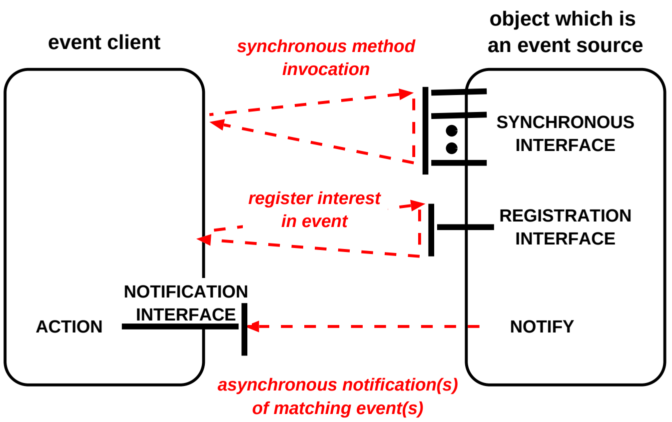
CAMBRIDGE EVENT ARCHITECTURE (CEA)

CEA 1. The *publish-register-notify* paradigm



CEA 1 * Asynchronous middleware platform extension

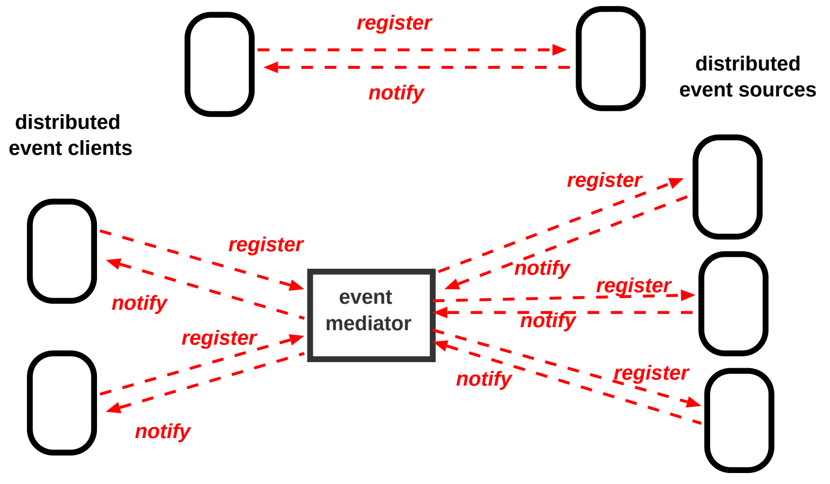
- A simple extension to any O-O (synchronous) Middleware platform such as OMG -CORBA to support asynchronous operation

* Events are named and specified in standard IDL (<ODL)

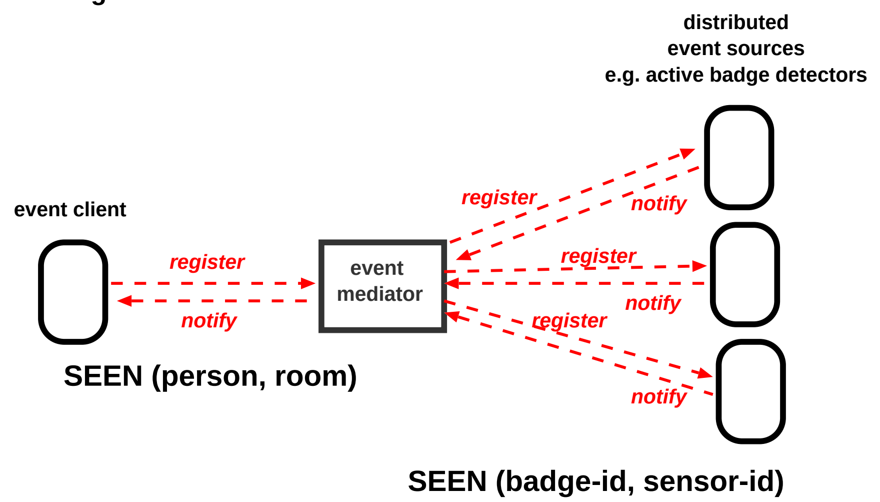
* Fine-grain, parametrised, event matching
  - parameter values or wildcards
  - source-side event filtering

* Extended platform can support:
  - media stream control
  - user interaction e.g. interactive presentation
  - mobile users and computers (detach - work - reattach)

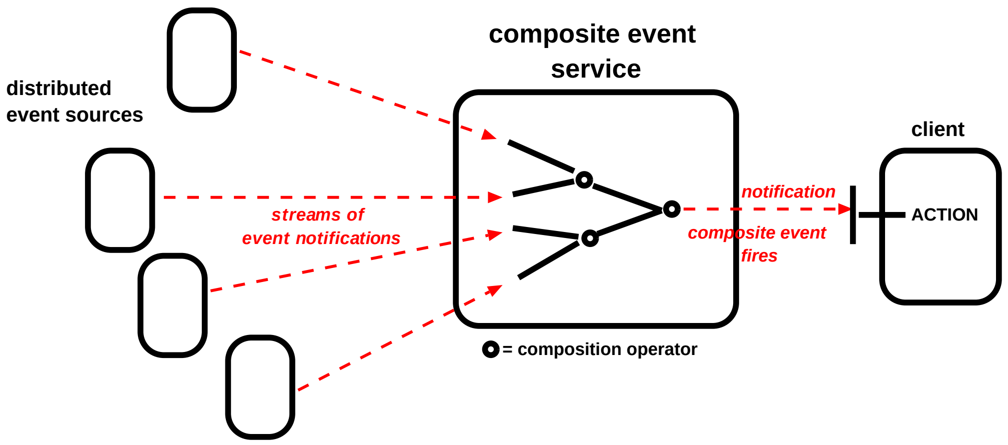
CEA 2. Direct and mediated notification



CEA 2 * decouple event source and client
* avoid overload on primitive event sources
* one-to-many and many-to-many communication
  - multicast protocol may be exploited at event source or mediator
* mediated communication can be use to provide a higher-level interface

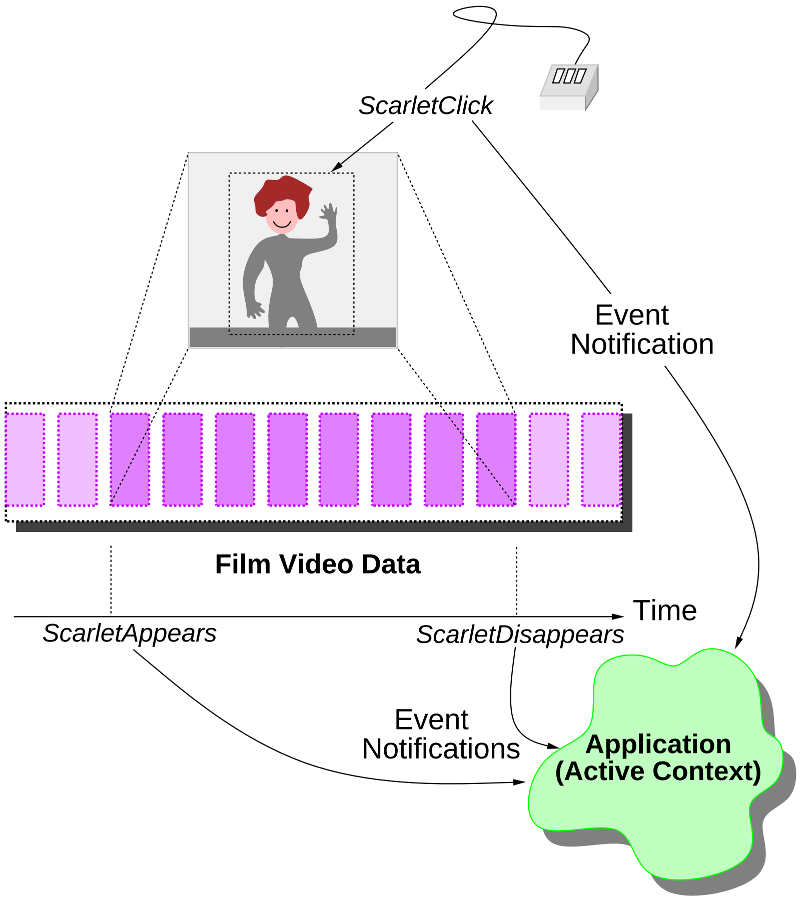


CEA 3. Event Composition - Composite event detection

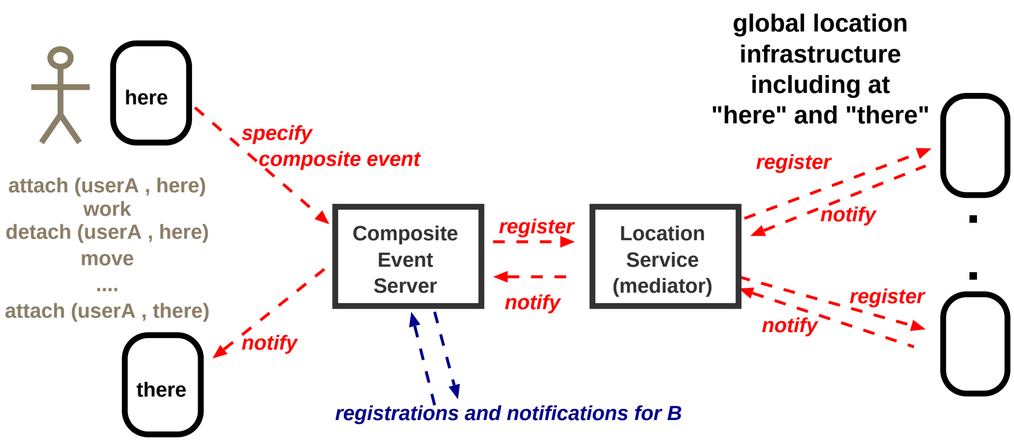


CEA 3 event composition operators

Without	**A-B**	*yields stream matching A until B occurs*
Sequence	**A;B**	*yields stream matching B after A occurs*
Or	**A|B**	*yields stream matched by A or B*
And	**A&B**	*yields stream matched by both A and B*
First	**First(A)**	*yields the first event that matches A*



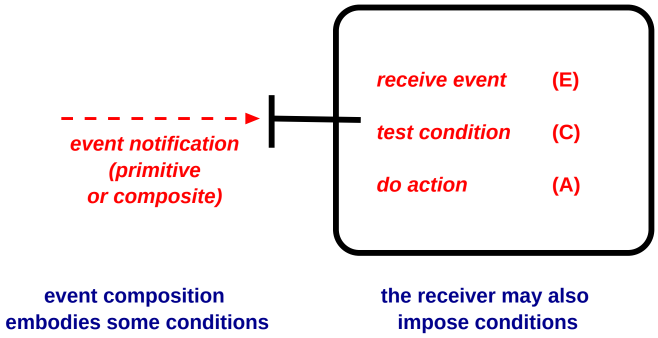
Example: supporting a mobile user



((detach (userA , *) ; (B - attach (userA , *))) ; First (attach (userA, *))
when userA attaches at "there"
notify to "there" the stream of events matching B
since userA detached from "here"

CEA 4. Active programming:*event-condition-action*

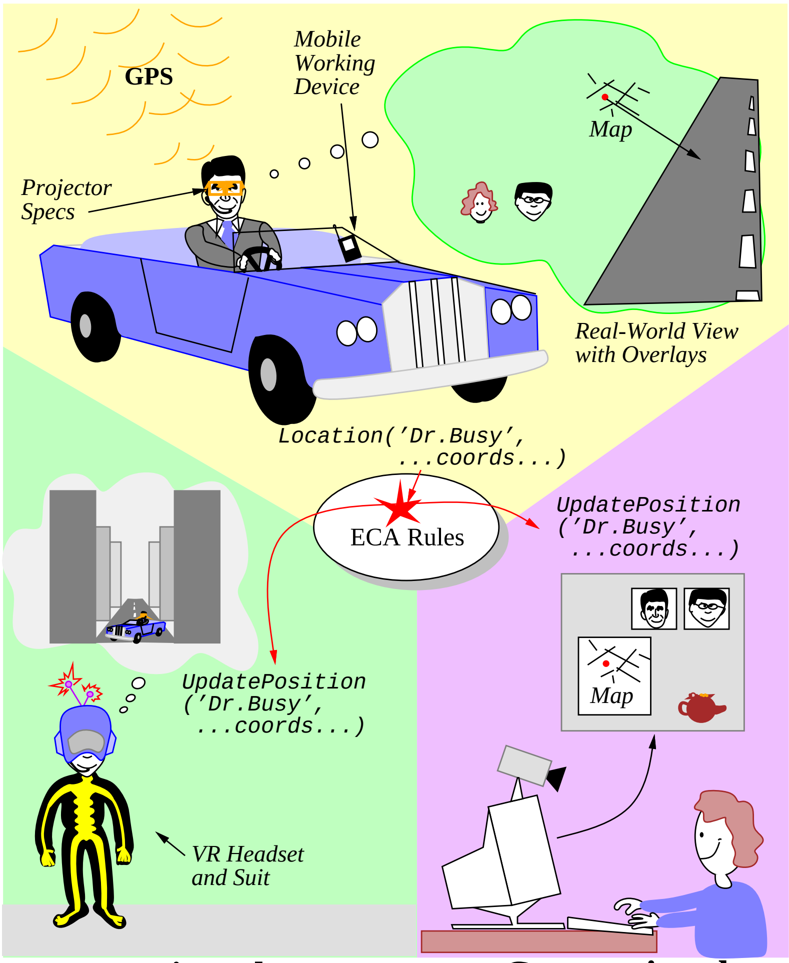
(Component composition)



* events are the glue for composing distributed software components

- active office
- active home
- virtual reality (VR)
- augmented reality (AR)
- integration of VR and AR

Augmented



Virtual **Conventional**

Distributed Implementation:

any component may fail at any time

Uncertainty:

either - the alarm has not been sent, all is well
or - the component that raises the alarm has failed,
the crisis may or may not have occurred

Solution - use a heartbeat protocol for failure tolerance

heartbeat rate
is tuneable pairwise between event sources and clients

client policy
for non-occurrence of either event or heartbeat