

Definition (DPI composition)

The series composition of two DPIs

$$\mathbf{d}_1 = \langle \mathbf{F}_1, \mathbf{R}_1, \mathbf{I}_1, \text{prov}_1, \text{req}_1 \rangle,$$

$$\mathbf{d}_2 = \langle \mathbf{F}_2, \mathbf{R}_2, \mathbf{I}_2, \text{prov}_2, \text{req}_2 \rangle,$$

for which $\mathbf{F}_2 = \mathbf{R}_1$, is defined as

$$(\mathbf{d}_1 \circ \mathbf{d}_2) := \langle \mathbf{F}_1, \mathbf{R}_2, \mathbf{I}, \text{prov}, \text{req} \rangle,$$

where:

$$\mathbf{I} = \{ \langle i_1, i_2 \rangle \in (\mathbf{I}_1, \mathbf{I}_2) \mid \text{req}_1(i_1) \leq_{\mathbf{R}_1} \text{prov}_2(i_2) \},$$

$$\text{prov} : \langle i_1, i_2 \rangle \mapsto \text{prov}_1(i_1),$$

$$\text{req} : \langle i_1, i_2 \rangle \mapsto \text{req}_2(i_2).$$