Abbreviations
~X_1 = (Auth2(h(~M_1),a_1,a_2,spk(a_3)),sign(Auth3(Auth2(h(~M_1),a_1,a_2,spk(a_3)),hash(Client1(~M_1,~M_2))),a_3),Client1(~M_1,~M_2)) = (Auth2(h(rpid_4),a_1,a_2,spk(a_3)),sign(Auth3(Auth2(h(rpid_4),a_1,a_2,spk(a_3)),hash(Client1(rpid_4,challenge_3))),a_3),Client1(rpid_4,challenge_3))

A trace has been found.