

Software Solutions Symposium 2017

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Methodology for Comparing Cloud Service Offerings

Jeff Davenport & Sarah Sheard

Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213



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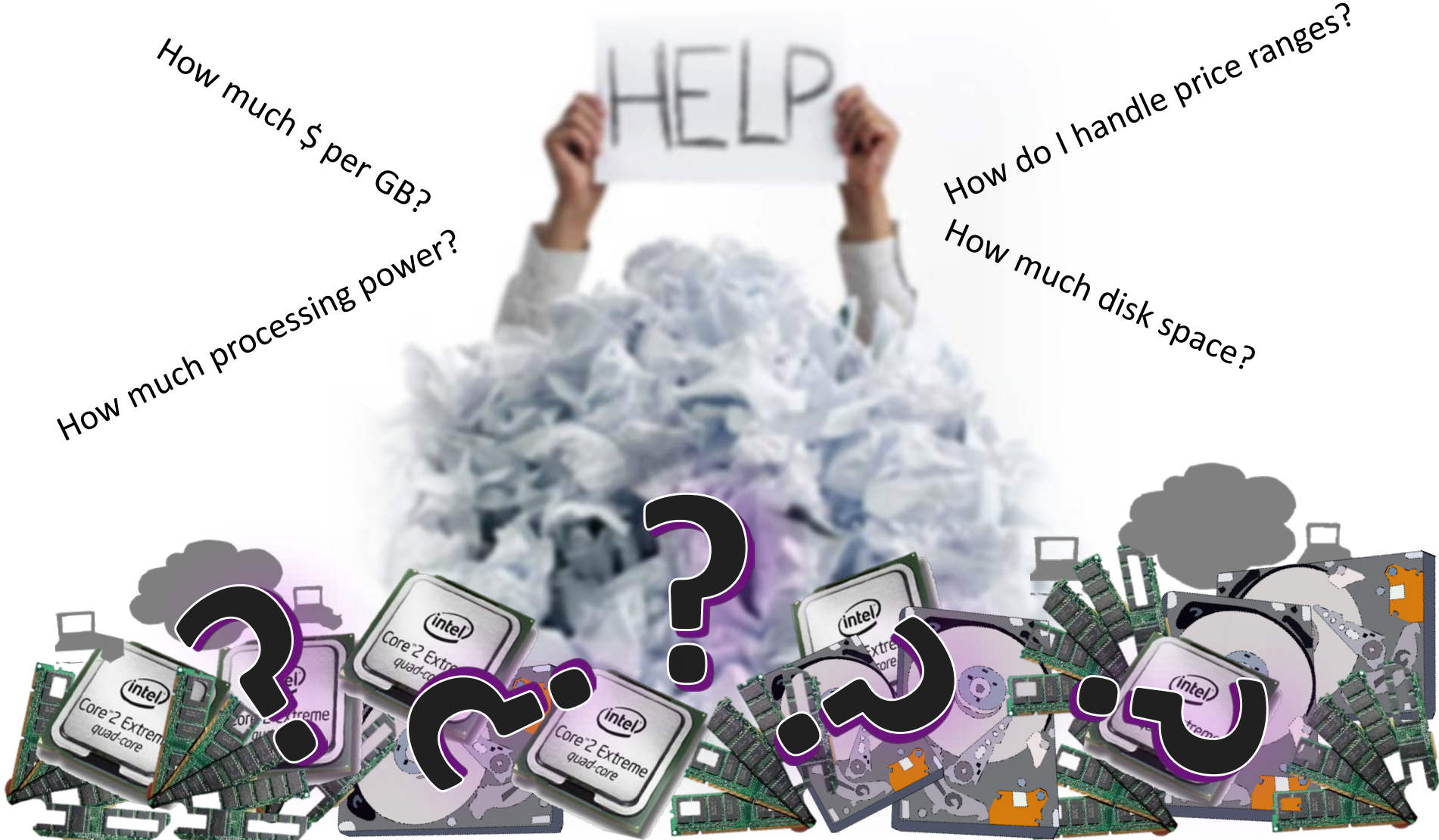
Methodology for Comparing Cloud Service Offerings

Introduction

The Problem

How much \$ per GB?
How much processing power?

How do I handle price ranges?
How much disk space?



The Solution

Identify Requirements



Identify Offerings

Align Offerings and Requirements

Compute and Compare Prices

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Methodology for Comparing Cloud Service Offerings

Defining Requirements

Identifying Pertinent Factors

Cores

Computing Muscle

- Does my computing work perform complex calculations?
- Does my computing work perform a lot of calculations?

RAM

Computing Space

- Does my computing work require a lot of data be held in memory, e.g., many large images?

Disk Space

Computing Storage

- How much data do you need to keep on hand?

Enter Data into Trade Studies Template

Attributes of Concern	Unit	Slates of Figures
Cores	#	Our Requirements
Disk Space	GB	AlphaCom Offerings
RAM	GB	BetaCloud Offerings
Needed front-line skill	?	
Support needed	?	
Frequency of backups	?	
No. backups retained	?	
How are upgrades handled	?	
How seamless are upgrades to us?	?	

▶ **Lookup** | Raw Slates | Step 1 | Step 2 | Step 3 | Step 4 | Step ... (+) | ◀

Other Pertinent Factors (That We Could Have Used)

Support

Computing Assistance

- How skilled will the front-line staff be that utilize the cloud environment?
- How much support is needed from the cloud service provider?

Backups

Computing Insurance

- How frequently will the cloud service provider back up the environment?
- How many backups will be retained by the cloud service provider?

Upgrades

Computing Evolution

- How will the cloud service provider handle upgrades to its provisioning system?
- Will those upgrades be seamless?

Your Requirements



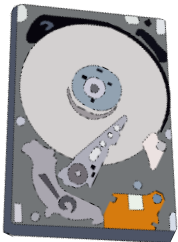
Cores
2 tiers

Processing Requirements	% of Time Required
$5 \leq x \leq 15$ cores	80% of year
$16 \leq x \leq 20$ cores	20% of year

Storage Requirements	% of Time Required
$10 \text{ GB} \leq x \leq 15 \text{ GB}$	80% of year
$15 \text{ GB} < x \leq 20 \text{ GB}$	20% of year



RAM
2 tiers



Disk Space
2 Tiers

Memory Requirements	% of Time Required
$25 \text{ GB} \leq x \leq 50 \text{ GB}$	50% of year
$50 \text{ GB} < x < 100 \text{ GB}$	50% of year

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Sample CSP Offerings

Sample Cloud Service Provider – *AlphaCom*



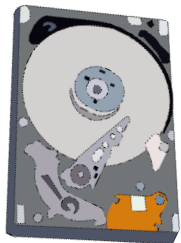
Cores
3 tiers

$0.25 \leq x < 1$ cores	\$0.37/core/day
$1 \leq x < 25$ cores	\$0.29/core/day
$x \geq 25$ cores	\$0.20/core/day

$1 \text{ GB} \leq x < 50 \text{ GB}$	\$0.039/GB/day
$50 \text{ GB} \leq x \leq 100 \text{ GB}$	\$0.035/GB/day



RAM
2 tiers



Disk Space
4 Tiers

$100 \text{ MB} \leq x < 1 \text{ GB}$	\$0.038 per GB per day
$1 \text{ GB} \leq x < 100 \text{ GB}$	\$0.021 per GB per day
$100 \text{ GB} \leq x < 500 \text{ GB}$	\$0.018 per GB per day
$500 \text{ GB} \leq x \leq 10 \text{ TB}$	\$0.016 per GB per day

Sample Cloud Service Provider – *BetaCloud*

0.25 ≤ x < 1 cores	\$0.35/core/day
1 ≤ x < 10 cores	\$0.32/core/day
10 ≤ x ≤ 100 cores	\$0.28/core/day



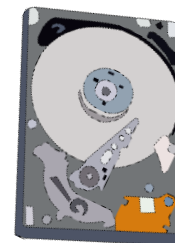
Cores
3 tiers



RAM
3 tiers

0.75 GB ≤ x < 30 GB	\$0.041/GB/day
30 GB ≤ x < 75 GB	\$0.033/GB/day
75 GB ≤ x < 125 GB	\$0.029/GB/day

100 MB ≤ x < 15 GB	\$0.038 per GB per day
15 GB ≤ x < 100 GB	\$0.020 per GB per day
100 GB ≤ x < 500 GB	\$0.018 per GB per day
500 GB ≤ x ≤ 10 TB	\$0.016 per GB per day



Disk Space
4 Tiers

Enter Data Into Trade Studies Template

Attribute	Slates of Figures	Range		% Price/Unit
		From	To	
Cores	Our Requirements	5	15	80
Cores	Our Requirements	16	20	20
RAM	Our Requirements	10	15	80
RAM	Our Requirements	15	20	20
Disk Space	Our Requirements	25	50	50
Disk Space	Our Requirements	50	100	50
Cores	AlphaCom Offerings	0.25	1	\$0.37
Cores	AlphaCom Offerings	1	25	\$0.29
Cores	AlphaCom Offerings	25	∞	\$0.20
RAM	AlphaCom Offerings	1	50	\$0.039
RAM	AlphaCom Offerings	50	100	\$0.035
Disk Space	AlphaCom Offerings	0.1	1	\$0.038
Disk Space	AlphaCom Offerings	1	100	\$0.021
Disk Space	AlphaCom Offerings	100	500	\$0.018
Disk Space	AlphaCom Offerings	500	10000	\$0.016

▶ | Lookup | **Raw Slates** | Step 1 | Step 2 | Step 3 | Step 4 | Step 5

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Methodology for Comparing Cloud Service Offerings

Normalizing Offerings

Aligning Offerings with Requirements



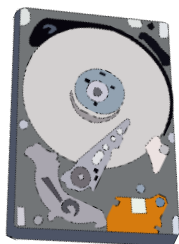
Cores

Your Requirements	<i>alphaCom</i>	<i>BetaCloud</i>
$5 \leq x \leq 10$ cores	\$0.29/core/day	\$0.32/core/day
$11 \leq x \leq 15$ cores	\$0.29/core/day	\$0.28/core/day
$16 \leq x \leq 20$ cores	\$0.29/core/day	\$0.28/core/day

Your Requirements	<i>alphaCom</i>	<i>BetaCloud</i>
$10 \leq x \leq 15$ GB	\$0.039/GB/day	\$0.041/GB/day
$15 < x \leq 20$ GB	\$0.039/GB/day	\$0.041/GB/day



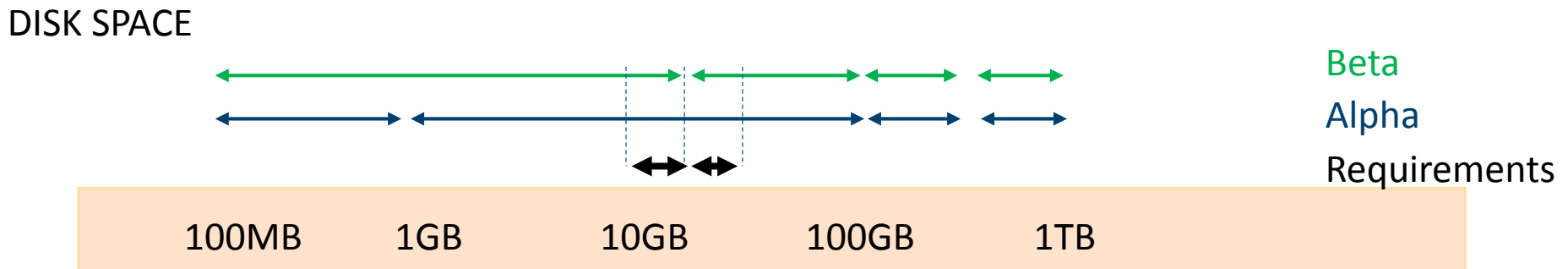
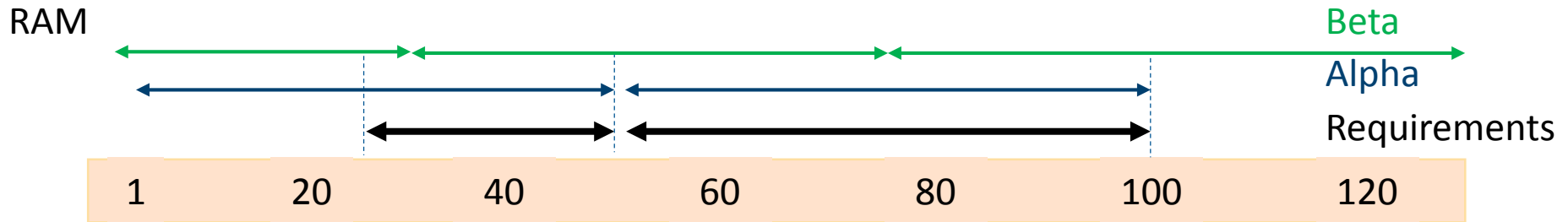
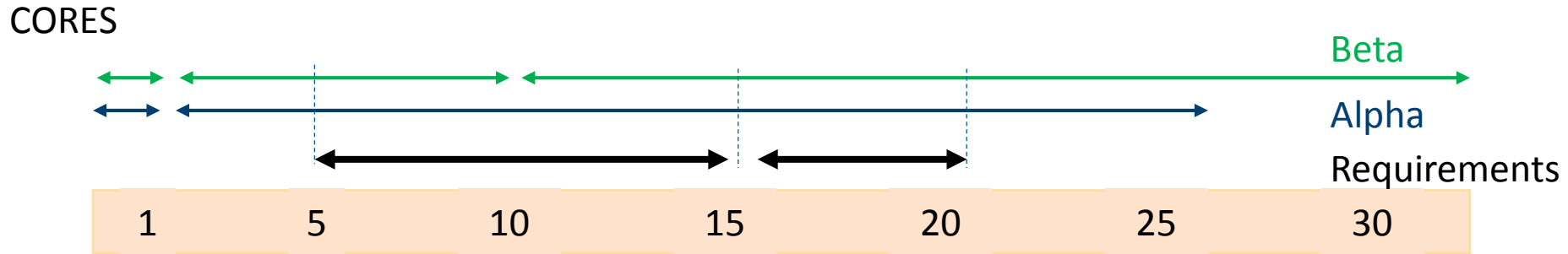
RAM



Disk Space

Your Requirements	<i>alphaCom</i>	<i>BetaCloud</i>
$25 \text{ GB} \leq x \leq 30 \text{ GB}$	\$0.021/GB/day	\$0.020/GB/day
$30 \text{ GB} < x \leq 50 \text{ GB}$	\$0.021/GB/day	\$0.020/GB/day
$50 \text{ GB} < x \leq 75 \text{ GB}$	\$0.021/GB/day	\$0.020/GB/day
$75 \text{ GB} < x \leq 100 \text{ GB}$	\$0.021/GB/day	\$0.020/GB/day

Non-identical tiers



Enter into trade studies template

Attribute	Slates of Figures	Range		% Price/Unit
		From	To	
Cores	AlphaCom Offerings	0.25	1	\$0.37
Cores	BetaCloud Offerings	0.25	1	\$0.350
Cores	AlphaCom Offerings	1	25	\$0.29
Cores	BetaCloud Offerings	1	10	\$0.320
Cores	Our Requirements	5	15	80
Cores	BetaCloud Offerings	10	100	\$0.280
Cores	Our Requirements	16	20	20
Cores	AlphaCom Offerings	25	∞	\$0.20
Disk Space	AlphaCom Offerings	0.1	1	\$0.038
Disk Space	BetaCloud Offerings	0.1	15	\$0.038
Disk Space	AlphaCom Offerings	1	100	\$0.021
RAM	Our Requirements	10	15	80
RAM	Our Requirements	15	20	20
Disk Space	BetaCloud Offerings	15	100	\$0.020
Disk Space	AlphaCom Offerings	100	500	\$0.018

▶	Lookup	Raw Slates	Step 1	Step 2	Step 3	Step 4	Step
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Enter into trade studies template

Attribute	Slates of Figures	Range		% Price/Unit
		From	To	
Cores	AlphaCom Offerings	1	25	\$0.29
Cores	BetaCloud Offerings	1	10	\$0.320
Cores	Our Requirements	5	15	80
Cores	BetaCloud Offerings	10	100	\$0.280
Cores	Our Requirements	16	20	20
RAM	BetaCloud Offerings	0.75	30	\$0.041
RAM	AlphaCom Offerings	1	50	\$0.039
RAM	Our Requirements	10	15	80
RAM	Our Requirements	15	20	20
RAM	BetaCloud Offerings	30	75	\$0.033
RAM	AlphaCom Offerings	50	100	\$0.035
RAM	BetaCloud Offerings	75	125	\$0.029
Disk Space	BetaCloud Offerings	0.1	15	\$0.038
Disk Space	AlphaCom Offerings	1	100	\$0.021
Disk Space	BetaCloud Offerings	15	100	\$0.020

▶ | Lookup | Raw Slates | Step 1 | **Step 2** | Step 3 | Step 4 | Step 5

Calculate price for required options



Cores

Requirements	Frequency	<i>alphaCom</i>	<i>BetaCloud</i>
$5 \leq x \leq 10$ cores	0.80	\$0.29/core/day	\$0.32/core/day
$10 < x \leq 15$ cores		\$0.29/core/day	\$0.28/core/day
$16 \leq x \leq 20$ cores		\$0.29/core/day	\$0.28/core/day
<i>Total Prices:</i>		\$3.37/day	\$3.42/day

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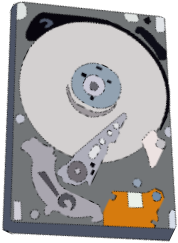
Calculate price for required options



Requirements	Frequency	<i>alphaCom</i>	<i>BetaCloud</i>
$10 \leq x \leq 15$ GB	0.80	\$0.039/GB/day	\$0.041/GB/day
$15 < x \leq 20$ GB	0.20	\$0.039/GB/day	\$0.041/GB/day
<i>Total Prices:</i>		\$0.53/day	\$0.55/day

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Calculate price for required options



Disk Space

Requirements	Frequency	<i>alphaCom</i>	<i>BetaCloud</i>
37.5 GB	0.50	\$0.021/GB/day	\$0.020/GB/day
75 GB	0.50	\$0.021/GB/day	\$0.020/GB/day
<i>Total Prices:</i>		\$1.18/day	\$1.13/day

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Enter into trade studies template

Attribute	Slates of Figures	Range		% Price/Unit
		From	To	
Cores	AlphaCom Offerings	1	4	\$0.29
Cores	BetaCloud Offerings	1	4	\$0.320
Cores	AlphaCom Offerings	5	15	\$0.29
Cores	BetaCloud Offerings	5	10	\$0.320
Cores	Our Requirements	5	15	80
Cores	BetaCloud Offerings	11	15	\$0.280
Cores	AlphaCom Offerings	16	20	\$0.29
Cores	BetaCloud Offerings	16	20	\$0.280
Cores	Our Requirements	16	20	20
Cores	AlphaCom Offerings	21	25	\$0.29
Cores	BetaCloud Offerings	21	100	\$0.280
RAM	BetaCloud Offerings	0.75	10	\$0.041
RAM	AlphaCom Offerings	1	10	\$0.039
RAM	AlphaCom Offerings	10	15	\$0.039
RAM	BetaCloud Offerings	10	15	\$0.041

▶
Lookup
Raw Slates
Step 1
Step 2
Step 3
Step 4
Step

Enter into trade studies template

Attribute	Slates of Figures	Range		% Price/Unit
		From	To	
Cores	AlphaCom Offerings	5	15	\$0.29
Cores	BetaCloud Offerings	5	10	\$0.320
Cores	Our Requirements	5	15	80
Cores	BetaCloud Offerings	11	15	\$0.280
Cores	AlphaCom Offerings	16	20	\$0.29
Cores	BetaCloud Offerings	16	20	\$0.280
Cores	Our Requirements	16	20	20
RAM	AlphaCom Offerings	10	15	\$0.039
RAM	BetaCloud Offerings	10	15	\$0.041
RAM	Our Requirements	10	15	80
RAM	AlphaCom Offerings	15	20	\$0.039
RAM	BetaCloud Offerings	15	20	\$0.041
RAM	Our Requirements	15	20	20
Disk Space	AlphaCom Offerings	25	50	\$0.021
Disk Space	BetaCloud Offerings	25	50	\$0.020

▶ | Lookup | Raw Slates | Step 1 | Step 2 | Step 3 | **Step 4** | Step

Enter into trade studies template

Attribute	Slates of Figures	Range		Median	% Price/Unit	\$Cost/Day	
		From	To				
Cores	AlphaCom Offerings	5	15	10	80	\$0.29	\$2.32
Cores	BetaCloud Offerings	5	10	7.5	40	\$0.320	\$0.96
Cores	BetaCloud Offerings	11	15	13	40	\$0.280	\$1.46
Cores	AlphaCom Offerings	16	20	18	20	\$0.29	\$1.04
Cores	BetaCloud Offerings	16	20	18	20	\$0.280	\$1.01
RAM	AlphaCom Offerings	10	15	12.5	80	\$0.039	\$0.39
RAM	BetaCloud Offerings	10	15	12.5	80	\$0.041	\$0.41
RAM	AlphaCom Offerings	15	20	17.5	20	\$0.039	\$0.14
RAM	BetaCloud Offerings	15	20	17.5	20	\$0.041	\$0.14
Disk Space	AlphaCom Offerings	25	50	37.5	50	\$0.021	\$0.39
Disk Space	BetaCloud Offerings	25	50	37.5	50	\$0.020	\$0.38
Disk Space	AlphaCom Offerings	50	100	75	50	\$0.021	\$0.79
Disk Space	BetaCloud Offerings	50	100	75	50	\$0.020	\$0.75

▶ ... | Raw Slates | Step 1 | Step 2 | Step 3 | Step 4 | **Step 5** | Step 6 ... ⊕ ⋮ ◀

Enter into trade studies template

Attribute	Slates of Figures	Range		Median	% Price/Unit	\$Cost/Day	
		From	To				
Cores	AlphaCom Offerings	5	15	10	80	\$0.29	\$2.32
Cores	AlphaCom Offerings	16	20	18	20	\$0.29	\$1.04
							\$3.364
RAM	AlphaCom Offerings	10	15	12.5	80	\$0.039	\$0.39
RAM	AlphaCom Offerings	15	20	17.5	20	\$0.039	\$0.14
							\$0.527
Disk Space	AlphaCom Offerings	25	50	37.5	50	\$0.021	\$0.39
Disk Space	AlphaCom Offerings	50	100	75	50	\$0.021	\$0.79
							\$1.181
							\$5.072
Cores	BetaCloud Offerings	5	10	7.5	40	\$0.320	\$0.96

▶ ... |
 Step 1 |
 Step 2 |
 Step 3 |
 Step 4 |
 Step 5 |
 Step 6 |
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Methodology for Comparing Cloud Service Offerings

Comparing Offerings

Calculate Costs

Requirements	<i>alphaCom</i>	<i>BetaCloud</i>
Cores	\$3.37/day	\$3.42/day
RAM	\$0.53/day	\$0.55/day
Disk Space	\$1.18/day	\$1.13/day

Total Daily Prices:

\$5.07

\$5.10

Total Annual Prices:

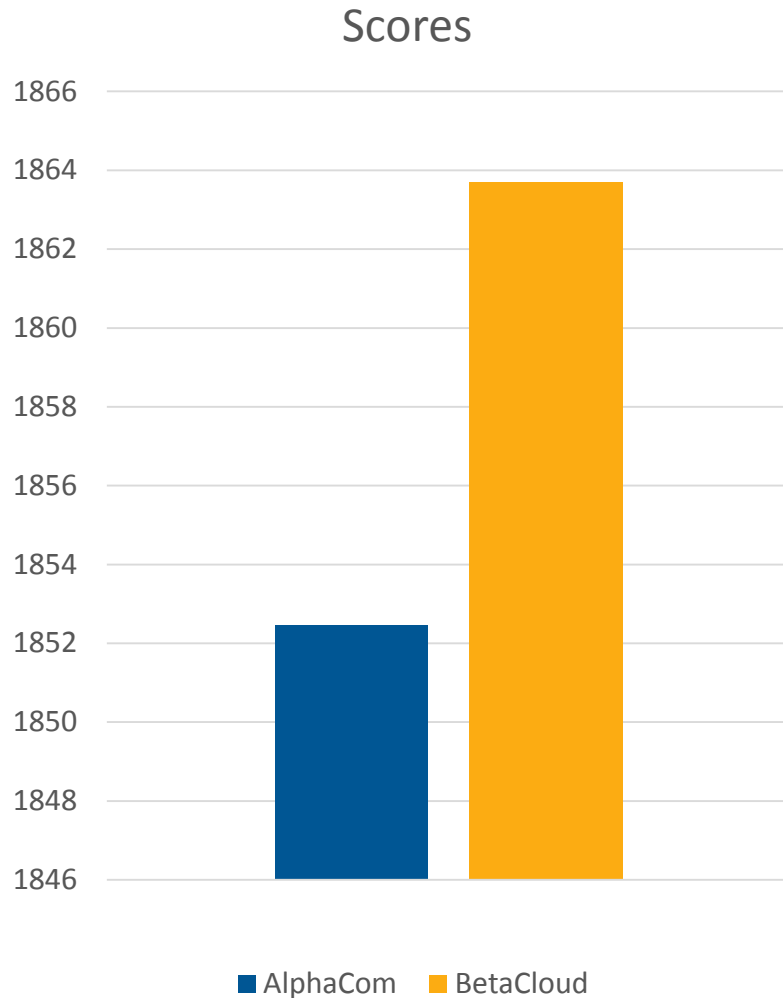
\$1852.46

\$1863.69

Enter into trade studies template

Attribute	Slates of Figures	Range		Median	% Price/Unit	\$Cost/Day	\$Cost/Year	
		From	To					
Cores	AlphaCom Offerings	5	15	10	80	\$0.29	\$2.32	
Cores	AlphaCom Offerings	16	20	18	20	\$0.29	\$1.04	
							\$3.364	\$1,228.70
RAM	AlphaCom Offerings	10	15	12.5	80	\$0.039	\$0.39	
RAM	AlphaCom Offerings	15	20	17.5	20	\$0.039	\$0.14	
							\$0.527	\$192.30
Disk Space	AlphaCom Offerings	25	50	37.5	50	\$0.021	\$0.39	
Disk Space	AlphaCom Offerings	50	100	75	50	\$0.021	\$0.79	
							\$1.181	\$431.45
							\$5.072	\$1,852.46
Cores	BetaCloud Offerings	5	10	7.5	40	\$0.320	\$0.96	

The Winner Is...



□ AlphaCom wins with \$1852.46/year

□ BetaCloud is \$1863.69/year

Note, difference of \$11.23 is less than 1%. Decision may be made on other factors or based on sensitivity analysis (analyze with slightly different inputs).

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Methodology for Comparing Cloud Service Offerings

Conclusion

Conclusion

Cloud service providers structure their offerings in different ways.

- Tiers are often used

Aligning their offerings to requirements helps to compare them.

- Factors aligned and compared should be based upon the requirements of the procurer.

Questions

