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# OBSERVER SHARED RESOURCE

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CADT Event Manager

## OPERATIONS

**ACTION** FireEvent:  $Event\_Type[i]$   
**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:**  $EventManager =$   
 $(subscribed : Event\_Type \rightarrow Set\ of\ Process\_Type \times$   
 $unlistenedEvents : Event\_Type \rightarrow Set\ of\ Process\_Type)$

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

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

**INVARIANT:**  $unlistenedEvents \subseteq subscribed$

**INITIAL:**  $unlistenedEvents = \emptyset \wedge subscribed = \emptyset$

**PRE:** true

**CPRE:** true

**FireEvent(eid)**

**POST:**  $subscribed^{in}(eid) \neq \emptyset \Rightarrow \exists pid \in Process\_Type \bullet pid \in unlistenedEvents^{in}(eid) \wedge$   
 $unlistenedEvents = unlistenedEvent - \{(eid, pid)\}$

**PRE:** true

**Subscribe(pid,eid)**

**POST:**  $subscribed = subscribed^{in} \oplus \{(eid, pid)\}$

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

**CPRE:** true

**Unsubscribe(pid,eid)**

**POST:**  $subscribed = subscribed^{in} - \{(eid, pid)\} \wedge$   
 $unlistenedEvents = unlistenedEvents^{in} - \{(eid, pid)\}$

**PRE:** true

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

**Listen(pid,eid)**

**POST:**  $subscribed = subscribed^{in} \wedge$   
 $unlistenedEvents = unlistenedEvents^{in} - \{(eid, pid)\}$