Advanced Telecommunications Questions

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Introduction

Some questions from, or relevant to, the course.

Questions

- What are the OSI layers?

- What are the IPS layers?

- What is a byte, halfword and word?

- What is a kibibyte? What is a mebibyte?

- What is bandwidth?

- Bit rate?

- Latency?

- What are the bitwise logical operations?

- Clear bits 3 and 4 in 10010110

- Set bits 3 and 4 in 10010110

- Invert bits 3 and 4 in 10010110

- Query the status of bit 1 in 10010110

- List the hex digits

- How many binary digits can one hex digit represent?

- Compare and contrast UDP and TCP

- Explain HTTP with reference to client-server, processes, objects, non-persistent HTTP and persistent HTTP

- What is the format and structure of a request message?

- What types of requests are there? In what cases are they used?

- What are the response codes?

- What is 200, 301, 400, 404 and 505?

- What is a cookie?

- What is DNS?

- What types of name servers are there?

- Walk through a simple name resolution example?

- What is caching?

- What is RR? What is A? What is AAAA? What is NS? What is CNAME? What is MX?

- What is DNSSEC?

- Explain, briefly, WebSockets

- What is 14 mod 2?

- What is -14 mod 6?

- What is (10+5) mod 4?

- What is (10*3) mod 4?

- What is $a^b \pmod c$ equivalent to?

- What is the multiplicative inverse?

- What are the aims of network security?

- What does a sound crypto system need?

- Explain symmetric-key encryption

- Explain asymmetric-key encryption

- What is a hybrid scheme?

- What is a message digest? What is a hash?

- Examples of hashing systems?

- Are hash functions deterministic? Are hash functions invertible? Are hash functions target collision resistant? Are hash functions collision resistant?

- Explain digital signatures with an example

- How is key management achieved?

- Explain the Diffie-Hellman Key Exchange

- List the major algorithm families and give an example system for each

- What is the advantage of elliptic key cryptography?

- Explain HMAC using an example

- How is authentication achieved using a key distribution centre?

- Explain the Needham-Schroder auth protocol using security protocol notation

- Show the layers of an application that uses SSL

- Explain the SSL handshake

- What is a VPN?

- What is entropy?