

File No: 59-4/9/2023-Rep(D)/com unit
National Archives of India
Ministry of Culture
Government of India

07/12/2023

Minutes

Presentations were made by 7 bidders who had participated in the Expression of Interest (EOI) for IT Solutions vide Tender Reference No.: 59-4/9/2023-RepD/Com Unit, Tender ID 2023_NAI_775397_1 on 06th December 2023 at 10:30 AM in the Atrium, Annexe Building, NAI. The meeting was chaired by DG, NAI in the presence of following NAI officials and approved External Members for said Expression of Interest (EOI) for IT Solutions of National Archives.

1. Dr. Sanjay Garg, DDA(G), NAI
2. Syed Farid Ahmad, DDA(F), NAI
3. Smt. Kalpana Shukla, DDA(KS), I/C, NAI
4. Sh. Shah Nawaz Khan, Sr. Dir. (IT), HOD NIC, MOC
5. Dr. Smruti Ranjan Sarangi, Prof. Department of Computer Science & Engineering, IIT Delhi
6. Shri Anil Kumar Pipal, Scientist 'G' & Group Coordinator, MeitY
7. Dr. Shailesh Kumar B. Solanki, HOD of Gujarat Abhilekhagar,
8. Sh. J.K. Luthra, I/C Com Unit, NAI
9. Dr. Sumita Das Majumder, ADA (R), NAI

1. A total of 9 bidders had applied for the said EOI, out of which only 7 bidders made presentations regarding the required complete Archival storage solution and Connectivity between NAI, RO, RC's and other locations. Bidders were invited in alphabetical order, and they made their presentations in front of all other bidders as per the following list:

S.No.	Bidder	Remark
1	M/s Bharat Sanchar Nigam Limited	Present
2	M/s Cloudmojo Tech Private Limited	Present
3	M/s Corporate Infotech Pvt Ltd	Present
4	M/s Cyfuture India Pvt Ltd	Present
5	M/s E Square System & Technologies Pvt Ltd	Present but did not make presentation

6	M/s Iron Mountain India Pvt Ltd	Present
7	M/s Railtel Enterprises Limited	Absent
8	M/s Tata Communications Limited	Present
9	M/s Writer Business Services Private Limited	Present

The main points come out from the above presentations are as follows:

1. M/s Bharat Sanchar Nigam Limited (BSNL)-

- Proposed use of AI for creating multiple use-cases such as chatGPT like search.
- 3 Options were provided for archiving data in two sites DC & DR.
- Proposed to deploy server/storage at NAI scanning locations.
- Storage built on open source – CePH and commodity hardware, removing vendor lock-in for long-term and also the use of NVMe access.
- Use of virtual desktops for editing & quality check vendors to avoid movement of large amounts of data. Improve productivity of the vendors.
- Has experience of delivering similar solutions to other Govt Organizations Election Commission of India, Ministry of Health, Ministry of Finance, Ministry of Defence
- Bandwidth/Network availability on fiber across India adds to their strength.
- In House cloud and Data Centre capability and serves many Govt departments being a PSU.
- Since BSNL is a central public sector undertaking under the ownership of the Department of Telecommunications, Ministry of Communications, Government of India, the data security (being the prime concern), would not be an issue.

2. M/s Cloud Mojo-

- Hybrid Solution, Pay as You Go Model.
- They have a consortium with Tata tele business services and Fujifilm. The major roles of each of them are as follow Cloud Mojo- System Integration, Managed Service, ROCK VAULT Software. Tata Tele- Sites Connectivity, Bandwidth, Microsoft Azure and Fujifilm- LTO Technology, Offline Backup, Disaster Recovery.
- Microsoft Azure archival also uses tapes.
- Has not delivered similar solution to any other customer.
- The data backup rule 3x2x2 and 4x2x2 model.
- Turtle Solution offers manual movement of tapes.
- They have offered the commercials rates also
- Single Vendor lock-in/Dependency

- Bandwidth/Network /Cloud dependability on third party service providers.

3. **M/s CIPL-**

- Deployment of resilient robust scalable highly available overall IT infrastructure across DC, DR, and cloud ready comprising of secured data storage, trustful network without packets drop, simplified managing and monitoring of complete IT.
- Deployment of geographically separated DC and DR site which will help in achieving zero data loss using secure data replication and data protection at local sites.
- High performance in NVME SSD based solutions for production data such as Document Management System (DMS) and PDFs. and NL SAS-based for archival of JPEG/TIFF formats.
- Secure Connectivity across DC,DR and remote sites to ensure highly available Network with zero loss traffic and integrated data security.
- Ensure resiliency and business continuity, in depth visibility, Bandwidth Cost Saving.
- Flexible integration on existing and future cross organizational work flows and new vendors.
- Backup and recovery for critical data to maintain desired SLA's on Disk based backup storage and Tape library,etc
- Netapp storage solution, with no specific offerings to suite the specific requirements of NAI.
- Storage solution based on hard disks.
- Bandwidth /Network/Cloud dependability on third party service providers.

4. **M/s Cyfuture –**

- They offered to deploy Cloud solution
- The solution presented not have clarity on SLA
- Bandwidth/Network/Cloud dependability on third party service providers.
- The vendor is using object storage-MINIO,
- They proposed two ways of strong data to cloud. One through Tiering option within MINIO and other by putting data in tapes (LTO, etc...).
- DC and DR connected through P2P line to eliminate any packet loss during replication
- JBOD with erasure coding in Object Storage and zoning in physical storage level used to ensure the zero data loss

- They have facilities of Monitoring Dashboard, Network monitoring tool, Virtual Firewall and VEEAM backup tool for backup and restoration. In Data Center in Noida NSEZ consisting of 500 Racks capacity to start with 20000 Sq. Feet Space, Redundant infrastructure, 99.982% uptime assurance.

5. **M/s Iron Mountain-**

- They offered hybrid storage solution from Quantum.
- They have proposed S3 compatible Object Storage of 27 TB per month on our MeitY Empaneled GCC.
- For ease of retrieval and searching of documents we have proposed Media Asset Management solution with inherent capabilities of AI based catalogue indexing, content discovery, Object detection, Metadata tagging.
- For ensuring data protection and disaster recovery we have proposed below two options:
 - Cloud Object Storage with Warm DR - Primary Site at WW DC1 and Secondary Site at WW DC2.
 - Cloud Object Storage with Cold DR- Primary Site at WW DC1 and Secondary copy at offsite location on Magnetic Tape in Vaults.
- They offered NVMe hard disc for active storage and LTO for cold storage
- Option to retain the ownership of assets such as Servers, Drives, Tapes from Day 1 as Capex + Datacenter Services option or asset ownership after 5 years to NAI.
- They propose to provide connectivity links of ILL/P2P between all the locations of NAI and the Scanning Center of Digitization Vendor
- Dedicated solution hosted in Webworks datacenters.
- Single Vendor lock-in/Dependency
- Bandwidth/Network /Cloud dependability on third party service providers.

6. **M/s TCL-**

- Offered combination of NAS + Object storage.
- Did not have reference customers as such for similar or equivalent deployments.
- Bandwidth/Network availability on fiber across India adds to their strength.

7. **M/s Writer-**

- Proposed a hybrid storage solution combining AWS Managed services like Amazon S3, Amazon Storage Gateway, and AWS Direct Connect to seamlessly connect on premise storage and cloud-based storage.
- The Amazon S3 storage have following classes S3 Standard , S3 Intelligent- Tiering, S3 Standard-IA, S3 Glacier IR and S3 Glacier Deep Archive
- Amazon S3 redundantly store six copies of NAI documents across 3 MeitY empaneled data centers. Amazon S3 is natively designed to provide 99.999999999% (11 9's) of data durability for stored data over a given year.
- The solution we are suggesting utilizes Amazon CloudFront to fetch the data from S3 bucket in Mumbai Region and storing it in S3 bucket in Hyderabad region in a cost-effective way.
- Ransomware Protection or Optional DR option : Provide Region Resiliency for S3 Storage Data. With End to End Audit Trail and Continuous logging, monitoring and alerts.
- They offered disaster recovery on Tape Storage - TBD
- They offered Storage area networks (SANs) of NetApp, designed to provide 99.999999999% durability
- AWS Direct Connect for Low Latency Transfers
- Amazon Cloud Front can be used as CDN to provide users low
- Latency access to static files like PDF, JPG.
- Writer Managed Services for Availability and Response
- Archival solution of AWS with options of using LTO tapes.
- Bandwidth/Network /Cloud dependability on third party service providers. (AWS)

The following points emerged after the presentation as follows:

1. Archival data with NAI is of national importance and has to be preserved carefully for all times to come. Although storage in archival cloud storage is a cost-effective option costing as low as USD 2 per TB per month and there is no capital investment required, it would be desirable to have at least one copy of data with and air-gap on an offline storage media, which is disconnected from the internet and cannot be corrupted or hacked.
2. Efficient network solutions for private and secure network since a huge volume of data need to be transferred across various channels.
3. The solution should take into account connectivity, accessibility, speed, mobility, security, scalability, quality, protection from data corruption, data leakage, data loss, and have an Air-gap.

The vendor needs to provide the solution for secure access of records along with audit logs.

4. Vendors should provide a solution with edge computing where only sanitized data should flow over the network
5. The solution should have a feature of conveniently locating any desired document by NAI.
6. Frequent data migration adds to the cost of a solution. The best approach would be to plan for 5 years along with data migration costs.
7. The cloud services should be used both for hot storage and cold storage. PDF-A files prepared under the upcoming projects of digitization of 30 crore pages, and also of the documents earlier scanned, should be hosted on NAI search portal i.e. Abhilekh-Patal. One copy of TIFF, JPEG/JPG and PDF/A files should be stored on archival cloud storage along with another on offline media as the disaster recovery.
8. The cloud services should preferably be within the geographical location in India and should be governed by Indian Law.
9. Concerns were raised on the unpredictable and humongous cost which may be incurred during downloading of data from archival cloud storage, if it is hosted on Global Cloud Service providers. Similar concerns were expressed about hot cloud storage, wherein higher charges are levied if the traffic on online portals increases beyond a certain limit. Cases where other departments had faced such challenges were discussed too.
10. BSNL brought up the point of US Cloud Act, which highlights the risk that data must be shared with US without any choice if the same is hosted with a company registered in US or has any relation/affiliation whatsoever with any US company.
11. However, all these aspects are taken into account by MEITY while empaneling cloud service providers.
12. A copy of TIFF, PDF(A) and JPEG/JPG files should be stored on offline media as the disaster recovery. LTO, Optical Disc and microfilm are the currently prevalent technologies for this.
13. Using microfilms for storing digital data in the form of 2D barcodes is a feasible technology but is prohibitively expensive in terms of initial capital cost, running into thousands of USD per TB. Optical (Bluray) storage is a comparatively cheaper option, but even that would cost between 10-20 USD per TB and the Bluray discs would need to be stored in vacuum chambers to prevent damage.
14. Linear Tape-Open (LTO) tape could help save cost for archiving data offline. Tape drives and LTO tapes are being manufactured by limited numbers of vendors, but are the most cost-effective

solution as on date. LTO tape vendor dependency was discussed in detail, and it was observed that almost all cloud service providers in the world are using this medium. Time taken in data migration from one tape to another is quite high, but this is usually a managed process that takes place in the background in an automatic fashion.

15. It was felt that replacement of media and data migration for the offline copy of archives should be part of the responsibilities of the vendor selected.
16. After considering all aspects, it was recommended that NAI should float a tender for procuring hot cloud storage for Abhilekh Patal, archival cold storage for TIFF/ JPEG/ PDF/A files along with appropriate access mechanism, and offline storage of the same data as DR on NAI premises along with equipment to access this offline data at six locations, i.e. NAI HQ, Lahore Shed, and all four RC/Ros for a period of thirty years. Migration of data as per need and replacement of offline storage media should be a part of the responsibilities of the vendor and a lifecycle cost-based approach should be followed while deciding the tender. QCBS approach should be followed to ensure quality of services.