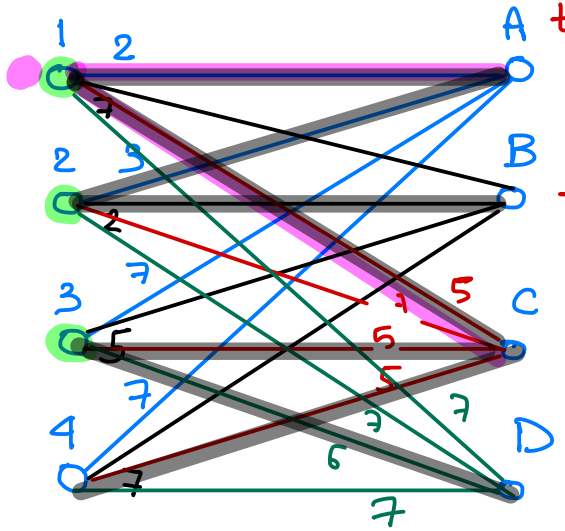
Progetto di Reti

#7,8,9



$$\max \sum_{j \in N} \alpha_j$$

$$\sum_{j \in N} \beta_{ij} \le f_i \quad i \in F$$

$$\alpha_j \le \beta_{ij} + d_{ij} \quad i \in F,\ j \in N$$

$$\alpha_j, \beta_{ij} \ge 0$$

$t=0$ • $\alpha = \beta = 0$

• α_j crescono in modo uniforme,

• β_{ij} rimangono a 0

$t=2$ • $\alpha_A = \alpha_B = \alpha_C = \alpha_D = 2$; (1,A), (2,B) TIGHT

$t=3$ • $\alpha_A = \alpha_B = \alpha_C = \alpha_D = 3$

$\beta_{1A} = \beta_{2B} = 1$; (1,A), (2,A), (2,A) TIGHT

CONGELATE

$t=4.5$ • $\alpha_A = \alpha_B = \alpha_C = \alpha_D = 4.5$

$\beta_{1A} = \beta_{2B} = 2.5$; $\beta_{2A} = 1.5$

APRIAMO (TEMPORANEAMENTE) FACILITY 2

$t=5$ • $\alpha_C = \alpha_D = 4.5 + \varepsilon$; (1,C), (4,C), (3,C)

$t=5.5$ • $\alpha_C = \alpha_D = 5.5$; (1,C), (4,C) TIGHT

$\beta_{1,C} = \beta_{4,C} = \beta_{3C} = 0.5$

APRIAMO (TEMP.) FACILITY 1

C-3

C-2

$t=6$ • $\alpha_D = 6$, (D,3) TIGHT

$t=6.5$ • $\alpha_D = 6.5$ (D,3) TIGHT

$\beta_{3D} = 0.5$

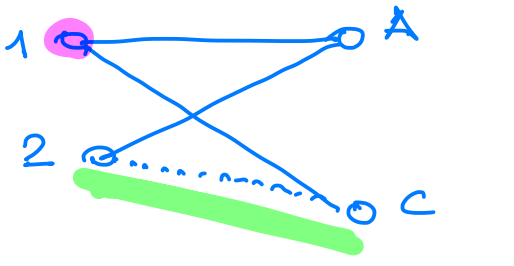
SOLUZIONE TEMPORANEA $\{1,2,3\}$ APERTE

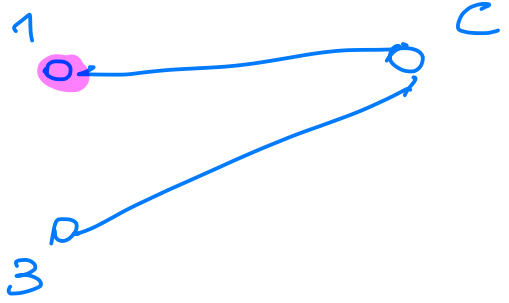
A-2, B-2, C-1, D-3

facility in conflitto: i, i' : $B_{ij} > 0$ $B_{ij} > 0$, $j \in N$

cliente j ha promesso soldi sia a i che a i'

CONFLITTO



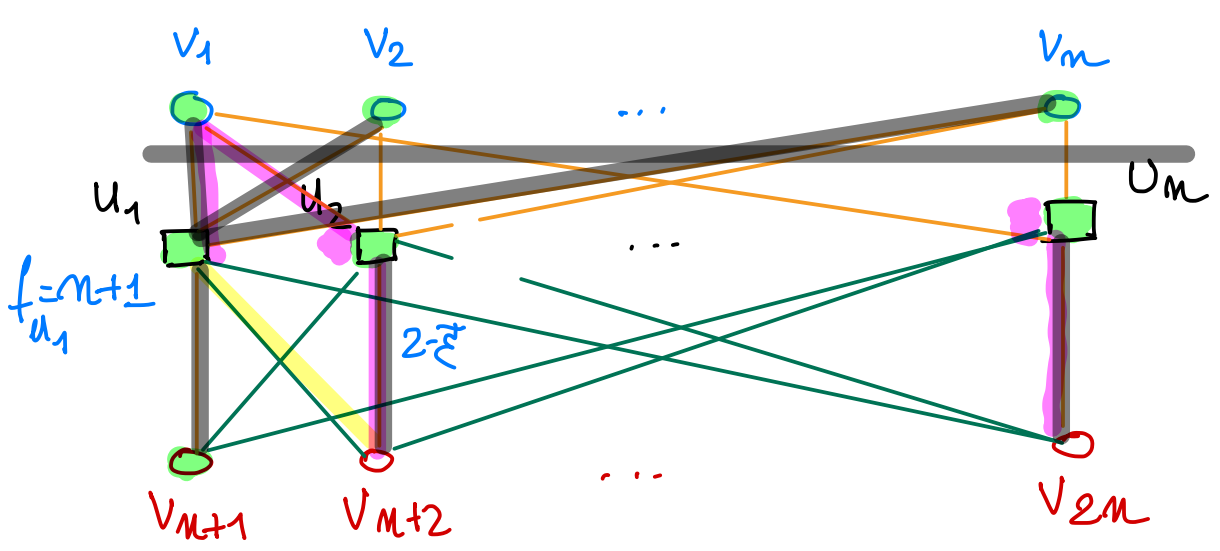


ORDINE

FACILITY 2 ✔

// 1 ✘

// 3 ✔



○ CLIENTI PUBBLICI

○ CLIENTI PRIVATI

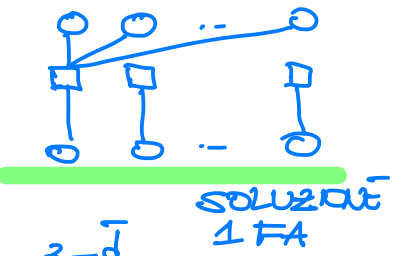
—— COSTO 1

—— COSTO 3

$f_{u_2} = f_{u_3} = \dots = f_{u_m} = m+2-\bar{\varepsilon}$

- $\alpha_1 = \alpha_2 = \dots = \alpha_m = \alpha_{m+1} = \dots = \alpha_{2m} = 1$ $\quad t=1$

$\alpha_1 = \alpha_2 = \dots = \alpha_m = \alpha_{m+1} = \dots = \alpha_{2m} = 1+1$



- $B_{u_i v_j} = 1 \quad i = 1..m \quad j = 1..m \quad t=2$

$B_{u_i v_{i+m}} = 1 \quad i = 1..m$

$t = 3-\bar{\varepsilon}$ •

$\alpha_{m+1} = \alpha_{m+2} = \dots = \alpha_{2m} = 3-\bar{\varepsilon}$

$B_{u_i v_{i+m}} = 2-\bar{\varepsilon} \quad i = 2..m$

FASE 1 ALGORITMO

COSTO SOLUZIONE DUALE $= 2(n+1) + (3-\varepsilon)(n-1) = O(n)$

COSTO SOLUZIONE PRIMALE = COSTO AP. FACILITY: $(n+1)+(n+2-\varepsilon)(n-1)$
+
COSTO CONNESSIONE $2n$
$= O(n^2)$

FASE 2 ALGORITMO

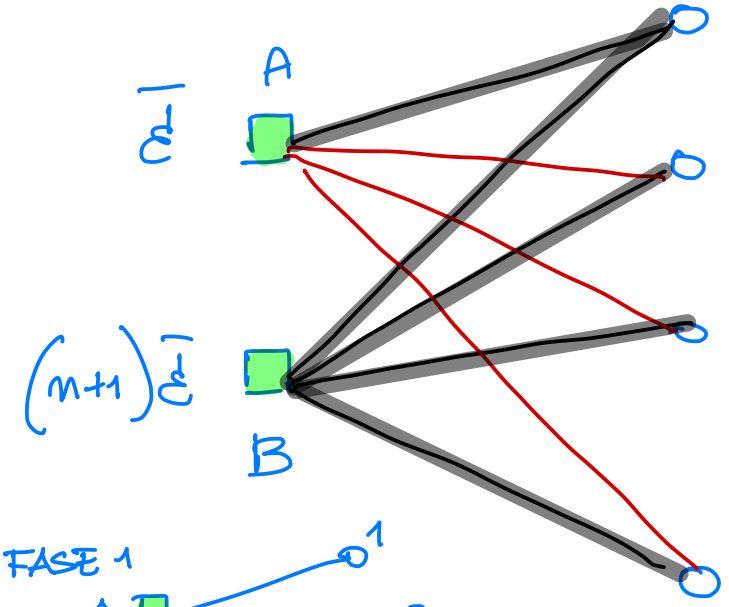
COSTO SOLUZIONE PRIMALE = COSTO AP. FACILITY $= n+1$
+
COSTO CONNESSIONE $1\cdot(n+1) + 3\cdot(n-1) =$

$2n+2+3n-3-\varepsilon(n-1) =$

$5n-1-\varepsilon(n-1)$

$n+1 + n+1 + 3n-3 =$

$5n-1$



1

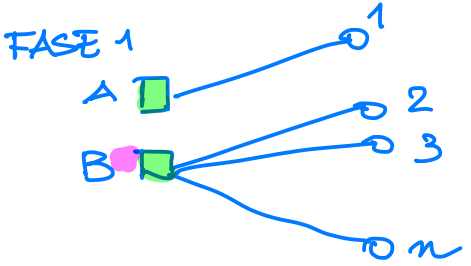
3

$t=1$ $\alpha_1 = \alpha_2 = \dots = \alpha_n = 1$

$t = 1+\bar{\varepsilon}$ $\alpha_1 = \alpha_2 = \dots = \alpha_n = 1+\bar{\varepsilon}$

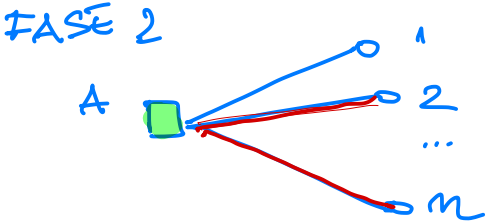
$\beta_{1A} = \beta_{1B} = \beta_{2B} = \dots = \beta_{nB} = \bar{\varepsilon}$

APRIAMO A



$t = 1+\bar{\varepsilon}+\dfrac{\bar{\varepsilon}}{n-1}$ $\alpha_2 = \dots = \alpha_n = 1+\bar{\varepsilon}+\dfrac{\bar{\varepsilon}}{n-1}$

$\beta_{2B} = \dots = \beta_{nB} = \bar{\varepsilon}+\dfrac{\bar{\varepsilon}}{n-1}$



COSTO SOL PRIMALE $\simeq 3n$

COSTO SOL DUALE $\simeq n$