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Cloud Computing,
Case Study

Pb 1: Encryption Time Calculation

Eg:- 0.05 sec for 1MB

If 1TB is 10^6 MB

$2TB = 2 \times 10^6 MB$

Total seconds $\Rightarrow$ $2 \times 10^6 \times 0.05$ sec

$= 10^5$ sec

$\frac{10^5}{3600}$ hour $\Rightarrow$ **27.78 hours**

Pb 2: CPU utilization

$$\text{Efficiency } \alpha = \frac{\text{Avg. vCPU used}}{\text{Total allocated vCPU}} \times 100$$

$$= \frac{5.5}{8} \times 100$$

$$= 68.75\%$$

Pb 3: Network Throughput

1Gbps is 1000 Mbps

$$\text{Efficiency} = \frac{\text{Used Throughput}}{\text{Maximum Throughput}} \times 100$$

$$= \frac{600\ \text{Mbps}}{1000\ \text{Mbps}} \times 100$$

$$= 0.6 \times 100$$

$$= 60\%$$

Pb 4: Energy Efficiency

To find: Total energy consumed (in Watt-hours)

Energy = Power(W) x Time(h)

A Energy : 500 W x 2h = 1000 Wh

B Energy : 300 W x 3.5h = 1050 Wh

∴ A is more energy efficient than B because A uses less energy comparatively

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Pb 5: CPU Utilization

We know optimal utilization [illegible] should be maintained

For 16 physical cores,

$$16 \times 75\% = 16 \times 0.75 = 12 \text{ Core}$$

∴ Maximum VMs can be found, for

1 VM we need 2 Cores

for $\frac{1}{2}$ VM we need 1 core

∴ 12 core would have 6 VMs
