Theta Graphs are Hall t-chromatic

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A graph satisfies *Hall's t-condition* on κ, G if for each subgraph H of G

$$\sum_{\sigma=1}^{t} \alpha\big(H(\sigma, L)\big) = t\alpha(H) \geq \sum_{v \in V(H)} \kappa(v)$$

A graph G is said to be *Hall t-chromatic* if the only color demands κ for which there does not exist a proper (t, κ) coloring of G are those that fail Hall's t-condition. A *theta graph* is a union of $m \geq 3$ internally disjoint paths, with the same end vertices. We show that every theta graph is Hall t-chromatic for all non-negative integers t.

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