

## Chapter IV

### The Performance Evaluation of the University Entrance Examination Computing Server System

#### The Performance Evaluation of the Enrollment Procedure at Chulalongkorn University

The evaluation is scoped into 4 points.

1. The maximum transaction rate per minute (TPM) of the system.

The system was implemented in Client-Server concept. The server was IBM RISC/6000. It connected with 30 clients, micro computers. The maximum transaction rate had been tested before the system was fully operated. This testing module, called pumping, was an application program. This program sent transaction records from clients to server. The officers ran this pumping program at 30 clients concurrently. As a result, the system could support 7 transactions per second, or 420 transactions per minute.

2. The average service time for each transaction.

Each client had its own printer. There were 3 types of printers, Epson LQ550, Epson LQ100 and Epson LQ1170. The service time per transaction is shown in Table 4.1

printer	LQ550	LQ1170	LQ100
service time / transaction	40 secs	15 secs	35 secs

Table 4.1 The Service Time of Printer.

LQ1170 was the best type. They were easy to be adjusted. LQ100, it was difficult to set the configuration. The officers had to spend most of the time to set them. Some of them took a long time to load Thai font.

The average recording time was 40 seconds per transaction.

$$\begin{aligned} \text{average service time} &= (\text{recording time} + \text{average printing time}) \\ \text{average printing time} &= (\text{LQ550speed} + \text{LQ100speed} + \text{LQ1170speed}) / 3 \\ &= (40 + 35 + 15) / 3 \\ &= 30 \text{ secs /transaction} \\ \text{average service time} &= 40 + 30 \\ &= 70 \text{ secs /transaction} \end{aligned}$$

### 3. The amount of successful transaction.

The 30 clients were set into 6 rows as shown in Figure 4.1. There were 6 ways that the student could walk and register. Each way reserved 5 clients.

The exact amount of record per hour that the server get was also evaluated by running a monitor program. The result is shown in Table 4.2.

### 4. Daily error records.

Error records occurred every day. The error slow down the system performance. The officer had to spend about 2-3 hours a day to correct them. Table 4.3 shows the number of error records per day. The total error records is 308.

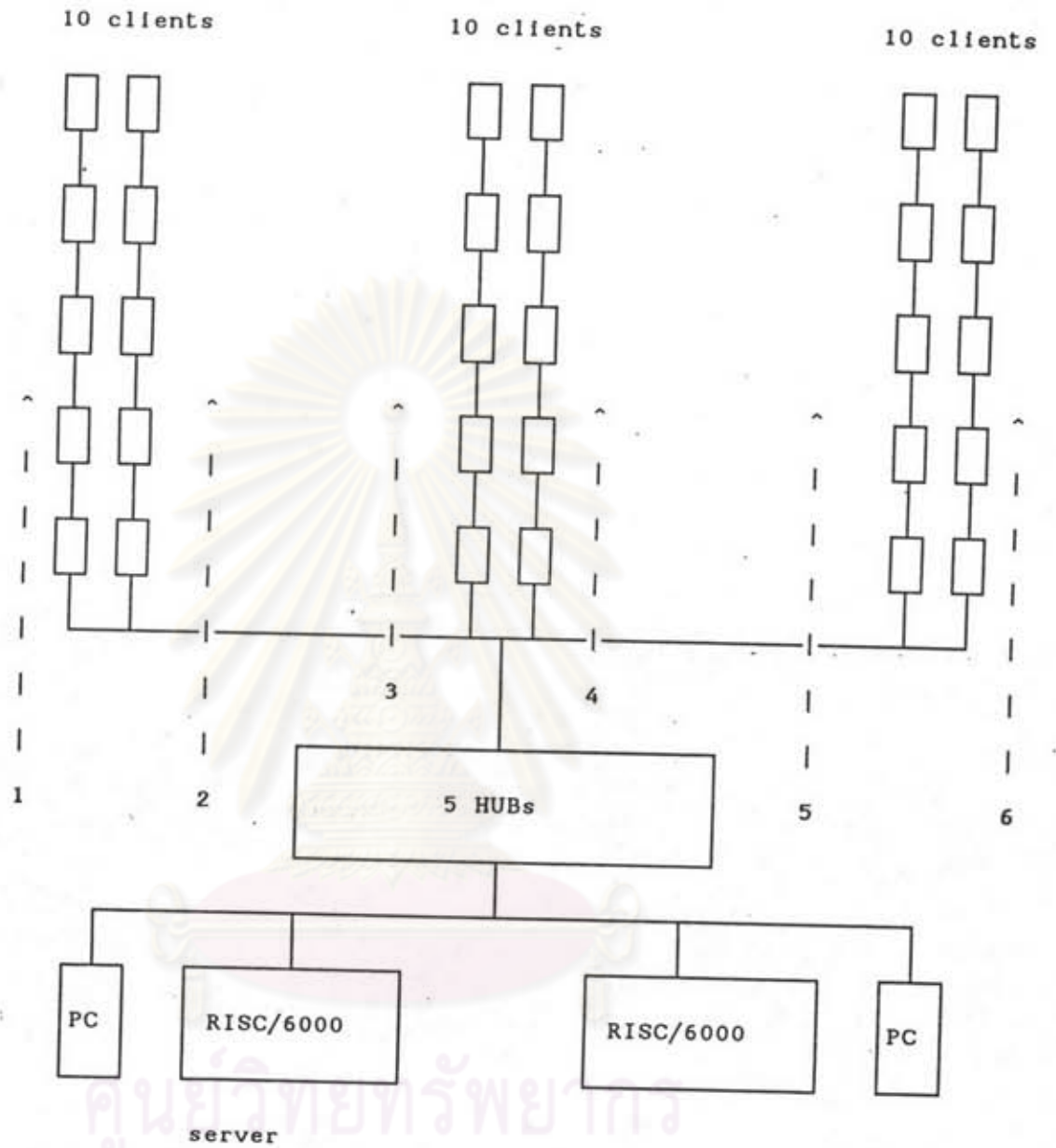


Figure 4.1 The Location of Clients and Server.

	4 March	5 March	11 March	12 March
08.00-09.00	900	1,653	1,640	1,447
09.01-10.00	956	1,230	1,302	1,290
10.01-11.00	1,300	1,002	1,030	1,293
11.01-12.00	829	601	700	710
01.00-02.00	1,030	1,535	1,783	1,689
02.01-03.00	1,600	1,360	1,440	1,449
03.01-04.00	880	508	649	810
<b>Total</b>	<b>7,475</b>	<b>7,889</b>	<b>8,544</b>	<b>8,718</b>

**Table 4.2** The Amount of Records Per Hour.

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย

Date	Pre-edit	Post-edit	error records
4	3,985	3,961	24
March	3,490	3,470	20
5	4,486	4,470	16
March	3,403	3,394	9
6	4,158	4,136	22
March	3,339	3,325	14
7	3,994	3,969	23
March	3,224	3,213	11
8	4,100	4,074	26
March	3,192	3,180	12
9	4,396	4,380	16
March	3,525	3,517	8
10	4,514	4,513	1
March	3,620	3,607	13
11	4,672	4,655	17
March	3,872	3,862	10
12	4,740	4,723	17
March	3,978	3,964	14
13	3,971	3,954	17
March	3,232	3,214	18

Table 4.3 The Amount of Error Records.

The Performance Evaluation of the Examination Rooms Preparing Procedure

The evaluation was concentrated on successful reports per day as shown in table 4.4 and table 4.5. The report printing speed was also evaluated. The result is shown in table 4.6. From the printing speed, the evaluators created models of the duration to print reports as shown in table 4.7.

REPORT	SUBJECT	OPERATION DATE
		BANGKOK
1. Reports to show the places that students will take the examination	01-11	21 March, 24 March
	12-44	21 March, 24 March
2. The list of students that will take the examination	01-11	20 March
	12-44	20 March
3. Forms to fill the student signature	01-11	18-20 March
	12-44	22 March
4. Letters to tell the students about their examination places	01-11	23 March
	12-44	23 March
5. Stickers to stamp at the examination desk	01-11	19-20 March
	12-44	22-23 March , 25 March
6. Reports to show each place unit that the students will take the examination	01-11	24 March
	12-44	
7. Forms to fill the student scores of the subjects that were corrected manually	01-11	29-30 March
	12-44	

Table 4.4 The Report printing Date (Bangkok province)

REPORT	SUBJECT	OPERATION DATE		
		SNR	NRS	BRP
1. Reports to show the places that the students will take the examination	01-11	22 March	23 March	20 March
	12-44	24 March	24 March	20 March
2. The list of students that will take the examination	01-11	22 March	23 March	20 March
	12-44	22 March	23 March	20 March
3. Forms to fill the student signatures	01-11	22 March	23 March	20 March
	12-44	22 March	23 March	20 March
4. Letters to tell the students about their examination places	01-11	22 March	23 March	20 March
	12-44	22 March	23 March	20 March
5. Stickers to stamp at the examination desk	01-11	-	-	-
	12-44	-	-	-
6. Reports to show each place unit that the students will take the examination	01-11	22 March	23 March	20 March
	12-44	22 March	23 March	20 March
7. Forms to fill the student scores of the subjects that were corrected manually	01-11	31 March	1 April	31 March
	12-44	31 March	1 April	31 March

Table 4.5 The report printing date ( Other province)

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย



Report Name	per minute	per page
1. Lists of student names that will take the examination	18 pages	40 records
2. Forms to fill the student signatures	14.8 pages	40 records
3. Letters to tell the students about their places to take the examination	33 pages	1 record
4. Stickers to stamp at the examination desks	220 records	-
5. Reports to show all names of the students who have the authority to take the examination	10 pages	40 records

Table 4.6 Printing Speed of Reports.\*

\* Every reports were printed by the Genicom printer. The printing speed is 1200 lines per minute.

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย



From table 4.6, models of the duration time for printing reports are shown in table 4.7

Report Name	MODEL
1. Lists of student names that will take the examination	amount of record    minutes 40 x 18
2. Forms to fill the student signatures	amount of record    minutes 40 x 14.8
3. Letters to tell the students about places to take the examination	amount of record    minutes 33
4. Stickers to stamp at the examination desks	amount of record    minutes 220
5. Reports to show all names of the students who have the authority to take the examination	amount of record    minutes 40 x 10

**Table 4.7** Models of the Duration Time for 5 Types of Report.

**The Performance Evaluation of the Examination Seat Numbers Validating Procedure**

The evaluation was concentrated on successful TM4 files that were validated by ORACLE. The result of an evaluation was concluded from history files that were created by ORACLE. Table 4.8 shows the result of an evaluation.

Subject	operation date	Time spent (days)	error (records)
01	12 Apr - 22 Apr	11	221
02	10 Apr - 20 Apr	11	239
03	12 Apr - 23 Apr	12	217
04	16 Apr - 23 Apr	8	254
05	11 Apr - 22 Apr	11	321
06	16 Apr - 21 Apr	6	172
07	21 Apr - 24 Apr	4	244
08	22 Apr - 24 Apr	3	221
09	23 Apr - 24 Apr	2	180
10	23 Apr - 24 Apr	2	174
11	16 Apr - 21 Apr	6	98
12	21 Apr - 23 Apr	3	82
14	23 Apr - 24 Apr	2	51
15	23 Apr - 24 Apr	2	4
16	23 Apr - 24 Apr	2	2
18	20 Apr - 22 Apr	2	26
22	22 Apr - 24 Apr	3	27
23	19 Apr - 19 Apr	1	2
24	23 Apr - 24 Apr	1	8
26	23 Apr - 24 Apr	2	4
28	23 Apr - 23 Apr	1	1
TOTAL	10 Apr - 24 Apr	15	1,548

Table 4.8 The Duration to Validate TM4 Files.

The Performance Evaluation of the Students Selecting Procedure

The evaluation was concentrated on each selection process. It was created 3 times. Table 4.9 shows the details of each selection process.

date	time spent	CPU	Note
28 April 1994	75 minutes	SUN SPARC 10*	Select for some faculties
30 April 1994	80 minutes	SUN SPARC 10*	Completely selection
7 July 1994	46 minutes	SUN SPARC 20**	Completely selection

Table 4.9 Duration in the Selection Process.

---

\* The CPU speed of the SUN SPARC 10 work station is 109.5 MIPS

\*\* The CPU speed of the SUN SPARC 20 work station is 167.4 MIPS

จุฬาลงกรณ์มหาวิทยาลัย