Definition (loop). Suppose $\mathbf{f}$ is a DPI with factored functionality space $\mathbf{F}_1 \times \mathbf{R}$:

$$\mathbf{f} = \langle \mathbf{F}_1 \times \mathbf{R}, \mathbf{R}, \mathbf{I}, \langle \mathtt{prov}_1, \mathtt{prov}_2 \rangle, \mathtt{req} \rangle .$$

Then we can define the DPI $\mathsf{loop}(\mathbf{f})$ as

$$\mathsf{loop}(\mathbf{f}) := \langle \mathbf{F}_1, \mathbf{R}, \mathbf{I}', \mathtt{prov}_1, \mathtt{req} \rangle ,$$

where $\mathbf{I}' \subseteq \mathbf{I}$ limits the implementations to those that respect the additional constraint $\mathtt{req}(i) \preceq \mathtt{prov}_2(i)$:

$$\mathbf{I}' = \{ i \in \mathbf{I} : \mathtt{req}(i) \preceq \mathtt{prov}_2(i) \}.$$

This is equivalent to "closing a loop" around $\mathbf{f}$ with the constraint $f_2 \succeq r$ (**??**).