Migrating Your Applications to the Cloud

How to Overcome the Challenges and Reduce the Costs

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Abstract

Many organizations want to realize the benefits of accessing and using their applications in the cloud. This paper discusses several challenges to achieving this goal, including:

- The limitations of historic solutions to date
- The new challenges unique to a cloud migration
- The current landscape of virtual technology

Also included is rationale for organizations to consider automated approach to application compatibility testing, fixing and packaging.
Introduction

What is the Cloud?

There are many definitions of the cloud. Here is one from the American National Institute of Standards and Technology (NIST):

"Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

In layman’s terms, the cloud combines two important aspects of how we use computers today; storage (computer power) and accessibility (security and management). The cloud couples these two functions together, providing an accessible web front end for the user with flexible or “elastic” resource capability behind it.

Cloud-based solutions offer many benefits, including mitigation of risk and reduction in resources required. Figure 1 illustrates additional benefits:

Current and Emerging Cloud Technologies

Technologies are now available for both desktop virtualization and application virtualization. Many applications are already available in the cloud, including Salesforce, Google Docs and Microsoft’s Office 365. These cloud-based applications employ a web front end, with all the processing completed on databases hosted on public or private cloud storage. The true dawn of cloud applications, however, will arrive when business and everyday

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desktop applications like 3D image rendering and editing solutions can run from a cloud environment. This is starting to be seen with HTML5, which is able to hook together mobile devices, web rendering, advanced applications and graphics.
Historic Migration Solutions

Microsoft’s Business Desktop Deployment (BDD) Paradigm

How do we get our business-critical desktop applications ready for a cloud environment? The most common approaches to application migration used by large and medium sized organizations are generally based on Microsoft’s Business Desktop Deployment (BDD) paradigm, illustrated in Figure 2.

In this model, the transition from a single platform occurs in the following basic stages:

- Discovery and source code
- Repository
- Application compatibility (assuming assessment and remediation)
- Infrastructure remediation and computer imaging (desktop or server)
- Application management and deployment
- User state migration and security profiles
- Deployment process
- Operational readiness

The Rise of Application Compatibility Issues

For migrations to versions of Windows prior to XP SP2, application compatibility issues were comparatively minor. Automated compatibility assessment and remediation tools were not generally required, and the risk and effort were generally low in proportion to the size of the application portfolio.

Application compatibility first started causing significant challenges when enterprises started moving to XP SP2. The problem was especially acute because no tools existed at that time. Of course, the application compatibility challenge becomes increasingly complex with each new technology version, with Windows 7 being the greatest challenge to date. Fortunately, various application compatibility technologies have been created to help organizations migrate successfully.

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Migration Today

A Hybrid Approach

Today, moving applications to the cloud is more complex. Not all applications are suitable for deployment to cloud-based solutions, and some applications may be better suited for one vendor’s cloud solution than another’s. Therefore, today’s migrations will not follow the historic approach advocated by the Microsoft BDD program, but will involve a mix of environments, including the following:

- Desktop application deployments
- Server-based hosting solutions
- Multiple virtualization environments
- Multiple cloud solutions

In fact, many companies are already opting for a hybrid model in the virtualization area. As the top four virtual technology vendors (Microsoft, Citrix, VMware and Symantec) compete to provide the best offering, releasing new product features each quarter in response to customer demand, many organizations will use two or more virtualization products to best address their user need and storage requirements.

Often a hybrid approach to virtualization is chosen out of necessity: some applications simply are not compatible with App-V, for example, while others cannot be virtualized with Symantec. This often prevents an organization from choosing a single virtual platform for use across their entire application estate, since the risk of not being able to remediate compatibility issues could leave them without critical business functionality.

In addition, organizations choose not to virtualize some applications at all; for instance, if an application is used rarely or only by a few people, the ROI of putting it into the cloud may be deemed too low. Therefore, organizations may choose to use some applications in a native format (EXE & MSI) alongside their virtualized applications.

In general, application administrators should expect a minimum of two deployment and target platforms, and therefore prepare for an explosion of complexity in managing their application portfolio.

Key Questions

To determine the best approach, application owners will need to address the following questions:

- Which applications are suitable for server, virtual and cloud deployments?
- What effort is required to update or remediate each application to ensure future compatibility?
- What tools are required to convert each application so that it is compatible with the target platform(s)?

Available Virtualization Technologies

Here is a non-exhaustive list of vendors offering application virtualization. Their products offer different benefits and may generate unique compatibility issues:

- Microsoft App-V
- VMware ThinApp
- Citrix XenApp
- Symantec SWV
New Challenges for the Cloud

Manual Methods Are No Longer Viable

Early virtual application capture technology (referred to as “sequencing” or “profiling”) experienced a number of technological limitations that impaired application installations or runtime functionality. The virtualization technology industry has improved over the past five years, but there are still limitations and rules that have to be adhered to for each technology. This can result in compatibility issues for application installs and runtime, update and un-install processes, leading to the following problems:

- Application compatibility assessments are now essential, requiring time and skill.
- Additional skills and resource are required to convert applications from native to virtual formats.
- Different technologies may suit specific applications.
- Some distribution technologies may not support every virtual solution.

Organizations often try to address these challenges by adding staff to the project team to manually assess, fix and convert desktop applications for the target virtual platform. Of course, this can entail huge cost, whether the company chooses outsourcing, off-shoring or hiring internally. Moreover, managing these large teams can become a challenge, with the consistency of volume and technical output left at risk. Moreover, now that we have many choices of virtualization technology, it is quite possible that enterprises will have to double, treble or even quadruple the amount of time and resource they allocate for manual application compatibility testing and remediation, since they will need to take into account not only the OS but also each virtualization technology.

The Advent of Automated Application Compatibility Testing and Remediation

With multiple target platforms, multiple technologies and multiple vendors, the historic, manual approach to migrating desktops and application portfolios is no longer suitable. Instead, organizations are opting for automated application compatibility testing and fixing, since the time needed for testing and remediation remains the same no matter how many virtual platforms are selected.

Weighing the Risks and Benefits of Moving to the Cloud

While moving to a cloud-based solution reduces or eliminates some historic migration components, it can bring new IT management challenges, such as:

- OS platform assessment and remediation
- Virtualization platform assessment
- Application conversion to target platform
- Middleware and dependency management
- User state and profile management

Figure 3 illustrates some of the common concerns that IT administrators and application owners must manage in the effort to migrate their applications from a standard desktop environment to virtual and server-based systems and then to the cloud.
As this diagram indicates, the magnitude of the risks increases as more applications are migrated to the cloud. Furthermore, the hybrid model that many organizations will be obliged to adopt also increases risk in proportion to the number of solutions included in the hybrid model.

Accordingly, decision makers must weigh the benefits of an optimal hybrid solution against the resulting complexity of the cloud enablement process. Again, the potential to apply automated application compatibility testing and remediation will become a key factor in this decision, as it will allow enterprises to reduce much of the risk.
Conclusion

This paper has highlighted many of the key challenges in moving to the cloud. Organizations should expect to adopt a hybrid migration model, with several virtual and hosting solutions and some applications remaining in the native deployment. Application administrators should prepare for multiple deployment and target platforms and expect an explosion of complexity in managing their application portfolio. Decision makers must weigh the benefits of an optimal hybrid solution against the resulting complexity of the cloud enablement process.

Key questions to ask include:

- Which of my applications will be best suited to a hosted, virtual or cloud deployment?
- What tools are required to test, remediate and convert my applications for new the target system(s)?
- Which challenges will cause particular pain for me?

In addition, given the challenges of a hybrid migration, with multiple target platforms, multiple technologies and multiple vendors, the historic, manual approach to migrating desktops and application portfolios is no longer suitable. Organizations should investigate taking an automated approach to application compatibility testing, fixing and packaging. This automation will greatly reduce both the complexity of the process and the time and cost required to complete this aspect of the migration.
For More Information

Cloud Computing
For more information about the cloud, please see the following:

- http://www.gartner.com/it/page.jsp?id=707508
- http://technology.timesonline.co.uk/tol/news/tech_and_web/article3874599.ece

Virtualisation Technologies
For more information about specific virtualization technologies, please see the following:

Microsoft Application Virtualisation (App-V)

VMware ThinApp:

Citrix XenApp:

Symantec SWV:

Quest ChangeBASE
For more information about Quest ChangeBASE solutions, please see:
- http://www.quest.com/changebase/
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