

Introduction to Distributed Systems.

(6 points)

This homework covers some of the basics for distributed systems.

This homework must be uploaded to OLAT until Monday, **19.03.2018**, at **08:00**, and will be evaluated on Tuesday, 20th March 2018!

Assignments:

1. Distribution Transparency

You need to design a distributed system, which should achieve maximal *scalability*. Assume that only desktop machines will access to the system. Given the transparencies: access, location, migration, relocation, replication, concurrency and failure, which transparency(ies) will you implement? Explain your answers! **(2 points)**

Expected output:

I will select *transparency1* because ...

I do not need to choose *transparency2* because ...

2. Scalability

Let $T(R, L)$ denotes the execution time of an application processing a problem of size L when being distributed among R nodes in a distributed system. For example, a response time of a service assuming the presence of L users and R servers.

- a. Define *efficiency* $E(pR, L)$ and *scalability* $S(pR, NL)$ of an application through T .

Assume that resources will be increased p times in order to handle the increased load of N times. **(2 points)**

- b. Write possible values of $E(pR, L)$ and $S(pR, NL)$. Assume a well/badly-scaling system!

(2 points)

Expected output b) : $a < E(pR, L) < b$; $c < S(pR, NL) < d$