
Assignment: 1

1. Discuss and comprehensively analyse the security features inherent in IPv6 protocol usage. [20 Marks]

The **discussion** should include the following.

- An overview of security options available in IPv6.
- Description and benefits of using IPSec along with IPv6.

The **analysis** should elaborate the following.

- Benefits of using IPv6 over IPv4 from a security perspective.
- Providing a case-study of an IoT environment where IPv6 will be of greater advantage (in terms of security) in comparison with IPv4.

2. Describe and critically evaluate the requirements that have resulted in the formation of 6LoWPAN protocol as an optimal solution in comparison with IPv6 in IoT environments. [80 Marks]

You may provide the description and critically evaluate the protocols by focusing on the following.

- Providing an appreciation of the key requirements of IoT infrastructures that may require system designers to select 6LoWPAN instead of IPv6.
- Discussing the drawbacks/disadvantages of using IPv6 in IoT environments: citing examples, evaluations, experiments from research studies that highlight the resource consumption (energy, processing power, etc.) of IPv6 vs. 6LoWPAN.
- Reporting a case-study that describes an IoT environment where both IPv6 and 6LoWPAN offer the same resource consumption (same advantages/disadvantages) and either of these can be selected.

Submission Notes:

(i) The above requirements and focal areas have been included to provide you with a basic guideline to structure your answers for this assignment. You are allowed to make changes *with addition of further sections as you deem necessary*.

(ii) *Case-studies* are usually examples from real-world scenarios. You are therefore, encouraged to find relevant examples from the Internet/research papers. However, if you are unable to do so, you are allowed to create hypothetical scenarios. The scenarios (hypothetical) should still be suitably realistic/relevant to be considered appropriate.

(iii) Your report should be properly formatted in IEEE conference format (<https://www.ieee.org/content/dam/ieee-org/ieee/web/org/conferences/Conference-template-A4.doc>). To properly cite your work use IEEE referencing style (<https://libguides.murdoch.edu.au/IEEE/all>).

(iv) Indicative length of Question 1: 4000 words/two pages. Question 2: 8000 words/four pages. Excluding reference list.

(v) The university and HEC guidelines on plagiarism are available online (<http://www.hec.gov.pk/english/services/faculty/Plagiarism/Pages/default.aspx>). **Plagiarism carries heavy penalties so please avoid plagiarism at all costs. All assignments will be evaluated using plagiarism detection**

software. A copy of the software is available in library, you may check it yourselves on the final draft of your assignment prior to submission.