Translucent Mode Transport

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Outline

Table Variables

Description of notation used in the objective function	
i	index for start node of a physical link
j	index for end node of a physical link
o	index for node that is origin of a demand
d	index for node that is destination of a demand
(i,j)	physical link between the nodes i and j
(o,d)	demand between the nodes o and d
c	Client traffic Type (1 to 5)
L_{ij}^{od}	Number of ODU-o low speed signals from node o to node d employing lightpath (i,j)
f_{ij}^{od}	Number of 100 Gbit/s optical channels (number of flows) between the link i and j for all demand pairs between o and d
W_{od}	Number of lightpath channels between the nodes o and d
B	Client signals granularities (1.25, 2.5, 10, 40, 100)
D_{od}	Client traffic demands between the nodes o and d
G	Network topology in form of adjacency matrix
BD	Bandwidth

Objective Function

$$\textit{minimize} \qquad \sum_{(o,d)} W_{od} \tag{1}$$

subject to

$$\sum_{jn\{o\}} L_{ij}^{od} = D_{odc} \qquad \forall (o,d) : o < d \tag{2}$$

$$\sum_{jn\{o\}} L_{ji}^{od} = \sum_{jn\{d\}} L_{ji}^{od} \qquad \forall (o,d) : o < d, \forall i : i \neq o, d \tag{3}$$

$$\sum_{jn\{d\}} L_{ij}^{od} = D_{odc} \qquad \forall (o,d) : o < d \tag{4}$$

$$\sum_{(o,d):o<d} \left(B(c) \times L_{ij}^{od} \right) \leq \sum BD \times W_{ij} \qquad \forall (i,j) \tag{5}$$

Objective Function

$$L_{ij}^{od} \geq 0; \qquad \forall (i,j), \forall (o,d) : o < d \quad (6)$$

$$\sum_{jn\{o\}} f_{ji}^{od} = W_{od} \qquad \forall (o,d) : o < d \quad (7)$$

$$\sum_{jn\{o\}} f_{ji}^{od} = \sum_{jn\{d\}} f_{ji}^{od} \qquad \forall (o,d) : o < d, \forall i : i \neq o, d \quad (8)$$

$$\sum_{jn\{d\}} f_{ji}^{od} = W_{od} \qquad \forall (o,d) : o < d \quad (9)$$

$$\sum_{(o,d):o<d} \left(f_{ij}^{od} + f_{ji}^{od} \right) \leq 80 G_{ij} \qquad \forall (i,j) : i < j \quad (10)$$

$$f_{ij}^{od} \geq 0 \qquad \forall (i,j) \forall (o,d) \quad (11)$$