Friday, December 03, 2010
9:42 AM

Lecture 8 (Dec 2)

- HW 2 posted
  due Dec 14 @ 2:39 PM
  (right before class starts)
  (Tuesday)

"Traffic Handling Capacity"

Example

Suppose that we have one channel.

Traffic intensity (for one user)

How often do you make a call?

3 calls per day, on average.

How long is the call?

10 mins per call, on average.

$\Rightarrow$ one person uses $\frac{30 \text{ mins}}{\text{day}}$

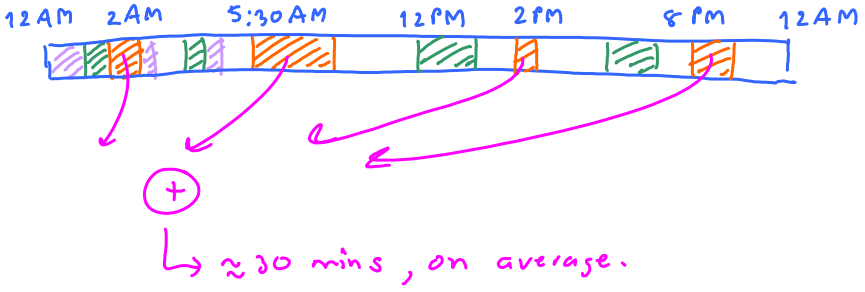
$$3 \frac{\text{calls}}{\text{day}} \times 10 \frac{\text{mins}}{\text{call}} = \frac{30}{24 \times 60} = \frac{1}{48} \text{ Erlang.}$$

(unitless)

Lecture 9 (Dec 7)

What does "Erlang" mean?

Consider the one channel that we have for one day:



$\hookrightarrow \approx 30$ mins, on average.

Conclusion: He utilizes $\frac{30 \text{ mins}}{} = \frac{1}{}$ portion of the channel.

1 day 48

Idea: Can we allocate $\frac{47}{48}$ portion of the channel to other users??

⇒ Can support 48 users, on average ??

Ans. No. Because call initiation times are random.

In fact, you can guarantee 100% up-time for only 1 user.

↓

95%, 98%, 99%

⇒ blocked call

⇒ Probability of blocking (P_b) ← likelihood that a call is blocked.

5%, 2%, 1%

0.05, 0.02, 0.01

Poisson Process: ← More on chapter 3

⇒ Random arrangement of "marks" (denoted by "x") on the time line.

These marks may indicate

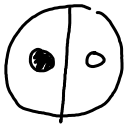
- the time that customers arrive or
- the time that call requests are made

Lecture 10 (Dec 14)

Trunking Efficiency

If one more user tries to make a call,

he/she can do it.



If one more user tries to make a call,
he/she will be able to do it
only when he/she is in the right sector.