

es-independent^{11,40}

$$\begin{aligned} & \text{es-independent}(es; i; k; x) \\ \equiv_{\text{def}} & \forall s_1, s_2: \text{es_state}(es; i). \\ & \text{es-x-equiv}(es; i; x; s_1; s_2) \\ \Rightarrow & ((\forall v: \text{es-kindtype}(es; i; k). \\ & \text{es-x-equiv}(es; i; x; (\text{es-trans}(es; i)(k, v, s_1)); (\text{es-trans}(es; i)(k, v, s_2)))) \\ & \wedge (\text{es-send}(es; i)(k, v, \text{es-read-state}(s_1)) = \text{es-send}(es; i)(k, v, \text{es-read-state}(s_2)))) \\ & \wedge ((\uparrow \text{islocal}(k)) \\ \Rightarrow & (\forall n: \mathbb{N}. \\ & \text{es-choose}(es; i)(\text{act}(k), n, \text{es-read-state}(s_1)) \\ = & \\ & \text{es-choose}(es; i)(\text{act}(k), n, \text{es-read-state}(s_2)))))) \end{aligned}$$

clarification:

$$\begin{aligned} & \text{es-independent}(es; i; k; x) \\ \equiv_{\text{def}} & \forall s_1: \text{es_state}(es; i), s_2: \text{es_state}(es; i). \\ & \text{es-x-equiv}(es; i; x; s_1; s_2) \\ \Rightarrow & ((\forall v: \text{es-kindtype}(es; i; k). \\ & \text{es-x-equiv}(es; i; x; (\text{es-trans}(es; i)(k, v, s_1)); (\text{es-trans}(es; i)(k, v, s_2)))) \\ & \wedge (\text{es-send}(es; i)(k, v, \text{es-read-state}(s_1)) \\ = & \\ & \text{es-send}(es; i)(k, v, \text{es-read-state}(s_2)) \\ \in & (\text{es-Msg}(es) \text{ List})) \\ \wedge & ((\uparrow \text{islocal}(k)) \\ \Rightarrow & (\forall n: \mathbb{N}. \\ & \text{es-choose}(es; i)(\text{act}(k), n, \text{es-read-state}(s_1)) \\ = & \\ & \text{es-choose}(es; i)(\text{act}(k), n, \text{es-read-state}(s_2)) \\ \in & (\text{es-kindtype}(es; i; k) + \text{Unit})))) \end{aligned}$$