

EE597 Lecture 8 June 22, 2016

Link Layer

Power Allocation over parallel channels

(sum rate maximization with constrained power)

- Waterfilling

Power Control over

Independent Links

- talked about how this works for 2 links

- today: generalization to any # of links

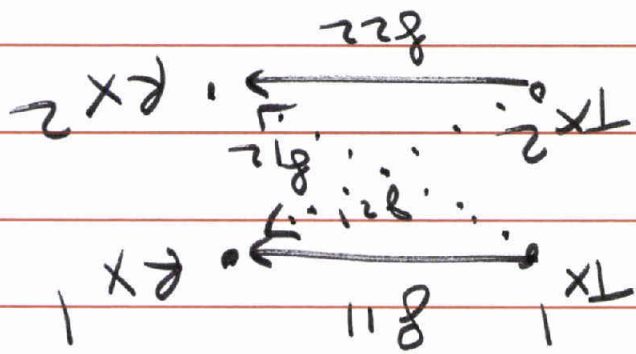
slotted Aloha

p-CSMA

IEEE 802.11 CSMA

randomized channel access

remainder of the 2 links problem:



gains are given/know, and not vary — slow fading

$$\text{SINR} \geq \theta$$

$$\frac{P_1 g_{11}}{P_2 g_{21} + N} \geq \theta$$

$$\frac{P_2 g_{22}}{P_1 g_{12} + N} \geq \theta$$

$$P_i g_{ii} - \sum_{j \neq i} \theta \cdot g_{ji} \cdot P_j \geq \theta N \quad \forall i$$

$$P_i g_{ii} \geq \theta \sum_{j \neq i} g_{ji} \cdot P_j + \theta N$$

$$\frac{P_i \cdot g_{ii}}{\sum_{j \neq i} P_j \cdot g_{ji} + N} \geq \theta \quad \forall i = 1, \dots, N$$

$$\text{SINR}_i \geq \theta \quad \forall i$$

