Task: put the black bowl in the bottom drawer of the cabinet and close it (b) **QAT SQIL** QAT **SQIL** (a) [Pick up the black bowl:  $\pi^{PTQ}(X)$ ,  $\pi^{QAT}(A)$ ,  $\pi^{SQIL}(A)$ ] [Move to the black bowl]  $t_2$ PTQ —QAT —SQIL Bit-width Success Rate (%)  $73.8 \pm 0.7$ FP PTO  $70.7 \pm 0.5$ INT4 QAT  $71.6 \pm 0.6$ **SQIL**  $73.2 \pm 0.6$ (d) LIBERO Benchmark (c) 40 50 60 80 90 100 130 140 30 110 120 150 Time step **SQIL SQII** (f) (e) [Put the bowl in the drawer:  $\pi^{PTQ}(\mathbf{x})$ ,  $\pi^{QAT}(\mathbf{x})$ ,  $\pi^{SQIL}(\mathbf{x})$ ] [Close the drawer:  $\pi^{PTQ}(\mathbf{X})$ ,  $\pi^{QAT}(\mathbf{X})$ ,  $\pi^{SQIL}(\mathbf{X})$ ]