|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cloud Providers | Price | | | | | | | | | | |
| CPU Price ($/107MI) | | | Storage Price ($/Gb) | | | BW Price ($/Gb) | | | | |
| US | EU | AS | US | EU | AS | Intra-DC | US | EU | AS | Inter-Regions |
| Provider 1 | 0.020 | 0.025 | 0.027 | 0.006 | 0.006 | 0.0066 | 0.001 | 0.0015 | 0.002 | 0.004 | 0.008 |
| Provider 2 | 0.020 | 0.018 | 0.020 | 0.0096 | 0.008 | 0.0096 | 0.001 | 0.0015 | 0.002 | 0.004 | 0.008 |
| Provider 3 | 0.0095 | 0.0090 | 0.0080 | 0.00120 | 0.0096 | 0.0090 | 0.001 | 0.0015 | 0.002 | 0.004 | 0.008 |

Configuration of the simulation parameters.

Parameter Value

Number of cloud provider 3

Number of regions 3

Number of DCs per provider Between 2 and 5 data centers

Number of VMs within a DC 8

Number of submitted Task Between 1000 and 10000 tasks

Task size Between 200 and 1000 MI

Number of data 200 Data size Between 300 Mb and 1 Gb

Inter-region BW (resp. delay) 500 Mb/s (resp. 150 ms )

Intra-region BW (resp. delay) 1 Gb/s (resp. 50 ms)

Intra-DC BW (resp. delay) 8 Gb/s (resp. 10 ms)

VM processing capability 1500 MIPS

VM number of CPU 2

VM RAM 4 Gb

VM storage capacity 8 Gb

Provider revenues per task execution (𝑅𝑒𝑣 ) 0.7$

Penalty per violation (𝐶𝑝𝑒𝑛𝑎𝑙𝑡𝑦) 0.0025 $

Response time service level objective𝑆𝐿𝑂𝑅𝑇 180 s

Minimum availability service level objective 𝑆𝐿𝑂𝑀𝐴 0.95

Specific parameters to the strategy   
Replication period 𝑃 32 violating tasks

𝑤 = 0.8 hence 𝑇 ℎ𝑅𝑇 = (0.8 × 180)

Number of K clusters to extract using the spectral clustering algorithm K 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Rule | Data transfer time ratio | Virtual Machine load | Data availability | Provider profit | Placement potential |
| 1 | High | High | NR | NP | Very Low |
| 2 | High | Medium | NR | P | Low |
| 3 | Medium | Medium | NR | P | Medium |
| 4 | Medium | Medium | R | P | High |
| 5 | Low | Low | R | P | Very High |