

Gestão de Centros de Dados

Date: 24/January/2011

Duration: 1h45m

Note: You are advised to read the whole test before answering any question, as some other questions may help/hint/clarify that question you want to answer...

Not everything is fully specified. This is intentional, and you may assume reasonable options and then formulate your answers. Times and grade values are approximate.

Q-1 [30m, 6 val.] Consider both (i) hypervisor-based virtualisation and (ii) physical partitioning.

- a) For each one, list both its advantages and, if they do exist, its disadvantages – i.e., refer situations where that technology should not be used.
- b) Now, consider the “business DC” (non-HPC): in most cases where one sees an opportunity for server consolidation, which technology (i) or (ii) should be used? Why?
- c) [Not a technology question at all...] Today, every major hypervisor supplier company (VMware, Xen, etc.) offers the hypervisor software for free, but charges for high-level administrative functions (such as managing/backing up/restoring multiple VMs with a single click) and high availability/load balancing functions (VM failover, VM migration). Why do you think their strategy is a good one?

Q-2 [30m, 6 val.] Discuss backup and restore strategies and/or technologies that allow you to decrease:

- a) The time spent doing the backup (i.e., the backup is performed faster)
- b) The time spent doing the restore of a previous backup (i.e., the restore is performed faster)

For each answer do refer, in a very loose way, the technology costs – e.g., you may state that technology A is low-cost, B is medium while C is high-cost.

Q-3 [35m 6 val.] Two buyers, one “Buyer A” that wants to run “scientific codes” that require intensive floating point calculations over large matrixes and another “Buyer B” who wants to run a RDBMS system to serve on-line transactions, want to choose the most adequate computer for their tasks. Their strategy is the following: (i) first, they will browse the “major brand’s” websites (e.g., IBM, Dell, HP, etc.) looking for performance data to build a shortlist of what they think are the best candidates; then, (ii) they intend to run their software (“Buyer A” will run its application and “Buyer A” its RDBMS) only on the few machines selected in step (i) above.

- a) In step (i), what benchmark data should “Buyer A” look for in the computer manufacturer’s web site? Why? [Note: if you do not remember the benchmark’s name, just describe its characteristics and what it reports – i.e., just answer the “why” part of the question].
- b) In step (i), what benchmark data should “Buyer B” look for in the computer manufacturer’s web site? [Note: if you do not remember the benchmark’s name, just describe its characteristics and what it reports – i.e., just answer the “why” part of the question].
- c) If the benchmark data the buyer wants is not available on the manufacturer’s web site, but other information about the computer such as its number of CPUs and CPU clock speed (or MIPS figure) is, should the buyer rely on that information to include the computer on the list? Why?
- d) Do you think that the strategy the buyers have defined is adequate, or would it be better if they have used a different one? Why?

Q-4 [10m 2 val.] As you know (and was presented in a seminar), unifying the infrastructures that are used to interconnect hosts and devices in an IT (not HPC) DC is the way to go today... Describe the characteristics of this new unified (or converged) infrastructure and its advantages over the previous ones.