

es-kind-sends-iff^{0,22}

state ds

$k:A$ sends $[tg, e.f(e):B]$ on l

$$\begin{aligned}
&\equiv_{\text{def}} (\forall e:\mathbb{E}. \text{kind}(e) = \text{rcv}(l, tg) \Rightarrow \text{valtype}(e) \subseteq \rho B) \\
&\quad \& (\forall x:\text{Id}. \text{vartype}(\text{source}(l); x) \subseteq \rho ds(x)?\text{Top}) \\
&\quad \& (\forall e:\mathbb{E}. \text{kind}(e) = k \Rightarrow \text{loc}(e) = \text{source}(l) \Rightarrow \text{valtype}(e) \subseteq \rho A) \\
&\quad \& \forall e@\text{source}(l). \\
&\quad \quad \text{kind}(e) = k \Rightarrow \text{isl}(f(e)) \Rightarrow (\exists e':\mathbb{E}. \text{kind}(e') = \text{rcv}(l, tg) \& \text{sender}(e') = e) \\
&\quad \quad \& (\forall e':\mathbb{E}. \\
&\quad \quad \quad \text{kind}(e') = \text{rcv}(l, tg) \\
&\quad \quad \quad \Rightarrow \text{kind}(\text{sender}(e')) = k \& \text{isl}(f(\text{sender}(e'))) \& \text{val}(e') = \text{outl}(f(\text{sender}(e')))) \\
&\quad \quad \& (\forall e':\mathbb{E}. \\
&\quad \quad \quad \text{kind}(e') = \text{rcv}(l, tg) \\
&\quad \quad \quad \Rightarrow (\forall e'':\mathbb{E}. \text{kind}(e'') = \text{rcv}(l, tg) \Rightarrow \text{sender}(e'') = \text{sender}(e') \Rightarrow e'' = e'))
\end{aligned}$$

clarification:

es-kind-sends-iff($es; k; A; l; tg; B; ds; e.f(e)$)

$$\begin{aligned}
&\equiv_{\text{def}} (\forall e:\text{es-E}(es). \text{es-kind}(es; e) = \text{rcv}(l, tg) \in \text{Knd} \Rightarrow \text{es-valtype}(es; e) \subseteq \rho B) \\
&\quad \& (\forall x:\text{Id}. \text{es-vartype}(es; \text{source}(l); x) \subseteq \rho \text{fpf-cap}(ds; \text{IdDeq}; x; \text{Top})) \\
&\quad \& (\forall e:\text{es-E}(es). \\
&\quad \quad \text{es-kind}(es; e) = k \in \text{Knd} \\
&\quad \quad \Rightarrow \text{es-loc}(es; e) = \text{source}(l) \in \text{Id} \\
&\quad \quad \Rightarrow \text{es-valtype}(es; e) \subseteq \rho A) \\
&\quad \& \text{alle-at}(es; \text{source}(l); e. \text{es-kind}(es; e) = k \in \text{Knd} \\
&\quad \quad \Rightarrow \text{isl}(f(e)) \\
&\quad \quad \Rightarrow (\exists e':\text{es-E}(es). \\
&\quad \quad \quad \text{es-kind}(es; e') = \text{rcv}(l, tg) \in \text{Knd} \\
&\quad \quad \quad \& \text{es-sender}(es; e') = e \in \text{es-E}(es))) \\
&\quad \& (\forall e':\text{es-E}(es). \\
&\quad \quad \text{es-kind}(es; e') = \text{rcv}(l, tg) \in \text{Knd} \\
&\quad \quad \Rightarrow \text{es-kind}(es; \text{es-sender}(es; e')) = k \in \text{Knd} \\
&\quad \quad \quad \& \text{isl}(f(\text{es-sender}(es; e'))) \\
&\quad \quad \quad \& \text{es-val}(es; e') = \text{outl}(f(\text{es-sender}(es; e'))) \in B) \\
&\quad \& (\forall e':\text{es-E}(es). \\
&\quad \quad \text{es-kind}(es; e') = \text{rcv}(l, tg) \in \text{Knd} \\
&\quad \quad \Rightarrow (\forall e'':\text{es-E}(es). \\
&\quad \quad \quad \text{es-kind}(es; e'') = \text{rcv}(l, tg) \in \text{Knd} \\
&\quad \quad \quad \Rightarrow \text{es-sender}(es; e'') = \text{es-sender}(es; e') \in \text{es-E}(es) \\
&\quad \quad \quad \Rightarrow e'' = e' \in \text{es-E}(es)))
\end{aligned}$$