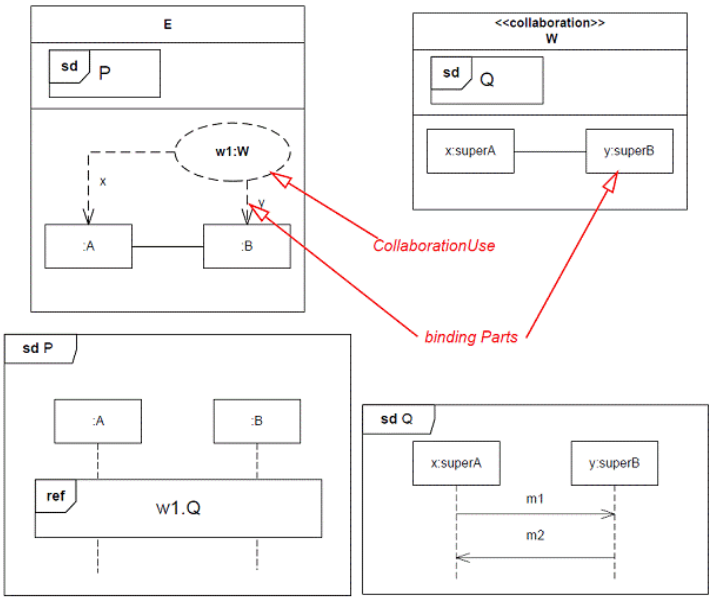


Figure 17.24 Describing Collaborations and their binding

The example in Figure 17.24 shows how collaboration uses are employed to make Interactions of a Collaboration available in another classifier.

The collaboration W has two parts x and y that are of types (classes) superA and superB respectively. Classes A and B are specializations of superA and superB respectively. The Sequence Diagram Q shows a simple Interaction that we will reuse in another environment. The class E represents this other environment. There are two anonymous parts :A and :B and the CollaborationUse w1 of Collaboration W binds x and y to :A and :B respectively. This binding is legal as :A and :B are parts of types that are specializations of the types of x and y.

In the Sequence Diagram P (owned by class E) we use the Interaction Q made available via the CollaborationUse w1.

17.8 Sequence Diagrams

The most common kind of Interaction Diagram is the Sequence Diagram, which focuses on the Message interchange between a number of Lifelines.

A sequence diagram describes an Interaction by focusing on the sequence of Messages that are exchanged, along with their corresponding OccurrenceSpecifications on the Lifelines.

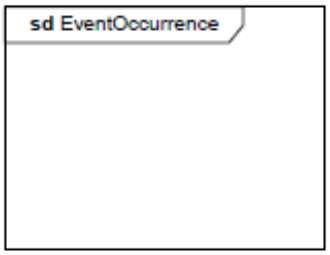
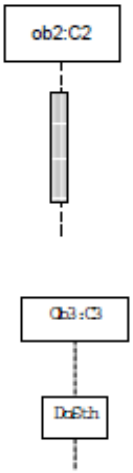
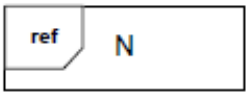
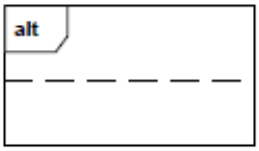
Interactions that are described by Sequence Diagrams form a basis for understanding the semantics of the meta classes in the Interactions package. Sequence Diagrams are used for the examples in sub clauses for the Interaction sub packages.

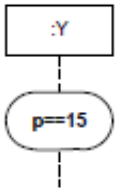
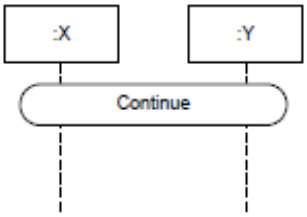
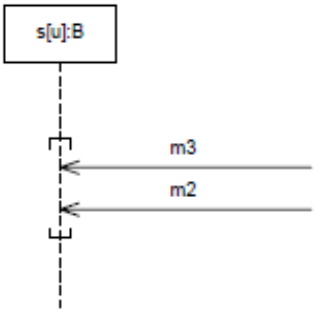
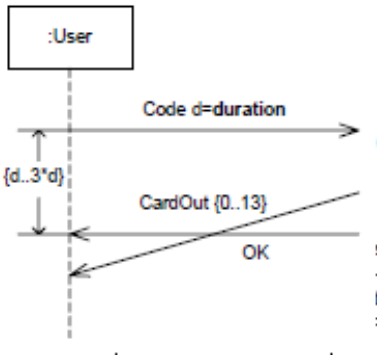
17.8.1 Sequence Diagram Notation

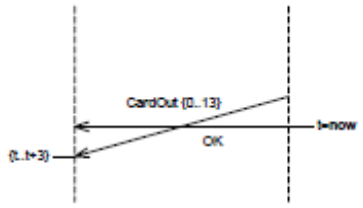
17.8.1.1 Graphic Nodes

The graphic nodes that can be included in sequence diagrams are shown in Table 17.1.

Table 17.1 Graphic Nodes Included in Sequence Diagrams

Node Type	Notation	Reference
Frame (for Interaction)		The notation shows a rectangular frame around the diagram with a name in a compartment in the upper left corner. See 17.2.4 (Interaction)
Lifeline		See 17.3.4 (Lifeline)
ExecutionSpecification		See 17.2.4 (ExecutionSpecification)
InteractionUse		See 17.7.4 (InteractionUse).
CombinedFragment		See 17.6.4 (CombinedFragment)

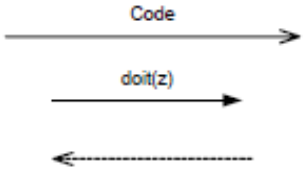
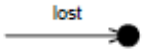
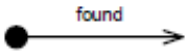
Node Type	Notation	Reference
StateInvariant		See 17.2.4 (StateInvariant)
Continuations		See 17.6.4 (Continuation)
Coregion		See 17.6.4 (Parallel interactionOperator)
DestructionOccurrenceSpecification		See 17.4.4 (DestructionOccurrenceSpecification) and example in Figure 17.14.
DurationConstraint Duration Observation		See Figure 17.5.

Node Type	Notation	Reference
TimeConstraint TimeObservation		See Figure 17.5.

17.8.1.2 Graphic Paths

The graphic paths between the graphic nodes are given in Table 17.2.

Table 17.2 Graphic Paths Included in Sequence Diagrams

Message		Messages come in different variants depending on what kind of Message they convey. Here we show an asynchronous message, a call and a reply. These are all *complete* messages. See 17.4.4 (Message)
LostMessage		Lost messages are messages for which the destination of the [lost] Message is outside the scope of the description. See 17.4.4 (Message)
FoundMessage		Found messages are messages with known receiver, but the sending of the message is not described within the specification. See 17.4.4 (Message)
GeneralOrdering		See 17.5.4 (GeneralOrdering)

Interactions are units of behavior of an enclosing Classifier. Interactions focus on the passing of information with Messages between the ConnectableElements of the Classifier.

17.8.2 Example Sequence Diagram

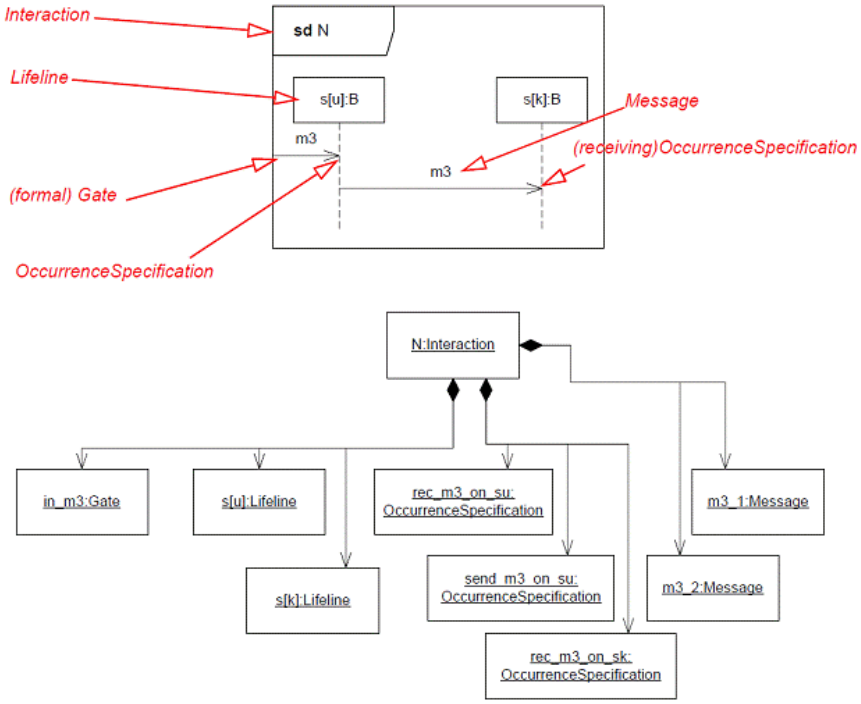


Figure 17.25 Overview of Metamodel elements of a Sequence Diagram

In order to explain the mapping of the notation onto the metamodel we have pointed out areas and their corresponding metamodel concept in Figure 17.25. Let us go through the simple diagram and explain how the metamodel is built up. The whole diagram is an Interaction (named N). There is a formal gate (with implicit name in_m3) and two Lifelines (named s[u] and s[k]) that are contained in the Interaction. Furthermore the two Messages (occurrences) both of the same type m3, implicitly named m3_1 and m3_2 here, are also owned by the Interaction. Finally there are the three OccurrenceSpecifications.

We have omitted in this metamodel the objects that are more peripheral to the Interaction model, such as the Part s and the class B and the connector referred by the Message.

17.9 Communication Diagrams

Communication Diagrams focus on the interaction between Lifelines where the architecture of the internal structure and how this corresponds with the message passing is central. The sequencing of Messages is given through a sequence numbering scheme.

Communication Diagrams correspond to simple Sequence Diagrams that use none of the structuring mechanisms such as InteractionUses and CombinedFragments. It is also assumed that message overtaking (i.e., the order of the receptions are different from the order of sending of a given set of messages) will not take place or is irrelevant.

17.9.1 Communication Diagram Notation

17.9.1.1 Graphic Paths

Communication diagram nodes are shown in Table 17.3.