Inference Rules

1. Frequently used inference rules:

$$\overline{F, \Gamma \vdash F}$$

$$\frac{\Gamma \vdash F_1 \Rightarrow F_2 \quad \Gamma \vdash F_1}{\Gamma \vdash F_2} \qquad \frac{F_1, \Gamma \vdash F_2}{\Gamma \vdash F_1 \Rightarrow F_2}$$

$$\frac{\Gamma \vdash F}{\Gamma \vdash P \text{ says } F} \qquad \frac{\Gamma \vdash P \text{ controls } F \quad \Gamma \vdash P \text{ says } F}{\Gamma \vdash F} \; \star$$

$$\frac{\Gamma \vdash P \text{ says } (F_1 \Rightarrow F_2) \quad \Gamma \vdash P \text{ says } F_1}{\Gamma \vdash P \text{ says } F_2}$$

$$\frac{\Gamma \vdash \forall x.F}{\Gamma \vdash F[x := t]}$$

$$\frac{\Gamma \vdash F_1 \quad \Gamma \vdash F_2}{\Gamma \vdash F_1 \wedge F_2} \qquad \frac{\Gamma \vdash F_1 \wedge F_2}{\Gamma \vdash F_1} \qquad \frac{\Gamma \vdash F_1 \wedge F_2}{\Gamma \vdash F_2}$$

$$\frac{\Gamma \vdash P \mapsto Q \quad \Gamma \vdash P \text{ says } F}{\Gamma \vdash Q \text{ says } F} \; \star$$

2. Less frequently used inference rules:

$$\frac{\Gamma \vdash slev(P) = l_1 \quad \Gamma \vdash slev(Q) = l_2 \quad \Gamma \vdash l_1 < l_2}{\Gamma \vdash slev(P) < slev(Q)}$$

$$\frac{\Gamma \vdash slev(P) = l \quad \Gamma \vdash slev(Q) = l}{\Gamma \vdash slev(P) = slev(Q)}$$

$$\frac{\Gamma \vdash l_1 < l_2 \quad \Gamma \vdash l_2 < l_3}{\Gamma \vdash l_1 < l_3}$$

$$\frac{\Gamma \vdash P \mapsto Q \quad \Gamma \vdash Q \mapsto R}{\Gamma \vdash P \mapsto R} \; \star$$

$$\frac{\Gamma \vdash F_1}{\Gamma \vdash F_1 \vee F_2} \qquad \frac{\Gamma \vdash F_2}{\Gamma \vdash F_1 \vee F_2} \qquad \frac{\Gamma \vdash F_1 \vee F_2 \quad F_1, \Gamma \vdash F_3 \quad F_2, \Gamma \vdash F_3}{\Gamma \vdash F_3}$$

$$\frac{\Gamma \vdash F[x := c]}{\Gamma \vdash \forall x.F} \; c \text{ must be a fresh variable}$$

$$\overline{\Gamma \vdash true}$$

$$\frac{\Gamma \vdash P \mapsto Q \quad \Gamma \vdash Q \text{ controls} F}{\Gamma \vdash P \text{ controls } F} \; \star$$

$\star$ derived rules