Oracle announces the T5 microprocessor with extravagant claims

By Bill Moran and Rich Ptak

Oracle announced its latest microprocessor, the T5, in a press release[1] dated March 26. As a part of their announcement, Oracle released a videotape[2] featuring Larry Ellison, Oracle's CEO, and John Fowler[3], Executive VP of Systems, expounding on T5 performance and benefits. Let's examine a few key claims.

- The T5 is the fastest microprocessor in the world.
- With the T5, Oracle has established 17 world records in benchmarking.
- The T5 has established a TPC-C record for the fastest single system.
- Oracle had displaced IBM's lead in integer performance.
- Ellison predicted that Oracle will continue to double the performance of its microprocessors annually by moving software functions into the hardware.
- Solaris continues a tradition of binary compatibility.

Benchmark Background

Before we discuss Oracle's benchmark results, let's review the recent history of benchmarking. Some years ago the issue of benchmarking was a very hot marketing topic. Vendors were keen to surpass each other, particularly in the TPC-C benchmark. However, as the performance levels for the benchmark grew higher and higher, it became more and more costly to run this benchmark. Eventually and for a variety of reasons, the results declined in importance. The final blow came as the industry realized that getting a TPC-C result could be a multi-million dollar project. Vendors felt it was no longer necessary to announce a TPC-C result with every new system announcement and the TPC-C[4] disappeared from view shortly thereafter. It is also worth noting that the TPC-C is a very old benchmark[5]. A proposed replacement benchmark, TPC-E, has not been accepted, nor run for most new systems.

Therefore, any new TPC-C result today will, of necessity, compare the results to much older systems since there are no TPC-C results for the newest systems. While not against TPC rules, such comparisons are not very informative for price/performance or even just performance. It may be that Oracle will succeed in resurrecting a TPC-C race. Our guess is that it won't happen.

T5 Fastest microprocessor in the world

The Oracle team claims that the T5 is the speed king of the microprocessors. However, most of the benchmarks that Oracle showcases are for the system or Java or some other benchmark. The quoted benchmarks require some twisting to indicate microprocessor performance.

The closest benchmark to measure microprocessor performance is the SPEC CPU2006 series – some of which measure both integer and floating point performance. Searching Oracle results

---

[1] http://www.oracle.com/us/corporate/press/1923343

[2] You can find the video here http://www.oracle.com/us/corporate/events/sparc2013/index.html

[3] Fowler pointed out that there is another microprocessor, the M5, for the larger Oracle M system .Larry promised a future TPC-C result for the M series.

[4] There were constant rumors that some vendors were designing their systems to optimize TPC-C performance.

[5] It was introduced in July 0f 1992 but it has been updated since. See http://www.tpc.org/tpcc/default.asp

yielded three T3 results and some older Sun Fire results. We found no Oracle T5 results. If the T5 is the 'speed king', you would expect Oracle would showcase its results in such benchmarks. Lacking such benchmarks, we would conclude that Oracle did not prove its case.

17 World records

Oracle claims that the T5 has set 17 world records. Following the link to Oracle's benchmark site[6], under the heading for recent results, no matter how we count we only get 8 results. (We give Oracle credit for 2 from JD Edwards) These (all T5 results except #4) are:

1. TPC-C Single System Performance
2. SPECjEnterprise2010
3. Two-Tier SAP SD Application
4. Two-Tier SAP SD Application M5-32 with SAP Enhancement Package 5 for SAP ERP 6.0
5. Two Socket results for SPECjbb2013
6. Two world records on a single system on JD Edwards EnterpriseOne
7. Oracle Times Ten In-memory Database

Perhaps the other referenced benchmarks are internal Oracle measurements, but they don't appear to be industry-standard.

TPC-C record for fastest single system

Oracle is absolutely correct, as far as this goes. They have the best TPC-C result for a single system with 8, 552, 523 tpmC. However, the comparison with IBM systems, while strictly valid under the TPC rules are effectively meaningless since the referenced IBM systems are so old[7], they might be considered obsolete. As mentioned earlier, there are no TPC-C results available for the latest IBM Power 7+ systems - T5's contemporary competitor.

Takes the lead from IBM in integer performance

We cannot agree with this claim. As mentioned, integer performance is best determined by the SPEC2006 series of benchmarks. Oracle provides no results for the T5 (or M5 either) for this benchmark. We believe that their claim is based on a Java benchmark.

Other benchmarks

We suspect that the reader's eyes might be glazing over at the mention of more benchmarks. However, we need to say a few more words about the SAP benchmark where Oracle claims another world record. The Oracle M5-32 achieved 85,050 users in the benchmark.[8] The best IBM result was with a 780 with 12 processors, 96 cores, and 384 threads. This IBM system does have a Power 7+ microprocessor so it's not obsolete like the 780 quoted in the TPC-C benchmark. The IBM number of users was 57,024. We concede that this is a solid number for Oracle. However, this result is worth a bit more analysis. The Oracle machine had 32 processors compared with the 12

---

[6] http://www.oracle.com/us/solutions/performance-scalability/index.html?origref=http://www.oracle.com/us/corporate/press/1923343

[7] The IBM 780 result is from August 2010. In raw performance it beats the T5 with a result of 10, 366,254 tpmC. Note that the IBM result is a clustered result while the T5 is, as Oracle says, a single system. The T5 wins with a price performance of $.55 compared to the IBM $1.38. Both are per tpmC. You can see the top TPC-C results at http://www.tpc.org/tpcc/results/tpcc_perf_results.asp

[8] For the details see http://www.sap.com/solutions/benchmark/sd2tier.epx

processors in the IBM system. Oracle had 192 cores compared with the 96 in the IBM 780. So with 2.7X the number of processors and 2X the number of cores, Oracle managed to beat the IBM number of users by only 49%. Clearly, Oracle fielded a beefier system than IBM; as a result they got a higher score. Incidentally, the Oracle results do not show that the M5 is the fastest microprocessor around.

Move software functions into the hardware to double performance

We were amazed to hear Larry Ellison carry on as he did in the video about moving software functions into hardware. He made it seem that Oracle was the first and only company to have this capability. Unfortunately for Larry's claim for Oracle leadership here, IBM has been doing this (particularly in its mainframes) for many years. It is a well-known, extensively implemented and completely valid way to improve performance. We do remain skeptical of Larry's claim that Oracle will be able to double its performance every year indefinitely by moving database and Java functions into the silicon.

Solaris−Binary compatibility

Solaris is a very good operating system. It offers binary compatibility to customers who have applications that run on earlier versions of the OS. They can run the applications on the latest version without any change. There will be new demands on Solaris, as both Larry and John Fowler pointed out, since it will need to scale with the M5 system. In addition, the OS will have to handle memory errors in the much larger memory of the M5. There is no question that challenges exist for Solaris in the future.

M5—A Mainframe

By identifying the M5 as a mainframe, Larry has invited comparison with IBM's mainframe. We went to a Sun meeting in NYC some years ago. We heard the Sun speakers identify MVS (or z/OS as IBM renamed it) as the gold standard in operating systems. They said that their plan was to enhance Solaris to make it ultimately match MVS. We think that both Oracle's software and hardware have a long way to go before it can match IBM's z series.

Conclusion

In spite of Larry's inflated claims of Oracle having caught up to and surpassed its competition in performance, we find no significant evidence of any such thing. It is dubious whether or not the T5 can live up to the claim of being the 'fastest microprocessor in existence'. We see no indication that the M5 can match the IBM mainframe. As we have shown, most of the other Oracle claims fail to stand up to scrutiny. While Oracle has strengthened their operating system and have registered some good numbers in certain benchmarks, they will have a struggle matching IBM's UNIX systems (Power7+), let alone the IBM mainframe. It will be interesting to see what the market decides.

Publication Date: April 3, 2013

About Ptak, Noel & Associates LLC

We help IT organizations become "solution initiators" in using IT management technology to business problems. We do that by translating vendor strategy & deliverables into a business context that is communicable and actionable by the IT manager, and by helping our clients understand how other IT organizations are effectively implementing solutions with their business counterparts. Our customers recognize the meaningful breadth and objectively of our research in IT management technology and process.

www.ptaknoel.com