

11B1WCI835: Storage Networks

Course Credit: 3

Semester: VIII

Introduction

This course involves study of various aspects of storage networks which include the design model SAN, NAS, DAS, CAS, etc. and the various technologies like SCSI, Fiber Channel, INFINIBAND, IP Storage etc.. The format of the course will be lecture-discussions, assignments. Students are strongly encouraged to participate actively in class discussions.

Course Objectives (Post-conditions)

Knowledge objectives:

To strengthen the ability to design and implement the various aspects of storage networks which include the design model SAN, NAS, DAS, CAS, etc. and the various technologies like SCSI, Fibre Channel, INFINIBAND, IP Storage etc.

Students will be able to:

- Know About various components and protocols used for creating storage networks.
- Know about various technologies existing for storage networks
- About Storage virtualization.
- Existing techniques for management of storage networks

About Data Centers and Distributed Storage Networks

Application objectives:

1. To develop, design and implement SAN Architecture.
2. To understand use of FCSAN, IPSAN protocols and RAID levels.
3. To understand and simulate the File system and virtualization algorithms.
4. To understand and simulate the Hadoop Distributed file system.

Expected Student Background (Preconditions)

Students should have basic knowledge about the functioning of various components of computer system.

Topics Outline:

S NO	Topics	Hrs
1	Intorduction to Storage Technology Data proliferartion Overview of storage infrastructure components Evolution of storage Information Lifecycle Management concept Basic storage management skills and activities	2
2	Technologies for Storage Networks Disk Subsystems Overview	10

	Architecture of Intelligent Disk Subsystem JBOD: Just A Bunch Of Disks RAID & RAID Levels Hot Sparing Hard Disks and Internal I/O Channels Caching: Acceleration of Hard Disk Access	
3	I/O Techniques DAS, SAN, NAS, evolution, Storage Area Networks (SAN): elements & connectivity Fibre Channel SAN & Products IP SAN Technology & Products IP SAN elements, standards (iSCSI, iFCP, mFCP, FCIP and iSNS) Migration from SCSI and Fibre Channel to IP storage Network attached Storage: elements & connectivity	18
4	Management of Storage Network: Requirements of Management Systems Management Interfaces Standardized and Proprietary Mechanisms In-band & Out-band Management	6
5	Storage Virtualization The concept of storage virtualization Storage virtualization on various levels of the storage network Symmetric & Asymmetric Storage virtualization Performance of SAN virtualization Scaling storage with virtualization	6
	Total	42

References

1. Storage Networks Explained, Ulf Troppens, Rainer Erkens, ISBN 0-470-86182-7, John Wiley & Sons
2. Storage Networks: The Complete Reference, R. Spalding, ISBN:0072224762, McGraw-Hill
3. Storage Networking Fundamentals: An Introduction to Storage Devices, Subsystems, Applications, Management, and Filing Systems, Marc Farley, ISBN: 1-58705-162-1, Cisco Press.
4. Designing Storage Area Networks: A Practical Reference for Implementing Fibre Channel and IP SANs, Second Edition", Tom Clark, ISBN: 0-321-13650-0, Addison Wesley

Evaluation Scheme:

S.No	Examination	Marks
1	T-1	15
2	T-2	25
3	T-3	35
4	*Internal Marks	25

*Internal Marks Breakdown:

Assignments 9 marks (3x3)

Quizzes 12 marks (3x4)

Regularity 4 Marks