TRANSITIVE®

The leader in cross-platform virtualization

Running Solaris/SPARC Applications on Newer, More Cost-efficient Platforms with QuickTransit®

"Transitive has successfully solved an age-old problem that software engineers have been trying to solve for years. This technology, which for the first time provides true instruction set architecture (ISA) independence, has tremendous potential to impact the entire computing industry, and its synergies with other emerging virtualization technologies are very exciting indeed."

— **Mendel Rosenblum**,
Associate Professor at Stanford University
and co-founder of VMware

Introduction

Transitive, the leader in cross platform virtualization, provides a family of products which allow Solaris/SPARC application software to run on a variety of new platforms with no source or binary changes to the applications. The three products in this family are:

- QuickTransit® for Solaris™/SPARC®-to-Linux®/x86-64
- QuickTransit® for Solaris™/SPARC®-to-Solaris™/x86-64
- QuickTransit® for Solaris™/SPARC®-to-Linux®/Itanium

QuickTransit does this through a process called dynamic binary translation (DBT). This means that the translation takes place on the fly while the application is "executing." QuickTransit inspects the application path that is being executed and translates the SPARC instructions into either x86 or Itanium instructions and translates the operating system (OS) calls into Linux calls as needed. Then the translated code is optimized and cached so that the next time the same path is executed it will not require translation again. Through this process application performance is impacted a very small amount by QuickTransit's processing, but much more by the relative speed and capacity of the original and target processors, in some cases achieving 2 to 4 times the processing speed of the application on its original platform. QuickTransit runs in user space in both Linux and Solaris, so it requires no special handling on the part of system administrators.

There are significant performance benefits that users enjoy when moving from older SPARC-powered systems to the latest Intel® Xeon® 7400 Series-powered servers. With up to six cores per processor, the Intel Xeon 7400 series brings more power to users than ever before. A four socket system will provide 24 cores of computing power available to users to improve the performance of their applications, especially if they are multi-threaded. Typically Transitive has measured application performance on modern Xeon processor-based systems to be two to four times faster than the older SPARC systems that the applications came from. In recent performance tests comparing systems powered by Intel Xeon 7400 series processors (2.66 GHz) to systems powered by UltraSPARC IV+ (1.5 GHz), selected benchmark tests ran as much as six to eight times faster on the Xeon. The performance you experience will vary by the workload, but our observation is that workloads that are highly threaded or otherwise take advantage of the six cores in the Xeon 7400 series processors run significantly faster.

"Typically, application performance on modern Xeon processor-based systems is two to four times faster than on older SPARC-based systems."

The case for Translation

Why would you run an application translated rather than migrating or porting to the target platform?

- It takes a significant amount of time (**and thus cost**) to port an older application to a new platform. If there is a change in the hardware instruction set, then the application must be recompiled. If there is a change in the OS then applications must be rewritten to use the new OS calls. If the new platform is of different architecture than the old platform then there could be some significant changes required just to get the application to do what it did before, without adding any new features. In many cases, the cost to port an application may be as much as 40% of the original development cost.

- If the source for the original application was lost, then porting is not possible. Reverse engineering, starting development from scratch, or translation are the only options available to the IT shop.
- If the application was obtained from a vendor (ISV or consultant) then, even if the source is available, the understanding of the application's architecture and logic are not necessarily available to those required to port the application.
- Many applications have other processing programs (e.g. Oracle 8) embedded within them. Even in the case where the source code and development knowledge is still available to the IT organization, porting would require that the data base application be upgraded to the new platform and appropriate changes made to accommodate new features. In the cases where the source code and/or the knowledge base are not available, porting is no longer an option.
- An application runs well on a Solaris/SPARC platform and utilizes an older, shared Oracle database (e.g. 8, 8i or 9i) running on a different server to perform its database transactions. Many applications are dependent on specific versions of Oracle. Moving this application to a different platform would require porting it AND upgrading to a newer version of Oracle (not a simple task) in order for it to continue working as it has on a new platform.

All of these cases require significant investment of time and money to simply run the application unchanged in a new environment, and a large part of that effort will be spent on testing the scenarios thoroughly prior to cutover. QuickTransit will allow Solaris/SPARC applications to run in new environments *with no change to the source or binary code*. It just runs.

"In selected benchmark tests, applications ran as much as six to eight times faster on the Intel Xeon 7400 series processor systems than on UntraSPARC IV+ systems."

Use Cases

QuickTransit users have had very good experiences running older Oracle databases compiled for Solaris/SPARC in new environments, saved time and money, and achieved success in a number of implementation scenarios:

- The company has made a strategic decision to move away from older SPARC hardware in order to save floor space and significant cost for power and air conditioning. Moving to a new platform by using QuickTransit has proven to be a much faster and lower cost solution than porting applications from ISVs or developed in-house.
- Companies concerned about disaster recovery (DR) and willing to invest in "shadow data centers" but not willing to bear the significant cost of using expensive SPARC hardware in them can run the Solaris/SPARC applications in an industry-standard server at a much lower cost and without porting the applications.
- Enterprises that need to inexpensively scale-out their Solaris/SPARC environment to help contain periods of significant computing power needs (i.e. year-end processing, heavy shopping season, etc.) may extend their Solaris/SPARC environment onto industry-standard servers, saving significant amounts of money and time.

- Companies who want to port their applications to new, industry-standard platforms, but need to achieve the savings in hardware cost, floor space, power and air conditioning right away have elected to use QuickTransit to move their applications immediately and then choose applications and modules that are high value porting opportunities for porting at a later date without disrupting the normal business processing. In this way, only those portions of the application portfolio that have a significant return on investment (ROI) need be ported. The other applications will continue to work as they always have.
- Companies who want to save on electricity to power and cool their data centers have found that there is significant savings to be had by consolidating older SPARC-based servers into modern Xeon-based servers. In one instance a customer was able to consolidate two full racks of SPARC servers into a single 4U blade system with two Intel quad core processors, achieving their savings goal without any noticeable change in performance to the users of the systems. In some cases we have seen consolidation using virtualization software at the rate of five SPARC systems to a single core of a multi-core Xeon based system. The consolidation factor will vary based on the usage of the servers and how they are deployed across the cores/processors/systems.

QuickTransit interoperates very conveniently with other applications, native or translated, in either a virtualized or native environment, allowing Solaris/SPARC applications to be supported as first class objects, sharing resources dynamically with Windows and Linux workloads for the first time.

Conclusions

Running Solaris/SPARC applications on modern industry-standard servers makes a lot of sense in today's IT environment. QuickTransit can help pull costs out of the data center through server consolidation, reduction in environmental costs, and the elimination of the cost, in both time and budget, of porting applications to a new platform without any functional or performance improvement.

Next Steps

To learn more about QuickTransit, visit http://www.transitive.com

To evaluate QuickTransit for your own requirements, consult http://www.transitive.com/evaluate

QuickTransit is available in a VMware appliance (a pre-configured VM) for convenient evaluation.

To talk to a QuickTransit sales representative, contact Transitive at sales@transitive.com or you may call our offices at +1 877 399 6111 (US) or +44 (0) 20 7822 4366 (Europe)

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