

dc = datacenter

Google Data Center Optimization

Rest Score $\leq g_i \forall i \dots P$

Natural Vars

$0 \leq R \rightarrow$ row on dc ≤ 1000

$0 \leq S \rightarrow$ Slots on row ≤ 1000

$0 \leq U \rightarrow$ Un Slots $\leq (R \times S)$

$0 \leq P \rightarrow$ Pools ≤ 1000

$0 \leq M \rightarrow$ Servers $\leq (R \times S)$

$U_A[U] \rightarrow$ Un Array \rightarrow 0-1 Row
1-1 Slot

$M_A[M] \rightarrow$ Server Array \rightarrow 0-1 Size(z)
1-1 Capacity(c)

BM \rightarrow 99999999

Decision Vars

$x_{ijk} \in \{0,1\} \forall i, j, k$

$y_{ijk} \in \{0,1\} \forall i, j, k$

Score $\in \mathbb{N}$

$g_i \in \mathbb{N} \forall i \dots P$

$$\sum_k x_{ijk} \leq 1$$

$$2 \quad g_i \leq \left(\sum_{j,k} x_{ijk} \cdot c_k \right) - \left(\sum_k x_{irk} \cdot c_k \right) \quad \forall i \dots P$$

$$3 \quad \sum_k y_{skl} = 0 \quad \forall s, l \text{ in } U_A$$

$$5 \quad \sum_i y_{ijk} = \sum_i x_{ijk} \cdot z_i \quad \forall j \dots R, \forall k \dots M$$

$$4 \quad \sum_i x_{ijk} \leq \sum_i y_{ijk} \cdot M \quad \forall j \dots R, \forall k \dots M$$

$$\sum_i y_{ijk} \leq \sum_i x_{ijk} \cdot M \quad \forall j \dots R, \forall k \dots M$$

$$6 \quad \sum_i \sum_j x_{ijk} = 1 \quad \forall k \dots M$$

Obj \rightarrow Max (Score)

$$\forall i \dots P \quad \forall j \dots R \quad \sum_k \sum_l x_{ijk} \cdot c_k \leq 10$$