

Three Common Mistakes in Modeling and Analysis of QoS of Service-Oriented Systems



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Motivation



- Some mistakes keep **reappearing** in the SOA literature and practice
- **No papers** on anti-patterns on QoS modeling/management for SOA
- Let's **discuss** the causes and possible improvements!

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Slide 2 of 7

1. Specifying QoS w/o Limiting Requests



- E.g.: Response time of operation X of Web Service A is **max 1 second**
- What if there are 1000 (or 1 million) **concurrent** requests?
- Response time (availability) **depends** on the number of requests!
- Q: Everybody knows this ...
=> A: Unfortunately, **not everybody**

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Slide 3 of 7

2. Predicting QoS using Past w/o Context



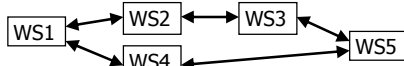
- E.g.: Collect **past** response times and **publish** in a directory for WS **selection**
- What if past requesters were from **Canada** and you are from **Australia**?
- What if number of requesters **rises**?
- Past results from different contexts can be **misleading**!
- Past is only **indication**, but use **context**

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Slide 4 of 7

3. QoS of Compositions w/o Validity Limits



- If max response time of all WSes is 1 s, is the max **overall** response time 4 s?
- What about: No. of requests? Context?
- What if **dependencies** (WS3 – WS4)?
- What is the **probability distribution**?
- Oftentimes, **deeper analysis** is needed

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Slide 5 of 7

Some Causes of Mistakes



- Works **under some circumstances**
- Validity limits viewed as **“minor issue”**
- Math is an **abstraction**, but actual implementation might not conform to it
- Concurrent requesters **not considered**
- **Black box** nature of (Web) services
- Lack of knowledge about similar issues in **other areas** (not only software)

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Slide 6 of 7

Some Possible Improvements



- **Require** discussions of validity limits (e.g., number of requests, context, dependencies) and used assumptions
- **Check** whether math is appropriate for known (or possible) implementations
- **Educate** about issues and mistakes