

DSPACE Solution and related infrastructure up-gradation at Centre for Digital Library and Documentation (CDLD)

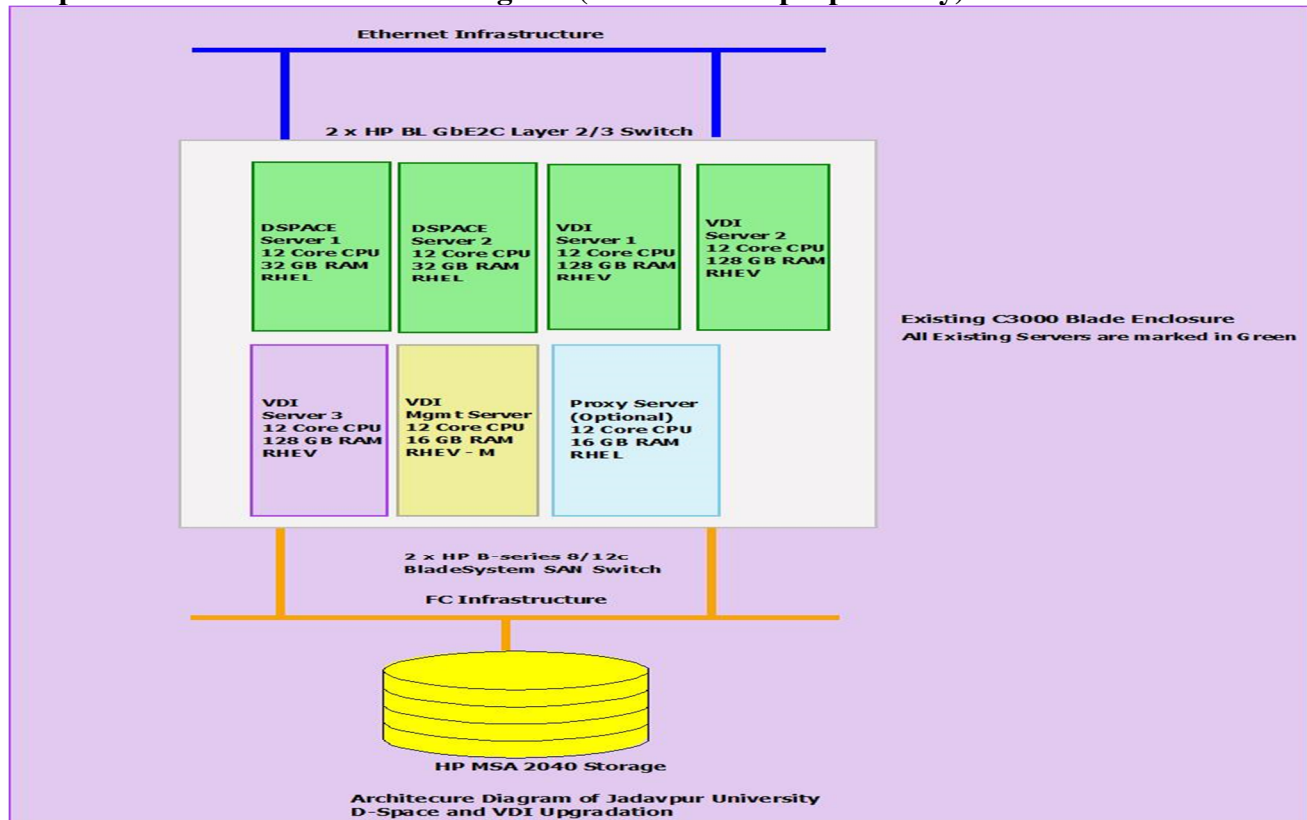
The Centre for Digital Library & Documentation has a learning Resource Centre (LRC) and a reading room. The Digital Library Management Software DSpace, developed by MIT, USA and Hewlett Packard has been installed. It is an open source software and has been customized to suit our requirements. DSpace accepts all forms of digital materials including text, images, video and audio etc. files. The Institutional Repository is being built in the CDLD.

The Learning Resource Centre has been set-up with sixty nodes for Teachers, Students, Research Scholars and Academic Administrators for retrieving On-line journals/books and for internet browsing. The Hardware infrastructure for archival of rare texts, Ph.D. theses has been installed.

Solution Requirement in brief:

- Migration of DSpace application / database to the new upgraded servers
- Upgraded and New Servers will be provisioned for Dspace solution, Desktop/Session Virtualization/VDI solution,
- VDI/Virtualization management for Proxy solution (Optional).
- The solution should be highly available and configured with RAS features.
- 70 Numbers of Desktop virtualization solutions required to make the library independent of desktops already provisioned.
- Power, Cooling and Space reduction for green data center initiative.

Proposed Solution Architecture Diagram (for indicative purpose only)



Existing Setup :

HP Blade Chassis with 4x Blade Servers (Model: C3000 BL460) with following configuration :

CPU : E5-2630L,2.0 GHz, 1333,1066,800 DDR3 only MHz, 20MB CPU
Memory :16GB PC2-5300 fully buffered DIMMs at 667 MHz scalable to 128GB or
Hard Disk Drive : 2 x 300GB 10K rpm SFF SAS Hot Plug or higher
Hard Disk Controller : SAS based supporting RAID 0/1
Multifunction ports : Minimum 2 gigabit ports
Fibre Channel Ports : Min 2 ports 8 Gbps
Management : OS independent hardware health status
Keyboard : Virtual KVM based remote control
Power Management : Remote power control

HP DESKTOPS (70 nos)

System Model : HP dx2000 MT (PK063PA)
BIOS : BIOS Date: 07/02/04 16:15:19 NR146 BIOS Rev: 1.09
Processor : Intel(R) Pentium(R) 4 CPU 2.80GHz
Memory : 246MB RAM (266MHz)
Hard Disk Drive: 80GB
Monitor : HP 15" CRT monitor
Keyboard : HP 102 key Standard keyboard (US layout)
Mouse : HP Wheel Mouse
Operating System : Windows XP

Solution Details : D Space & LDAP, Desktop / Session Virtualisation

Dspace Digital Repository Solution is used for preserving the digital assets like Books, Teaching Notes, Project Reports, Question Papers, Video Courseware, NPTEL Content, Journals, Thesis, Seminar notes etc. of Institution in multimedia formats including text, graphics, animation, video, audio and images. The whole solution works on the network in the intranet / internet format for concurrent sharing by multiple users. DSpace is developed jointly by ‘Massachusetts Institute of Technology’ MIT Libraries and ‘Hewlett-Packard’ HP as an open source system which can be customized and extended as per the specific requirement.

The Lightweight Directory Access Protocol (LDAP): LDAP is a set of open protocols used to access centrally stored information over a network. The main benefit of using LDAP is that information for an entire organization can be consolidated into a central repository, allowing single sign-on for various applications.

Solution Details:

Blade enclosures considered and total 7 Number of blades are provisioned namely for upgradation of DSpace solution, Desktop Virtualization, and Proxy server.

DSpace-

2 numbers of existing C3000 BL460 Servers, 2 Processors having total of 12 Cores in each server will be required for DSpace solution implementation. Up gradation of these existing servers has been proposed to 12 CPU cores and 32 GB Memory. **RHEL** will be the platform for hosting of DSpace solution. DSpace will be implemented on Redhat Enterprise Linux.

Desktop Virtualisation Environment (VDI)-

3 nos. of C3000 BL460 server will be configured for Virtual Desktop environment in high availability mode. Out of these 3 servers, 2 no. of servers are existing. These servers will be having 12 CPU Core and 128GB of RAM in each server.

One server has been considered as standby. (optional)

Desktop/SessionVirtualisation to be deployed using Virtualisation software as required for server and clients to deliver Microsoft and Linux access both as desired for all existing desktops which will be used as Thin Clients.

One new BL460 has been considered for Virtualization manager deployment. This server is having 12 core and 16 GB of memory.

All the Blade servers are connected to the central storage via SAN switch of the enclosure. Single SAN switch is considered. Redundant SAN switch may be quoted as an option. The enclosure is connected to the network via Ethernet Module. The central Storage has been proposed with 5 TB of RAW Storage space for current and future use. Snapshot and clone features of SAN may be used for data redundancy.

Wherever mentioned VDI refers to Desktop/Session Virtualisation for Client Desktops.

Software and Services Specification of DSpace for Digital Repository:

Customizing DSpace Meta Data-

This involves customizing the DSpace Meta Data to incorporate the metadata fields as per the Institutions' requirements. This would also incorporate the indexing of the metadata for the search functionalities, like "Free Text Search" and "Advanced Search", in the digital repository.

Customizing Lucene Search-

This will involve customizing the indexing and search pages so as to search using the customized metadata.

Deliverables-

Deliverables for this project would be as stated below:

- Requirement Analysis Document Customization of DSpace as per requirements.
- Deployment of DSpace in production servers Conduct of the solution testing along with designated personnel of the Institutions
- Conduct the user training for 2 days to the designated personnel of Institutions
- Installation Document

Compliances of DSpace Required-

A] It must provide high degree of compliance to international metadata standards such as MARC-21, DOI, METS, MODS, UNICODE, XML and Dublin Core. DSpace support only the Dublin Core Metadata Standard

B] The software should allow seamless import of metadata directly from freely available MARC-21 data sources on the web. Different Utilities can be written to convert data from one metadata standard to another metadata standard

C] The software should allow the creation of Compatible metadata for all kinds of information Objects including technical reports, engineering drawings, images, etc.

D] The software should also have the z39.50 client capabilities for federated searching of web-based databases.

E] Must be based on n-Tier Client-Server Architecture to ensure easy scalability when a library needs require it to move into higher-end database and/or application server and web Technologies over a period of time.

F] Should allow the attachment of digital objects such as full text in PDF or MS-Word, image, files, sound, video clips, etc., to metadata records.

G] Digital objects which are attached must be available for viewing/download to authenticated users of the online public access catalogue (OPAC).

H] The online public access catalogue (OPAC) should be browser-based module and an integral part of the software offering.

I] Should allow the OPAC to be hosted on a web site or public domain IP address.

J] The offering should be available with open source back-end Relational Database Management System (RDBMS) servers. DSpace is compatible with Oracle, Postgre SQL Databases

K] Must be available on open source operating systems such as Linux Red hat and above apart

from the Windows 2000 and XP operating system family.

- L]** The system should have customizable database architecture with efficient data archiving, migration, retrospective, conversion and retrieval as per requirement of the University. DSpace support Oracle and Postgre SQL which are customizable
- M]** The system module should accommodate live data input and editing at different levels. DSpace provides in built Workflow system. The users can be assigned roles like Submitter, Reviewer, Approver, Administrator
- N]** The system should offer Intra- and Inter-net sharing of resources with similar repositories of other institutions. DSpace support Metadata Harvesting for data sharing between two instances of DSpace
- O]** The system should allow ample scope for further research and training with the software. DSpace architecture is based on J2EE platform. DSpace can be customized in terms of the following points-
 - User interface: Customize the metadata
 - Configure Browse and Search: Configurable database
- P]** Licensing- default license with creative commons for specific collection.
- Q]** Access restriction- Embargo setter and/or IP authenticated access.
- R]** Mail based new user registration mechanism and RSS feed.
- S]** XML-UI interface with Mirage (using Cocoon etc.) for better interface theme, multilingual support etc.
- T]** The site: DSpace@MIT (<http://dspace.mit.edu/>) shall be followed for DSpace installation, customization, migration etc.

Scope of Work for Dspace Solution:

- Meeting with end user to collect the requirements and finalize the plan
- Customization of DSpace and Metadata as defined in customization of Metadata section in this document.
- Customization of Lucene search Engine as defined in this document
- Installation of OS and layered components: Installation of Operating System and layered products like Apache Web Servers, SendMail System, Samba Services, and infrastructure services like DNS client services
- Prerequisites Software Installation: Installation of prerequisite software for Dspace, which includes various Java patches and layered Java products, like java activation services, mail api layers etc.
- Installation of Apache: Installation and configuration of secured (SSL) Apache for use with Dspace.
- Installation of Tomcat: Installation and configuration of Tomcat for use with Dspace.
- Install Dspace: Install and configure Dspace. This is base configuration
- Configure PostgreSQL: Configure postgresql
- Configure Dspace: Configure Dspace for usage by user community
- Creating sample Users and setting permissions: Create sample users with varying access rights for participation in Dspace digital library.
- Initialize (run scripts): Automate startup and shutdown procedure of dspace
- Providing the feature for live data input and editing at different level of workflow
- Providing the feature to create users with different rights i.e. Submitter, Reviewer, Approver and Administrator, in Digital library.
- Provision of full text search and advance search functionalities in digital library.
- A sustainable production level deployment of infrastructure to host the digital Repository.
- Create Communities and collections in consultation with user department
- Setting up the proper access permission to communities , collections , items and bit streams as per the guidelines from user department
- Customizing Home page design and providing links to other related sites
- Integrating mail system for communication and alerts

- Statistics configuration
- Integration with of LDAP authentication system
- Implement embedded Video Streaming
- Initialize (run scripts): schedule backup
- Training on Administration and usage: Administration of Dspace. Demonstrate key concepts in Dspace to user groups
- Consulting technical support of Dspace solution for 1 year.
- RSS Feeds Implementing RSS feeds for Dspace Collections and items Investment Outlay
- Upgradation and Migration of Dspace should provide the following
 - Granular Access Permissions
 - Supports OAI-PMH 2.0
 - Follows latest Metadata standards - Dublin Core
 - Uses CNRI Handle system
 - Uses Lucene Search Engine for efficient retrieval
 - Statistics
 - Users & User Groups
 - Embargo Feature
 - Multiple Language
 - New “Bootstrap” Look of Dspace JSPUI
 - Discovery in JSPUI
 - Major support for indexing in Google and Google Scholar
 - Bibliographic Import of Data from 3rd party websites
 - Migration of Community and Collection via UI
 - Versioning of Items
 - Feature: Request a Copy
 - Feature: AJAX Status Bar during File Upload
 - Feature: Mobile Ready JSPUI / Responsive Theme

Implementation of LDAP

LDAP Services

LDAP Services will be setup and Institution staff will be trained to use the LDAP authentication system effectively. Sample users and configuration of LDAP for Dspace allowing single sign-on needs to be done.

Project Activities: Activity Description

- 1.] **Preparation of Requirement Analysis Document** : The institution will identify the concerned personnel to provide detailed user requirement to consultant. Consultant would visit the institution site for 2-3 days to meet the user and understand the user requirement would prepare the Requirement Analysis Document and would formally submit to the institution for approval. After the Requirement Analysis Document is approved by the institution then further activities would be carried out.
- 2.] **Software Application Design/Development and Testing**: Project Team would customize the DSpace/LDAP as per the requirement mentioned in Requirement Analysis Document.
- 3.] **Identification of Data Center for deployment**: Institution would finalize the Data Center and would ensure the readiness of Hardware, Operating System and Networking prior to deployment.
- 4.] **Deployment at the Production servers**: The institution would make arrangements for making data center ready and facilitate project team to perform deployment.
- 5.] **Training**: The institution will identify the Trainees and facilitate training facilities. Vendor will arrange the training at the site.
- 6.] **User Manual**: Vendor would provide user manuals to the institution in electronic form and one printed Copy.

Desktop Virtualisation / Thin Client Session - Specific Features of Solution :

- ☐ User has flexibility of operating environment without administrator's interference or Rebooting
- ☐ User can store their data based on their login which will not be available to others unless permitted ensuring no data loss
- ☐ No backing up of all desktops required
- ☐ Centrally administer and enforce rules and policies
- ☐ Software updates and upgrades will be central and one shot
- ☐ Security and High Availability on Server Side through RHEVM/VMware/Hypervisor based solution
- ☐ All data is centrally stored and backed up
- ☐ All clients are flexible; meaning any user can get their server and data on any machine anytime
- ☐ Old as well as new applications can be used by running them on servers and accessing in a thin client mode
- ☐ The lab setup can be used for other purposes because it is easy to re-provision in a Virtual / thin client session mode
- ☐ Exploit the hardware resources to the full and avoid costly upgrades
- ☐ Server upgrade automatically improves client experience and performance

Additional components required for above solution :

Blade Server – Dual CPU Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/8.0GT-s QPI/60W) / 32GB DDR3 memory / 2*300GB SAS HDD / Dual Port FC HBA / Dual Port 10Gb Ethernet Port /3 years warranty/ RAID controller with support for RAID 0, 1/ 3/5 years warranty

CPU upgrade - Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/8.0GT-s QPI/60W)

Memory Upgrade – 8GB memory modules @ 1333MHz or higher

SAN Switch: Internal Blade SAN switch with requisite downlinks to server bays and minimum 4 number uplink port for SAN connectivity. SAN Switch should be populated with the required number of 8Gbps SFP modules for both uplink and downlink connectivity.

SAN System - Fibre Channel external storage system with Two Fibre active – active RAID controllers having a minimum of 4GB Cache per controller after removing the overhead of operating system. Offered Storage system shall be supplied with minimum of Dual 16Gbps FC ports and Dual 10Gbps ISCSI ports per controller. Should support hot plug expansion and replacement of hard drives, redundant controllers, fans and power supplies. SAN to be configured with 5TB raw capacity using 900GB SAS HDD@10K rpm.

Offered storage subsystem shall support minimum 512 Logical units with LUN size support more than 40TB at storage controller level. Storage Array shall support at-least 180 Enterprise SAS drives. Should support Windows server 2008 / 2012, Linux, VMware.

Operating System : RedHat Enterprise Linux 2 socket , 1 guest with one/three years subscription support

Virtualization Software : RedHat Enterprise Virtualization/VMware or Microsoft including requisite MS licenses for all virtual/thin clients for legal usage

All other hardware and software components to be provided as is deemed necessary for the solution to function as per the scope and features provided in this document.

Dspace Implementation and Support (Services for Implementation, Customization and Services for Customization, Installation and Training of DSpace at customer place as per the Scope of Work, 1 Year Tele & remote technical support) Configuration of Central Authentication System using LDAP, Configuration of DSpace current version.

Virtual /Thin Client setup and implementation with existing PCs.

Hardware Implementation for above.

New 17/18.5 "HP Monitors ,70 nos along with 10 desktops - HP Model 3330MT Corei3-3240/2GB/500GB/No ODD/Win8Pro Downgrade/3-3-3/18.5" LED

RHEL/Windows Server with Hypervisor/VMware, High availability S/W as required for above.

Bill of Material (Revised as per resolution in the pre-bid meeting dtd. 31/05/2014)

Sl. No.	Items	Qty
1	Blade SAN Switch (3 & 5 years warranty)	1
2	Processor Upgrade- Intel E5-2630L (3 & 5 years warranty)	2
3	Memory upgrade(with 8GB DIMMs)(3&5 years warranty)	42
4	New Blade Server with Xeon CPU x 2 for VDI Management (3 & 5 years warranty)	1
5	SAN System 5TB (3 & 5 years warranty)	1
6	RHEL Srv., 2 skt., 1 Guest 9 x 5 1yr & 3 yrs Lic.	6
7	RHEV /Windows Server with Hyper visor/VMware (1yr & 3 yrs Lic.)	Quantity may be quoted as required for complete solution to function with proper justification
8	High-Availability Software as required for above	
9	New 18.5" LED Monitor (HP/Samsung/LG) (3 & 5 years warranty), Buyback option for HP 15" CRT monitor may be provided	70
10	Desktop: Corei3-3240/2GB/500GB/No ODD/Win8Pro Downgrade/3-3-3/18.5" LED (3 & 5 years warranty), Operating System may be quoted as an option.	10
11	Implementation of H/W and Virtualisation with Support	1
12	Dspace and LDAP Implementation and Support (Services for Implementation, Customization, Installation, Migration and Training of DSpace at customer place as per the Scope of Work, 1 year & 3 Years Tele & remote technical support) Configuration of Central Authentication System using LDAP, Configuration of DSpace Version 3.1 or, above (may be latest stable version).	1

Pl. note that the offer should clearly include the time-frame for supply, installation, customization, migration and implementation of the CDLD up-gradation work.