

**CPET 590 Topics on Cloud Computing
Assignment 2**

Assigned date: 1/26/2017

Due Date: 2/1/2017, before 5 PM, as an email attachment.

Be sure to include references if the answers were obtained from outside the text book.

Questions from Chapter 1. Distributed System Models and Enabling Technologies.

Question 1. (35 points)

Briefly explain the following terms associated with network threats or security defense in a distributed computing systems:

- (a) Denial of service (DoS)
- (b) Trojan horse,
- (c) Network worm
- (d) Service spoofing
- (e) Authentication
- (f) Data integrity
- (g) Confidentiality

Questions from Chapter 2. Distributed System Models and Enabling Technologies, pp. 122-128

Question 2. (15 points)

Differentiate and exemplify the following terms related to clusters:

- a. Centralized versus decentralized clusters
- b. Homogeneous versus heterogeneous clusters
- c. Dedicated versus enterprise clusters

Question 3. (20 points)

This problem refers to the redundancy technique. Assume that when a node fails, it takes 10 seconds to diagnose the fault and another 30 seconds for the workload to be switched over.

- a. What is the availability of the cluster if planned downtime is ignored? (availability without planned downtime)
- b. What is the availability of the cluster if the cluster is taken down one hour per week for maintenance, but one node at a time? (availability with planned downtime for maintenance)

Question 4. (30 points)

This problems related to cluster computing:

- 1) Define and distinguish the following terms on scalability:
 - a. Scalability over machine size
 - b. Scalability over problem size
 - c. Resource scalability
- 2) Explain the architectural and functional differences among the availability cluster configurations:
 - a. Hot standby
 - b. Active take over
 - c. Fault-tolerant cluster