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: $EventManager =$
$$(subscribed : Event\_Type \rightarrow \text{Set of} Process\_Type \times$$
$$unlistenedEvents : Event\_Type \rightarrow \text{Set of} Process\_Type)$$
    TYPE: $Process\_Type = 0..N\_PROCESSES\text{-}1$
            $Event\_Type = 0..N\_EVENTS\text{-}1$
    INVARIANT: $unlistenedEvents \subseteq subscribed$

    INITIAL: $unlistenedEvents = \emptyset \land subscribed = \emptyset$

  PRE: true
  CPRE: true
    FireEvent(eid)
  POST: $subscribed^{\text{in}}(eid)! = \emptyset \Rightarrow \exists\, pid \in Process\_Type \bullet pid \in unlistenedEvents^{\text{in}}(eid) \land$
$unlistenedEvents = unlistenedEvent - \{(eid, pid)\}$

  PRE: true
    Subscribe(pid,eid)
  POST: $subscribed = subscribed^{\text{in}} \oplus \{(eid, pid)\}$

  PRE: $pid \in subscribed(eid)$
  CPRE: true
    Unsubscribe(pid,eid)
  POST: $subscribed = subscribed^{\text{in}} - \{(eid, pid)\} \land$
        $unlistenedEvents = unlistenedEvents^{\text{in}} - \{(eid, pid)\}$

  PRE: true
  CPRE: $\exists\, e \in EID \bullet pid \in unlistenedEvents(e)$
    Listen(pid,eid)
  POST: $subscribed = subscribed^{\text{in}} \land$
        $unlistenedEvents = unlistenedEvents^{\text{in}} - \{(eid, pid)\}$