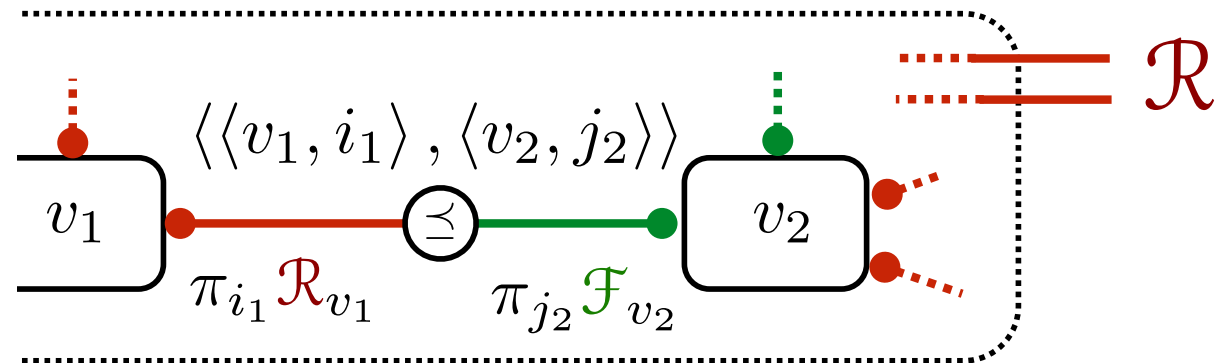


**Definition** (Co-design problem with implementation). A *Co-Design Problem with Implementation* (CDPI) is a tuple  $\langle \mathbf{F}, \mathbf{R}, \langle \mathcal{V}, \mathcal{E} \rangle \rangle$ , where  $\mathbf{F}$  and  $\mathbf{R}$  are two posets, and  $\langle \mathcal{V}, \mathcal{E} \rangle$  is a multigraph of DPIs. Each node  $v \in \mathcal{V}$  is a DPI  $v = \langle \mathbf{F}_v, \mathbf{R}_v, \mathbf{I}_v, \text{prov}_v, \text{req}_v \rangle$ . An edge  $e \in \mathcal{E}$  is a tuple  $e = \langle \langle v_1, i_1 \rangle, \langle v_2, j_2 \rangle \rangle$ , where  $v_1, v_2 \in \mathcal{V}$  are two nodes and  $i_1$  and  $j_2$  are the indices of the components of the functionality and resources to be connected, and it holds that  $\pi_{i_1} \mathbf{R}_{v_1} = \pi_{j_2} \mathbf{F}_{v_2}$  (??).



**Figure 0.1:**

redo in tikz