

The **Data Storage Package** will meet the following specifications:

The system must be able to provide for online, near line, and off line data. The difference between online, nearline, and off line should be transparent to the user and any software used with the system. Nominal delays associated with, for example, reading from, and/or loading a tape is acceptable for accessing near line or off line data, respectively.

The online system is required to provide for 128 TB of usable disk space. Five hundred and twelve TB of space is preferred. One hundred TB of near line storage is required. It is desired that near line storage be 256 TB. However, the vendor may propose a different mix (or provide a number of options that differ only in amounts of online and near line storage) of online and near line capacity that is the most efficient cost effective mix for our application. The vendor may propose a tape or a disk based system for the near line and off line segments. However, it is required that there is the ability to make archival backups on removable media, which can be removed from the room housing the system.

Primary network connection, from the clients, to the hardware is 1 Gb/s wire ethernet. For each system that appears as a separate device from the user point of view, a 4 port Ethernet system is required. An 8 port capacity is preferred. The ability to upgrade to 10 Gb/s Ethernet is desired. As many as 25 clients should be able to attach to the server.

Uninterrupted Power Supplies (UPS) will be GFE. The vendor will provide information on how many APC model Smart UPS 3000s are required at least 4 weeks before installation. Provider must configure the system to shutdown gracefully during an extended power interruption.

The system must fit in no more than two side by side racks that are 28.875 in deep and that can be as tall as 55U. The systems must have all required hardware to mount the systems in these racks. The racks will be GFE. Provider will specify required rack space at least 4 weeks before installation. Additionally, vendor will provide any other information required to prepare the installation site.

The disk space, even if provided by multiple physical RAID systems, appears to be a single entity to the end users. If this is not possible then logical units will be made as large as possible to facilitate easier organization of the data.

Vendor will install all hardware. Installation means that all equipment will be rack mounted and required cables will be connected as needed to ensure the system is completely operational. Equipment will be connected to the NRL network once prudent virus scanning and testing is performed.

Vendor will provide system administrator training at an appropriate level. An appropriate level means that the assumed starting point is an experienced Linux administrator with further experience with GIS data server systems.

The **Data Organization Software Package** will meet the following specifications:

A data organization software package must be provided on its own server. First and foremost, the software must maintain data organization making it simple for end users to:

- 1) Catalog data including custom metadata formats
  - a. Must be capable of 'crawling" through storage space looking for data
  - b. Editing of metadata
  - c. Allow cataloging of associated data (ground truth data associated with the aircraft collected data (similar to "business" data)
  - d. Must be able to "watch" a particular directory structure and when new data shows up, it should follow created rules to automatically ingest, process (using user supplied codes), and catalog the data
- 2) Use a web based client to view either full or reduced resolution georeferenced images and visualize products on a map
  - a. The server must allow connections from windows, MAC, or unix clients
  - b. System should allow reprojection onto difference datums, subsetting of data, mosaicking of multiple images, section of bands (for MSI and HSI) for viewing
  - c. Search for data products based on location, date taken, data type, or other catalog attributes
- 3) Allow for automatic provisioning of data – creation of thumbnails, footprints, etc.
- 4) Ingest and work with vector data
- 5) Ingest and work with Geotiff, NITF, MrSid, BIL/BSQ, and HDF imagery files
- 6) Create and execute processing chains through an Open Geospatial Consortium (OGC) compliant Web Processing Service (WPS)
  - a. Run custom codes on data that may be found on multiple storage sites. The codes should run only on data sets that have the required characteristics and results should be provided back to the user
  - b. Processing occurs on server computer
  - c. View resulting products as new layers on map
  - d. Automatically catalog resulting products
- 7) System must allow user based security that controls access to data
  - a. By location of data
  - b. By product type
  - c. By user's login and file permissions on systems where the data reside
- 8) Allow for image delivery
  - a. Allow delivery of raw data, intermediary files, or product layers
- 9) Vendor will provide limited training not to exceed 3 days local to the Washington DC area.

#### Acceptance Testing

The vendor will demonstrate the following processes for the Data Storage Package:

- 1) The system powers on, fully boots, and can be connected to by a client
- 2) The system at maximum power draw is within the specification of the requested UPS
- 3) The entire system will shutdown gracefully when power is cut to any of the UPS systems

- 4) Movement of data onto the physical storage system either through an external drive or through a network connection.
  - a. Movement of data into the near line state
  - b. Movement of data into the off line state
- 5) The system retains information sufficient to retrieve data from near line and off line storage and place onto the online storage location.
- 6) Demonstrate that network bandwidth is within accepted levels

The Vendor will demonstrate the following processes for Data Organization Software Package:

- 1) Vendor will start the server software and demonstrate the clients can connect to the server
- 2) Using the client, the vendor will demonstrate the ingestion of a data in a standard format. Demonstrate provisioning and the ability to view the data on a client
- 3) Demonstrate viewing of extracted bands, altering datum, adding layers
- 4) Demonstrate the ingestion of data from multiple locations

Specification	Required	Desired
<b>Data Storage Package</b>		
Online disk based storage	128 TB	512 TB
Near Line storage (tape or disk based)	100 TB	256 TB
Option for additional online space	64 TB	256 TB
Option for additional near line space	32 TB	256 TB
Off line storage limited only be media	Yes	
Server 1 GB/s Ethernet ports	4 ports	8 ports
Server 10 GB/s Ethernet ports	4 ports	4 ports
System allows user based security settings	Yes	
Difference between online, near line, off line transparent to user	Yes	
System design allows for future expansion of online and near line storage capacity	Yes	
Number of 55U racks required to house system – smaller is better	2	1
Training on storage system	Yes	
Optional additional online storage		64 TB
Optional additional online storage		64 TB
Optional Additional Near Line Storage		64 TB
Optional Additional Near Line Storage		64 TB
<b>Data Organization Software Package</b>		
Data organization system runs on own server	Yes	
Server specifications are sufficient to support X number of clients	12	25

Cataloging can work through 'crawling" through predetermined directories	Yes	
Metadata , once acquired, can be edited	Yes	
Connect and process data using web based client	Yes	
Allows reprojection of data	yes	
Allows subsetting of images	Yes	
Allows for mosaicing of images	yes	
Allows data searches based on location, datum data type	Yes	
Allow for automatic provisioning of data	Yes	
Work with vector data		
Input data file formats	Geotiff, NITF, MrSid, BIL/BSQ, jpegs, World Jpegs and HDF	
Create and execute processing chains		
Allows user based security	Yes	
Allows image delivery	Yes	
Training class	Yes	