Definition (loop). Suppose dp is a DPI with factored functionality space $F_1 \times R$:

$$\mathsf{dp} = \langle F_1 \times R, R, I, \langle \mathsf{prov}_1, \mathsf{prov}_2 \rangle, \mathsf{req} \rangle .$$

Then we can define the DPI loop(dp) as

$$\mathsf{loop}(\mathsf{dp}) := \langle F_1, R, I', \mathsf{prov}_1, \mathsf{req} \rangle ,$$

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

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

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