

25-5-16-FN

Reg. No.

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Question Paper Code : 57260

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Sixth Semester

Computer Science and Engineering

CS 6601 – DISTRIBUTED SYSTEMS

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. List the Limitations of distributed system.
2. Name some services and examples of Middleware.
3. What is the role of Proxy server and mobile code ?
4. Define Inter-process Communication.
5. Describe the characteristics of Peer to Peer systems.
6. Discuss on LDAP.
7. Distinguish between physical clock and logical clock.
8. Write the Happened-before relation.
9. List the issues in designing load balancing algorithms.
10. Write any two advantages of Process Migration.

PART – B (5 × 16 = 80 Marks)

11. (a) Explain in detail about trends in distributed systems. (16)
- OR**
- (b) (i) Enlighten the examples of distributed systems. (10)
(ii) Write short notes on WWW. (6)
12. (a) Illustrate TCP and UDP communication with suitable example programs. (16)
- OR**
- (b) Write down the steps in javaRMI and explain it with suitable programs. (16)
13. (a) (i) With neat sketch explain Routing Overlays in detail. (8)
(ii) Write short notes on the following :
(1) Napster and its legacy (4)
(2) Peer to Peer Middleware (4)
- OR**
- (b) Elucidate about File Service Architecture with neat diagram. (16)
14. (a) Write short notes on the following :
(i) Ricart and Agrawala's algorithm (8)
(ii) Maekawa's Voting algorithm (8)
- OR**
- (b) (i) Explain concurrency control in detail. (12)
(ii) Discuss on Nested Transactions. (4)
15. (a) Illustrate the features and mechanism of Process Migration with suitable examples. (16)
- OR**
- (b) Discuss on Task assignment, loading balancing and sharing in detail. (16)

Question Paper Code : 71687

1. What is the need of openness in Distributed system?
2. Define Transparency. What are its types?
3. State the advantages of overlay networks.
4. Differentiate between RMI and RPC.
5. What are the main tasks of routing overlay?
6. How will you make use of name space and DNS?
7. Define consistent cut.
8. What are the rules to abort the nested transaction?
9. What are the sub activities involved in process migration?
10. What is the basic idea behind task assignment approach?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the design issues to be considered in designing distributed systems? Explain in detail about each of them. (8)
- (ii) Discuss in detail about the trends in distributed systems. (8)

Or

- (b) (i) Discuss in detail about the examples (any two) of distributed systems. (8)
- (ii) Utilize World Wide Web as an example to illustrate the concept of resource sharing, client and server. (8)
12. (a) (i) Explain in detail about Middleware layers and Inter process communication. (8)
- (ii) What is the purpose of external data representation and marshaling? Discuss. (8)

Or

- (b) (i) What is RMI? How it is implemented? Write notes on JAVA RMI. (8)
- (ii) How message queues are useful? Explain briefly. (8)
13. (a) (i) What is meant by Napster legacy? Explain in detail. (8)
- (ii) Explain in detail about routing overlay employed in Ocean store storage system. (8)

Or

- (b) (i) Discuss the mounting issues of remote file systems on NFS client. (8)
- (ii) List the different approaches to implement the Name Caches and explain them briefly. (8)
14. (a) (i) Explain the Chandy and Lamports Snapshot algorithm for determining the global states of distributed systems. (8)
- (ii) Describe the distributed mutual exclusion algorithm that uses multicast and logical clocks. (8)

Or

- (b) (i) Explain detail about two phase commit protocol. (8)
- (ii) Summarize in detail about CODA. (8)

15. (a) (i) Explain how process migration is implemented in heterogeneous system. (8)
- (ii) Discuss the issues related to thread programming, thread lifetime and thread synchronization. (8)

Or

- (b) (i) Describe in detail about the Load balancing approach. (8)
- (ii) Give the techniques and methodologies for scheduling process of a distributed system. (8)



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12/05/18

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Question Paper Code : 40914

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Sixth Semester

Computer Science and Engineering

CS 6601 – DISTRIBUTED SYSTEMS

(Common to Information Technology)

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Write down the principles of distributed systems.
2. State the objectives of resource sharing model.
3. Identify the two significant factors affecting interacting process in a distributed system.
4. List out the design issues of Remote Procedure Call (RPC).
5. What are the characteristics of peer-to-peer system ?
6. Label the different forms of transparency in file services.
7. Define the terms : clock skew and clock drift.
8. Mention some motivations for replication.
9. Write the uses of threads.
10. List out the desirable features of global scheduling algorithm.



PART – B

(5×13=65 Marks)

11. a) i) Categorize the application areas of distributed systems. (7)
ii) Summarize the recent trends in distributed systems. (6)

(OR)

- b) Consider a distributed system environment of the prevailing WWW and discuss the challenges meeting out sharing of resources. (13)

12. a) Compare the various types of system models in distributed environment. (13)

(OR)

- b) i) List and explain the parts of a distributed object model. (7)
ii) Give a note on characteristics of group communication. (6)

13. a) i) Give the functional and non-functional requirements of peer-to peer middleware. (7)

- ii) Specify the benefits of overlays routing over traditional multitoning and intelligent routing. (6)

(OR)

- b) i) Explain the function of File Service Architecture. (7)

- ii) Briefly describe about name space implementation. (6)

14. a) i) Generate Chandy and Lamport's snapshot algorithm for determining global states of distributed systems. (7)

- ii) Outline the importance of nested transactions with an example. (6)

(OR)

- b) i) Why do we go for optimistic concurrency control ? Explain. (7)

- ii) Briefly explain the operation of two-phase commit protocol. (6)

15. a) Discuss the implementation of process migration with an example. (13)

(OR)

- b) Tabulate the comparison of various load-balancing approaches used in distributed environment. (13)

PART – C

(1×15=15 Marks)

16. a) Explain the Pastry's routing algorithm. Illustrate with an example. (15)

(OR)

- b) With a simple case study, explain the concept of distributed deadlocks. (15)

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Question Paper Code : 52871

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Sixth Semester

Computer Science and Engineering

CS 6601 — DISTRIBUTED SYSTEMS

(Common to Information Technology)

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is distributed system?
2. What are the three main standard technological components of Web?
3. Compare RMI with RPC.
4. What is meant by marshalling and unmarshalling?
5. What is the need for peer-peer middleware system?
6. What is LDAP?
7. Why is computer clock synchronization necessary?
8. What is phantom deadlock?
9. Differentiate between load balancing and load sharing approach for scheduling processes.
10. What are the benefits of process migration in distributed systems?

PART B — (5 × 13 = 65 marks)

11. (a) Describe the trends in the distributed systems in detail. (13)

Or

- (b) Discuss the major issues in distributed systems. (13)

12. (a) What is overlay network? Explain types of overlay in detail. (13)

Or

- (b) (i) What is group communication? Give any two key application areas of group communication in distributed systems. (5)
(ii) Explain the role of proxy and skeleton in remote method invocation. (8)
13. (a) (i) Differentiate IP and overlay routing for peer-to-peer applications. (7)
(ii) Explain file service architecture in detail. (6)

Or

- (b) (i) How does AFS ensure that the cached copies of files are up-to-date when files may be updated by several clients? (4)
(ii) Explain the Pastry's routing algorithm. (9)
14. (a) Describe Maekawa's algorithm for mutual exclusion. (13)

Or

- (b) Give the distributed algorithm for deadlock detection and illustrate with an example. (13)
15. (a) Discuss about the issues in design load balancing algorithms. (13)

Or

- (b) Describe the issues in designing thread packages. (13)

PART C — (1 × 15 = 15 marks)

16. (a) In the ring-based election algorithm, two or more processes may almost simultaneously discover that the coordinator has crashed and then each one may circulate an election message over the ring. Although this does not cause any problem in the election, it results in waste of network bandwidth. Modify the algorithm so that only one election message circulates completely round the ring and others are detected and killed as soon as possible.

Or

- (b) In client server model that is implemented by using a simple RPC mechanism, after making an RPC request, a client keeps waiting until a reply is received from the server for its request. It would be more efficient to allow the client to perform other jobs while the server is processing its request. Develop a mechanism that may be used in this case to allow a client to perform other jobs while the server is processing its requests.

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Question Paper Code : 80301

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Computer Science and Engineering

CS 6601 — DISTRIBUTED SYSTEM

(Common to Sixth Semester Information technology)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Name five reasons why to build distributed system.
2. Discuss the design issues in Intranet.
3. Write the characteristics of multicast communication.
4. Define Network virtualization.
5. Give the advantages in using name caches in file systems.
6. List the file accessing models.
7. Define nested transactions.
8. What is clock's drift rate?
9. Write down the goals to achieve an optimal assignment.
10. List the features of scheduling algorithms.

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) List the various challenges in distributed systems and explain them. (10)
- (ii) How resource sharing is done in distributed systems (6)

Or

- (b) Elaborate on the recent trends in distributed systems. (16)

12. (a) Illustrate TCP and UDP communication with suitable example programs. (16)

Or

- (b) Explain any two indirect communication techniques in detail. (16)
13. (a) (i) Explain in detail about naming in file systems. (8)
(ii) With neat sketch explain Routing Overlays in detail. (8)

Or

- (b) (i) Describe in detail about Andrew File system in detail. (10)
(ii) Discuss on File Sharing semantics. (6)
14. (a) (i) Explain distributed mutual exclusion with suitable algorithms. (8)
(ii) Elaborate on any three election algorithms. Use diagrams wherever necessary. (8)

Or

- (b) (i) Describe atomic commit protocols in detail. (8)
(ii) Explain replication in detail. (8)
15. (a) (i) Explain the thread models and the issues in thread implementation with diagrams.
(ii) Describe the features of process migration.

Or

- (b) (i) Discuss the load balancing approach of resource management in detail. (8)
(ii) What is meant by load sharing? Explain any one algorithm of load sharing to manage resources. (8)

[illegible]

Question Paper Code : 50396

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Sixth Semester

Computer Science and Engineering
CS 6601 – DISTRIBUTED SYSTEMS
(Common to : Information Technology)
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART - A

(10×2=20 Marks)

1. Define Transparency.
2. List any two resources of hardware and software, which can be shared in distributed systems with example.
3. What are the three types of communication paradigm in distributed system ?
4. Differentiate persistent and non-persistent connections.
5. Give the characteristics of peer-to-peer middleware.
6. What is naming and locating facility ?
7. What are the techniques used to synchronize clocks ?
8. Write down the types of messages in Bully algorithm.
9. What thread operations are the most significant in cost ?
10. What are the priority assignment policies ?

50396



PART – B

(5×16=80 Marks)

11. A) Write a brief note on each of the challenges of distributed systems. (16)
(OR)
B) Elucidate the trends in distributed systems. (16)
12. A) Explain in detail about the fundamental model of communication in distributed systems. (16)
(OR)
B) Explain in detail the RPC architecture with the functionality of its components. (16)
13. A) Discuss about the Pastry Routing Algorithm in detail. (16)
(OR)
B) i) Briefly describe about the file accessing models in distributed environment. (10)
ii) What is name cache ? List out its types. Also discuss about the working of LDAP. (3+3)
14. A) i) Examine how mutual exclusion is handled in distributed system. (8)
ii) Examine briefly about global states. (8)
(OR)
B) i) Discuss in detail about one phase and two phase atomic commit protocol (flat and hierarchical). (8)
ii) Write in detail about CODA. (8)
15. A) Define threads. Explain all multithreading models and thread issues. (16)
(OR)
B) List out the issues in load balancing algorithm. Discuss about any four policies of load balancing algorithm. (16)

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Question Paper Code : 20372



B.E./B.Tech DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Sixth Semester

Computer Science and Engineering

CS 6601 — DISTRIBUTED SYSTEMS

(Common to Information Technology)

(Regulations 2013)

Time : 3 hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is location aware computing?
2. State any four factors to be considered for variations in client server model.
3. Compare the communicating entities : Object, components and web services.
4. "Tiered architectures are complementary to layering" — Comment.
5. What is Napster?
6. Define Gnutella.
7. List the methods to ensure serializability.
8. State the issues in Clocks.
9. Draw the pictorial representation of lifecycle of Java Thread.
10. What is User-Mode Scheduling (UMS)?

PART B — (5 × 13 = 65 marks)

11. (a) (i) What is the need for distributed system? List the distributed systems challenges. (5)
(ii) Identify the five types of hardware resource and five types of data or software resource that can be shared efficiently. Give examples. (8)

Or

- (b) (i) Elaborate the design issues to be considered for spontaneous networking. (5)
- (ii) A user arrives at a railway station for the first time, carrying a PDA that is capable of wireless networking. Suggest how the user could be provided with information about the local services and amenities at that station, without entering the station's name or attributes. What are the technical challenges to be addressed? (8)

12. (a) (i) Discuss on Distributed Shared Memory (DSM) with suitable illustrations. (8)
- (ii) Consider a simple server that carries out client requests without accessing other servers. Explain why it is generally not possible to set a limit on the time taken by a server to respond to a client request. What should the server do, to execute requests within a bounded time? (5)

Or

- (b) (i) What is Publish-Subscriber Systems? Explain its characteristic features with neat sketch. (8)
- (ii) Classify and tabulate the arbitrary failures with respect to class, affects and comments. (5)
13. (a) What is Pastry? Explain the Pastry's Routing Algorithm with pseudo-code. (13)

Or

- (b) (i) Explain File Service Architecture and Andrew File System with suitable sketch. (10)
- (ii) State the differences between Overlay networks and IP routing. (3)
14. (a) (i) State the problems in Cristian's algorithm. Explain how Berkeley algorithm overcomes the problems of Cristian's algorithm with neat sketch. (8)
- (ii) Describe the Central Sever Algorithm with neat sketch. State its performance measures. (5)

Or

- (b) Elucidate Coda architecture with respect to file systems, communication coda and processes in coda with necessary block diagrams. (13)
15. (a) (i) State the issues in load balancing algorithms. (5)
- (ii) What is Process Migration? State the issues in migration. Describe Negotiation in Migration process with neat sketch. (8)

Or

- (b) (i) Give a brief account on desired features of scheduling algorithms. (5)
- (ii) Define Thread. Elucidate the actions involved in multithreaded architecture and multithreaded models with appropriate sketch. (8)

PART C — (1 × 15 = 15 marks)

16. (a) A client makes remote procedure calls to a server. The client takes 5 milliseconds to compute the arguments for each request, and the server takes 10 milliseconds to process each request. The local operating system processing time for each send or receive operation is 0.5 milliseconds, and the network time to transmit each request or reply message is 3 milliseconds. Marshalling or unmarshalling takes 0.5 milliseconds per message.

- (i) Calculate the time taken by the client to generate and return from two requests :
- (1) if it is single-threaded, and (4)
- (2) if it has two threads that can make requests concurrently on a single processor. Context-switching time can be ignored. (8)
- (ii) Is there a need for asynchronous RPC if client and server processes are threaded? (3)

Or

- (b) (i) A client attempts to synchronize with a time server. It records the round-trip times and timestamps returned by the server is given in the table below. Which of these times should it use to set its clock? To what time should it set it? Estimate the accuracy of the setting with respect to the server's clock.

Round-trip (ms)	Time (hr:min:sec)
22	10:54:23.674
25	10:54:25.450
20	10:54:28.342

If the minimum time between sending and receiving a message in the system is 8 ms, is there any change in the derived solution? (7)

- (ii) Two processes P and Q are connected in a ring using two channels and they constantly rotate a message m. At any one time, there is only one copy of m in the system. Each process's state consists of the number of times it has received m and P sends m first. At a certain point P, has the message and its state is 101. Immediately after sending m, P initiates the snapshot algorithm. Explain the operation of the algorithm in this case, giving the possible global state(s) reported by the algorithm. (8)



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Question Paper Code : 91406

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Sixth Semester

**Computer Science and Engineering
CS6601 – DISTRIBUTED SYSTEMS
(Common to : Information Technology)
(Regulations 2013)**

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. List the challenges in the design of distributed systems.
2. Define pervasive networking.
3. What are the three important aspects of distributed systems that are modeled using fundamental models ?
4. What is marshalling ?
5. State any four characteristics of peer to peer systems.
6. What are the limitations of napster ?
7. Why does cascading aborts occur ?
8. What are the tasks of recovery manager ?
9. What is Load Sharing ?
10. "Thread is a lightweight process". Justify with an example.

PART – B

(5×13=65 Marks)

11. a) Explain in detail about the trends in distributed systems.

(13)

(OR)

- b) Consider a World Wide Web (WWW) distributed application design. Describe the characteristics and challenges in the above design when considering resource sharing phenomenon.

(13)

91406



12. a) Discuss about overlay networks with Skype as an example. (13)

(OR)

b) Write in detail about publish subscribe networks with a suitable example. (13)

13. a) Explain how does Andrew file system ensure the cached copies of files are up-to-date when files are updated by several clients. (13)

(OR)

b) Explain in detail about the squirrel web caching service based on Pastry. (13)

14. a) Discuss in detail about the following distributed mutual exclusion algorithms

1) The Central Server Algorithm

2) Ring Based Algorithm. (13)

(OR)

b) Why is computer clock synchronization necessary ? Describe the design requirements for a system to synchronize the clocks in a distributed system. (13)

15. a) What is context switching ? Describe in detail about process migration. (13)

(OR)

b) Discuss in detail about the Load Balancing approach in a peer-peer system. (13)

PART – C

(1×15=15 Marks)

16. a) The Enterprise Java Beans architecture will be suitable to implement a massively multiplayer online games. If yes, give appropriate solutions. (15)

(OR)

b) Discuss whether message passing or DSM is preferable for fault-tolerant applications. (15)