Xi'anJiaotong-LiverpoolUniversity

西交利物浦大学

PAPER CODE	EXAMINER	DEPARTMENT	TEL
CSE108		Computer Science and Software Engineering	

2nd SEMESTER 2017/18 REGULAR EXAMINATIONS

BACHELOR DEGREE – Year 2

Operating Systems Concepts

TIME ALLOWED: 2 Hours

INSTRUCTIONS TO CANDIDATES

1、 Total marks available are 100.

2、 Answer all questions.

3、 The number in the column on the right indicates the marks for each question.

4、 Answer should be written in the answer booklet(s) provided.

5、 The university approved calculator - Casio FS82ES/83ES can be used.

6、 All the answers must be in English.

1. Explain the following terms:
1.1 Process Control Block (PCB). (10 marks)
1.2 Hashed Page Tables. (10 marks)

2. Explain why spinlocks are not appropriate for single-processor systems yet are often used in multiprocessor systems. (10 marks)

3. To build a robust distributed system, you must know what kinds of failures can occur.
3.1 List three possible types of failure in a distributed system. (6 marks)
3.2 Specify which of the entries in your list also are applicable to a centralized system. (4 marks)

4. Consider the following page reference string: 2, 3, 2, 1, 5, 2, 4. Assuming demand paging with three frames (initial setting is Empty|Empty|Empty), how many page faults would occur for the following replacement algorithms?
4.1 First In First Out replacement (3 marks). Justify your answer by giving a trace of how the page resident in each frame changes over time (7 marks).
4.2 Optimal Page replacement (3 marks). Justify your answer by giving a trace of how the page resident in each frame changes over time (7 marks). Note: First In First Out replacement will be used by default.

5. Assume that someone sends encrypted messages by using DES in the OFB mode of operation with a secret (but fixed) IV value.
5.1 Show how to perform a known plaintext attack in order to decrypt transmitted messages. (10 marks)
5.2 What about the CBC mode? (10 marks)
5.3 Is it better with the CFB mode shown in the figure below? (20 marks)

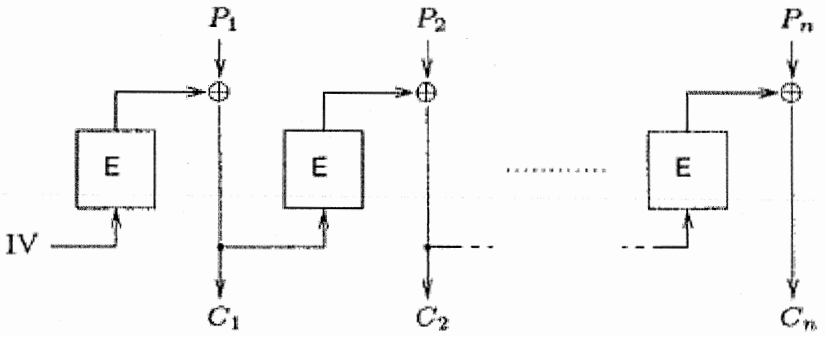

Figure CFB mode

END OF EXAM PAPER