Hand in problems Week 6

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Exercise & Solution

Problem 1

Photons at a wavelength of 600 nm, incident on a photodiode is 10^{12} photons per second. If a current of 0.1 μA flows through the photodiode, determine the quantum efficiency of the photodiode. Also derive the corresponding responsivity (in A/W).

We can find the photon responsivity R_Λ of a photodiode and the quantum efficiency η with a direct approach just using the definition given for this parameters.

$$R_\lambda = \frac{I_p}{P} \ , \ I_p = e\eta\frac{P}{h\nu}, \ \eta = I_p\frac{hc}{eP\lambda} \tag{1}$$

Where I_p is the photocurrente produce by the photodiode and P is the power that can expressed in terms of the flux ϕ_F with this its a direct calculation as follows:

$$R_\lambda = \frac{I_p}{\phi_F h\nu} = \frac{I_p\lambda}{\phi_F hc} = 0.30205\left[\frac{A}{W}\right] \tag{2}$$

$$\eta = \frac{I_p}{e\phi_F} = 62.42\% \tag{3}$$

Problem 2

Outline a sketch of the network from the study visit. Mark in your figure the site locations visited and explain their purpose. Also mark important routes, like the connection between the EPC (mobile core) and the end user, and the core ring.

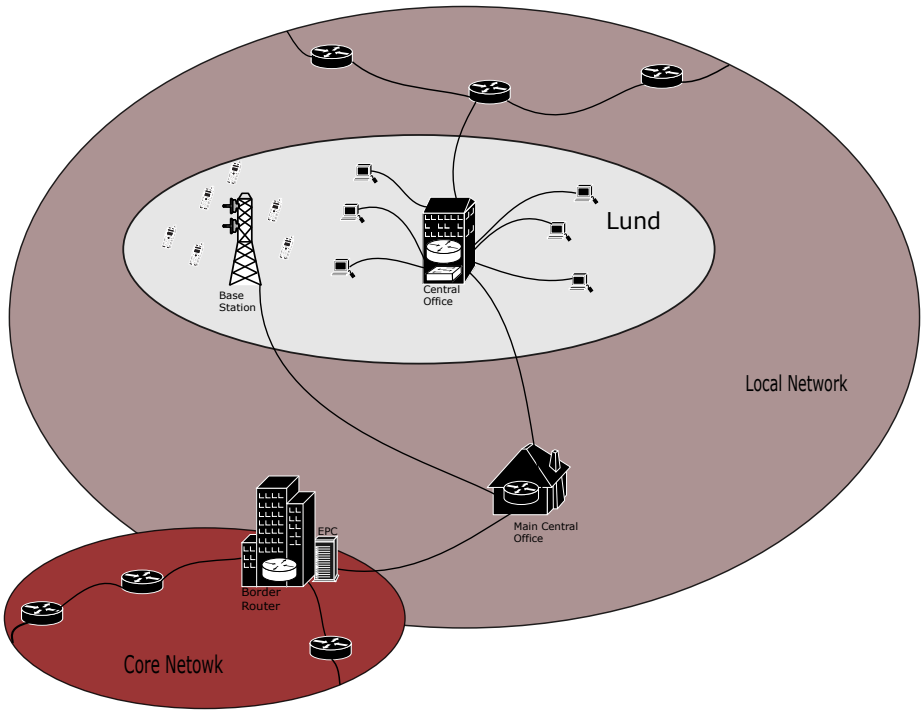


Figure 1: Here we can see the real network as I understand the layout we can see the compositions of networks where Lund is the access network and we can see the connection to the local network threw that main office in Eslov and the Border router in Malmo is the connection to the Core Network and tot he Mobile Network threw the EPC

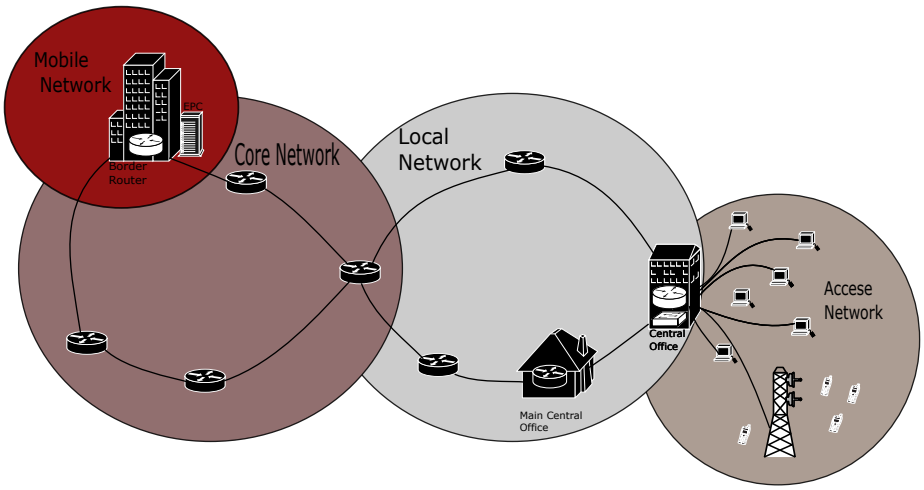


Figure 2: Here we have the logical Network how we theoretical think the network should look like.

References

[1] R. Ramaswami, K. Sivarajan and G. Sasaki: Optical Networks: A Practical Perspective, 3rd Ed. ISBN: 978-0-12-374092-2

[2] G. P. Agrawal: Fiber-optic communication system, 4th Ed. ISBN:9780470505113