

## es\_realizer-induction<sup>0,22</sup>

$\forall P_1:(\text{es\_realizer}\{i:l\} \rightarrow \text{Prop}_i)$ .

$P_1(\cdot)$

$\Rightarrow (\forall \text{left}, \text{right}:\text{es\_realizer}\{i:l\}. P_1(\text{left}) \Rightarrow P_1(\text{right}) \Rightarrow P_1(\text{left} \oplus \text{right}))$

$\Rightarrow (\forall \text{loc}:\text{Id}, T:\text{Type}_i, x:\text{Id}, v:T. P_1(@\text{loc } x \text{ initially } v:T))$

$\Rightarrow (\forall \text{loc}:\text{Id}, T:\text{Type}_i, x:\text{Id}, L:\text{Knd List}. P_1(@\text{loc} \text{ only events in } L \text{ change } x:T))$

$\Rightarrow (\forall \text{lnk}:\text{IdLnk}, \text{tag}:\text{Id}, L:\text{Knd List}. P_1(\text{only events in } L \text{ send on } \text{lnk} \text{ with } \text{tag}))$

$\Rightarrow (\forall \text{loc}:\text{Id}, ds:x:\text{Id fp} \rightarrow \text{Type}_i, \text{knd}:\text{Knd}, T:\text{Type}_i, x:\text{Id},$

$f:(\text{State}(ds) \rightarrow T \rightarrow \text{decl-type}\{i:l\}$

$(ds; x)).$

$P_1(@\text{loc} \text{ effect } \text{knd}(v:T) x := f \text{ State}(ds) v))$

$\Rightarrow (\forall ds:x:\text{Id fp} \rightarrow \text{Type}_i, \text{knd}:\text{Knd}, T:\text{Type}_i, l:\text{IdLnk}, dt:x:\text{Id fp} \rightarrow \text{Type}_i,$

$g:(\text{tg}:\text{Id} \times (\text{State}(ds) \rightarrow T \rightarrow (\text{decl-type}\{i:l\}(dt; \text{tg}) \text{ List}))) \text{ List}.$

$P_1(\text{sends } \text{knd}(v:T) \text{ on } l:\text{tagged}(g, \text{State}(ds), v):dt))$

$\Rightarrow (\forall \text{loc}:\text{Id}, ds:x:\text{Id fp} \rightarrow \text{Type}_i, a:\text{Id}, T:\text{Type}_i, P:(\text{State}(ds) \rightarrow T \rightarrow \text{Prop}_i).$

$P_1(@\text{loc} \text{ precondition for } a(v:T):P \text{ State}(ds) v))$

$\Rightarrow (\forall \text{loc}:\text{Id}, k:\text{Knd}, L:\text{Id List}. P_1(@\text{loc}: k \text{ writes only members of } L))$

$\Rightarrow (\forall \text{loc}:\text{Id}, k:\text{Knd}, L:\text{IdLnk List}. P_1(@\text{loc}: k \text{ sends only on links in } L))$

$\Rightarrow (\forall \text{loc}, x:\text{Id}, L:\text{Knd List}. P_1(@\text{loc}: \text{only members of } L \text{ read } x))$

$\Rightarrow \{\forall x_1:\text{es\_realizer}\{i:l\}. P_1(x_1)\}$