Logarithmic Relaxation in Supercooled Liquids JACOB EAPEN, North Carolina State University — Slowly relaxing materials are classified as either strong or fragile with the latter displaying a pronounced non-linear variation in viscosity with temperature. While viscosities are easily measured in an experiment, the attendant relaxations of stresses are not easily accessible. This paper describes a Molecular Dynamics (MD) investigation of the stress relaxations in a supercooled system. The stress correlator in the model fragile system portrays three characteristic variations as a function of temperature with three identifiable cross-over temperatures – $T_o$, $T_x$ and $T_c$. The stress correlator transitions from a power law behavior at high temperatures to an incipient logarithmic variation at a cross-over temperature $T_o$. Upon decreasing the temperature, the logarithmic relaxation grows in time and finally breaks down at a second cross-over temperature $T_x$. In the temperature range between $T_o$ and $T_x$, the stress correlator relaxes logarithmically through a dynamically homogeneous crowding mechanism. $T_x$ marks the transition from a logarithmic to a stretched exponential relaxation which coincides with the emergence of dynamical heterogeneity characterized by relatively fast relaxations through strings and small cluster movements.