Summary and Conclusions

Which language is best?

Welke taal is het beste?

کدام زبان بهتر است؟

哪一种语言是最好的呢？

Welche Sprache ist die Beste?
Event Model

Dataflow Analysis:
Number of packets consumed and produced during time intervals

Network Calculus:
Arrival curves constraining the number of packets per time interval

Schedulability Analysis:
Minimum interarrival time of packets

Queuing Theory:
Probability distributions of packet interarrival times
Node Model

Dataflow Analysis:
Dependency of packet generation upon consumption;
Worst case processing time

Schedulability Analysis:
Scheduling policy; Worst case processing delay;

Network Calculus:
Service curves defining the minimum node service

Queuing Theory:
Probability distributions of service times
Analysis Result

• **Dataflow Analysis:**
  - Throughput
  - Buffer sizes
  - Worst case latency

• **Schedulability Analysis:**
  - Schedulability
  - Worst case latency

• **Network Calculus:**
  - Worst case latency
  - Buffer sizes

• **Queuing Theory:**
  - Average latency
  - Average throughput
  - Average buffer occupation
## Features and Weaknesses

<table>
<thead>
<tr>
<th>Method</th>
<th>Feature</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dataflow Analysis</td>
<td>Can express flow dependency and flow control; Worst case;</td>
<td>Must be used with restricted models (e.g. SDF, CSDF)</td>
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<tr>
<td>Schedulability Analysis</td>
<td>Easy to model events and nodes; Worst case;</td>
<td>Cannot model flow dependencies; Limited model accuracy</td>
</tr>
<tr>
<td>Network Calculus</td>
<td>Abstract models; Worst case;</td>
<td>Hard to derive accurate models; Cannot represent flow dependencies;</td>
</tr>
<tr>
<td>Queuing Theory</td>
<td>Abstract models; Average case;</td>
<td>Hard to derive accurate models; Cannot represent flow dependencies;</td>
</tr>
</tbody>
</table>
Conclusion

- No simple order or clear relation between the formalisms
- Major differences are aesthetical
- Each has different preferences of problem and applications
- Generalizing or retargeting a formalism becomes unnatural and cumbersome
- Integrating of two or more formalisms is promising