Caching SAN Adapters

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Session 201-B: Accelerating Enterprise Applications with Flash Memory
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Caching SAN Adapters

- Caching SAN Adapters
  - What is a Caching SAN Adapter?
  - Caching SAN Adapter Essentials
- Accelerated Virtualization
  - VDI Acceleration for Education
- Database Acceleration
  - Caching SAN Adapters versus adding DRAM

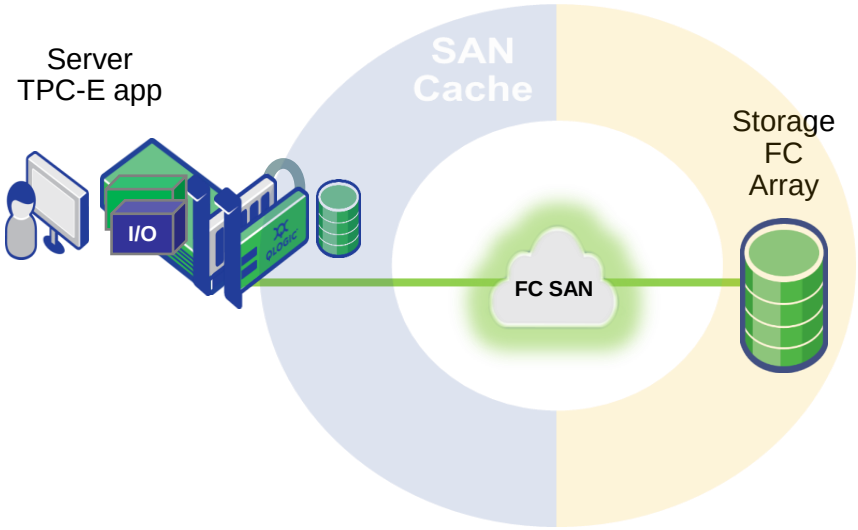
What is a Caching SAN Adapter?

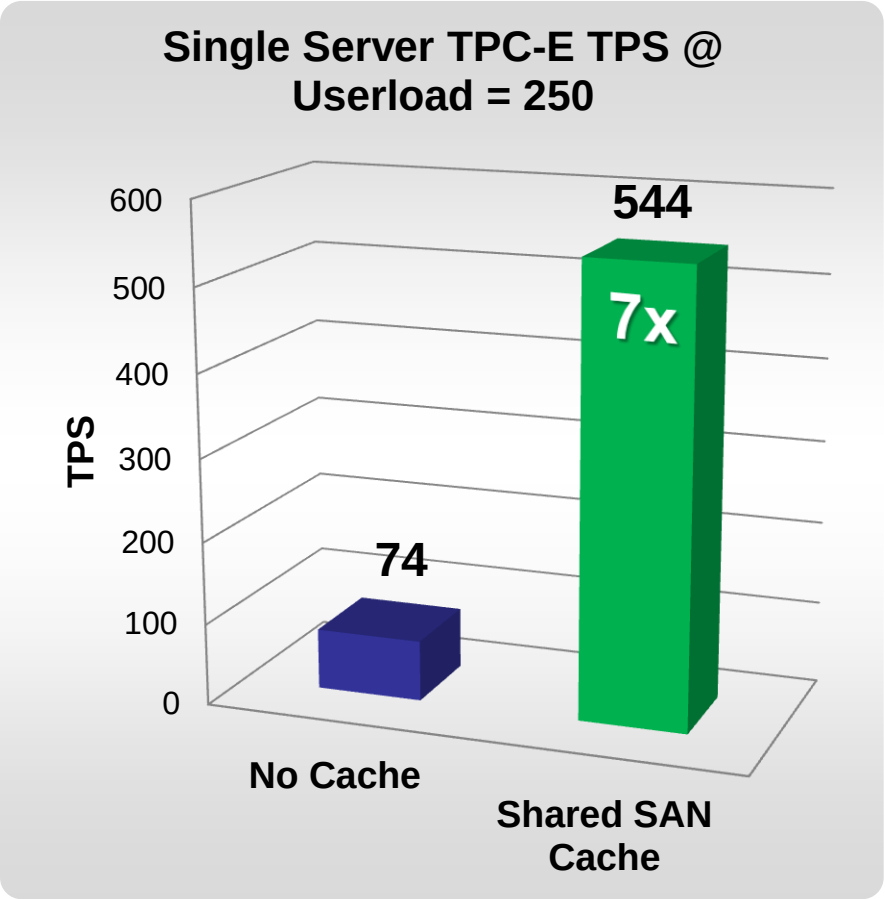
*"In an enterprise server, a Caching SAN Adapter is a **host bus adapter (HBA) for storage area network (SAN)** connectivity which accelerates performance by **transparently** storing duplicate data such that future requests for that data can be serviced faster compared to retrieving the data from the source. A caching SAN adapter is used to accelerate the performance of applications **across multiple clustered or virtualized servers** and uses DRAM, NAND Flash or other memory technologies as the cache."*

http://en.wikipedia.org/wiki/Caching_SAN_adapter

- A SAN HBA
- Transparently managing cache
- Host Cache is shared in a cluster of servers

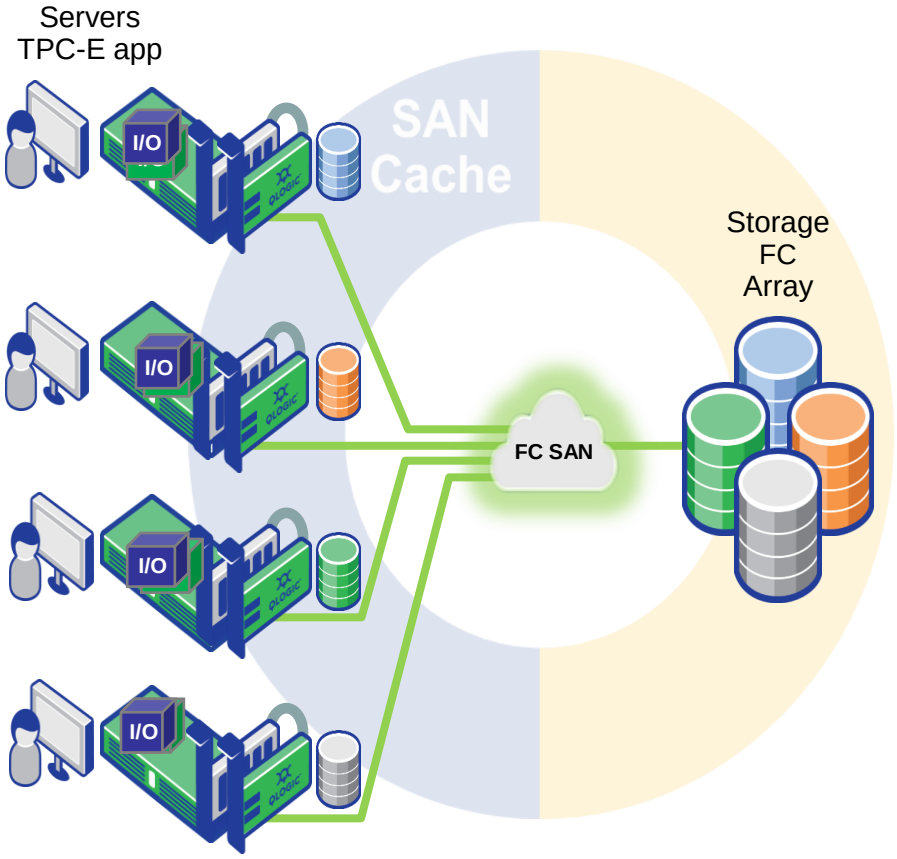
Transparent Server-based Caching

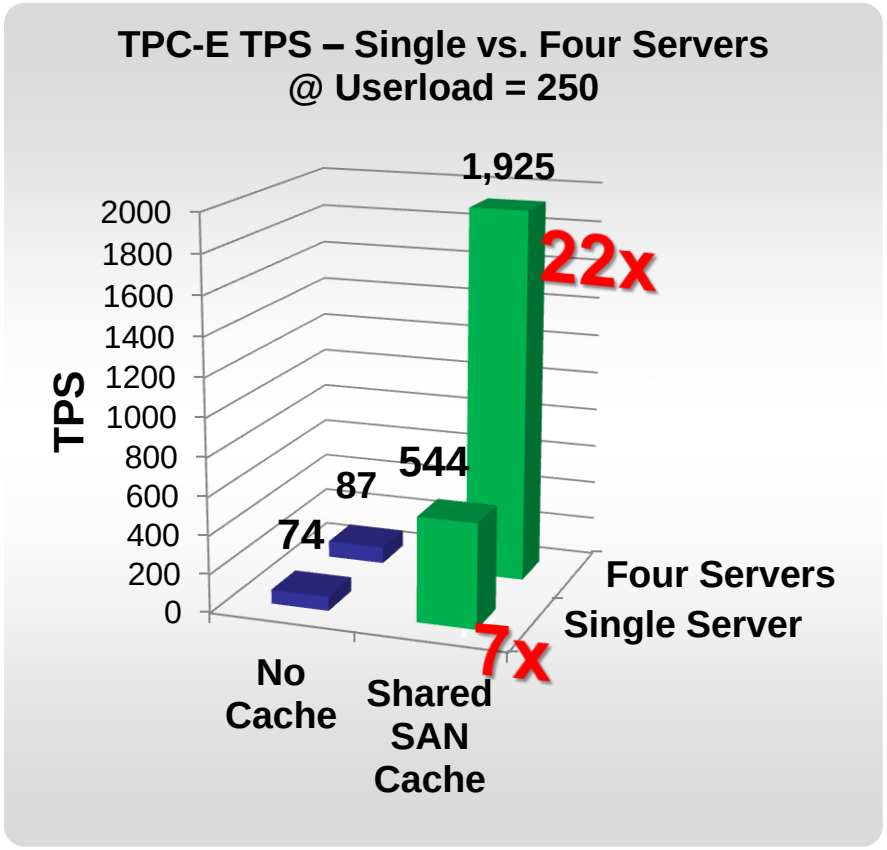




- Caching SAN Adapter transparently manages the SSD Cache on the server
- Only 30% of the database needs to be cached to see a possible 7 times the Transactions Per Second (TPS) is achievable

More Servers on Same SAN Storage



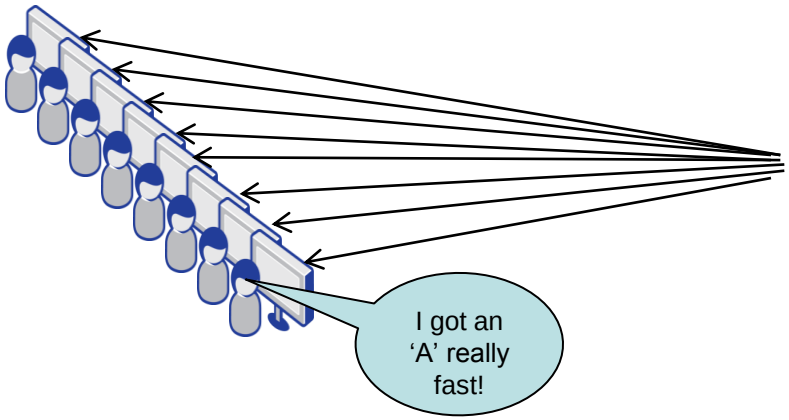


- Adding four servers with no cache barely moved the TPS needle
- Four networked Caching SAN Adapters sharing cache could nearly quadruple TPS
- Legacy storage life is dramatically extended – customers save massive $$$

VDI is the killer app for K-12

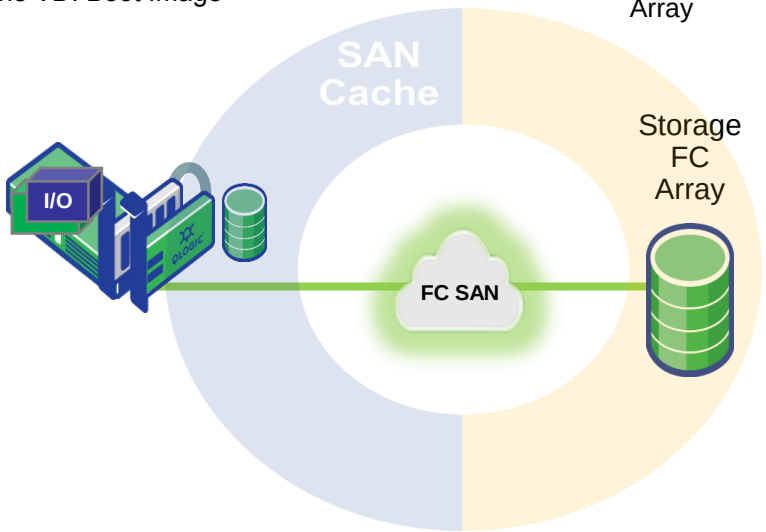
- Critical to address reboots between classes (boot storms)

Virtual Desktop Clients, on cheaper PCs or tablets boot up at cache based speeds!



Virtual Desktop Servers with Caching SAN Adapters can "cache" the VDI Boot Image data

The VDI Boot Image Data resides on an Array



Database Server Acceleration – Server DRAM Issues

- Increased DRAM on the server can increase SQL performance
  - Drawback is cache is captive to just the server it is installed into
  - DRAM in the server is expensive for large databases limiting the size of the database that can be optimized with DRAM
  - Local hard drive space is needed for DRAM crash recovery – this gets fragmented and ugly over time
  - The Server CPU has to do the work of managing the cache – taking cycles from your applications

Database Acceleration – Caching SAN Adapter

- Networked Caching SAN Adapters share cache
- The Caching SAN Adapter is managing the cache, transparently to the host – more CPU cycles for the application
- Database sizes can be much larger with Caching SAN Adapters as there is no need for local crash files
- Virtualized and Clustered multi-server environments of any size database are optimized

Caching SAN Adapters

- In Summary
  - Based on an SAN model
  - Transparent, Shared, Networked Cache
  - Many Database and Virtualization Applications can benefit

References

Caching SAN Adapter – wikipedia.org