This Storage Intelligence (StorInt™) dispatch covers recent Microsoft Exchange Solution Review Program (ESRP)[1] V3 results for Exchange 2010. There have been a large number of submissions this past quarter however none in the 1K-and-under mailbox category. But since this is our first dedicated discussion for this mailbox category, this will be our first time to see these results. Future dispatches will report on the over-5K and 1K-to-5K mailbox categories, but all prior ESRP V2 and ESRP V3 performance dispatches are available on SCI's website[2].

Latest ESRP V3.0 results

We start our ESRP analysis with Exchange database and log access latency results. Recall that this chart is sorted by the database **read** latencies.
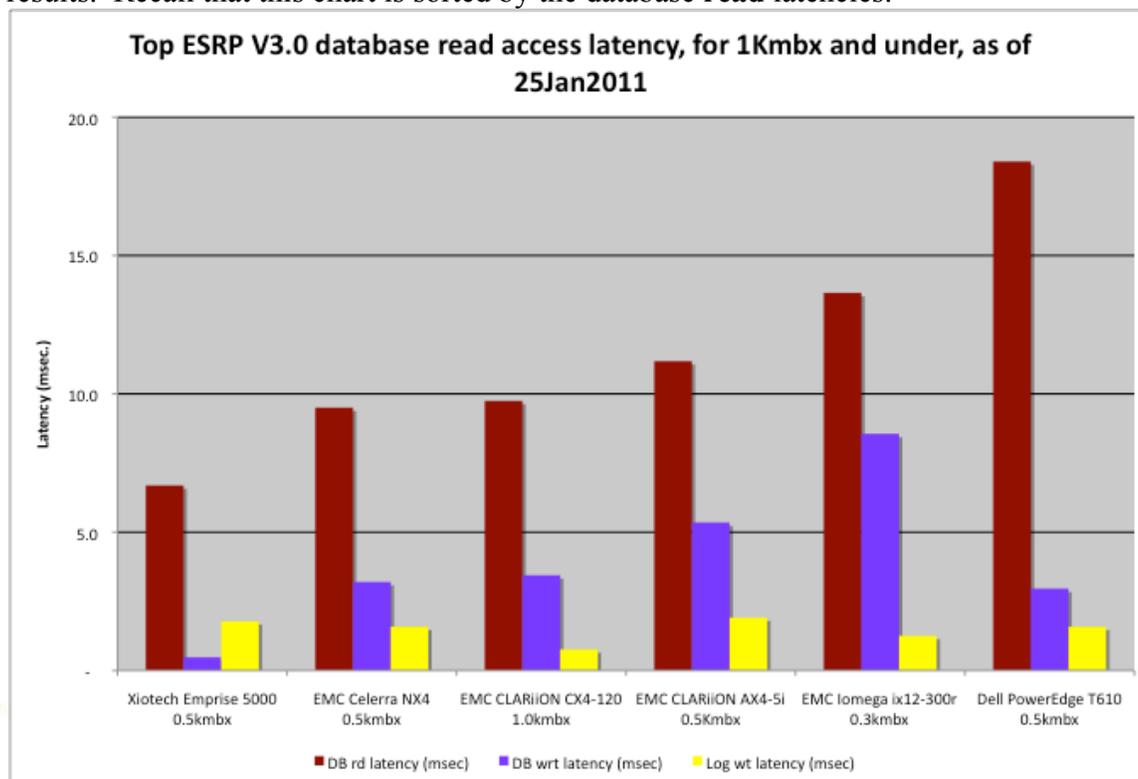

Figure 1 Top ESRP database-read latencies

For Figure 1, the Xiotech Emprise 5000 takes top honors with EMC taking then next 4 slots followed by Dell. Note that the Xiotech product was the only FC attached storage in this category the rest being iSCSI (EMC) or SAS (Dell). Unclear why that would show up so well here but it does. The other anomaly is the relatively great write latency shown by the Xiotech storage. However, it should be stated that Xiotech had 20, 15Krpm disks whereas the rest only had

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[1] ESRP results from http://technet.microsoft.com/en-us/exchange/ff182054.aspx, as of 25 January 2010
[2] All prior SCI ESRP Dispatches can be found at http://silvertonconsulting.com/cms1/dispatches/

8 or fewer and slower speed disks. One would not expect random database read latency to be significantly impacted by wide data striping but write latency, mostly dependant on overall destaging throughput, could easily be helped with more disks. Of course, faster disks would help all these metrics

As a side note, each month I review one chart from each of our performance dispatches in my blog[3] and the last year when I blogged on ESRP database and log latencies it received lots of comments[4]. It seems that some believe that latency is not an important concern for Exchange 2010 storage performance. As I stated in my response to those many comments, I strongly disagree with that view.

Next we turn to ESRP database transfer counts for the 1K-and-under mailbox category. Unlike higher mailbox categories, at this mailbox count we have historically used un-normalized or actual database transfers per second.
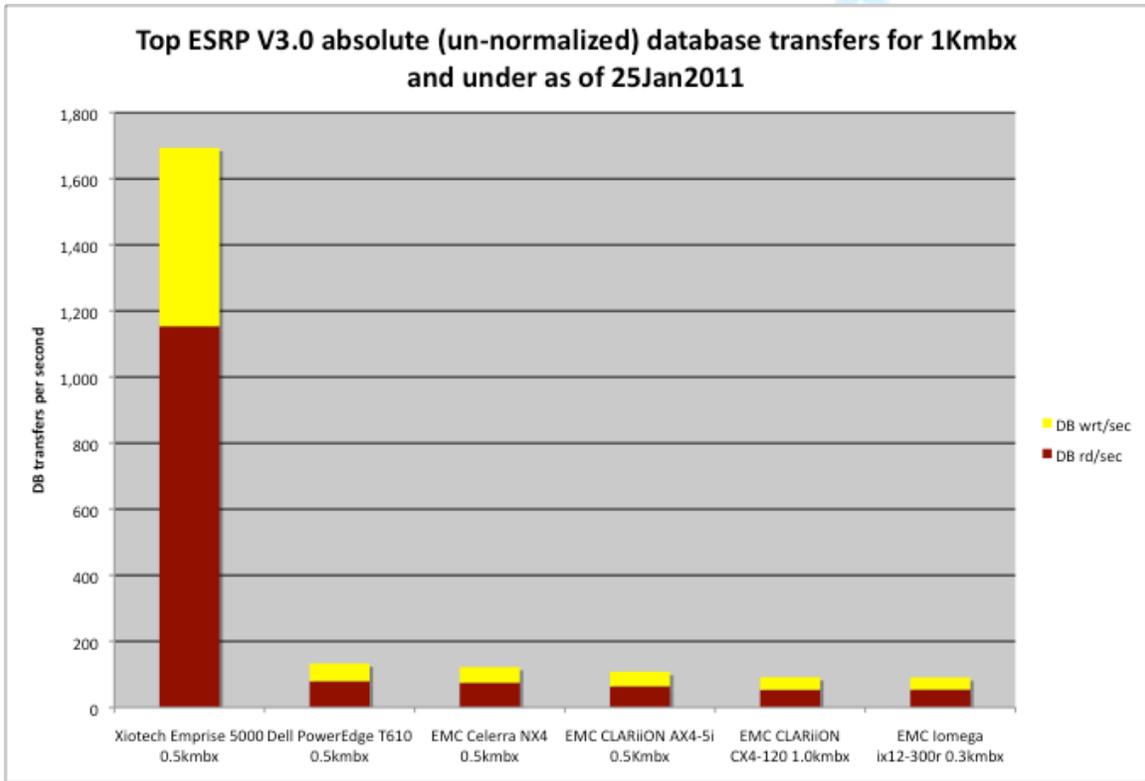

Figure 2 Top DB transfers per second

Figure 2 clearly shows the advantage of more and faster disks, wide striping and FC storage access. The fact that Xiotech is over 10X the nearest competitor is no doubt also due to its better caching and higher internal bandwidth (guessing here). However,

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[3] See http://RayOnStorage.com or http://silvertonconsulting.com/blog
[4] See http://silvertonconsulting.com/blog/2010/08/18/microsoft-exchange-performance-esrp-v3-0-results-chart-of-the-month/

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another factor was the simulated IO/mbx/sec Jetstress driver parameter. Xiotech used 0.6 IO/mbx/sec, while all the others were at 0.18 IO/mbx/sec or lower which may account, at least, for a factor of 3.5 of their advantage but cannot speak to all of it.

Dell's SAS storage was able to hold it's own against the EMC iSCSI storage in this comparision. However, in all fairness, Dell T610 and EMC CLARiiON AX4-5i were the only two subsystems using 8-disks. The EMC Celerra NX4 had 6-disks while the remaining CLARiiON CX4-120 and Iomega ix12-300r had only 4-disks each.

Now why the Celerra NX4 (with an AX4 backend) with 6-disks was able to beat the CLARiiON AX4-5i with 8-disks, both with iSCSI, can only be due to Celerra's use of faster (10Krpm) disks. The CLARiiON's used the slower, 7200rpm disks. Apparently, faster disks matter to Exchange (or Jetstress's simulation of Exchange) performance.
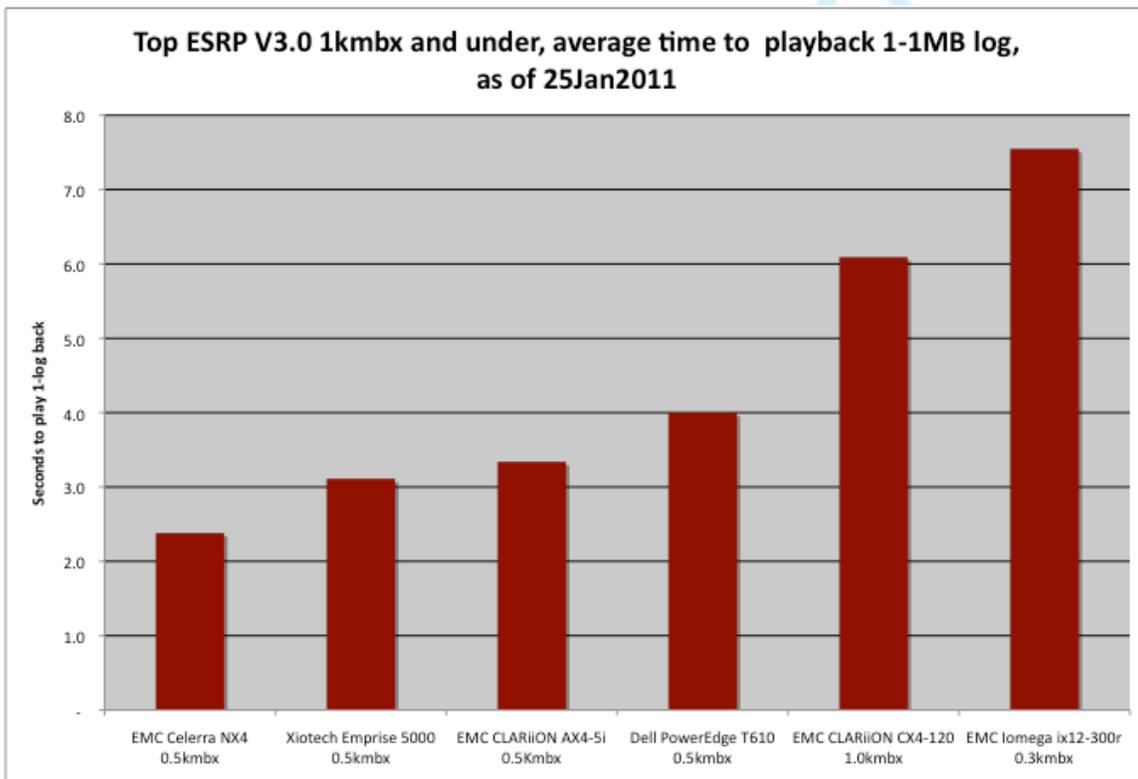
Next we examine log playback performance.

Figure 3 Top log playback times

Surprising results here. Unclear why Celerra did so much better than Xiotech in the playback of a 1MB transaction log, given all the other advantages of the Xiotech's system.

Log playback seems to be a pretty complex workload, driven as fast as the storage can handle it. Wheras the other simulated email workloads are all driven by the IO/mbx/sec Jetstress parameter, which was higher for Xiotech than all the rest. These results

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probably say something like Celerra's configuration had some spare bandwidth that deserved a higher IO/mbx/sec driver parameter than what was actually used. Whether this would have changed the rankings for the other charts is anyone's guess. Cellera's performance here was better but not 10X better than Xiotech.
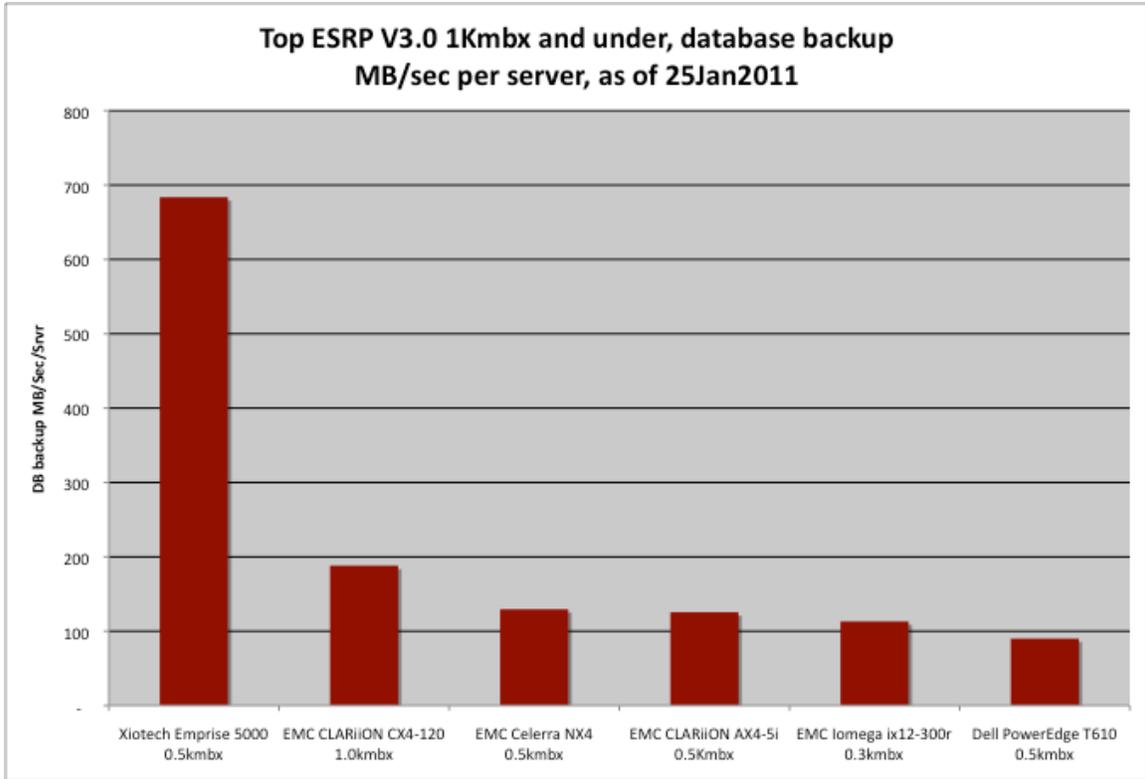

Figure 4 Top 10 database backup activity in MB/second/database

Finally, Figure 4 shows Exchange backup throughput rates in MB/sec/server. Again, the Xiotech system dominates these results here but the advantage is not nearly as striking as the database transfers per second. This time the CLARiiON CX4-120 system emerged as #2 with Celerra as #3. Recall the CX4-120 had only 4 large capacity disks. I believe database backups are primarily sequential access, and in this case the fewer disks seem to work just fine. The difference between the Celerra and the CLARiiON AX4-5i is ~4MB/sec and at this level may just be noise.

As we have stated before, with Exchange 2010's mailbox resiliency using DAGs and lagged databases, backup activity can seem less important. However, there are many valid reasons for database backups and as such, an ongoing need for mailbox backups will remain. Thus, we will continue to report on this metric for the foreseeable future.

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Conclusions

Well we have finally completed our analysis of one full pass across all mailbox categories for ESRP v3.0 or Exchange 2010. There have been many surprises but for being only 1-year old, one serious eye-opener was the large number of submissions (45) that continue to stream in. SPECsfs2008 is still not there yet and it's almost 2.5 years old now. I look forward to future ESRP analyses as we fill in some of the blanks and deal with many more submissions that are sure to show up.

As for today's analysis, I suppose it's no surprise that the Xiotech's wide striped, 15Krpm, 20-disk FC storage system would dominate performance on this 1K-and-under mailbox category. But the advantage in raw number and speed of disks may not be the complete story. The fact that they pushed Jetstresss closer to their upper end of their performance envelope in combination with their distinct storage advantages enabled them to do much better than their competition, at least for now.

Finally, as discussed in prior dispatches, ESRP/Jetstress results seem designed to be difficult to compare but in our view, merit the effort. Thus, we strive to refine our analysis with each report. As always, feel free to contact us with any ideas on how to improve. In that regard, our contact information can be found below or on our website at SilvertonConsulting.com.

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