Revision - IT110

Sunday 18/12/2016

- Final Exam will cover:

  Chapter 1 to Chapter 10 + Content of week 9

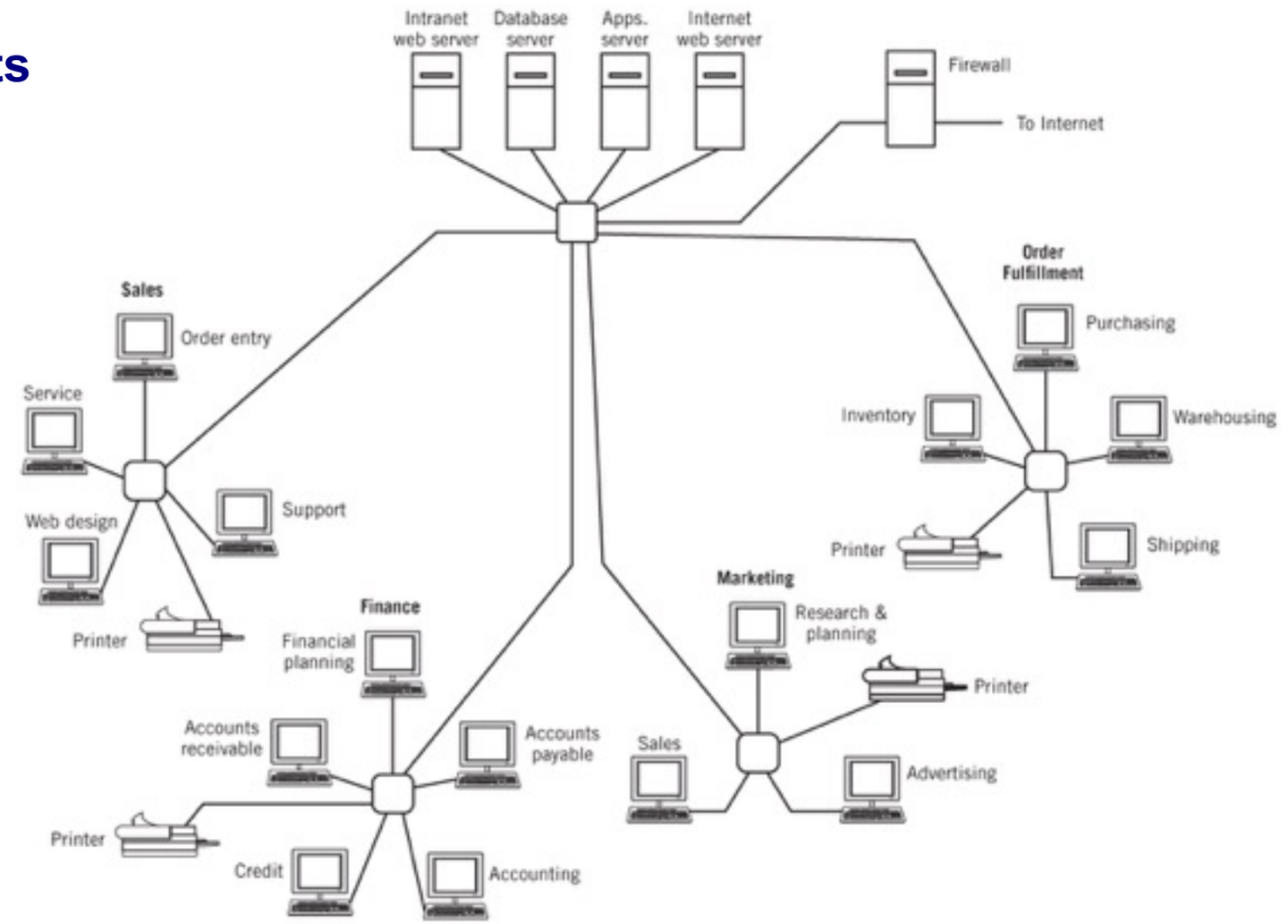
- Type of Questions:

  Multiple Choice - Fill Blank - Short/Long Questions

CHAPTER 1: Computer System

Computer System Components

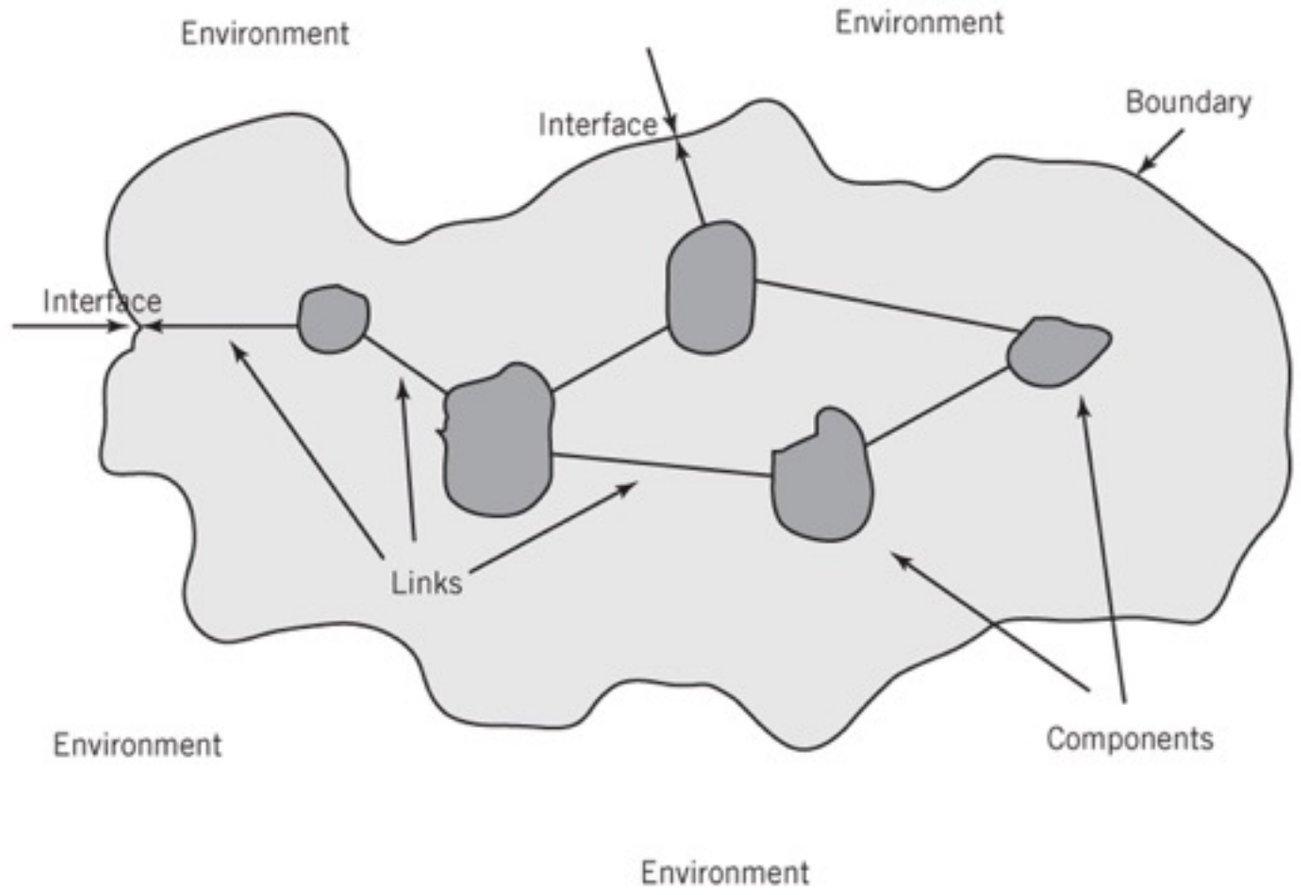
- *Hardware*
- *Software*
- *Data*
- *Communications*



CHAPTER 2: Introduction to Systems Concepts and Systems Architecture

Distributed processing systems

- Client-Server Computing
  - 2-tier architecture
  - 3-tier architecture
  - N-tier architecture
  - Web-Based Computing
- Peer-to-Peer Computing: Computers on a network are treated as equals



CHAPTER 3: Number Systems

Positional Notation:

- Decimal: system of **positional** notation based on powers of 10. {0,1, 2,3,4,5,6,7,8,9}

$$527 = 5 \times 10^2 + 2 \times 10^1 + 7 \times 10^0$$

- Binary system: system of **positional** notation based powers of 2. {0,1}

$$10110_2 = 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$$

- Octal system: system of **positional** notation based on powers of 8. {0,1,2, 3,4,5,6,7}

$$624_8 = 6 \times 8^2 + 2 \times 8^1 + 4 \times 8^0 = 404_{10}$$

- Hexadecimal system: system of **positional** notation based powers of 16.

{0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F}

$$AF2_8 = 10 \times 16^2 + 15 \times 16^1 + 2 \times 16^0 = 2802_{10}$$

CHAPTER 3: Number Systems

Perform the following conversion, demonstrate all the steps:

(3D70)16 to (……)10

(11101)2 to (……)10

(122)8 to (.....)10

CHAPTER 3: Number Systems

Perform the following conversion, demonstrate all the steps:

(3D70)16 to (……)10

$$3D70_{16} = 3 \times 16^3 + 13 \times 16^2 + 7 \times 16^1 + 0 \times 16^0 = 15728_{10}$$

(11101)2 to (……)10

$$11101_2 = 1 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = 29_{10}$$

(122)8 to (.....)10

$$122_8 = 1 \times 8^2 + 2 \times 8^1 + 2 \times 8^0 = 82_{10}$$

CHAPTER 3: Number Systems

Perform the following conversion, demonstrate all the steps:

(500)10 to (……)2 **(263)10 to (……)8** **(590)10 to (……)16**

CHAPTER 3: Number Systems

Perform the following conversion, demonstrate all the steps:

(500)10 to (……)2

500/2 = 250 + 0

250/2 = 125 + 0

125 /2 = 62 +1

62 /2 = 31 +0

31 /2 = 15 +1

15/2 = 7 +1

7/2 = 3 + 1

3/2 = 1 + 1

1/2 = 0 +1

(263)10 to (……)8

263/8 = 32 + 7

32/8 = 4 + 0

4/8 = 0 + 4

0/8 = 0 + 0

(590)10 to (……)16

590/16 = 36 + 14 (14 = E)

36/16 = 2 + 4

2/16 = 0 + 2

111110100_2 =0001 1111 0100= $1F4_{16}$

CHAPTER 3: Number Systems

Fractions: Base 10 and Base 2

$.2589_{10}$

Place	10^{-1}	10^{-2}	10^{-3}	10^{-4}
Value	1/10	1/100	1/1000	1/10000
Evaluate	2 x 1/10	5 x 1/100	8 x 1/1000	9 x1/1000
Sum	.2	.05	.008	.0009

$.101011_2 = 0.671875_{10}$

Place	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}
Value	1/2	1/4	1/8	1/16	1/32	1/64
Evaluate	1 x 1/2	0 x 1/4	1x 1/8	0 x 1/16	1 x 1/32	1 x 1/64
Sum	.5		0.125		0.03125	0.015625

CHAPTER 3: Number Systems

Fractions: Base 10 and Base 2

Perform the following conversion, demonstrate all the steps:

1101.100001_2 to $\ldots\ldots\ldots\ldots_{10}$

CHAPTER 3: Number Systems

Fractions: Base 10 and Base 2

Perform the following conversion, demonstrate all the steps:

1101.100001_2 to $\ldots\ldots\ldots\ldots_{10}$

1) $.515625_{10} = .100001_2$

Place	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}
Value	1/2	1/4	1/8	1/16	1/32	1/64
Evaluate	1 x 1/2	0 x 1/4	1x 1/8	0 x 1/16	1 x 1/32	1 x 1/64
Sum	.5	0	0	0	0	0.015625

2) $13_{10}=1101_2$

CHAPTER 3: Number Systems

Addition

Base	Problem	Largest Single Digit
Decimal	6 +3	9
Octal	6 +1	7
Hexadecimal	6 +9	F
Binary	1 +0	1

CHAPTER 3: Number Systems

Addition

Base	Problem	Carry	Answer
Decimal	6 +4	Carry the 10	10
Octal	6 +2	Carry the 8	10
Hexadecimal	6 +A	Carry the 16	10
Binary	1 +1	Carry the 2	10

CHAPTER 3: Number Systems

Adding two binary numbers

+	0	1
0	0	1
1	1	10

	1	1	0	1	1	0	1
+			1	0	1	1	0

CHAPTER 3: Number Systems

Adding two binary numbers

	1	1		1	1	1	
	1	1	0	1	1	0	1
+			1	0	1	1	0
1	0	0	0	0	0	1	1

CHAPTER 3: Number Systems

Subtracting two binary numbers

-	0	1
0	0	1
1	1	0

	1	0	1	1	0	1
-		1	0	1	1	0

CHAPTER 3: Number Systems

Subtracting two binary numbers

		1	0	1	1	0	1
-			1	0	1	1	0
			1	0	1	1	1

CHAPTER 3: Number Systems

Multiplying two binary numbers

x	0	1
0	0	0
1	0	1

CHAPTER 3: Number Systems

Multiplying two binary numbers

x	0	1
0	0	0
1	0	1

			1	1	0	1	
x				1	1	0	
			0	0	0	0	
+		1	1	0	1		
+	1	1	0	1			
1	0	0	1	1	1	0	

Dividing two binary numbers

Dividing two binary numbers

				1	0	1				
1	1	0	1	1	0	0	0	1	0	0
				-	1	1	0	1		
					0	1	0	0	0	0
				-			1	1	0	1
							0	0	1	1

CHAPTER 4: Data Formats

Type of Data	Standard(s)
Alphanumeric	Unicode, ASCII, EDCDIC
Image (bitmapped)	▪GIF (graphical image format) ▪TIF (tagged image file format) ▪PNG (portable network graphics)
Image (object)	PostScript, JPEG, SWF (Macromedia Flash), SVG
Outline graphics and fonts	PostScript, TrueType
Sound	WAV, AVI, MP3, MIDI, WMA
Page description	PDF (Adobe Portable Document Format), HTML, XML
Video	Quicktime, MPEG-2, RealVideo, WMV

5 Simple Data Types

- Boolean: 2-valued variables or constants with values of true or false
- Char: Variable or constant that holds alphanumeric character
- Enumerated
  - User-defined data types with possible values listed in definition
    - Type DayOfWeek = Mon, Tues, Wed, Thurs, Fri, Sat, Sun
- Integer: positive or negative whole numbers
- Real
  - Numbers with a decimal point
  - Numbers whose magnitude, large or small, exceeds computer's capability to store as an integer