Last Lecture:
- Hierarchical state machines: the rest
- Deferred events
- Passive reactive objects

This Lecture:
- Educational Objectives:
  - Capabilities for following tasks/questions.
  - What are constructive and reflective descriptions of behaviour?
  - What are UML Interactions?
  - What is the abstract syntax of this LSC?
  - How is the semantics of LSCs constructed?
  - What is a cut, fired-set, etc.?
- Content:
  - Rhapsody code generation
  - Interactions: Live Sequence Charts
  - LSC syntax
  - Towards semantics
LifelineDurationConstraint

Figure 14.31 - Timing Diagram with more than one Lifeline and with Messages

OMG (2007), OMG:ACSystem HasCard Unlock

OK {1..14} OpenDoor

Code Message

Figure 14.26 - Sequence Diagram with time and timing concepts

OMG (2007).

Figure 14.27 - Communication diagram

OMG (2007).

Figure 14.28 - Interaction Overview Diagram representing a High Level Interaction diagram

OMG (2007).

Interactions as Reflective Description

An interaction \( I \) has a set of interactions \( I \), \( \epsilon \), \( \sigma \)

\( I \) is the semantical model of an interaction diagram, the set of states, the set of messages, the set of state transitions, the set of message sequences, the set of messages.

The most prominent interaction diagram is the sequence diagram (formerly known as collaboration diagram), an interaction diagram that reflects on the temporal aspects of the interaction.

Why Sequence Diagrams?

The sequence diagram (formerly known as collaboration diagram) is the most prominent interaction diagram. It reflects on the temporal aspects of the interaction. Sequence diagrams are used to show the flow of control in a system, and they are often accused to lack a formal semantics.

Interactions as Reflective Description

A reflective description tells what triggers the requirement, example scenario or invariant? •

Most severe •

What means to express •

An interaction \( I \) is a set of states, messages, state transitions, message sequences, and something which is either satisfied or not satisfied by a computation.

Some drawbacks of UML 1.x •

Most prominent interaction •

Diagram of UML 1.x:

message sequence chart (MSC)

message sequence chart (MTC)

statechart (SC)

activity diagram (AD)

communication diagram (CD)

sequence diagram (SD)

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Diagram of UML 1.x:

message sequence chart (MSC)

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is a set of $S$, $L$, $Θ$ expresses $L$ only if $(2 \subseteq Cond$ could be mapped to method/operation calls.

Note conditions is a set of $Θ$ with $E$, $D$, $\sim$subseteq $L$ with $\cdot$, $\circ$, $\circ$.

An abstract syntax). A signature, $\text{LSC body}$ is a tuple $I$, $\text{instance head}$ $\text{locInv}$, $\theta$, $l$...

Let $A$ be a finite, non-empty, partially ordered set of $I$, $\circ$, $\circ$.

This is the location of $l$ if $I \in l$ (e.g.

\[ x \geq 0 \land x < y \implies y > 0 \land y > z \implies \neg \theta \land \theta \]


