



Oracle Shows SPARC Roadmap, 2010–2015, and Introduces T3 SPARC Systems
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Oracle announced a new SPARC-based T-series family of systems, the T3 models, as part of its [Oracle OpenWorld conference](#), September 19–22 in San Francisco, California. [The T3 systems](#) are scheduled to ship in 4Q10, starting in October 2010.

These systems are built upon 16-core SPARC CMT (chip multithreading) processors, which are intended to provide high performance for Web-based, network-facing, multithreaded (database) and collaborative workloads. The new 16-core processors — doubling the number of cores from previous T-Series processors — were designed by Sun Microsystems engineers, working with a 40nm process, and then the processors were fabricated by TSMC of Taiwan.

This set of T3 server models is a follow-on to the T2 and T2+ systems models, which are generally deployed for scale-out configurations in enterprise and service provider infrastructure, and were originally introduced in 2007. The T-series systems — available in 1-, 2-, and 4-socket configurations — are known for their energy efficiency, small physical footprint and overall performance for the workloads mentioned above. Importantly, they support a series of Oracle/Sun system innovations, including the LDOMs for SPARC systems (now called Oracle VM Server for SPARC, or OVMs); the Solaris containers that provide granular isolation of applications; and the ZFS extensible file system for large datastores).

A Look at the Five-Year SPARC Roadmap

In another related development at OpenWorld, Oracle showed a more detailed roadmap of its plans to develop SPARC processors, spanning the period from now until 2015.

The five-year roadmap was much anticipated, given the competitive nature of the Unix server marketplace — and previous announcements of the IBM POWER7-based IBM Power Systems servers and Intel Itanium 9300-based HP Integrity servers this summer. Three companies — IBM, HP and Oracle — sell more than 90% of Unix servers worldwide — and many Unix system customers evaluating next-gen systems wanted to learn more details about the technical roadmap to support their near-term and long-term planning.

The roadmap makes clear that there is a drive to increase the core count for CMT SPARC, quadrupling the core count over the five-year period from now until 2015. At the same time, there will be increasing focus on process changes affecting density, performance optimization, and energy efficiency. IDC believes that, over time, the CMT SPARC processor design will gain so many transistors that it will begin to evolve from an initial focus on network-facing, parallel-threaded workloads and a range of business applications — and more in the direction of supporting more scalable, demanding workloads, such as are supported today on the Fujitsu SPARC64 processors.

Now, it appears that this division of labor — with CMT focused on smaller systems (1–4 sockets) — and SPARC64 focused on high-end systems (8–64 sockets) is due for some eventual convergence —but it's too soon to say exactly how and when that would happen. IDC believes, however, that execution on this roadmap will be achieved through an extension of the intercompany agreement that had existed between Sun Microsystems and Fujitsu Limited.

Details of the T3 Launch

Highlights of the T3 systems launch included the following:

- The T3 series SPARC processor — This is a 16-core processor, with each core running at 1.65GHz. It supports 128 threads per 16 cores. It is the latest version of the CMT (chip multithreaded) SPARC design, which is used in SPARC-based servers with 1–4 sockets.
- SPARC T3-1B server — Single-socket 16-core blade with 128 threads.
- SPARC T3-1 server — This is a 2U, single-socket server with 16 cores/128 threads. The rack-optimized T3-1 is intended for deployment in scale-out Web infrastructure.
- SPARC T3-2 server — This is a 3U, two-socket server with a total of 32 cores and 256 threads. A four-socket, 5U version (SPARC T3-4) has a total of 64 cores and 512 threads.
- The rack-optimized SPARC T3 server models can be configured with 2GB (T3-1 and T3-1B), 4 GB and 8 GB memory DIMMs — up to 128/256/512GB per system. Support for 16GB DIMMs is planned for 2011.
- Support for Oracle Solaris 10 and Oracle Solaris 11 Express, which is shipping as a beta release for developers to start using now, before Solaris 11 ships next year.
- All of the T3 systems are engineered to optimize support for Oracle software products, including Oracle Database 11g, Oracle Fusion Middleware, and Oracle Applications, such as Oracle Siebel CRM and Oracle WebCenter Suite.

IDC Analysis: Two Paths to SPARC Evolution

The technical roadmaps showed by Oracle and by Fujitsu — which both build to the SPARC V9 architecture — show alternating product introductions around the T-Series and M-Series servers. Both are built on compatible SPARC technology, with different implementations supplied by Oracle (based on Sun SPARC CMT technology) and by Fujitsu Limited (based on SPARC64 technology).

The T-Series servers are based on the CMT SPARC processors, which will be rapidly adding cores to the total supported per processor, as the density of transistors within each chip implementation rises, over time. As was noted previously, Oracle will design the CMT processors, and they will be fabricated by another firm (for the T3 series, it will be TSMC). For its part, Fujitsu, has been designing and manufacturing the SPARC64 processors, which are the engines for the scalable M-Series servers. Fujitsu both designs and fabricates these processors.

If observers had been looking for a discontinuity, or a major shift in the roadmap, it wasn't visible on the five-year roadmap, although the alternating deliverables will give each company more time to complete its designs, to tape out the new processors, to fabricate them and to test them.

However, it appears that by 2015, some kind of convergence may take place, with neither T-Series or M-Series mapped to the SPARC implementation that is to be delivered that year. IDC believes it is possible that, given the parallel development paths on the same V9 architecture, the two aspects of the chip design goals will finally synch up in 2015.

In a follow-on to the APL agreement between Sun and Fujitsu, announced in 2007, the most scalable Oracle SMP servers will be the M-Series products (M4000, 5000, 8000 and 9000), which will be optimized for use with the next version of Solaris — Solaris 11. Fujitsu already is shipping the "Jupiter II" series of SPARC64 processors. It plans another version, which is scheduled to ship in 2012. As CMT technology evolves, it seems possible that attributes of both design streams (CMT and SPARC64) will come closer together, but there's been no official statement about that, to date.

For this convergence to be realized, IDC believes some trade-offs will need to be made in both the CMT and SPARC64 core designs in order to accommodate the unique workload needs of both T-series and M-series systems. However, it appears that the processor will house enough transistors to support both "styles" of computing — network facing for Web traffic and parallelized workloads — and the stateful, serial processing, with single-threaded performance more characteristic of processors for SMP servers. IDC believes the SPARC technology roadmap is a focal point in Oracle and Fujitsu's plan to extend their inter-company technology agreement.

Oracle's Plan to Evolve the CMT SPARC Processors and Products

The roadmap makes clear that there is a drive to increase the core count for CMT SPARC, quadrupling the core count per processor over the five-year period from now until 2015. Over time, there will be increasing focus on process changes affecting density, performance optimization, and energy efficiency. IDC believes that, over time, the CMT SPARC processor design, which Oracle inherited from Sun, will gain so many transistors that it will begin to evolve more in the direction of supporting more scalable, stateful workloads such as are supported today on the Fujitsu SPARC64 processors.

Fujitsu's Role in Advancing M-Series SPARC Designs

Fujitsu and Oracle will very likely expand their already-close relationship, now that Oracle has acquired Sun. Signs of that were everywhere at Oracle OpenWorld: Fujitsu was the premier sponsor of the Oracle OpenWorld conference in San Francisco, and had a featured speaker, Fujitsu Corporate Senior Vice President Noriyuki Toyoki, delivering a keynote speech on Monday, September 20. Fujitsu also had a large breakout session focusing on the relationship with Oracle, and the SPARC roadmap, as shown at the keynotes.

It's worth noting that Fujitsu emphasized its tradition of services and solutions for enterprise customers in a keynote address video. Fujitsu has large service delivery capabilities in EMEA, Asia/Pacific and North America — and more capability than is being fully utilized in the Americas. IDC also believes that Fujitsu has a special opportunity to engage more intensively as an Oracle services partner, given its worldwide resources, and its deep knowledge of SPARC and Solaris technologies. But the true dimensions of that evolving partnership will remain to be seen, should Oracle and Fujitsu decide to ink an agreement regarding services delivery.

Competition in the Marketplace

If the roadmap shown at Oracle OpenWorld is the plan of record, then it will lend important credibility to current and longtime customers of SPARC-based systems that have invested deeply in that technology over the past 15 years. It would also validate the repeated statements of Oracle regarding its intention to invest heavily in SPARC and Solaris, which have been made, and advertised widely, ever since Sun was acquired by Oracle in late January 2010.

Without customer buy-in, the Sun installed base (more than 1.5 million servers worldwide) would be open to further attack by IBM and HP — both of which launched anti-Sun competitive replacement campaigns, starting in the summer of 2009, while the Sun acquisition was still in the approval process. Those programs were designed to push platform migration away from Sun, and toward IBM and HP. Indeed, IDC research studies have found that platform migration programs, many of them "on hold" in 2009, are once again on the increase generally — but that the outcomes are often unpredictable. That is, workloads from older Unix systems could move to another Unix, or to Linux — or even to Windows.

And while IBM and HP have highlighted their competitive wins against Sun servers, the Sun installed base is still extensive, on a worldwide basis, with its greatest strengths in financial services, telecommunications and government. IDC notes that the SPARC-Solaris combined platform supports binary-compatibility back to the late 1990s.

Conclusion

The real question for Oracle is how to get the word about the SPARC roadmap out to customers evaluating platform migration or change to a competing Unix server. Given the order of announcements this year, the Oracle OpenWorld announcements came not a moment too soon — with the fourth quarter typically a period of seasonal acquisition of Unix servers, using funds that must be spent by year's end. For the T-series systems, this competition for server footprints may come to include not only IBM's Power Systems, and HP's Integrity systems, but also 2-, 4-, and 8-socket systems based on x86 server technology running Linux or Windows.

From the beginning of its acquisition of Sun, Oracle has steadfastly emphasized its interest in bringing both SPARC and Solaris to market — and in investing heavily in both technologies. IDC interprets this as a way to have control of both hardware and software intellectual property (IP), so that both can be optimized for greater performance and throughput than would be the case if they were tuned separately. This strong push for SPARC/Solaris has been puzzling to many because of the option to leverage other processors to boost system performance. It now appears that the combination of faster processors, flash memory and solid-state disks described at OpenWorld, providing both near-term and long-term system performance improvements, is just the start of a planned reinvention of the 20-year-old SPARC franchise for a new generation of Web-enabled workloads.

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