Interaction between surfaces with ionizable sites STEPHEN BARR, ATHANASSIOS PANAGIOTOPOULOS, Chemical and Biological Engineering, Princeton University — A key factor controlling the interaction between surfaces in aqueous solutions is the surface charge density. Surfaces typically become charged though a titration process where surface groups can become ionized based on their dissociation constant and the pH of the solution. In this work we use a Monte Carlo method to treat this process explicitly in a system with two planar surfaces in a salt solution. We find that the surface charge density changes as the surfaces come close to contact due to interactions between the ionizable groups on each surface. In addition, we observe an attraction between the surfaces above a threshold surface charge, in good agreement with previous theoretical predictions based on uniformly charged surfaces. However, close to contact we find the force is significantly different than the uniformly charged case. We also explore the role of salt concentration and the density of the ionizable sites.