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Oracle Solaris 11 Observability and Dynamic Tracing (DTrace) Frequently Asked Questions (FAQ)

Last updated 04/11/2013

1-What is Oracle Solaris Dynamic Tracing (DTrace)?

Oracle Solaris DTrace is a comprehensive dynamic tracing framework for Oracle Solaris 11 designed for real-time application debugging and performance troubleshooting. Oracle Solaris DTrace provides a powerful infrastructure that permits administrators, developers, and service personnel to concisely answer arbitrary questions about the behavior of the operating system and user programs. It is a powerful tool that can be used by both entry-level and experienced system administrators to troubleshoot—in hours or minutes—system and application performance problems that might have previously taken days. Oracle Solaris DTrace is safe to use on development, test, and production systems.

2-What are the benefits of Oracle Solaris DTrace?

With Oracle Solaris DTrace, system administrators can identify the root cause of transient performance bottlenecks safely and quickly on production systems. Developers can also use Oracle Solaris DTrace to identify performance bottlenecks in their code during product development and testing. By using the information from Oracle Solaris DTrace to optimize performance, more users or more transactions can be supported on existing systems.

3-What are the key highlights of Oracle Solaris DTrace?

DTrace offers these key benefits:

- It provides a fully instrumented operating system with more than 80,000 instrumentation points across all facets, including virtualization, networking and storage.

- It provides a unified view of both the application and the kernel.

- No changes to applications are required.

- There is no need to reboot or even restart applications before, during, or after an Oracle Solaris DTrace session.

- It is safe to use on production systems because users cannot accidentally "panic" the system.

- It provides precise and accurate responses to queries.

- Prewritten scripts of Oracle Solaris DTrace routines make it easy to get started with Oracle Solaris DTrace.

4-What is the performance overhead of Oracle Solaris DTrace?

When not in use, Oracle Solaris DTrace has no impact on system performance or on other behavior. When being used, Oracle Solaris DTrace overhead is dependent on the number of probe points being observed, but in most situations the overhead is very low, and Oracle Solaris DTrace requests that place an excessive load on the system are automatically terminated by default.

5-How does Oracle Solaris DTrace work?

Oracle Solaris DTrace allows the system administrator to dynamically turn on probes. Probes are essentially programmable sensors scattered throughout the Oracle Solaris software. Once a probe is turned on, Oracle Solaris DTrace gathers the data, aggregates it, and reports back to the system administrator in real time.

6-Is Oracle Solaris DTrace integrated into Oracle Solaris 10 and later releases?

Yes, Oracle Solaris DTrace is integrated into Oracle Solaris 11 and does not require a separate license.

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7-Do I need to make changes in my existing applications while using Oracle Solaris DTrace?

No. Oracle Solaris DTrace instruments applications dynamically with no changes required.

8-How is Oracle Solaris DTrace different from the Oracle Solaris Predictive Self Healing feature set?

Predictive Self Healing consists of two major engineering components—System Management Facility and Fault Management Architecture—which are collectively called Predictive Self Healing. Both automatically detect, manage, and compensate for faults as they occur, thereby proactively preventing system failures. SMF handles software faults, and FMA primarily handles firmware/hardware faults. Both are designed for automatic self-correction of errors as they occur, and both log diagnostic information relating to the faults. Collectively, they are designed to keep systems and applications running without manual intervention by increasing availability in the event of hardware and software faults.

Oracle Solaris DTrace is used as needed for understanding system and application behavior. With information gleaned from DTrace, system administrators and developers can tune the system and applications for best performance. Oracle Solaris DTrace does not manage faults; it tells the user what is happening in the system, and the user must then take action in order to realize performance improvements.

9-What systems does Oracle Solaris DTrace run on?

Oracle Solaris DTrace is a part of Oracle Solaris 10, Oracle Solaris 11 and future Oracle Solaris releases. DTrace has also been ported to other operating systems, including BSD, Apple's Mac OS X, and Linux.

10-Why should I use Oracle Solaris DTrace instead of existing tools such as truss?

Historically, transient failures have been debugged using process-centric tools such as truss. However, these tools were not designed for systemic problems. The tools for systemic problems are designed for postmortem analysis. Oracle Solaris DTrace is designed to understand system behavior in real time on production systems.

11-Does Oracle Solaris DTrace require root access? If not, doesn't this create security problems?

Oracle Solaris DTrace is well integrated with the Oracle Solaris Process Rights Management facility. By default, only the superuser can use Oracle Solaris DTrace, but a set of privileges is defined that can be assigned to any given user. These privileges allow successively greater visibility into the system, ranging from visibility about processes owned by the user to full system observability and interaction.

12-Does effective use of Oracle Solaris DTrace, especially D script development, require access to Oracle Solaris source code?

No. Oracle Solaris DTrace itself can be used to list available probe points, and the _Solaris Dynamic Tracing Guide_ gives excellent examples of how to make use of them.

13-Where can I learn more about Oracle Solaris DTrace?

You can learn more about Oracle Solaris DTrace by visiting Oracle Technology Network (FIXME: link to DTrace technology page). Oracle University also offers a Oracle Solaris DTrace for System Administrators course.

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14-How can I get more news about Oracle Solaris?
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For more information on Oracle Solaris 11, please visit the
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