This paper aims at a better understanding of controllability and observability properties of heterogeneous networks of linear systems. It extends prior work by Hara et al. [2009], who characterized controllability for homogeneous networks of identical linear SISO systems. Our approach is based on extending the classical notion of strict system equivalence to networks of linear systems. We survey and extend known characterizations for controllability and observability for arbitrary interconnected linear MIMO systems. Both static and dynamic interconnection laws are considered and various applications to classes of homogeneous and heterogeneous networks are derived.

Key words: Networks, linear systems, system equivalence, controllability, observability, interconnections.