Migrating Applications To The Cloud In A Cost Effective Manner

Andy Bennett
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Introduction
The Problem
Operations Want To Be Agile
Operations Want To Be Lean
Applying Machine Learning
Optimisation Results

Compare tested performance for available instances. Click on the instance to show test details.

SHOW: ALL  VCENTER  GOOGLE_COMPUTE  AMAZON_EC2  AZURE

LEGEND
= BASELINE  = OPTIMISED  = TO BE DEPLOYED
Making Savings

Optimisation Results

Compare tested performance for available instances. Click on the instance to show test details.

SHOW: ALL  VCENTER  GOOGLE_COMPUTE  AMAZON_EC2  AZURE

HIDE LEGEND

LEGEND
■ BASELINE  ■ OPTIMISED  ■ TO BE DEPLOYED

Graph showing comparison of performance for different instances from various cloud providers.
Making Savings

Optimisation Results

Compare tested performance for available instances. Click on the instance to show test details.

SHOW: ALL VCENTER GOOGLE_COMPUTE AMAZON_EC2 AZURE

HIDE LEGEND

LEGEND
- BASELINE - OPTIMISED - TO BE DEPLOYED

AWS-EC2 t2.medium
432
$326/yr
Making Savings

Optimisation Results

Compare tested performance for available instances. Click on the instance to show test details.

SHOW:  ALL  VCENTER  GOOGLE_COMPUTE  AMAZON_EC2  AZURE  HIDE LEGEND

LEGEND
• BASELINE  • OPTIMISED  • TO BE DEPLOYED

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$326/yr
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Optimisation Results

Compare tested performance for available instances. Click on the instance to show test details.

SHOW: [ALL] [VCENTER] [GOOGLE_COMPUTE] [AMAZON_EC2] [AZURE]

LEGEND

- BASELINE
- OPTIMISED
- TO BE DEPLOYED

- AWS-EC2 t2.medium
  432
  $326/yr

- AWS-EC2 m3.medium
  508
  $434/yr
Making Savings

Optimisation Results

Compare tested performance for available instances. Click on the instance to show test details.

SHOW:   □ ALL □ VCENTER □ GOOGLE_COMPUTE □ AMAZON_EC2 □ AZURE

LEGEND
□ BASELINE □ OPTIMISED □ TO BE DEPLOYED

AWS-EC2 t2.medium
432
$326/yr

AWS-EC2 m3.medium
508
$434/yr

15% Reduction in Performance for a 25% Reduction in Cost
Calculating Performance

Test Details

SELECT INSTANCE
Amazon t2.small

GRID SEARCH TEST RUNS

LEGEND
- BASELINE  - PREDICTED  - FULL TEST RUN

[Graph showing performance metrics with bars for different instances and categories]
The Parameter Space Is Vast

A conservative example

- 18 JVM Parameters
  - Heap size; Garbage collector options; etc
- 5 Servlet Container Parameters
  - Acceptor Threads; etc
- 5 Operating System Parameters
  - Queue sizes; Swap space; Scheduler settings

- Assume each option has 10 settings
  - Most actually have a lot more but a few have less.

$10^{28}$ possible configurations spread over 28 dimensions
The Parameter Space Is Vast

Add 2 points for Parameter 1

+ 4 points
The Problem Space Is Vast

Parameter 1

Parameter 2

Add 2 points per parameter

Parameter 1

Parameter 2

+ 2 points
Fit response surface

Parameter 1

Parameter 2

Performance
"No Silver Bullet"
Counterintuitive Results
Infrastructure For Testing
Testing Lifecycle

- Requests per Second
- Test Load
- Non-heap Memory Usage
Testing Lifecycle

Requests per Second

Test Load

Non-heap Memory Usage

![Graph showing testing lifecycle metrics](image-url)
Testing Lifecycle

Requests per Second

Test Load

Non-heap Memory Usage
Requests per Second
Request Latency
m3.large
m3.large
m3.large
m3.large
m3.large

- Startup
- Provision
- Test
- Waste?
m3.large

- Startup
- Provision
- Test
- Test
m3.large

Startup | Provision | Test | Test

Overhead
m3.large

Startup  Provision  Test  Test

Overhead  Value
m3.large

- Startup
- Provision
- Test (x2)

Overhead → Value → Waste
m3.large

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<th>Provision</th>
<th>Test</th>
<th>Waste?</th>
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m3.large

Startup  Provision  Test  Test

Startup  Provision  Test  Test
Please

Remember to rate this session

Thank you!

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Thanks !