
OBSERVER SHARED RESOURCE

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: $EventManager =$
 $(suscibers : Event_Type \rightarrow SetofProcess_Type \times$
 $unlistenedEvents : Event_Type \rightarrow SetofProcess_Type)$

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

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