Informatica

Managing Data Growth in Oracle E-Business Suite with Data Archiving and Test Data Management

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Executive Summary

Oracle E-Business Suite applications are critical for most of your business's daily operations and for processing your customers' requests. Given the importance of your Oracle E-Business Suite applications, it's no wonder that the volume of data within them is growing at a staggering rate.

And the problem isn't going away. As your business grows, more transaction volumes are added to your Oracle E-Business Suite applications. Your IT organization also has to retain data for longer periods to comply with regulations—further increasing data volumes and management costs.

Data growth is exacerbated by creating multiple copies of production data in nonproduction environments. All of these factors occur when IT is expected to do more with less. Your IT organization needs a cost-effective, long-term solution for managing growing data volumes in your Oracle E-Business Suite applications throughout its lifecycle—from development, test, production, and archive to retirement. Application information lifecycle management (ILM) solutions are the answer.

This white paper examines how application ILM solutions can help your IT organization better manage the growing data volume in your Oracle E-Business Suite applications and ensure that SLAs are met while costs are controlled. After reading this paper, you'll have a better understanding of:

- The challenges involved in managing explosive data growth in Oracle E-Business Suite applications
- How conventional methods of managing this data growth fall short
- Why application ILM is a superior data management solution
- Key criteria to properly evaluate an application ILM solution

The Informatica® application ILM product family provides the full range of capabilities your IT organization needs to better manage Oracle E-Business Suite application data growth. Short case studies in this paper show how companies have used Informatica application ILM products to better manage their Oracle E-Business Suite application data, resulting in:

- Lower storage costs and faster response times
- Improved application performance and availability
- Increased IT efficiency and lower staffing costs

The Challenges: Managing Data Growth in Oracle E-Business Suite

As Figure 1 shows, data volumes aren't just growing—they're exploding. Most large enterprises have petabytes of data stored in all data repositories across the organization—and that volume is likely to grow to exabytes in the coming years. Forrester estimates that, on average, data repositories for large critical applications grow annually at 65 percent.[1] Most of this growth is due to an accumulation of inactive data. It's estimated that 85 percent of production data is inactive.
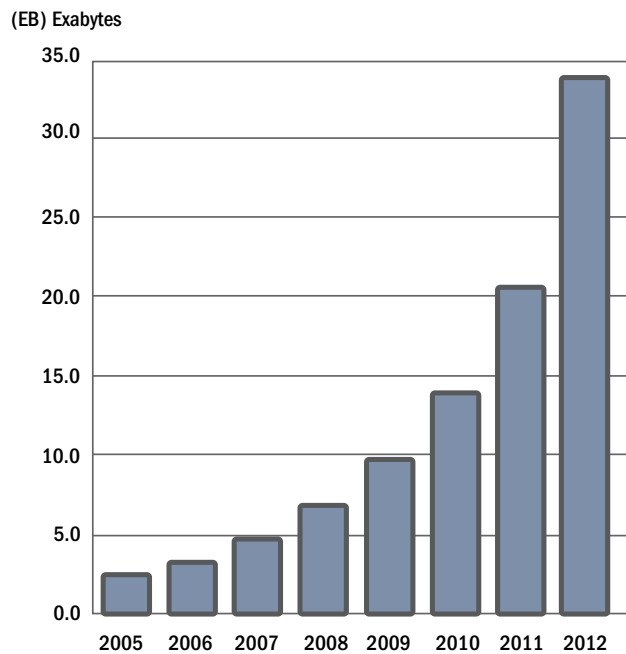
(EB) Exabytes

Figure 1: It's estimated that data repositories for large business applications, such as Oracle E-Business Suite, are growing by more than 65% annually.

[1] Forrester Research, Securing Next-Generation Information Architectures: The Promise Of Improved Security Or The Risk Of New Attack Vectors, October 2008.

The growth in your Oracle E-Business Suite data volumes stems from several factors.

- **Business growth.** As your business grows, more transaction volumes are added to your Oracle E-Business Suite applications. When your company merges with or acquires another, or expands its operations globally, the result is more generated transaction data. At the same time, more and more business users are demanding access to Oracle E-Business Suite applications, adding to the load and performance requirements.

- **Expanded implementations and upgrades.** Oracle E-Business Suite deployments have expanded across multiple departments, and individual application modules are being added on a regular basis. If your IT organization has upgraded to the latest versions of Oracle E-Business Suite (e.g., version 11.5.10 or higher), you've discovered that more tables are added with each upgrade and new data is being generated with new features and functionality. Application upgrades have forced the data growth issue to the fore while your IT organization struggles to manage your application availability periods.

- **Proliferation of legacy applications.** The tendency to maintain unsupported legacy versions of Oracle E-Business Suite applications beyond their value only exacerbates data growth and keeps software license and infrastructure cost at unnecessarily high levels.

- **Compliance requirements.** To comply with industry and government regulations, your IT organization needs to retain inactive data in Oracle E-Business Suite and other business applications for longer periods—sometimes more than 10 years—further increasing data volumes and management costs.

As data volumes grow, it takes more time and effort for your end users and database administrators to perform essential tasks on production systems. Data entry responsiveness declines. Reports take longer to run. Transactions take longer to enter. Database backups are slower and can't be done overnight. Upgrading application versions or applying software patches becomes more complicated and can't be completed over a weekend. Maintaining application service levels while keeping cost down becomes virtually impossible.

With larger data volumes, it takes longer for your IT organization to provision nonproduction environments. Provisioning additional copies of these environments just compounds the data growth problem. On average, IT organizations create four or five copies of production data for nonproduction use. These are usually complete copies, although a subset would be more than sufficient. These full, secondary copies of the data sets consume valuable database and storage capacity.

These challenges have prompted IT organizations to look for more effective solutions to manage the growing data in their Oracle E-Business Suite applications.

Conventional Solutions and Their Limitations

If your IT organization is like most, you've used a variety of methods to manage data growth in your Oracle E-Business Suite applications. For example:

• You may have purchased additional storage and processing hardware.

• You may have tuned the database and the application SQL.

• You may have used Oracle purge routines or developed in-house scripts to purge, archive, or create subset copies.

But these conventional approaches often fail to deliver a long-term solution to your Oracle E-Business Suite data management challenges. Let's explore the limitations of these typical solutions.

Hardware Upgrades

Throwing more hardware at the problem may seem like the simplest answer, but it is not a viable long-term solution—even with the downward trend of disk and processor costs. With larger and larger data volumes, input/output or network bandwidth becomes the bottleneck eventually. And more hardware just increases architectural complexity while offering limited scalability improvements.

Database and Application Tuning

Database administrators commonly turn to tuning to manage data growth within the database and improve application performance. But DBAs quickly discover that while tuning is effective the first time, successive tunings offer diminishing returns and are more time intensive.

Database partitioning may offer improved database performance but is limited in its deployment to just a few tables for out-of-the-box Oracle E-Business deployments. For more complex modules, such as Accounts Payables and Receivables, which feature complicated relationships across tables and table spaces, table-level partitioning is insufficient and out-of-the-box solutions from Oracle are not available.

Oracle Purge Routines

Using Oracle purge routines to remove data is inadequate and incomplete. An estimated 15 percent of Oracle modules come with purge routines, and only 50 percent of that small amount contain both purge and archive routines. The remaining modules have neither purge nor archive routines. These routines are also inflexible. They don't provide extensible business rules or the ability to accommodate customizations. This lack of flexibility can result in an inadequate amount of data being archived—and the wrong data being archived.

In addition, a purge routine that deletes data entirely is not a viable option—companies need to retain data. And IT organizations need to continue to make historical data available to users and allow them to access it seamlessly along with production data. When IT organizations archive data using Oracle routines, end users have no way to report against the combined live and archived data.

Hand Coding

In-house code or scripts are very expensive to develop and maintain because they require deep knowledge of Oracle business entities, table schemas, relationships, and business rules. As the metadata evolves from one Oracle version to the next, these scripts need to be modified, which inflates maintenance costs. Given the complexity of Oracle E-Business Suite, in-house scripts tend to apply business rules for archiving, purging, masking, or creating subsets of data inconsistently across records, tables, and entities.

A Better Solution: Application Information Lifecycle Management

The key to managing exploding data volumes in Oracle E-Business Suite applications lies in two facts: the value of all data diminishes over time, and all data is not created equal.

Let's first examine the time element. Perhaps your IT organization occasionally needs to access old inventory transactions within the manufacturing application module of Oracle E-Business Suite. But once an item is removed from inventory, most of this data is no longer required for day-to-day business operations. This "historical" data is largely inactive—used infrequently for reporting and compliance purposes.

The second consideration is the fact that all data is not equally important. Not all data in production systems is needed for effective testing and development in nonproduction environments. Your IT organization may be able to conduct perfectly adequate testing with a just a portion of data—for example, the last six months of purchase order and customer transactions for selected regions within North America and Europe. Not all data needs to be copied to multiple test environments.

IT organizations need a way to cost-effectively, efficiently, and securely manage different classifications of data based on their value to the business throughout the data lifecycle. Application information lifecycle management (ILM) solutions are the answer.

The Storage Networking Industry Association defines ILM as "policies, processes, practices, and tools used to align the business value of information with the most appropriate and cost-effective IT infrastructure from the time information is conceived through its final disposition."

Application ILM solutions enable IT organizations to copy or move less valued or less frequently accessed data from production systems to second-line or third-line storage to reduce costs and improve performance—all while satisfying data retention, access, and security requirements.

Application ILM solutions help IT organizations to:

- Cost-effectively manage data growth by archiving inactive data from production systems.

- Support regulatory compliance by economically retaining data for a longer period and masking sensitive data to reduce the risk of data breaches.

- Safely retire legacy systems and applications, while making sure that the business has complete access to the data within them.

- Optimize test data management by creating leaner copies containing the most relevant data sets.

- Support corporate divestitures by untangling complex transactional systems, separating out only functionally related data that is pertinent to the divested organization.

The Ideal Solution: Informatica Application ILM

Informatica's application ILM product family is the ideal solution for IT organizations seeking to manage growing data volumes in their Oracle E-Business Suite applications.

This family of products provides a complete application ILM solution that addresses the entire lifecycle of data in Oracle E-Business Suite applications:

- In the test and development phase, Informatica Data Subset helps your IT organization to efficiently provision and protect data in test environments while controlling costs. The software optimizes test environments by creating nonproduction systems with smaller subsets or copies of production data; if protecting sensitive data in each copy is required, Informatica offers a bundled solution, which combines Informatica Data Subset and Informatica Persistent Data Masking products as the Informatica Test Data Management solution.

- In the operation and production phase, Informatica Data Archive helps your IT organization to cost-effectively manage the explosion of data volumes in Oracle E-Business Suite. It allows IT to easily and safely partition and archive application data and then readily access it when needed. Highly active, business critical data can be stored in a separate partition on tier 1 infrastructure, while aging, less active data can be stored in a highly compressed partition stored on lower cost infrastructure.

- In the retirement phase, Informatica Data Archive reduces costs by allowing the application and the supporting hardware and software stack to be shut down, thereby saving on license, maintenance, and administration costs.

Informatica's application ILM product family leverages the power of the Informatica Platform, the industry's leading data integration platform, to handle the huge data volumes typical of very large global enterprises. These products provide superior scalability and performance, delivering data to the most cost-effective storage option based on their value. They also offer unparalleled interoperability. The software is based on an open, easily extensible architecture, enabling simple integration with third-party solutions.

Informatica's application ILM product family delivers the full range of capabilities that your IT organization needs to effectively manage data growth in Oracle E-Business Suite, including:

- Robust data growth assessment capabilities

- Prebuilt accelerators for Oracle E-Business Suite

- Simple customization and extensibility

- Comprehensive archiving techniques

- Inclusive techniques for creating and managing subsets

- Comprehensive integrated data masking techniques

Application ILM Solutions for Oracle E-Business Suite Data

What Should Your IT Organization Look For?

- Data growth assessment capabilities: Can the solution assess and target the largest and fastest growing Oracle E-Business Suite modules?

- Oracle E-Business Suite coverage: Does the solution offer comprehensive prebuilt business entities and rules for the latest versions of Oracle E-Business Suite?

- Customization support: Does the solution offer extensible metadata to support customization of your Oracle E-Business Suite applications?

- Completeness of partitioning, archiving, and test data management techniques: Does the solution integrate with database partioning with integrated archiving? Is the archive easily accessible? Can the solution be used to create meaningful subsets optimized for use by each unique test case with integrated data masking to adhere to data privacy requirements?

Robust Performance and Data Growth Assessment Capabilities

Your IT organization first needs to evaluate which Oracle E-Business Suite application modules and tables are growing most rapidly and causing performance related issues. An application ILM solution should enable you to assess data growth and the impact on business reports, transaction processing, and query performance on an ongoing basis. In order to maintain a proactive management plan, these up-to-date reports allow you to continually adjust partitioning, archiving, and subset creation strategies and maximize the ROI of your application ILM solution.

ILM Performance Monitor is a hosted tool that imports AWR reports, identifies poor performing queries, reports or programs aligned with Oracle E-Business Suite specific modules speeding diagnosis and remediation.

Informatica Data Archive features in-depth data growth analysis capabilities that allow you to evaluate current and future data growth rates across Oracle E-Business Suite applications in both production and nonproduction environments. As Figure 2 illustrates, the data growth assessment capability enables your IT organization to understand which tables and modules occupy the most space. It also helps your team proactively plan for growth in data volumes by forecasting the estimated reduction in size from archiving inactive data and reducing the size of nonproduction copies (see Figure 3).
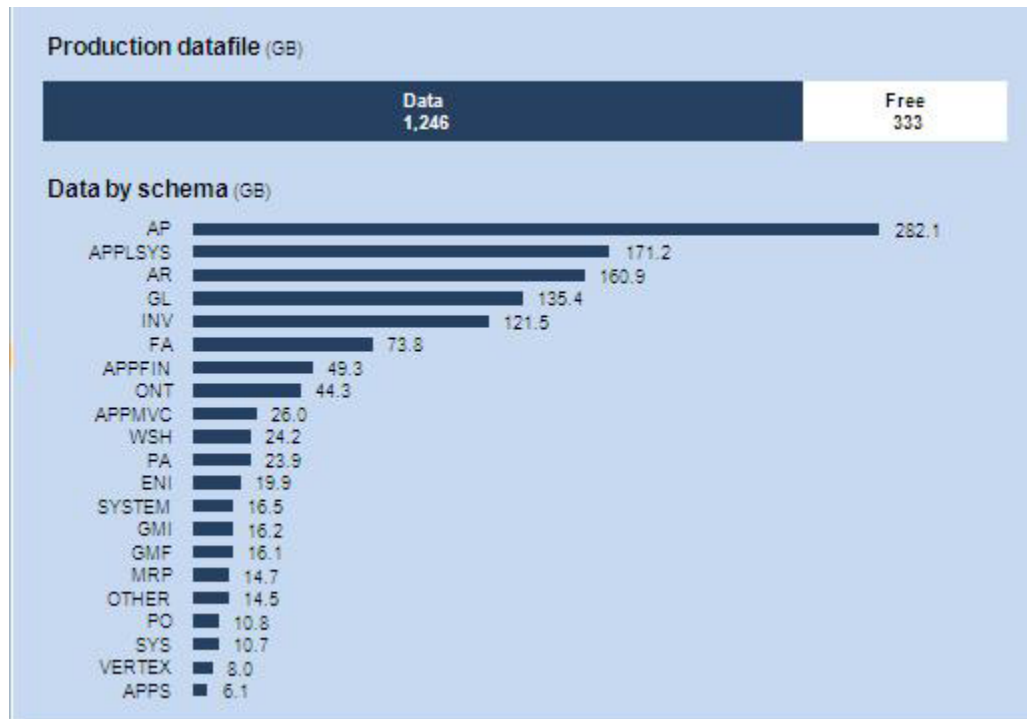

Figure 2. With Informatica Data Archive, your IT organization has an inventory of the most rapidly growing table spaces and modules across Oracle E-Business Suite.

Archive and Subsetting reduces production and non-production datafile size
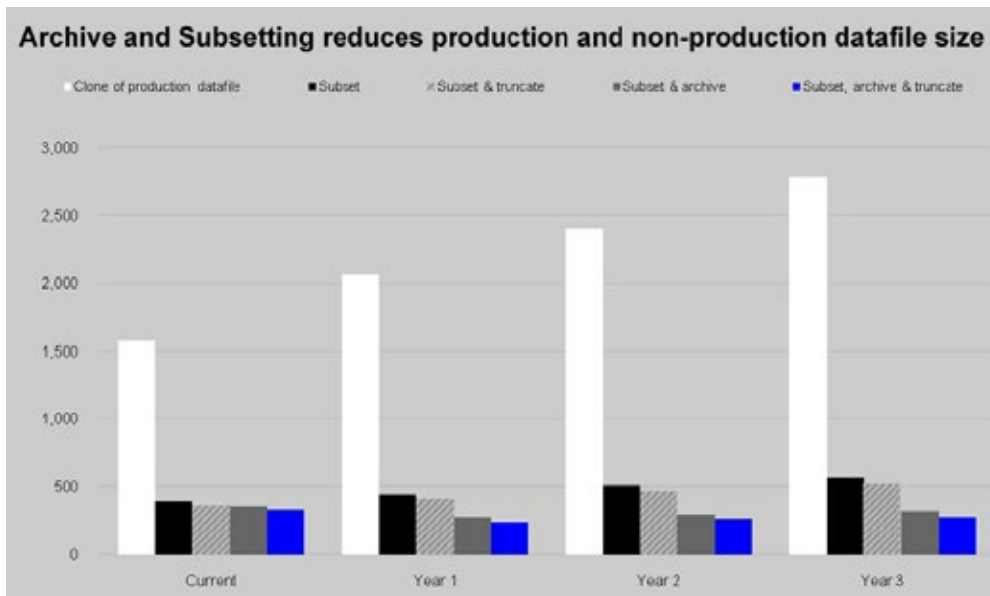
Figure 3. Data growth analysis enables your IT organization to understand the impact of data archiving and subsetting strategies on data growth in Oracle E-Business Suite applications.

Prebuilt Accelerators for Oracle E-Business Suite

To ensure your data's integrity after archiving and creating secure test data subsets, your IT organization needs to understand how business entities are defined, how tables and entities are related, and the business rules within Oracle E-Business Suite. This information is not available in the database. An application ILM solution should offer comprehensive prebuilt business entities and rules for Oracle E-Business Suite. These prebuilt business rules should allow data to be partitioned and/or extracted by different parameters such as date, geography, function, entity ID, and organization. An application ILM solution that provides a full set of prepackaged business entities and rules for the various Oracle E-Business Suite modules helps to speed deployment of the solution.

All products in the Informatica application ILM product family offer broad connectivity and the most comprehensive set of prebuilt, application-aware accelerators for Oracle E-Business Suite. These accelerators provide complete, out-of-the-box support for Oracle E-Business Suite modules, including CRM, AP, PO, GL, INV, and HR.

You can use these accelerators to partition, purge, relocate, create subsets, and mask complete business entities and quickly deploy entity-based database partitioning, archiving, subset, and privacy policies for Oracle E-Business Suite and custom business applications.

Simple Customization and Extensibility

Because every organization configures its Oracle E-Business Suite application differently, an application ILM solution must be able to be fully customized to fit varying business needs. The solution must allow modifications and extensions to the business rules for partitioning, archiving, and creating test data subsets. Custom tables and fields may also be added in an Oracle E-Business Suite implementation, and the application ILM solution needs to be able to operate against these custom objects. This is especially true for modules such as Order Management.

The Informatica application ILM product family's prebuilt accelerators are fully extensible. You can modify entity models and business rules to satisfy your business requirements and build new accelerators from existing ones for custom applications. Using a simple graphical user interface like that shown in Figure 4, you can view, edit, and customize templates (accelerators) and business rules. By mining the database and using a wizard-based interface, you can quickly extend prebuilt metadata to incorporate custom tables created in Oracle E-Business Suite and add new attributes to augment structural metadata with rich context.
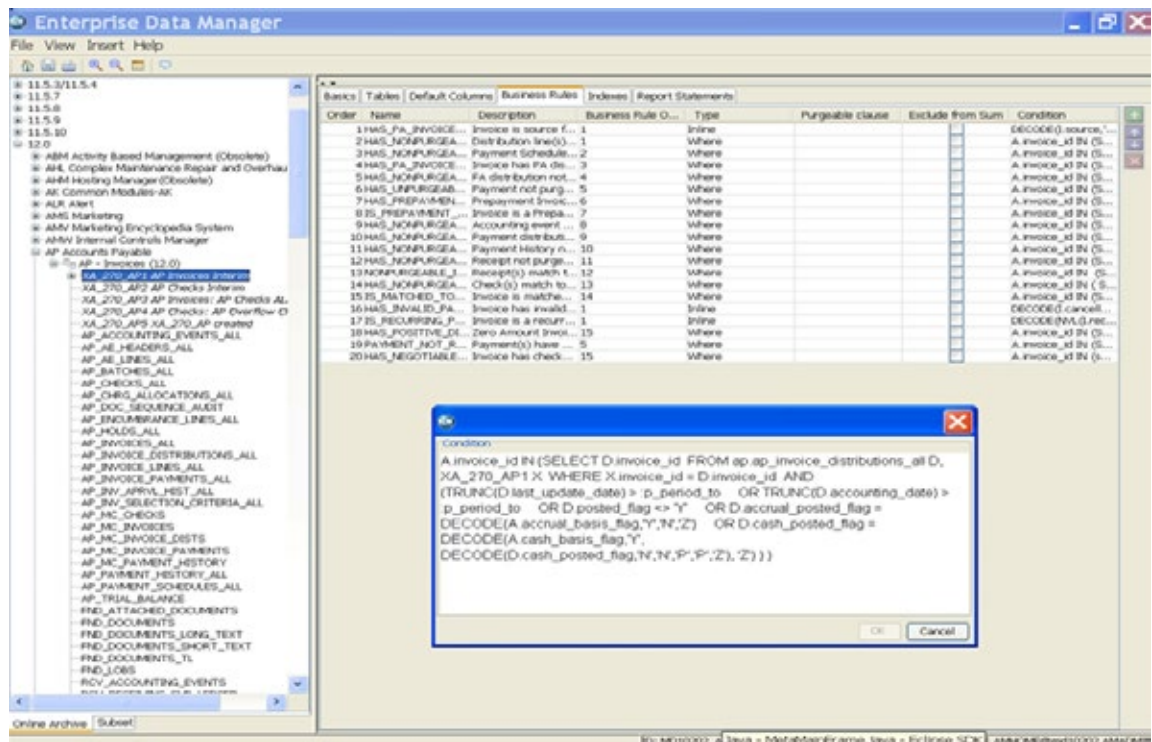

Figure 4. Your IT organization can use the simple graphical user interface to easily customize and extend Oracle E-Business Suite application accelerators.

Informatica's application ILM products also ensure that partition, archiving, subset, and masking policies continue to function even when your IT organization applies patches or updates to an Oracle E-Business Suite module.

Comprehensive Archiving Techniques

The major drivers for application ILM solutions are usually to improve performance and reduce costs. Simply relocating inactive data from the production system to lower-cost servers and storage achieves both goals, but your business requirements are likely to be more complex. You need to consider your organization's budget constraints and performance and access requirements when selecting an application ILM solution—not to mention what options are available when data is not eligible for archiving.

If your primary goal is to improve application performance with the existing hardware, it is critical to be able to leverage database partitioning as a key technology to facilitate an ILM strategy. Aligning a database partition strategy with access patterns serves the same purpose as implementing an archiving solution, but with no impact to the business user or application code changes (see Smart Partitioning).

Your IT organization will probably access archived data less frequently than active data. But you may still have to periodically retrieve the combined archived and operational data directly from the Oracle E-Business Suite interface. In this case, the data should be archived to a format that facilitates relatively high query performance—such as another database instance, located on a lower-cost infrastructure. On the other hand, if inactive data resides in older Oracle E-Business Suite versions that should be retired, you may have to access it only rarely. In such cases, access from a reporting tool, rather than from the application interface, may be adequate. Slower query performance can be tolerated, and the data may be archived to a more optimal, compressed format, such as a compressed file residing on a lower-cost infrastructure.

Regardless of the archive format, however, archived data needs to be easily accessible either from the original Oracle E-Business Suite application interface or through standard interfaces for reporting. As data ages and access requirements change over time, your IT organization needs a way to convert and relocate the data from one archiving format and location to another, enabling multiple cost-effective storage tiers, as Figure 5 illustrates.
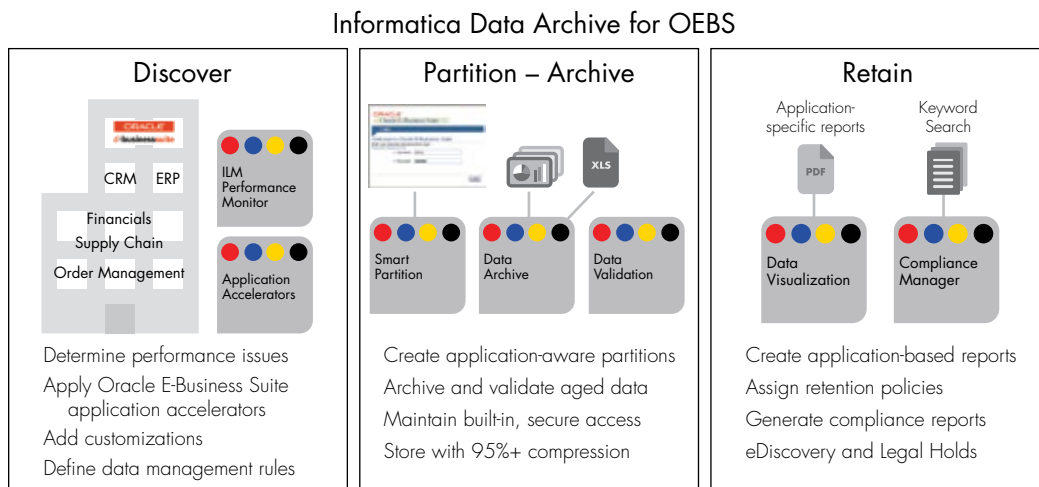
Informatica Data Archive for OEBS

Figure 5. Application ILM solutions should offer a variety of archiving formats and accessibility options to enable multiple, cost-effective storage tiers.

An application ILM solution that offers multiple archiving formats and accessibility options allows IT organizations to determine the appropriate trade-offs among archive size, performance, application accessibility, and cost.

Your IT organization must also be able to restore archive data to its original location. Otherwise, there is no way to correct mistakes during archiving or to accommodate changes to access requirements. For example, purchase order transactions that are closed and reopened may need to be restored because they have become active again. The application ILM solution needs to restore archived data at different levels of granularity, such as selected transactions, business entities, or the entire archive. Informatica Data Archive provides comprehensive archiving techniques that enable your IT organization to cost-effectively and centrally manage scalable archiving processes across multiple databases, Oracle E-Business Suite instances, and other CRM, ERP, and custom applications. Based on the initial performance monitoring and data growth analysis, you can target the fastest growing and largest module for partitioning and/or archiving. Transactional data only or complete business entities, which include master and reference data, can be safely archived (see Figure 6), maintaining data integrity and ready access. If you ever need to access the archived data more frequently, you can restore the entire archive, selected business entities, or an archive snapshot.
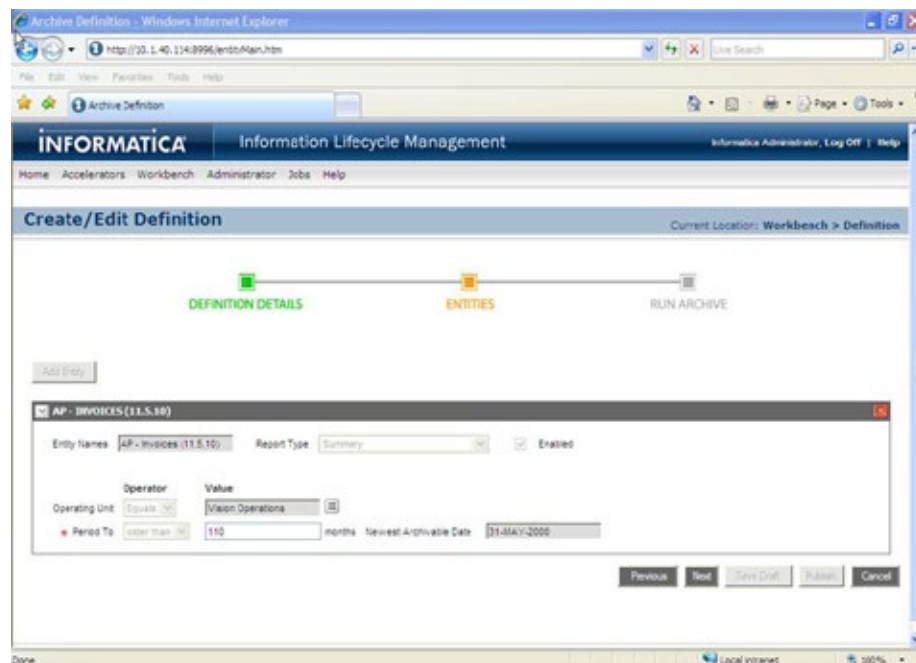

Figure 6. Archive complete business entities using Informatica Data Archive.

Inactive data can be relocated to another database instance or to a secure, highly compressed file. Informatica Data Archive lets you choose the archiving format and destination based on your organization's cost, performance, and access requirements. Archiving to another database has the benefit of supporting seamless access from the same Oracle E-Business Suite application, as Figure 7 shows, and offers high performance.
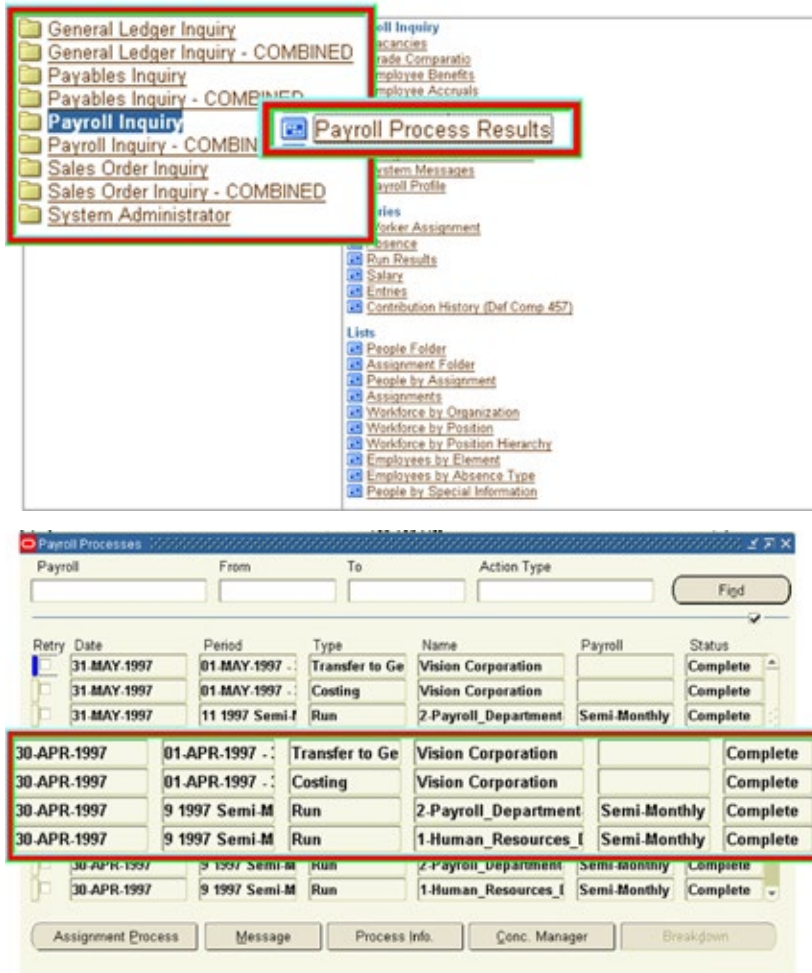

Figure 7. Informatica Data Archive provides seamless access of current and archived data from the Oracle E-Business Suite interface.

Archiving to a compressed, optimized file format can dramatically reduce space requirements. This option supplies a powerful application-independent interface for searching and browsing archived data based on business entities. Standard ODBC/JDBC interfaces are also available for reporting, using any third-party reporting or business intelligence tool. This method can significantly reduce both storage and software license costs and is ideal for application retirement.

By reducing the size of the production instance, Informatica Data Archive makes backup, recovery, and upgrades faster and easier. By retiring legacy applications and archiving the data within them, your IT organization can save on management, software, and hardware costs.

To support regulatory compliance, Informatica Data Archive can easily integrate with third-party archiving or content management solutions, such as Symantec, HDS, and EMC, to facilitate centralized management and e-discovery of all types of archived data.

Smart Partitioning

In many situations, organizations may have large volumes of production data in key Oracle E-Business Suite transaction tables – yet the data is not eligible for archiving. Informatica Data Archive Smart Partitioning offers the performance benefits of archiving without the need to relocate or archive data. Smart Partitioning, built on the underlying Oracle database partitioning capability, is a feature in the Data Archive product that aligns database partitions with the E-Business Suite business entity. For example, all of the records related to purchase orders that are closed and have been closed in a particular quarter can be physically stored on a single database partition retaining all data integrity relationships. Because many business users only access active or recently closed purchase orders, the response time for accessing purchase orders is drastically improved.

Because data is physically aligned by status and in this case age, the number of rows the database needs to comb through to return the right set of records that satisfies the query is significantly reduced, ultimately improving application performance. Additionally, when the transactions are then eligible for archiving, it is simply a matter of executing partition-based tasks to either compress, archive, or purge the aging data— as opposed to issuing a batch of row-delete statements, which could have a negative impact on database resource utilization. If the volume of aged data to be archived is significant, processes based on row deletion could take a long time to complete. With Smart Partitioning, the tasks complete in a matter of minutes independent of the size of the data set to be archived.

Comprehensive Techniques for Creating and Managing Subsets

To reduce the size of nonproduction copies requires the creation of meaningful slices of production data based on different criteria, such as geography, business function, and time. These slices also have to be aware of the complex relationships between transaction records across tables and entities in Oracle E-Business Suite, as Figure 8 shows, to create subsets that preserve data and referential integrity.
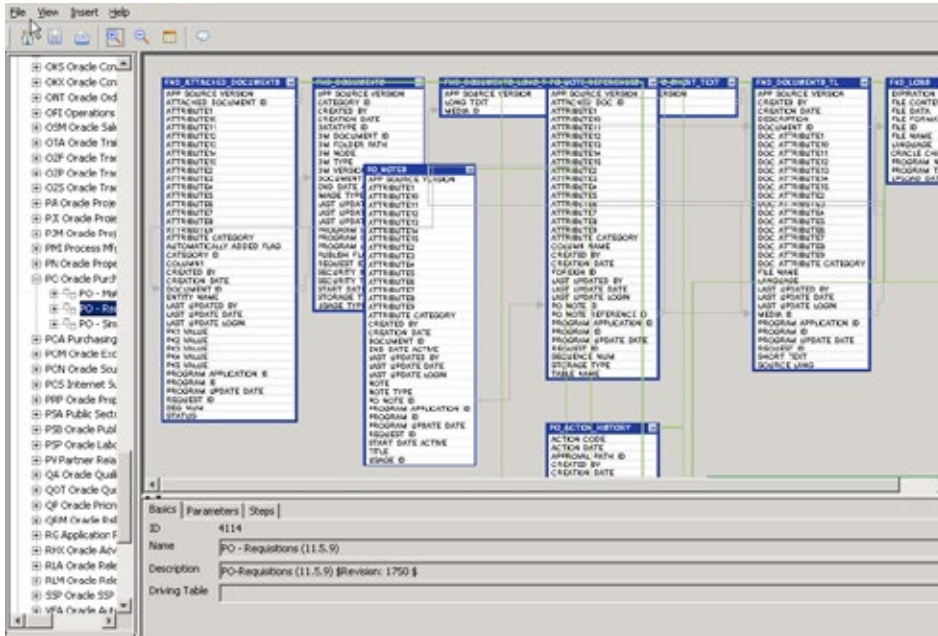

Figure 8. To create subsets that preserve data and its referential integrity, an application ILM solution must be aware of the complex relationships between tables in Oracle E-Business Suite.

After subsets are created for development and testing, the production application continues to be updated with new transactions. The test data may need to incorporate these new transactions or additional boundary scenarios. It is important that the application ILM solution allows the existing subset copy to be refreshed with incremental updates, without having to provision a new environment. Periodic, incremental refresh results in better test data quality and enables more of the complex relationships between tables in Oracle E-Business Suite.

Informatica Data Subset automates the creation of smaller, targeted databases from large, complex databases. As Figure 9 illustrates, the software centrally manages subset processes across databases (e.g., Oracle, DB2, SQL Server, Sybase, and Teradata) and applications, including Oracle E-Business Suite. Informatica Data Subset helps IT organizations untangle complex transactional systems, separating out only functionally related data. With referentially intact, smaller targeted copies of Oracle E-Business Suite application production data, your IT organization can dramatically reduce the amount of time, effort, and disk space necessary to support nonproduction environments and shrink your overall storage footprint.
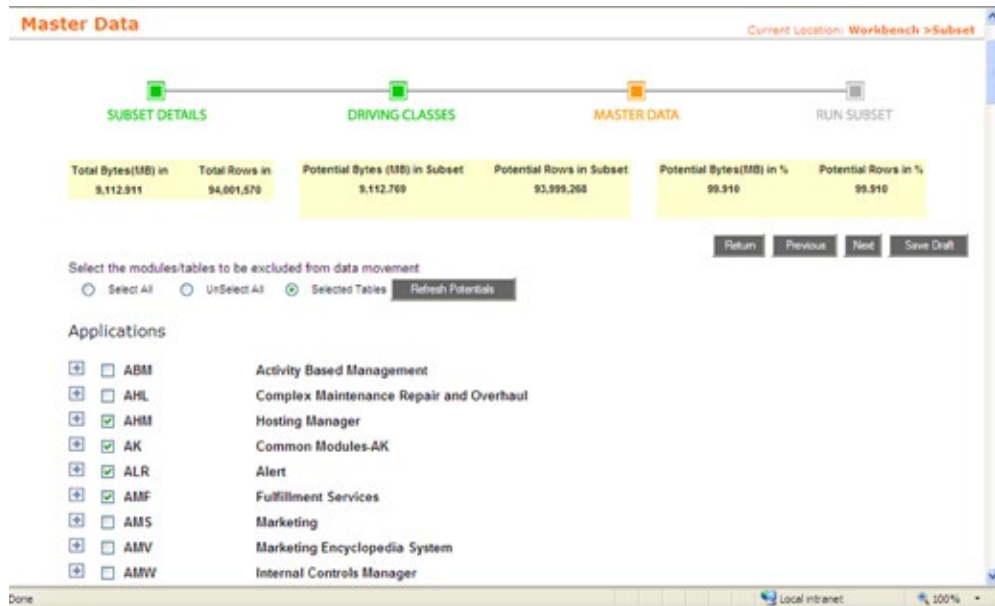

Figure 9. Easily automate the process of creating and managing data subsets using Informatica Data Subset's simple interface.

Simulation reports validate the targeted data and provide an estimate of how much data will be provisioned before actual execution of subset rules. With comprehensive audit logs and reports, you can track the provisioning of data effectively. And if Smart Partitioning was implemented in the production instance, creating data subsets of Oracle E-Business Suite becomes a matter of copying database partitions to the nonproduction instances.

Informatica Application ILM for Divestitures

Organizations that require Oracle E-Business Suite data to be split out from the result of divestiture should consider leveraging an Application ILM-based approach. Rather than manually separate data based on org_id, companies have used Smart Partitioning to segment data related to a specific org_id. The database is then cloned and the non-related org_id partitions are simply dropped. Master, setup, and lookup data is maintained as is application data relational integrity resulting in very quick data divestiture projects.

Informatica Application ILM in Action

Hundreds of companies worldwide have relied on Informatica application ILM products to manage data growth in their Oracle E-Business Suite applications. These case studies demonstrate how these products have helped three companies:

- Reduce storage cost and improve response time

- Improve application performance and availability

- Increase IT efficiency and avoid staffing costs

Reduce Storage Cost and Improve Response Time

The increasing demand for IKON Office Solutions document management products and services has fuelled data growth in the company's transaction-intensive Oracle modules, such as Order Management, Field Service, and Purchase Order. These transaction-intensive modules were growing at up to 2 terabytes per year. Taking into account copies of the production databases, the total database size was projected to soon reach 80 terabytes—a size beyond the company's current storage infrastructure.

IKON deployed Informatica Data Archive to:

- Reduce costs by $1.5 million annually

- Realize a full ROI in only six months

- Save 4.8 TB in production systems by archiving inactive data

- Decrease the time it takes to perform a backup from eight hours to six hours

Increase IT Efficiency and Avoid Staffing Costs

AT&T's wireless division was experiencing greater transaction processing demand in both its Oracle E-Business Suite supply chain and financials applications. The system has a regular load of about 6,000 to 7,000 concurrent users who require a very high level of service. The system also supports an additional 100 to 200 auditors who require 100-percent system availability. The data growth in AT&T's production system caused backup windows to last four days and unacceptable completion times for data loading and provisioning.

With Informatica's application ILM products, AT&T's wireless division was able to:

- Archive 1.2 TB out of 10.2 TB from the Oracle E-Business Suite production system

- Improve database performance by 30 percent

- Save 10 hours per month in data loading by avoiding performance and data growth issues

- Save 40 hours per month by reducing the backup window from four days to merely hours

- Increase application availability by trimming the batch run time from 6.5 to 3.5 hours

Conclusion

Your IT organizations can no longer ignore the escalating costs associated with managing the growing data volumes in your Oracle E-Business Suite applications. Traditional methods of managing data growth address only the symptoms—not the root cause of the problem. The key to capping your IT organization's data management costs and risks is to relocate dormant data to lower-cost infrastructure and start provisioning "lean" masked copies of production data for your development, testing, and training environments. This is what application ILM solutions can do for you.

Informatica's application ILM product family delivers the full range of capabilities that your IT organization needs to effectively manage data growth in Oracle E-Business Suite across the complete lifecycle of the data—from development, test, production, and archive to retirement. When your IT organization implements a comprehensive, scalable, and flexible application ILM solution such as the one available from Informatica, you'll reduce the total cost of ownership of your Oracle E-Business Suite applications by:

- Improving application performance

- Retiring legacy applications safely

- Optimizing development, testing, and training environments

- Improving the quality of development, testing, and training activities

- Supporting compliance with internal, industry, and governmental data privacy mandates and regulations

Together, Informatica and your IT organization can align the business value of data with the most appropriate and cost-effective IT infrastructure to manage it.

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Put potential to work.™

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