ensemble size $M > 0$, a set of requirements $R_v \subseteq S$ for each $v \in V$ and a cost function defined by $f(\mathcal{B}) := \chi(G^{\mathcal{B}})$ for each $\mathcal{B} \in \mathbb{B}$, where $\mathbb{B}$ denotes the set of all possible ensemble assignments with respect to the assumptions made —, we must for any $\mathcal{B} \in \mathbb{B}$ define a set $N(\mathcal{B}) \subseteq \mathbb{B}$ representing the neighborhood of $\mathcal{B}$ in $\mathbb{B}$. It turned out to be easier to manage, not to define $N(\mathcal{B})$ directly, but rather to introduce a set $M(\mathcal{B})$ of admissible elementary moves m on $\mathcal{B}$, with $m(\mathcal{B})$ denoting the resulting ensemble assignment when applying m to $\mathcal{B}$, and then setting $N(\mathcal{B}) := \{m(\mathcal{B}) \mid m \in M(\mathcal{B})\}$.

Given an ensemble assignment $\mathcal{B} \in \mathbb{B}$, an elementary move $m \in M(\mathcal{B})$ has been designed to be of the form $m = (v, u, z, s)$, with $v \in V$, $u \in \{0, \dots, |\mathcal{B}_v|\}$, $z \in \{0, \dots, |\mathcal{B}_v| + 1\}$, $u \neq z$ and $s \in S$. Furthermore, in the case of $u \neq 0$ we demand that $s \in B_u$, where $B_u \in \mathcal{B}_v$ is the ensemble of vertex v with index u. (For u and z to make sense, we assume for each $v' \in V$ that the ensembles of $\mathcal{B}_{v'}$ carry indices from 1 to $|\mathcal{B}_{v'}|$. Then, for $i = 1, \dots, |\mathcal{B}_{v'}|$, $B_i \in \mathcal{B}_{v'}$ is the ensemble of v' with index i.)

With these assumptions made, an elementary move $m = (v, u, z, s) \in M(\mathcal{B})$ is interpreted as the transfer of service s, which is an element of the "source ensemble" $B_u \in \mathcal{B}_v$ of m, to the "target ensemble" $B_z \in \mathcal{B}_v$ of m. Following special cases have to be considered seperately:

- Given $u = 0$, s is understood to be a non-required service not yet an element of any ensemble of v (not broadcasted), which is to be an element of ensemble $B_z \in \mathcal{B}_v$ after the move m has been made.
- Given $z = 0$, s is a service of the ensemble $B_u \in \mathcal{B}_v$, and is not to be an element of any ensemble of v (not broadcasted) after the move m has been made.
- Given $z = |\mathcal{B}_v| + 1$, the move m opens a new ensemble B_z not yet existing for vertex v, which consists exactly of element s after the move m has been made.

Remark: Given an elementary move $m = (v, u, z, s) \in M(\mathcal{B})$ with $u = 0$ or $z = 0$, for reasons of convenience, we introduce a virtual ensemble B_0 of v consisting of all the services not broadcasted on v. Thus, if $u = 0$, we remove the service s from the virtual source ensemble. On the other hand, if $z = 0$, we add the service s to the virtual target ensemble.

3.3 Motivation for 3.4

Now, having defined neighborhood, we could use the standard design of the tabu concept and the aspiration criteria and should have a complete TS working. Unfortunately, it turns out not to be that easy. Following example gives a first understanding of the difficulties we face.

Let $\mathcal{B} \in \mathbb{B}$ be an ensemble assignment. For each pair of vertices $v_1, v_2 \in V$ with $(v_1, v_2) \in E$ and for each pair of ensembles $B_1 \in \mathcal{B}_{v_1}$, $B_2 \in \mathcal{B}_{v_2}$ the following two properties may be fulfilled:

1. $|B_1| > 2$, $|B_2| > 2$. (This ensures that no single elementary move may cause B_1 or B_2 to become the empty set.)
2. $B_1 \neq B_2$, and at least 2 elementary moves are needed to make B_1 and B_2 equal.