We interpret the purely spectral forward Maxwell equation with up to third-order induced polarizations for pulse propagation and interactions in quadratic nonlinear crystals. The interpreted equation, also named the nonlinear wave equation in the frequency domain, includes quadratic and cubic nonlinearities, delayed Raman effects, and anisotropic nonlinearities. The full potential of this wave equation is demonstrated by investigating simulations of solitons generated in the process of ultrafast cascaded second-harmonic generation. We show that a balance in the soliton delay can be achieved due to competition between self-steepening, Raman effects, and self-steepening-like effects from cascading originating in the group-velocity mismatch between the pump and the second harmonic. We analyze the first-order contributions, and show that this balance can be broken to create fast or slow pulses. Through further simulations we demonstrate few-cycle compressed solitons in extremely short crystals, where spectral phenomena, such as blue/red shifting, nonstationary radiation in accordance with the nonlocal phase-matching condition, and dispersive-wave generation are observed and marked, which helps improve the experimental knowledge of cascading nonlinear soliton pulse compression.