

Cloud Computing

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1) Service Period = 30 days

Service hours/day = 16 hours

Total uptime = $16 \times 30 = 480$ hrs

Cost = 3500 Rs/day

So
total cost = $3500 \times 30 = 105000$

Now

Total downtime = 5hrs + 30min + 1 and $\frac{1}{2}$ hour + 5mins + 2 and half hr
= 9hrs 35min

$$\begin{aligned}\text{Server availability} &= 1 - \frac{dt}{Upt} = \left(1 - \frac{9.417}{480}\right) \times 100 \\ &= 98.03\%\end{aligned}$$

Monthly uptime % = 98.03% < 99%.

$$\begin{aligned}\text{Service credit available} &= 30\% \text{ of } (< 99\%) \\ &= \frac{30}{100} \times 105000 \\ &= 31500\text{₹}\end{aligned}$$

Effective cost payable towards buying cloud service

$$= 105000 - 31500 = 73500\text{₹}$$

2 a) The hardware support processor provides guest OS power that can be accessed directly to platform's resources without replacing equipment control. Previously virtual machines have maintained control over the actual platform, while the virtual machine emulates the equipment into guest OS. This new processor provides both VM and guest OS, which must be executed without disabling the equipment or modification of OS. The hardware processor that support 64-bit processing is now the benefits of 64-bit calculations to filter on essential OS and published applications and thus improving capabilities of virtual machine.

b) Key Difference between them is that Full virtualization allows multiple guest OS to function independently on host system while para virtualization enables multiple OS to work with host OS in collaboration.

- Due to this difference full virtualization provides complete isolation and hence is more secure.
- Full virtualization enables OS to emulate new hardware which improve security and productivity compared to para virtualization where it does not fully rebuild the hardware.
- Doesnot require hardware or OS assistance to virtualize OS compared to paravirtualization requiring drivers.

5) Parameters affecting VM migration performance are -

- a) Migration Link :- Bandwidth of migration link is most influential factor. Link capacity is reversed proportional to migration time and downtime.
- b) Page dirty rate :- rate at which memory pages in VM are modified. Higher value results in more data being sent per iteration which leads to longer total migration in given time.
- c) Depends on what we are using, pre and post migration overheads are more significant compared to iterative pre-copy and stop-and-copy stages. With given low page dirty rates & high speed link.

⇒ Now performance comparison of 2 techniques pre-copy & post-copy migration.

- For extremely high page dirty rate (compared to link speed), pre-copy iteration works best as most data will be transferred in push state.
- For high link speed data can easily be pulled when it is in demand. So use of post-copy will be preferred.
- Also pre-copy is suited for interactive applications since pulling resources again and again while interacting will make application slow.
- Post-copy is better for memory-intensive applications since pulling all resources in advance will take more memory.