THE DIGITAL MALAWI PROGRAM PHASE I: DIGITAL FOUNDATIONS PROJECT

CREDIT NUMBER: **60500MW**

PROJECT NUMBER: **P160533**

Purchaser: The Public Private Partnership Commission

Project: Digital Malawi Program Phase I: Digital foundations Project

Contract title: Design, Installation and Commissioning of a data Centre in Malawi

Country: Malawi

Responses to the Queries

No	Bank's Observation	Response Provided
1	From our initial reading, this requirement is for multi-tenanted Government Cloud solution. In such a case can we quote for Openstack based solution which is equivalent to what most public cloud providers provide.	1.3.1.6 Cloud and Automation. The data centre shall support the following cloud and automation capabilities • The Solution should be co-engineered between the original equipment manufacturer and a hypervisor • Capable to be deployed as a government Private Cloud, Public Cloud, Hybrid Cloud Deployment Models • ***What is unacceptable is a vendor solution that will lock us in with no way out and at the mercy of that VENDOR
2	There is no mention of specs for Security devices like NGFW, WAF, Routers etc, is the bidder allowed to quote for these equipments since we believe this is required for the solution to work	Bidders can quote for all ancillary equipment not listed but required for the solution to work

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3	Can we assume that there is redundant dark fibre link between the two sites, how many cores are available in this link and what is the distance between the two sites	Redundant dark fibre or capacity shall be provided, and the two sites sits at about 300Km apart. The minimum of 6 cores should be considered
4	Can we assume both the building are ready and we just have to provide things that are relevant for the data center like AC/Power/Cooling/Raised Floor/Access Control/EMU/UPS etc	Bidders are advised that the buildings are not ready. The link to the drawings of primary site are provided in the bid document. Secondary site information shall be provided later, and the additional things should be relevant to the data centre only
5	There is no mention of specs for generators on both sites, can we quote one	Bidders are advised to quote for the generator with an output that meets the power needs of the data centre and ancillary equipment's only
6	You have mentioned integration to ESB, can you give us details of the ESB platform	The details shall be provided after the procurement process of the same
7	Can we get copy of primary and DR site building layout for cabling, Data center room dimensions and layout plans	The Link for downloading copy of primary site is provided on the PPPC Website under Procurement. The DR site information will be provided later
8	In the data center in Primary and Secondary, how many racks are you planning to have in future, this will allow us to guess the load required	There is no secondary data center but a DR site. The number of Racks for HCI solution will depend on the Vendors solution. In terms of future expansion, it would depend on request by customers
9	We will need the floor layout for us to design the DC, plus we need separate rooms for housing UPS and batteries, separate rooms for housing fire suppression gas cylinders, separate room for Electricity/Power Terminations, separate room for housing generator and fuel tanks, separate room for ISP and WAN terminations (Meeting rooms)	The link to access the drawing is on the Website.
10	Regarding batteries, our suggestion is to buy battery power for 8 hours, and then buy a good standby generator on both sites. Because powering via batteries will reduce as the load of servers or the numbers of servers gets added in future	Refer to 1.2.1.4

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11	What is the distance between primary and DR site, do you need us to quote DWDM, this will be more effective and efficient in the long run for better management of fiber connectivity and then you don't have to worry buying switches with extended long wave GBICs	The distance between the primary and the DR site is approximately 321.7 kilometers Option1-Use of Dark fiber and quoting for switches, auxiliary equipment and your technology to be deployed (DWDM) Option 2- Lease line by Government in connecting the two sites
12	In order for us to scope the correct hardware like Firewall, Load Balancers, Web access firewall, we need to know your estimated load or transactions that you expect	Your NGFW and WAF, Routers and Load Balancer can be scoped by talking to GWAN or if in doubt by using best practice conceptual design approach to your proposed solution based on the technical requirements of the bid document
13	We request for the proposed buildings/facility layouts for both the proposed primary site in Lilongwe and the proposed secondary site in Blantyre – we seek the layouts in AutoCad format to enable our re-designing purposes for solution fitting.	Access the drawings through the Link provided below.
14	We had the team mentioning that there is a contractor on site – does this apply for both Lilongwe and Blantyre sites?	Yes
15	If there is a contractor on site, we presume that they already have a work plan and design – should we need to alter the designs, who will be responsible for those costs arising from the final proposed facility which shall entail the required standards?	Per the Bid Document the winning Bidder would have to provide advice on partitioning and other requirements to achieve tier 3 data center status and to accommodate the Vendors solution Refer to 1.2.1.4
16	We seek information on the available power sources and supply sizing on both sites and from your electricity utility company?	Power will be coming from ESCOM. They will be responsible for bringing in at least 34KV and stepdown Transformer
17	We need advice on the requested generator sizes for both sites – note that the generator is not in the tender documents but was mentioned during the pre-bid meeting.	Generator Capacity (KVA) presently is unknown at this time. The specs will depend on vendors equipment power consumption plus other devices we wish to support at the Data Center. Due to future scalability the defined calculated capacity will be increased 30% during purchase
18	Regarding the training requirements – could you clarify what kind of training would be required for the data center physical infrastructure solutions?	Training plan has to articulated in the vendors proposal for both outside at the OEM manufacture site and at Local office in Malawi of the Vendor

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19	Who is responsible for the fibre cable laying between the two sites – Lilongwe and Blantyre?	There is fiber cable laid between Primary DC and DR site
20	Regarding the two sites, were environmental factors that could be detrimental to the facilities considered?	Yes
21	Are there Datacentres already build and it just needs to be fitted with the correct environmental e.g. Raised flooring aircons etc or is the requirement to build Datacentres from scratch	No, the Data Centers are not built but there are plans to use some existing buildings for the assignment. The renovations are under a new contract which will be ready when a winning bidder is selected. The winning bidder as per the Bid document will provide inputs to requirements of achieving the status of a tier 3 data center
22	If existing Datacentres exist, can you share a floor plan	Refer to No.21 above
23	Will a site inspection / Site visit be possible	Yes, Site visit is possible, and it can be arranged
24	Who will be provisioning the WAN connectivity between the various government entities including the main DC connectivity and the DR site	Presently GWAN is provisioning WAN connectivity to MDAs and other Government institutions and they will continue to do so when the data center is built under the guidance of the winning bidder during installation and training and their set up office in Malawi.
25	Our understanding for this scope is that the DC will be provisioned up to the cloud platform level which includes 7x HCI nodes in prod and 7x HCI nodes in DR with Backup and recovery	Yes, your understanding is correct
26	Migration of services to existing DC is excluded from this phase	Legacy application systems of some MDAs would have to be ran at the Data Center as such migration of these system from standalone premises server to the private cloud Data Center should be factored in the Design of the data center infrastructure.
27	On-going management of the system will be done by resources in Malawi based on SOP's and training that will be provided	Yes, with support as stated in the bid document plus set up office personnel of winning bidder in Malawi
28	The NOC software needs to cover the DC environmental up to application monitoring	The Vendor should provide a management system to their solution that will monitor Equipment at the data center and network devices at the NOC. Since the NOC consists of Hardware and software, license

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		issues should be well defined and made aware to the purchaser (PPPC). Vendors should articulate clearly in their proposal whether it is a third party or an OEM software and renewal procedures and cost/License
29	Section 1.2 Section 1.2.1.1 a) Are there existing network links between GWAN data centres (new one and DR site) and the MIX? If so, what are the capacities?	There is no GWAN data Center. The RFB is for the new to be built National Data Center which also will be connected to GWAN
30	Section 1.2.1.3 b) What Applications, Operating Systems/Database Management systems are the early adopters running? This will be needed for migration planning purposes.	N/A
31	Section 1.3.1.2 c) Are firewalls and Intrusion Detection already in place? If affirmative, what types are they and the versions running?	N/A
32	d) Is the DR site already available in Blantyre? If not available must the design include it?	DR site is to be built also
33	e) What is the minimum required size of the off-site storage?	N/A
34	Section 1.3.1.3 f) Is the generator set available or any backup power at the primary site? How many KVAs?	N/A
35	Section 1.3.1.5 g) Any preferred tools for monitoring?	N/A
36	Section 2.1.1.9 h) Is there VPN between the Primary site and DR site in BT already present. What's the provisioned bandwidth?	N/A
37	Section 2.1.1.12 i) What is the minimum required storage? Section 2.3.1.1	N/A

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38	j) How many integration points are required for the Service Bus?	N/A
39	k) Are there workflows present that require digitization?	N/A
40	Section 2.5.1 l) What is type of data will be migrated? We want to know the format file or schema based and what direction – single or multi directional data?	N/A
41	m) Will the migration include manual data?	N/A
42	Confirm that Primary DC & NOC is located in Lilongwe & DR Site is located in Blantyre	Primary DC will be in Lilongwe and DR site at Blantyre.
43	Confirm that NOC is located in the same building as the Primary DC in Lilongwe or in a different building?	NOC will be at the Primary DC Building
44	Confirm that all data centres & NOC infrastructure will be designed to Uptime Institutes Tier III Specifications?	Yes
45	It is understood that the shells of the DC buildings in Lilongwe & Blantyre are under construction. If so, please explain; (a) How was correct DC size & layout to Tier III standards established?	Refer to 1.2.1.4
46	How was the scalability & modularity of the DC's to cater for strategic expansion needs established/determined?	The Data center is now going to be built
47	Have separate network equipment areas, i.e. (A&B Meet-me-rooms, A&B Telecoms rooms, A&B Energy Centres, A&B Battery Rooms, A&B Generator Rooms, A&B Diesel Tank rooms, separate plant rooms/passages for HVAC & Fire systems, been considered in the current brick-&-mortar design?	Refer to 1.2.1.4, 2.1.1 and 5.4-System Inventory Table
48	Please provide AutoCAD drawings of both DC shells under construction on Lilongwe & Blantyre.	Use the link below to access the drawings

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49	Please specify Malawi Govt strategic DC HCI expansion requirements/guidelines?	To be decided by the Government
50	Will the NOC be located in the same or separate building either at the DC in Lilongwe or the DR site in Blantyre?	Same Building at the DC in Lilongwe
51	DC, EC & Battery Room & General Design; (a) Do the brick-&-mortar shell designs comply with data centre standards – impervious double skin walls with 50 mm airgap (with rainwater weep-holes), steel reinforced concrete roof slab & steel roof structure? Provide dimensions of DC building shells?	Information is described in the DC building drawings
52	Please specify if DC plant machinery & equipment is to be separated from the network equipment areas?	N/A
53	Please specify type of raised floor to be installed in all DC areas and clear floor void depth required.	Refer to 1.2.1.4
54	Will the floor void be used as a pressurized conditioned-air supply plenum? Please specify required design requirements?	Refer to 2.1.1, 1.2.1.4 and 5.4-System Inventory Table
55	Will cold aisle containment be required in order to conserve energy and improve Power Utilization Effectiveness (PUE)?	Refer to 2.1.1 and 5.4- System Inventory Table
56	Is the design of the DC shell being fully coordinated with all other DC disciplines? E.g. Are HVAC wall sleeves, power cable sleeves, bus-bar sleeves, fire pipe sleeves, etc. etc. being constructed into the DC brick-&-mortar shell?	Refer to 2.1.1
57	Is the brick-&-mortar shell of the DC large enough or modular in design to accommodate future DC expansion in all areas?	Yes
58	Please specify whether equipment racks will be procured and supplied by contractor and what are the rack	The project is Turn Key and per the scope of the RFB refer to 2.1.1

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	specifications, e.g. 42U, 47U etc. as well as required specifications to be applied for power supply to each network equipment rack?	
59	Please clarify modularity design requirements for all data centre disciplines, Fire, HVAC, Electrical power, BMS, UPS, Main Low Voltage Boards, batteries, etc.	Depends on Vendor design solution, Refer to 2.1.1 and 5.4-
60	Please specify lighting levels required compliant with IEC, BS, SANS-ISO101142 specifications & type of luminaire?	Specifications under Physical building contract
61	Please specify general ventilation requirements and if quality of fresh-air ingress into the DC is to be filtered & monitored?	Refer to 1.2.1.4, 2.1.1 and 5.4-System Inventory Table
62	Please specify whether all power and electronic wireways & cabling are to be surface mounted in trunks, bosal tubing, etc. or sub-surface mounted (chased into) the brick-&-mortar walls of the DC?	Refer 1.2.1.4 and 5.4-System Inventory Table
63	Please specify PUE for the DC design?	Per Vendors Solution
64	UPS & Battery Back-up; (a) Must the UPS's be monolithic or modular type in (N+1 config.) in each EC for the network power supply, N+N for the HVAC power supply and N for the general & critical site services power supplies?	2.1.1 and 5.4-System Inventory Table
65	b) Please specify make, model & brands of UPS's preferred?	Depends on Vendor solution
66	(c) Please elaborate on UPS battery back-up time specifications?	Depends on Vendor solution
67	(d) Please specify make type & quality of back-up batteries to be deployed?	Depends on Vendor solution
68	e) Compliant with International safety standards & good practices, please	Refer to 1.2.1.4 and 5.4- System inventory Table

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	specify ventilation design (air-changes-per-hour - ACH) requirements in battery rooms?	
69	(f) Please specify that battery monitoring (Volts, Amps, Temperature) at single battery cell level will be required	Depends on Vendor solution
70	Distribution Boards & Switchgear; (a) Please specify standardized type of power panels and power distribution units (PDU's) & switchgear are to be standardized on throughout DC?	Depends on Vendor solution
71	(b) Specify which automatic transfer switch system (ATS) is to be deployed for utility, generator and UPS power automatic switching?	Refer to 2.1.1
72	(c) Provide specification for the distribution of power to the network equipment racks. Will it be via a PDU & individual feed to each rack or via a busbar with tap-off boxes to each rack?	Depends on Vendor solution
73	Standby Generators; (a) Please specify whether generators A&B will be open sets located in sound attenuated rooms or closed attenuated package sets installed outside the DC in the open?	Refer to 1.2.1.4
74	(b) For 72-hour generator autonomy, will two off day tanks and one bulk tank be required or just one bulk tank	Depends on Vendor solution
75	(c) Please specify if a fuel filtering (5 micron) and polishing system will be required to keep bulk fuel in clean & pristine?	Depends on Vendor solution
76	Bulk Utility Power Supply; (a) Incoming Substation – l Please the scope of work required, substation building, incoming power, reticulation, transformer, RMU,	ESCOM will provide power at least 34KV and Transformer to the Yard at the DC building

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	metering, switchgear, cabling, etc. specifications at & for each specific DC site?	
77	(b) Specify exactly what the DC builder will be responsible for supplying, installing and commissioning?	Refer to 2.1.1
78	HVAC Equipment; (a) Please provide specifications on what type of cooling is required in all areas of the DC and the preferred OEM plant, machinery and equipment to be deployed with EC fans, variable speed scroll compressors, electronic expansion valves, etc.?	Refer to 2.1.1, 1.1.1.4 and 5.4-System Inventory Table
79	(b) Please specify what positive pressure must be maintained in the DC to prevent the ingress of polluted and dust laden air?	Depends on Vendor solution
80	(c) Please specify if separate plant room areas must be created to accommodate the CRAC units and if the condensers will be located in a vertical condenser wall to be designed and constructed or at ground level?	Refer to 1.2.1.4
81	(d) Assuming that the floor void will be used a pressurized conditioned supply air plenum, please provide specifications on the deployment of air-conditioner floor stands, supply- and return air curved veins, sleeves & AVM'sto reduce airflow friction and increase cooling efficiency	Refer to 2.1.1 and per Vendor solution
82	Fire Suppression & Detection Systems; (a) Please clarify specification on Fire suppressant to be used, Inergen Inert Gas, FM200, NOVEC 1230?	Refer to 1.2.1.4, 2.1.1 and 5.4 System Inventory Table
83	(b) Please clarify specification on type of detection system to be deployed	Refer to 1.2.1.4 and System Inventory Table

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84	(c) Please confirm specification that fire panel will be addressable & will fully interface with BMS & VESDA fresh-air monitoring system.	Refer to 1.2.1.4 and System Inventory Table
85	(d) Please confirm & specify installation of high sensitivity early warning fire system – VESDA, to monitor both fresh-air quality and to provide early smoke detection alarm in all areas of DC.	Refer to 1.2.1.4 and System Inventory Table
86	Building Management System; (a) Please specify the BMS for all of the DC infrastructure, plant, machinery & equipment will be a completely independent and separate system (from the Network system) fully interfaced with the Client NOC.	Refer to 1.2.1.4 and System Inventory Table
87	(b) Please specify need to have the BMS remotely monitored and supported on a 365/24/7 basis by the supplier and service provider.	Refer to 1.2.1.4 and System Inventory Table
89	Connectivity with external Transmission providers: (a) how the main Transmission Providers will enter the grounds.	There is fiber manhole in existence at DC and DR sites
90	(b) Diverse routes and manholes required	To be investigated during site visit
91	(c) Microwave alternatives to be housed	There will be No Microwave use as an alternative
92	(d) The transmission network to be monitored and interfaced with the DC NOC	There will be Dark Fiber to the Primary DC Vendors will have to cost for switches and other auxiliary equipment based on their solution
93	Connectivity within the DC: (a) ODF's and Racks to be specified.	Per Vendors solution
94	(b) Structured cable runs to be specified.	Refer to 1.2.1.4
95	**(c)** Structured cross connects to be specified.	Refer to 1.2.1.4

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96	Cable trays and Runs within the DC: (a) Please specify the size and layout within the DC.	Refer to 1.2.1.4
97	Please specify number of equipment racks will be required in each DC, size & maximum power density of each rack.	Depends on Vendor solution. Refer to 2.1.1
98	Please send as a technical drawing of the buildings, dedicated for the Data center.	Bidders are advised to use the Link below
99	How many square meters should be the Data center?	Please refer to the drawings
100	How much is the planned electrical consumption of the hosted equipment (servers, routers, switches and etc.) in the Data center?	Depends on the solution of the Vendor Solution
101	What are the requirements for the Data center Halls? Min, max acreage?	Please Refer to the drawings
102	Who is responsible for arranging the contract with the local electricity company? Are you going to arrange this Contract or the project contractor must do this?	The Government will arrange for this
103	Who is responsible for arranging the contract with the local water company? Are you going to arrange this Contract or the project contractor must do this.	The Government will be responsible
104	Who is responsible for arranging the contract with the local sanitation company? Are you going to arrange this Contract or the project contractor must do this.	It is the Responsibility of the Government
105	Does the property around the current buildings are fenced? If yes, how many square meters should be enclosed?	It would be fenced to provide security
106	How many hours in a year do you expect the diesel generator/s to work?	Depends on ESCOM outages
107	NOC Features/Services/Monitoring	The Vendor should provide a management system to their solution that will monitor Equipment at the data center and network devices at the NOC. Since the NOC

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		consists of Hardware and software, license issues should be well defined and made aware to the purchaser (PPPC). Vendors should articulate clearly in their proposal whether it is a third party or an OEM software and renewal procedures and cost/License
108	Software Defined Network Open stack	Since each OpenStack service provides a REST API so all the resources (compute, storage, and networking) can be managed through a dashboard. It gives administrators control while empowering users to provision resources through a web interface. Vendor solution which offers integration or supports openstack is welcomed. What the project wants to avoid is a vendor solution that locks us into only their system with no way to wiggle out
109	Generator Specifications	Generator Capacity (KVA) presently is unknown at this time. The specs will depend on vendors equipment power consumption plus other devices we wish to support at the Data Center. Due to future scalability the defined calculated capacity will be increased 30% during purchase
110	Firewall requirement	Since firewall duty is actually designed to prevent unauthorize access to and from a private network or a Data Center. The vendor should incorporate in their design the use NGFW, WAF Equipment and IDS/IPS solution
111	Vendor specific pointers in the bid like 3.4.4.x	We want the Vendor to adhere to ISO Telecommunication management network model of **FCAPS** approach to Software Define Network (SDN) solution they are providing. The categories of the acronyms are: ➢ **Fault** ➢ **Configuration** ➢ **Performance** ➢ **Accounting or Administration** ➢ **Security**
112	Are there Data centres already build and it just needs to be fitted with the correct environmentals e.g. Raised flooring	No, the Data Centers are not built but there are plans to use some existing buildings for the assignment. The renovations are under a new contract which will be ready when a winning bidder is selected.

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	aircons etc or is the requirement to build Data centres from scratch	The winning bidder as per the Bid document will provide inputs to requirements of achieving the status of a tier 3 data center
113	If existing Data centres exist, can you share a floor plan	Refer to answer to No.112
114	Will a site inspection / Site visit be possible	Yes, Site visit is possible and it can be arranged
115	Who will be provisioning the WAN connectivity between the various government entities including the main DC connectivity and the DR site	Presently GWAN is provisioning WAN connectivity to MDAs and other Government institutions and they will continue to do so when the data center is built under the guidance of the winning bidder during installation and training and their set up office in Malawi.
116	Our understanding for this scope is that the DC will be provisioned up to the cloud platform level which includes 7x HCI nodes in prod and 7x HCI nodes in DR with Backup and recovery	Yes, your understanding is correct
117	On-going management of the system will be done by resources in Malawi based on SOP's and training that will be provided	Yes, with support as stated in the did document plus set up office personnel of winning bidder in Malawi
118	The NOC software needs to cover the DC environmental up to application monitoring	Please refer to Answer No.107

Note:

- ***Bidders are advised that the solution should support dual stack IPV4/IPV6***
- ***Bidders may access the data centre drawings through the following link which is also available on the PPPC Website:***

  https://drive.google.com/drive/folders/1UkbiXoSmOooum4ROAR84GP5FzSbOMvx8?usp=sharing