

ANNOUNCEMENT NUMBER: (A) AB-2018/01 (08th January 2018)

Requests for Proposals for Small Modular Data Center

Bid Submission: 14:00hrs, 16th January 2018 (Tuesday)

Venue: *5th Floor - Elections Commission
Hilaaleemagu – Male' 20307*

REQUEST FOR PROPOSAL SPECIFICATION TO PROCURE SMALL MODULAR DATA CENTER

General Scope: Elections Commission is seeking procurement services for the acquisition of Small Modular Data Center. Bidders are required to advise on lead time. Bidders are to include key consideration for:

- ✓ Availability of product
- ✓ Doorstep delivery price
- ✓ Delivery Period
- ✓ Payment terms
- ✓ Should Include minimum 1 year Troubleshooting and Maintenance
- ✓ Team CV's and related documents

INSTRUCTION TO BIDDERS

- ✦ No allowances will be made for bidder's failure to obtain all relevant information prior to submitting a proposal.
- ✦ **Any minimum requirements specified herein must be met or exceeded and shall not be interpreted as limitations which could degrade quality in any manner.**
- ✦ **Achievements would only include the appreciations and awards received or obtained from suppliers /customers /Distributors, etc.**
- ✦ No requests for revisions or cost increases will be considered after submittal of proposal. It is the intent of the specifications to ensure that a high level of goods/ services quality is maintained.
- ✦ Proposals will be evaluated against the Point Allocation Table of for Bid Proposals attached as ANNEX_B ("Point Allocation Table for Bid Proposals").
- ✦ Each bidder is required to submit ONE (1) copy of their proposal in printed form.
- ✦ Any actual or prospective bidder who is aggrieved in connection with this solicitation or award of a contract may seek resolution of his/her complaints by contacting Secretariat of Elections Commission.
- ✦ Written competitive proposals, other submissions, correspondence, and all records made thereof, as well as negotiations conducted pursuant to this RFP, are deemed confidential. However, Secretariat of Elections Commission shall not be held responsible for any breach of confidentiality of any portion of a proposal once it is submitted.
- ✦ **By offering a submission to this RFP, the bidder certifies that they have not divulged to, discussed with or compared their competitive proposals or any information contained therein relevant to this proposal with other competitors in any manner.**
- ✦ **Lack of required submittals or furnishing inadequate information may be a cause for rejection of proposal.**

REQUIRED SUBMITTALS – TO BE FURNISHED ON SEPARATE SHEET(S)

Each Proposal must include all of the following submittals:

1) Proposal Response Form (as in ANNEX_A)

2) Bidder Representation (Name, address and phone number of a contact person(s) as per this RFP).

3) Statement of Qualification

a. Company Profile (Company profile with date the firm was incorporated or went into business). It is inevitable that company profile incorporate the following document(s) with it:

- i. Company License
- ii. GST Registration Certificate
- iii. Pension Registration Certificate
- iv. Tax Clearance Report (latest)
- v. Achievements (Appreciations or Awards received from dealers or clients)
- vi. Timeline of Work
- vii. Staff Team CV's and there related documents

b. **Proof of the recent contracts:** Similar in size and complexity to the work described in the specification (the document(s) should be on an official letterhead of the company, etc. and must have an authorized signature on it, and Date of project completion)

4) Statement of Quotation

- a. Payment terms
- b. Delivery period from the date of confirmation of the quotation

BIDDER REPRESENTATION:

- ★ I represent that this proposal is submitted in compliance with all terms, conditions and specifications of the Request for Proposal and that I am authorized by the owner/ principals to execute and submit this proposal on behalf of the business identified below:
- ★ Company Name: _____
- ★ Address: _____
- ★ Company Registration No: _____
- ★ GST Registration No: _____
- ★ Pension Registration No: _____
- ★ Phone Number: _____ Fax Number: _____
- ★ Name of the Authorized Representative: _____
- ★ Title/ Position of the Authorized Representative: _____
- ★ Contact Number of the Authorized Representative: _____
- ★ Signature of the Authorized Representative: _____
- ★ Date Submitted: _____

Requests for Proposals for Small Modular Data Center

Elections Commission of Maldives

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1 Overall Technical Requirements

The modular data center facilities include the power supply and distribution system, cooling system, cabinet system, and monitoring system. This chapter describes the functional requirements for the equipment.

Minimum Quantities for data Center

| Item | Qty |
|---|-----|
| Integrated Distribution Cabinet | 1 |
| Integrated UPS Cabinet | 1 |
| Integrated ICT Cabinet (1 preferred for switching) | 3 |
| Cooling System, indoor unit | 2 |
| Cooling System, Outdoor unit | 4 |
| rPDU modules | 8 |
| Composite Cabinet Internal Cable Bundle,A/C Cable, With Heating and Humidifer | 4 |
| Display monitor | 2 |
| Ambient Temperature and Humidity Sensor | 8 |
| 12V 9AH Battery Packs | 16 |

1.1 Certification Requirements

- Supplier certification requirements
The supplier must be certified by the following certification systems and provide the certificates:
 1. Computer Information System Integration Qualification Certificate (Class 1)
 2. ISO 9001/TL9000
 3. ISO 14001
 4. ISO IEC_27001
 5. OHSAS 18001
- Testing equipment requirements
The supplier should have state-authorized labs that have been certified by the following organizations and provide the certificates:
State-level lab accreditation organization: CNAS
Third-party test and certification organizations: UL
- Product certification requirements
Air conditioner: CE, SASO certificates obtained; RoHS, REACH, reports obtained
Battery cabinet: CE, RoHS, REACH, certificates obtained
Converged cabinet: CE, RoHS, REACH, SASO certificates obtained

1.2 Installation and Environment Requirements

- Environmental adaptability requirements
The modular data center should apply to the outdoor environment with the air temperature range of -20°C to $+45^{\circ}\text{C}$, the relative humidity range of 5% to 95%, and the altitude range of 0 m to 4000 m.
- Power supply requirements
The equipment room should provide the single or dual power supplies of 380V AC, 50 & 60 Hz, 3Ph+N+PE.
- Installation requirements
The module should support single-row deployment to efficiently use the equipment room space and can be installed on the concrete floor or ESD floor.
- Floor height requirements
The modular data center can be installed without a raised floor and meets the requirements for the 2.6 m net height.

1.3 Overall Modular Requirements

The data center uses the modular architecture design and features the cold aisle containment. A single module should integrate the cabinet system, power supply and distribution system, cooling system, management system, and generic cabling system. The total IT load is 15 kW at most.

- Tier requirement: Tier2
- Surge protection level: CLASS II/C, In 20kA, I_{max} 40kA, 8/20 μs
- Waterproof and dustproof level: IP20
- Certification requirement: Main components should be CE certified.
- Configuration requirement: aisle containment, rack-mounted variable-frequency air conditioner, easy maintenance, less footprint, high integration, and high energy efficiency
- Rack-mounted UPS in N+1 mode.
- Installation and maintenance requirement: The module can be installed on the concrete floor (raised floor not required) in a building and can be maintained from the front and rear.
- Backup time requirement: 15 min to 180 min backup time is supported.
- Cooling mode: Air cooled rack-mounted air conditioners are supported.
- Monitoring function: A single module can be remotely monitored over the web user interface (Web UI). Alarms can be sent by the short message service (SMS). The mobile APP can be used for mobile operation and maintenance (O&M).
- Cabling mode: Cables can be routed from the top or bottom.
- Containment flexibility requirement: Cold aisle containment can be used.
- Modular design: Modular design is adopted for power distribution equipment, UPS, monitoring equipment, and air conditioner indoor units to facilitate maintenance.

2 Detailed Technical Requirements

2.1 Power Supply and Distribution System Requirements

The power supply and distribution system should use the N+1 architecture and meet the tier 2 requirements. The 380V AC, 50/60 Hz, 3Ph+N+PE power distribution solution is supported.

2.1.1 UPS

The UPS for the small data center must meet the following requirements:

- The UPS whose rated capacity is 20 kVA, can be installed in the 19-inch rack, and occupies only 3 U heights.
- The UPS rated input voltage is 380/400/415 V, 50/60 Hz, 3Ph+N+PE.
- Wide input voltage range: 138–485 V AC
- The UPS provides high efficiency up to 95% in online mode.
- The UPS has strong overload capacity and continues running for 60s when overloaded by 125%.
- The UPS provides RS485 communications port for easily monitoring its parameters and status.

| Category | Item | 20 kVA | Qty. : 2pcs |
|-----------|------------------------|---|-------------|
| Input | Input voltage range | 80–280 V AC, single-phase When the voltage is 80–176 V AC, the load power is linearly derated to 40%–100%. 138–485 V AC, three-phase When the voltage is 138–305 V AC, the load power is linearly derated to 40%–100%. | |
| | Rated input voltage | 380 V AC / 400 V AC / 415 V AC (three-phase) | |
| | Input frequency range | 40–70 Hz | |
| Output | Rated capacity | 20 kVA | |
| | Rated voltage | 380/400/ 415 V AC; three-phase output; a voltage system can be selected by setting a voltage level over the LCD. | |
| | Power factor | 0.9 | |
| | Max. efficiency | 95% | |
| | Overload capacity | <ul style="list-style-type: none"> • In normal mode, when the UPS is overloaded to a range between 105% and 125%, the UPS transfers to the bypass mode in 5 minutes if the bypass is normal, or disconnects the power output if the bypass is abnormal. • In normal mode, when the UPS is overloaded to a range between 125% and 150%, the UPS transfers to the bypass mode in 1 minute if the bypass is normal, or disconnects the power output if the bypass is abnormal. • In normal mode, when the UPS is overloaded to more than 150%, the UPS transfers to the bypass mode in 0.1 second if the bypass is normal, or disconnects the power output if the bypass is abnormal. | |
| Structure | Dimensions (H x W x D) | 130 mm x 430 mm x 757 mm | |
| | Installation mode | Rack-mounted | |

| Category | Item | 20 kVA | Qty. : 2pcs |
|-------------|--|---|-------------|
| | Surge protection | IEC/EN60240-2 IEC/EN61000-4-5 YD/T1095-2000 YD/T944-2007 The AC input meets class D surge protection requirements (differential mode and common mode: 5 kA, 8/20 μ s). | |
| Environment | Port type | Dry contact/USB/Modbus/SNMP | |
| | Operating temperature | 0–40°C | |
| | Relative humidity | 0%–95% RH (non-condensing) | |
| | Altitude | < 1000 m (derated when the altitude is between 1000 m and 4000 m. For derating data, refer to the IEC62040-3.) | |
| | Storage and transportation temperature | –40°C to +70°C (battery pack: –20°C to +40°C) | |

2.1.2 Power Distribution Box

- Installation mode: rack-mounted
- Power distribution box height: 6 U; indicator module: 1 U; Electrical performance the 3 U high power distribution module should provide at least four IT outputs, and the 6 U high power distribution module should provide at least 14 IT outputs.
 - The power distribution box contains the UPS input, UPS output, UPS maintenance bypass switch, and surge protection switch.
 - The class C SPD is deployed in standard configuration. A surge protection switch should be installed before the SPD, and a micro switch with the surge protection switch or SPD fault indicator should be used to remotely monitor the SPD status.
- Application environment
 - Operating temperature: 0°C to +40°C
 - Operating humidity: \leq 95% RH
 - Operating altitude: 2000 meters without derating

2.1.3 rPDU

- Electrical performance
 - Single-phase 220 V AC input voltage, 50/60 Hz
 - Single input of the rPDU
 - Input: junction box input or standard IEC60309 three-core plug input
 - Output: C13/C19 standard socket, circuit breaker protection supported by the rPDU of 32 A current
- Application environment
 - Operating temperature: 0°C to +40°C
 - Operating humidity: \leq 95% RH
 - Operating altitude: 2000 meters without derating

| Item | Specifications |
|--|---------------------------|
| Input voltage range | 176–264 V AC |
| Input voltage | 220 V AC |
| Input current | 32 A |
| Number of inputs | Single |
| Output power distribution specifications | 20 x C13 + 4 x C19 |
| Dimensions (L x W x D) | 1732 mm x 50 mm x 44.5 mm |
| Net weight | 2.49 kg |

2.2 Cooling System Requirements

2.2.1 Technical Requirements for In-row Precision Air Conditioners

The air conditioners should feature efficient cooling, effective energy saving, high reliability, wide working conditions, wide power range, high compatibility, intelligent monitoring, and easy maintenance.

High Energy Efficiency

Name brand DC inverter compressors with high energy efficiency can achieve 20%–100% stepless speed adjustment to provide cooling capacity on demand, thereby greatly reducing energy consumption.

- Four DC fans in the indoor unit use the horizontal air supply mode for racks. 30%–100% stepless fan speed adjustment is supported, which enables precise control over the supply air temperature and direction, thereby reducing energy consumption.
- Optimal system configurations and efficient refrigeration coil pipes ensure efficient heat exchange.
- The variable-frequency temperature control algorithm enables quick response to load changes and precise temperature control to conserve energy.
- Fans support variable-frequency start, which lowers the start current and prevents shock on the power grid and other electrified equipment.
- A wet film humidifier consumes more than 90% less energy than a conventional humidifier because energy consumption of a wet film humidifier comes only from the water pump.
- The air conditioners are connected over FE ports and networked through the MAC protocol bus to achieve teamwork control, which effectively saves energy.

High Reliability

- The DC variable-frequency air conditioner greatly reduces the number of startup and shutdown times, reducing component failures and extending the lifespan of key components.
- The electronic expansion valve is used, allowing rapid and precise adjustment of the refrigerant volume based on the temperature and humidity requirements and improving system stability. A backup power module is provided to close the electronic expansion valve when the system experiences a power failure.

- The Positive Temperature Coefficient (PTC) electric heater provides dual protection functions: automatic reset and auto-recovery disabling.
- The air conditioner is designed for non-condensation at low loads to maintain the humidity in cold aisles below 80% at low loads (10% load at least) in a high-humidity environment.
- The air conditioner features 6 kV surge protection design, providing high surge protection reliability.

High Compatibility

- The air conditioner can be rack-mounted, which considerably decreases the cooling system footprint as it occupies only 11 U high space.
- Both the refrigerant pipes and water pipes can be routed from the top or bottom.
- Heating and humidification functions are optional.

Wide Power Range

Adaptability to multiple power systems:

- System supply voltage 220–240 V AC, L+N+PE, 50 Hz
- Voltage range: 198–264 V AC
- Frequency range: 47–53 Hz

Intelligent Monitoring

Users can monitor and configure parameters for the cooling system on the monitoring unit.

Easy Installation and Maintenance

- The air conditioner can be easily inserted into a cabinet, facilitating installation.
- End face sealing stop valves are reserved for the ports on the indoor and outdoor units. The welding-free design achieves fast maintenance and no ignition is required.
- Remote parameter setting, and remote inspection are supported, reducing service costs.
- Key components support front and rear maintenance. The entire air conditioner can be easily replaced without extra maintenance space. During the maintenance and replacement of an air conditioner, other air conditioners are not affected.
- The control unit can be pulled out for maintenance. The power module, auxiliary source module, and main control module above it can be quickly removed and inserted for maintenance, greatly reducing O&M time and difficulty.

2.2.2 Environmental Requirements for In-row Precision Air Conditioners

| Item | Specifications |
|------------------------------------|---|
| Indoor unit operating temperature | 0–45°C |
| Indoor unit operating humidity | 5%–95% RH (non-condensing) |
| Outdoor unit operating temperature | –20°C to +45°C |
| Storage temperature | –40°C to +70°C |
| Storage humidity | 5%–95% RH (non-condensing) |
| Altitude | 0–4000 m (derated when the altitude is greater than 1000 m) |

2.2.3 Installation Requirements for In-row Precision Air Conditioners

| Installation Mode | Rack-Mounted |
|---|--|
| Maximum equivalent length of the one-way pipe | 60 m |
| Thermal insulation foam thickness | ≥ 13 mm |
| Water drainage | The distance between the upper drainage of the water pump and the cabinet installation floor should not exceed 4 meters. |

2.2.4 Main Technical Specifications for In-row Precision Air Conditioners

The following table lists the main technical specifications for air conditioners.

Table 2-1 Air conditioner technical specifications

| | |
|---------------------------------------|--------------------------|
| Specifications | 11 kW |
| Indoor fan type | EC fan |
| Total cooling capacity | ≥ 11 kW |
| Sensible cooling capacity | ≥ 11 kW |
| Sensible heat ratio | 1 |
| Air volume | ≥ 2600 m ³ /h |
| Indoor unit installation mode | Rack-mounted |
| Outdoor unit installation mode | Wall/floor-mounted |
| Heating capacity (optional) | ≥ 3kW |

NOTE

The cooling capacity is measured at the indoor inlet air temperature 37.8°C, relative humidity 20%, and condensing temperature 35°C.

2.3 Cabinet System Requirements

2.3.1 Aisle Containment System

- The depth of a contained aisle should be no more than 250 mm.
- Hot aisle: The front door is a single-swing double-layered glass door that prevents condensation.
- Cold aisle: The front door is a perforated door.

2.3.2 Cabinet System

Cabinets are necessary facilities in a data center. They provide an appropriate operating environment for accommodating and interconnecting equipment.

The cabinets must provide the following features:

- The ventilation rate of the perforated door is greater than or equal to 70%.
- Two power distribution units (PDUs) can be vertically installed at the rear of the cabinet.
- The position of each U is marked on the vertical mounting bars.
- The front and rear doors are locked and can be unlocked only with dedicated keys.
- The total depth of the cabinet and aisle is 1350 mm at most.

| Item | Technical Specifications |
|---------------------------|--|
| Dimensions (H x W x D) | Cabinet: 2000 mm x 600 mm x 1350 mm |
| Color | Black |
| Material | High-intensity class A carbon cold rolled steel sheet and zinc-coated steel sheet |
| Air channel | Front and rear air channels |
| Installation space | <ul style="list-style-type: none"> • Each cabinet provides 42 U available space. • The distance between the front and rear mounting bars can be adjusted by a step of 25 mm. Positions for vertically installing two PDU2000s are provided at the rear of the cabinet. |
| Installation mode | Installed on a concrete or raised floor |
| Static load | 1500 kg |
| Dynamic load | 1000 kg |
| Protection level | IP20 |

2.4 Monitoring and Management System

2.4.1 Monitoring System for a Single Micro-Module

2.4.1.1 System Overview

Each micro-module should provide a general environment and power monitoring interface to constantly monitor equipment such as the power supply and distribution devices, UPS, air conditioners, temperature and humidity sensors, water sensors, smoke detectors, video surveillance devices, and access control devices inside the module. If a component fault or parameter error is detected, alarms are generated in diverse modes such as color, email, SMS, and audio. Historical data and alarm events are recorded. All monitoring information is reported to the management platform through a standard northbound SNMP interface. Users can query device information in real time using the pad APP or mobile phone APP, enabling mobile operation and maintenance. To ensure unified planning, management, and commissioning of the micro-module, make ensure that the micro-module monitoring system is of the same brand as the micro-module.

2.4.1.2 Monitoring Function Description

1. Temperature and humidity monitoring: detects the ambient temperature and humidity inside the module.
2. Water leakage monitoring: detects water leakage in areas where there are sources of water inside the module.
3. Smoke monitoring: detects smoke inside the module.

4. Precision air conditioner monitoring: comprehensively diagnoses the running status of air conditioners in real time and monitors the running status and parameters of air conditioner components such as the compressor, fan, heater, humidifier, and air filter.
5. Door access monitoring: has access right management, access event record, and alarm record functions.

2.4.1.3 Specifications Requirements for Key Hardware

1. Data collector

| Item | Specifications |
|-----------------------------|---|
| Power input | <ul style="list-style-type: none"> • Operating voltage: 85–300 V AC (rated voltage: 200–240 V AC or 100–120 V AC) • Operating frequency: 45–66 Hz (rated frequency: 50 Hz or 60 Hz) • Input current: 6.7 A |
| Power output | <ul style="list-style-type: none"> • Output voltage: 42–58 V DC (rated voltage: 53.5 V DC) • Output power of a single power supply: 1000 W (176–300 V AC); 470 W (linear derating at 85–175 V AC) • Output current: 14 A |
| System memory | 512M |
| Solid state disk | 2 GB and 128 MB of storage space |
| FE port expansion | Two WAN ports, two LAN ports, and 10/100M communications rate |
| RS485 serial port expansion | <ul style="list-style-type: none"> • Four RS485 ports reserved; with the default communications rate of 9600 bit/s • Each port providing 12 V DC power with the rated current of 450 mA |
| AI/DI expansion (RJ45) | <ul style="list-style-type: none"> • Six AI/DI ports used for connecting to sensors such as smoke detectors, water sensors, and temperature sensors • Each port providing 12 V DC power with the rated current of 85 mA |
| DO expansion (RJ45) | <ul style="list-style-type: none"> • Two expansion dry contacts with the contact point capacity of 20 W, maximum withstand voltage of 60 V DC, and rated current of 0.5 A • Two active DO ports with the output voltage of 12 V DC and output current of 450 mA |
| Wireless communication | Wireless communication that complies with IEEE802.15.4 |
| 3G | Provide a SIM card slot; support 3G communication |
| USB | General USB port |
| SD card | One micro-SD card |
| Buttons | <ul style="list-style-type: none"> • SW: wireless network pairing button • Default: restoring the default IP address |

2. Pad

The controller pad (9.6 inches at least) supports wireless access to the data center facility management system. The APP can be used to monitor the data center equipment and environment parameters in real time. The pad for the micro-module uses a capacitive screen and supports multi-touch control.

ANNEX A: (PROPOSAL RESPONSE FORM)

| # | Qty | Description | Delivery Period (Days) | Total inclusive of GST (MVR) |
|---|-----|---------------------------|---------------------------|------------------------------|
| 1 | 1 | Small Modular Data Center | | |

Per the attached specification and proposal response Form

Quotation Validity: 30 (In Days)

Company Stamp

Signature

ANNEX B: (POINT ALLOCATION TABLE FOR THE BID PROPOSALS)

Small Modular Data Center

| Component | Categories | Points |
|-----------------------------|--|--------|
| Statement of Qualifications | <p>a) Price Feasibility Points for this category will be awarded on a ratio basis, with the party proposing the Lowest price securing full marks for the category.</p> | 60 |
| | <p>b) Delivery Period Points for this category will be awarded on a ratio basis, with the party proposing the least number of days securing full marks for the category.</p> | 20 |
| | <p>c) Recent Similar Projects successfully completed Points for this category will be awarded on a ratio basis, with the party producing highest number of relevant documents securing full marks for the category.</p> | 10 |
| | <p>d) Warranty (Parts and Services – 5 points to each) Minimum 1 year should be provided Points for this category will be awarded on a ratio basis, with the party proposing the highest number of years (warranty) securing full marks for the category.</p> | 10 |
| | | 100 |

Note: For more information contact 3004428/ 3004431