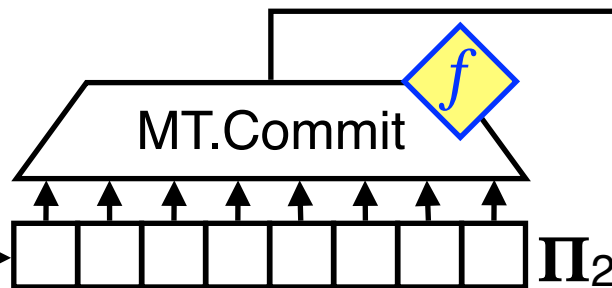
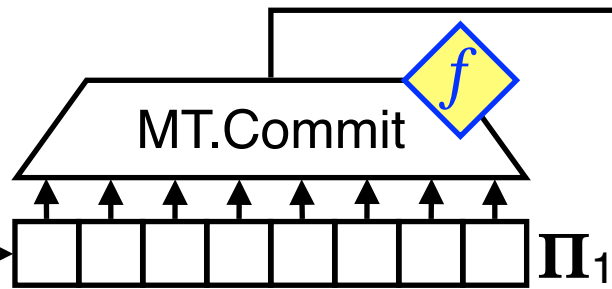
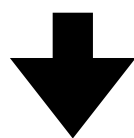
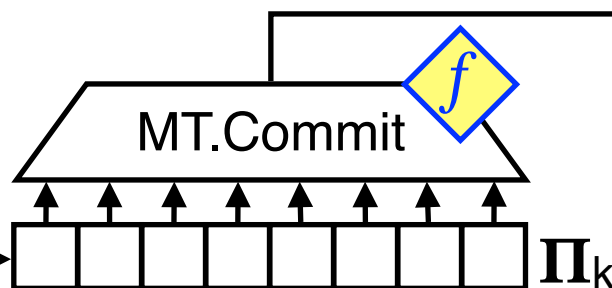


$\mathcal{P}(\mathbb{X}, \mathbb{W})$ 
 $\mathbf{P}_{\text{IOP}}(\mathbb{X}, \mathbb{W})$ 

 $\vdots$ 


IOP verifier queries:  $(Q_1, \dots, Q_k)$   
 IOP oracle answers:  $(\mathbf{a}_1, \dots, \mathbf{a}_k)$   
 MT proofs:  $(\text{pf}_1, \dots, \text{pf}_k)$

 $rt_1$ 
 $\rho_1$ 
 $rt_2$ 
 $\rho_2$ 
 $\vdots$ 
 $rt_k$ 
 $\rho_k$ 
 $((Q_i, \mathbf{a}_i, \text{pf}_i))_{i \in [k]}$ 
 $\mathcal{V}(\mathbb{X})$ 

- sample IOP randomness  $\rho_1$

- sample IOP randomness  $\rho_2$

 $\vdots$ 

- sample IOP randomness  $\rho_k$

- check MT proofs

 $\bigwedge_{i \in [k]} \text{MT.Check} \diamond_f (rt_i, Q_i, \mathbf{a}_i, \text{pf}_i)$ 

- check IOP decision

 $\mathbf{V}_{\text{IOP}}^{[Q_i, \mathbf{a}_i]_{i \in [k]}}(\mathbb{X}, (\rho_1, \dots, \rho_k))$