



## **Oracle Applications Upgrade Overview: 10.7.x to 11.x/11i**

### **ACS Migration Methodology**

*Applications Consulting Specialists, Inc.*

#### **Introduction**

The time is now, the technology is the Internet! As you would expect, the Internet allows you to streamline your IT organization. By requiring only a standard browser on the desktop, centralizing complexity onto professionally managed servers, and exploiting the global WAN to reach more users, you can significantly reduce your IT cost infrastructure. Even more important than IT cost savings, the Internet changes the way you run your business. Leveraging the Internet Platform with Oracle Applications Release 11i is based on the latest version of all technologies. To ensure smooth implementations, Application Consulting Specialists, Inc (ACS) leverages two major initiatives, the ACS Migration Methodology and the ACS Project Management Method. ACS Migration Methodology (MM) is a comprehensive toolkit for migrating Oracle Applications products. ACS MM is a tested framework for quality migrations used successfully nationwide by ACS consultants, and the ACS Project Management Method is a standardized ACS approach to migration project management.

The upgrade from 10.7.x to 11.x/11i represents a major revamp of technology, how the business is run, and user perspective. ACS leverages concepts incorporated from Oracles EMM Methodology in combination with our own successful application upgrade project experience to provide a proven methodology and tool-set to upgrade Oracle Applications successfully. ACS, Inc. is a national professional services firm that helps to improve its clients' business performance through the intelligent application of information technology. ACS provides a continuum of services throughout its clients' solutions life cycle. These services comprise management consulting, enterprise resource planning & solutions design, implementation, E-Commerce/E-Business, and customer relationship management systems. The Oracle Application Upgrade Practice at ACS, Inc. has grown over the past few years into one of our most popular and successful service offerings. ACS has successfully completed a number of application upgrades during the past few years. Currently, while working with clients with Release 11.x project implementations underway, we are strongly suggesting that clients intending to implement Release 11i in the year 2000 begin their planning phase as soon as possible.

#### **What is ACS Migration Methodology?**

ACS Migration Methodology (MM), is ACS's methodology and tool-set to effectively upgrade the Oracle Applications software. It consists of a project management methodology, knowledge base with specific Oracle Applications upgrade information and migration tools to help expedite the successful completion of the upgrade. ACS MM is our life-cycle method and toolkit for migrating from one Oracle Applications release to another. It is a proven, structured approach that is applicable to any Oracle Applications upgrade. The ACS MM process includes four major phases, (Planning & Migration Assessment, Update & Test, Transition, Production) and two categories of tasks, (Core Tasks and Optional Tasks). Core tasks represent the minimum critical path to complete a migration. These tasks include the standard application installation and migration tasks documented in the new Oracle Release Installation and Release Upgrade Preparation Manuals. Optional tasks include steps addressing unique requirements for a specific migration project. These include customizations, custom interfaces, application or technical architecture changes, and business process changes due to new application functionality.

The simplest Oracle Application upgrade would consist of installing the new release based on recommendations included in the Oracle Release Installation Manual and performing the steps documented in the Oracle Release Upgrade Manual, which include: executing pre-upgrade steps prior to running Oracle's standard data migration tool, running Oracle's standard data migration tool and executing post-upgrade steps after running Oracle's standard data migration tool.



## What is different about the ACS Migration Methodology?

Typical methodologies only provide a project management framework for effectively managing any project. ACS MM goes a step further and incorporates the experience gained by ACS's consultants over the years in upgrading Oracle Applications. This has been done by the creation of knowledge bases to capture Oracle Application upgrade specific issues, problems and resolutions. The ACS MM approach is very flexible and can adapt to a client's specific needs. If a client has experienced resources to dedicate to the upgrade effort, ACS can minimize consulting costs by assigning complementary resources during the times they are needed. ACS can help by providing the project managerial, technical and functional resources required. ACS can also provide the entire team if the client does not have the resources to dedicate to the effort. Our project managers continuously update a knowledge base with information about new features available in the new release and their limitations. The knowledge base is also updated with upgrade specific issues and their resolutions. This information helps in reducing the number of upgrade test runs. The information stored in the knowledge base is extremely useful for the rapid completion of upgrade projects. Techniques to migrate to the Internet Computing Architecture have also been developed, keeping in mind the long-term maintenance of the system. These techniques have also taken into consideration different environments, which include Character mode, Citrix, and Smart Client. Several methods have been devised to leverage the existing client infrastructure to migrate to Release 11.x/11i. Tools have been developed to help identify customizations that will be affected by the upgrade. This reduces the analysis effort and provides an accurate estimation of the time required for modifying the customizations. The methodology, knowledge base and tools coupled with experienced consultants provide a powerful combination for successful upgrades.

## ACS Migration Methodology – Major Phases and Processes

### Planning/Migration Assessment Phase

Planning is the key to a smooth and successful upgrade. The planning phase should begin as soon as possible after your company commits to proceeding with an applications upgrade. Identifying the significant issues that you should consider while upgrading, implementing, and using a product is the key to a successful upgrade. In the Planning & Migration Assessment Phase, you need to consider the following processes:

- **Project Management**
- **Business Requirement Review**  
Updates the business needs impacted by the upgrade project. Changes are documented in business processes between your current release and the Release 11.x/11i applications.
- **Requirement Mapping Update**  
Evaluates the changes in the Release 11.x/11i applications against the business requirements defined in the Business Requirements Review process.
- **Migrate Application and Technical Architecture**  
This process evaluates the incremental impact to the existing architecture as a result of the migration.
- **Migrate Custom Extensions**  
Defines the tasks and deliverables to update customizations for compatibility with Release 11.x/11i or to replace the customizations with new functionality available in Release 11.x/11i.
- **Data Migration**  
Defines the tasks and deliverables required to migrate current system data to the Release 11 application.
- **Documentation**  
Updates existing documentation created during implementation of the current release to that of the Release 11.x/11i environment. If none exists, it should be developed
- **Business System Testing**  
Verifies that the Release 11.x/11i application functionality meets the business objectives.



- **Training**
- **Production Migration**

During Planning/Migration Assessment you analyze the impact of application release changes and propose steps to complete the upgrade project using the following information sources: current production system documentation, supporting technical architecture and administrative environment including Oracle Applications, customizations, and application interfaces, new application release documentation, emphasizing Oracle's Product Release Installation and Oracle Release Upgrade Preparation Manuals, which summarize functional and technical changes from prior releases, business and system goals and objectives of the organization as related to the upgrade including plans for process change, enabling new application functionality, replacement of customizations, retirement of legacy systems, and application and technical architectural changes

### **Update and Test Phase**

During Update and Test the project team performs tasks to establish a test environment, configure and tests new application processes in the test environment, and assesses if the test results achieve the sfunctional business objectives and requirements. The team will also update or build customizations, custom data migrations, interfaces, and the application and technical architecture as part of the completed solution. It is important to distinguish between the standard pre- and post-data migration steps documented in the Oracle's Product Release Installation and Release Upgrade Preparation manuals and supplementary steps unique to your project. Such supplementary steps are required to support custom interfaces or migration of custom data.

### **Transition Phase**

During Transition, the project team establishes the fully configured and migrated production environment and deploys the upgraded applications environment into the organization. All elements of the upgrade must come together to transition successfully to a final production environment. During this phase, end users are trained on new release functionality. The technical team updates the production environment by executing the standard migration steps including pre-and post-upgrade steps. Custom migration steps are also executed, if required, to convert data and implement changes to application interfaces. If a phased deployment approach is being employed, transition may consist of multiple deployments where subsets of the applications may be deployed to various geographical sites and/or business units over time. Transition is a demanding experience for the project team and, in particular, for the end users who may have to maintain multiple systems until production is declared. Preparation and planning in advance is key to facilitating the transition process while minimizing the disruption to the business.

### **Production Phase**

Production begins immediately with the production cutover. It marks the last phase of the upgrade project, and the resumption of the system support cycle for the new release. System performance is assessed and the upgraded system is tuned to achieve performance objectives. Other system refinements may be necessary to achieve a stable production system.



## ACS Migration Methodology Summary

It is recommended that the key users be trained on the new Oracle Applications Release at the beginning of the upgrade project. This creates knowledgeable users who can make well-informed decisions regarding the new features available in the system. The tactical and strategic goals of the organization will be documented in order to plan and make the necessary decisions required throughout the upgrade. The impact of the new release on the business processes will be analyzed and a business case will be built to provide a baseline for measuring the benefits of the upgrade. The impact of the new release on existing customizations and interfaces will be studied using special tools developed specifically for this purpose. The current technical infrastructure will be looked at and any changes will be recommended. A detail plan will be developed for the upgrade consistent with the business and technical objectives of the client.

At this stage, typical Deliverables would include: A benefits summary document and business case for the upgrade, a proposed business process change document (any new modules that the client needs to be implemented will also be identified), technical infrastructure recommendations to support the new release, customizations and interfaces impact analysis document, listing of customizations that need not be upgraded (due to additional functionality available in the new release) and a detailed project plan for the upgrade.

The Release 11.x/11i demonstration database will be installed to allow the key users to get familiar with the new environment. The Demo database also acts as a good reference point when certain problems arise in the test database. The necessary hardware to support the new release will be installed and configured. The upgrade will be run on a test environment, which will be a copy of the production environment. A Conference Room Pilot (CRP) will be run on the upgraded test environment. This CRP will allow the business users to validate any process changes identified. The CRP can also be used to configure and test any of the new features available in Release 11.x/11i

All the customizations, interfaces and reports that were identified earlier as impacted by the upgrade will have to be modified and tested in the Release 11.x/11i test environment. All customizations that were replaced by new functionality in Release 11.x/11i will be removed or disabled. As part of the pre-upgrade steps the required data that does not meet the Release 11.x/11i integrity requirements will be cleansed. The Auto-Install (Upgrade) process and pre & post-upgrade programs are normally not tuned for a particular installation. Therefore, these programs will be tuned in order to complete the production upgrade process without any extended downtime for the production system. The end user training material will be updated with the changes to the business processes impacted by Release 11.x/11i. All the applications will be unit tested for application specific functionality. A system integration/user acceptance test plan and test scripts will be created. The user acceptance test environment will be created from a copy of the production environment. It is recommended to plan a clear cut-off date for the copy to be made from production to create the test environment. All the key reports will be run on the production system before the copy is made so that they can be compared to the reports run on the test environment after the upgrade. The system integration/user acceptance test will be performed on the test environment. A detailed production upgrade schedule will be created listing the hour-by-hour details for the production upgrade.

Deliverables at this point include: Process change documentation, end user training material, technical documentation for customizations, interfaces and reports, DBA auto-install procedures, system integration/user acceptance test plan and test scripts, test results documentation and the production upgrade schedule. Migrate Prerequisites: The production upgrade can be started on the successful completion of the system integration/user acceptance testing. The production environment hardware and software should also be prepared for the upgrade.

The end-users will be trained on any of the new features in Release 11.x/11i and the user interface. The training effort is typically greater for customers migrating from a character mode environment to Release 11.x/11i. Although the official end-user-training task is in the migration phase it is always good to keep end-users involved in the upgrade process from an earlier stage. If the end users are involved with the user acceptance testing, the final training effort will be much easier. The production hardware will be installed and configured. Once the production



environment is ready, the detailed production upgrade schedule will be followed. The upgrade schedule will include details about the reconciliation reports that need to be run, pre and post-upgrade steps, the auto-install process and the list of customizations that need to be migrated. Once the production upgrade has been completed all the reconciliation reports will be run and compared to the reports run prior to the upgrade. Also, the key business functions will be tested prior to the sign-off on the upgrade. Post-upgrade support will begin and the production system will be monitored for integrity and performance. Final Deliverables include: Data reconciliation summary, recommendation document for ongoing maintenance and project sign-off document.

## **Release 11.x/11i System Architecture**

Release 11.x/11i adheres to Oracle's Internet Computing Architecture. The Oracle software is installed and managed primarily on middle tier servers, eliminating desktop software installation and upgrades. Commercial web browsers provide HTML and Java capabilities on the desktop and communicate with one or more application servers using standard HTTP and TCP/IP networking. This significantly reduces the costs associated with managing traditional client/server systems. Users benefit from the same functionality and rich graphical user interface as the client/server release. Release 11.x/11i can be implemented using a two-tier or three-tier architecture. The three-tier architecture is the recommended and typical approach. In a three-tier architecture the database server, concurrent processing servers and administration server are installed on the Database Tier. The Web Server (Listener) and Forms (Developer 2000) Server are installed on the middle or application tier. The Client Tier consists of a browser or Oracle's Applet viewer. Typically there are multiple Middle Tier Servers depending on the number of users connecting to the Applications. The Forms Servers do allow for load balancing among the multiple servers.

Historically, a large number of Oracle customers have used remote presentation software similar to Citrix Winframe to deploy the Release 10.7 SC applications in order to simulate a thin-client/server-based environment. Such presentation software is no longer needed in the Release 11.x/11i environment. Customers moving from a Citrix environment can leverage their existing infrastructure to implement Release 11.x/11i. The Citrix servers can be reused as middle-tier application servers. Experienced resources and a detailed understanding of the Release 11.x/11i architecture is required to make decisions, keeping in mind the long-term maintenance of the system.

Internet Computing Architecture provides Oracle Applications with a framework for multi-tier, distributed computing. In the multi-tier computing model, various functions of the Oracle Applications architecture are distributed among multiple levels, or tiers, of machines. Although many physical machines may be used in a configuration, scalability derives from processing capabilities on three separate tiers: the desktop client tier, the application tier, and the database tier. The Multi-tier Architecture consists of the following tiers:

### **Desktop Tier**

In Release 11 and 11i, the client interface is provided through a Java applet. The client can download the applet on demand, or cache the applet locally and download only when the applet is updated. All updates are installed on the server and are downloaded to the client automatically from the server. Shifting software administration from the desktop to the network provides you with both a graphical user interface and lower administration costs:

### **Application Tier**

The application servers form the middle tier between the desktop clients and database servers. They provide load balancing, business logic, and other functionality. In installations that use multiple application servers, only one needs to run the Oracle Web Application Server software.

### **Database Tier**



The database tier holds all data and data-intensive programs, and processes all SQL requests for data. The database tier includes the Oracle8i Server, the administration server, and the concurrent processing server. By definition, machines in this tier do not communicate directly with Applications users, but rather with machines on the application tier that mediate these communications, or with other servers on the database tier.

### **Administration Server**

The administration server is the machine from which you maintain the data in your Applications database.

### **Concurrent Processing Server**

Most interaction with Applications data is done through Applications forms. There are also reporting programs, however, that periodically need to be run. These programs may contain a very large number of computations, so to ensure that they do not interfere with interactive operations, they can be configured to run on a separate machine called the concurrent processing server.

## **Technology Stack – Release 11i**

Oracle Applications is 100% web enabled with Internet Computing Architecture and R11i. With Oracle Release 11i in addition to a Web enabled product, Oracle Applications is using the cutting edge technology and leveraging the Internet Platform in a big way. R11i is based on the latest version of following technologies:

- RDBMS 8i
- Reports 6
- Forms 6
- Oracle Application Server 4
- Discoverer 3.3
- Enterprise Manager 2
- Workflow 2.5
- J-Initiator

## **Conclusions**

There are many challenges presented by an upgrade to Release 11.x/11i. The benefits of the upgrade should be identified and a business case identifying the hard dollar benefits is recommended. Change management issues related to changes in business processes have to be addressed. The new features in Release 11.x/11i and more importantly their limitations have to be clearly understood. All customizations impacted by the upgrade have to be quickly identified and modified to work with the new release. The Internet Computing Architecture needs to be understood and the existing infrastructure has to be leveraged to implement Release 11.x/11i. The upgrade process needs to be tuned to run within the production downtime window. The system needs to be thoroughly tested to prevent any surprises. The end users have to be trained in the new release in order to realize all the benefits initially projected. Although these challenges seem daunting, proper planning and a clear-cut methodology along with experienced resources will ensure a smooth upgrade. This paper has attempted to describe the process and methodology ACS has developed and customized to upgrade from Oracle Applications Release 10.7.x to 11.x/11i. Every install and upgrade is different. This is because of different uses of the applications, customizations and environmental differences. Upgrading from Release 10.7.x to Release 11/11i is a major architectural and technological change and is comprised of many different elements. Whereas Internet Computing and Release 11i is a major change in technology stack in addition to the new features and functionality.



First, ACS recommends a number of practice upgrades prior to your real conversion. Second, establish a good testing period for feature and functional changes. Use the Oracle Vision Demo Database to simulate your business needs. Third, plan your upgrade carefully and an experienced pair of eyes can make a big difference. Make sure you understand the new architecture and technology changes before planning the upgrade. ACS's Migration Methodology approach provides the project management roadmap, knowledge base of upgrade related problems and issues and the tools to help expedite the upgrade project. The ACS MM approach coupled with ACS's experienced consultants provides a failsafe combination for a rapid and smooth upgrade.