Given $(a_1, a_2, \ldots)$ and $(b_1, b_2, \ldots)$ of real numbers with $a_i > 0$ $\forall$ i define $h: \mathbb{R}^\infty \to \mathbb{R}^\infty$ by:

$$h((x_1, x_2, \ldots)) = (a_1x_1 + b_1, a_2x_2 + b_2, \ldots)$$

Show that if $\mathbb{R}^\omega$ is given the product topo it is a homeomorphism.

~~The~~ h_i is continuous for all i so h is continuous in the product topology

$$h^{-1}((x_1, x_2, \ldots)) = \left(\frac{x_1 - b_1}{a_1}, \frac{x_2 - b_2}{a_2}, \ldots\right)$$

Since $a_i > 0$ h^{-1} is well defined and continuous thus h is a homeomorphism.