

EXTENDS *TwoPhase**IndAuto* \triangleq

$$\begin{aligned}
& \wedge TCConsistent \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee ([type \mapsto \text{"Commit"}] \in msgs) \\
& \quad \vee \neg(rmState[rmi] = \text{"committed"}) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee (tmPrepared = tmPrepared \cup \{rmi\}) \\
& \quad \vee \neg([type \mapsto \text{"Commit"}] \in msgs) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee \neg([type \mapsto \text{"Commit"}] \in msgs) \\
& \quad \vee \neg(rmState[rmj] = \text{"working"}) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee ([type \mapsto \text{"Prepared"}, rm \mapsto rmi] \in msgs) \\
& \quad \vee \neg([type \mapsto \text{"Commit"}] \in msgs) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee ([type \mapsto \text{"Prepared"}, rm \mapsto rmi] \in msgs) \\
& \quad \vee \neg(tmPrepared = tmPrepared \cup \{rmi\}) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee (rmState[rmj] = \text{"committed"}) \vee (rmState[rmj] = \text{"prepared"}) \\
& \quad \vee \neg([type \mapsto \text{"Commit"}] \in msgs) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee \neg([type \mapsto \text{"Abort"}] \in msgs) \\
& \quad \vee \neg([type \mapsto \text{"Commit"}] \in msgs) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee \neg([type \mapsto \text{"Abort"}] \in msgs) \\
& \quad \vee \neg(tmState = \text{"init"}) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee \neg([type \mapsto \text{"Commit"}] \in msgs) \\
& \quad \vee \neg(tmState = \text{"init"}) \\
& \wedge \forall rmi \in RM : \forall rmj \in RM : \\
& \quad \vee (rmState[rmj] = \text{"prepared"}) \\
& \quad \vee \neg([type \mapsto \text{"Prepared"}, rm \mapsto rmj] \in msgs) \\
& \quad \vee \neg(tmState = \text{"init"})
\end{aligned}$$