Generalized presentations of groups, in particular of $\mathrm{Aut}(F_\omega)$

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We introduce generalized presentations of groups. Roughly speaking, a generalized presentation of a group G consists of a generalized free group $\mathcal{F}$ (which is a certain subgroup of a big free group $\mathrm{BF}(\Lambda)$) and of a subset R of $\mathcal{F}$ such that G is isomorphic to $\mathcal{F}/\overline{\langle\langle R\rangle\rangle}$, where $\overline{\langle\langle R\rangle\rangle}$ is the closure of $\langle\langle R\rangle\rangle$ with respect to an appropriate topology on $\mathcal{F}$.
We give a generalized presentation of $\mathrm{Aut}(F_\omega)$, the automorphism group of the free group of infinite countable rank. This generalized presentation is countable, although the group itself is uncountable.