

## weak-precond-send-p<sup>0,22</sup>

$$\begin{aligned}
& \text{weak-precond-send-p}(es;T;A;l;tg;a;ds;P;f) \\
\equiv_{\text{def}} & (\forall x:\text{Id}. \text{vartype}(\text{source}(l);x) \subseteq \rho \text{ ds}(x)?\text{Top}) \\
& \& \forall e@\text{source}(l). \text{kind}(e) = \text{locl}(a) \Rightarrow \text{valtype}(e) \subseteq \rho A \\
& \& (\forall e:\text{E}. \text{kind}(e) = \text{rcv}(l,tg) \Rightarrow \text{valtype}(e) \subseteq \rho T) \\
& \& (\forall e':\text{E}. \\
& \quad \text{kind}(e') = \text{rcv}(l,tg) \\
& \quad \Rightarrow \text{kind}(\text{sender}(e')) = \text{locl}(a) \\
& \quad \quad \& P((\text{state when sender}(e')), \text{val}(\text{sender}(e'))) \\
& \quad \quad \quad \& \text{val}(e') = f((\text{state when sender}(e')), \text{val}(\text{sender}(e')))) \\
& \& \forall e@\text{source}(l). \\
& \quad \exists e':\text{E}. \\
& \quad e \text{ c} \leq e' \\
& \quad \& \text{kind}(e') = \text{rcv}(l,tg) \& e \leq \text{sender}(e') \\
& \quad \quad \vee \text{loc}(e') = \text{source}(l) \& (\forall v:A. \neg P(\text{state after } e',v))
\end{aligned}$$

*clarification:*

$$\begin{aligned}
& \text{weak-precond-send-p}(es;T;A;l;tg;a;ds;P;f) \\
\equiv_{\text{def}} & (\forall x:\text{Id}. \text{es-vartype}(es; \text{source}(l); x) \subseteq \rho \text{ fpf-cap}(ds;\text{IdDeq};x;\text{Top})) \\
& \& \text{alle-at}(es;\text{source}(l);e.\text{es-kind}(es; e) = \text{locl}(a) \in \text{Knd} \Rightarrow \text{es-valtype}(es; e) \subseteq \rho A) \\
& \& (\forall e:\text{es-E}(es). \text{es-kind}(es; e) = \text{rcv}(l,tg) \in \text{Knd} \Rightarrow \text{es-valtype}(es; e) \subseteq \rho T) \\
& \& (\forall e':\text{es-E}(es). \\
& \quad \text{es-kind}(es; e') = \text{rcv}(l,tg) \in \text{Knd} \\
& \quad \Rightarrow \text{es-kind}(es; \text{es-sender}(es; e')) = \text{locl}(a) \in \text{Knd} \\
& \quad \quad \& P(\text{es-state-when}(es;\text{es-sender}(es; e')), \text{es-val}(es; \text{es-sender}(es; e'))) \\
& \quad \quad \quad \& \text{es-val}(es; e') \\
& \quad \quad \quad = \\
& \quad \quad \quad f(\text{es-state-when}(es;\text{es-sender}(es; e')), \text{es-val}(es; \text{es-sender}(es; e'))) \\
& \quad \quad \quad \in T) \\
& \& \text{alle-at}(es;\text{source}(l);e.\exists e':\text{es-E}(es). \\
& \quad \text{es-causle}(es;e;e') \\
& \quad \& \text{es-kind}(es; e') = \text{rcv}(l,tg) \in \text{Knd} \& \text{es-le}(es;e;\text{es-sender}(es; e')) \\
& \quad \quad \vee \text{es-loc}(es; e') = \text{source}(l) \in \text{Id} \& (\forall v:A. \neg P(\text{es-state-after}(es;e',v)))
\end{aligned}$$