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

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

Then we can define the DPI loop(dp) as

$$\text{loop(dp)} \doteq \langle F_1, R, I', \text{prov}_1, \text{req} \rangle,$$

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

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

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