What Makes Oracle Linux the Best Platform for Oracle Database 12c
Introduction

Oracle Databases support essential business applications such as order entry, financials, human resources, customer relationship management, and enterprise resource planning. These applications sustain core operations that generate revenue, improve business efficiency, and increase profitability. Because business success often depends closely on these strategic applications, IT departments strive to provide an optimal Oracle Database infrastructure — one that delivers responsive performance, scalable capacity, tight security, and “always-on” availability. The infrastructure must also be easy to manage and support fast database server provisioning, allowing transaction capacity to be added easily and deployed into production quickly.

Because Oracle products are designed and tested to work together, there are distinct advantages in running Oracle Database servers and applications on an end-to-end Oracle solution stack, especially when that stack includes Oracle Linux. Figure 1 depicts the underlying technology layers in the solution stack: servers and storage, networking, virtualization, operating system, database, middleware, and applications.

![Figure 1. An end-to-end Oracle solution stack that includes Oracle Linux brings the benefits of extensive testing and integration to Oracle Database deployments.](image)
For Oracle Database workloads on Oracle Linux, deep testing and integration between the layers brings substantial benefits: fast transaction speeds, scalable performance, and the security and reliability needed to meet strict service level agreements (SLAs). In addition, an end-to-end Oracle stack increases administrative efficiency since there’s no need for cross-platform skill sets to manage multiple vendor technologies. And there’s the added benefit of a single point of contact — from industry’s leading database infrastructure experts — for your most critical service and support issues.

Simply put, Oracle Linux is the best platform choice for Oracle Database workloads. Oracle Linux delivers high transaction performance, enterprise-class reliability, and a cloud-ready infrastructure — all at an extremely low total cost of ownership (TCO).

Oracle is now shipping the Oracle Database 12c release, which follows a multi-tenant architecture designed to simplify the process of evolving to a cloud-based Database-as-a-Service (DBaaS) delivery model. To build an optimal infrastructure for Oracle Database 12c or other releases, forward-thinking solution architects select Oracle Linux for the operating system tier. Oracle Linux is the cost-effective and high-performance choice when modernizing infrastructure or consolidating database instances on Oracle Database 12c. This paper explains why Oracle Linux is your best choice for hosting Oracle Database environments.
Oracle Linux: The Development Standard at Oracle

Oracle invests heavily in engineering and quality assurance for its Linux operating system. While many customers choose Oracle Linux to support their mission-critical applications, Oracle Linux is also the principal platform for Oracle’s own database, middleware, and application software engineering projects. With more than 175,000 Oracle Linux instances deployed on both physical and virtual servers, Oracle Linux is the development standard across the Oracle Database product portfolio.

Oracle Linux receives more than 128,000 hours of database and application testing each day, which hardens software releases throughout each product’s lifecycle. Even before formal evaluation occurs, Oracle Linux is the base platform on which developers prove functionality, quality, and software viability. And before any database or application software is made available, Oracle engineering teams conduct formal stress tests on Oracle Linux to certify Oracle Database and Oracle Real Application Clusters (RAC), along with an extensive battery of system verification and performance tests.

Oracle Linux includes the Unbreakable Enterprise Kernel (UEK), which is specifically optimized for the best performance of Oracle software. The Oracle Database and Oracle Linux development teams collaborate on performance enhancements to the UEK, tuning system calls and C library interfaces that accelerate applications and query processing times. Oracle engineers extensively test the optimized UEK across Oracle’s database, middleware, and application tiers as well as on Oracle servers and engineered systems. UEK is also subject to incremental and widespread testing across IT development systems running the family of Oracle Database products.

The Industry Standard for Oracle Database

In addition to the thousands of servers that support Oracle’s internal development teams, Oracle Linux is experiencing rapid adoption in the commercial Linux marketplace, gaining broad acceptance as the enterprise standard for Oracle Database workloads. According to Gartner, Oracle Linux realized year-over-year market share growth of more than 80 percent in 2012. This success highlights how IT organizations are increasingly selecting Oracle Linux on x86 systems to create mission-critical database infrastructures that are responsive, highly scalable, and cost-effective.

As an example, consider the transition to Oracle Linux undertaken by SEI, a leading global provider of investment processing and investment management outsourcing solutions. SEI processes over 1.6 million wealth management accounts (as of December 31, 2012) with $424 billion in mutual fund and separately managed assets. To deliver high-performing and reliable wealth management solutions to its customers, SEI selected Oracle Linux as the basis of its new SEI Wealth Platform built on Oracle Database, Oracle RAC, Oracle Enterprise Manager, Oracle Coherence, and Oracle WebLogic Suite. SEI selected Oracle Linux because its performance, flexibility, and scalability allow the platform to address client workloads that scale over time. After calculating the ratio of solution cost versus solution performance, SEI concluded that Oracle Linux running on x86 systems was the optimal database infrastructure for their data-intensive application workloads.

Oracle Linux Advantages for Database Deployments

Beyond the flexibility and low TCO of open source, Oracle Linux offers enterprise-class performance, security, and mission-critical reliability, availability, and serviceability (RAS). But what distinguishes Oracle Linux from other OS platforms — in particular for Oracle Database workloads — are advantages afforded by the platform’s deep integration with the solution stack, optimizations resulting from industry collaborations, and enhancements in the UEK.

Transaction Performance and Scale

The Oracle Database and Oracle Linux engineering teams collaborate continuously on improvements and optimizations to boost database application performance. For example, when traditional interprocess communication (IPC) mechanisms exhibited stability issues under heavy loads, Oracle engineers pioneered a new approach — Reliable Datagram Sockets (RDS), a low-latency connectionless protocol for delivering datagrams reliably to thousands of endpoints. Because RDS resulted in fewer retransmissions (especially during times of peak processing), it greatly improved database performance on Linux. Oracle contributed the RDS code to the open source community and it is now part of the Linux kernel. As a result, Oracle Database engineers were subsequently able to simplify the database code, removing extraneous user code that addressed the instability issues — allowing Oracle Linux to do the “heavy lifting” for high-performance database communications.

Other optimizations stem from enhancements designed to accelerate performance on today’s multicore x86 processors and advanced systems architectures. Historically Linux was widely deployed for compute- and data-intensive High-Performance Computing (HPC) applications. InfiniBand, which offers superior throughput, low latency, and excellent scalability, was frequently used as a switching fabric in demanding HPC applications and is now a prevalent technology throughout enterprise datacenters for similar reasons.

Notably, InfiniBand switches are a critical component in the Oracle Exadata Database Machine (an Oracle engineered system targeted at extreme database performance) in which InfiniBand provides high-bandwidth connections between the system’s compute and storage nodes. Data throughput performance in Oracle Exadata depends heavily on the optimized InfiniBand networking stack in Oracle Linux, the core OS in these powerful systems. Collaborating with a leading supplier of InfiniBand products, Mellanox Technologies, Oracle developers tuned the Oracle Linux Infiniband stack to scale throughput in support of extremely demanding workloads. Oracle ultimately contributed these performance-related improvements for InfiniBand to the open source community — one of many technologies that the Oracle Linux team has made to further the success of open source.

Collaborating with Intel has also resulted in enhancements that help Oracle Database applications scale well on x86 servers running Oracle Linux. Partnering with Oracle Database engineers, Intel optimized CPU threading algorithms, allowing the database to take advantage of Intel SIMD and AVX instructions that improve NUMA scalability. In addition, the Oracle Database software uses the multi-threaded Intel® IPP (Intel® Integrated Performance Primitives) library to accelerate columnar compression/decompression as well as encryption operations. For database applications compiled on
Oracle Linux, Oracle and Intel also recommend the optimized Intel compiler to obtain the best possible application performance.

Oracle Linux with UEK includes extensive performance and scalability improvements to the process scheduler, memory management, file systems, and the networking stack. It was tuned to perform better and faster on leading-edge x86 configurations that feature many CPU cores and large amounts of main memory. Optimized libraries and system calls help to improve performance for Oracle Database queries. Because of these optimizations and pervasive testing that occurs within Oracle, Oracle Linux is able to address large transaction capacities and scale well as the number of database users or the number of databases increases. For companies consolidating multiple databases on the Oracle Database 12c release, fast transaction response times and good scalability are key factors that contribute to a cost-effective infrastructure supporting this new release. Improvements to the operating system are also pushed upstream into the open source Linux community so that the optimizations can benefit non-Oracle application workloads as well.

**Superior Benchmark Results**

Benchmarks on both Oracle and non-Oracle hardware validate the outstanding performance and price/performance available with an Oracle Linux solution. For TPC-C benchmark results published on 7/10/12, Oracle's Sun Server X2-8 system — running Oracle Linux with UEK Release 2 — achieved the fastest Online Transaction Processing (OLTP) performance on an x86 system, exceeding 5 million tpmC on this 8-socket system (Figure 2). In a TPC-C benchmark submitted 9/27/12, Cisco also used Oracle Linux to produce record-breaking price/performance results (.47 USD per tpmC) running the TPC-C benchmark on a two-processor Cisco UCS system.²

![Figure 2. TPC benchmarks on Oracle Linux show outstanding performance and price/performance on x86 systems.](image)

² Source: 5,055,888 tpmC - results submitted 7/10/12 using Oracle Database 11g Release 2 Enterprise Edition, Oracle Sun Server X2-8 system, and Oracle Linux (result ID # 112032701 at [http://www.tpc.org/1787](http://www.tpc.org/1787)); 3,014,684 tpmC - results submitted 7/11/11 using IBM DB2 ESE 9.7, IBM System x3850 X5 system, and SUSE Linux Enterprise Server 11 SP1 for X86_64 (result ID #111071101 at [http://www.tpc.org/1783](http://www.tpc.org/1783)); 1,609,186 tpmC - results submitted 9/27/12 using Oracle Database 11g Standard Edition, Cisco UCS C240 M3 system, and Oracle Linux UEK R2 (result ID # 11209260 at [http://www.tpc.org/1789](http://www.tpc.org/1789)).
In Oracle Database benchmarks and internal stress testing, Oracle deploys Oracle Linux with the Unbreakable Enterprise Kernel because it delivers optimal performance results, both during benchmark tests as well as in real-life production.

**Resource Management**

Allocating system resources (CPUs, memory, network and storage bandwidth) to specific processes — such as Oracle Database instances — helps strategic applications get the resources they need, at the same time restricting resources available to other less-critical applications. Oracle Linux enables resource management through the use of control groups (cgroups), a feature introduced in Oracle Linux 6. For Oracle Database applications on large systems (like the Oracle Exadata Database Machine X3-8), cgroups can be especially valuable because it’s possible to perform “instance caging,” binding database instances to specific CPUs. On NUMA architectures, this has the effect of pinning processes to the same processor and memory nodes. NUMA binding in this way can be a big performance win since it allows a processor to access local rather than non-local memory, making memory accesses considerably faster.

**Database Smart Flash Cache**

Since many OLTP workloads are read-intensive, Oracle Database engineers developed Database Smart Flash Cache, an innovative solution on Oracle Linux to accelerate I/Os for read-mostly database workloads. This functionality allows the database buffer cache to expand beyond the System Global Area (SGA) in main memory to a second-level cache that resides on a flash device. Because flash memory is an order of magnitude faster for read operations (e.g., 4ms disk reads vs. 0.4 ms flash reads), this feature significantly accelerates database performance without any additional cost beyond the cost of the secondary flash. This caching feature is only available on Oracle Linux and Oracle Solaris. (For more information, see [http://www.oracle.com/technetwork/articles/systems-hardware-architecture/oracle-db-smart-flash-cache-175588.pdf](http://www.oracle.com/technetwork/articles/systems-hardware-architecture/oracle-db-smart-flash-cache-175588.pdf).)

**Mission-Critical Reliability, Availability, and Serviceability (RAS)**

In conjunction with advanced reliability features in leading-edge x86 systems, Oracle Linux creates a highly available platform for deploying mission-critical database applications. IT’s ability to apply kernel fixes and security patches as soon as these updates become available is a vital element in protecting data and maintaining application continuity. While other operating systems require planned outages to apply kernel fixes as well as time to reboot, Oracle Linux supports “zero-downtime” updates using Ksplice technology. Only available on Oracle Linux, Ksplice enables changes while the kernel is running — with no reboot or interruption — eliminating system downtime associated with updates. Available to Oracle Linux Premier Support customers at no additional cost, Ksplice greatly simplifies server maintenance, improving the continuous availability of business-critical database applications. (For more information, see [http://www.oracle.com/us/technologies/linux/ksplice-datasheet-487388.pdf](http://www.oracle.com/us/technologies/linux/ksplice-datasheet-487388.pdf).)

The Oracle Linux operating system takes full advantage of RAS features in today’s x86 processors configured in Oracle Sun and third-party x86 systems. These advanced processors follow the Machine Check Architecture (MCA) in which CPUs can report hardware errors (e.g., bus, Error-Correcting
Code (ECC), parity, and cache errors) to the operating system. Oracle Linux runs a Machine Check Exception (MCE) daemon called `mcelog` that detects and reports unrecoverable hardware problems. The daemon tracks and logs hardware errors, taking action based on error thresholds and in some cases triggering events such as CPU or memory off-lining.

In addition to fault management at the processor level, Oracle’s Sun servers feature superior RAS capabilities at the system level, including redundant hot-swappable power supplies and cooling fans, hot-swappable drives, and ECC memories, as in Oracle’s Sun Server X3-2 system. Oracle’s Sun Server X2-8 system features hot-swappable PCIe Express Modules, as well as hot-pluggable drives and redundant hot-swappable power supplies and fans. Using the Intelligent Platform Management Interface (IPMI) utility (ipmitool), administrators can perform server initialization, monitoring, and maintenance tasks from Oracle Linux, managing Field-Replaceable Units (FRUs), network configurations, sensor readings, and remote chassis power controls through the system’s service processor.

**Advanced End-to-End Data Integrity Solutions**

Oracle Database and Oracle Linux engineering teams have collaborated with third-party vendors to develop several cutting-edge data integrity solutions that prevent silent data corruption. Silent data corruption can occur when invalid data is read or written without an I/O error reported to the application or operating system. It typically occurs as the result of a component failure or an administrative mistake. Such errors can be catastrophic for data-centric business applications and result in extended outages. Oracle engineers have helped to construct data integrity solutions that follow the T10 Protection Information (T10 PI) standard, performing integrity checking across the end-to-end data path — from the application to the operating system, through the switch and host bus adapter, and to the disk storage device itself. When data is first written, the solution generates integrity metadata or protection information that is validated at each stage of the data path. Any detected errors are directed to the application for remediation. Oracle implements an open source interface to expose the T10 PI standard to the Linux kernel and end-user applications.

The Oracle Database and Oracle Linux teams have qualified T10 PI solutions with Emulex adapters with EMC, Fusion-io, and Huawei. In these solutions, the Oracle Automatic Storage Management library (ASMlib) embeds protection information in each I/O request that is passed through the layers in the Oracle Linux operating system and UEK to the Emulex HBA driver. The driver verifies data integrity before forwarding data to the storage device, which revalidates integrity before writing the data to disk.

**High Availability with Oracle Clusterware: Included with Oracle Linux Support**

Oracle Database applications frequently demand high availability, which is why Oracle supplies Oracle Clusterware to Oracle Linux Basic and Premier Support customers at no additional charge. Oracle Clusterware is software that allows multiple Oracle Linux servers to operate as a single system, providing redundancy in the event of a hardware or software failure. Each node communicates through a private interconnect, maintaining a cluster heartbeat that indicates node availability. The main software components are the Voting Disk, which records node membership, and the Oracle Cluster Register, which stores and manages cluster information (Figure 3).
What Makes Oracle Linux the Best Platform for Oracle Database 12c

Oracle Clusterware is included at no charge with Oracle Linux Basic and Premier Support agreements. For datacenters that deploy Oracle RAC, Oracle recommends using Oracle Clusterware to monitor and manage the RAC infrastructure. When a node in a RAC cluster is started, all database instances, listeners, and services are automatically started. If an instance fails, it is automatically restarted. Since Oracle Clusterware is included as a part of Oracle Linux support, customers can enjoy a single point of contact for the software infrastructure along with validated software compatibility, which helps to reduce downtime and improve availability.

Built-In Security and Data Safeguards

Along with the extensive testing that Oracle Linux undergoes internally for database applications, the operating system includes advanced enterprise features to secure access and protect data. Open source Linux receives intense scrutiny from the development community, which yields strong code and ongoing security enhancements. As a result, Oracle Linux includes robust security features — IP filtering for firewall capabilities, strong encryption, and military-grade SELinux mechanisms.

Many database applications are subject to strict information privacy and regulatory requirements. For applications that require stringent security, these Oracle Database 12c options are supported and extensively tested on Oracle Linux:

- Oracle Advanced Security Transparent Data Encryption (TDE), which enforces data-at-rest encryption in the database layer.

Figure 3. Oracle Clusterware is included at no charge with Oracle Linux Basic and Premier Support agreements.

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- Oracle Advanced Security Transparent Data Encryption (TDE), which enforces data-at-rest encryption in the database layer.
• Oracle Advanced Security Data Redaction, which provides on-the-fly redaction of sensitive data in SQL query results (prior to display) to protect sensitive data.

• Oracle Audit Vault and Database Firewall, which provide controls to block SQL injection threats and consolidate audit data from databases, operating systems, and directories.

Simplifying Virtualized Workloads

Faced with tight budgets and the need for greater agility, many IT organizations are moving production Oracle Database applications from physical servers to virtual environments — and taking advantage of full compatibility of Oracle Linux deployed either on bare metal or virtual guests. As an example, Dubai World, the investment holding company for the Dubai government, decided to migrate their Oracle Database applications to Oracle VM and Oracle Linux because they could improve utilization of infrastructure resources and deploy new database applications more quickly. Premjit Nair, the Principal Infrastructure Architect for Dubai World, commented on the transition:

“Upgrading our Oracle stack on commodity servers using Oracle VM and Oracle Linux provided us with a cost-effective infrastructure that will increase productivity, mitigate risks, and reduce total cost of ownership. And remarkably, we did the entire upgrade and migration without interrupting business at any time or making changes to existing setups and configurations.”

To simplify the process of moving applications from physical servers to virtual guests to a cloud delivery model, the Oracle Linux and Oracle VM teams work closely together to ensure compatibility. As a result, Oracle Linux with the Unbreakable Enterprise Kernel can be deployed either on physical servers or on virtual servers with Oracle VM Server for x86. Oracle Linux and Oracle VM are optimized for performance and engineered to work well together. As a matter of fact, a recent study examined performance of Oracle Database workloads on bare metal and virtual servers using Oracle VM and Oracle Linux. The study found that the virtualized environments made better use of available database licenses and system resources — at the same time providing comparable performance.3

All Oracle applications including Oracle Database are fully qualified and certified on Oracle VM. To accelerate time-to-production for virtual environments, Oracle VM Templates provide a fully configured software stack with pre-installed and pre-configured software images in a virtual machine. Oracle VM Templates exist for many Oracle products, including Oracle Linux, Oracle Database, Oracle Fusion Middleware, and Oracle applications like Oracle E-Business Suite, PeopleSoft, and Siebel Customer Relationship Management (CRM). (For available templates, see http://www.oracle.com/technetwork/server-storage/virtualbox/documentation/templates-101937.html.) By using Oracle VM Templates, administrators can deploy single-instance Oracle Database and Oracle RAC configurations in a matter of minutes.

Oracle has also been collaborating with Microsoft to simplify deployment of Oracle Linux on Microsoft® Hyper-V® and the Windows® Azure™ cloud platform. Part of this effort focuses on developing VM templates that include Oracle products (such as Oracle Database) on Oracle Linux.

This approach allows administrators on Microsoft servers to configure VMs quickly with an enterprise-grade Linux release and Oracle software. The templates can access public yum servers for updates and support can be purchased for each VM on an as-needed basis, creating a cost-efficient Oracle Database solution for Microsoft cloud environments.

**Manageability**

An integrated and consistent set of management tools (rather than an assortment of multi-vendor tools) can help to increase administrator productivity and decrease labor costs. Oracle Enterprise Manager provides an intuitive interface for managing application performance and availability across the end-to-end Oracle solution stack, including applications, database, systems, virtual servers, and Oracle Linux. Oracle Enterprise Manager gives administrators a single-pane-of-glass to deploy and manage Oracle Database workloads on Oracle Linux — even if those workloads are virtualized using Oracle VM. To simplify Oracle Linux patching and updates, Oracle Enterprise Manager is included at no additional charge with an Oracle Linux Support subscription, which helps to reduce infrastructure management costs and reduce TCO.

In conjunction with the multi-tenant capabilities of Oracle Database 12c, Oracle Enterprise Manager 12c features automation that permits rapid self-service provisioning of database clouds, saving administrators additional time and effort. These new management features help to pave the way to a cloud-based, on-demand Database-as-a-Service (DBaaS) delivery model.

**Simplified Deployment**

In addition to Oracle VM Templates, there are a number of other ways in which Oracle has made it easy to deploy Oracle Database software on Oracle Linux. The possibilities vary from factory-built, tightly integrated solutions like Oracle’s engineered systems, to build-your-own validated and documented configurations, to Oracle x86 systems pre-installed with Oracle Linux, to software packages that properly configure Oracle Linux systems for the database software. While these options have different advantages, all of them share a similar benefit: simplifying deployment and expediting time-to-production.

**Purpose-Built Engineered Systems**

Oracle designs engineered systems that are preassembled and pre-integrated to reduce complexity and speed application deployment. Because Oracle Linux offers superior performance and enterprise-class features, it is the operating system embedded in most Oracle engineered systems, including these solutions:

- **Oracle Virtual Compute Appliance.** This appliance enables rapid, repeatable software-defined infrastructure for x86 applications including database workloads. Customers can go from power on to production quickly and deploy ready-to-run virtual machines in a matter of minutes.

- **Oracle Database Appliance.** In a compact 4U form-factor, this appliance is an entry-level engineered system that integrates Oracle Database, Oracle Linux, Oracle VM, x86 servers, storage,
and networking. It delivers highly available database services in an off-the-shelf solution for small database requirements.

- **Oracle Exadata Database Machine.** With optimizations specific to Oracle Database 11g and 12c workloads, the Oracle Exadata Database Machine factory-integrates Oracle servers, Oracle Linux, storage, and other software. This engineered system is designed for one task and one task alone: to accelerate Oracle Database services for large-scale data warehousing and OLTP applications.

- **Oracle Exalytics In-Memory Machine X3-4.** Oracle Exalytics includes best-in-class hardware, the Oracle Linux operating system, an Oracle Business Intelligence software suite, and in-memory analytics software — all optimized to work together.

- **Oracle Big Data Appliance.** This Oracle engineered system delivers comprehensive big data analytics at a low TCO. It is optimized for both batch and real-time processing using Cloudera Distribution for Apache Hadoop, Oracle NoSQL Database, Cloudera Impala, and Cloudera Search.

- **Oracle Database Backup Logging Recovery Appliance.** This appliance provides robust protection for Oracle Databases to prevent against data loss. Backup workloads are offloaded to the appliance, where dedicated hardware and storage handle backup and recovery tasks in an efficient manner.

Oracle Linux provides extreme scalability for large engineered systems. For example, in the Oracle Exadata Database Machine X3-8 that features 4TB RAM and 160 processor cores, Oracle Linux scales well to support highly demanding database workloads.

**Oracle Validated Configurations**

For end users who want a tested and documented stack on which to install and deploy Oracle Database, Oracle Validated Configurations are pre-validated architectures. These solutions define software, hardware, storage, and network components as well as documented best practices, making it easier, faster, and more cost-effective to deploy Oracle Linux and Oracle applications in your enterprise. Over 150 validated and tested architectures (including Oracle Database and Oracle RAC configurations on both Oracle and third-party hardware) are published at [http://www.oracle.com/technetwork/server-storage/linux/validated-configurations-085828.html](http://www.oracle.com/technetwork/server-storage/linux/validated-configurations-085828.html).

**Pre-installation Packages and Preloaded Oracle Systems**

When deploying database applications on Oracle Linux, the Oracle Database software requires certain packages, package versions, and kernel parameters. To adhere to best practices, administrators typically minimize the operating system image, installing only the minimal number of Oracle Linux packages. Then, they can apply an Oracle Database pre-installation package to resolve dependencies, address prerequisites, and configure the kernel prior to database installation. Oracle makes available pre-installation packages for both Oracle Database 12c and 11g that help to provide a painless and easily repeatable deployment process.

When ordering certain Oracle x86 servers, customers can request systems pre-loaded at the factory with Oracle Linux. This creates an out-of-the-box solution for database applications. Applying pre-installation packages to these systems prepares them quickly for database software installation. When
customers purchase an Oracle Premier Support for Systems or Operating Systems subscription, support for Oracle Linux is included, yielding a readily available and fully supported database configuration, resulting in lower total cost of ownership.

**Empowering Database Solutions on Oracle Linux**

As you begin to document your business goals and determine your best path to deployment, remember that Oracle Linux can be freely downloaded from https://edelivery.oracle.com/linux. In addition to no-charge software downloads, Oracle makes all errata for Oracle Linux freely available from public yum servers — no other commercial Linux vendor provides these updates at no charge! This means that your administrators can set up a proof-of-concept environment that includes all released bug and security fixes without initially purchasing a support contract, allowing you to get started immediately evaluating the benefits of Oracle Linux for your database infrastructure.

To help you implement IT solutions quickly and cost-effectively, Oracle fosters relationships with industry partners and technology leaders that can help you develop implementation plans, customize solutions, provide training, and supplement your internal staffing. The Oracle Linux team works closely with these partners to develop effective solutions and tools to deploy and effectively manage Oracle Database applications on Oracle Linux. Oracle engineers consult with software partners to certify applications on Oracle Linux and collaborate with hardware partners to qualify systems, validate drivers, and optimize performance of Oracle Database on Oracle Linux.

**Conclusion**

When configured with Oracle Linux, today’s powerful x86 systems create a scalable, reliable and cost-effective platform for Oracle Database applications. The optimized UEK maximizes transaction performance while innovative RAS features in Oracle Linux — including zero-downtime updates with Ksplice technology — promote continuous availability of business-critical Oracle Database applications. But what underscores Oracle Linux as the best deployment choice for Oracle Database is simply this: Oracle Linux is the development standard at Oracle.

When you deploy Oracle Database on Oracle Linux, you have the confidence of deploying on a platform backed by development teams that work closely together to optimize performance, enterprise security, and availability. Because Oracle applications, middleware, and database products are all developed on Oracle Linux, you’ll know you’re deploying on the most extensively tested solution. And with your Oracle Linux Support agreement, your software environment is backed by the expertise of Oracle’s global 24x7 support organization, regardless of whether you deploy on certified partner hardware, Oracle servers, or on an Oracle engineered solution. And with your Oracle Linux support contract, you also receive management and high availability solutions at no additional charge, which helps to reduce the TCO of your database infrastructure.

Download a copy of Oracle Linux today from https://edelivery.oracle.com/linux and get started with an evaluation. Contact your Oracle representative to learn more, or visit http://www.oracle.com/linux.
For More Information

For more information, visit the resources listed below.

| TABLE 1. RESOURCES FOR MORE INFORMATION |
| WEB RESOURCES                  | WEB URL                                                                 |
| Oracle Linux Home Page         | http://www.oracle.com/linux                                             |
| Download Oracle Linux          | https://edelivery.oracle.com/linux                                      |
| Oracle Validated Configurations | http://www.oracle.com/technetwork/topics/linux/validated-configurations-085828.html |
| "How I Used Cgroups to Manage System Resources in Oracle Linux 6" | http://www.oracle.com/technetwork/articles/servers-storage-admin/resource-managers-linux-1506602.html |
| "How I Simplified Oracle Database 12c and 11g Installations on Oracle Linux 6" | http://www.oracle.com/technetwork/articles/servers-storage-admin/ginnydbinstallonlinux-488779.html |
| T10 PI Data protection solutions | http://www.oracle.com/technetwork/articles/servers-storage-dev/silent-data-corruption-1911480.html |
| WHITE PAPERS                   | WEB URL                                                                 |
| Database Smart Flash Cache     | http://www.oracle.com/technetwork/articles/systems-hardware-architecture/oracle-db-smart-flash-cache-175588.pdf |