

Total boundedness in metrizable spaces

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We show that a metric space  $(X, d)$  is separable if and only if

the bornology of its  $d$ -bounded subsets agrees with the bornology of  $\rho$ -totally bounded subsets with respect to some equivalent metric  $\rho$ . We also show that the bornology of  $d$ -totally bounded subsets agrees with the bornology of  $\rho$ -bounded subsets with respect to some equivalent metric if and only if the former bornology has a countable cofinal family. Finally, we characterize those bornologies on a metrizable space that are bornologies of totally bounded sets for some metric compatible with the topology.