

causal-order-preserving-interleaving^{11,40}

$\forall es:\mathbb{E}\mathbb{S}, Ack, Req:(\mathbb{E}\rightarrow\mathbb{P}), f:(\{e:\mathbb{E}\mid Ack(e)\}\rightarrow\{e:\mathbb{E}\mid Req(e)\})$.

$e.f(e)$ is $c<$ preserving on $e.Ack(e)$

$\Rightarrow (\forall e, e':\{e:\mathbb{E}\mid Ack(e)\} . (\neg e' c\leq e) \Rightarrow (e < e'))$

$\Rightarrow (\forall e, e':\{e:\mathbb{E}\mid Req(e)\} . (\neg e' c\leq e) \Rightarrow (e < e'))$

$\Rightarrow (\forall e, e':\{e:\mathbb{E}\mid Req(e)\} . (e < e') \Rightarrow (\exists a:\{e:\mathbb{E}\mid Ack(e)\} . ((e < a) \& (a < e'))))$

$\Rightarrow (\forall e:\mathbb{E}. Req(e) \Rightarrow (\forall a:\mathbb{E}. Ack(a) \Rightarrow e c\leq a \Rightarrow e c\leq f(a)))$