Verteilte Systeme I
Winter Term 2019/20
G2T1 – Assignment 1 (theoretical part)

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30. Oktober 2019

1 Transparency Levels

a)

The access is location transparent, because the location is hidden behinde an unresolved URL.

b)

The service is not replication transparent because ther is a unique link for every location that has to be checked separatly.

c)

The access is replication transparent, because it is not apparent if Otto checking one or multiple web services.

d)

i.

It is only possible to write all copys at once so all copys are allways the same. That means independent from when or which copy is read the answer is allways up to date.

ii.

Write operations are performed on n-1 copies. Read operations are performed on 2 copies, the client acceptes the new version.

2 System Models

a)

- No message is lost
- The maximal possible delay is known

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b)

i.

Every process i sends its own messages at time $i * \delta t$: $t_i^{send}(m) = i * \delta t$ The tranmission of a given message is not longer than δt, so if a process i starts sending after i * δt every process with a lower id has allready finished and all processes know there messages.

ii.

The worst-case is n * δt as δt is reserved for every prozess as time to send und δt is the loangest time a prozess needs for transmitting a message

3 Three-Army-Problem

a)

b)

4 System Availability

a)

$$A_x = \frac{80t}{100t} = 80\%$$

$$A_y = \frac{60t}{100t} = 60\%$$

b)

$$A_{A_x|A_y} = \frac{80t}{100t} = 80\%$$

c)

$P(A_i, A_j)$ = observing node A_i as up given that node A_j is up

$$P(A_x|A_y) = \frac{60t}{60t} = 100\% \rightarrow \text{not dependent}$$

$$P(A_y|A_x) = \frac{60t}{80t} = 75\% \rightarrow \text{is dependent}$$

d)

The availability depends on $A_x = 80\%$ which is equal to $A_{A_x|A_y}$.