

Migration

Dr Peadar Grant

April 15, 2024

Contents

1 Cloud utilisation

S.2

2 Candidate systems

S.6

1 Cloud utilisation

1.1 System

Systems of interest can be quite varied. Remember that not all systems are 3-tier web or MS-AD environments - there is a huge world out there! Some of the most interesting systems are the less usual!

1.2 Provision models

On-site using data centre environment (of varying quality).

Co-lo in a dedicated data centre facility.

Cloud using 1 or more cloud providers. (Cloud provider as per Nist definition of cloud computing)

1.3 Pull factors

1. Replacement of capital expenditure by operational expenditure.
2. Avoiding sunk hardware costs and upgrade cycles.

1.4 Push factors

1. Cost of maintaining on-site data centre environments and their supporting infrastructure (e.g. power, cooling, monitoring, networking).
2. Demand for space / reduced rental costs

2 Candidate systems

Important to consider what can be moved vs what should be moved.

2.1 System decomposition

System needs to be broken down into its constituent components. It is best to consider cloud migration as a possibility for individual components of an application, rather than the system itself as a unit.

2.2 Strategies

We assume our *source environment* is the setup we are currently using. AWS have identified 7 Rs describing different migration strategies:

Retire: decommission / remove applications that are no longer needed in your source environment.

Retain: source environment. Candidates:

- Applications requiring major refactoring, and you want to postpone that work until a later time.
- May be legacy applications without business justification for migrating them.

Repurchase / replace (drop and shop) switch to a different product (move from custom / COTS to SaaS model). Example: Migrate your customer relationship management (CRM) system to Salesforce.com.

Rehost (lift and shift) move application cloud without making changes. Example: Migrate on-premises database / server stack from onsite server to an EC2 instance in the AWS

Cloud.

Relocate (hypervisor-level rehost) extension of the rehost model where an already virtualised environment is relocated to the cloud.

Replatform (lift and reshape): move an application to the cloud, replacing some components with cloud-based equivalents. Example: Migrate your on-premises Oracle database to Amazon Relational Database Service (Amazon RDS) for Oracle in the AWS Cloud.

Refactor/re-architect: modify architecture to use cloud-native capabilities. Example: Migrate your on-premises Oracle database to the Amazon Aurora PostgreSQL-Compatible Edition.

Moving any particular system will may not be a single choice.

2.3 Contra-indications

Some components present extreme difficulties (not insurmountable) migrating to cloud environment

1. Non-PC/ARM based systems.
2. **Mainframe** systems (e.g. IBM z/OS) and so-called *midrange* (e.g. IBM i) systems.
3. **Legacy PC operating systems** (e.g. OS/2, Xenix, PICK, DOS), particularly early versions without TCP/IP support.
4. Systems requiring **access to hardware** (e.g. serial, parallel, specific interface cards)
5. Systems that **cannot function off-line** in the absence of connectivity (e.g. some business-critical systems)

May still be possible to move certain components of systems containing the above to cloud environments if the system can be clearly decomposed into interconnecting parts.

2.4 Onsite connectivity

Moving

Possible to connect a VPC to an onsite LAN using a VPN gateway.

Some co-lo data centres offer Amazon Direct Connect (not discussed in detail here).