Welcome!

Thank you for joining us on today’s Gartner webinar.
Five Options for Migrating Applications to the Cloud

Richard Watson
Memo:
Move some applications to the cloud

Regards,
your CIO.

We’ve got room!
Decision Point

- **What is the right cloud migration choice for my application?**
  - Rehost (on HlaaS)
  - Refactor (using SlaaS and PaaS),
  - Revise (for HlaaS or PaaS)
  - Rebuild (on PaaS),
  - or Replace (with SaaS)?
How do I make this decision?

Supply side analysis

Demand-driven analysis

Why am I making this decision?

What do I need to achieve?

What is constraining me?

What are my choices?

Here are the vendors in the market

Which offering is closest to what I need?
How do I make this decision?

- Supply side analysis
- Demand-driven analysis
- Guesswork
- Reference Architecture
Agenda

Demand-driven analysis

- Why am I making this decision?
- What do I need to achieve?
- What is constraining me?
- What are my choices?

Decision Context
Migration Goals
Requirements & Constraints
Alternatives
Decision Tools
Decision Context

• This is not a decision whether or not to migrate applications to the cloud.
• The application already exists in some form.
• Not really a question of migration but optimization
Architectural Context

“What is my organization’s strategy for adopting cloud computing?”

“You can’t do anything with it? What does it cost?”

“What is the delivery strategy for overhauling this application?”

“What is the replacement for strategic applications? What are the risks of doing nothing?”

“What is my organization’s strategy for adopting cloud computing?”

“Build, Buy, Borrow, or Rent?”

“What is my target application platform?”

“Application Portfolio Management”

“Legacy Modernization”

“Application Platform Strategy”

“Cloud Adoption Strategy”

“Application Cloud Migration”
Where in the cloud adoption cycle?

Step 1: Pre-work
- Create cloud computing core team
- Define business objectives
- Scope the effort
- Establish cloud adoption principles

Step 2: Business and application assessment
- Conduct a BIA
- Construct an internal cost model
- Consider changes to organizational procedures
- Determine application requirements and dependencies
- App external cloud ready?

Step 3: Vendor selection process
- Create and submit the RFI
- Review vendor response
- Suitable vendor?
- Re-evaluate app?
- Yes
- Send RFQ and kick off migration planning
- No

Step 4: Mitigate risk and liability
- Devise an exit strategy
- Explore other risk mitigation options
- Risk acceptable?
- Yes
- Add the app to the cloud roadmap
- No

Step 5: Steady state
- Manage vendors
- Govern internally
- Review regularly

Repeat steps 2 through 4 as necessary, on an application-by-application basis.

Before vendor selection step, apply this Decision Point: “Cloud Application Migration: Rehost, Refactor, Revise, Rebuild, or Replace?”

Apply Decision Point: "Data Center Sourcing: Cloud, Host, Co-lo, or Do-It-Yourself"

Gather requirements and constraints for Decision Point here.
1. Identify migration goals
   - Use the guidance in “Application Rationalization”, “Legacy modernization”, “Buy, Build, Rent or Borrow”, and “Cloud adoption strategy” frameworks

2. Gather requirements and constraints
   - Use the guidance in App Rationalization and Strategic Software Assessment Frameworks

3. Filter out alternatives based on evaluation criteria
   - Use the Decision Filters to rule out alternatives

4. Prioritize migration goals and match with remaining alternatives
   - Use the Alternatives Assessment Tool

5. Assess provider quality of service and interaction cost implications
   - Use the QoS and Interaction requirements list as a starting point for a migration cost model
Identify migration goals

- Use the guidance in “Application Rationalization”, “Legacy modernization”, “Buy, Build, Rent or Borrow”, and “Cloud adoption strategy” frameworks

Gather requirements and constraints

- Use the guidance in App Rationalization and Strategic Software Assessment Frameworks

Filter out alternatives based on evaluation criteria

- Use the Decision Filters to rule out alternatives

Prioritize migration goals and match with remaining alternatives

- Use the Alternatives Assessment Tool

Assess provider quality of service and interaction cost implications

- Use the QoS and Interaction requirements list as a starting point for a migration cost model
Migration goals and priorities

- Rapid Time to Market
- Deliver new capabilities / application modernization
- Supporting scalability requirements more cost effectively
- Avoid operating expenses, preserve capital
- Operational Efficiencies
- Free up data center space
- Leverage Existing Investments
- Provide access to all consumers, all devices
- More easily integrate with other web, cloud apps
Requirements and Constraints

- Legacy application characteristics
- Modernization requirements
- Application platform and architecture principles
- Development and operations team constraints
- Migration cost considerations
# What am I buying: Software or Service?

<table>
<thead>
<tr>
<th>What are you paying for?</th>
<th>Services</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to the service</td>
<td></td>
<td>License to use software</td>
</tr>
</tbody>
</table>

**Example 1: HaaS**

Someone else is racking the hardware; their software creates new instances, configures them, supports you, and bills you per amount consumed.

Examples providers are HaaS service providers include Amazon, Rackspace, Terremark, and Microsoft Windows Azure.

**Example 2: PaaS**

Full application platform service offering, hosted by the provider, or provided as an image and hosted by a HaaS partner. Accessed on the web by the developer.

Example providers include: force.com, Caspio, Heroku

Software (and appliance) products that enable both internal IT organizations and external providers to build for creating private HaaS in a data center of your choice.

Example vendors are VMware, Citrix, Platform Computing, 3Tera, and Eucalyptus Systems, and IBM.

An as-a-product offering, deployed by the buyer in its data center of choice a cloud-enabled application platform.

Example vendors include: Apprendra, Longjump, Corent, TIBCO Silver Fabric, Appistry CloudIQ
## Rehost

### Definition

- Redeploy the application to a different hardware environment
- Change the application’s infrastructure configuration
- Similar to deploying a Java application server on a Linux x86 server instead of Solaris SPARC-based server

### Cloud model tiers

| What services am I consuming? | VMs as a service / OSs as a service, block or volume storage as a service. |

### Audience

System administrators, operations staff, ‘DevOps’.

### Examples

Deploying an existing Java EE Container with an application on Amazon EC2 Linux instances, backed by Elastic Block Store (EBS) for persistent VM images.
| Definition                                                                 | • Running your applications (usually web applications) on cloud provider’s infrastructure.  
|                                                                           | • Make application code or configuration changes to connect the application to new infrastructure services. Similar to linking in a new database driver, identity management system, or authentication module. |
| Cloud model tiers | SlaaS … PaaS |
| What services am I consuming? | Providers supply cloud based frameworks and management tools allowing developers to take advantage of cloud characteristics of provider’s infrastructure. |
| Audience            | Developers   |
| Examples            | Deploying Ruby on Rails web application to Heroku (including linking a monitoring service based on New Relic); Deploy ASP.NET app to Windows Azure. |
**Revise**

| Definition | • Modify or extending the existing code base to support legacy modernization requirements, then use rehost or refactor options to deploy to cloud  
• Scale of changes encompasses major revisions to add new functionality or rearchitect application for the cloud |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud model tiers</td>
<td>HIaaS … SIaaS … PaaS</td>
</tr>
<tr>
<td>What services am I consuming?</td>
<td>Either VMs as a service (HIaaS) or frameworks and management tools allowing developers to take advantage of cloud characteristics of provider’s infrastructure (PaaS with or without SIaaS).</td>
</tr>
<tr>
<td>Audience</td>
<td>Developers</td>
</tr>
<tr>
<td>Examples</td>
<td>Redesigning a monolithic Java application, decomposing the functions into smaller parallel chunks, then deploying on Rackspace Cloud servers.</td>
</tr>
</tbody>
</table>
# Rebuild

## Definition
- Rebuild your solution on a provider’s application platform.
- Discard code for an existing application.
- Rebuild requires re-architecting the application for a new container.

## Cloud model tiers
- PaaS

## What services am I consuming?
An externally managed application platform for building and running applications

## Audience
Developers, ‘Citizen developers’

## Examples
- Building a force.com application for order management.
- Other providers include: Longjump, WaveMaker, Cordys BOP, Magic Software uniPaaS
<table>
<thead>
<tr>
<th><strong>Replace</strong></th>
</tr>
</thead>
</table>

**Definition**
- Discard an existing application (or set of applications) and use commercial software delivered asaaS to satisfy those business requirements.
- Typically existing data requires migration to the SaaS environment.

**Cloud model tiers**
- SaaS

**What services am I consuming?**
- A complete, turnkey application solution (i.e., IT organization does not build solution but may configure and integrate it).
- Users access SaaS via a user-centric interface, such as a web browser or a mobile device.

**Audience**
- Users – business users or IT. Developers or DBAs perform initial configuration.

**Examples**
- Salesforce CRM, SugarCRM for customer records management, Workday for HR processes, Omniture for Web analytics, LiveMeeting for Web conferencing.
## Impact of architecture alternatives

<table>
<thead>
<tr>
<th></th>
<th>Rehost</th>
<th>Refactor</th>
<th>Revise</th>
<th>Rebuild</th>
<th>Replace</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Programming language</strong></td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same/New</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Source code</strong></td>
<td>Same/Updated</td>
<td>Updated</td>
<td>Updated/New</td>
<td>New</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>App configuration/metadata</strong></td>
<td>Same/Updated</td>
<td>Extended</td>
<td>Extended</td>
<td>New</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Frameworks</strong></td>
<td>Same</td>
<td>Same/New</td>
<td>Same/New</td>
<td>New</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Containers</strong></td>
<td>Same</td>
<td>Same</td>
<td>Same/New</td>
<td>New</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Application data</strong></td>
<td>Same</td>
<td>Same/Transformed</td>
<td>Same/Transformed</td>
<td>Transformed</td>
<td>Transformed</td>
</tr>
<tr>
<td><strong>Hosting hardware</strong></td>
<td>New</td>
<td>New</td>
<td>New</td>
<td>New</td>
<td>New</td>
</tr>
</tbody>
</table>
Future Developments

• Progress on portability standards
• Evolution of cloud business models
• Incumbent platform players wake up
Decision Tools

• Assumptions

1. Already decided to migrate to cloud
   • Quality of Service, Trust, User support, Security, and Confidentiality risks will be manageable
   • Any outsourced option will add operational complexity to the application environment
   • Agreed these are most pressing adoption barriers, but covered elsewhere.

2. Already identified characteristics of the apps
   • E.g., Application is relatively isolated (few dependent applications)
   • Traffic pattern is bursty – unlikely that the economics make sense if the app is in constant use 24x7, 365 days (high ‘duty cycle’).
Identify migration goals

- Use the guidance in “Application Rationalization”, “Legacy modernization”, “Buy, Build, Rent or Borrow”, and “Cloud adoption strategy” frameworks

Gather requirements and constraints

- Use the guidance in App Rationalization and Strategic Software Assessment Frameworks

Filter out alternatives based on evaluation criteria

- Use the Decision Filters to rule out alternatives

Prioritize migration goals and match with remaining alternatives

- Use the Alternatives Assessment Tool

Assess provider quality of service and interaction cost implications

- Use the QoS and Interaction requirements list as a starting point for a migration cost model
Can the sysadmin team assemble a VM image with full application stack and configure hardware?

Can 3rd party software be run in a VM and is it supported by the vendor?

Does the application have a ‘fat client’ form-factor?

Does the application require modernization?

Rule out Rehost

Use the refactor filter

© 2010 Gartner, Inc. and/or its affiliates. All rights reserved.
Can the development team recompile and repackage the application from existing source code?

Yes

Are the demands for this function or business requirements rapidly changing?

Yes

Rule out refactor and revise

No

Is the application required with extremely short time-to-market deadline?

Yes

Then

No

Use the rebuild filter
Decision Filters – Rebuild filter

1. Is code or framework lock-in an unacceptable risk?
   - No
   - Yes

2. Is the organization small vendor risk adverse?
   - No
   - Yes

3. Then:
   - Use replace filter
   - Rule out rebuild on proprietary PaaS
Are business users prepared to modify their business processes?

Does the application require a non-trivial level of process integration or customization?

Is preserving data semantics a priority?

Rule out replace

Use migration goal assessment tool

© 2010 Gartner, Inc. and/or its affiliates. All rights reserved.
Identify migration goals
- Use the guidance in “Application Rationalization”, “Legacy modernization”, “Buy, Build, Rent or Borrow”, and “Cloud adoption strategy” frameworks

Gather requirements and constraints
- Use the guidance in App Rationalization and Strategic Software Assessment Frameworks

Filter out alternatives based on evaluation criteria
- Use the Decision Filters to rule out alternatives

Prioritize migration goals and match with remaining alternatives
- Use the Alternatives Assessment Tool

Assess provider quality of service and interaction cost implications
- Use the QoS and Interaction requirements list as a starting point for a migration cost model
## Migration Objectives Assessment Tool

<table>
<thead>
<tr>
<th>Migration Objectives</th>
<th>Rehost</th>
<th>Refactor</th>
<th>Revise</th>
<th>Rebuild</th>
<th>Replace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid time to market</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Deliver new capabilities / Modernization</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Supporting scalability requirements cost effectively</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Avoid operating expenses, preserve capital</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Operational Efficiencies</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Free up data center space</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Leverage existing investments</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Provide access to all consumers, all devices</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>More easily integrate with other web, cloud apps</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

1 = minimal support; 2 = moderate support; 3 = strong support
Identify migration goals
- Use the guidance in “Application Rationalization”, “Legacy modernization”, “Buy, Build, Rent or Borrow”, and “Cloud adoption strategy” frameworks

Gather requirements and constraints
- Use the guidance in App Rationalization and Strategic Software Assessment Frameworks

Filter out alternatives based on evaluation criteria
- Use the Decision Filters to rule out alternatives

Prioritize migration goals and match with remaining alternatives
- Use the Alternatives Assessment Tool

Assess provider quality of service and interaction cost implications
- Use the QoS and Interaction requirements list as a starting point for a migration cost model
Related Documents

Gartner for IT Professionals / Burton IT1

• Building a Solid Cloud Adoption Strategy: Success by Design
• SaaS Implementation Survey: Where, When, and How to Use SaaS
• Market Profile: Hardware Infrastructure as a Service (HIaaS) 2010
• Amazon EC2: Is It Ready for the Enterprise?
• Market Profile: Platform as a Service 2009
• Application Platform Strategies for the 2010’s
• 2010 Planning Guide: Application Platform Strategies
• Build, Buy, or Borrow: Choosing Custom Development Software, Open Source Software, Commercial Off-the-Shelf Software, or Software as a Service
• Cloud Databases: Structure in a Nebulous World
• The Dark Side of Cloud Computing
Related Documents

Gartner for IT Leaders

- Cool Vendors in Application Platforms as a Service, 2010. G00175441
Experience live analyst expertise and much more

Catalyst Conference

July 26-28, 2011 San Diego, CA

Visit gartner.com/us/events
Two simple steps for increasing the value of today’s webinar experience

• Visit [gartner.com/webinars](http://gartner.com/webinars)
  • Today’s presentation will be available in 24 hours
  • See a Schedule of upcoming Gartner webinars (plus replays of previous webinars) and share these resources with your colleagues

• Contact your Gartner account executive with any additional questions, comments or to order a complimentary copy of today’s presentation