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# OBSERVER SHARED RESOURCE

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CADT Event Manager

## OPERATIONS

**ACTION** Fire\_Event:  $Event\_Type[i]$

**ACTION** Subscribe:  $Process\_Type[i] \times Event\_Type[i]$

**ACTION** Unsubscribe:  $Process\_Type[i] \times Event\_Type[i]$

**ACTION** Listen:  $Process\_Type[i] \times Event\_Type[i]$

## SEMANTICS

### DOMAIN:

**STATE:**  $EventManager =$

$(suscibers : Event\_Type \rightarrow SetofProcess\_Type \times$   
 $unlistenedEvents : Event\_Type \rightarrow SetofProcess\_Type)$

**TYPE:**  $Process\_Type = 0..N\_PROCESSES-1$

$Event\_Type = 0..N\_EVENTS-1$

**INVARIANT:**  $\forall ue \in dom(self.unlistenedEvents) \bullet$

$self.unlistenedEvents(ue) \subseteq self.suscibers(ue)$

**INITIAL:**  $\forall ue \in Event\_Type \bullet self.unlistenedEvents(ue) = \wedge self.suscibers(ue) = \emptyset$

**PRE:** true

**CPRE:** true

**Fire\_Event(eid)**

**POST:**  $self.unlistenedEvents(eid) = self^{in}.subscribed(eid) \wedge$

$\forall e \in EID \bullet (self.subscribed(e) = self^{in}.subscribed(e) \wedge$

$(e \neq eid \Rightarrow self.unlistenedEvents(e) = self^{in}.unlistenedEvents(e)))$

**PRE:** true

**Subscribe(pid,eid)**

**POST:**  $self.subscribed(eid) = self^{in}.subscribed(eid) \cup \{pid\} \wedge$

$\forall e \in EID \bullet (self.unlistenedEvents(e) = self^{in}.unlistenedEvents(e) \wedge$

$(e \neq eid \Rightarrow self.subscribed(e) = self^{in}.subscribed(e)))$

**PRE:**  $pid \in self.subscribed(eid)$

**CPRE:** true

**Unsubscribe(pid,eid)**

**POST:**  $self.subscribed(eid) = self^{in}.subscribed(eid) \setminus \{pid\} \wedge$

$self.unlistenedEvents(eid) = self^{in}.unlistenedEvents(eid) \setminus \{pid\} \wedge$

$\forall e \in EID \bullet e \neq eid \Rightarrow (self.unlistenedEvents(e) = self^{in}.unlistenedEvents(e) \wedge$

$self.subscribed(e) = self^{in}.subscribed(e))$

**PRE:** true

**CPRE:**  $\exists e \in EID \bullet pid \in self.unlistenedEvents(e)$

**Listen(pid,eid)**  
**POST:**  $pid \in self^{in}.unlistenedEvents(eid) \wedge$   
 $self.unlistenedEvents(eid) = self^{in}.unlistenedEvents(eid) \wedge pid \wedge$   
 $\forall e \in EID \bullet (self.subscribed(e) = self^{in}.subscribed(e) \wedge$   
 $(e, eid \Rightarrow self.unlistenedEvents(e) = self^{in}.unlistenedEvents(e)))$