

es-simul^{11,40}

$$\begin{aligned}
& e:s.P(s)@j \\
& \equiv_{\text{def}} (\forall x:\text{Id}. \text{vartype}(j;x) \subseteq_r ds(x)?\text{Top}) \\
& \quad c \wedge (\forall e'@j. (e' < e) \Rightarrow (P(\text{state after } e') \vee (\exists e'':\text{E}. ((e' <_{\text{loc}} e'') \ \& \ (e' < e)))) \\
& \quad \ \& \ \forall e'@j. (e < e') \Rightarrow (P((\text{state when } e')) \vee (\exists e'':\text{E}. ((e'' <_{\text{loc}} e') \ \& \ (e < e')))))
\end{aligned}$$

clarification:

$$\begin{aligned}
& \text{es-simul}(es;e;j;ds;s.P(s)) \\
& \equiv_{\text{def}} (\forall x:\text{Id}. \text{es-vartype}(es; j; x) \subseteq_r \text{fpf-cap}(ds;\text{IdDeq};x;\text{Top})) \\
& \quad c \wedge (\text{alle-at}(es;j;e'.\text{es-causl}(es; e'; e) \\
& \quad \Rightarrow (P(\text{es-state-after}(es;e')) \\
& \quad \vee (\exists e'':\text{es-E}(es). (\text{es-locl}(es; e'; e'') \ \& \ \text{es-causl}(es; e'; e)))))) \\
& \quad \& \ \text{alle-at}(es;j;e'.\text{es-causl}(es; e; e') \\
& \quad \Rightarrow (P(\text{es-state-when}(es;e')) \\
& \quad \vee (\exists e'':\text{es-E}(es). (\text{es-locl}(es; e''; e') \ \& \ \text{es-causl}(es; e; e'))))))
\end{aligned}$$