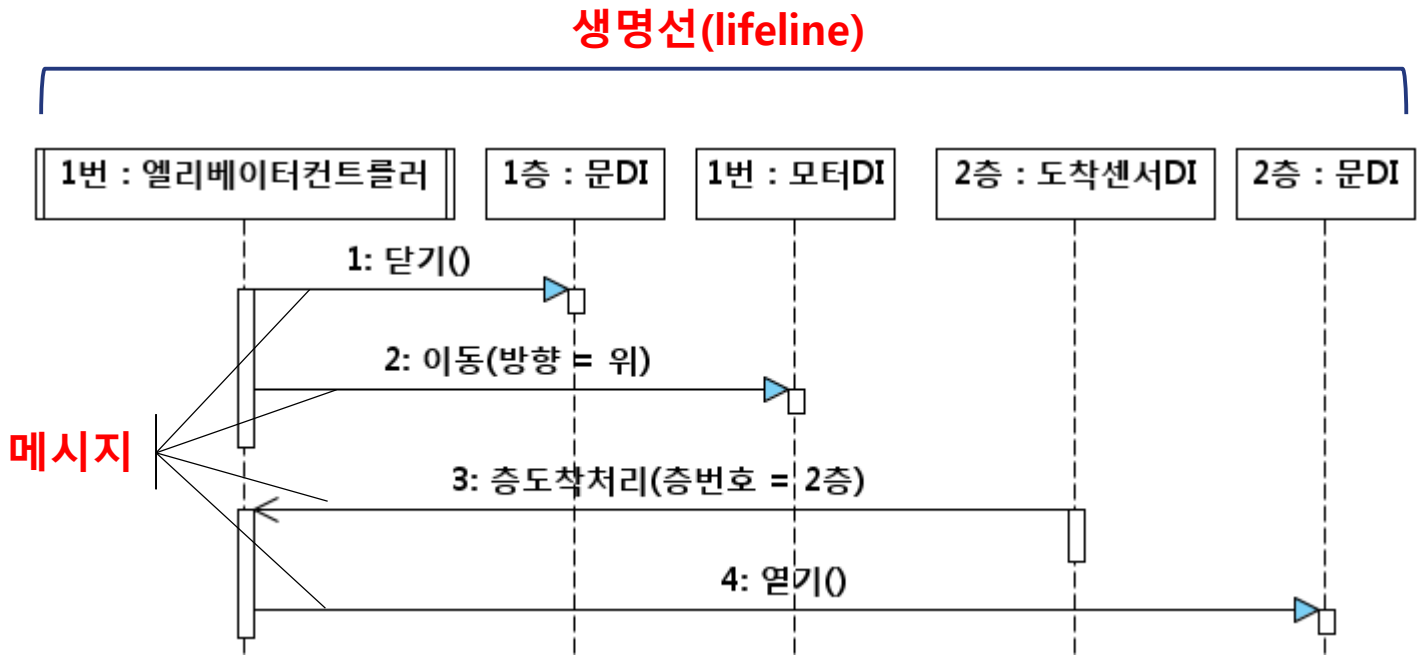
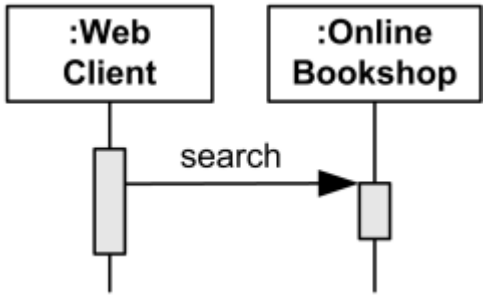
Sequence Diagram

시퀀스 다이어그램: 핵심 개념

- Lifeline: named element which represents an individual participant in the interaction
- Message: a named element that defines one specific kind of communication between lifelines of an interaction

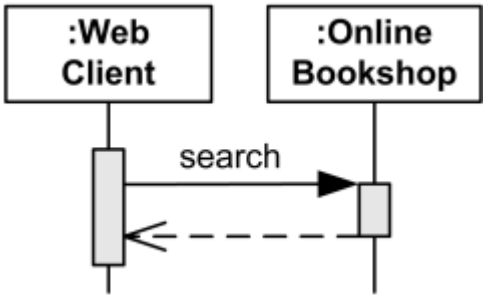


Message by Action Type



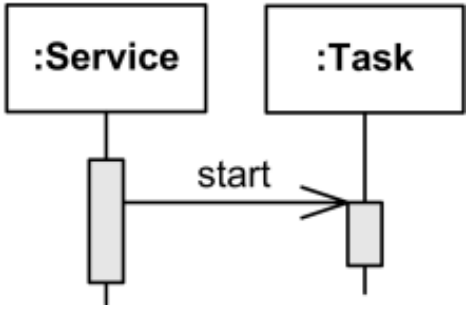
Synchronous message

Web Client searches Online Bookshop and waits for results.



Reply message

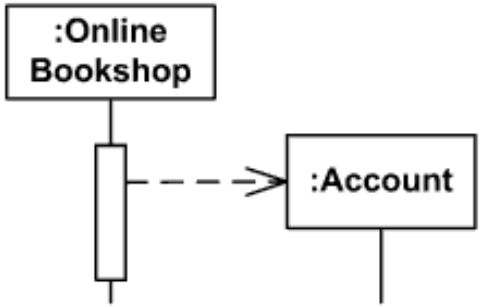
Web Client searches Online Bookshop and waits for results to be returned.



Asynchronous message

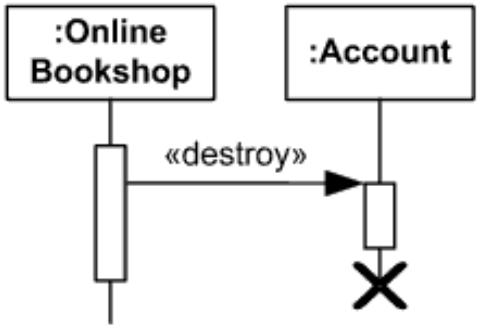
Service starts Task and proceeds in parallel without waiting

Message by Action Type



Create message

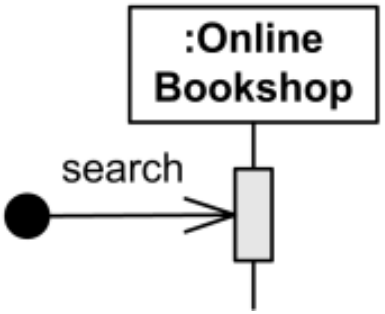
Online Bookshop creates Account.



Delete message

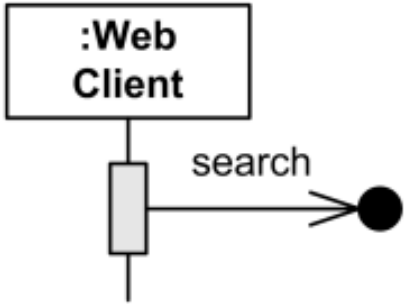
Online Bookshop terminates Account.

Messages by Presence of Event



Found message

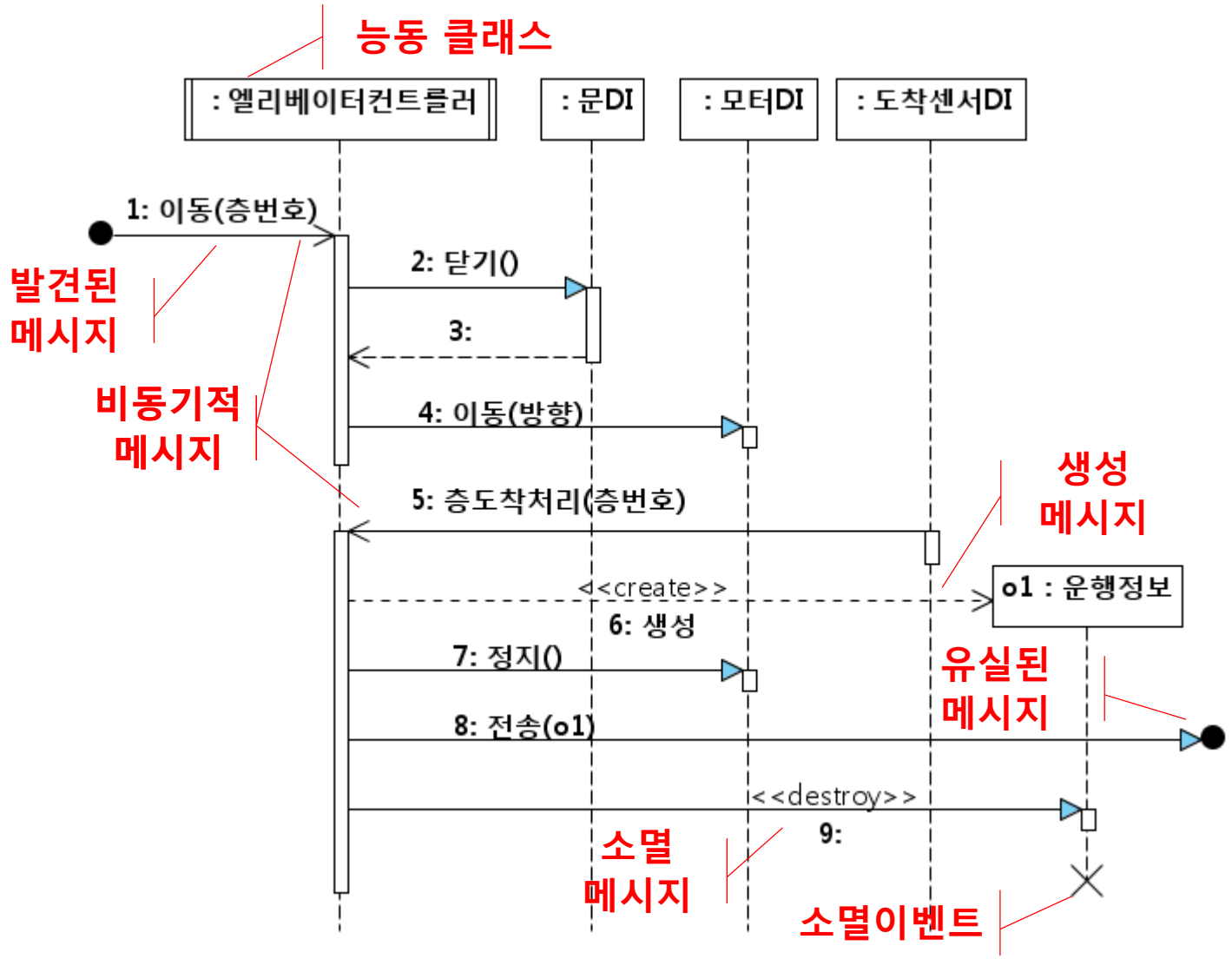
Online Bookshop gets search message of unknown origin



Lost message

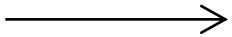
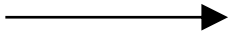
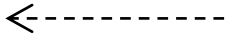
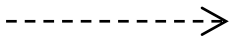
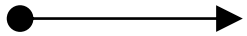
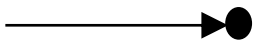
Web Client sent search message which was lost

Message Type

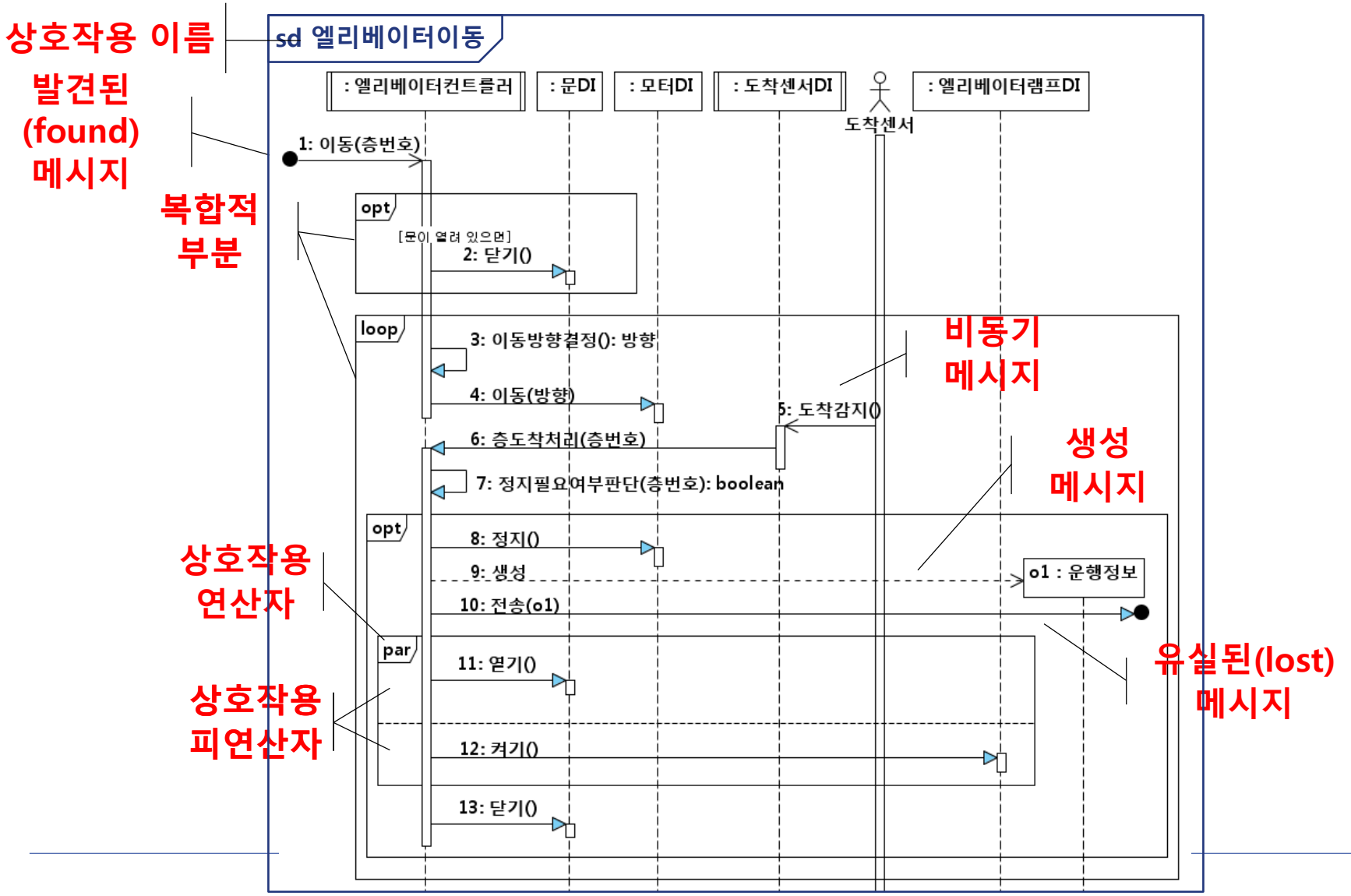


메시지

- 메시지는 상호작용의 생명선간의 통신을 표현

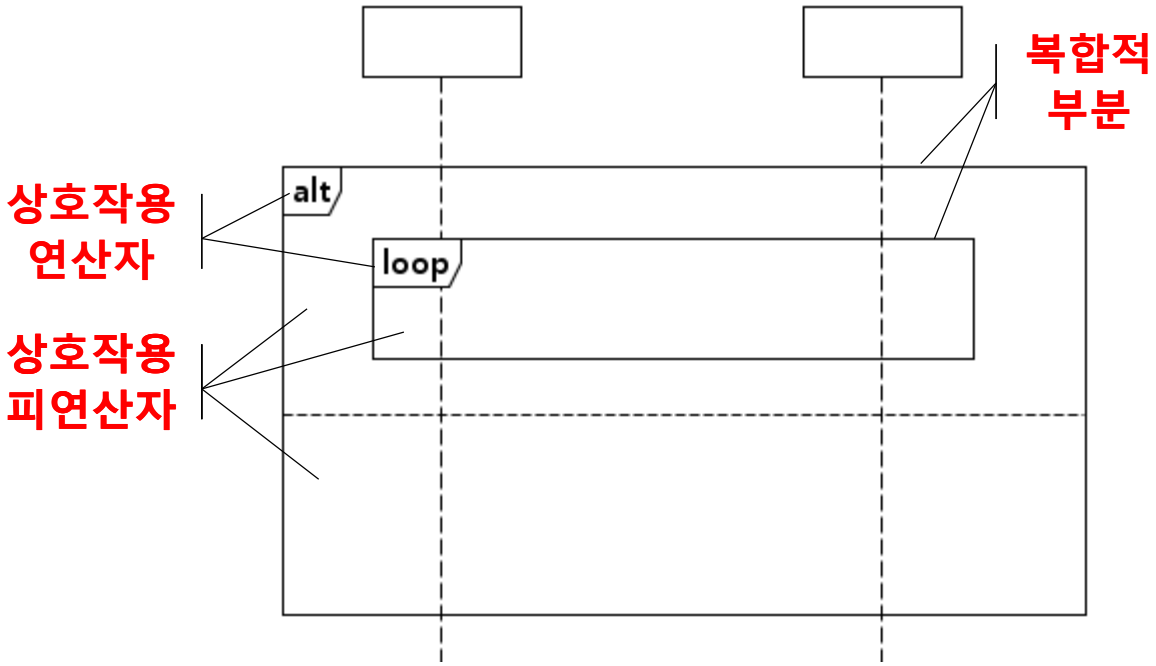
분류 기준	유형	표현법	설명
송신자의 대기 여부	비동기적 메시지		송신자을 대기시키지 않음
	동기적 메시지		송신자을 대기시킴
	대답 메시지		동기적 메시지의 수행 결과
메시지의 의미	생성 메시지		생명선 생성
	소멸 메시지*	N/A	생명선 소멸
	행위 메시지	N/A	상대 행위의 호출
송신/수신자의 정의 여부	발견된 메시지		모르는 송신자로부터의 메시지
	유실된 메시지		모르는 수신자로의 메시지
	완전 메시지	N/A	송신/수신자가 정의된 메시지

UML 2.x의 추가된 표현법



복합적 부분(combined fragment)

- 다양한 유형의 부분 상호작용을 복합적으로 표현



Operators

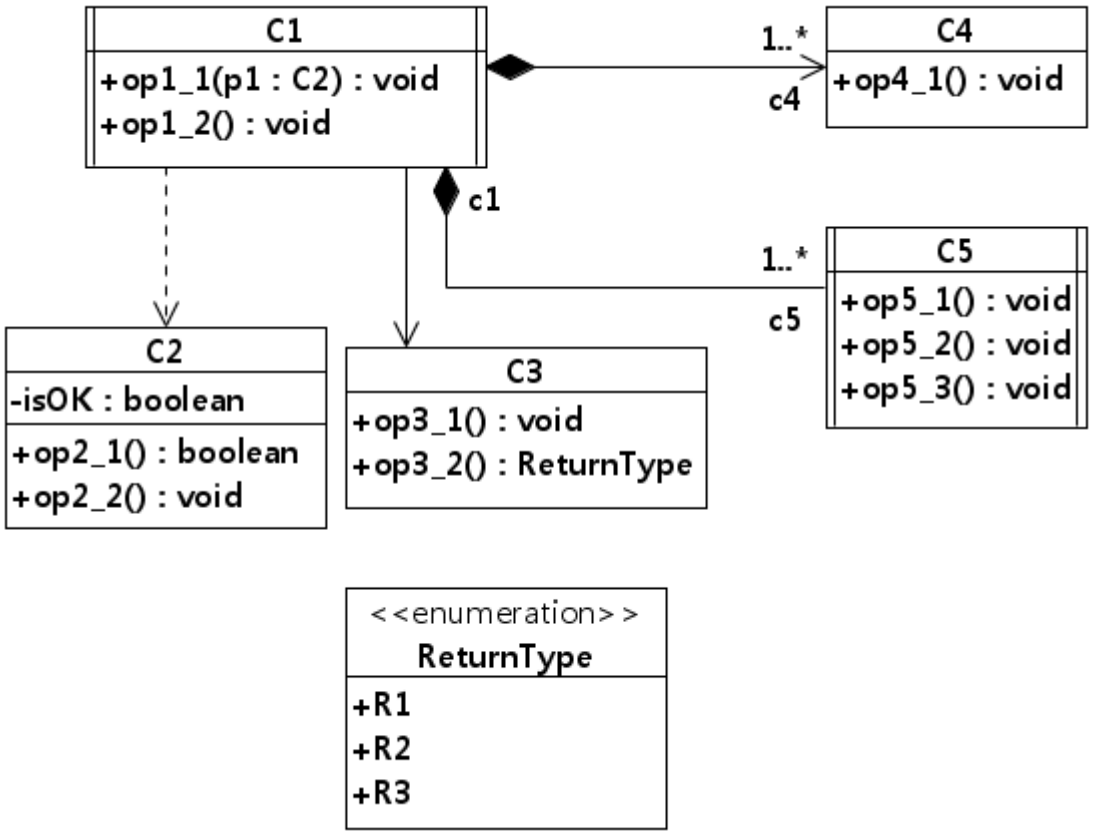
alt - alternatives
opt - option
loop - iteration
break - break
par - parallel
critical - critical region

strict - strict sequencing
seq - weak sequencing(default)

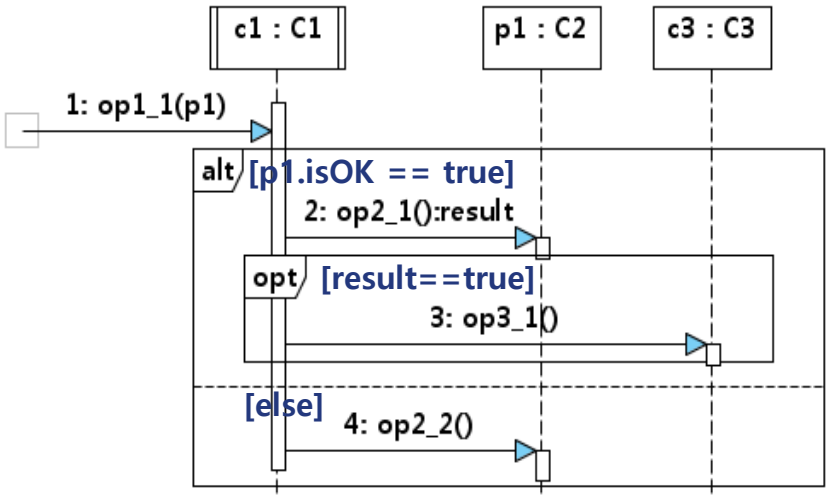
ignore - ignore
consider - consider
assert - assertion
neg - negative

복합적 부분(combined fragment)

- 관련 클래스 다이어그램

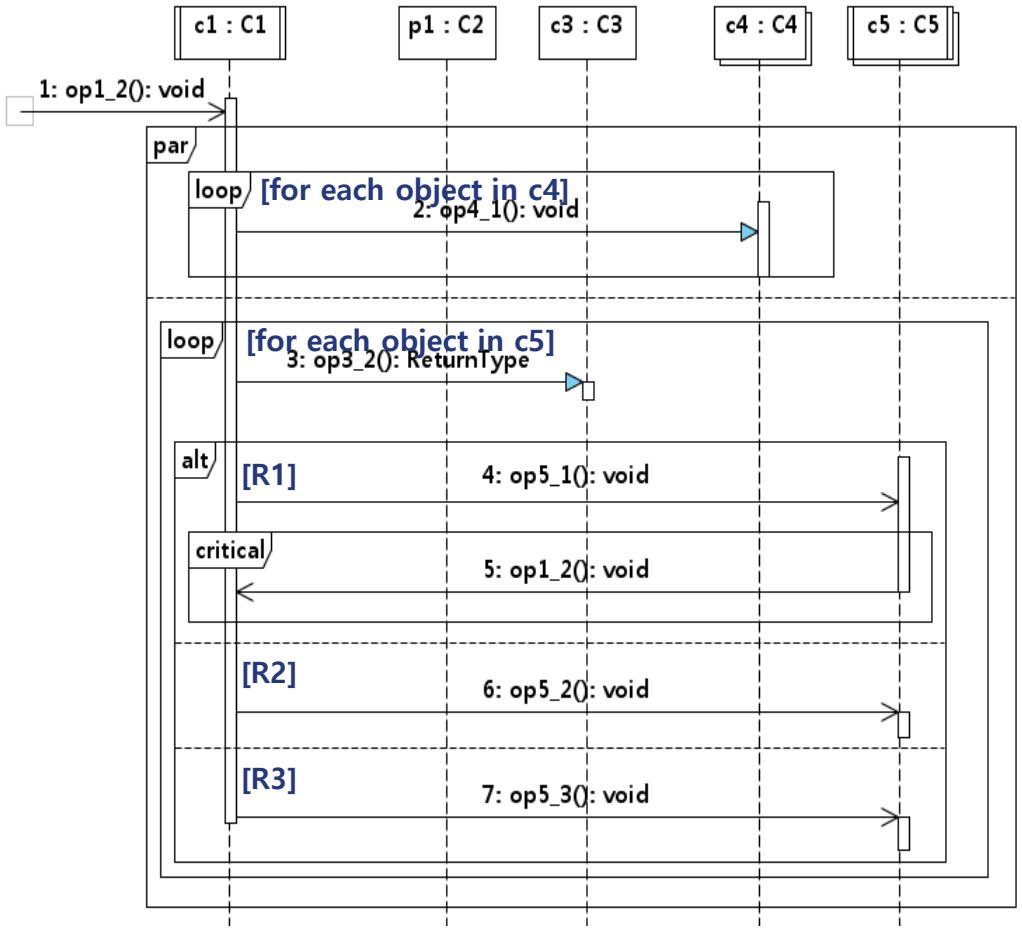


복합적 부분 – alt, opt



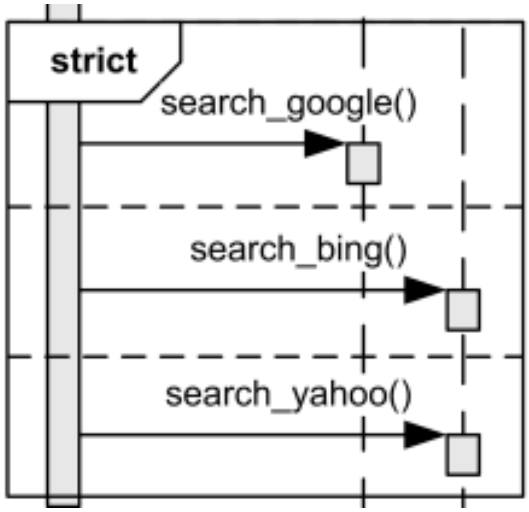

```
class C1 {
  private C3 c3 ;
  private Collection<C4> c4 =
      new ArrayList<C4>() ;
  private Collection<C5> c5 =
      new ArrayList<C5>() ;
  public void op1_1(C2 p1) {
    if ( p1.getIsOK() == true ) {
      boolean result = p1.op2_1() ;
      if ( result == true ) c3.op3_1() ;
    }
    else {
      p1.op2_2() ;
    }
  }
}
```

loop, par, critical

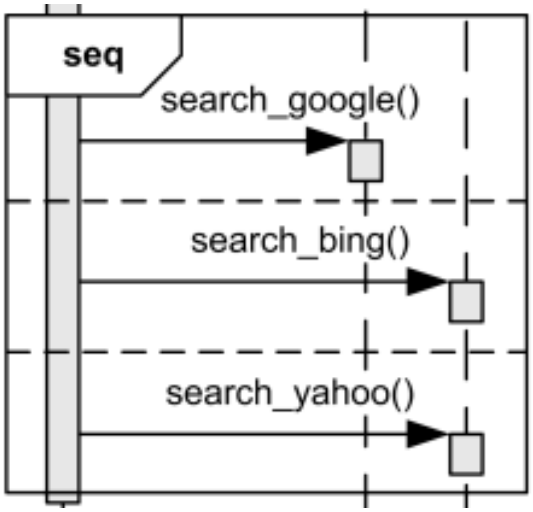



```
class C1 {
  private C3 c3 ;
  private Collection<C4> c4 =
      new ArrayList<C4>() ;
  private Collection<C5> c5 =
      new ArrayList<C5>() ;
  public synchronized  void op1_2() {
    parallel {
      for ( C4 o4 : c4 ) o4.op4_1() ;
    }
    and {
      for ( C5 o5 : c5 ) {
        ReturnType r = c3.op3_2() ;
        switch ( r ) {
          case ReturnType.R1 :
              o5.op5_1() ; break ;
          case ReturnType.R2 :
              o5.op5_2() ; break ;
          case ReturnType.R3 :
              o5.op5_3() ; break ;
        }
      }
    }
  }
}
```

Weak and Strict Sequencing

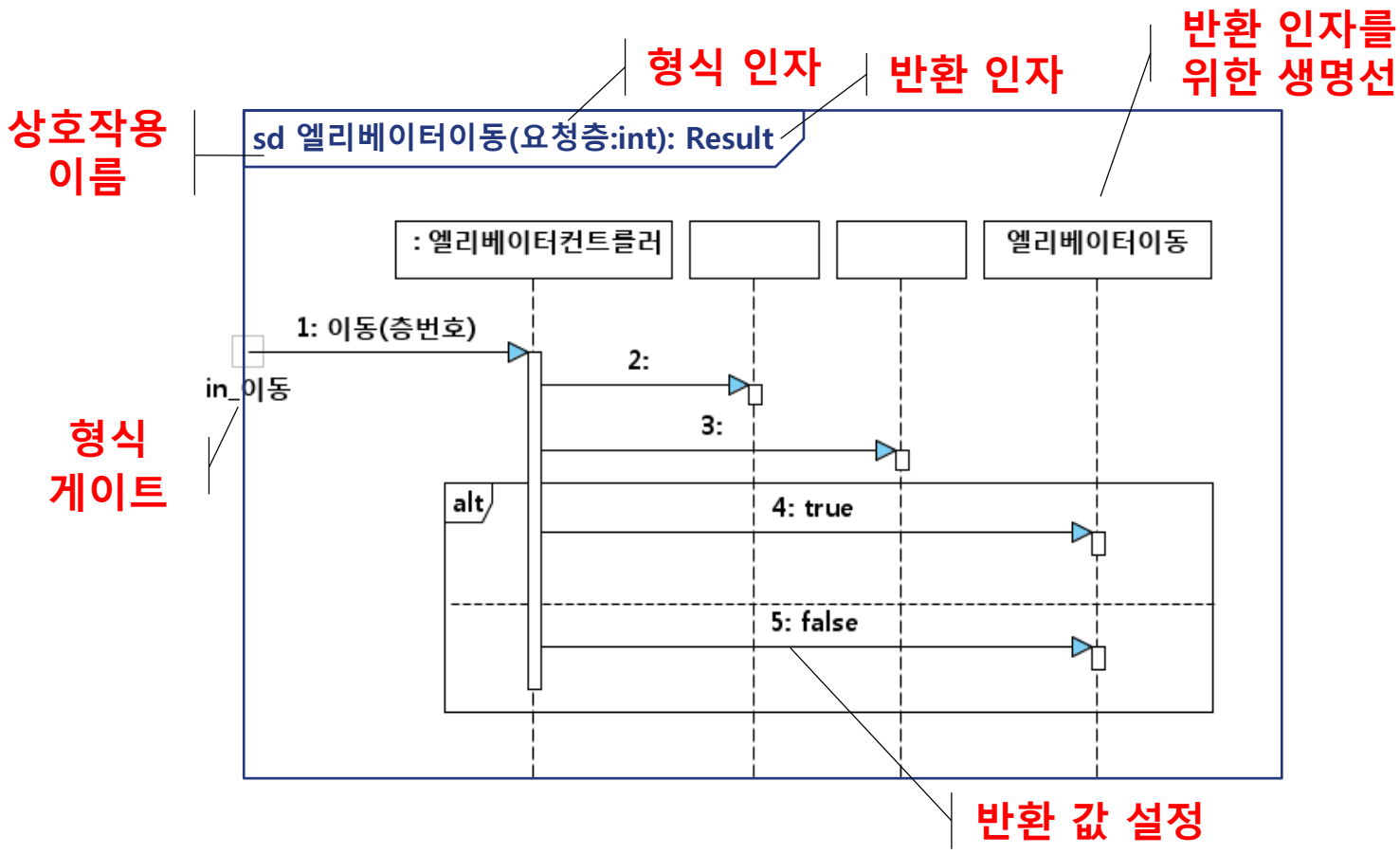


Search Google, Bing and Yahoo in the strict sequential order.



Search Google possibly parallel with Bing and Yahoo, but search Bing before Yahoo.

상호작용(interaction)

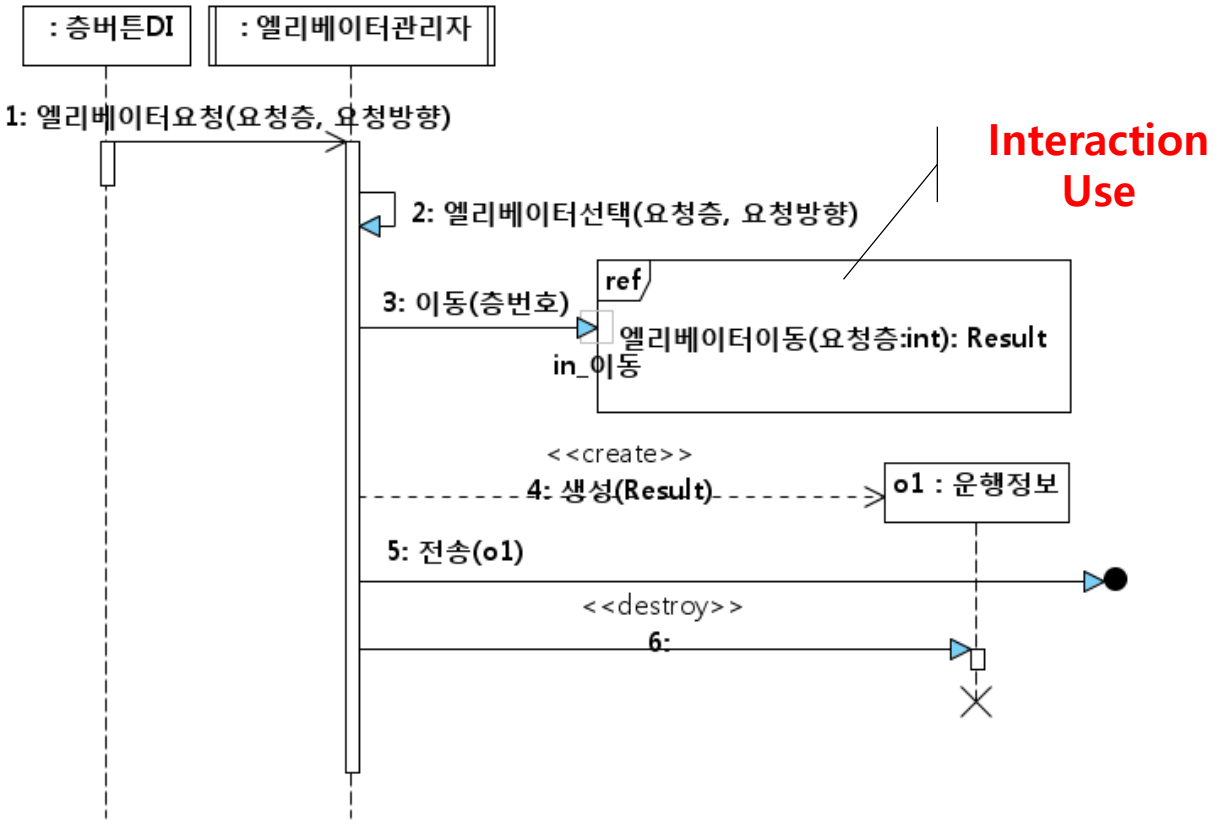


상호작용(interaction)

- **상호작용의 이름**
  - 상호작용에 부여된 이름으로서 시퀀스 다이어그램의 좌측 상단에 “sd” 키워드 뒤에 기술된다.
  - 상호작용 이름은 다른 시퀀스 다이어그램 또는 상호작용 개요 다이어그램에서 참조(ref)될 때 참조될 상호작용의 이름으로서 사용된다
- **상호작용은 인자와 반환 인자**를 포함할 수가 있다.
  - 상호작용의 반환 값은 상호작용과 동일한 이름의 생명선을 이용하여 표현할 수가 있다.
- **상호작용의 게이트(gate)**
  - 상호작용의 외부로부터 수신되는 메시지를 표현할 때 메시지 송신 지점을 표현할 때 사용된다.

상호작용 이용(use)

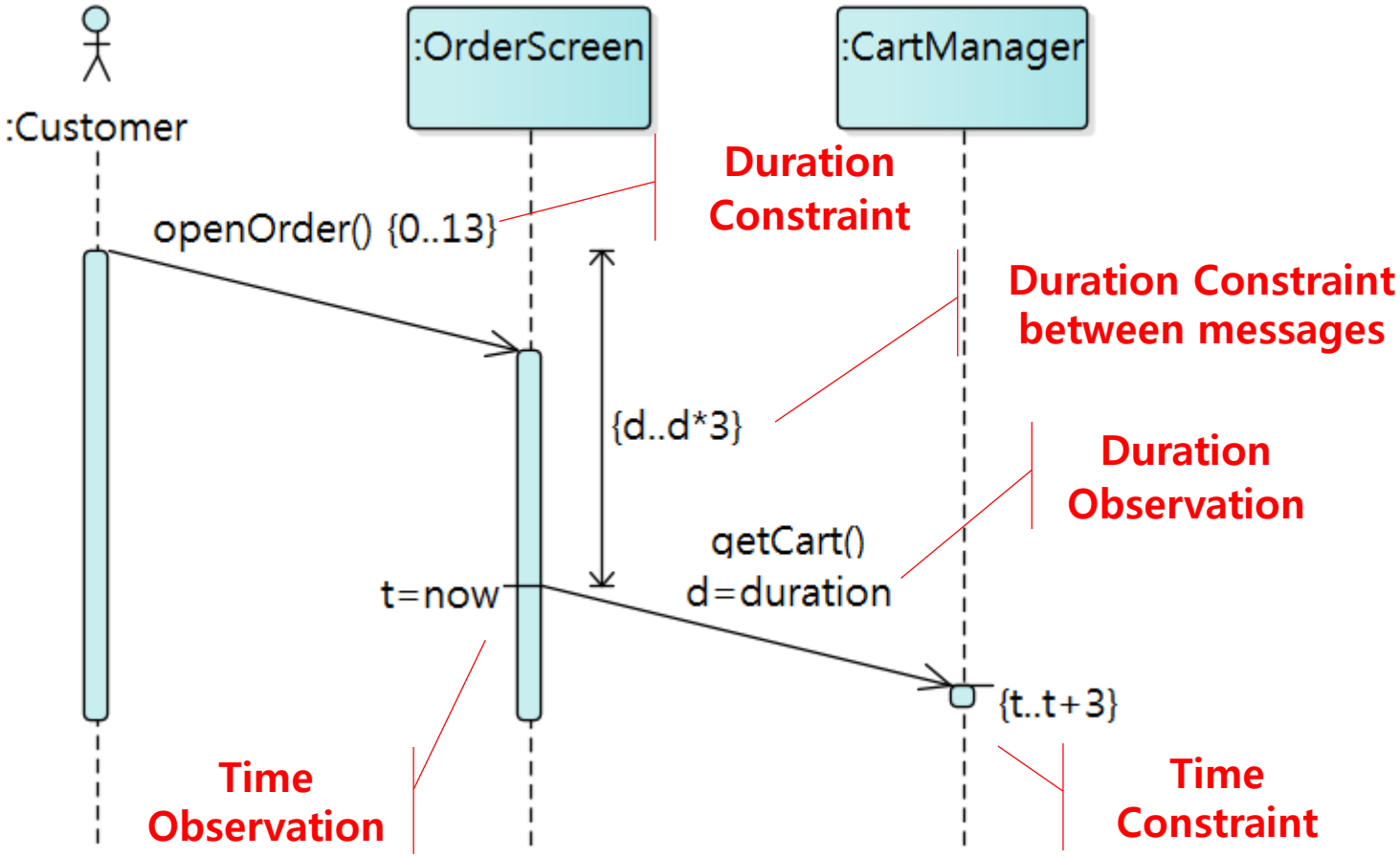
- Interaction use allows to use (or call) another interaction.
- Large sequence diagrams can be simplified with interaction uses.
- It is also used to reuse common interaction between several other interactions.



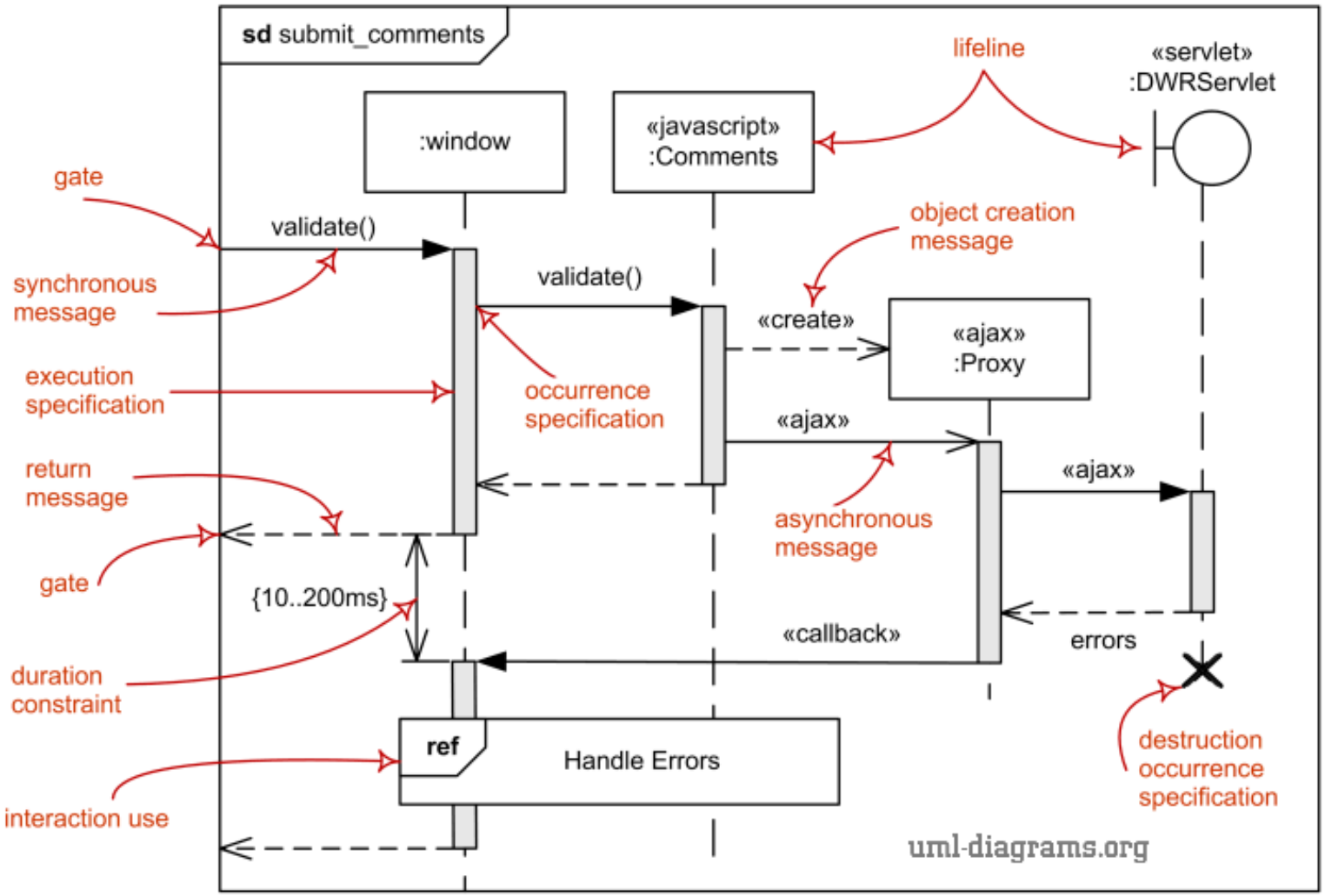
Sequence Diagram: Timing

Concept	Description
Timing Observation	Capture the point at which the message was sent.
Timing Constraint	Indicate the minimum and maximum time at which the message should arrive at the target.
Duration Constraint Between Messages	Indicate the minimum and maximum interval between sending or receipt of the previous message at the current message's source Lifeline, and sending the current message.
Duration Observation	Capture the duration of a message.
Duration Constraint	Indicate the minimum and maximum limits on how long a message can last.

Sequence Diagram: Timing



Sequence Diagram: Summary



Q&A