ORACLE TUXEDO

KEY FEATURES AND BENEFITS

FEATURES

- Multi-language support: C, C++, COBOL, Java, PHP, Python, Ruby
- Ready for private cloud deployment
- Distributed cache
- Highly optimized infrastructure for maximum application performance
- Linear scalability and high availability
- Distributed transaction processing
- XA optimizations across Oracle products
- Effective work load balancing/management
- Clustering and failover capabilities
- Replicated service framework
- Robust fault management
- Data-dependent routing
- Rich, enterprise messaging capabilities
- Advanced and flexible security infrastructure
- IDE for ease of application development
- Metadata driven application development
- Comprehensive manageability and monitoring
- Business transaction monitoring
- Ease of diagnostic
- Out-of-the-box integration with SOA, Mainframes and 3rd party apps
- Easy to use, RESTful and SOAP/http Web services
- Tools for migrating and modernizing mainframe applications

In its third decade of reliable performance across tens of thousands of deployments, Oracle Tuxedo is one of the world's most respected high-end computing platforms. It combines the peace of mind that comes from years of reliability, performance, and maturity with the latest standards and technologies needed to make your mission-critical application a first-class participant in private cloud and/or traditional data center environment. Whether you're modernizing an existing C or C++ application, re-hosting a mainframe COBOL application, or building new application services in Java with extreme transaction processing needs, Oracle Tuxedo remains the dependable choice.

The Engine for High-Throughput and Mission-Critical Applications

Oracle Tuxedo provides a solid foundation for application services, with strong reliability and transaction integrity, ultra-high performance, linear scalability, and configuration-based deployment. As the distributed transaction-processing platform of choice, it provides the operational backbone of the world's leading companies—running many of their largest mission-critical systems, including core banking services, airline reservations, brokerage services, e-commerce operations, and telecom services. Oracle Tuxedo keeps these systems up and running even when deploying new application services, scaling server configurations to handle additional workload, or failing over within or across data centers.

Highly Reliable Distributed Transaction Processing

Oracle Tuxedo provides a service-oriented infrastructure for efficiently routing, dispatching, and managing requests, events, and application queues across system processes and application services. With virtually limitless scalability, it manages peak transaction volumes efficiently, improving business agility and letting IT organizations quickly react to changes in business demands and throughput. Oracle Tuxedo optimizes transactions across multiple databases and ensures data integrity across all participating resources, regardless of access protocol. The system tracks transaction participants and supervises an XA two-phase commit protocol, ensuring that all transaction commits and rollbacks are properly handled.

Distributed Transaction Processing Features and Benefits	
Distributed transaction management server	Optimizes transactions and ensures data integrity across all participating resources, regardless of the access protocol
XA two-phase commit	Automatically tracks transaction participants and ensures that all resources are updated properly or exercises a rollback, ensuring data integrity despite component failures

Multiple messaging models	Supplies synchronous, asynchronous, and conversational messaging APIs for heterogeneous platform support
Transaction queuing	Provides flexibility in processing or deferring transactions to allow distributed applications to work together asynchronously
Event brokering	Provides a transactional event system based on the publish-and-subscribe programming model

Linear Scalability and Reliability

For companies that need to increase the accessibility of existing applications via Web services; consolidate enterprise transactions and messaging; and migrate mainframe applications to a compatible, proven application platform, the multi-language, "build to scale" application platform of Oracle Tuxedo provides a proven mission-critical infrastructure.

At the heart of Oracle Tuxedo is a high-performance, highly reliable messaging engine that provides guaranteed "exactly once" delivery. This engine provides synchronous, deferred synchronous, and conversational messaging APIs—all transparently, whether in one machine, a cluster of related machines, or across independent Oracle Tuxedo domains. Using data-dependent routing, Oracle Tuxedo can route messages based not only on priority and context, but also message content. This enables efficient transaction processing and ensures the highest level of performance and flexibility for a company's most critical messaging solutions.

Using a replicated services framework that can automatically spawn additional servers based on real-time system loads and throughput, Oracle Tuxedo ensures the highest reliability and performance for the most demanding mission-critical applications. Oracle Tuxedo ensures constant access to applications, continually monitoring components for application, transaction, network, and hardware failures. With robust operations, administration, and maintenance (OA&M) services—that can stop and restart application services automatically—Oracle Tuxedo eliminates single points of failure, so applications are always available when and where customers and partners need them.

Scalability and Reliability Features and Benefits	
Application parallelization	Allows applications to handle requests in parallel and process multiple transactions simultaneously on different, distributed nodes, thus eliminating single point of failure and increasing scalability
Linear Scalability	Provides almost linear increase in application throughput corresponding to increase in available resources
Replicated service framework	Dynamically replicates distributed applications throughout the network to maximize performance and reliability
Clustering and failover	Provides deployment of Tuxedo applications in cluster mode, allowing another available node, group to takeover application processing automatically in case of a failure
Robust fault management	Minimizes downtime and keeps applications running through planned and unplanned downtime by eliminating single points of failure
Automated load management and balancing	Provides automated service replication based on real-time system loads and dynamically balances requests across all available resources, ensuring consistently high throughput
Data-dependent routing	Routes messages based on their context and/or content, and enables efficient transaction processing and prioritization

Optimizations for Maximum Performance

Oracle Tuxedo Advanced Performance Pack includes several optimizations, which can improve Tuxedo application's performance, scalability and availability significantly without requiring any change to the application. These optimizations are available to all Tuxedo applications running on any supported Tuxedo platform.

Oracle Exalogic: Tuxedo Optimizations and Benefits	
Shared Memory Queues	Uses shared memory queues instead of IPC message queues for inter-process communications eliminating up to eight buffer copies
Auto SPINCOUNT tuning	Dynamically tunes SPINCOUNT attribute of Tuxedo configuration based on the application workload for optimal performance of locking algorithm
XA optimizations	XA transaction implementation is enhanced for optimal performance when working with Oracle RAC and Oracle WebLogic Server based apps
FAN/TAF Integration	Applications can subscribe to UP/DOWN and RLA's for Oracle RAC instance to improve availability and reduce planned/unplanned downtime

Optimizations for Engineered Systems

Oracle Tuxedo uses highly optimized protocols for inter-process communication within the same node and across nodes on Oracle engineered systems, such as Exalogic, maximizing throughput and reducing response time for all applications.. Oracle Tuxedo applications benefit from optimizations implemented for Oracle Exalogic platform, which increase throughput as much as 8 times and reduce latency by 80% for applications deployed on Oracle Exalogic.

Oracle Exalogic: Tuxedo Optimizations and Benefits	
SDP Support	SDP (Socket Direct protocol) is supported on all network links (including Jolt, /WS clients, domains, WTC, etc.) for better performance for certain workloads
Direct Intra-domain communication	Eliminates BRIDGE as the bottleneck in intra-domain communications in MP mode by directly accessing queues of remote servers in Tuxedo MP mode configuration
Direct Inter-domain communication	Applications in one domain can access process in another domain using Exabus/RDMA and without using GWTDOMAIN

Tuxedo Applications in Private Cloud

Oracle Tuxedo applications can be deployed in Oracle Virtual Machines and a variety of other virtualization environments. With pre-installed, ready-to-go Oracle Virtual Machine template, deploying a Tuxedo application in virtual environment juts takes a few minutes.

Leveraging integration with Oracle Enterprise Manager, Oracle Tuxedo applications can be dynamically provisioned and deployed and automatically scaled up and out within a private cloud environment. This can be done either in physical or virtual environments. Using Oracle Enterprise Manager plug-I for Tuxedo, included in Oracle TSAM Plus, one can provision, administer, and manage private cloud resources to create Tuxedo Platform as a Service. One can define service templates that control the provisioning of Tuxedo applications. These templates can be

instantiated by end-users to create fully provisioned and configured Tuxedo instances.

Oracle Tuxedo's dynamic resource broker allows defining rules for auto provisioning and deployment of Tuxedo applications. Tuxedo applications can be scaled up and out within a Tuxedo domain or across multiple domains.

Advanced Security

The comprehensive security features incorporated in Oracle Tuxedo include authentication, authorization, auditing, and Secure Sockets Layer (SSL) support when deploying applications across networks. Oracle Tuxedo also provides a plug-in framework to support a public key infrastructure (PKI), digital signatures, message encryption, and third-party security products for networked applications—enabling it to work within existing corporate security standards. The default plug-in uses Lightweight Directory Access Protocol (LDAP) for authentication and authorization framework that can be used to store credentials and Access Control Lists (ACLs) across diverse LDAP environments, including Microsoft Active Directory, Sun LDAP, and IBM SecureWay LDAP with an IBM RACF back end. Generic LDAP authentication and authorization framework includes features, such as flexible LDAP schema support and nested group support for authorization. In addition, Tuxedo applications get greater flexibility in securing resources and benefit from integration with Oracle Entitlement Server by specifying finer grained resource level authorization policies.

Oracle Access manager is an enterprise-level security platform that provides a full range of Web-perimeter security functions and Web single sign-on services including identity context, authentication and authorization; policy administration; testing; logging; auditing and more. Tuxedo's out-of-the-box integration with Oracle Access Manager enables sharing credentials and authorization policies across application stacks in a central location. In addition, integration with OAM enables single sign-on across applications as token generated after authentication in one application can be shared with other application, eliminating need for repeated sign-on.

Simplified Application Development

Oracle Tuxedo supports developing application services in many programming languages, including C, C++, COBOL, Java and dynamic languages such as PHP, Python and Ruby. Applications developed in these languages can co-exist in the same container, even in the same resource group, for optimized access across heterogeneous languages environments. Oracle Tuxedo clients can be developed using C# in addition to the programming languages mentioned above.

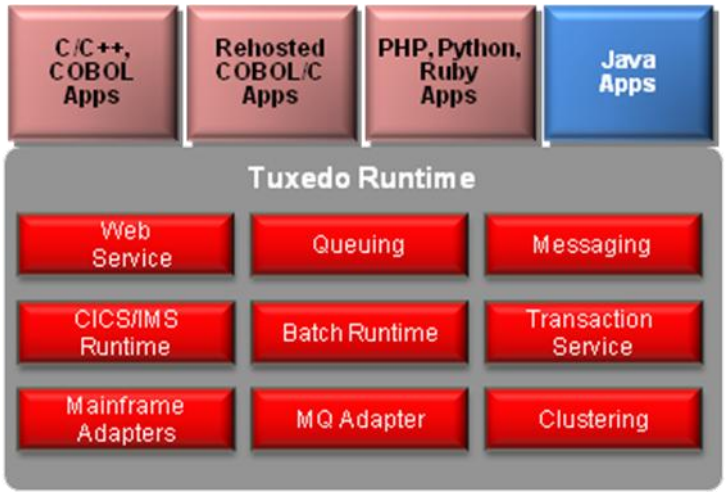

Figure 1: Oracle Tuxedo supports application development in multiple programming languages, including Java. Such applications are deployed in the same container.

Oracle Tuxedo supports following programming models:

ATMI: provides an highly optimized, X/Open based API for C, C++, COBOL and Java across all Oracle Tuxedo supported platforms for developing transactional and messaging applications, supporting request-response, asynchronous, conversational and message based communication paradigms.

SCA: This is a standard based and extremely easy to use programming model, allowing developers to focus on business logic without need to learn any APIs. Developers implement service interface in C++ and run corresponding implementation through Tuxedo provided tools to create application servers for Tuxedo runtime. This programming model makes it simple for standalone C/C++ applications to be hosted within Tuxedo runtime and leverage its reliability, availability, scalability and performance benefits.

Oracle Tuxedo provides an integrated development environment for Tuxedo applications. Easy to use graphical user interface of Tuxedo plugin for Solaris Studio IDE provides ability to create Tuxedo specific projects, edit source code, build, create configuration, run and debug Tuxedo applications. Tuxedo applications also get access to all of the Solaris Studio features such as performance and thread analysis, memory leak and error detection, etc.

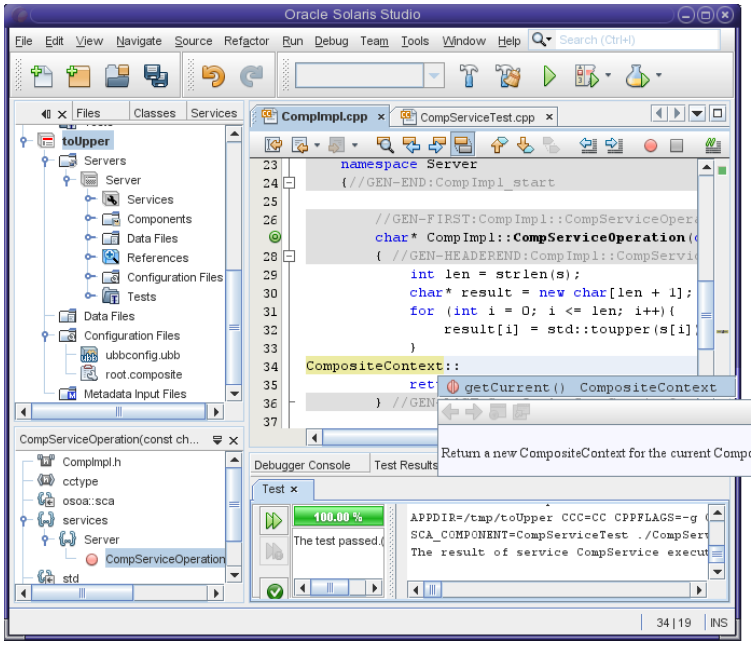

Figure 2: Oracle Tuxedo Plugin for Oracle Solaris Studio reduces time to market for new Tuxedo application development.

Oracle Tuxedo supports metadata driven application development. If a developer starts with service interface definition in Tuxedo metadata repository, Oracle Tuxedo tools can create stubs for developer for interface implementation.

As data volumes and customer expectations increase, driven by social, mobile, cloud and always connected devices, so does the need to handle more data in real time. Distributed cache provides fast access to frequently used data to such mission-critical Tuxedo applications. With distributed caching Tuxedo applications now have out-of-the-box access to Oracle Coherence, the industry leading in-memory data-grid solution. With this integration, Tuxedo applications benefit from rich feature set of Oracle Coherence, such as in-memory cache cluster, local/remote cache, cache replication, etc. In addition, with service result caching feature, incoming service requests are examined for cache hit. Upon cache hit, response is returned from the cache without invoking the target service, enabling dynamic use of distributed cache without having to change application code.

Enterprise Messaging

Oracle Tuxedo is known for its low latency, scalable, transactional, and highly available runtime infrastructure. These features, combined with the rich messaging features, provide a platform for high performance enterprise messaging. Offering features such as in-memory or persistent queuing, store-and-forward, asynchronous queue operations, publish and subscribe, filtering, notification and delivery interest points, reliable message delivery, dynamic queue alias, undelivered message action, and more, Oracle Tuxedo Message Queue capabilities can be used to meet your most demanding messaging requirements.

Manageability and Monitoring

Effective management of the application stack is critical to lower the total cost of ownership of enterprise mission-critical applications. Oracle Tuxedo includes comprehensive set of tools to manage and monitor Tuxedo infrastructure and deployed applications in development/test and/or production environment. Oracle Tuxedo includes command line tools, such as tmadmin, which can be used interactively or from shell scripts for automation. Tuxedo also provides MIB (Management Information base) API and JMX interface, which can be used to manage and monitor Tuxedo applications from custom applications or to create custom tools. Jython based scripting tool uses these interfaces internally and can be used to create scripts quickly to automate operations, collect runtime statistics and perform administrative tasks.

In addition, Oracle Tuxedo System and Application Monitor Plus (TSAM Plus)'s capabilities of application performance management, service level management, and operations automation can be used to improve performance of Tuxedo applications, improves overall quality of service and reduces cost of operations. Oracle TSAM includes Management Pack for Oracle Tuxedo, which integrates Tuxedo management and monitoring with Oracle Enterprise Manager, allowing Tuxedo infrastructure and applications to be monitored and managed from the same console as other Oracle products. With integrated management and monitoring, Tuxedo applications also benefit from many features of Oracle Enterprise Manager, such as automatic topology discovery, Tuxedo domain health monitoring, comprehensive SLA management framework and so on.

Oracle Enterprise Manager's Business Transaction Monitor (BTM) component enables monitoring of business transactions which span multiple oracle products, including Oracle Tuxedo, Oracle WebLogic Server and Oracle Database. A transaction, which started in one of the products can be traced throughout its lifetime across the products from the same console without any need to correlate information from different log files thus reducing time-to-diagnose and improving service level agreements.

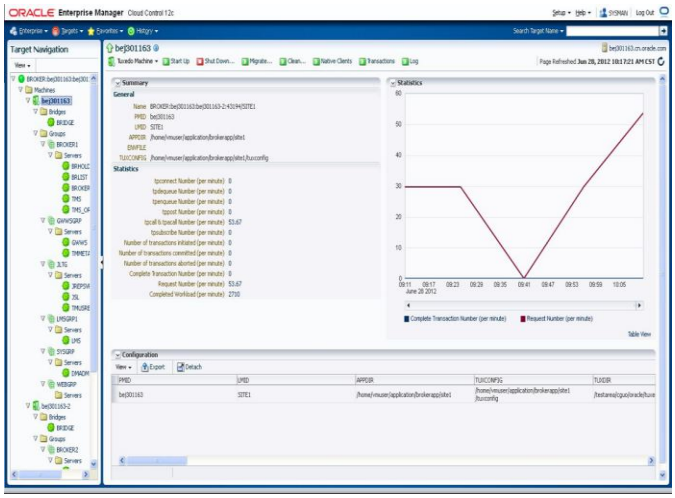

Figure 3: Oracle TSAM facilitates the collection of performance data and system statistics to help lower downtime and maintenance costs.

Widely Extensible Integration Infrastructure

The Oracle Tuxedo includes comprehensive functionality to integrate Tuxedo applications with other applications to create composite (or hybrid) end-to-end solutions, promoting reuse of the existing assets. For example, such composite applications can be created to combine the availability and scalability of Oracle Tuxedo with the extensibility of Java or to access legacy mainframe applications from a new application. Customers can integrate Oracle Tuxedo applications with other applications using one or more of the integration options listed in the table below:

Integration Options	
Oracle SALT	Provides high-performing, configuration-driven model that enables access to Oracle Tuxedo services as standard Web services either using SOAP over HTTP or as RESTful Web services. Oracle Tuxedo applications can transparently call external Web services as if calling another Oracle Tuxedo service
Oracle WebLogic Tuxedo Connector	Provides bidirectional, peer-to-peer, cross-platform interoperability between Oracle WebLogic and oracle Tuxedo with transaction and security context propagation
Native transport to/from Oracle Service Bus	Provides bidirectional connectivity to/from Oracle Service Bus without any coding, including security and transaction propagation
Oracle Tuxedo JCA Adapter	Provides bidirectional, peer-to-peer, cross-platform interoperability with transaction and security context propagation. Hot-pluggable with any JCA compliant application server.
CORBA Interoperability	Supports standard IIOP with other object request brokers properly implementing the appropriate CORBA standard
.net client API	Provides API for access to Oracle Tuxedo applications from Microsoft .net infrastructure
Oracle Tuxedo Jolt	Provides Java API for access to Tuxedo applications from standalone clients or other Java environments
Oracle Tuxedo Mainframe Adapters	Provides bi-directional access to CICS/IMS applications running on IBM mainframes in global transaction context
Mainframe Transaction Publisher	Configuration driven approach to access existing mainframe CICS/IMS transactions from Java applications. Enables import of COBOL copybook transactions and generates Java beans and other configurations artifacts.
IBM WebSphere MQ Adapter	Provides transparent access to IBM WebSphere MQ queues

Oracle Tuxedo's domains architecture supports interoperability among different messaging and transaction-processing applications running in separate environments, networks, geographic locations, and companies as well as across application server platforms—including Oracle WebLogic Server, Oracle Service Bus, JEE application servers, and IBM mainframes running CICS or IMS TM. Use of XML is dominant for web based applications. Oracle Tuxedo supports XML payloads, message parsing, conversion to and from Tuxedo buffer types and routing to other applications based on XML contents.

Contact Us

For more information about how your organization can leverage the power of Oracle Tuxedo, please visit oracle.com or call +1.800.ORACLE1 to speak to an

RELATED PRODUCTS AND SERVICES

Oracle Tuxedo delivers a robust platform to run high-volume applications across distributed, heterogeneous computing environments, enabling transactions that stretch from customer-facing, business-critical applications to back-office processes, across any system, anywhere in the world.

RELATED PRODUCTS:

- Oracle TSAM
- Oracle SALT
- Oracle Tuxedo JCA Adapter
- Oracle Tuxedo Message Queue
- Oracle Tuxedo Application Rehosting Workbench
- Oracle Tuxedo Application Runtime for CICS and Batch
- Oracle Tuxedo Application Runtime for IMS
- Oracle Tuxedo Mainframe Adapters
- Oracle Enterprise Manager
- Oracle WebLogic Server
- Oracle SOA Suite

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