

# Summary of Stability of Adaptive Service Level Agreements

K. Begnum, M. Burgess,  
T.M. Jonassen and S. Fagernes

**Oslo University College**

# SLA – with feedback

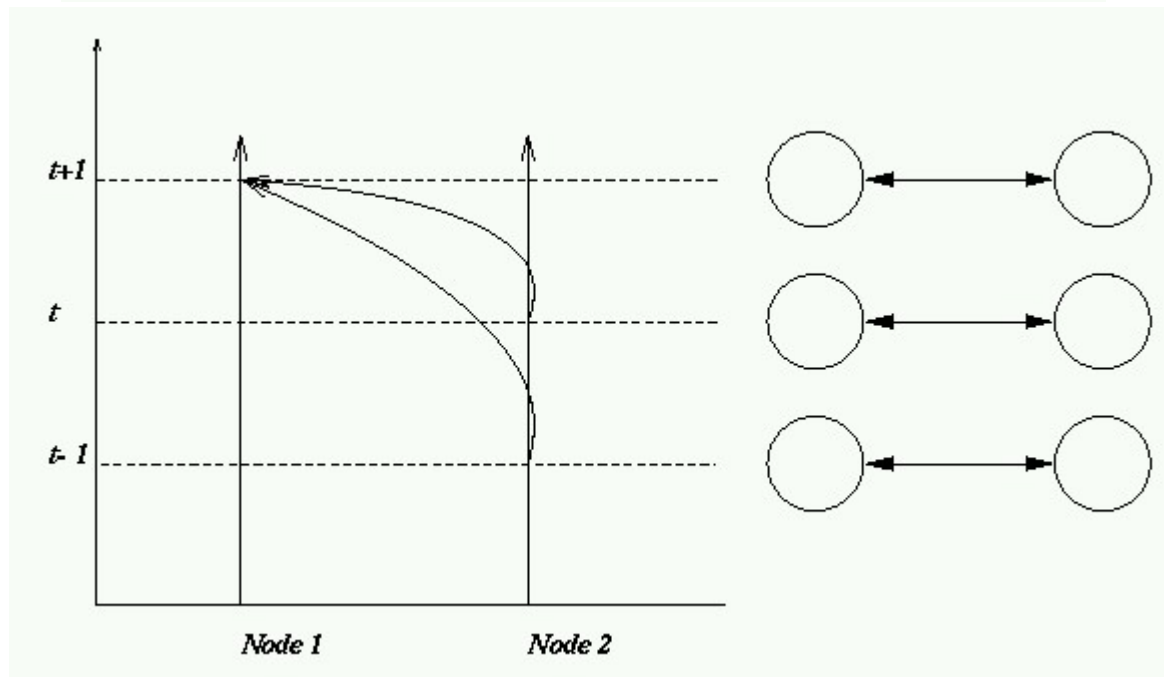
- What happens when we try to punish non-cooperation?
  - Monitoring of mutual SLAs
  - “Peering” agreements
- Apply logic to combine several measurements
  - Pitfalls: logical operations are non-linear
  - Non-linear = unstable (often)

# Reactive policy

- Proposed QoS based on several criteria
  - $QoS(A \text{ AND } B) = f(QoS(A) \text{ AND } QoS(B))$
- How do we represent “AND”?
  - Multiplication of expectations
  - $f(*)$  is a function that includes a punishment
- When two parties apply the same policy...
  - Based on past behaviour of “opponent”
  - “Tit for tat” - do as you are done to

# Model

$$\langle q_1 \rangle(t+1) = \underbrace{\alpha_2 q_2(t)}_{\text{tit-for-tat}} + \underbrace{\beta_2 q_2(t)q_2(t-1)}_{\text{tit-for-2tat}}$$



$$\langle q_1 \rangle(t+1) = \alpha_2 q_2(t) + \beta_2 q_2(t)q_2(t-1)$$
$$\langle q_2 \rangle(t+1) = \alpha_1 q_1(t) + \beta_1 q_1(t)q_1(t-1)$$

# Results

- Most parameter choices highly unstable
- Either max or zero service
- Some room for improvements, but...

*This kind of feedback is too fragile, so watch out!*

