Republic of the Philippines
DEPARTMENT OF SCIENCE AND TECHNOLOGY
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)

TERMS OF REFERENCE FOR SUPPLY, DELIVERY, INSTALLATION, AND TESTING OF THE DEVELOPMENT OF RESEARCH AND DEVELOPMENT INFORMATION SYSTEMS

INFORMATION SYSTEM OVERVIEW

As part of the PAGASA Information and Communication Technology (ICT) to in-place a system of advanced observational and surveillance systems for meteorological and hydrological elements, satellite-based telecommunications network, super-computers for data processing, analyses; and computer-based workstations for generating increased volume of more detailed information, the Research and Development and Training Division (RDTD), aimed to develop an information system purposely for the division's, products and services entitled: **Research and Development Information System (REDIS).**

The system integrates the existing information system and components such as the Library and Training Management Information System, Numerical Modelling Information System, HydroMet TropMet and Instruments Research Information System and Astronomical Archive Information System as shown in Figure 1. REDIS will also function as the online resource center for PAGASA Employees and researchers and will serve as the home page of the Research and Development products and services.

Figure 1. **REDIS System Architecture**

Received by
R. PAULO 9/27/21

I. APPROVED BUDGET FOR THE CONTRACT (ABC)

The approved budget for the development of Research and Development and Training Division Information System including its subsystems were shown in the table below:

INFORMATION SYSTEM	ABC
COMPONENT A.1: Research and Development Information System (REDIS)	5,229,000
COMPONENT A.2: REDIS Storage Expansion	
COMPONENT B.1: Expansion of Library Holdings and Training Management Information System	
COMPONENT B.2: Numerical Modelling Information System	
COMPONENT B.3: HydroMet TropMet and Instrument Research Information System	
COMPONENT B.4: Astronomical Archives Information System	

II. QUALIFICATION OF THE BIDDER

(Please refer to Section B. Instruction to Bidders, the Bid Data Sheet and Checklist of Eligibility and Technical Requirements of the Bidding Documents)

III. DELIVERY PERIOD AND PLACE OF DELIVERY

The winning bidder shall deliver all hardware and software components including the delivery of the system but not limited to installation and configuration within the period of **nine (9) months** at the PAGASA Central Office located at PAGASA Science Garden Complex, BIR Road, Diliman Quezon City, and / or the onsite data center.

IV. BID PROPOSAL CONTENTS

The prospective bidder is expected to comply and respond in accordance with the specific instructions to bidders and submit all the documentary requirements under the Checklist of Eligibility, Technical and Financial Requirements. The submission of documentary requirements must be properly arranged in order and with labels.

The prospective bidder shall respond paragraph by paragraph and shall clearly indicate compliance to all the required specifications (*Please see Section V. TECHNICAL SPECIFICATIONS*) and shall specify the number of days or schedules within which to complete the delivery of all the goods required (*Please see Section VII. SCOPE OF WORK*).

The prospective bidder shall be required also to include in this proposal, original descriptive literature and unamended brochures of all equipment/materials to be supplied. If applicable, plans, drawings and diagrams/configurations must likewise be provided.

These details will allow the PAGASA-Bids and Awards Committee to fully evaluate and determine compliance from the prospective bidders. The following are additional requirements which will be part of the technical bid documents:

- Prospective bidders shall include certificates of experience within the five (5) year period in the installation, configuration, troubleshooting and other technical support services of the software and hardware of the system they are offering.

- Prospective bidders shall submit a Gantt chart showing the proposed schedule for the project.

- Prospective bidders must provide a list of their on-site local and warm body technical support to be deployed for the project accompanied by curriculum vitae and proof of their competency such as, but not limited to diplomas and certificates.

- Proposed Service Level Agreement which clearly indicates that technical support shall be provided no longer than four (4) hours on the time of the call, 24 x 7.

V. SUMMARY OF INFORMATION SYSTEM COMPONENTS

The winning bidder shall supply, deliver, install, test, and commission the components of the **Research and Development Information System as well as its components.** Likewise, for the detailed technical specifications of the following items please refer to *Section VI and VII.*

	UNIT	ITEM DESCRIPTION	QTY	PURPOSE
A.1.a A.1.b	sets	Desktop Workstation computer Laptop Workstation	2 13	Main System: REDIS
A.2.a A.2.b A.2.c A.2.d	sets	Storage Server (rack type) Desktop Computer Laptop 15" Laptop 13"	1 3 6 6	R & D dBase Storage Training Management System Training Management System Expansion of Library holdings
B.1.a B.1.b	sets	System Server (rack type) 24 ports Gigabit Network Switch	1 1	Local server for in-house development of R & D info sys Internet/ Intranet connectivity
B.2.a B.2.b	sets	Desktop Computer Laptop 13"	1 4	Numerical models
B.3.a B.3.b	sets	Laptop 14" Android tablet	3 6	HTMIRDS info sys Mapping, surveying, and on-site maintenance
B.4.a B.4.b	sets	Desktop Workstation computer Laptop 15"	1 2	Astronomy info sys

VI. DETAILED TECHNICAL SPECIFICATIONS (COMPONENT A)

The winning bidder shall supply, deliver, install, test, and commission the components of the **Research and Development Information System as well as its Subsystems** with the following minimum specifications:

A.1 Research and Development Information System (REDIS)

SPECIFICATION
A.1.a Desktop Workstation computer
Provide two (2) units with the following specifications or better: a. Intel core i7-8700 processor b. Windows 10 Pro or latest version of operating system c. Memory of 16GB DDR4 d. 512GB SSD capacity e. 2TB HDD capacity f. With 27" UHD touch display g. With Nvidia GTX 1050 graphics with 4GB VRAM h. Ports: 802.11AC WiFi +BT, HDMI Port, USB 3.1, and Type C i. Include UPS, wireless mouse and keyboard
A.1.b Laptop Workstation Computers
Provide thirteen (13) units with the following specifications or better: a. AMD Ryzen 5 processor b. Windows 10 latest version of operating system c. Memory of 16GB DDR4 d. 512GB HDD capacity with PCIe NVMe M.2 SSD e. 13.3" diagonal FHD IPS touch display f. AMD Radeon Vega 6 graphics g. Ports: 1 USB 3.1 Gen 1 Type-C (5 GB/s signaling rate, Power Delivery 3.0; Card Reader: 1 microSD media reader h. Laptop bag, and wireless mouse

A.2 REDIS STORAGE EXPANSION

SPECIFICATION
A.2.a Storage Server (Rack Type)
Provide one (1) unit with the following specifications or better: a. 2U rackmount server b. 16 Terabyte usable storage with Raid 5 configuration c. CPU of Intel® Xeon® E-2124 quad-core 3.3 GHz processor (burst up to 4.3 GHz) and 64-bit x86 architecture d. Support client OS like Apple Mac OS 10.7 or later; Linux and UNIX; Microsoft Windows 7, 8, and 10, and lastly Microsoft Windows Server 2003, 2008 R2, 2012, 2012 R2 and 2016 e. With encryption engine of AES-NI f. With system memory of 16GB UDIMM DDR4 ECC (2 x 4GB) g. With memory Slot of 4 x Long-DIMM DDR4 and flash memory of 5GB (Dual boot OS protection) h. Drive bay equivalent to 8 x 3.5-inch SATA 6Gb/s, 3Gb/s i. Compatible with 3.5-inch bays: 3.5-inch SATA hard disk drives; 2.5-inch SATA hard disk drives, and 2.5-inch SATA solid state drives, Hot swappable and support SSD cache acceleration

j. Four (4) gigabit ethernet port (RJ45)
k. With 2 x 10GbE SFP+ SmartNIC port
l. With wake on LAN (WOL) capability and jumbo frame
m. Have the following 4x PCIEe Slot: Slot 1: PCIe Gen 2 x4 (PCH); Slot 2: PCIe Gen 3 x8 (CPU); Slot 3: PCIe Gen 3 x4 (CPU), and Slot 4: PCIe Gen 3 x4 (CPU)
n. With USB 3.2 Gen 2 (10Gbps) Port: 2x Type-C USB 3.2 Gen 2 5V/3A 10Gbps and 4x Type-A USB 3.2 Gen 2 5V/1A 10Gbps
o. Power supply Unit of 300W(x2), 100-240V
p. Power consumption of Operating Mode (typical): 89.99 W
q. Operating system of QTS 4.3.5 (embedded Linux)
r. Support the following browsers: Apple Safari 7 or later; Google Chrome; Microsoft Internet Explorer 10 or later, and Mozilla Firefox
s. Support multi-language settings
t. Support the following file systems: Internal hard drive (EXT4) and External hard drive (EXT3, EXT4, NTFS, FAT32, HFS+)
u. With network and virtual switch (TCP/IP dual stack, jumbo frame, port trunking, DHCP server & client, RADVD, USB Wifi adapter, virtual switch, static route, NCSI, DDNS settings)
v. Support the following web server: HTTP/HTTPS Connections, Supports WebDAV Connection, Supports Virtual Host (Max: 32), and Importable SSL Certificate
w. Provide network security at least for: Network access protection with auto-blocking (SSH, Telnet, HTTP(S), FTP, CIFS/SMB, and AFP); Host access control for shared folders (CIFS/SMB); AES 256-bit folder-based and volume-based encryptions which are validated by FIPS 140-2 CAVP (Cryptographic Algorithm Validation Program), and 256-bit external drive encryption (AES)
x. Provide storage management for Supported RAID types: RAID 0, 1, 5, 6, 10, 50, 60, JBOD, Single; RAID Hot Spare and Global Hot Spare; RAID Rebuild Speed Customization, and Online RAID capacity expansion

A.2.b Desktop Computer

Provide three (3) units with the following specifications or better:

a. Intel core i7-8750H processor
b. Windows 10 Pro operating system
c. Microsoft Office version 2016
d. Cached memory of 12MB
e. Memory of 16GB SDRAM, 2666Mhz
f. Video memory of NVIDIA GeForce GT 730 with 4GB DDR3 dedicated memory
g. Hard disk capacity of 2TB 7200rpm SATA
h. Integrated HD audio
i. 23" Full HD, IPS, Anti–Glare LED backlit display
j. 802.11ac plus Bluetooth 4.2, dual band Gigabit Ethernet
k. Include 750VA UPS, wireless mouse and keyboard

A.2.c Laptop 15"

Provide six (6) units with the following specifications or better:

a. AMD Ryzen 5 4500U processor
b. Windows 10 Home operating system
c. Microsoft Office version 2016
d. Memory of 16GB DDR4, 2666Mhz, cached memory of 6MB
e. AMD Radeon Vega 8 Graphics
f. 15.6 inches diagonal HD SVA BrightView micro-edge (1366x768)
g. Hard disk capacity of 512GB PCIe NVMe M.2 SSD
h. Integrated HD audio, Realtek RTL8821CE 802.11ac, Bluetooth 4.2 combo, dual band Gigabit Ethernet
i. 15.6 Value Backpack, and wireless mouse

A.2.d Laptop 13"
Provide six (6) units with the following specifications or better: a. Intel core i5-10210U processor b. Windows 10 Home operating system c. Microsoft Office version 2016 d. Cached memory of 6MB e. Memory of 16GB LPDDR3, 2133Mhz f. Video memory of 2GB NVIDIA GeForce MX250 g. Storage capacity of 512GB M.2 PCIe NVME SSD h. 13.3 inches FHD Non-touch display i. 802.11ac plus Bluetooth j. Include Value Backpack, and wireless mouse

VII. DETAILED TECHNICAL SPECIFICATIONS (COMPONENT B)

The system integrates the four (4) components such as the Library and Training Management Information System, Numerical Modelling Information System, HydroMet TropMet and Instruments Research Information System and Astronomical Archive Information System.

B.1 Expansion of Library Holdings and Training Management Info Sys

SPECIFICATION
B.1.a System Server (Rack Type)
Provide one (1) unit with the following hardware specifications or better: a. 1x Rackmount Server b. Intel Xeon Gold 6252 2.1G, 24C/ 48T, 10.4GT/s, 35.75M Cache, Turbo, HT (150W) c. Windows Server® 2019 Standard,16CORE, FI,No Med,No CAL, Multi Language d. DDR-2933 and enabled iDRAC Group Manager e. 2.5 chassis for up to 10 hard drives and 3 PCIe slots f. LCD Bezel and Riser Config 4, 2x16 LP g. 3200MT/s RDIMMs, performance optimized h. 8x 16GB RDIMM, 3200MT/s dual rank i. 6x 1.2TB 10K RPM SAS 12 Gbps 512n 2.5in Hot-plug hard drive j. 3x 240GB SSD SATA Mixed use 6Gbps 512e 2.5in Hot-plug S4610 drive k. 1x PERC H740P RAID Controller, *GB NV Cache, Mini card l. With performance BIOS setting m. 5 standard fans for R640 an 1x Standard 1U heatsink n. 1x Dual, Hot-plug, Redundant Power Supply (1+1) 750W o. Broadcom 57412 Dual Port 10GbE SFP+ & 5720 Dual Port 1GbE BASE-T rNDC p. UEFI BIOS Boot Mode with GPT Partition q. 1x VMware vCenter Server 7 standard for vSphere 7 (Per Instance) 3yrs license and subscription r. With 1x vSphere standard preinstalled 1-CPU 3yrs term license and subscription s. With RAID controller (HW=0,1, 5, 6) t. Redundant power supply
B.1.b Gigabit Network Switch
Provide one (1) unit with the following hardware specifications or better: a. 10Gb, highly available connectivity between the virtualization environment and the storage system b. 1-rack-unit (RU) 24-port gigabit web smart switch. c. Provide 24x 1Gbe ports d. Provide 4 x 10GbE SFP+ fixed ports

e. Support stacking, IO to PSU airflow
f. Lifetime limited standard technical support and hardware warranty
g. With 3yrs ProSupport Plus: 7x24 (4-hour onsite service)
h. Supports IEEE 802.1Q VLAN on all Ethernet-based interfaces
i. Supports Q-in-Q
j. Supports NX-OS
k. Managed switch L2, Peripheral: 2x10GE SPF+ Transceiver, 2 Pair, 6meter Fiber

B.2 Numerical Modelling Information System

SPECIFICATION
B.2.a Desktop Computer
Provide one (1) unit with the following specifications or better: a. CPU - Intel Core i7-10700F 10th Gen processor b. RAM - 2x 8GB single DDR4, 3200MHz c. GPU - GTX 1660 Ti Ventus XS OC 6GB GDDR6 d. Motherboard that Supports 10th Gen Intel Core and Pentium Gold / Celeron processors for LGA1200 socket. e. PSU- 650W f. SSD with 240G Capacity g. HDD with 2TB Capacity h. 24" inches display monitor i. Aerocool Tor Pro Full Tower case j. With external PCIE Network Adapter, TP-Link TG-3468 PCIe k. With cooling system, ID cooling Auraflow X 240 SNOW RGB sync l. With liquid AIO CPU cooler m. Include UPS, Logitech MK120 corded desktop combo mouse and keyboard, and warranty
B.2.b Laptop 13"
Provide four (4) units with the following specifications or better: a. Intel Core i7 10th Gen b. Windows 10 Pro operating system c. Microsoft Office version 2016 d. 16GB memory e. 512GB SSD capacity f. 13.4" touchscreen display g. Include laptop bag, wireless mouse, and warranty

B.3 HydroMet TropMet and Instrument Research Information System

SPECIFICATION
B.3.a Laptop 14"
Provide three (3) units with the following specifications or better: a. AMD Ryzen 7 4800U processor b. Windows 10 Home operating system c. Pre-installed Microsoft Office lifetime license 2019 d. 16GB soldered DDR4-3200 e. 512GB hard drive capacity, PCIEx4 NVME SSD f. Radeon Vega 8 graphics video card g. 14" FHD IPS 300nits anti-glare graphic display h. 720 webcam and privacy shutter

i. 3-cell battery integrated up to 14 hours
j. Keyboard backlit, buttonless touchpad and fingerprint reader
k. Audio stereo speakers (Dolby Audio), 2x2W dual array mic, combo audio/mic jack
l. Wireless LAN: 11ax, 2x2 + BT 5.0
m. Include Logitech pebble wireless mouse M350 (white)

B.3.b Android tablet

Provide six (6) units with the following specifications or better:

a. Android OS
b. CPU Speed 3.09 GHz, 2.4 GHz, 1.8GHz CPU type octa core processor
c. 102.4GB available memory
d. 6GB RAM capacity
e. 128GB ROM capacity
f. 11.0" main display size
g. Resolution of 2560 x 1600, TFT technology and 16M color depth
h. Stylus Pen support
i. Rear camera resolution of 13.0MP + 5.0MP, and with autofocus
j. Front camera resolution of 8.0MP
k. Video recording resolution of UHD 4k (3840x2160) at 30fps
l. Include accessories such as book cover keyboard and Stylus Pen

B.4 Astronomical Archives Information System

SPECIFICATION

B.4.a Desktop Workstation computer

Provide one (1) unit with the following specifications or better:

a. Intel Core i7 10th Gen
b. Windows 10 Pro or latest version of operating system
c. Microsoft Office Professional Plus 2019
d. Memory of 16GB DDR4
e. 512GB SSD capacity
f. 2TB HDD capacity or higher
g. With 27" UHD touch display
h. With Nvidia GTX 1050 graphics with 4GB VRAM
i. Ports: 802.11AC WiFi +BT, HDMI Port, USB 3.1, and Type C
j. Include UPS, wireless Logitech mouse and keyboard, mouse pad

B.4.b Laptop 15"

Provide two (2) units with the following specifications or better:

a. Intel Core i7 8th Gen
b. Windows 10 Pro operating system
c. Microsoft Office Professional Plus 2019
d. RAM 16GB memory
e. Storage: 1TB
f. Keyboard backlit, fingerprint reader
g. 15.6 inches FHD
h. Include laptop bag, and wireless mouse

VIII. SCOPE OF WORK

The scope of work covers the supply, delivery, installation, configuration, testing, training of **Research and Development Information System as well as its Subsystems** with the aforementioned minimum specifications. The works and services to be performed under this contract shall essentially consist of, but not limited to, the following:

1. Implementation
a. Delivery, Installation and configuration of rack mount appliance a.1 Rackmount Server, a.2 Rackmount Storage Server, a.3 24 ports Gigabit Network Switch b. Delivery and testing of additional components c. Deploy at least five (5) virtual servers with specification limited to rack type server a. Maintenance and support for 2 years on servers and storage and 1 year on other components b. 24/7 Support services
2. System acceptance

The winning bidder shall assure that any manufacturing defects found on any hardware shall be corrected within the warranty period.

IX. GENERAL NOTES

Prior to the undertaking of the project, **the winning bidder** should submit and provide manuals and configuration, datasheets, brochures and other documents essential to the project. Should provide two (2) hard copies, and soft copies to end users.

X. WARRANTIES

The winning Bidder shall provide the following warranty:

a) 2 years warranty on servers and storage and 1 year on other components.

b) Availability of technical support services 24/7 via telephone, text, email, mobile phone, or SMS which include Remote Access Assistance thru internet web or VPN access during the warranty period.

c) The winning bidder shall neither assign, transfer, pledge nor subcontract any part or interest therein.

XI. TRAINING OF PERSONNEL

Agency Personnel should be provided with training to operate all proposed hardware and software. They should also be able to perform first (1st) level troubleshooting and problem identification with documented guide books and references.

Prepared by:

9/10/21

LORY JEAN L. CANILLO
Weather Observer II

Noted by:

SHARON JULIET M. ARRUEJO
RDTD-ISSP Project Leader

Recommending Approval:

ESPERANZA O. CAYANAN, Ph.D.
DA for Research and Development

Approved by:

VICENTE B. MALANO, Ph.D.
Administrator