

PC Model

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1 Functions

- Routing function: f
- Set of \forall routing functions: \mathcal{F}
- Packet match fields read by f : $\langle m_1, \dots, m_n \rangle$
- Set of \forall packet match fields read by f : \mathcal{M}
- Subset of \mathcal{M} : M_i
- Values of packet match fields M_i in a call to f : $v_i(M_i)$
- Domain of valid packet match field values of M : $dom(M_i)$
- Set of \forall routing actions: \mathcal{R}

$$f : dom(\mathcal{M}) \rightarrow \mathcal{R} \tag{1}$$

2 Pipelines

- Pipeline: p
- Set of \forall pipelines: \mathcal{P}
- p is a singly rooted dag of tables t_i *s.t.* an edge (t_i, t_j) , indicates control flow may pass from t_i to t_j .

- We assume the set of packet match fields p reads is the same as the set f reads, and carry terminology over (*e.g.* \mathcal{M} , M_i , $\text{dom}(M_i)$).
- We denote ‘ f is embeddable into p ’ as: $f \Rightarrow p$.

3 Tables

3.1 Table outputs

- A t_i ’s outputs may be some combination of:
 - Pipeline egress actions
 - Writes to t_i ’s output register, $r(t_i)$
 - Transfer of control to a subsequent table t_j
- Register $r(t_i)$ has size $|r(t_i)|$.
- If t_i may output to a pipeline egress, we say t_i is an egress table.

3.2 Table inputs

- A t_j ’s inputs $I(t_j)$ may be some combination of:
 - Packet match fields read by p , $m_i \in \mathcal{M}$
 - A t_i ’s output register $r(t_i)$

3.3 Table rules

- The maximum number of rules a t_i can contain is: $\text{maxrules}(t_i)$