

E-State^{11,40}

EventsWithState

$$\begin{aligned}
&\equiv_{\text{def}} E:\text{Type} \\
&\quad \times (eq:\text{EqDecider}(E)) \\
&\quad \times pred?:(E \rightarrow (?E)) \\
&\quad \times info:(E \rightarrow ((:Id \times Id) + (:IdLnk \times E) \times Id)) \\
&\quad \times oaxioms:\text{EOrderAxioms}(E; pred?; info) \\
&\quad \times T:(Id \rightarrow Id \rightarrow \text{Type}) \\
&\quad \times V:(Id \rightarrow Id \rightarrow \text{Type}) \\
&\quad \times M:(IdLnk \rightarrow Id \rightarrow \text{Type}) \\
&\quad \times init:(i:Id \rightarrow \text{EState}(T(i))) \\
&\quad \times Trans:(i:Id \rightarrow k:\text{Knd} \rightarrow \text{kindcase}(k; a.V(i,a); l,t.M(l,t)) \rightarrow \text{EState}(T(i)) \rightarrow \text{EState}(T(i))) \\
&\quad \times val:(e:E \rightarrow \text{kindcase}(\text{kind}(e); a.V(\text{loc}(e),a); l,t.M(l,t))) \\
&\quad \times Send:(i:Id \rightarrow k:\text{Knd} \rightarrow \text{kindcase}(k; a.V(i,a); l,t.M(l,t)) \rightarrow (x:Id \rightarrow T(i,x)) \rightarrow \\
&\quad \quad (\text{Msg}(M) \text{ List})) \\
&\quad \times Choose:(i,a:Id \rightarrow \mathbb{N} \rightarrow (x:Id \rightarrow T(i,x)) \rightarrow (? (V(i,a)))) \\
&\quad \times time:(E \rightarrow \mathbb{Q}) \\
&\quad \times (va:\text{val-axiom}(E;V;M;info;pred?; \\
&\quad \quad \quad init;Trans; \\
&\quad \quad \quad Choose;Send;val;time) \\
&\quad \times \text{Top}))
\end{aligned}$$

clarification:

E-State{i:l}

$$\begin{aligned}
&\equiv_{\text{def}} E:\text{Type}\{i\} \\
&\quad \times (eq:\text{EqDecider}(E)) \\
&\quad \times pred?:(E \rightarrow (E + \text{Unit})) \\
&\quad \times info:(E \rightarrow ((:Id \times Id) + (:IdLnk \times E) \times Id)) \\
&\quad \times oaxioms:\text{EOrderAxioms}\{i\}(E; \\
&\quad \quad \quad pred?; \\
&\quad \quad \quad info) \\
&\quad \times T:(Id \rightarrow Id \rightarrow \text{Type}\{i\}) \\
&\quad \times V:(Id \rightarrow Id \rightarrow \text{Type}\{i\}) \\
&\quad \times M:(IdLnk \rightarrow Id \rightarrow \text{Type}\{i\}) \\
&\quad \times init:(i:Id \rightarrow \text{EState}(T(i))) \\
&\quad \times Trans:(i:Id \rightarrow k:\text{Knd} \rightarrow \text{kindcase}(k; a.V(i,a); l,t.M(l,t)) \rightarrow \text{EState}(T(i)) \rightarrow \text{EState}(T(i))) \\
&\quad \times val:(e:E \rightarrow \text{kindcase}(\text{kind}(info;e); a.V(\text{loc}(info;e),a); l,t.M(l,t))) \\
&\quad \times Send:(i:Id \rightarrow k:\text{Knd} \rightarrow \text{kindcase}(k; a.V(i,a); l,t.M(l,t)) \rightarrow (x:Id \rightarrow T(i,x)) \rightarrow \\
&\quad \quad (\text{Msg}(M) \text{ List})) \\
&\quad \times Choose:(i:Id \rightarrow a:Id \rightarrow \mathbb{N} \rightarrow (x:Id \rightarrow T(i,x)) \rightarrow ((V(i,a)) + \text{Unit})) \\
&\quad \times time:(E \rightarrow \mathbb{Q}) \\
&\quad \times (va:\text{val-axiom}(E;V;M;info;pred?;
\end{aligned}$$

init;Trans;
Choose;Send;val;time)
 $\times \text{Top}))$