We will assume that the flow f is integer-valued. Let $e^* = (v, w)$. If the edge e^* is not saturated with flow, then reducing its capacity by one unit does not cause a problem. So assume it is saturated.

We first reduce the flow on e^* to satisfy the capacity conditions. We now have to restore the capacity conditions. We construct a path from w to t such that all edges carry flow, and we reduce the flow by one unit on each of these edges. We then do the same thing from v back to s. Note that because the flow f is acyclic, we do not encounter any edge twice in this process, so all edges we traverse have their flow reduced by exactly one unit, and the capacity condition is restored.

Let f' be the current flow. We have to decide whether f' is a maximum flow, or whether the flow value can be increased. Since f was a maximum flow, and the value of f' is only one unit less than f, we attempt to find a single augmenting path from s to t in the residual graph $G_{f'}$. If we fail to find one, then f' is maximum. Else, the flow is augmented to have a value at least that of f; since the current flow network cannot have a larger maximum flow value than the original one, this is a maximum flow.

[1] ex257.178.863