amok and tries to grab as much hardware resource as possible for its own use. QOS provides a way to limit the resource allocated to individual users, groups and workloads to ensure that there is a fair distribution of resources as appropriate, or even to the point that resources can be managed, allocated and billed according to upfront determined usage requirements.

Energy efficient – greatest density of GB per rack footprint

Energy consumption is a consideration that all have when running a datacentre in these modern times, being “eco-friendly” can be a competitive advantage, but in fact saving energy equals saving money. Leveraging flash storage delivers high performance at low energy consumption levels, a fraction compared to traditional spinning drives of the 10K and 15K RPM ilk and combined with data duplication technologies, storage devices are minimized as any duplicated data is removed from being stored at all. Cloudians object storage platform provides huge scale out architectures leveraging extreme dense storage technologies utilizing industry standard x86 hardware combined with compression technology to reduce the data footprint.

Open standards – restful API

In the modern datacentre the ability to integrate applications and infrastructure components with each other has become vital to build out orchestrated cloud environments that provide for automated IT service offerings. Time to provision is now measured in seconds/minutes rather than hours/days/weeks and this is facilitated by common framework languages that are supported by multiple devices/platforms. The Restful API is crucial to this, allowing communication between propriety systems to link tasks and events, providing integration levels previously unobtainable with legacy platforms.

With Amazon’s dominance in the cloud hosting market, their S3 API has become the API standard within the cloud application market, supporting hundreds of industry standard and new innovative applications. Cloudian HyperStore offers complete S3 compatibility, ensuring seamless S3 integration with every available AWS/S3 application. HyperStore allows unmatched customer choice in deploying applications and storage on-and off-premises. The highly active S3 developer community generates lots of innovative apps in categories including: enterprise secure file sharing; backup, data retention & archiving; NFS/CIFS gateways; and desktop file storage & backup; Cloudian uniquely supports them all.



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Cloudian HyperStore software makes it easy to build full-featured, Amazon S3-compliant cloud/object storage platform that can be based on-premises, behind your firewall. It is available as either stand-alone software, or fully integrated with Cloudian HyperStore appliances. Either way, HyperStore software ensures unlimited scale, multi-datacentre storage, fully automated data tiering, and support for all S3 applications, all at public cloud prices.

Q Associates has always been at the forefront of storage technology and understand how to help clients optimise their investment on technology by offering architectural advice and guidance based on industry best practice. Working together, Q Associates and Cloudian can provide a best of breed storage infrastructure that allows organizations to deploy the most appropriate technology for the relevant workloads and data sets ensuring that when storage is needed, it is optimized for £/IOP and £/GB to ensure that the datacentre built today is ready for tomorrows challenges.

It you'd like to understand more about the benefits of Object Storage or chat with one of our specialists about the best way to manage your data, you can contact us on the details below:

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